2024 Annual Monitoring Report

Final

Ross Landfill Site – ECA No. A413209

Township of Whitewater Region

March 27, 2025

Jp2g Project # 17-6047I



Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

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EXECUTIVE SUMMARY

The Ross Waste Disposal Site is located on Lot 10, Concession 5, in the geographic Township of Ross. The 2024 Annual Monitoring Report is required to satisfy Conditions 92, 93 (p) and 93 (r) of Environmental Compliance Approval No. A413209.

Two groundwater quality monitoring events (June and October) and four surface water monitoring events (May, June, October, and November) were completed in 2024. The spring and fall monitoring consisted of the collection of static water levels, groundwater samples from twenty-eight (28) monitoring points, and surface water samples from three (3) locations. Similar to previous years, the direction of groundwater flow is to the north. Leachate at the site is characterized by groundwater from Borehole BH-5 that is located immediately downgradient of the active fill area of the site. Background values at the site are characterized by groundwater from monitoring well BH-8 that reveals chemical concentrations that are below the Ontario Drinking Water Standards Objectives and Guidelines. The analytical results continue to show a diffuse plume present to the north that is characterized by decreasing chemical concentrations with separation distance from the fill area.

The monitoring points not considered to be impacted by the landfill site are: BH-2A Deep, BH-6A Deep, BH-8, BH-10A Deep, BH-10B Mid, BH-10C Shallow, BH-11A Deep, BH-11B Shallow, BH-13B Shallow, BH-14A Deep, BH-14B Shallow, BH-15A Deep, BH-15B Shallow, BH-16A Deep, BH-16B Shallow, BH-17A Deep, and BH-17B Shallow.

Wells that are considered to be impacted include: BH-2 Shallow, BH-4 Shallow and Deep, BH-5, BH-6 Shallow, BH-7 Shallow and Deep, BH-9 Shallow and Deep, BH-12, and BH-13 Deep.

Wells BH-15, BH-16, and BH-17 that were installed in 2013 are used as RUC compliance wells. The results of the 2024 monitoring reveals exceedances to the trigger median value for manganese at BH-16B Shallow and BH-16A Deep over four consecutive sampling events. The values show a minor increasing trend since 2020 but are considered low. It is our recommendation that manganese be added to the fall analysis at BH-16 to gather additional trend data. Elevated parameters at monitoring station BH-16 appear to be either a result of the natural mineralization of the groundwater at this location or a result of impacts from external sources other than the landfill site.

As water levels seem to indicate potential flow to the downgradient wells (BH-15, BH-16) coupled with the elevated concentrations in the deep setting of BH-16, it is our recommendation that a bi-level well be installed between BH-5 and BH-16 to determine the potential of the impact from landfilling.

Surface water samples were collected in 2024 from sampling locations SW-1A and SW-3 (BLC). Water quality was assessed in relation to the Trigger Mechanism at monitoring location SW-1A. There were no exceedances of the Trigger Mechanism in 2024.

Recommended monitoring for 2025 is provided in **Section 10**.

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LIST OF ACRONYMS

WDS	Waste Disposal Site
ECA	Environmental Compliance Approval
CAZ	Contaminant Attenuation Zone
GAL	Golder Associates Limited
MECP	Ministry of the Environment, Conservation and Parks
TSS	Technical Support Section
ODWS/OG	Ontario Drinking Water Standards, Objectives, and Guidelines
PWQO	Provincial Water Quality Objectives
QA/QC	Quality Assurance and Quality Control
POC	Point of Compliance
RUC	Reasonable Use Criteria
RUPO	Reasonable Use Performance Objectives
CWQG	Canadian Water Quality Guidelines
MVC	Mine View Culvert
BLV	Blind Line Culvert
APV	Aquatic Protection Value

1.0 INTRODUCTION

The Ross Waste Disposal Site (WDS, or site or property or landfill) operates under Provisional Environmental Compliance Approval (ECA) No. A413209 dated December 23, 2005, as amended March 15, 2013, and July 21, 2014, issued for the use and operation of a 5.4 hectare Landfilling Area and Segregated Waste Storage and Processing Facility within an approximate 25-hectare site (**Appendix A**)**.** In 2006, the Township purchased the adjacent Rochon property (12.25 ha) for use as a contaminant attenuation zone (CAZ) to the north and north-west. In 2009, the Municipality purchased the Hawthorne farm (18.5 ha) located immediately north-east of the Site, 4.52 ha of which is to be used as part of the CAZ. The entire 24.77 ha landholding is located on Part Lot 10, Concession 5, in the geographic Township of Ross, Township of Whitewater Region. **Figure 1** is an Existing Conditions Plan, and **Figure 2** is a regional map that shows the entirety of the Ross Landfill Site including purchased property.

This report presents the results of the 2024 monitoring activities that were completed at the Ross WDS. The report and activities have been completed and reported on in *general conformance* with the November 2010 Ministry of the Environment Technical Guidance Document entitled "Monitoring and Reporting and Surface Water for Waste Disposal Sites" (MOE 2010). A "Monitoring and Screening Checklist" is provided in **Appendix B**.

1.1 Site Location

A detailed description of the site location is as follows:

- The Site is located at 990 Kohlsmith Road on Part of Lot 10, Concession 5, (Geographic Township of Ross) in the Township of Whitewater Region. Based on available information, the latest legal survey plan of the original 8.0 ha property was completed by Borne and Simpson dated August 21, 1973. As noted, the municipality purchased additional properties in 2006 and 2009 to the north-west, north, and north-east of the site. The site is owned by the municipality and is comprised of a 5.4 ha landfilling area within a 24.77 ha (±) total site area.
- The site operates under ECA No. A413209 and is licensed to receive solid, non-hazardous municipal waste as well as tires, scrap metal and other recyclable items which will be stored and processed. The site has established storage facilities for empty propane tanks, tires, white goods, scrap metals, and waste electrical and electronic equipment.
- The site coordinates are:
    - 45^0 38' 08" North – 76^0 48' 42" West
    - NAD 83 - UTM 18N – easting 358777 - northing 5055178 (Acquired from Google Earth)

An Existing Conditions Plan 2024 (scale of 1:2,000) is provided as **Figure 1** and a regional site map (scale of 1:15,000) is provided as **Figure 2**. **Figure 3** is a Site Plan and illustrates the monitoring well and approximate surface water sampling locations.

1.2 Site Ownership and Key Personnel

The site is owned and operated by the Township of Whitewater Region. Contacts for the Municipality and the Competent Environmental Practitioner are as follows:

Municipal Contact
The Corporation of the Township of Whitewater Region
Deanna Nicholson, Environmental Services Superintendent
44 Main Street
P.O Box 40,
Cobden, ON, K0J 1K0
Tel. Number: 613-646-2282 Ext. 127
Email: dnicholson@whitewaterregion.ca

CEP Contact Ground and Surface Water
Andrew Buzza, P.Geo.
Tel. Number: 613 828-7800
Email: andrew.buzza@jp2g.com

1.3 Description and Development of the Waste Disposal Site

This section provides a general description of the site including operational details. The following is provided:

Environmental Compliance Approval:
The site operates under ECA No. A413209 dated December 23, 2005, which has been amended on March 15, 2013, and July 21, 2014. The most recent amendment supports the initiation of Stage 2 landfilling operations (provided as **Appendix A**).

Site Status:
The site is currently operational.

Site Capacity:
Jp2g Consultants Inc. provided details on the remaining capacity of the Ross WDS in the 2024 Annual Operations Report. Based on a comparison of site surveys (November 2023 and February 2025), approximately 6,915 m^3 of material was landfilled in 2024. An estimated 169,320 m^3 of landfilling capacity, excluding final cover, remains from the approved design capacity of 375,400 m^3.

Projected Site Life:
At an assumed waste disposal rate of 7,500 m^3 per year, the site is life is approximately 22 years.

Area of current waste cell footprint and approved footprint in hectares:
The current and approved waste disposal area includes a 5.03 ha landfilling area as well as a 0.37 ha FBAL area within the 30 m buffer resulting from historical landfilling operations at the northern corner of the site. This equates to a total approved landfilling area of 5.4 ha.
Area of entire waste disposal site in hectares:
The most recent amendment to the ECA, dated July 21, 2014, identifies a 5.4-hectare fill area within a 25-hectare area site.

Total properties and areas:
The most recent amendment to the ECA lists the entire site as being 25 hectares. In 2007, the Township purchased the adjacent Rochon property (12.25 ha) for use as a CAZ. In 2009, the Municipality purchased the Hawthorne farm (18.5 ha) located immediately east of the site, 4.52 hectares of which is used as a part of the site's CAZ. The entire 24.77-hectare site is located on Part of Lot 10, Concession 5, in the geographic Township of Ross, Township of Whitewater Region.

Dates when waste disposal site opened, operated, and closed as applicable:
The site has reportedly been in operation since the early 1970s. There was a four-year period (2002 – 2006) when the site was closed as a result of the amalgamation of the Township. The site is currently operational.

Information on final cover, slopes, and engineering controls:
Final cover is applied as final grades are reached.

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 authorizing and or control instruments associated with the site.

Description of any storm water management facilities:
There are no stormwater management facilities associated with the site.

Description of any leachate collection systems; and any sewage works:
The Ross WDS is functioning based on natural attenuation. There is no collection system and or any sewage works at the site.

Any site developments, which occurred during the year of the monitoring report:
No unusual site developments occurred in 2024.

Any new developments in the vicinity of the site of relevance from a monitoring perspective:
There are no new developments of relevance from a monitoring perspective.

Historical Site Overview

Environmental baseline investigations which were undertaken:
Historical monitoring has been completed at the Ross WDS. The earliest monitoring reported is from the year 1991. Since this time, monitoring and monitoring well installations have been undertaken. A list of relevant studies is provided in the "References" at the end of the report.

Design and construction of the site:
Development of the site to accommodate the Stage 1 approved waste disposal volume of 59,935 m^3 proceeded in accordance with the "Site Development and Operations Plan" dated June 2001 and follow the drawings included with the correspondence dated September 11, 2003, to J. Hiraishi EAAB.

By the spring of 2013, the Stage 1 trench capacity had been exhausted, and the Township obtained approval to landfill above the original ground elevation in the Stage 1 limits under ECA Notice No. 1 dated March 15, 2013.

Future waste disposal operations are to proceed in accordance with the "Design and Operations Report" dated February 2013 and accompanying drawings, listed below, under ECA Notice No. 2 dated July 21, 2014.

Drawing 1	Existing Conditions Plan 2012
Drawing 2	Cross Section A
Drawing 3	Proposed Final Contours
Drawing 4	Cross Sections B&C

Development of environmental monitoring systems:
The development of environmental monitoring programs was initially provided in early documents prepared by Golder Associates Ltd. (GAL) (1991 – 2005). Jp2g has reported on the environmental monitoring since 2006. Throughout this time, the environmental monitoring has been amended as necessary to reflect the construction of new monitoring wells and/or requests from the Ministry and their Technical Support Section (TSS) report reviews. The current monitoring plan was established based on the "Environmental Monitoring Report" dated February 2013, as per ECA Conditions 72 and 73, and TSS Groundwater and Surface Water review comments.

Development of engineered control systems:
There are no engineered control systems.

Conceptual Site Model:
Details that would comprise the conceptual model are provided in **Section 4.3** of this report.

Initial placement of waste materials:
The initial placement of waste material is documented in earlier reports as referenced at the end of this report.

Filling and closure of the waste cells:
Techniques regarding the filling and closure of waste cells have been documented in the "Design and Operations Report" prepared by Jp2g Consultants Inc., February 2013.

Placement of final cover:
The technique for the placement of final cover is documented in the "Design and Operations Report" prepared by Jp2g Consultants Inc., February 2013.
Date of site closure, actual or projected, including any closure plans:
A date for final closure has not been determined. Based on the Design and Operations Report, the estimated date of closure could be in the 2040's. To date, a closure report has not been prepared.

1.4 Monitoring and Reporting Program

The objectives of the 2024 Monitoring Program are based on the 2012 Environmental Monitoring Report (Jp2g 2013). This report was submitted to the Ministry to address Conditions 38, 39, 40, and 41 of the ECA to obtain approval for Stage 2 landfilling operations. The proposed monitoring program includes:

- Measure groundwater levels during two sampling events;
- Collect groundwater samples from selected monitoring stations;
- Collect surface water samples during two sampling events and after two storm events;
- Provide an assessment of the data collected; and
- Report on the status of all monitoring wells and compliance with O.Reg. 903.

This program was developed based on additional Ministry ground and surface water technical review comments on the application and annual monitoring reports. The monitoring program and reporting has been refined accordingly to address various comments.

The 2024 ground and surface water monitoring program included the following:

Groundwater Locations	Spring Event	Fall Event
BH-2 Deep, BH-2 Shallow, BH-4 Deep, BH-4 Shallow, BH-5, BH-6 Deep, BH-6 Shallow, BH-7 Deep, BH-7 Shallow, BH-8, BH-9 Deep, BH-9 Shallow, BH-10 Deep, BH- 10 Middle, BH-10 Shallow, BH-11 Deep, BH-11 Shallow, BH-12, BH-13 Deep, BH-13 Shallow, BH-14 Deep, BH-14 Shallow, BH-15 Deep, BH-15 Shallow, BH-16 Deep, BH-16 Shallow, BH-17 Deep, BH-17 Shallow	Water Levels – Parameters as listed in Column 1 of Schedule 5	Water Levels – Parameters as listed in Column 2 of Schedule 5
Surface Water Locations	**Spring, Summer, and Fall Event**	
SW-1A SW-2 (MVC) Upgradient SW-3 (BLC) Downgradient	Parameters as listed in Column 3 of Schedule 5	

In addition to the two regular surface water monitoring events, two additional surface water sampling events were completed, each following a storm. Surface water analysis for all events includes parameters listed in Column 3 of Schedule 5.

The program includes the following amendments to the monitoring as described in the 2013 Environmental Monitoring Report: Monitoring wells BH-15, BH-16, and BH-17 were installed in 2013. Additionally, monitoring well BH-1 was decommissioned in 2018.

As required by ECA Condition 81(a), a site-specific Trigger Mechanism and Contingency Plan which was presented in the 2014 Annual Report is included in this Report.

2.0 BACKGROUND

Investigations of the Ross WDS have been carried out over several years, beginning in 1990 by Golder Associates Limited (GAL). Over this period, numerous boreholes were constructed and equipped with monitoring wells. In 2000, a borehole geophysical investigation was completed. Details on the drilling activities and borehole records were submitted by GAL (2006 and 2007). Discussions on the geological and hydrogeological details have been summarized in this report and are based on GAL descriptions.

There are 28 groundwater monitoring points constructed within the vicinity of the landfill site. These consist of 3 single level piezometers, 11 bi-level piezometers and 1 tri-level piezometer. Monitoring well locations are provided in **Figures 1** and **3**. Immediately north of the fill area boundary there is a “draw” in the woodlot that at times experiences seasonal standing water during wetter periods of the year. The Township has in the past collected surface water samples from this location (i.e., surface water location SW-1). As a result of the nature of this area (low area catching meltwater and stormwater only) surface water location SW-1 was moved northeast to approximately 25 meters west of monitoring well BH-11. This is proximal to the area where it is anticipated that the groundwater discharges to the surface. The first sampling of the relocated SW-1 (now referred to as SW-1A) was in 2012. The location of both the historical site SW-1 and the relocated site SW-1A is provided in **Figure 3.**

2.1 Ministry Technical Review Comments

Since the amalgamation of the former Township of Ross, Township of Westmeath, Village of Beachburg, and Village of Cobden to form the Township of Whitewater Region, a number of Ministry technical reviews have been completed on the Ross Waste Disposal Site. Relevant correspondence is provided in **Appendix C**, and the most recent ground and surface water comments are summarized below.

Ministry Groundwater Water Comments

MECP Memorandum dated July 26, 2022 Review of the 2021 Annual Report and Jp2g letter June 21, 2022	Comments
Groundwater Trigger Mechanism – The results from the 2021 monitoring reveals all parameters below the trigger median value with the exception of TDS of BH17-B. Values are low and do not reveal increasing trend. Agricultural activities adjacent to monitoring wells BH-15 and BH-16. If concentrations from these locations continue to rise and there are lines of evidence that suggests that they are landfill related, additional action will be required.	A review of any increasing trends in landfill leachate indicator parameters at the CAZ limits is included in the 2024 Annual Report. Additional review and survey (if needed) of monitoring well ground elevations will be conducted to better define the vertical delineation of the landfill leachate plume at the monitoring wells BH-5, BH-12, BH-13, and BH-14 located between the landfilling area and the CAZ limits. Also review adjacent land use in 2025.
Operation Changes - The changes will trigger to amend the ECA. I have no concerns for these changes from groundwater perspective.	Plans illustrating the reconfigured waste mound design and new waste storage and transfer facilities will be developed in support for an application to amend the ECA.
Groundwater Monitoring Program in 2022 - The proposed groundwater monitoring program is acceptable.	The proposed groundwater monitoring program was conducted in 2023 and 2024.

Ministry Surface Water Comments

MECP Memorandum dated October 31, 2024 Review of the 2023 Annual Report	Comments
The consultant's interpretation of surface water impact is reasonable in that the landfill is not having an adverse effect on surrounding surface water; however, there are increasing concentrations of leachate indicator parameters at BH-5 (leachate well) beginning in around 2015. Concentrations of TAN, boron, chloride, iron and copper in BH-5 have the potential to impair surface waters.	Surface water quality at the site is discussed in Section 8.0.
The consultant has provided a response to previous comments on the 2021/22 annual reports. Moving forward: **- the consultant will compare surface water quality data to the CWQG of 3 mg/L for nitrate-nitrogen.** **- sodium, strontium, and manganese will be added to the surface water parameter list.** **- phenols will be removed from the trigger mechanism.** **- the trigger concentrations for chloride and boron will be changed to the CWQG values.**	The proposed surface water program was implemented in 2024 and will continue moving forward.

The above responses are acceptable. The proposed surface water monitoring program for 2024 is acceptable.	
The concentrations observed at the trigger location (SW-1A) on each sampling event should be compared to the trigger concentration value for each parameter. The contingency plan should be triggered if there is an exceedance of trigger concentrations for any one of the trigger parameters over four consecutive events (i.e., one monitoring year) and/or there are significant changes to the surface water quality (i.e., increase in leachate indicator parameters versus historical values or clear apparent increases in indicator parameter concentrations over time). The trigger mechanism should be reviewed annually to ensure it is still relevant to the site-specific leachate indicators and conceptual site model.	The contingency plan will be triggered if trigger concentrations exceed over four consecutive events. Surface water quality at the site is discussed in Section 8.0.
Careful examination of surface water quality data relative to PWQOs and CWQGs should continue and should include trend plots of key leachate indicator parameters over time to visualize if parameter concentrations are increasing in surface water locations adjacent to the site.	A graph presenting the concentrations over time at SW-1A is presented in Section 8.0.
It appears the consultant has considered the previous comments about not impinging on the 30m buffer on the north side of the site. They indicate waste was removed from the south portion of the mound and placed on top of the mound. The consultant should probably confirm that this would conform to the approved elevations for the site.	The buffers surrounding the landfilling area exceed 30m, the revised final elevations are proposed in the application to amend the ECA.
The ECA application should be reviewed by Approvals Branch to make sure minimum buffer requirements are met.	Agreed

The Township initiated contact with MECP on February 24, 2022, regarding a proposed redesign and expansion of the waste mound to accommodate a new access road, weigh scales and waste/recycling material storage facilities. The Township intends on filing an application to amend the ECA in 2025.

3.0 GEOLOGICAL CONDITIONS

The geological conditions of the site have been reported in detail in previous submissions (GAL and Jp2g). Borehole logs are found in **Appendix D**. The geologic conditions are summarized as follows:

Fill Materials:
Fill consisting of sand or silty sand was encountered at boreholes BH-2, BH-3, BH-4, BH-4A, BH-5, BH-9, BH-10, and BH-12. Fill material at the site ranged in thickness from 0.2 meters at borehole

BH-3 to approximately 4.9 meters at borehole BH-12. Refuse was encountered at locations BH-2, BH-5, BH-9, and BH-12.

Native Overburden Material:
Native overburden materials were encountered at locations throughout the site. Topsoil with an average thickness of 0.13 meters was encountered at boreholes BH-1, BH-3, BH-6, BH-7, BH-8, BH-10, BH-11, BH-13, and BH-14. A sand layer was encountered at locations throughout the site with layers of sand and gravel being present in the northern part of the site at boreholes BH-3, BH-4, BH-5, BH-7, and BH-14. Layers of silty clay to clay silt were encountered at boreholes BH-1, BH-2, BH-3, BH-6, BH-8, BH-10, BH-11, and BH-13. The average thickness of this layer was in the order of 1.4 meters. At borehole locations BH-1, BH-2, and BH-11, a layer of glacial till was encountered below the sand and silty clay at an average depth of 12 meters below ground surface.

Bedrock:
The site is reported to be underlain by granitic bedrock at depths approaching 13 meters at various locations about the site.

2013 Well Data:
The geologic conditions of the site for wells located along the property boundary include a layer of topsoil followed by medium-grained sand and some clay at BH-15 that is located in the northern corner of the site property. A thin layer of topsoil followed by fine, medium, and coarse-grained sand intermixed with gravel and some stones was encountered at the shallow setting of BH-16, while sand intermixed with gravel was observed at the deep setting of BH-16 located along the northwest property boundary of the site. A layer of sandy clay followed by silty sand was observed at the northeast property boundary of the site at BH-17.

4.0 HYDROGEOLOGY

4.1 Hydraulic Conditions

Hydraulic conductivities at the site have been determined by rising head tests and from grain size distributions. Hydraulic conductivities at the site are reported to range from 1.7×10^{-4} cm/s to 13×10^{-2} cm/s. These values are considered to be representative of what would be expected for the overburden sand deposit in the area of the site. The average linear groundwater velocity has been reported to vary between 1 and 45 meters per year.

Groundwater levels were measured at the monitoring well locations at the site to assist in determining the direction of groundwater flow. The 2024 water table elevations (geodetic) are provided in **Table 1**. Vertical gradients determined from the 2024 water level data are also provided.

Table 1: Summary of Water Level Data

Monitoring Well	Jun-24	Oct-24
BH-1	Decomissioned	
BH-2B Shallow	152.03	152.51
BH-2A Deep	152.15	152.68
BH-3	Destroyed	
BH-4A Shallow	151.83	151.74
BH-4 Deep	152.38	152.35
BH-5		
BH-6B Shallow	152.18	152.10
BH-6A Deep	152.23	152.14
BH-7B Shallow	151.71	151.61
BH-7A Deep	151.25	151.17
BH-8	153.32	153.23
BH-9B Shallow	152.16	152.21
BH-9A Deep	152.31	152.07
BH-10C Shallow	152.64	152.57
BH-10B Middle	152.68	155.59
BH-10A Deep	152.72	152.64
BH-11B Shallow	151.80	151.77
BH-11A Deep	151.96	151.91
BH-12	152.51	152.42
BH-13B Shallow	151.75	151.63
BH-13A Deep	151.74	151.65
BH-14B Shallow	152.47	152.39
BH-14A Deep	152.45	152.38
BH-15B Shallow	150.88	150.78
BH-15A Deep	150.90	150.79
BH-16B Shallow	151.64	151.55
BH-16A Deep	151.62	151.53
BH-17B Shallow	151.77	151.71
BH-17A Deep	151.70	151.69

⇧ - Direction of vertical hydraulic gradient

N/A - No groundwater elevation available

4.2 Groundwater Flow

The direction of overburden groundwater flow from the October monitoring event is provided in **Figures 4A** and **4B** for shallow and deep groundwater, respectively. Consistent with previous years, the groundwater flow is interpreted to be northward. Locally, the groundwater table is relatively flat. Hydraulic gradients are 0.0045m/m (deep and shallow setting) between BH-2 and BH-7 and from 0.0061m/m (deep setting) to 0.0048m/m (shallow setting) between BH-8 and BH-7.

Deep
Distance between wells BH-2A to BH-7A = 200 metres
Head drop from BH-2A to BH-7A (October 2024) = 152.68 – 151.17/200 = 0.0045m/m

Shallow
Distance between wells BH-2B to BH-7B = 200 metres
Head drop from BH-2B to BH-7B (October 2024) = 152.51 – 151.61/200 = 0.0045m/m

Deep
Distance between wells BH-8 to BH-7A = 340 metres
Head drop from BH-8 to BH-7A (October 2024) = 153.23– 151.17/340 = 0.0061m/m

Shallow
Distance between wells BH-8 to BH-7B = 340 metres
Head drop from BH-8 to BH-7B (October 2024) = 153.23– 151.61/340 = 0.0048m/m

4.3 Conceptual Model

The leachate generated at the landfill will migrate in a predominately vertical direction because of the high permeability of the material in the unsaturated zone. The physical characteristics (density, solubility) of the chemicals in the leachate will determine whether the contaminants will migrate along the water table surface, or within the saturated zone along the bedrock surface. The primary pathway for leachate migration is north from the fill area.

North of the fill area is SW-1A which is located near the intersection of two areas characterized as being “seasonal draws” that at times catch seasonal water. The location of SW-1A is shown in **Figure 3**.

5.0 WELL MAINTENANCE

All wells are reported to be in working order in 2024. A photographic record of all well locations from the 2024 environmental monitoring is provided in **Appendix E**.

There are currently 28 groundwater monitoring points established at the site. These consist of 3 single level piezometers, 11 bi-level piezometers, and 1 tri-level piezometer. The location of the monitoring wells is provided in **Figure 3**. The name, elevation, type, location, and operational status of respective wells are provided in **Table 2**.

Table 2: Monitoring Well Status

Monitoring Well	Reference Elevation Top of Pipe (mASL)	Ground Elevation (mASL)	Top of Screen Depth (Metres Below Ground)	Top of Screen Depth (mASL)	Well Type	Coordinates Easting	Coordinates Northing	Operational Status
BH-1	-	-	12.90	-	On-Site Upgradient	358731	5055129	Decommisioned
BH-2B Shallow	162.15	161.41	8.80	152.61	On-Site Cross Gradient	358579	5055310	Operational
BH-2A Deep	162.15	161.41	11.30	150.11	On-Site Cross Gradient	358579	5055310	Operational
BH-3	-	-	8.50	-	On-Site Cross Gradient	-	-	Destroyed
BH-4A Shallow	159.84	159.09	7.70	151.39	On-Site Centre	358738	5055412	Operational
BH-4 Deep	159.86	159.19	12.30	146.89	On-Site Centre	358738	5055412	Operational
BH-5	-	-	7.70	-	On-Site Centre	358655	5055367	Operational
BH-6B Shallow	160.65	159.83	9.80	150.03	CAZ - Down Gradient	358636	5055417	Inaccessible
BH-6A Deep	160.46	159.79	14.50	145.29	CAZ - Down Gradient	358636	5055417	Operational
BH-7B Shallow	158.74	158.20	6.00	152.20	CAZ - Down Gradient	358657	5055487	Operational
BH-7A Deep	158.31	158.15	12.95	145.20	CAZ - Down Gradient	358657	5055487	Operational
BH-8	162.27	161.34	10.70	150.64	On-Site Upgradient	358915	5055245	Operational
BH-9B Shallow	159.98	159.07	6.80	152.27	On-Site Centre	358704	5055395	Operational
BH-9A Deep	159.98	159.08	11.85	147.23	On-Site Centre	358704	5055395	Operational
BH-10C Shallow	158.97	158.01	5.75	152.26	On-Site Centre	358796	5055382	Operational
BH-10B Middle	158.95	158.04	10.50	147.54	On-Site Centre	358796	5055382	Operational
BH-10A Deep	159.01	158.01	15.09	142.92	On-Site Centre	358796	5055382	Operational
BH-11B Shallow	154.02	153.12	2.80	150.32	CAZ - Down Gradient	358755	5055521	Operational
BH-11A Deep	154.02	153.12	6.85	146.27	CAZ - Down Gradient	358755	5055521	Operational
BH-12	160.91	160.31 (2)	8.20	152.11 (2)	On-Site Centre	358762	5055401	Operational
BH-13B Shallow	156.84	156.24 (2)	5.30	150.94 (2)	CAZ - Down Gradient	358624	5055533	Operational
BH-13A Deep	156.82	156.22 (2)	7.80	148.42 (2)	CAZ - Down Gradient	358624	5055533	Operational
BH-14B Shallow	157.87	157.27 (2)	7.25	150.02 (2)	CAZ - Cross Gradient	358798	5055454	Operational
BH-14A Deep	157.88	157.28 (2)	10.50	146.78 (2)	CAZ - Cross Gradient	358798	5055454	Operational
BH-15B Shallow	153.91	152.97	4.54	148.425	CAZ - Down Gradient	358589	5055746	Operational
BH-15A Deep	153.79	152.92	8.78	144.141	CAZ - Down Gradient	358590	5055746	Operational
BH-16B Shallow	164.20	163.29	10.16	153.128	CAZ - Down Gradient	358440	5055614	Operational
BH-16A Deep	163.97	163.28	14.60	148.675	CAZ - Down Gradient	358439	5055615	Operational
BH-17B Shallow	154.96	154.23	4.57	149.658	CAZ - Down Gradient	358834	5055539	Operational
BH-17A Deep	154.72	154.00	10.67	143.336	CAZ - Down Gradient	358831	5055539	Operational

Notes:
1) BH-6A was repaired October 2018
2) Pipe cut

6.0 2024 ENVIRONMENTAL MONITORING

In 2024, two (2) water quality-monitoring events were completed in which groundwater levels and selected water quality samples were collected as required by Condition 73 of ECA No. A413209. The required 'spring' and 'fall' events were completed in June and October 2024, respectively. As per Condition 72 of the ECA, surface water sampling was carried out during the spring and fall sampling events. In addition, the ECA requires that surface water samples be collected following two (2) storm events. Storm event sampling was completed in May and November 2024. **Table 3** indicates the monitoring stations sampled during the 2024 monitoring program as well as the stations that are required by the ECA. The locations of the monitoring stations are provided in **Figure 3**.

All sampling in 2024 was completed by Jp2g Consultants Inc. with laboratory analysis completed by Caduceon Environmental Laboratories. All sampling was completed in general accordance with standard sampling procedures provided in **Appendix F**.

Table 3: 2024 Environmental Monitoring Details

Monitoring Well	Required by ECA	Trigger Location	May Storm Event	Nov Storm Event	Jun-24		Oct-24	
					Water Level	Sampled	Water Level	Sampled
BH-1	Decommissioned							
BH-2B Shallow	√				√	NS	√	NS
BH-2A Deep	√				√	NS	√	NS
BH-3	Destroyed							
BH-4A Shallow	√	√			√	√ + VOCs	√	√
BH-4 Deep	√	√			√	√ + VOCs	√	√
BH-5	√				√	√ + VOCs	√	√
BH-6A Deep	√				√	√ + VOCs	√	√
BH-6B Shallow	√				√	√ + VOCs	√	√
BH-7A Deep	√				√	√ + VOCs	√	√
BH-7B Shallow	√				√	√ + VOCs	√	√
BH-8	√				√	√ + VOCs	√	√
BH-9A Deep	√				√	√ + VOCs	√	√
BH-9B Shallow	√				√	√ + VOCs	√	√
BH-10A Deep		√			√	√ + VOCs	√	√
BH-10B Middle	√	√			√	√ + VOCs	√	√
BH-10C Shallow	√	√			√	√ + VOCs	√	√
BH-11A Deep	√	√			√	√ + VOCs	√	√
BH-11B Shallow	√	√			√	√ + VOCs	√	√
BH-12	√				√	√ + VOCs	√	√
BH-13A Deep	√	√			√	√ + VOCs	√	√
BH-13B Shallow	√	√			√	√ + VOCs	√	√
BH-14A Deep	√	√			√	√ + VOCs	√	√
BH-14B Shallow	√	√			√	√ + VOCs	√	√
BH-15A Deep					√	√ + VOCs	√	√
BH-15B Shallow					√	√ + VOCs	√	√
BH-16A Deep					√	√ + VOCs + DUP	√	√ + DUP
BH-16B Shallow					√	√ + VOCs	√	√
BH-17A Deep					√	√ + VOCs	√	√
BH-17B Shallow					√	√ + VOCs	√	√
MVC (SW-2)	√		NS	NS		NS		NS
SW-1 Historical	Removed							
SW-1A Current	√		√	√ + DUP		√ + VOCs		√
BLC (SW-3)	√		√	√		NS		NS

Notes:

1) NS - No sample was taken as location was dry or inaccessible
2) DUP - Duplicate samples were taken
3) VOCs - Volatile Organic Compound Samples Collected
4) VOCs as listed in column 1 were analyzed

7.0 GROUNDWATER QUALITY

7.1 Assessment Program

Groundwater sampling was completed at the Ross WDS to evaluate the quality and to assess any impact that the site may have on the local groundwater environment. Results of the compiled chemical analysis are provided in **Appendix G**. The following sections discuss the variation of chemical concentrations of the sampled groundwater at monitoring locations throughout the site. These sections include assessment of the site background water quality, leachate impacted groundwater, and water quality from other sample locations about the site. Where applicable, chemical concentrations have been compared to the Ontario Drinking Water Standards, Objectives, and Guidelines (ODWS/OG) and, if relevant, the Provincial Water Quality Objectives (PWQO's). When available, groundwater elevations were provided in the long-term trend graphs to illustrate the relative groundwater elevation in correlation to the chemical trends.

7.2 Quality Assurance and Quality Control

Blind field duplicate samples were collected from monitoring wells BH-16 Deep during the spring and fall events. In addition, duplicate samples were collected at surface water station SW-1A during the November storm event. All quality assurance and quality control (QA/QC) duplicate samples were submitted for laboratory analysis of the environmental quality parameters listed in the environmental monitoring program. The QA/QC results are presented in the chemical database that is provided in **Appendix G.**

All the average RPD values calculated were ≤25% for surface water and groundwater duplicates. This suggests that groundwater and surface water sample handling and analytical protocols were acceptable, and that analytical results were reproducible.

7.3 Background Water Quality

The background water quality is defined as the groundwater which is believed to be unaffected by leachate from the site. At the Ross WDS, background values are typically represented by low chemical concentrations that have historically been collected from samples from monitoring location BH-1, however, as landfilling operations have surrounded and compromised monitoring well BH-1, it was decommissioned in 2018 and background assessment has been based on water quality retrieved from monitoring well BH-8 since. This well is located upgradient of the active landfill area.

All concentrations from monitoring well BH-8 reveal values that are less than the ODWS/OG. An apparent anomalous elevated DOC level was noted in October 2023. Levels returned to historical values in 2024. Concentrations of nitrate and TDS may be considered slightly elevated. Concentrations of chloride and TDS in the vicinity, as previously discussed by Golder Associates Ltd (GAL), suggest potential impact from road de-icing operations along Kohlsmith Road. The elevated nitrate concentrations are attributed to the application of fertilizers on surrounding agricultural land. **Table 4** outlines the concentrations of typical overburden background indicator parameters from the 2024 monitoring at BH-8 and the median values from the entire sampling history at this location.

Table 4: Background Values Monitoring Well BH-8

Parameters	ODWS/OG	BH-8		BH-8 Median Values
		June	October	
		2024		
TDS	500	221	278	231
Chloride	250	7	7	7.2
Sulphate	500	16	15	15
Nitrate	10	7.01	7.99	6.5
Alkalinity	30 - 500	191	182	141
Sodium	200	4	4	4
Manganese	0.05	<0.01	--	<0.01
Barium	1	0.04	0.04	0.03
Boron	5	<0.01	<0.01	<0.01
Calcium	-	72	69	54

All values in mg/L

Median values are taken from the sampling history

-- Not analyzed

***BOLD** - Exceeds ODWS/OG*

7.4 Leachate Characteristics

Leachate characteristics are typically those chemical concentrations that exhibit the highest chemical values. In the case of the Ross WDS, leachate values are considered to be representative of concentrations from samples collected from monitoring well BH-5. Monitoring well BH-5 is located immediately downgradient of where recent landfilling activities have taken place, at the north-eastern edge of the Stage I landfilling area. In reference to the borehole log (**Appendix D**), monitoring well BH-5 is located in approximately 9.1 m of fine to medium grained loose to compact sand with trace silts. Monitoring well BH-5 exhibits concentrations thought to be more representative of leachate from recent landfilling activities.

Water quality from monitoring well BH-5 reveals manganese (June only), TDS, DOC, alkalinity, chloride, sodium, iron, boron, and barium to exceed ODWS/OG in 2024. Concentrations at this location are also characterized by elevated values of TDS, chloride, sulphate, alkalinity, sodium, manganese, barium, boron, and calcium relative to background concentrations. **Table 5** provides a comparison of indicator parameters from BH-5 to background values. **Graph 1** outlines concentrations of the typical leachate parameters over the past six monitoring events.

Table 5: Range of Leachate Values

Parameters	ODWS/OG	BH-8 Background Median Value	BH-5 Leachate		BH-5 Leachate Range
			June	October	
			2024		
TDS	500	231	**2630**	**3100**	94 - **3240**
Chloride	250	7.2	**411**	**622**	3 - **622**
Sulphate	500	15	9	5	5 - 125
Nitrate	10	6.5	0.13	0.28	<0.05 - 6
Alkalinity	30 - 500	141	**1740**	**2010**	62 - **2110**
Sodium	200	4	**435**	**561**	1 - **561**
Manganese	0.05	<0.01	**0.19**	--	<0.01 - **8.73**
Barium	1	0.03	**1.76**	**2**	<0.01 - **2.9**
Boron	5	<0.01	**5.9**	**9.7**	<0.01 - **9.7**
Calcium	-	54	253	195	23 - 322

All values in mg/L

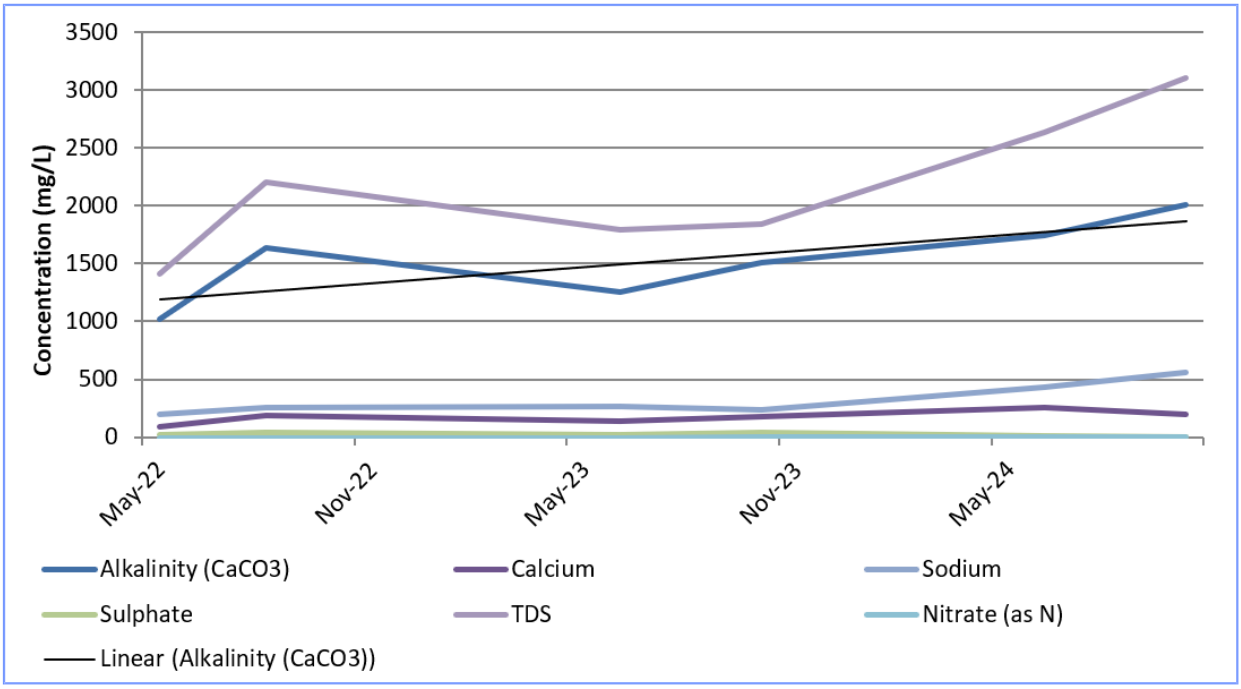
***BOLD** - Exceeds ODWS/OG*

-- Not analyzed

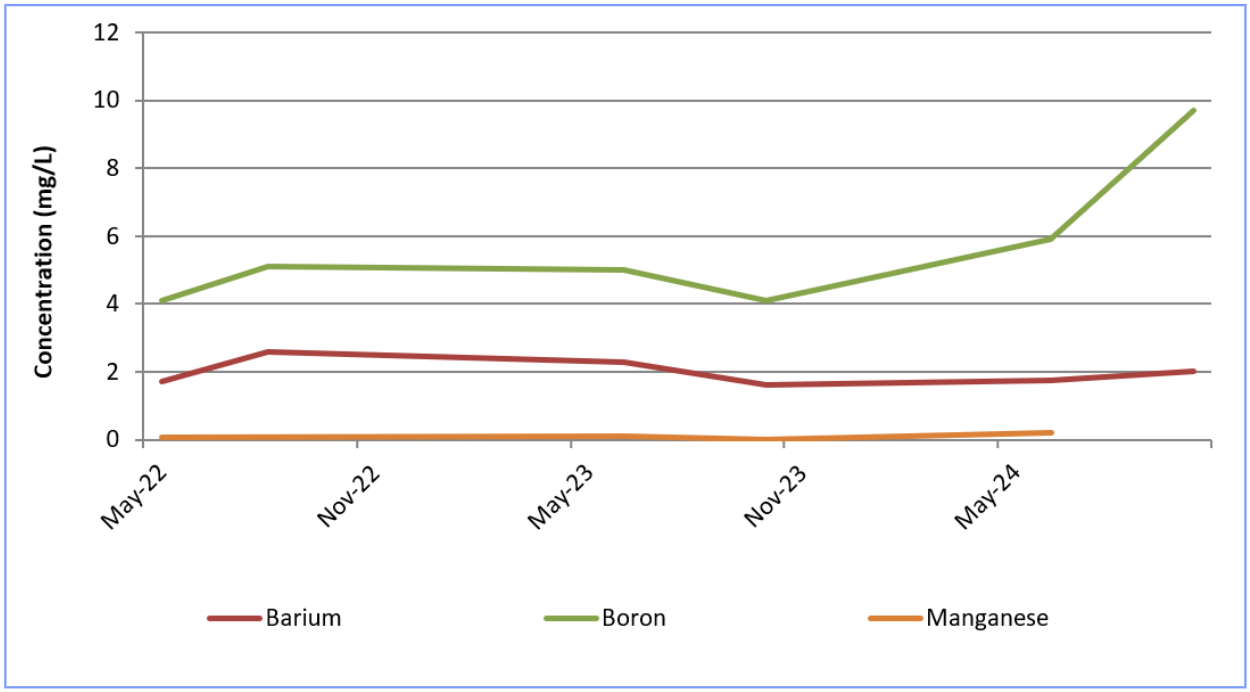
Median values are taken from the sampling history

Leachate range values taken from the sampling history

Graph 1A: Leachate Parameters over Time BH-5



Graph 1B: Leachate Parameters over Time BH-5



Historically BH-5 has shown a sensitivity to seasonal trends. Lower concentrations are typically observed in the spring which could be a result of spring freshet dilution to the otherwise high concentrations at this location. Into 2023, this trend has somewhat stabilized, which is demonstrated in **Graph 1**. The trend will continue to be tracked as future data is collected. A slight increasing trend is noted for alkalinity, TDS, and sodium.

7.5 Overburden Groundwater

The following sections provide a discussion on the analytical results from the samples collected from individual sample locations. The location of all monitoring wells is provided in **Figure 3**.

Background

Monitoring well BH-1 is located on site in the southwestern corner and has historically been interpreted to be representative of background conditions. However, as landfilling within Stage 1 surrounded this borehole, it no longer became reliable as a background location. Accordingly, monitoring well BH-1 was decommissioned in the fall of 2018. Groundwater quality from monitoring well BH-8 that is located in the northeast corner of the site is considered representative of background values. **Table 6** provides the median background values from Monitoring Well BH-8 in comparison to leachate values.

Table 6: Comparison of Median Background Values to Leachate Concentrations

Parameters	ODWS	BH-8	BH-5
		Background	Leachate
TDS	500	231	94 - **3240**
Chloride	250	7.2	3 - **620**
Sulphate	500	15	5 - 125
Nitrate	10	6.5	<0.05 - 6
Alkalinity	30 - 500	141	62 - **2110**
Sodium	200	4	1 - **561**
Manganese	0.05	<0.01	<0.01 - **8.73**
Barium	1	0.03	<0.01 - **2.9**

All values in mg/L
Background concentrations are median values
***Bold** exceeds ODWS*
-- Not analyzed
Median values are taken from the sampling history
Leachate range values taken from the sampling history

BH-2

Monitoring well BH-2 is a bi-level well (BH-2A Deep setting and BH-2B Shallow setting) that is located at the western corner of the site. This well is interpreted to be slightly outside the main flow path from the waste disposal area. The deep piezometer setting was noted as dry in both sampling events in 2024 and could not be sampled. The chemical profile has historically been similar to, and sometimes less than, background values at this location. Long-term trends at this location are illustrated in **Graph 2**. At this time, BH-2 Deep is not interpreted to be impacted by the landfill site.

The shallow piezometer setting was also noted as dry in both sampling events and could not be sampled. Concentrations at this location appear to show intermittent fluctuations in values among sampling events. At times, concentrations are in line with historical sampling values, whereas at other times they are elevated. It is possible that the chemical profile at this location is highly sensitive to the groundwater elevation (**Graph 3**). BH-2 Shallow exhibits slight evidence of impact from the landfill site.

Concentrations at the deep and shallow settings of BH-2 were compared to surface water quality guidelines. Copper and (to a lesser extent) boron have been known to exceed PWQO's at BH-2B (shallow) from time to time.

Table 7 provides a comparison of chemical results from monitoring well BH-2 to background levels and leachate characteristics in 2023. Chemical trends are provided in **Graphs 2** and **3**.

Table 7: Comparison of BH-2 to Background and Leachate Concentrations

Parameters	ODWS	BH-8	BH-5	BH-2A Deep		BH-2B Shallow	
		Background	Leachate	June	October	June	October
				2023			
TDS	500	231	94 - **3240**	156	--	339	--
Chloride	250	7.2	3 - **620**	14	--	11	--
Sulphate	500	15	5 - 125	25	--	14	--
Nitrate	10	6.5	<0.05 - 6	<0.10	--	1.88	--
Alkalinity	30 - 500	141	62 - **2110**	126	--	270	--
Sodium	200	4	1 - **561**	7	--	7	--
Manganese	0.05	<0.01	<0.01 - **8.73**	0.02	--	**0.33**	--
Barium	1	0.03	<0.01 - **2.9**	0.03	--	0.05	--

All values in mg/L

Background concentrations are median values

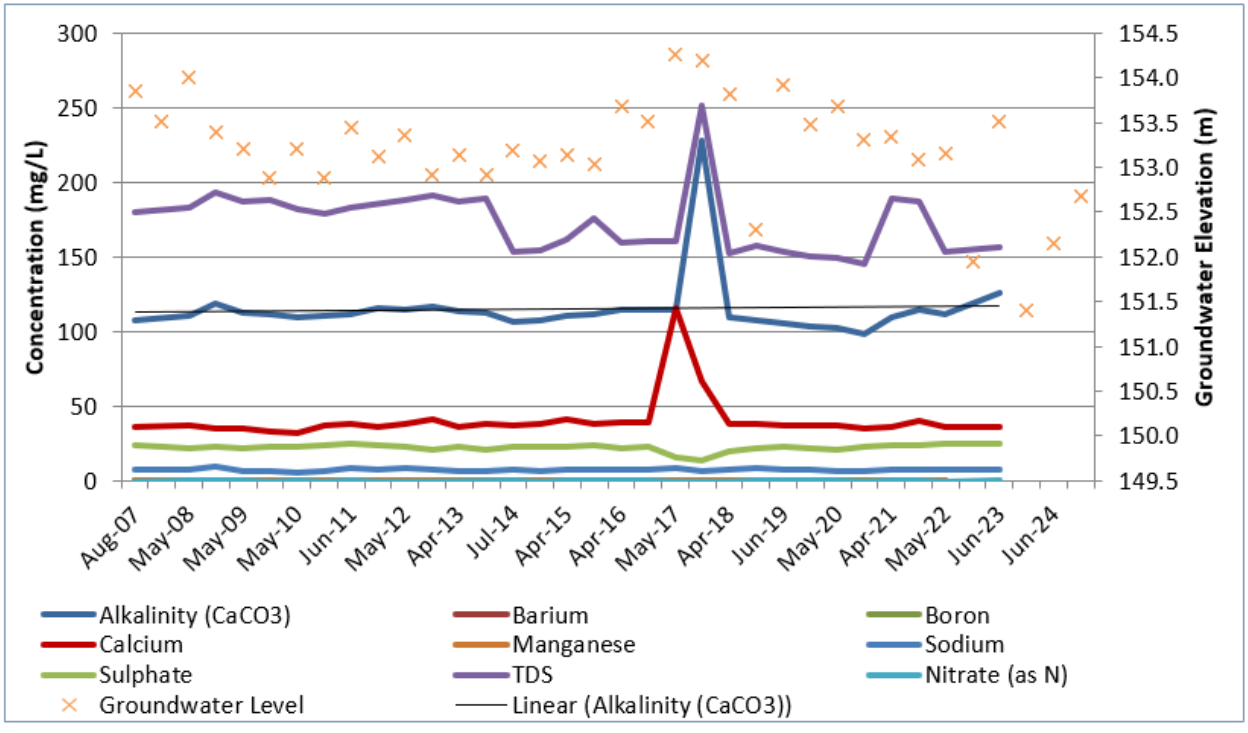
***Bold** exceeds ODWS*

-- Not analyzed

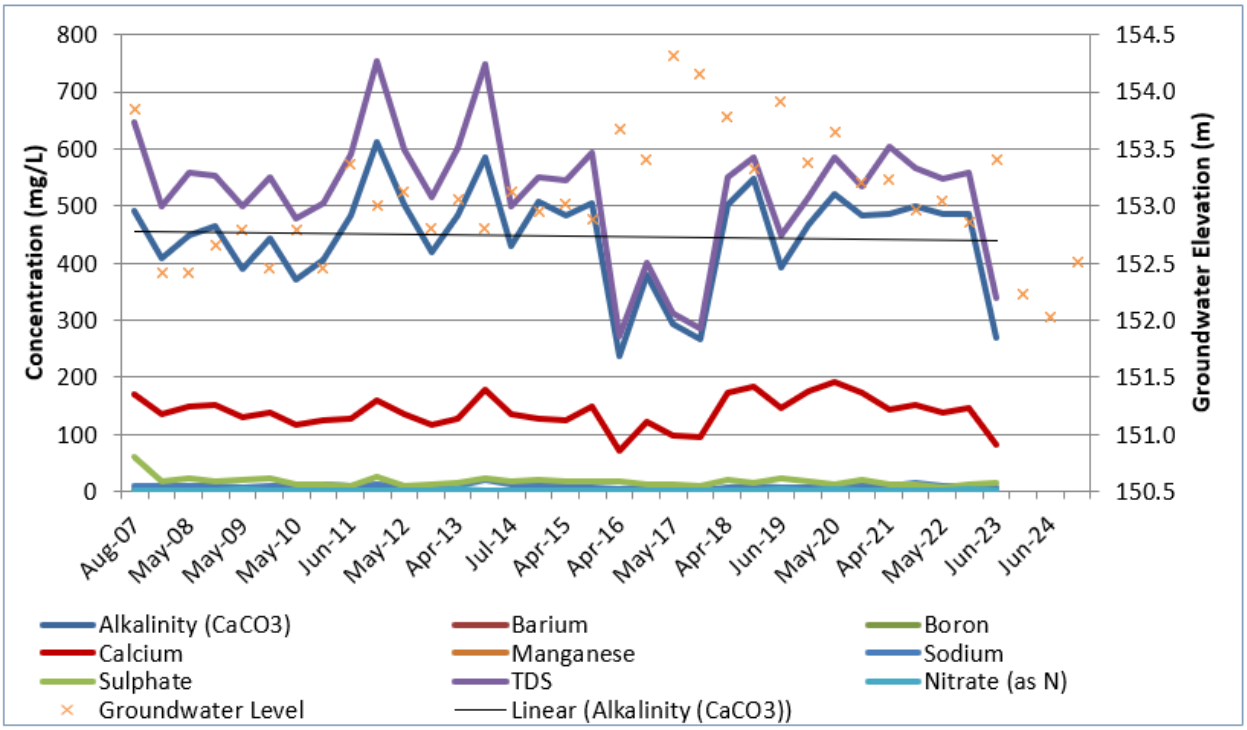
Median values are taken from the sampling history

Leachate range values taken from the sampling history

Graph 2: Leachate Parameters over Time BH-2A Deep



Graph 3: Leachate Parameters over Time BH-2B Shallow



BH-4

Monitoring location BH-4 is a bi-level well (BH-4A Shallow setting and BH-4 Deep setting) and is located on-site, downgradient in the northern corner of the active fill area. Ontario Drinking Water Standard exceedances of manganese (0.09 mg/L in June), nitrate (12.9 mg/L in June and 15.0 mg/L in October), and TDS (595 mg/L in June and 584 mg/L in October) were noted at the monitor's deep setting. This well also reveals elevated concentrations of nitrate, TDS, alkalinity, chloride, sulphate, sodium, manganese, and barium in relation to background values. Water quality at monitoring well BH-4 Deep reveals subtle increasing trends in recent years. Water quality at BH-4 Deep is thought to be slightly impacted by the landfill site.

The shallow piezometer setting reveals concentrations of nitrate (15.3 mg/L in June and 16.9 mg/L in October) to exceed the ODWS during 2024. Similar to the deeper setting, this well also reveals elevated concentrations of alkalinity, TDS, chloride, sulphate, nitrate, sodium, and barium in relation to background values. Water quality at BH-4A Shallow is also interpreted to be slightly impacted by the landfill site, however no significant long-term trends are observed. **Table 8** illustrates the chemical contractions from this location in comparison to background and leachate values. Trends over time are provided in **Graphs 4** and **5**.

Concentrations analyzed during the 2024 monitoring period at the shallow setting do not exceed surface water guidelines (PWQO's). In the deep setting, boron exceeded the PWQO's in June and October.

Table 8: Comparison of BH-4 to Background and Leachate Concentrations

Parameters	ODWS	BH-8	BH-5	BH-4 Deep		BH-4A Shallow	
		Background	Leachate	June	October	June	October
				2024			
TDS	500	231	94 - **3240**	**595**	**584**	**464**	**473**
Chloride	250	7.2	3 - **620**	47	43	23	23
Sulphate	500	15	5 - 125	36	28	26	21
Nitrate	10	6.5	<0.05 - 6	**12.9**	**15.0**	**15.3**	**16.9**
Alkalinity	30 - 500	141	62 - **2110**	366	357	273	284
Sodium	200	4	1 - **561**	26	22	10	9
Manganese	0.05	<0.01	<0.01 - **8.73**	**0.09**	--	**<0.01**	
Barium	1	0.03	<0.01 - **2.9**	0.13	0.13	0.09	0.09

All values in mg/L

Background concentrations are median values

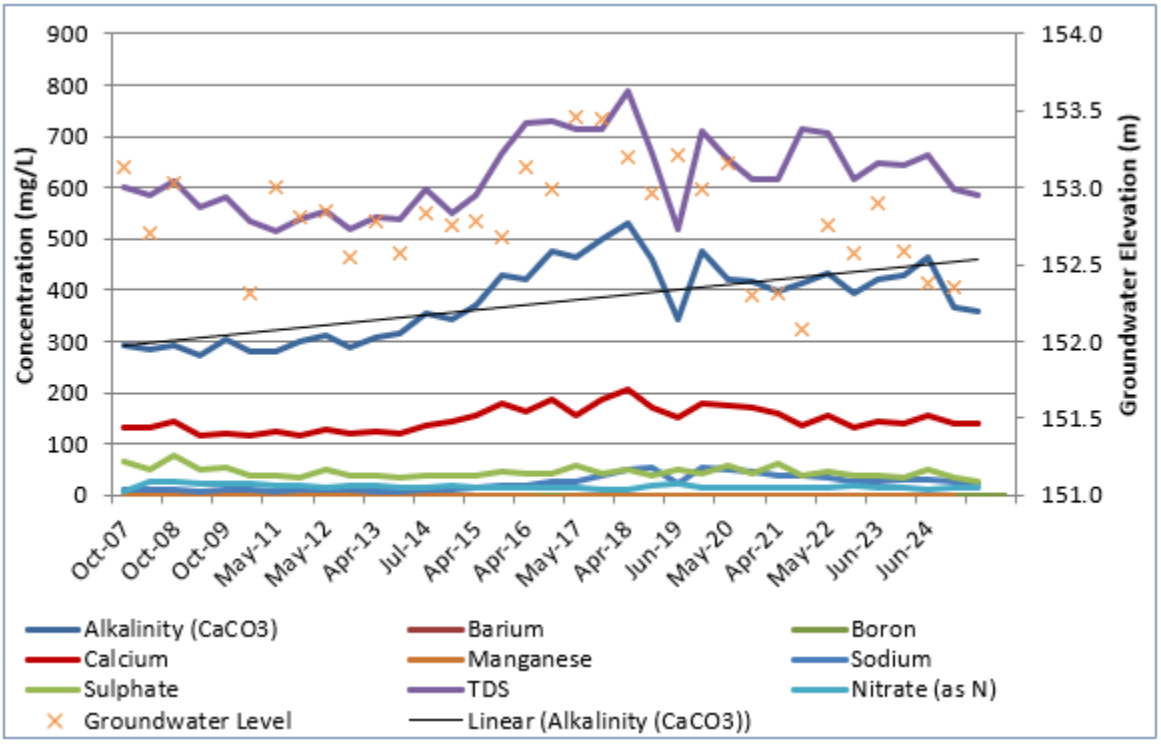
***Bold** exceeds ODWS*

-- Not analyzed

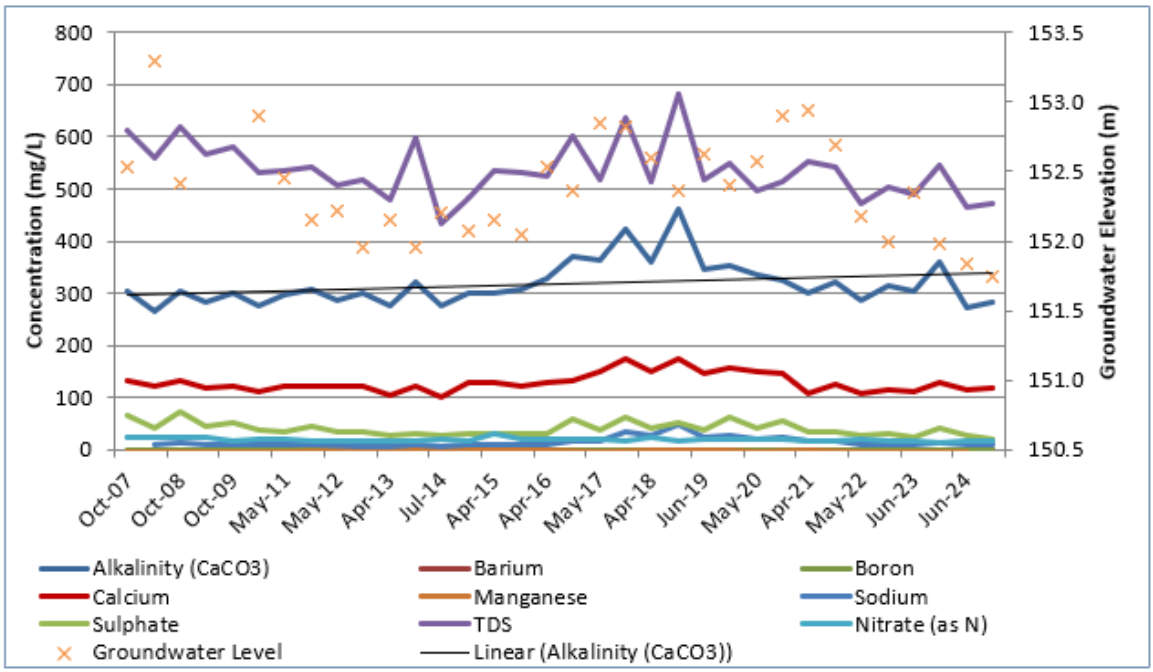
Median values are taken from the sampling history

Leachate range values taken from the sampling history

Graph 4: Leachate Parameters over Time BH-4 Deep



Graph 5: Leachate Parameters over Time BH-4A Shallow



Long-term trends illustrated in **Graphs 4** and **5** show a gradual increase in several parameters from 2014 to 2019 with stable concentrations in recent years. Slight concentration fluctuations noted in the deep and more severely in the shallow settings correlate with the seasonal fluctuations in the groundwater table. Lower concentrations in the spring can be attributed to groundwater dilution resulting from spring freshet.

BH-5

Monitoring station BH-5 is a single-level piezometer. Concentrations from this location have been interpreted to be representative of leachate impact at the site with elevated concentrations of alkalinity, chloride, DOC, iron, manganese, barium, boron, sodium, and TDS. Concentrations at this well are noted to be increasing. Refer to **Section 7.4** for continued discussion on this well.

BH-6

Monitoring location BH-6 is a bi-level well (BH-6A Deep setting and BH-6B Shallow setting) which is located to the north of the landfill area and is interpreted to be within the flow path and downgradient from the site. Concentrations from the deep piezometer setting location reveal all assessed chemical concentrations to be less than ODWS/OG values. Concentrations are relatively consistent over time at this location, with the exception of a slight decrease in the stability of several parameters in recent years (October 2019). Since 2019 the concentrations have remained slightly elevated. **Graph 6** outlines the chemical profile at this location and shows that chemical concentrations from the deep setting do not appear to be influenced by the groundwater elevations. The groundwater at BH-6A deep is not interpreted to be impacted by the landfill site.

The shallow piezometer setting reveals concentrations of DOC (19.6 mg/L in June and 7.6 mg/L in October), iron (5.18 mg/L in June and 1.05 mg/L in October), manganese (0.62 mg/L in June), and

TDS (793 mg/L in June) to exceed the ODWS during 2024. Parameters such as TDS, alkalinity, chloride, sulphate, sodium, manganese, and barium reveal concentrations that are somewhat higher than background values. This may suggest that the groundwater at BH-6B Shallow could be affected by the landfill operations. Notably increasing long-term trends revealed in **Graph 7** reaffirm this. **Table 9** provides a comparison of sampling results to background and leachate concentrations at the site.

Table 9: Comparison of BH-6 to Background and Leachate Concentrations

Parameters	ODWS	BH-8	BH-5	BH-6A Deep		BH-6B Shallow	
		Background	Leachate	June	October	June	October
				2024			
TDS	500	231	94 - **3240**	178	174	**793**	384
Chloride	250	7.2	3 - **620**	16	15	107	45
Sulphate	500	15	5 - 125	23	22	18	18
Nitrate	10	6.5	<0.05 - 6	<0.10	<0.10	<0.10	<0.10
Alkalinity	30 - 500	141	62 - **2110**	141	141	473	232
Sodium	200	4	1 - **561**	13	12	104	37
Manganese	0.05	<0.01	<0.01 - **8.73**	0.02	--	**0.62**	
Barium	1	0.03	<0.01 - **2.9**	0.03	0.02	0.45	0.10

All values in mg/L

Background concentrations are median values

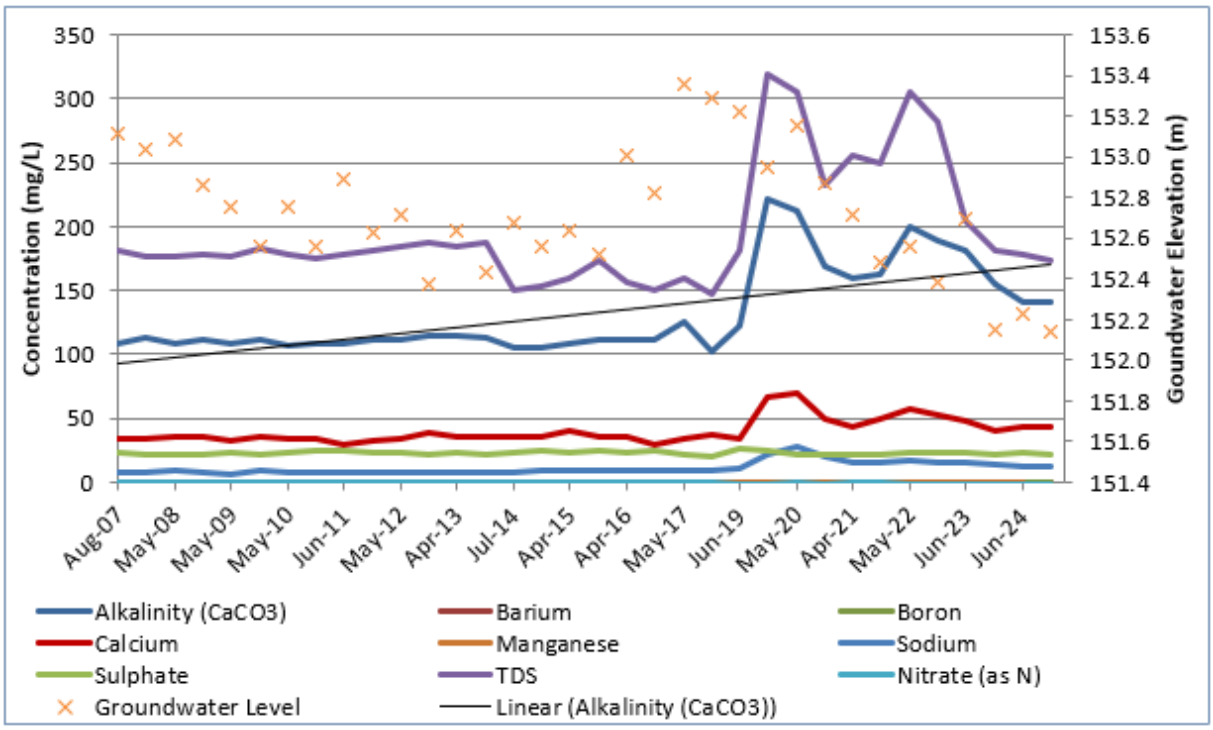
***Bold** exceeds ODWS*

-- Not analyzed

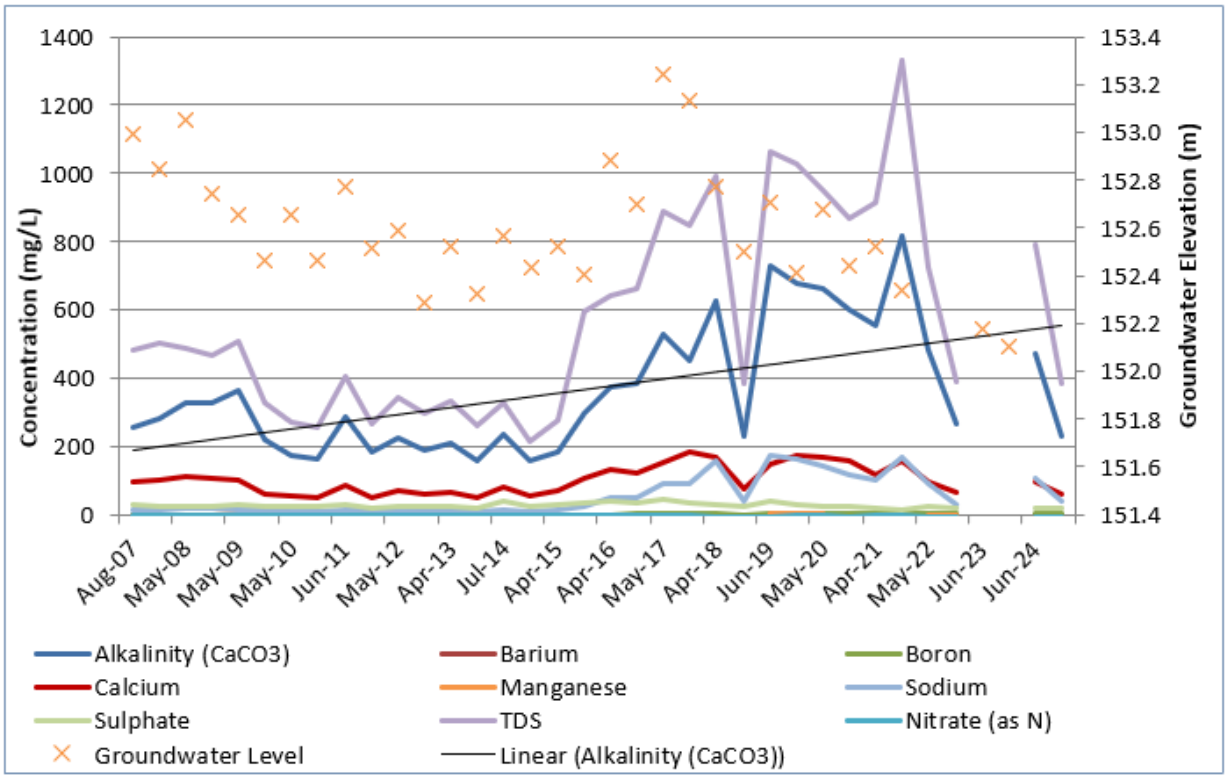
Median values are taken from the sampling history

Leachate range values taken from the sampling history

Graph 6: Leachate Parameters over Time BH-6A Deep



Graph 7: Leachate Parameters over Time BH-6B Shallow



Being directly downgradient from both BH-5 and the active landfilling area, it is likely that the spikes shown on **Graph 7** can be associated with the concentration spikes that are experienced

by BH-5. Peak concentrations of the spikes shown in the BH-5 monitoring results are significantly higher than those which are represented in BH-6B data. This decline in concentration between the two well points suggests a large amount of contaminant attenuation within the subsurface. Concentrations in recent years have dramatically increased at the shallow setting of this location; this trend will be tracked over future monitoring periods.

Water quality at BH-6 was compared to PWQO's. All parameters at the deep setting are shown to be less than PWQO's at this location. Similarly, historically all parameters at the shallow setting are shown to be less than PWQO's at this location with the exception of boron, copper, and iron which exceed the PWQO consistently since April 2016.

BH-7

Monitoring location BH-7 is a bi-level well (BH-7A Deep setting and BH-7B Shallow setting) which is located slightly further north than monitoring well BH-6. This well is in the downgradient flow path from the fill area. The deep piezometer setting reveals exceedances of iron (0.6 mg/L in October), manganese (0.45 mg/L in June), and nitrate (14.0 mg/L in June and 15.3 mg/L in October). The anomalous DOC exceedance in October 2023 has returned to historical levels in 2024. Samples from this location also exhibit concentrations of TDS, chloride, sulphate, nitrate, alkalinity, sodium, manganese, and barium to be greater than background values. Trends from this well are provided in **Graph 8** and reveal a slightly increasing trend since the chemical profile hit a low point in the spring of 2013. Monitoring location BH-7A Deep may be considered to be slightly impacted from the landfill site based on the comparison of these parameters.

The shallow setting at this location (BH-7B Shallow) reveals manganese (0.97 mg/L in June), nitrate (13.5 in June and 15.4 mg/L in October), and TDS (604 mg/L in June and 596 mg/L in October) to exceed provincial guidelines. Concentrations of TDS, chloride, sulphate, nitrate, alkalinity, sodium, manganese, and barium at BH-7B Shallow are elevated above background levels and indicate impact from the waste disposal site. Trends for this well are provided in **Graph 9**.

Table 10 provides a comparison of sampling results from monitoring well BH-7 to background and leachate concentrations at the site.

Table 10: Comparison of BH-7 to Background and Leachate Concentrations

Parameters	ODWS	BH-8	BH-5	BH-7A Deep		BH-7B Shallow	
		Background	Leachate	June	October	June	October
				2024			
TDS	500	231	94 - **3240**	493	464	**604**	**596**
Chloride	250	7.2	3 - **620**	25	23	37	32
Sulphate	500	15	5 - 125	33	25	42	38
Nitrate	10	6.5	<0.05 - 6	**14.0**	**15.3**	**13.5**	**15.4**
Alkalinity	30 - 500	141	62 - **2110**	292	279	381	378
Sodium	200	4	1 - **561**	15	13	18	17
Manganese	0.05	<0.01	<0.01 - **8.73**	**0.45**	--	**0.97**	--
Barium	1	0.03	<0.01 - **2.9**	0.12	0.11	0.15	0.15

All values in mg/L

Background concentrations are median values

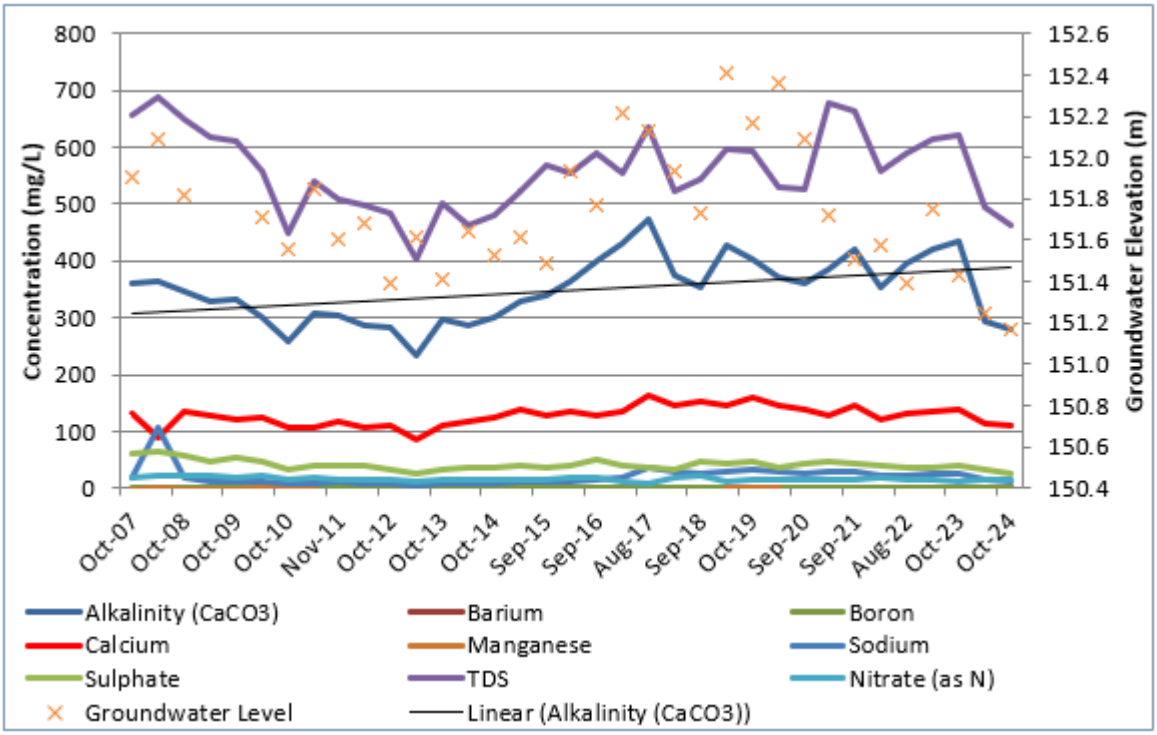
***Bold** exceeds ODWS*

-- Not analyzed

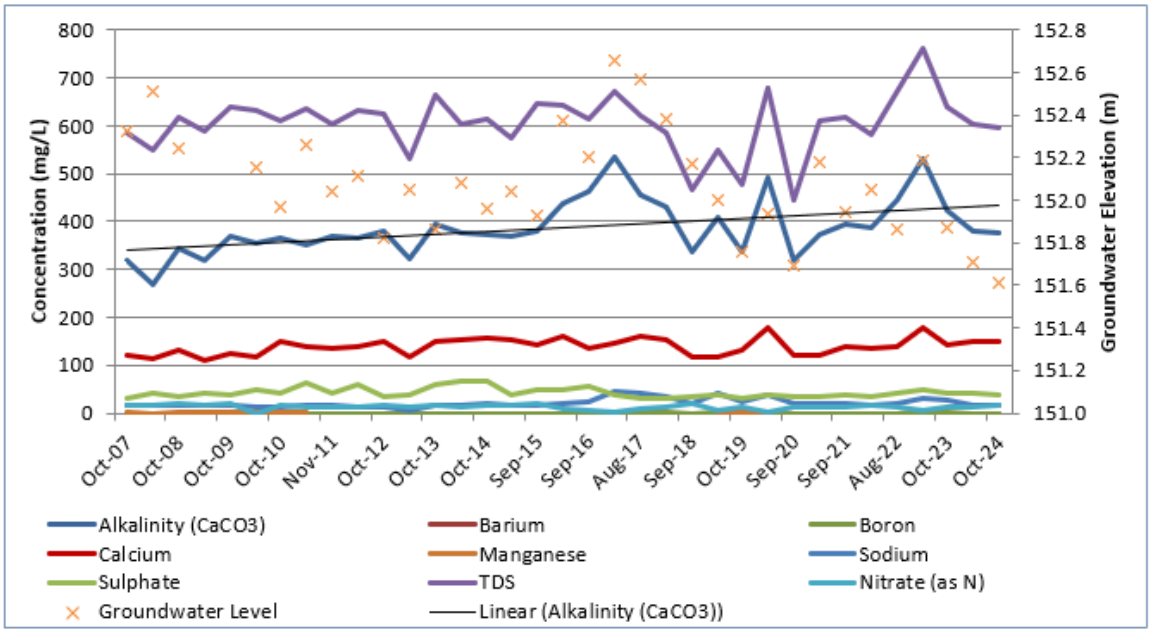
Median values are taken from the sampling history

Leachate range values taken from the sampling history

Graph 8: Leachate Parameters over Time BH-7A Deep



Graph 9: Leachate Parameters over Time BH-7B Shallow



The water quality from both the deep and shallow settings was compared to the PWQO's. All parameters were found to be lower than PWQO with the exception of iron in October in the deep setting. Short-term trends presented in **Graph 8,** and more prominently in **Graph 9**, indicate some regular influence on the chemical profile by the local groundwater table elevation. Both **Graphs 8** and **9** indicate slight increasing trends.

BH-8

Monitoring well BH-8 is located on site and has been interpreted to be representative of background conditions. All parameters reveal concentrations that are less than ODWS/OG.

BH-9

Monitoring location BH-9 was completed as a bi-level piezometer (BH-9A Deep setting and BH-9B Shallow setting) and is located on the downgradient boundary of the landfilling area slightly south-west of monitoring station BH-4. This well is located within the flow path from the site.

Piezometer setting BH-9A Deep reveals manganese (2.3 mg/L in June) and TDS (748 mg/L in June and 722 mg/L in October) to be greater than ODWS/OG values during the 2024 monitoring events. Concentrations of TDS, chloride, sulphate, alkalinity, sodium, manganese, and barium are greater in comparison to background values and suggest impact at this location. Concentrations from the deep piezometer setting reveal fluctuating values over time but overall indicate an increasing chemical profile due to upgradient landfilling operations (**Graph 10**).

Monitoring station BH-9B Shallow reveals concentrations of iron (0.73 mg/L in June and 1.00 mg/L in October), manganese (4.00 mg/L in June) and TDS (722 mg/L in June and 754 mg/L in October)

to exceed the ODWS/OG. The concentration of iron has increased significantly since April 2021. Concentrations of TDS, chloride, sulphate, alkalinity, sodium, manganese, and barium are greater in comparison to background values and suggest impact at this location. This well is interpreted to exhibit minor impact from the landfill site. Chemical trends from the shallow setting (shown in **Graph 11**) reveal a general increase of selected concentrations over time.

Table 11 provides a comparison of sampling results from monitoring well BH-9 to background and leachate concentrations at the site.

The water quality from both the deep and shallow settings was compared to the applicable surface water guidelines (PWQO's and or CWQGs). Boron concentrations from the shallow and deep settings were above the PWQG but less than the CWQG. Iron from the shallow setting exceeded the PWQO and CWQG in 2024.

Table 11: Comparison of BH-9 to Background and Leachate Concentrations

Parameters	ODWS	BH-8	BH-5	BH-9A Deep		BH-9B Shallow	
		Background	Leachate	June	October	June	October
				2024			
TDS	500	231	94 - **3240**	**748**	**722**	**722**	**754**
Chloride	250	7.2	3 - **620**	100	107	100	105
Sulphate	500	15	5 - 125	33	28	32	27
Nitrate	10	6.5	<0.05 - 6	2.63	2.18	0.18	<0.10
Alkalinity	30 - 500	141	62 - **2110**	459	429	456	472
Sodium	200	4	1 - **561**	47	43	47	43
Manganese	0.05	<0.01	<0.01 - **8.73**	**2.3**	--	**4.0**	--
Barium	1	0.03	<0.01 - **2.9**	0.18	0.17	0.23	0.23

All values in mg/L

Background concentrations are median values

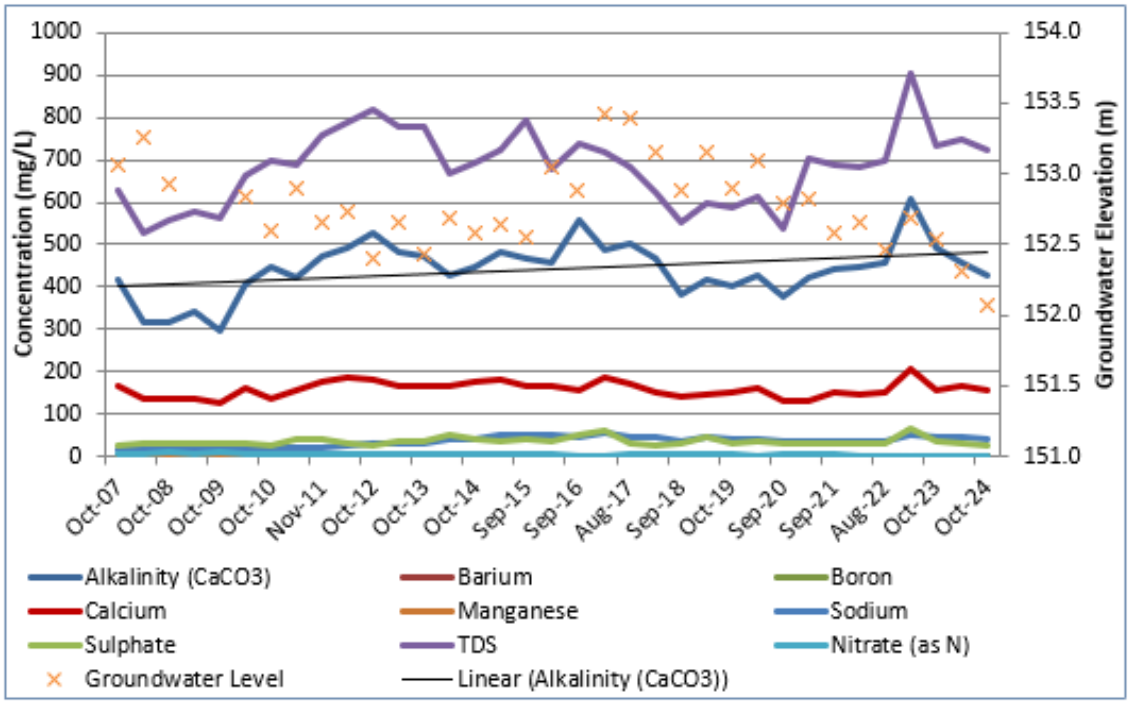
***Bold** exceeds ODWS*

-- Not analyzed

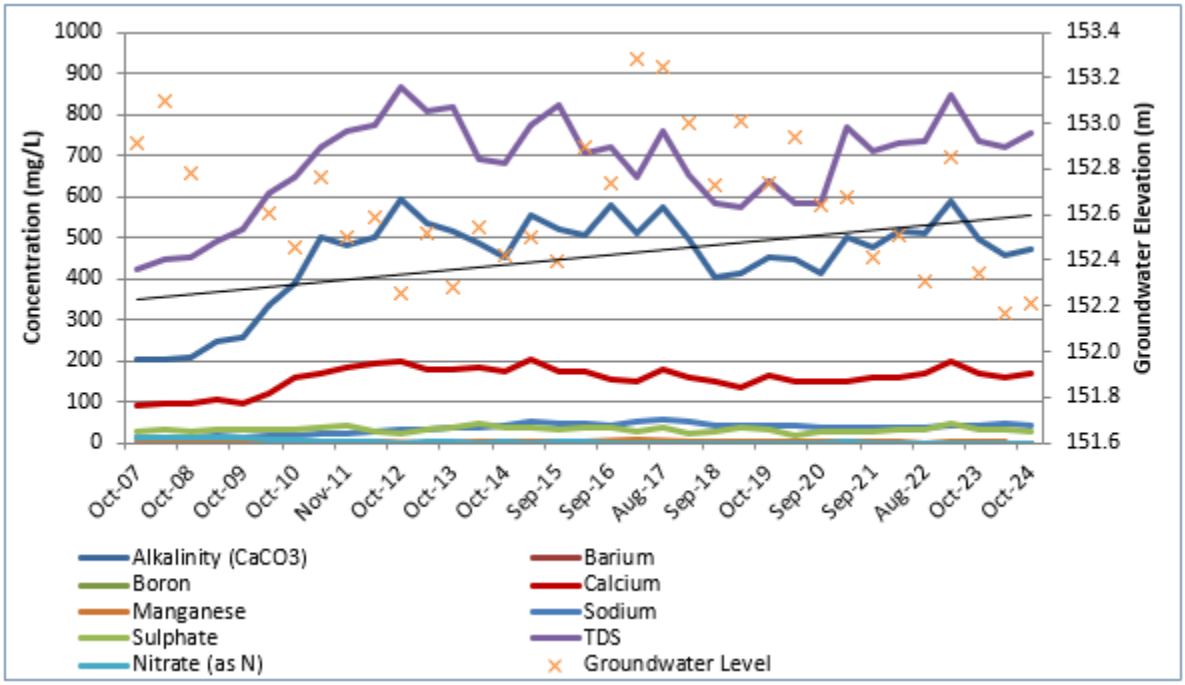
Median values are taken from the sampling history

Leachate range values taken from the sampling history

Graph 10: Leachate Parameters over Time BH-9A Deep



Graph 11: Leachate Parameters over Time BH-9B Shallow



BH-10

Monitoring location BH-10 is a tri-level monitoring well that is located just off the northeast edge of the landfilling area (BH-10A deep, BH-10B middle, and BH-10C shallow).

The deep piezometer setting (BH-10A) revealed all parameters to be less than ODWS/OG during the 2024 sampling with the exception of nitrate (11.9 mg/L in June and 11.2 mg/L in October). The sampling results are consistent with historical results at this location. A slight decline in TDS concentrations has been noted over the years, however concentrations have been elevated since 2021. Levels, however, remain within historical ranges (**Graph 12**). Concentrations of indicator parameters suggest that monitoring interval BH-10A has not been impacted by the landfill site.

The middle piezometer setting (BH-10B) reveals all parameters to be less than ODWS/OG with the exception of nitrate (10.9 mg/L in October) during the 2024 sampling. Similar to the deep setting, groundwater from this piezometer reveals stable concentrations of indicator parameters that are not considered to be impacted by the waste site. The 2024 monitoring results are consistent with historical values (**Graph 13**) with the exception of a slight decline in TDS concentrations, similar to the deep setting results.

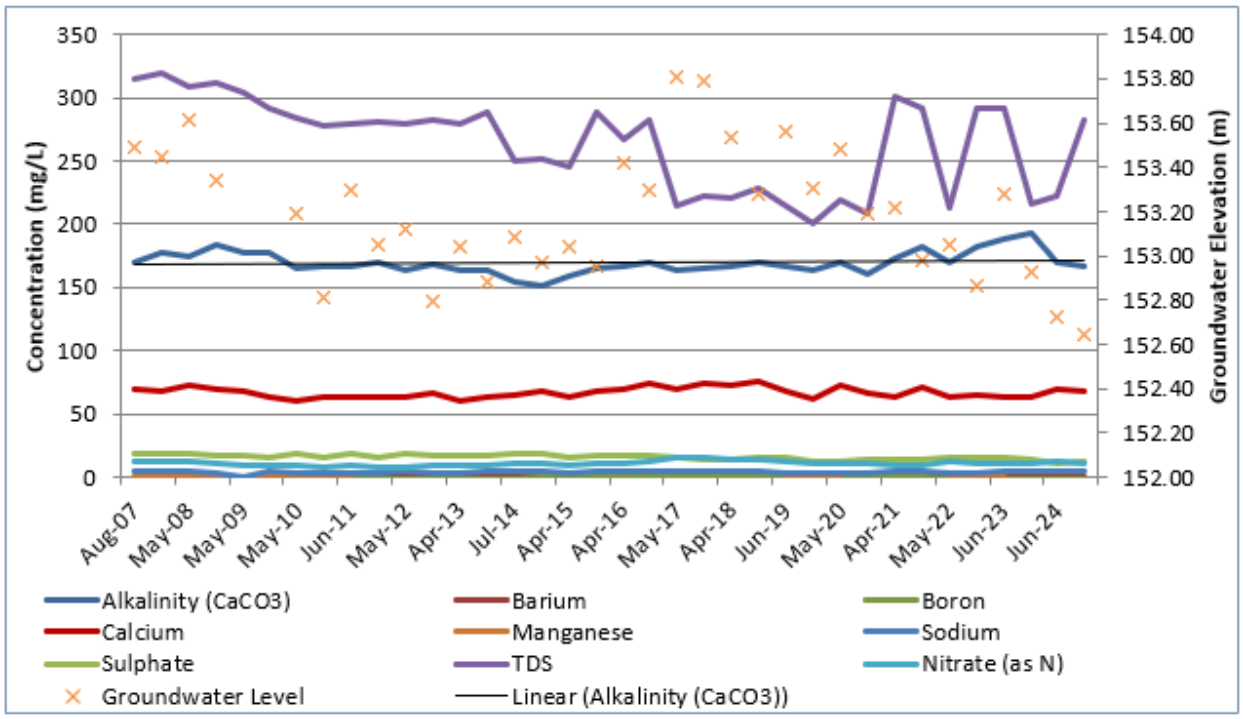
The shallow piezometer setting (BH-10C) reveals all parameters to be less than ODWS/OG during the 2024 sampling. Concentrations of indicator parameters reveal values similar to, and less than, background values indicating that BH-10C Shallow remains unimpacted by the landfill site. Chemical concentrations from this location do not reveal any significant increasing trends, however, do appear to be more sensitive to change in groundwater elevation (as shown in **Graph 14**) than other settings at this location. **Table 12** provides a comparison of sampling results from monitoring well BH-10 to background and leachate concentrations at the site.

Table 12: Comparison of BH-10 to Background and Leachate Concentrations

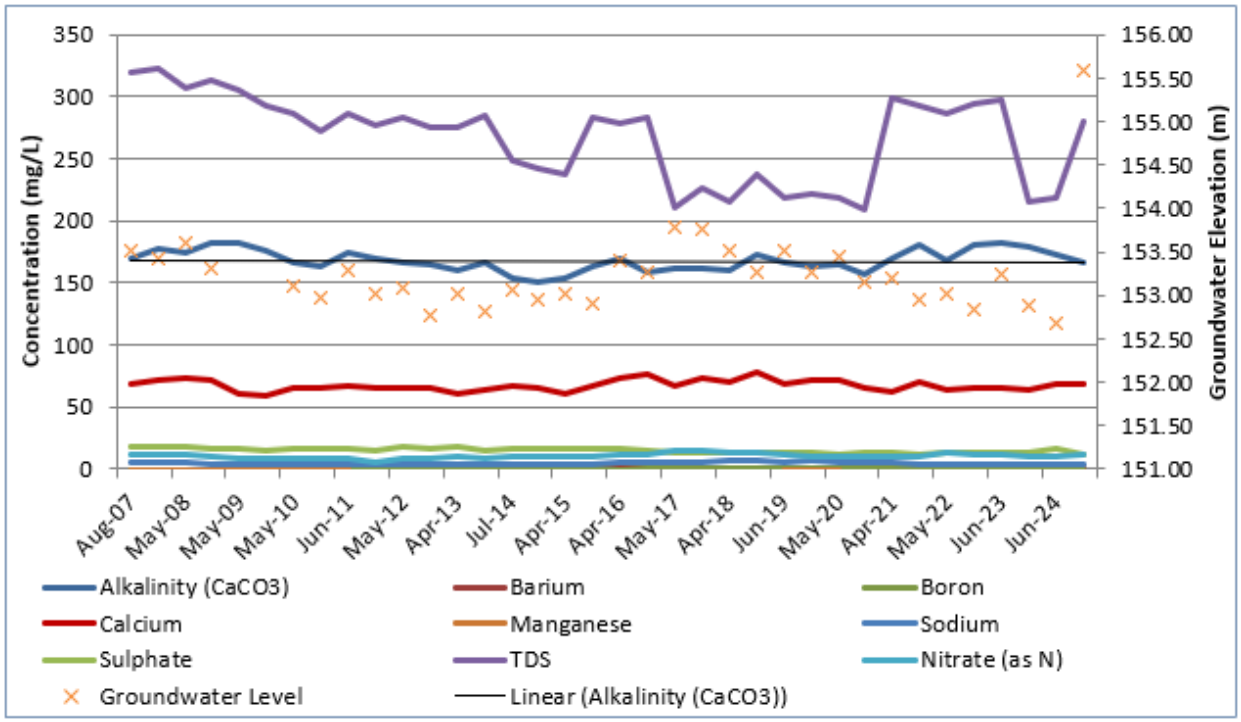
Parameters	ODWS	BH-8	BH-5	BH-10A Deep		BH-10B Middle		BH-10C Shallow	
		Background	Leachate	June	Oct	June	Oct	June	Oct
				2024					
TDS	500	231	94 - **3240**	222	283	219	280	196	276
Chloride	250	7.2	3 - **620**	9	9	9	9	8	12
Sulphate	500	15	5 - 125	11	13	16	12	11	10
Nitrate	10	6.5	<0.05 - 6	**11.9**	**11.2**	10.0	**10.9**	7.36	8.50
Alkalinity	30 - 500	141	62 - **2110**	169	166	172	167	153	170
Sodium	200	4	1 - **561**	4	4	4	4	5	5
Manganese	0.05	<0.01	<0.01 - **8.73**	<0.01	--	<0.01		<0.01	
Barium	1	0.03	<0.01 - **2.9**	0.04	0.04	0.04	0.04	0.03	0.03

All values in mg/L
Background concentrations are median values
***Bold** exceeds ODWS*
-- Not analyzed
Median values are taken from the sampling history
Leachate range values taken from the sampling history

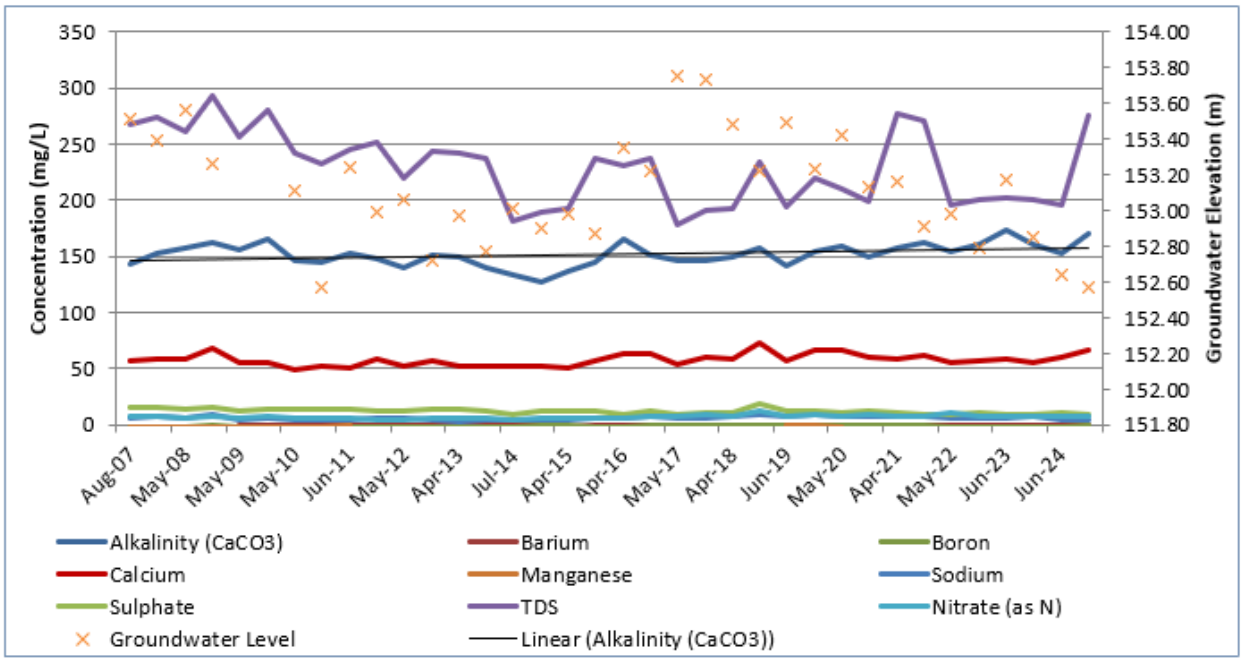
Graph 12: Leachate Parameters over Time BH-10A Deep



Graph 13: Leachate Parameters over Time BH-10B Middle



Graph 14: Leachate Parameters over Time BH-10C Shallow



BH-11

Monitoring location BH-11 was completed as a bi-level piezometer (BH-11A deep setting and BH-11B shallow setting). Monitoring station BH-11 is located off-site, downgradient, and directly north of the landfilling area boundary and slightly northeast from SW-1A.

Concentrations of all parameters from the deep piezometer setting reveal values that are less than ODWS/OG during the 2024 sampling. Iron concentrations have in the past exceeded the ODWS/OG on four occasions (2011, 2012, 2014, and 2020). Historical values prior to 2011 were, on balance, less than laboratory detection limits. Iron concentrations have since reduced but at times see higher values. Concentrations at this location are similar to historical values and are within range of background values. Groundwater at BH-11A Deep is not interpreted to be impacted by the landfill site.

Concentrations from the shallow setting do not reveal any values that exceed provincial guidelines. The shallow setting shows comparable trends with respect to iron values (i.e., beginning in 2011) as are seen in the well's deep setting. Similarly, this concentration increase does not seem to be indicative of the presence of leachate. Impact at BH-11B Shallow is not anticipated.

Table 13 provides a comparison of sampling results from monitoring well BH-11 to background and leachate concentrations at the site. Groundwater trends from this location are provided in **Graphs 15** and **16** and are noted to be relatively stable.

Concentrations from both the deep and shallow settings were compared to PWQOs. In all instances, values were less than the respective guidelines.

Table 13: Comparison of BH-11 to Background and Leachate Concentrations

Parameters	ODWS	BH-8	BH-5	BH-11A Deep		BH-11B Shallow	
		Background	Leachate	June	October	June	October
				2024			
TDS	500	231	94 - **3240**	194	192	320	289
Chloride	250	7.2	3 - **620**	7	7	8	7
Sulphate	500	15	5 - 125	24	22	20	19
Nitrate	10	6.5	<0.05 - 6	6.69	7.24	7.07	7.37
Alkalinity	30 - 500	141	62 - **2110**	140	150	209	192
Sodium	200	4	1 - **561**	4	4	4	4
Manganese	0.05	<0.01	<0.01 - **8.73**	<0.01	--	<0.01	--
Barium	1	0.03	<0.01 - **2.9**	0.03	0.04	0.05	0.05

All values in mg/L

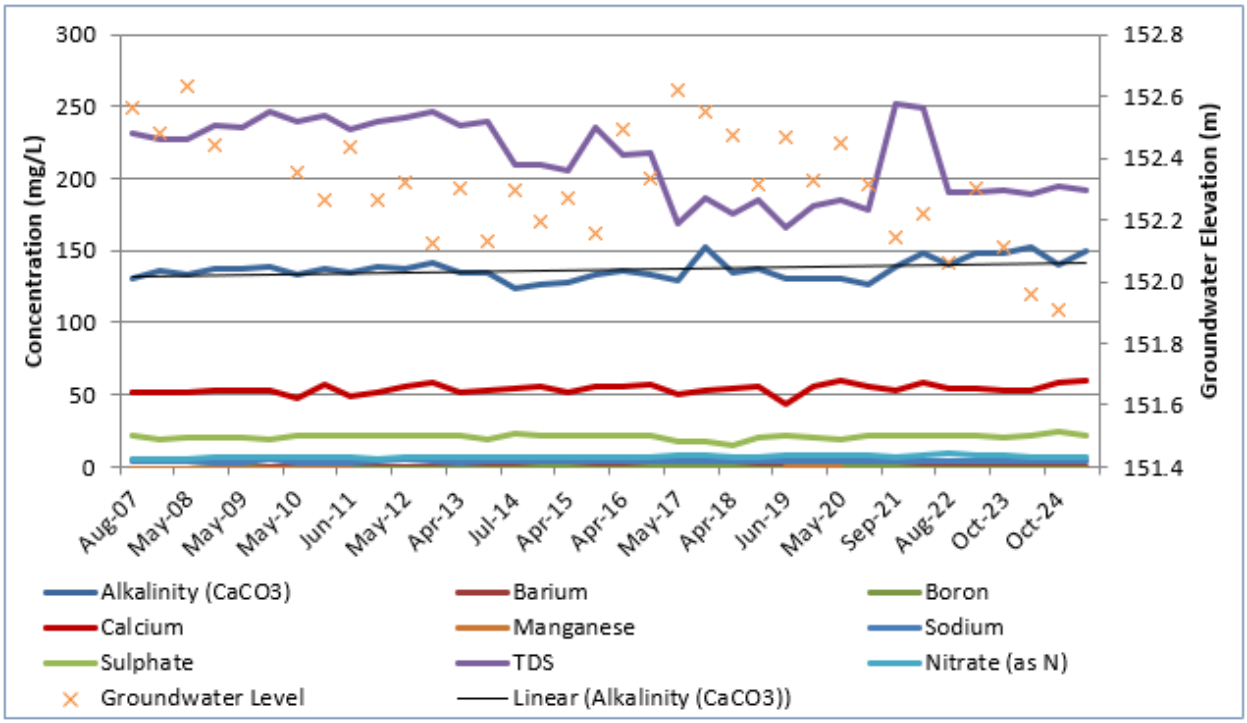
Background concentrations are median values

***Bold** exceeds ODWS*

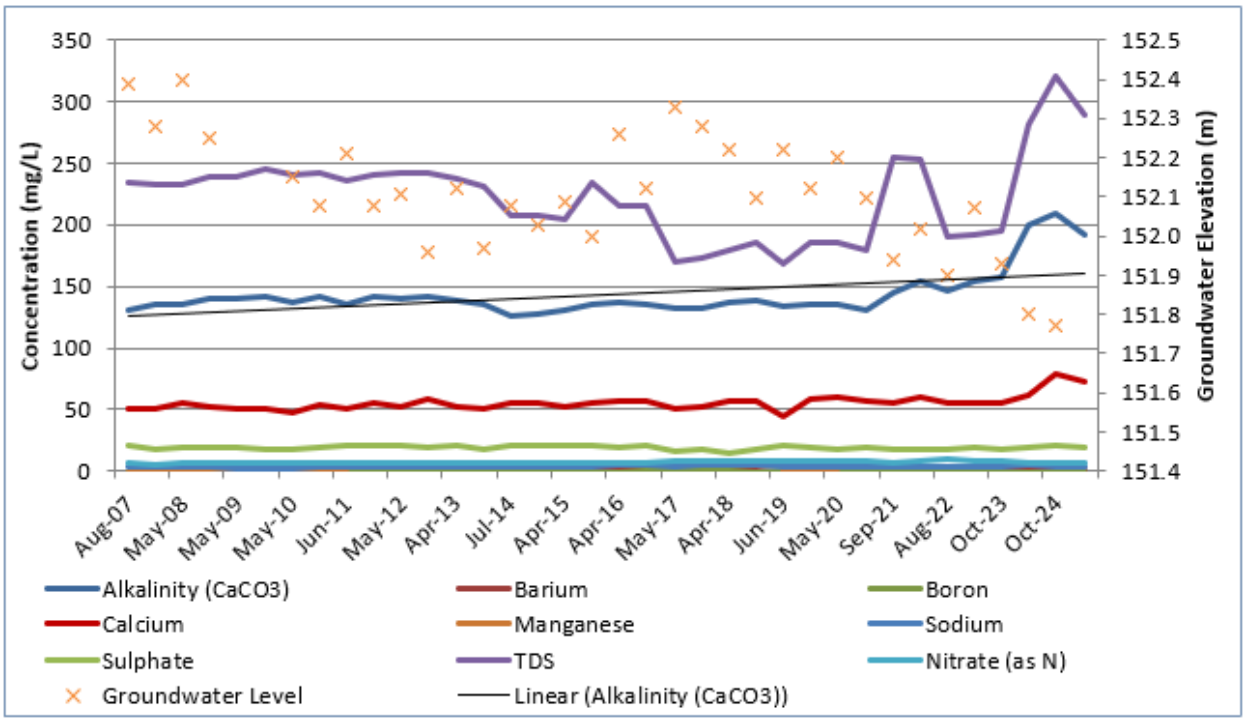
-- Not analyzed

Median values are taken from the sampling history
Leachate range values taken from the sampling history

Graph 15: Leachate Parameters over Time BH-11A Deep



Graph 16: Leachate Parameters over Time BH-11B Shallow



BH-12

Monitoring station BH-12 is a single level piezometer located to the northeast of the fill area and is immediately downgradient of a former active fill area. Concentrations from this location have historically been interpreted to represent leachate values at the site with elevated concentrations of leachate parameters. BH-12 was drilled into the historical waste mound in an area that has not been actively filled in at least 15 years. All concentrations at monitoring well BH-12 were found to be below ODWS/OG values during the 2024 sampling period with the exception of manganese (1.29 mg/L in June), nitrate (13.7 mg/L in June and 15.4 mg/L in October), and TDS (585 mg/L in June and 606 mg/L in October). Concentrations of alkalinity, chloride, sulphate, sodium, barium, DOC, and calcium are also notably elevated at this location.

Concentrations analyzed during the 2024 monitoring period do not exceed surface water guidelines (PWQO's or CWQG's).

Table 14 provides a comparison of sampling results from monitoring well BH-12 to background and leachate concentrations at the site. Groundwater trends from this location are provided in **Graph 17**.

Table 14: Comparison of BH-12 to Background and Leachate Concentrations

Parameters	ODWS	BH-8	BH-5	BH-12	
		Background	Leachate	June	October
				2024	
TDS	500	231	94 - **3240**	**585**	**606**
Chloride	250	7.2	3 - **620**	42	43
Sulphate	500	15	5 - 125	29	25
Nitrate	10	6.5	<0.05 - 6	**13.7**	**15.4**
Alkalinity	30 - 500	141	62 - **2110**	368	382
Sodium	200	4	1 - **561**	21	25
Manganese	0.05	<0.01	<0.01 - **8.73**	**1.29**	--
Barium	1	0.03	<0.01 - **2.9**	0.16	0.16

All values in mg/L

Background concentrations are median values

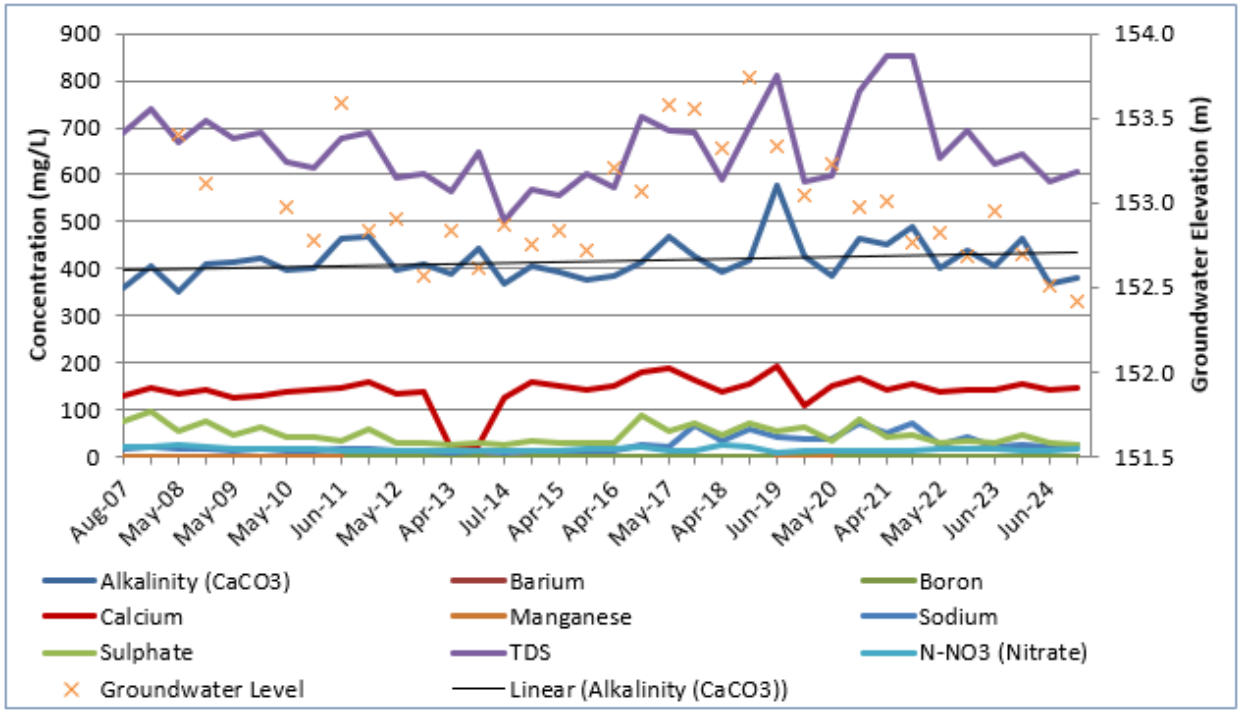
***Bold** exceeds ODWS*

-- Not analyzed

Median values are taken from the sampling history

Leachate range values taken from the sampling history

Graph 17: Leachate Parameters over Time BH-12



Long-term trends at monitoring well BH-12 are generally noted to have a stable or subtle

decreasing profile, however, recent sampling events have showed slightly elevated values. Short-term fluctuations in the well's chemical profile indicate some level of sensitivity to groundwater elevation at this location.

BH-13

Monitoring station BH-13 is a bi-level monitoring well (BH-13A Deep setting, BH-13B Shallow setting). This well is located to the north and within the flow path mid-way from the landfilling area to the border of the downgradient CAZ.

The deep piezometer setting at this location reveals all parameters to be less than ODWS/OG. Elevated alkalinity, calcium, and TDS concentrations suggest minor impact at BH-13A Deep. Similar to the iron concentration profile at monitoring well BH-11, iron concentrations at this location are noted to be slightly elevated since 2011. The iron concentrations have since reduced to historical levels (below laboratory detection limits). Trends from this location are provided in **Graph 18**.

The shallow setting does not reveal any exceedances of ODWS/OG. Parameters from the shallow piezometer setting previously exhibited a fairly consistent trend in concentration with some short-term fluctuations likely associated with the seasonal change in groundwater levels. Sampling at this location in the past twelve years, however, has exhibited highly fluctuating peaks in concentration. Samples collected in the fall appear to show concentrations up to four times as high as those taken in the springtime for selected parameters. This pattern is clearly represented in **Graph 19** by large spikes in concentration during the fall monitoring events from 2011 through to 2015, and again in since 2019. It is likely that these eccentric trends are related to an extreme sensitivity to groundwater elevation and could be correlated to an increase in chemical concentrations. Concentrations of indicator parameters are in general low and the groundwater at BH-13A Deep is considered to be slightly impacted by the landfill site. The concentration profile at this station should be closely monitored in the future to identify whether or not the fluctuations seen in **Graph 19** are caused by an encroaching leachate plume, or by other factors.

Table 15 provides a comparison of sampling results from monitoring well BH-13 to background and leachate concentrations at the site.

Table 15: Comparison of BH-13 to Background and Leachate Concentrations

Parameters	ODWS	BH-8	BH-5	BH-13A Deep		BH-13B Shallow	
		Background	Leachate	June	October	June	October
				2024			
TDS	500	231	94 - **3240**	341	301	75	326
Chloride	250	7.2	3 - **620**	12	11	3	14
Sulphate	500	15	5 - 125	19	16	5	16
Nitrate	10	6.5	<0.05 - 6	9.31	9.91	0.92	8.49
Alkalinity	30 - 500	141	62 - **2110**	214	183	56	204
Sodium	200	4	1 - **561**	7	6	4	8
Manganese	0.05	<0.01	<0.01 - **8.73**	<0.01	--	<0.01	--
Barium	1	0.03	<0.01 - **2.9**	0.07	0.06	<0.01	0.03

All values in mg/L

Background concentrations are median values

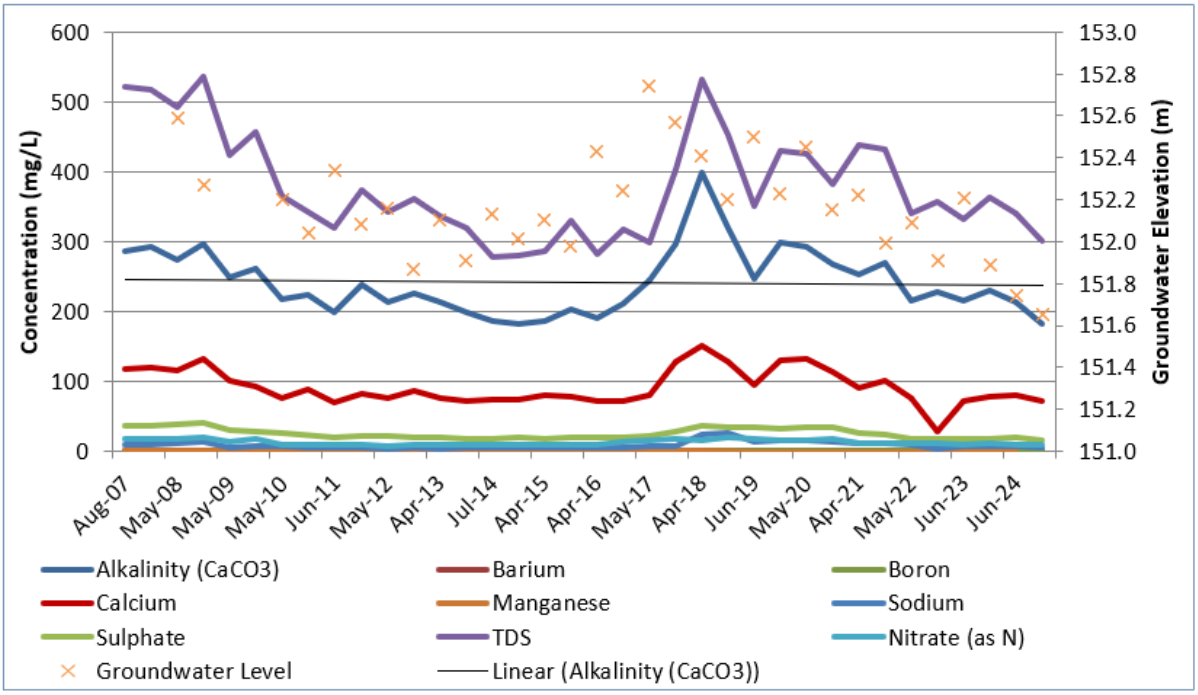
***Bold** exceeds ODWS*

-- Not analyzed

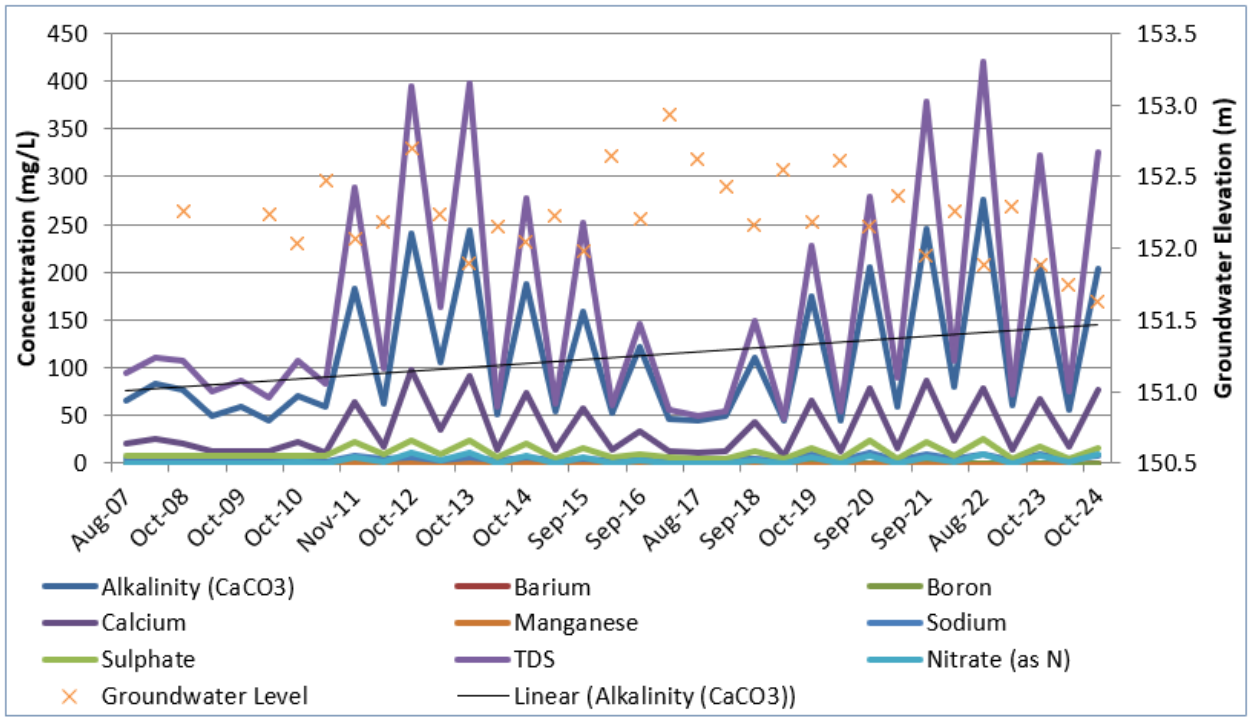
Median values are taken from the sampling history

Leachate range values taken from the sampling history

Graph 18: Leachate Parameters over Time BH-13A Deep



Graph 19: Leachate Parameters over Time BH-13B Shallow



Short-term fluctuations noted at BH-13 Deep and Shallow appear to share some correlation to the local groundwater elevation. High concentrations on balance correspond with low groundwater levels.

BH-14

Monitoring station BH-14 is a bi-level monitoring well (BH-14A Deep setting, BH-14B Shallow setting). This well is located off-site to the east and is considered to be within the downgradient flow path from the eastern part of the site.

Samples from the deep and shallow piezometer settings did not reveal any concentrations of indicator parameters to be greater than ODWS/OG during the 2024 sampling. The low concentrations of leachate indicator parameters suggest no leachate impact.

Concentrations analyzed during the 2024 monitoring period at both deep and shallow settings do not exceed surface water guidelines (PWQO's) at this location.

Table 16 provides a comparison of sampling results from monitoring well BH-14 to background and leachate concentrations at the site. Trend graphs for this well are provided in **Graphs 20** and **21** and reveal slightly increased values of some parameters.

Table 16: Comparison of BH-14 to Background and Leachate Concentrations

Parameters	ODWS	BH-8	BH-5	BH-14A Deep		BH-14B Shallow	
		Background	Leachate	June	October	June	October
				2024			
TDS	500	231	94 - **3240**	190	188	168	166
Chloride	250	7.2	3 - **620**	7	8	5	5
Sulphate	500	15	5 - 125	25	22	18	15
Nitrate	10	6.5	<0.05 - 6	7.04	8.00	5.07	5.91
Alkalinity	30 - 500	141	62 - **2110**	136	135	127	126
Sodium	200	4	1 - **561**	4	4	3	3
Manganese	0.05	<0.01	<0.01 - **8.73**	<0.01	--	<0.01	--
Barium	1	0.03	<0.01 - **2.9**	0.03	0.03	0.03	0.03

All values in mg/L

Background concentrations are median values

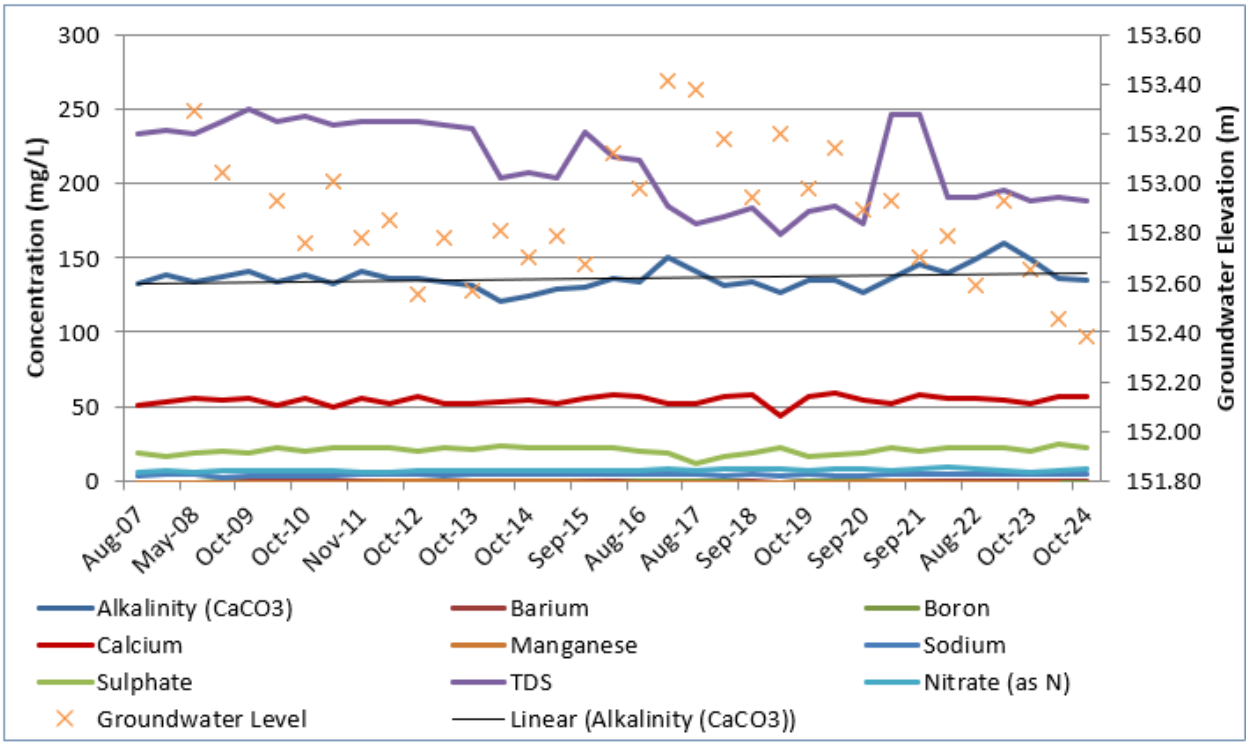
***Bold** exceeds ODWS*

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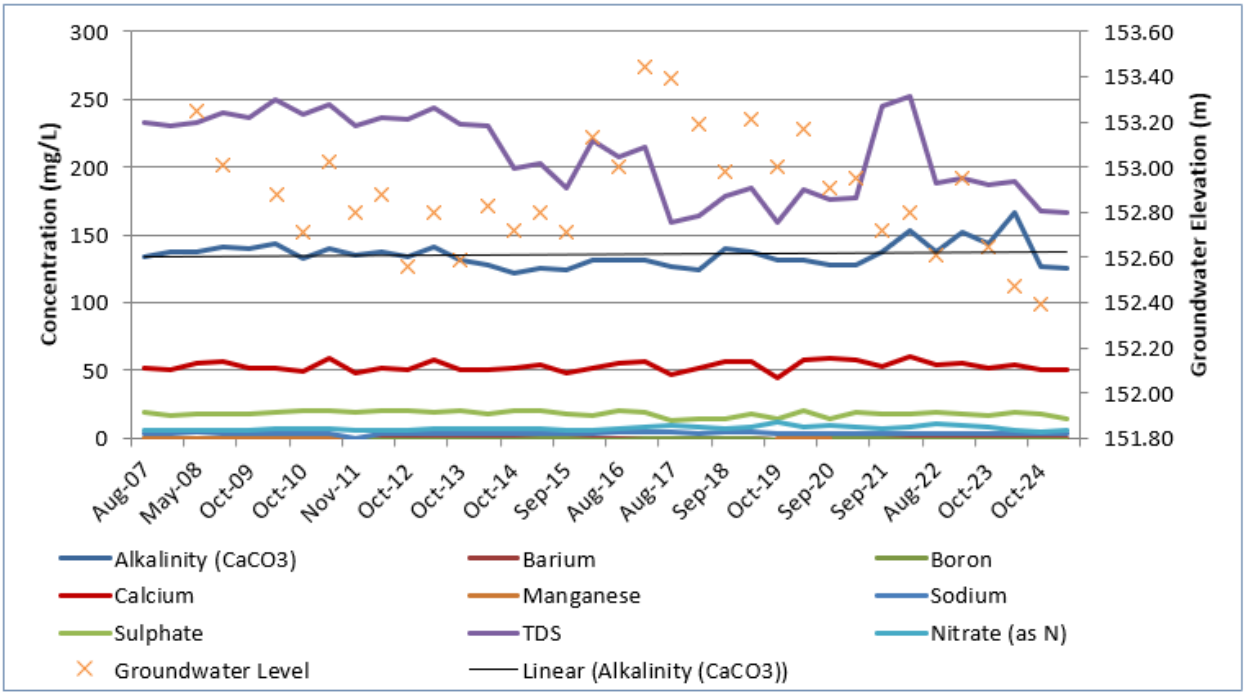
Median values are taken from the sampling history

Leachate range values taken from the sampling history

Graph 20: Leachate Parameters over Time BH-14A Deep



Graph 21: Leachate Parameters over Time BH-14B Shallow



BH-15, BH-16, and BH-17

In the summer of 2013, three bi-level groundwater monitoring wells were constructed to act as "Point of Compliance" (POC) wells (i.e., wells BH-15, BH-16, and BH-17). Monitoring wells, BH-15A and B, BH-16A and B, and BH-17A and B are located at the downgradient extent of the municipally owned contaminant attenuation zone. They are located roughly north, north-west, and north-east (respectively) of the existing fill area. Locations of these wells are provided in **Figure 3**.

Tables 17, **18**, and **19** provide a comparison of the 2024 monitoring results to median background and leachate concentrations.

Table 17: Comparison of BH-15 to Background and Leachate Concentrations

Parameters	ODWS	BH-8	BH-5	BH-15 Deep		BH-15 Shallow	
		Background	Leachate	June	October	June	October
				2024			
TDS	500	231	94 - **3240**	210	203	347	338
Chloride	250	7.2	3 - **620**	11	10	13	14
Sulphate	500	15	5 - 125	49	47	19	17
Nitrate	10	6.5	<0.05 - 6	1.16	0.72	**10.8**	**11.1**
Alkalinity	30 - 500	141	62 - **2110**	162	159	215	211
Sodium	200	4	1 - **561**	5	5	7	6
Manganese	0.05	<0.01	<0.01 - **8.73**	0.02	--	<0.01	
Barium	1	0.03	<0.01 - **2.9**	0.03	0.03	0.07	0.02

All values in mg/L

Background concentrations are median values

***Bold** exceeds ODWS*

-- Not analyzed

Median values are taken from the sampling history

Leachate range values taken from the sampling history

Table 18: Comparison of BH-16 to Background and Leachate Concentrations

Parameters	ODWS	BH-8	BH-5	BH-16 Deep		BH-16 Shallow	
		Background	Leachate	June	October	June	October
				2024			
TDS	500	231	94 - **3240**	**722**	**722**	**682**	**650**
Chloride	250	7.2	3 - **620**	85	83	87	73
Sulphate	500	15	5 - 125	37	36	39	34
Nitrate	10	6.5	<0.05 - 6	2.49	2.61	5.31	7.00
Alkalinity	30 - 500	141	62 - **2110**	491	475	426	408
Sodium	200	4	1 - **561**	40	37	35	39
Manganese	0.05	<0.01	<0.01 - **8.73**	**0.11**		**0.06**	
Barium	1	0.03	<0.01 - **2.9**	0.16	0.16	0.17	0.15

All values in mg/L

Background concentrations are median values

***Bold** exceeds ODWS*

-- Not analyzed

Median values are taken from the sampling history

Leachate range values taken from the sampling history

Table 19: Comparison of BH-17 to Background and Leachate Concentrations

Parameters	ODWS	BH-8	BH-5	BH-17 Deep		BH-17 Shallow	
		Background	Leachate	June	October	June	October
				2024			
TDS	500	231	94 - **3240**	192	188	193	190
Chloride	250	7.2	3 - **620**	7	8	7	7
Sulphate	500	15	5 - 125	26	24	20	18
Nitrate	10	6.5	<0.05 - 6	6.58	6.97	7.43	7.76
Alkalinity	30 - 500	141	62 - **2110**	135	137	144	144
Sodium	200	4	1 - **561**	4	4	4	4
Manganese	0.05	<0.01	<0.01 - **8.73**	<0.01	--	<0.01	--
Barium	1	0.03	<0.01 - **2.9**	0.03	0.03	0.03	0.03

All values in mg/L

Background concentrations are median values

***Bold** exceeds ODWS*

-- Not analyzed

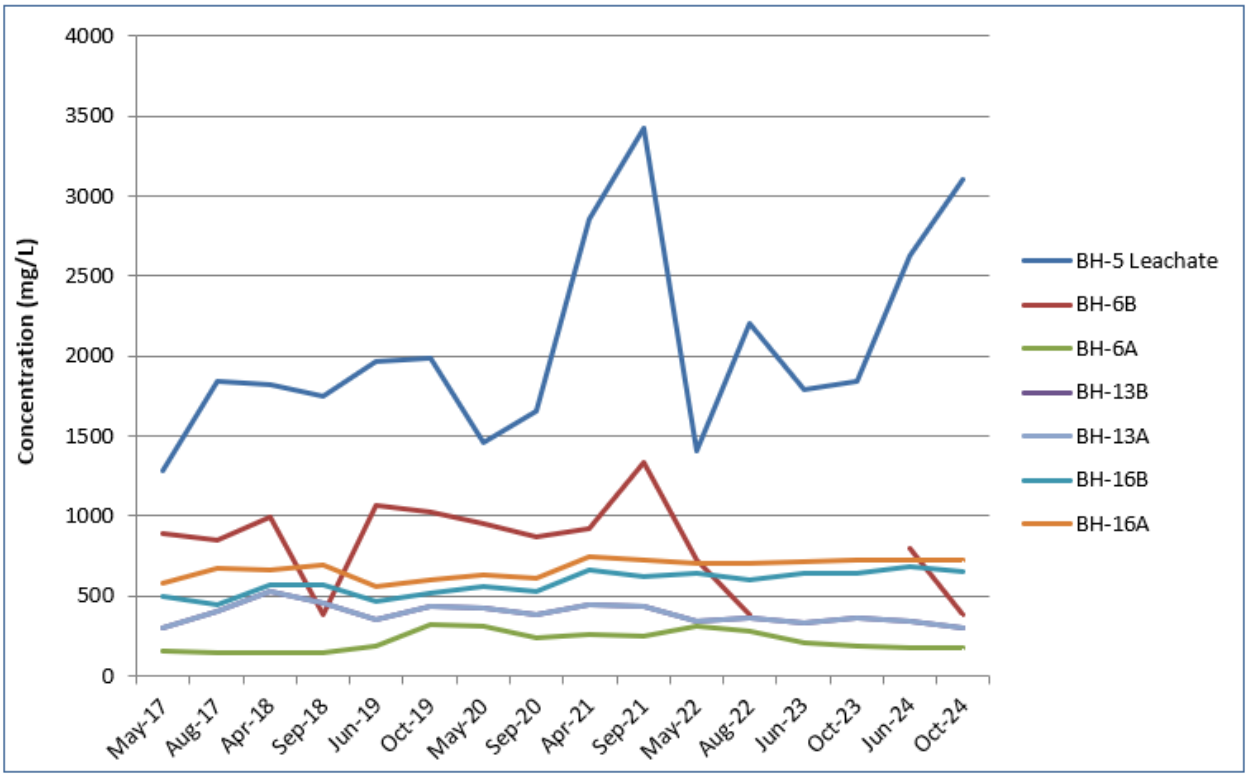
Median values are taken from the sampling history

Leachate range values taken from the sampling history

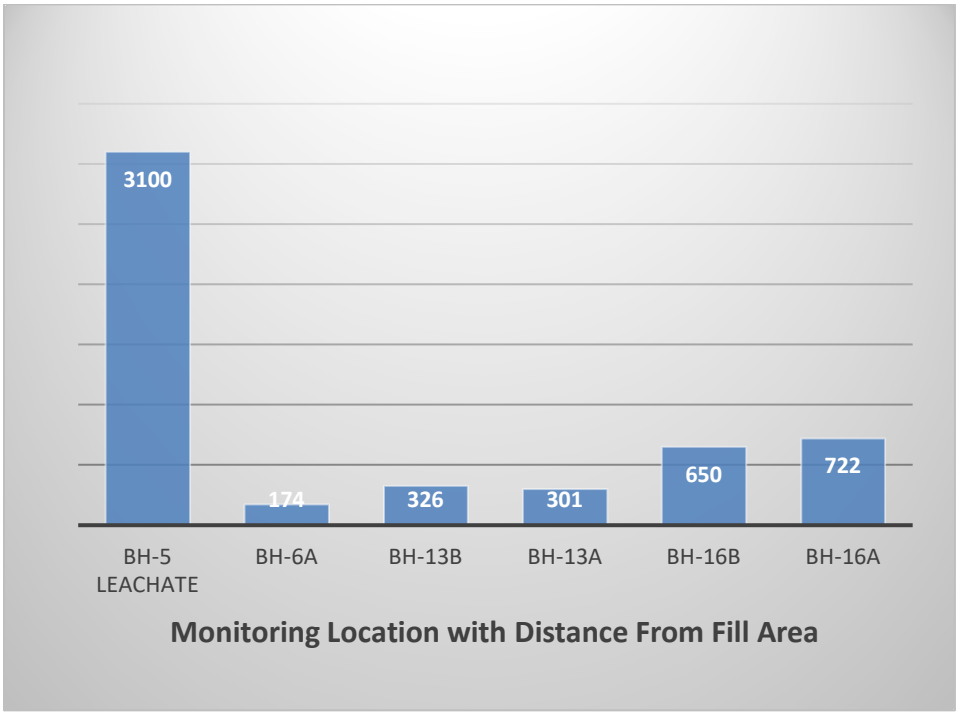
Monitoring well BH-16 is located slightly outside the main flow path from the center of the site and reveals the highest values of the three locations. Monitoring well BH-16 is also located approximately 260 meters downgradient from monitoring well BH-6 which is located close to, and between, the fill area and BH-16.

Concentrations from well BH-16 are at times higher than the respective values from the shallow and deep levels at BH-6. Intuitively, we would expect lower chemical concentrations with increasing distance from the landfill site. As an example, **Graphs 22A** and **22B** provide a comparison of TDS concentrations north-west of the site. **Graph 22A** shows TDS concentrations over time at the selected locations, and **Graph 22B** shows the fall 2024 TDS values at locations based on distance from the site. The locations included in the graphing are as follows: BH-5 Leachate well; BH-6 immediate downgradient well; BH-13 mid-distance well; and BH16, furthest downgradient well.

Graph 22A: Comparison of TDS Values at Downgradient Well Locations Over Time



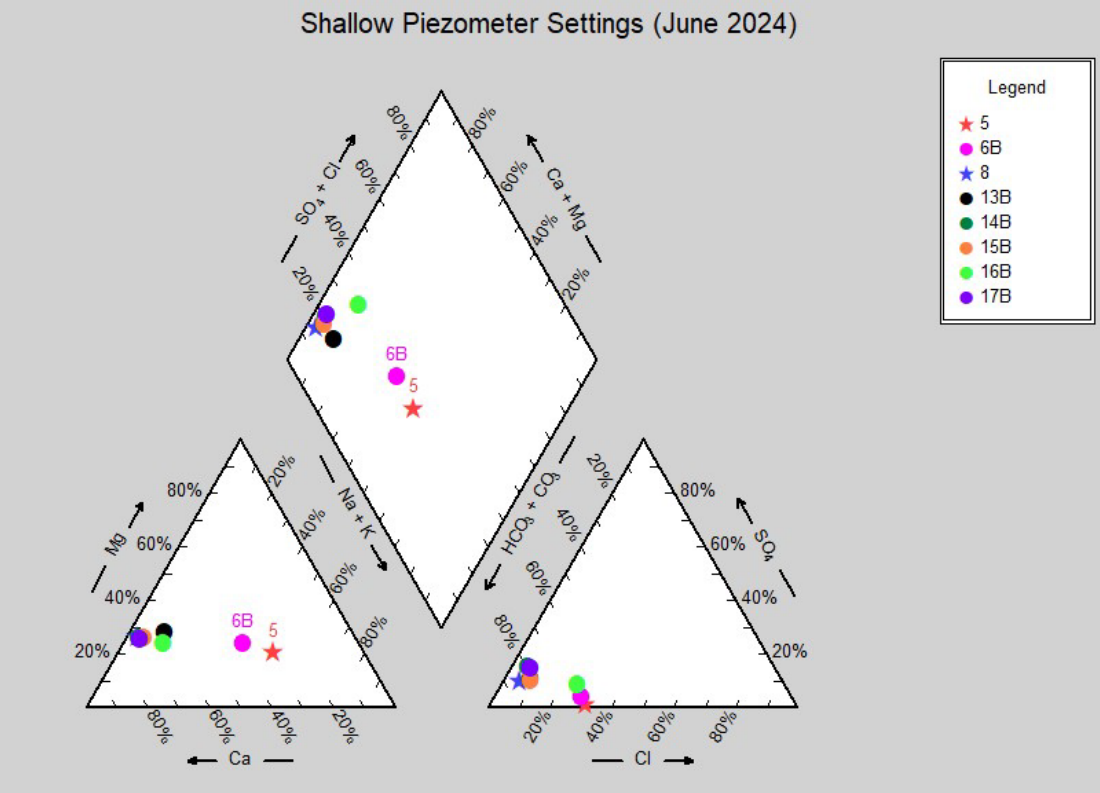
Graph 22B: Comparison of TDS Values at Downgradient Well vs Distance



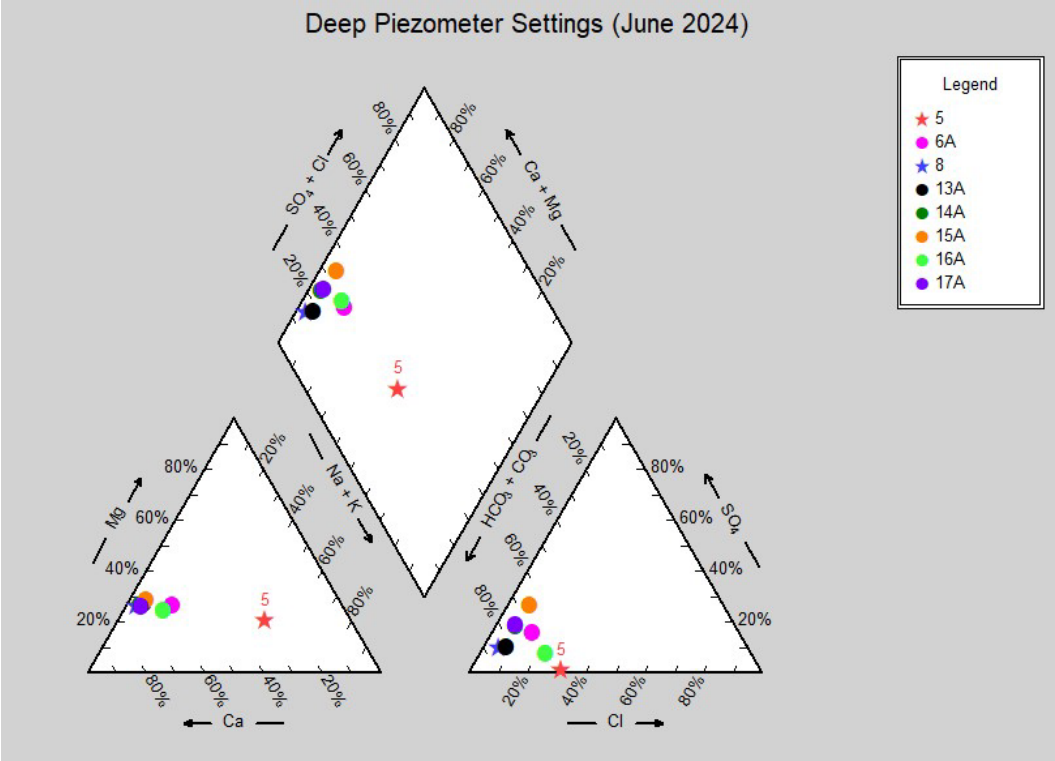
As indicated, the leachate values are the highest at BH-5 followed by monitoring well BH-16A, BH-16B, then BH-13A. Concentrations from monitoring locations BH-16 shallow and deep are higher than wells BH-13 shallow and deep and BH-6 deep which are all located closer to the fill area. As shown in the borehole logs (**Appendix D)**, the geology of BH-6 and BH-13 is characterized as being coarse textured glaciomarine deposits comprised mainly of sand, gravel and silt and clay. The geology at BH-16 is reported to be more coarse consisting of primarily sand with gravel. Ontario Geologic Survey (google earth mapping) shows the presence of morainal material approximately 150 m northeast of BH-16. It is possible that the elevated values from BH-16 are either a result of differing natural mineralization of the groundwater at this location or a result of impacts from external sources other than the landfill site. We would suggest that the far downgradient wells are not being severely impacted by the landfill operations and continued monitoring is recommended.

Graphs 23 and **24** are tri-linear plots that show the relationship of monitoring wells BH-6, BH-13, BH-15, BH-16, and BH-17 to both background and leachate values for both the shallow and deep settings during the spring sampling event.

Graph 23: Tri-Linear Plot – POC Shallow Groundwater to Leachate and Background



Graph 24: Tri-Linear Plot – POC Deep Groundwater to Leachate and Background



For both the shallow and deep piezometer settings, water quality from the downgradient boundary wells (BH-15, BH-16, and BH-17) plots closely to the background water quality and mid field water quality from BH-8 and BH-13, respectively. Overall, the graphing suggests that the downgradient wells align more closely with background groundwater than the leachate water quality suggesting that these areas are not impacted.

7.6 Volatile Organic Compound Testing

Samples collected during the spring sampling event from all monitoring stations were analyzed for the organic parameters that are listed in Column 1 of Schedule 5 (MOE, 1998). The chemical results are compiled in **Appendix G**. Concentrations of all parameters from all locations were below ODWS/OG limits with the following exceptions:

- BH-5: Benzene with a level of 2.5 µg/L, above the standard of 1 µg/L

The levels detected are similar to historical levels. Dichloromethane was detected in BH-16A. Historically it was not detected. The detection will be monitored to determine whether a new trend is occurring, or the value is anomalous. Historically, monitoring location BH-2 also revealed the presence of organic compounds. The presence of organic compounds indicates some level of impact because of the landfill operations. Continued VOC analysis will include the parameters listed in Column 1, Schedule 5 (MOE, 1998).

7.7 Leachate Impacted Area

As described in the previous sections, a number of monitoring wells both on-site and in the near vicinity of the site show evidence of varying levels of leachate impact. The results continue to show a diffuse plume present to the north that is characterized by decreasing chemical concentrations with separation distance from the fill area.

Several parameters have been identified as being indicators of landfill leachate, they include: *alkalinity, barium, boron, calcium, manganese, sodium, strontium, sulphate, and TDS*. With respect to elevated chloride and nitrate at the site, they are considered to be, in part, a product of de-icing along Kohlsmith Road and fertilizer applications from nearby farming operations, respectively. The nitrate values at the site are sporadic ranging from below or near the detection limit at monitoring wells BH-2, BH-5, and BH-6 to greater than 15 mg/L at monitoring well BH-4 and BH-7. Concentrations are elevated in both the shallow and deep piezometer settings along the north-eastern perimeter of the site. Concentrations at BH-13 are elevated in the deeper setting, and further downgradient at wells BH-15 and BH-16, nitrate is elevated in the shallow setting.

Based on the discussion from **Section 7.5** the following shows the primary distribution of non and impacted groundwater at the site.

Perceived To Not Be Impacted	Perceived To Be Somewhat Impacted
BH-2 Deep	BH-2 Shallow
BH-6 Deep	BH-4 Shallow and Deep
BH-8	BH-5
BH-10 Shallow, Medium, Deep	BH-6 Shallow
BH-11 Shallow and Deep	BH-7 Shallow and Deep
BH-13 Shallow	BH-9 Shallow and Deep
BH-14 Shallow and Deep	BH-12
BH-15 Shallow and Deep	BH-13 Deep
BH-16 Shallow and Deep	
BH-17 Shallow and Deep	

Figure 5 shows the distribution of the perceived impacted and non-impacted groundwater at the site.

7.8 Assessment of Impact of Landfill on Groundwater

The Reasonable Use Concept addresses the levels of off-site contaminants which are considered acceptable by the MECP. The Reasonable Use Criteria (RUC) allow for the definition of the level of contamination in the groundwater beyond which mitigating action should be undertaken. The acceptability of the site in terms of its impact on groundwater has been assessed in terms of the RUC. The RUC establish the acceptability of change in groundwater quality as follows:

Non-health Related (Aesthetic) Parameters: Degradation of less than 50% of the difference between the background quality and the established objective for the particular non-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 (Aesthetic):

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

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. In this instance the background values are considered to be the median values from the background location.

The parameters used in the Reasonable Use Assessment are Key Indicator Parameters representative of landfill leachate impact and are those parameters that are part of the monitoring program. Nitrate is not included due to ongoing farming operations in the area and chloride values must be considered with the possibility of input from road de-icing activities. **Table 20** outlines the Reasonable Use Criteria.

Table 20: Reasonable Use Criteria

Parameters	P_b (1)	C_m	F	C_{allow}
Barium	0.03	1 (MAC)	0.25	0.27
Boron	0.01	5(MAC)	0.25	1.26
Manganese	0.01	0.05(AO)	0.50	0.03
Sulphate	15	500 (AO)	0.50	258
TDS	231	500 (AO)	0.50	366
Alkalinity	141	500 (OG)	0.50	321
Chloride	7.4	250 (AO)	0.50	129
DOC	1.1	5 (AO)	0.50	3
Sodium	4	200 (AO)	0.50	102
Iron	0.03	0.3 (AO)	0.50	0.17

All values in mg/L

(1) - Background values are the median values from monitoring well BH-8

Median values are taken from the sampling history

AO - Aesthetic Objective

OG - Operational Guideline

MAC - Maximum Acceptable Concentration

F - Degradation factor

The maximum allowable concentrations (i.e., Reasonable Use Performance Objectives; RUPO), as outlined in **Table 20**, are compared to concentrations identified at monitoring wells BH-15A Deep, BH-15B Shallow, BH-16A Deep, BH-16B Shallow, BH-17A Deep, and BH-17B Shallow. The comparison of values is provided in **Table 21**. These wells (wells BH-15, BH-16, and BH-17) have been drilled along the downgradient CAZ boundaries.

Table 21: Summary of MOE Guideline B-7 (Reasonable Use) Calculations

Parameters		ODWS	C_{allow}	BH-15A Deep		BH-15B Shallow		BH-16A Deep		BH-16B Shallow		BH-17A Deep		BH-17B Shallow	
				Jun	Oct	Jun	Oct	Jun	Oct	Jun	Oct	Jun	Oct	Jun	Oct
				2024											
Health Related	Barium	1	0.27	0.03	0.03	0.07	0.02	0.16	0.16	0.17	0.15	0.03	0.03	0.03	0.03
	Boron	5	1.26	0.01	0.01	0.03	0.02	0.45	0.42	0.36	0.38	<0.01	<0.01	<0.01	<0.01
Aesthetic Parameters	Manganese	0.05	0.03	0.02	--	<0.01	--	**0.11**	--	**0.06**	--	<0.01	--	<0.01	--
	Sulphate	500	258	49	47	19	17	37	36	39	34	26	24	20	18
	TDS	500	366	210	203	347	338	**722**	**722**	**682**	**650**	192	188	193	190
	Alkalinity	30-500	321	162	159	215	211	491	475	426	408	135	137	144	144
	Chloride	250	129	11	10	13	14	85	83	87	73	7	8	7	7
	DOC	5	3	1.3	1.0	1.4	1.2	**5.4**	4.5	3.7	3.5	1.2	1.1	1.1	1.2
	Sodium	200	102	5	5	7	6	40	37	35	39	4	4	4	4
	Iron	0.3	0.17	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03

All values in mg/L
Bold *- Exceeds ODWS*
- Exceeds RUC
-- Not analyzed

Table 21 reveals the following parameters to exceed RUPO:

- **Manganese:**
  BH-16 Deep June (0.11 mg/L)
  BH-16 Shallow June (0.06 mg/L)
- **Total Dissolved Solids:**
  BH-16 Deep June and October (722 and 722 mg/L)
  BH-16 Shallow June and October (682 and 650 mg/L)
- **Alkalinity:**
  BH-16 Deep June and October (491 and 475 mg/L)
  BH-16 Shallow June and October (426 and 408 mg/L)
- **Dissolved Organic Carbon:**
  BH-16 Deep June and October (5.4 and 4.5 mg/L)
  BH-16 Shallow June and October (3.7 and 3.5 mg/L)

The 2024 sampling results from the three downgradient locations do not reveal any concentrations of heath related parameters to be greater than the RUPOs. In comparing the values of TDS, alkalinity, and DOC from BH-16 to wells that are located closer to the site (i.e., BH-13, and BH-6), the concentrations in wells located furthest from the fill area are on balance greater than values from wells located closer to the site. Intuitively we would expect the opposite. As indicated on **Graphs 23** and **24** the groundwater at BH-16 plots more closely to the background water quality from BH-8 than the leachate water quality from at BH-5. Accordingly, we would suggest that the far downgradient wells are not being severely impacted by the landfill operations and continued monitoring is recommended.

7.9 Groundwater Trigger Mechanism

Typically, trigger concentrations refer to the allowable concentration for a "Trigger Parameter" in the groundwater at the Point of Compliance (POC). In 2006, Golder Associates prepared as a requirement of Condition 81 of the Amended ECA dated December 23, 2005, a groundwater trigger mechanism for review. The concentrations used as "Trigger Values" included the RUC concentrations (i.e., C_{allow}) as outlined in **Section 7.8** of this report. The piezometers used in the assessment were grouped into three categories:

- **North:** On-site wells including wells in the CAZ located downgradient and north of the fill area (i.e. BH-4 Deep, BH-4A Shallow, BH-11A Deep, BH-11B Shallow, BH-13A Deep, and BH-13B Shallow).
- **North-east:** On-site wells that are downgradient and located along the northeast landfill site property boundary (i.e., BH-10A Deep, BH-10B Mid, and BH-10 C Shallow).
- **North and east:** On-site wells downgradient to the north and east (i.e. BH-14A Deep and BH-14B Shallow).

Historical exceedances included mainly TDS and alkalinity.

Under Condition 81(a) of the amended ECA dated July 21, 2014, the 2014 Annual Monitoring Report (Jp2g March 2015) provided for review a proposed Trigger Mechanism and Contingency Plan for Director Approval under the procedures in Condition 97. The proposed trigger locations include the recently drilled downgradient wells as follows:

- **North-east:** Monitoring well BH-17 shallow and deep
- **North:** Monitoring well BH-15 shallow and deep
- **North-west:** Monitoring well BH-16 shallow and deep.

As indicated in **Section 7.8**, several of the parameters from the new downgradient wells that are used in the Reasonable Use Assessment have concentrations that are not only greater than the RUPO but also greater than values of the respective concentrations from wells that are located closer to the waste disposal site. Intuitively, as previously discussed, we would expect concentrations from wells located closer to the contaminant source to have higher impact. As a result of this type of anomaly the following was recommended.:

> *Complete two more rounds of groundwater monitoring (i.e., 2015 environmental monitoring program) to build up the database for the three "trigger" location wells to 5 sampling events. Beginning in 2016, assess the results of the yearly environmental monitoring against the median values for the trigger parameters from the chemical database of the three trigger location wells. The complete database should be used to determine median values until such time that the results of 10 sampling events are available. Subsequent to this, the median value should be determined by the last ten events.*
>
> *The exceedance of the trigger parameters will be considered any 4 consecutive concentrations that are greater than the median values. Four consecutive exceedances will trigger the implementation of additional detailed studies or the implementation of remedial measure to be determined.*

The results of the groundwater trigger assessment as described above are presented in **Table 22**.

Table 22: Groundwater Trigger Assessment

Parameters	ODWS	BH-15A Deep					BH-15B Shallow				
		Median	Jun 2023	Oct 2023	Jun 2024	Oct 2024	Median	Jun 2023	Oct 2023	Jun 2024	Oct 2024
Barium	1	0.04	0.04	0.04	0.03	0.03	0.09	0.08	0.07	0.07	0.02
Boron	5	0.01	0.01	0.01	0.01	0.01	0.07	0.04	0.03	0.03	0.02
Manganese	0.05	0.01	0.06	--	0.02		0.01	<0.01	--	<0.01	--
Sulphate	500	46	47	46	49	47	22	16	17	19	17
TDS	500	296	287	210	210	203	359	343	330	347	338
Alkalinity	30-500	190	190	190	162	159	241	225	211	215	211
Chloride	250	13	11	10	11	10	18	11	11	13	14
DOC	5	1.6	2.0	6.2	1.3	1.0	2.2	2.1	5.6	1.4	1.2
Sodium	200	6	5	6	5	5	11	7	7	7	6
Iron	0.3	0.03	<0.03	<0.03	<0.03	<0.03	0.03	<0.03	<0.03	<0.03	<0.03

Parameters	ODWS	BH-16A Deep					BH-16B Shallow				
		Median	Jun 2023	Oct 2023	Jun 2024	Oct 2024	Median	Jun 2023	Oct 2023	Jun 2024	Oct 2024
Barium	1	0.16	0.17	0.18	0.16	0.16	0.16	0.17	0.17	0.17	0.15
Boron	5	0.43	0.43	0.47	0.45	0.42	0.32	0.28	0.35	0.36	0.38
Manganese	0.05	0.05	0.09	--	0.11	--	0.04	0.08	--	0.06	--
Sulphate	500	32	30	30	37	36	29	31	28	39	34
TDS	500	708	708	722	722	722	637	643	636	682	650
Alkalinity	30-500	490	524	523	491	475	417	425	440	426	408
Chloride	250	72	72	77	85	83	64	66	63	87	73
DOC	5	5.5	5.6	15.6	5.4	4.5	4.0	4.2	12.2	3.7	3.5
Sodium	200	40	39	39	40	37	34	33	32	35	39
Iron	0.3	0.03	<0.03	<0.03	<0.03	<0.03	0.03	0.05	0.04	<0.03	<0.03

Parameters	ODWS	BH-17A Deep					BH-17B Shallow				
		Median	Jun 2023	Oct 2023	Jun 2024	Oct 2024	Median	Jun 2023	Oct 2023	Jun 2024	Oct 2024
Barium	1	0.03	0.04	0.03	0.03	0.03	0.03	0.04	0.03	0.03	0.03
Boron	5	0.01	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Manganese	0.05	0.01	<0.01	--	<0.01	--	0.01	<0.01	--	<0.01	
Sulphate	500	23	22	22	26	24	18	16	18	20	18
TDS	500	189	188	187	192	188	193	192	190	193	190
Alkalinity	30-500	138	145	146	135	137	144	152	152	144	144
Chloride	250	7	6	6	7	8	7	6	6	7	7
DOC	5	1.6	2.6	4.2	1.2	1.1	1.5	1.9	5.0	1.1	1.2
Sodium	200	4	4	4	4	4	4	4	4	4	4
Iron	0.3	0.03	<0.03	<0.03	<0.03	<0.03	0.03	<0.03	<0.03	<0.03	<0.03

Notes:

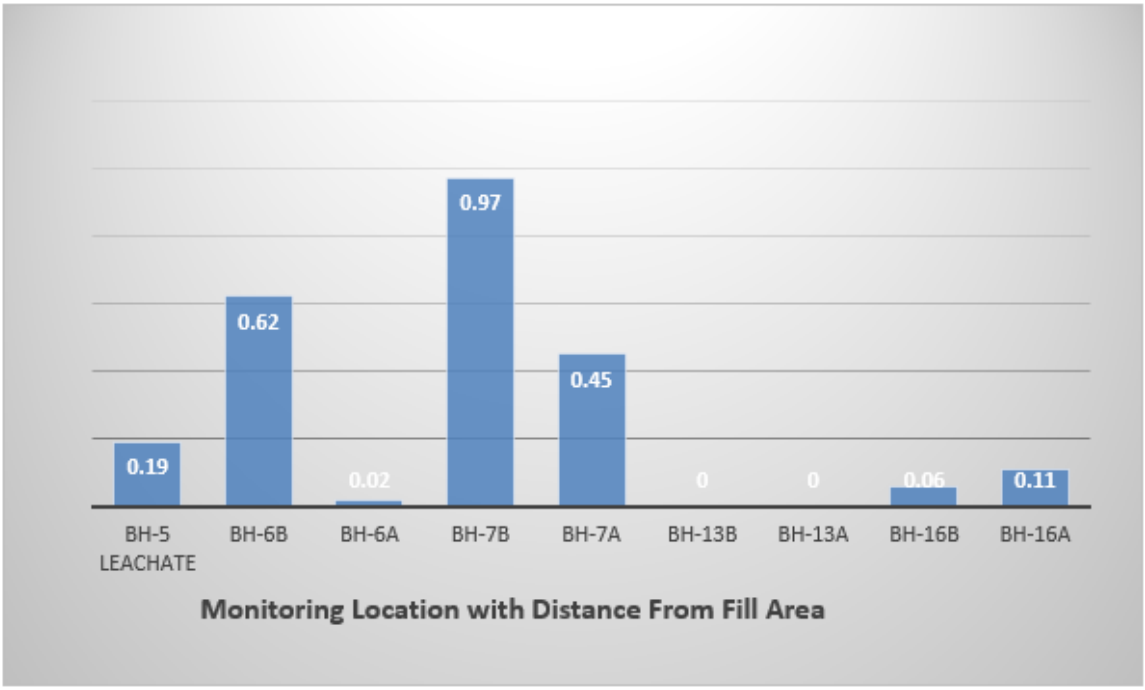
- All concentrations in mg/L
- Median values are taken from last 10 monitoring events
- Yellow highlight denotes exceedance of median values
- Red value indicates ODWS exceedance
-- Not analyzed

The results of the 2024 monitoring reveals exceedances to the trigger value for all parameters at

one or more locations. Alkalinity at BH-17A (deep) exceeded the trigger value on four consecutive occasions in 2022-2023, however in 2024 the trigger values were not exceeded. The values are low and do not reveal any significant increasing trends in concentration.

Manganese, being analyzed in the spring monitoring event only, exceeded the trigger concentration at BH-16A and BH-16B in 2021, 2022, 2023 and 2024, i.e. four (4) consecutive event monitoring events. There is a slight increasing trend since 2020, however levels remain relatively low. **Graph 25** shows the spring 2024 manganese values at locations based on distance from the site. The locations included in the graphing are as follows: BH-5 Leachate well; BH-6 immediate downgradient well; BH-7 and BH-13 mid-distance wells; and BH16, furthest downgradient well.

Graph 25: Comparison of TDS Values at Downgradient Well vs Distance



In comparing the values of manganese from BH-16 to wells that are located closer to the site (i.e., BH-7, and BH-6), the concentrations in wells located closer to the landfill are an order of magnitude greater than values from BH-16. Again, it would be expected that levels would attenuate over the distance.

Concentrations of TDS and alkalinity are elevated at BH-16, and as discussed in **Section 7.5**, in comparing these values from BH-16 to wells that are located closer to the site (i.e., BH-13, and BH-6), the concentrations in wells located furthest from the fill area are on balance greater than values from wells located closer to the site. Intuitively we would expect the opposite. In evaluating the surficial geology, the esker located in the vicinity of BH-16 may result in a differing natural mineralization of the groundwater at this location. Accordingly, we would suggest that the far downgradient wells are not being severely impacted by the landfill operations. It is our recommendation that manganese be added to the fall analysis at BH-16, and that a bi-level well be installed between BH-5 and BH-16 to determine the potential of the impact from landfilling.

8.0 SURFACE WATER

8.1 Surface Water Characteristics

Historically, three surface water stations were identified; they were SW1, SW2, and SW3. Surface water station SW-1 was located in the "draw" that runs along the northern limit of the site as shown on **Figure 3**. This station was relocated in 2012 to an area in the vicinity where the groundwater is anticipated to discharge to the surface water and is now referenced as SW-1A. Two other stations are sampled, MVC (SW-2) that is located along Mine View Road east of the site and BLC (SW-3) that is located along the Blind Line. The location of SW-2 and SW-3 are provided in **Figure 2**. Photographs of these monitoring stations are included in **Appendix E**.

Seasonal surface water in the vicinity of the Ross WDS originates at a divide that is located approximately 225 meters southwest of the culvert on Mine View Road. The surface water at this location is in the form of a gentle swale that conveys water from the farmers' fields. The swale meanders north-east towards Mine View Road where it crosses under the road approximately 150 meters north of Kohlsmith Road. From Mine View Road to the northeast, there is no defined channel. The swale is intermittent and continues to meander in a northeast direction through a grassy field.

At approximately 500 meters northeast from Mine View Road the swale disappears prior to reaching the northwest corner of the landfill site. From here there is a "draw" in the woodlot north of the site that at times experiences seasonal surface ponding during wetter periods of the year, but for the most part, the ravine that runs behind the site is dry.

Some puddles at times exist with no visual flow to a distance of approximately 65 meters northeast of BH-6. Beyond this point, the "draw" is dry and there is no defined channel from this location. This was the approximate location of the initial SW-1. In 2016, the area around the former SW-1 was surveyed to help assess the groundwater interaction near and at the "draw". A cross-sectional profile of the site is provided as **Figure 6** and stretches in an approximately north-northwestern direction from BH-1 to BH-15. **Figure 6** shows that the "draw" located to the north of the site is not a discharge point for groundwater.

Further to the northeast, at a distance of approximately 60 meters, a defined channel emerges (i.e., area of the relocated SW-1 in 2012, now referenced as SW-1A). From this point, the water course is defined, and flows to a municipal ditch located on the east side of the closed road allowance known as the Blind Line. From the Blind Line, surface water flows southerly and crosses Kohlsmith Road approximately 600 meters east of the site.

8.2 Water Quality Assessment

In 2024, the three surface water locations MVC (SW-2), SW-1A, and BLC (SW-3) were sampled. The locations are shown on **Figures 2** and **3** and UTM coordinates are provided as follows:

Monitoring Station	Description	UTM Coordinates
Mine View Culvert SW-2 (MVC)	Upstream sampling location	N5054829, E358248
SW-1A	Current location	N5055527, E358726
Blind Line Culvert SW-3 (BLC)	Downstream sampling location	N5055749, E359273

Surface water station SW-1A is located immediately north of the site slightly west of BH-11. It was moved to this location in the fall of 2012. Surface water station SW-2 (MVC) is located to the southwest at the Mine View Road culvert, upstream of the site and SW-3 (BLC) is located to the northeast at the Blind Line culvert, downstream of the site.

In 2024 the following surface water sampling events were completed:

Monitoring Period	Samples Collected
May 2024 (Storm)	SW-1A and SW-3
June 2024 (Regular Monitoring)	SW-1A
October 2024 (Regular Monitoring)	SW-1A
November 2024 (Storm)	SW-1A and SW-3

In 2024, as described above, SW-1A was sampled during the spring and fall, as well as during the May and November storm events. Station SW-3 (BLC) was also sampled during the two storm events, however there was insufficient water to sample in the spring and fall events. No samples were collected at SW-2 (MVC) in 2024 due to insufficient water.

The tabulated chemical analyses are provided in **Appendix G**. All parameters reveal concentrations that are less than PWQO's, CWQG's, and Aquatic Protection Values (APV's) in 2024 except for the following:

SW-1A: Flows of 0.02 L/s

- Nitrate (6.91 mg/L, 7.9 mg/L, 7.35 mg/L, and 5.62 mg/L) – May (storm), June, October, and November (Storm)
- Total phosphorus (0.032 mg/L) – November (Storm)

SW-2 (MVC): No flow in 2024

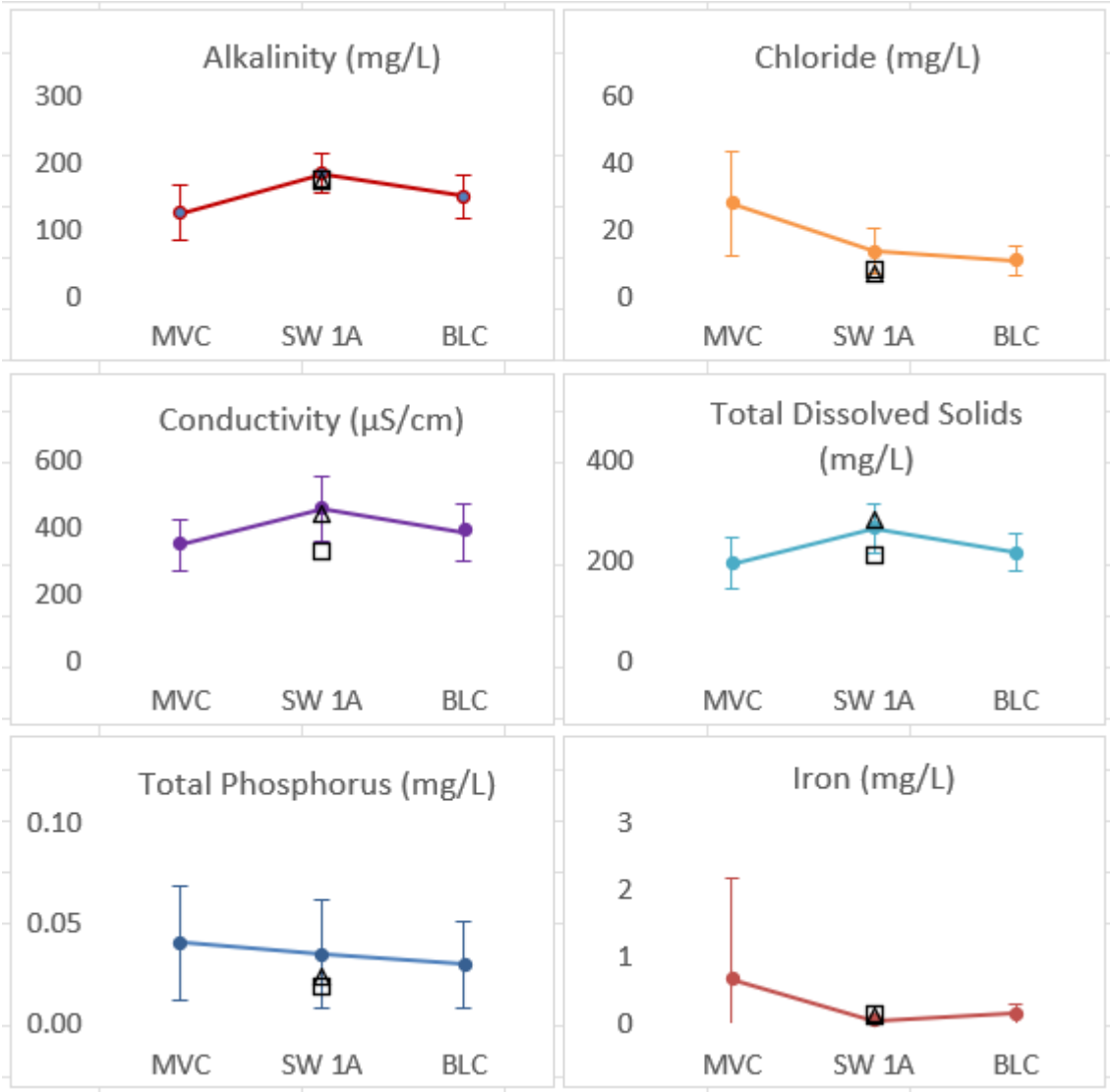
- No samples were collected (location dry)

SW-3 (BLC): Flows of approximately 0.6 L/s

- Nitrate (4.33 mg/L) – May (Storm)

A visual representation of the spring and fall surface water monitoring results for select parameters in relation to the mean concentration at each monitoring station is presented in **Graph 26**.

Graph 26: Comparison of Surface Water Concentrations



Note: Coloured lines represent mean concentrations since 2012 and error bars present one standard deviation from the mean. Triangle markers illustrate June 2024 monitoring results and square markers illustrate October 2024 monitoring results.

Although some elevated parameters have been noted, the data does not indicate any impact on the nearby surface water because of the landfilling activities.

8.3 Trigger Mechanism and Contingency Plan

The surface water trigger parameters and compliance points were reviewed as part of the 2024 monitoring program and the existing trigger mechanism and contingency plan for surface water is recommended as summarized below.

8.3.1 Surface Water Trigger Parameters

The trigger parameters for the site are selected from the list of leachate indicator parameters with available PWQO, CWQGs, or APV values. The parameters selected are those that are indicative of leachate impacts and that can be distinguished from naturally occurring or ambient background conditions. The following leachate indicators are recommended as surface water trigger parameters: unionized ammonia, boron, and chloride. Other parameters are not included because of not having provincial guidelines, having the potential to be influenced by local activities (farming, road maintenance, local mineralogy) and or having little use for the determination of leachate impact (i.e., pH, zinc, nitrate, nitrite, lead, chromium, cadmium).

8.3.2 Surface Water Trigger Concentrations

The surface water trigger concentrations are the higher of the respective CWQGs or 75th percentile of background concentrations for the individual trigger parameters.

Parameters	Guideline	Trigger Concentration (mg/L)	Trigger Mechanism
Un-ionized Ammonia	CWQG	0.019	Exceedance of trigger concentration over four consecutive events
Boron	CWQG	1.5	
Chloride	CWQG	120	

8.3.3 Surface Water Point of Compliance

There are currently three surface water stations established at the site. They are SW-2 (MVC), SW-1A, and SW-3 (BLC). The Mine View Road Culvert SW-2 location is significantly upgradient from, and isolated from, the landfill site, and as such is not suitable as a compliance point. The Blind Line Culver SW-3 is considered downgradient on the water course north of the site. This location is susceptible to external sources of impact that primarily include farming. Additionally, and to a lesser degree, there is the potential for this location to be impacted by low level maintenance along the Blind Line. As a result, the trigger location is defaulted to SW-1A. This location is essentially the "headwater" for the surface water leaving the site and should be isolated from potential external sources.

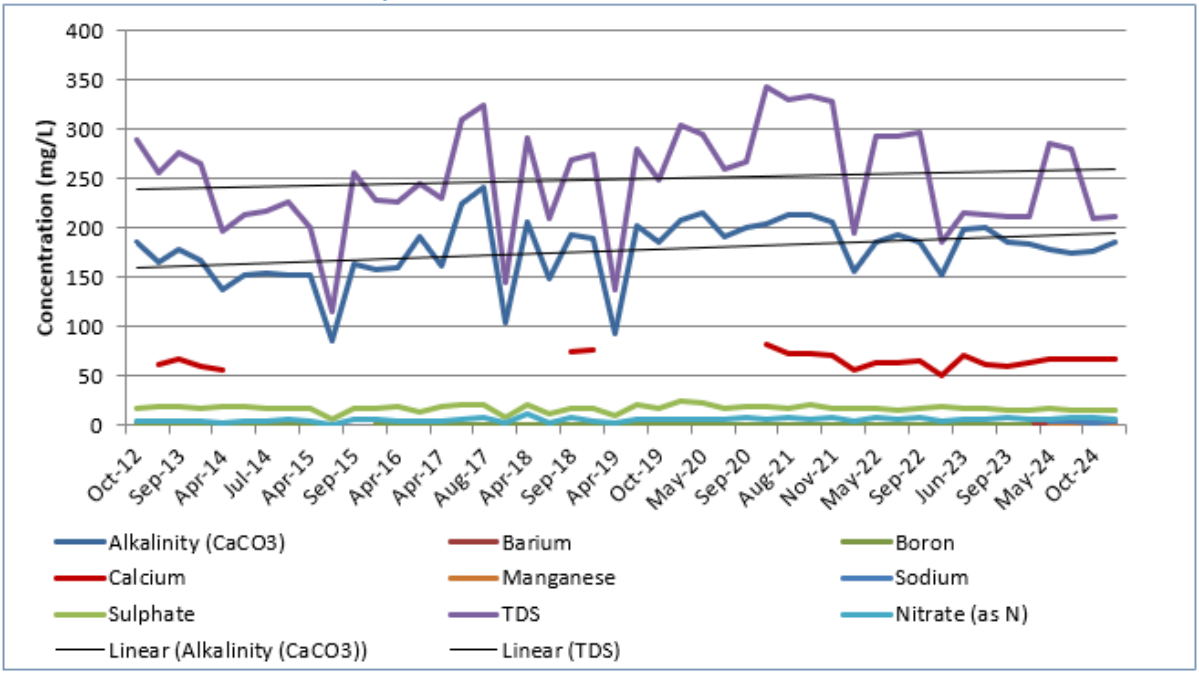
Contingency measures would be implemented if:

- the calculated 75th percentile concentrations (taken over the entire sampling history) exceed the compliance values (i.e., the higher of the PWQO, CWQG and or the APV values) for any one of the trigger parameters at the trigger location over four consecutive sampling events (i.e., one monitoring year); and/or
- there are significant changes to the surface water quality (i.e., increase in leachate indicator parameters versus historical values or clear apparent increases in indicator parameter concentrations over time).

The 75th percentile evaluation is presented as part of the chemical database. At the trigger location (SW-1A), there were no instances where the calculated 75th percentile concentrations exceed the compliance values (i.e., the higher of the PWQO, CWQG and or the APV values) for any one of the trigger parameters (un-ionized ammonia, boron, and chloride).

In addition, there were no significant changes to the surface water quality such as observable increases in leachate indicator parameters versus historical values or clear apparent increases in indicator parameter concentrations over time. Surface water trends from SW-1A are provided in **Graph 27** and are noted to be relatively stable.

Graph 27: Leachate Parameters over Time SW-1A



8.3.4 Surface Water Contingency Plan

The following surface water contingency plan is considered relevant for the site and includes:

- Increased sampling frequency;
- Analysis of additional indicator parameters such as toxicity testing;
- Increased number of sampling locations;
- Use of cover material to influence leachate generation or surface water flow patterns;
- Remedial alternatives.

9.0 LANDFILL GAS

A landfill gas monitoring program was established in the spring of 2011. Landfill gas measurements at the Ross WDS are collected from all wells and the on-site buildings. Sampling and analysis of landfill gas is completed using a BW GasAlert MaxXT handheld gas monitor calibrated to methane, carbon monoxide, hydrogen sulfide, and oxygen with methane measured as percentage of the lower explosive limit.

Tabulated monitoring results for both spring and fall sampling events for 2011 through to 2024 are provided in **Appendix H**. Recent readings from selected wells that suggest signs of landfill leachate impact are presented in **Table 23**.

Table 23: Summary of Landfill Gas Readings from Affected Wells

Test Location	June 2024	October 2024
BH-4 Shallow	19.6% oxygen, 71 ppm CO	No gas detected
BH-5	No gas detected	No gas detected
BH-7 Deep	No gas detected	No gas detected
BH-7 Shallow	No gas detected	No gas detected
BH-8	No gas detected	No gas detected
BH-12	No gas detected	No gas detected

No detections of methane were measured in 2024. The results of the historical landfill gas monitoring activities correspond with the conclusions made in the discussion on groundwater quality in **Section 7.0**. The wells that showed the highest signs of leachate impact in groundwater samples (i.e. BH-4A Shallow and BH-7A Deep) also appear to show the presence of methane, CH_3 - an indicator of landfill gas. None of the on-site structures such as the office building or attendant's shelter were found to contain detectable quantities of methane at the time of sampling.

10.0 2025 MONITORING PROGRAM

An essential component of an effective water quality monitoring program is a well-developed and maintained sampling program. It is necessary to follow the same procedures and protocols during each phase of the monitoring program to ensure that all measurements and samples are representative of the actual conditions. This section outlines the proposed sampling stations, sampling frequencies, and chemical parameters.

10.1 Groundwater

The proposed groundwater monitoring program for the landfill site during its operation period is based on the following:

- Two monitoring events: (spring and fall) monitoring of groundwater levels at all monitoring locations.
- The completion of groundwater sampling according to the schedule provided in **Table 24**.
- Annual reporting of the chemical results and a yearly assessment of the need to amend the monitoring program. Any deviations from the monitoring program must be approved in accordance with ECA Condition 97.
- All groundwater monitoring stations should be clearly marked, have adequate access, and be maintained in good working order.
- In the event that a monitoring well becomes disabled, an assessment should be provided as to whether or not the well is to be replaced or decommissioned.
- Record the status of all monitoring wells and a statement on the well's compliance with O.Reg. 903.

10.2 Surface Water

Further to the Ministry's comments and as per the Environmental Monitoring Report (February 2013), two additional surface water stations have been established at the site. One located along Mine View Road (upgradient from the site; i.e., SW-2) and the second at Blind Line (the unopened road allowance between Concession 5 and 6 downgradient from the site, i.e., SW-3). Surface water monitoring should be completed as outlined in **Table 24.**

- The sampling of three surface water stations SW-2 (MVC), SW-1A, and SW-3 (BLC). The location of the monitoring stations is as follows:
    - **SW-2 (MVC)** – Mine View Road culvert, upstream of the landfilling area.
    - **SW-1A** – The area where the surface water originates, located slightly north of the landfilling area.
    - **SW-3 (BLC)** – Blind Line culvert (the unopened road allowance between Concession 5 and 6), downstream of the landfilling area.
- Two monitoring events: (spring and fall) monitoring of surface water flows at all locations.
- The completion of surface water sampling according to the schedule and analysis provided in **Table 24** (minimum detection limit to meet ODWS/OG or PWQO, whichever is lower).
- After any two storm events, surface water flow measurements, sampling, and analysis as per **Table 24** should be completed.
- Annual reporting of the chemical results and a yearly assessment of the need to amend the surface water sampling program. Any deviations from the monitoring program must be approved in accordance with ECA Condition 97.
- All surface water monitoring stations should be clearly labelled.

Table 24: Monitoring Locations and Schedule

Monitoring Location	Spring	Summer/Fall
Groundwater		
All groundwater monitoring wells: BH-2 Deep, BH-2 Shallow, BH-4 Deep, BH-4 Shallow, BH-5, BH-6 Deep, BH-6 Shallow, BH-7 Deep, BH-7 Shallow, BH-8, BH-9 Deep, BH-9 Shallow, BH-10 Deep, BH-10 Middle, BH-10 Shallow, BH-11 Deep, BH-11 Shallow, BH-12, BH-13 Deep, BH-13 Shallow, BH-14 Deep, BH-14 Shallow, BH-15 Deep, BH-15 Shallow, BH-16 Deep, BH-16 Shallow, BH-17 Deep, BH-17 Shallow	Water Level – Column 1 Schedule 5 Field Measurements: Temperature pH Conductivity	Water Level – Column 2 Schedule 5 Field Measurements: Temperature pH Conductivity
Surface Water		
All surface water monitoring stations (Note 1): SW-1A, SW-2, and SW-3	Column 3, Schedule 5 (Note 2), Hardness, Sodium, Strontium, and Manganese Field Measurements: Temperature pH Conductivity Dissolved Oxygen Flow	Column 3, Schedule 5 (Note 3), Hardness, Sodium, Strontium, and Manganese Field Measurements: Temperature pH Conductivity Dissolved Oxygen Flow

(1) In addition to the two regular surface water events, two additional "storm" events are required

(2) VOC analysis at SW-1A, once per year.

(3) Provide a review of parameters for upcoming sampling.

11.0 DISCUSSION AND RECOMMENDATIONS

Water quality monitoring was completed in 2024 at the Ross WDS. Sampling was completed on two occasions for groundwater and on four occasions for surface water. The spring and fall monitoring events for groundwater consisted of the collection of static water levels, groundwater samples from selected monitoring wells, and an assessment of monitoring well conditions.

The spring and fall monitoring events as well as two storm events for surface water consisted of the collection of surface water samples from selected stations and measuring surface water discharge rate at surface water monitoring stations MVC, SW-1A, and BLC.

The following is a summary of the activities and investigation:

<u>Groundwater</u>

- The general trend of the direction of groundwater flow is similar to previous years. Groundwater flow is to the north.
- Leachate at the site is characterized by groundwater from monitoring well BH-5, located close to the active fill area. Historically BH-12 was considered to be representative of leachate concentrations, however, with the movement of active landfilling operations to the east end of the site, BH-5 is becoming a more relevant leachate indicator.
- Background water quality values at the site are characterized by groundwater from monitoring well BH-8.
- The analytical results continue to show a diffuse plume present to the north that is characterized by decreasing chemical concentrations with separation distance from the fill area; however, elevated concentrations of selected parameters are present at wells BH-15 and BH-16. There appears to be other factors affecting elevated levels at these outlying wells. Additional sampling will increase the chemical database at these locations.
- Several parameters have been identified as being indicators of landfill leachate, they include TDS, chloride, sulphate, nitrate, alkalinity, sodium, manganese, and barium.
- Elevated chloride and nitrate at the site are considered in part a product of de-icing along Kohlsmith Road and fertilizer applications from nearby farming operations respectfully.
- Concentrations of DOC across the site in October 2023 were elevated and are considered to be anomalous. This was confirmed in 2024 with levels similar to historical levels.
- The following monitoring points are not considered to be impacted by the landfill site: BH-2A Deep, BH-6A Deep, BH-8, BH-10A Deep, BH-10B Mid, BH-10C Shallow, BH-11A Deep, BH-11B Shallow, BH-13B Shallow, BH-14A Deep, BH-14B Shallow, BH-15A Deep, BH-15B Shallow, BH-16A Deep, BH-16B Shallow, BH-17A Deep, and BH-17B Shallow.
- The main landfill leachate impact at the site is present in the monitoring wells: BH-2, BH-4, BH-5, BH-6, BH-7, BH-9, BH-12, and BH-13. The impact is shown on **Figure 5**.
- The shallow contamination at the site shows elevated levels of leachate indicator parameters in shallow monitoring wells:

  BH-2B Shallow, BH-4A Shallow, BH-5 (leachate), BH-6B Shallow, BH-7B Shallow, BH-9B Shallow, and BH-12.
- The vertical extent of the deep leachate impacts is observed through elevated leachate indicator parameters within deep monitoring wells:

  BH-4 Deep, BH-7A Deep, BH-9A Deep, and BH-13A Deep.
- The installation of three monitoring wells was completed in the summer of 2013. These wells (BH-15, BH-16, and BH-17) were used as RUC compliance wells. The results of the 2024 monitoring reveals exceedances to the trigger median value for manganese at BH-16B Shallow and BH-16A Deep over four consecutive sampling events. The values show a minor increasing trend since 2020 but are considered low. It is our

recommendation that manganese be added to the fall analysis at BH-16 to gather additional trend data. Elevated parameters at monitoring station BH-16 appear to be either a result of the natural mineralization of the groundwater at this location or a result of impacts from external sources other than the landfill site.

- As water levels seem to indicate potential flow to the downgradient wells (BH-15, BH-16) coupled with the elevated concentrations in the deep setting of BH-16, it is our recommendation that a bi-level well be installed between BH-5 and BH-16 to determine the potential of the impact from landfilling.

Surface Water

Surface water samples were collected in 2024 from sampling location SW-1A during the spring and fall, as well as during the May and November storm events. Station SW-3 (BLC) was also sampled during the two storm events, however there was insufficient water to sample in the spring and fall events. No samples were collected at SW-2 (MVC) in 2024 due to insufficient water. All parameters reveal concentrations less than PWQOs, CWQGs, and APVs with the exception of the following:

Surface Water Monitoring Station SW-1A:

- Nitrate (6.91 mg/L, 7.9 mg/L, 7.35 mg/L, and 5.62 mg/L) – May (storm), June, October, and November (Storm)
- Total phosphorus (0.032 mg/L) – November (Storm)

Surface Water Monitoring Station SW-3 (BLC):

- Nitrate (4.33 mg/L) – May (Storm)

The surface water is not considered to be impacted by the landfill site.

Landfill Gas

Landfill gas monitoring has been completed at the site since 2011 through to 2024. The 2024 results did not reveal any presence of landfill gas. None of the on-site structures such as the office building or attendant's shelter were found to contain detectable quantities of methane at the time of sampling.

***The following is recommended*:**

- Continued environmental monitoring as outlined in **Section 10** of this report is to include:
  - Ground water level monitoring,
  - Ground water sampling,
  - Surface water sampling, and
  - Landfill gas monitoring.
- Maintain all monitoring wells in good working order.
- Evaluate the effectiveness of the groundwater trigger mechanism and provided changes where deemed necessary. It is our recommendation that a bi-level monitoring well be installed between BH-5 and BH-16 to determine the potential of the impact from landfilling.

- Prepare an Environmental Monitoring Report on the results for the 2025 annual environmental monitoring.

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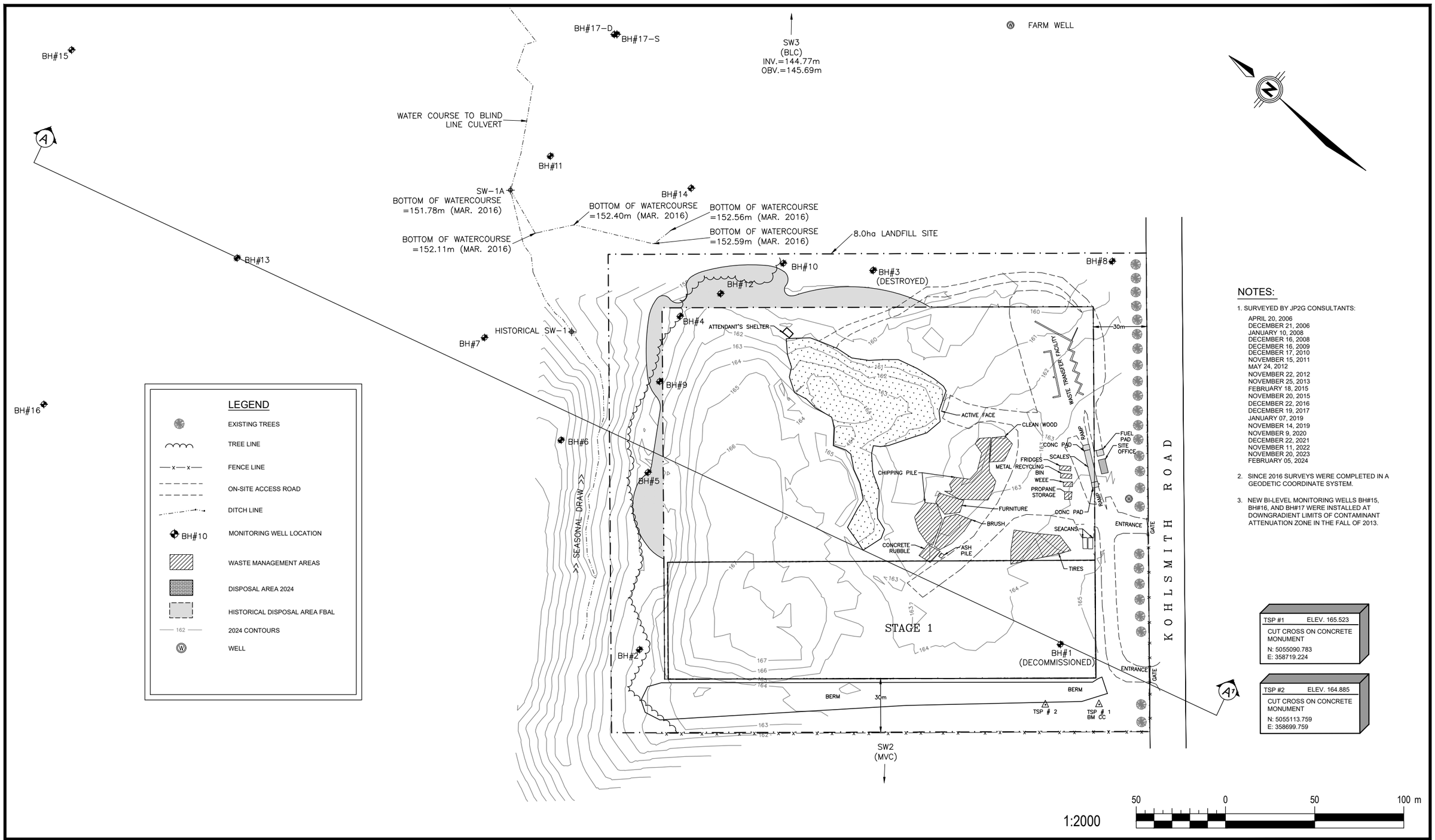
Ministry of the Environment and Energy, (1993) Guidelines Manual for Landfill Sites Receiving Municipal Waste.

LIMITATIONS AND USE OF THE REPORT

This report was prepared for the exclusive use of the Township of Whitewater Region. 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



NOTES:

1. SURVEYED BY JP2G CONSULTANTS:
   - APRIL 20, 2006
   - DECEMBER 21, 2006
   - JANUARY 10, 2008
   - DECEMBER 16, 2008
   - DECEMBER 16, 2009
   - DECEMBER 17, 2010
   - NOVEMBER 15, 2011
   - MAY 24, 2012
   - NOVEMBER 22, 2012
   - NOVEMBER 25, 2013
   - FEBRUARY 18, 2015
   - NOVEMBER 20, 2015
   - DECEMBER 22, 2016
   - DECEMBER 19, 2017
   - JANUARY 07, 2019
   - NOVEMBER 14, 2019
   - NOVEMBER 9, 2020
   - DECEMBER 22, 2021
   - NOVEMBER 11, 2022
   - NOVEMBER 20, 2023
   - FEBRUARY 05, 2024
2. SINCE 2016 SURVEYS WERE COMPLETED IN A GEODETIC COORDINATE SYSTEM.
3. NEW BI-LEVEL MONITORING WELLS BH#15, BH#16, AND BH#17 WERE INSTALLED AT DOWNGRADIENT LIMITS OF CONTAMINANT ATTENUATION ZONE IN THE FALL OF 2013.

TSP #1	ELEV. 165.523
CUT CROSS ON CONCRETE MONUMENT	
N: 5055090.783	
E: 358719.224	

TSP #2	ELEV. 164.885
CUT CROSS ON CONCRETE MONUMENT	
N: 5055113.759	
E: 358699.759	

1:2000

50 0 50 100 m

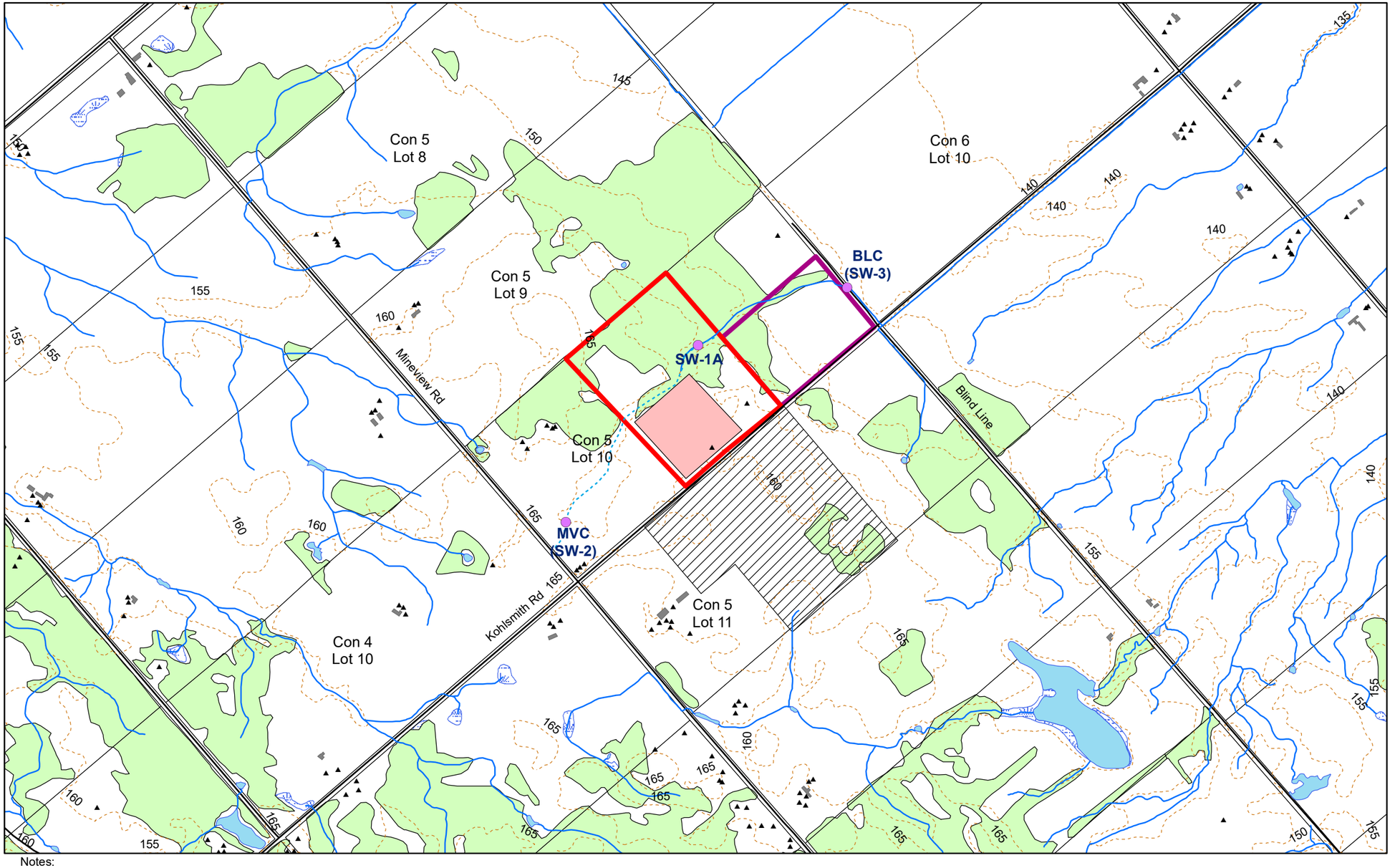
No.	DATE	BY		REVISIONS

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	RM
DRAWN	TN
CHECKED	KM
APPROVED	KM
SCALE	1:2000

TOWNSHIP OF WHITEWATER REGION
ROSS WASTE DISPOSAL SITE
EXISTING CONDITIONS PLAN 2024

PROJECT	17-6047I
PLOTTED	18-FEB-2025
DRAWING	1



Legend

- Surface Water Sampling Location
- Building Symbol
- Seasonal 'Draw'
- Water body
- Water Course
- Building
- Road
- Landfilling Area
- Ross Landfill Site
- Municipal Property
- Contour 5m Interval
- Lot/Con
- Aggregate Site
- Wooded Area
- Wetland

N
W
E
S

Notes:
Shape data From Land Information Ontario, 2018
Shapefiles created by Jp2g Consultants Inc.
Surface water locations are approximate
BLC - Blind Line Culvert
MVC - Mineview Culvert

0 0.375 0.75 1.5 Kilometers

Ross Landfill Site

Twp of Whitewater Region

1:15,000

Project No:
21-6137C

Figure 2 - Regional Map

Drawn By: HV

Checked by: KM

Date: April 2024

FORMER ROCHON PROPERTY
CONTAMINANT ATTENUATION ZONE
12.25 ha

FORMER HAWTHORNE PROPERTY
CONTAMINANT ATTENUATION ZONE
4.52 ha

BH-15
BH-16
BH-17
BH-11
BH-13
BH-14
BH-10
BH-3
(DESTROYED)
BH-8
(BACKGROUND)
BH-12
BH-4
BH-7
BH-9
BH-6
BH-5
BH-2
BH-1
(DECOMMISSIONED)

SW-1A
HISTORICAL SW-1
BLC
(SW-3)
MVC
(SW-2)

RECYCLING AND REUSED MATERIAL STORAGE AREA

STAGE 2
(WASTE MOUND)

STAGE 1
(TRENCH-AND-FILL)

30
65
30
30

TSP# 2
TSP# 1
BM CC

KOHLSMITH RD.

OWNER: YVES & DIANE ROCHON

OWNER: WELDON GUTZ

LEGEND

- BH-99 — GROUNDWATER MONITORING WELL LOCATION
- SW-99 — SURFACE WATER SAMPLE LOCATION
- 162 — 2023 GROUND SURFACE CONTOUR
- PROPERTY BOUNDARY
- LANDFILLING AREA
- FENCE LINE
- APPROXIMATE DIRECTION OF GROUNDWATER FLOW ACROSS SITE

NOTES:

1- SURFACE CONTOUR BASED ON NOVEMBER 2022 LAND SURVEY COMPLETED BY JP2G CONSULTANTS INC.

2- REFER TO FIGURE 6 FOR A CROSS SECTIONAL PROFILE OF CROSS SECTION A-A'.

3- NEW MONITORING WELL (BH-15, BH-16, AND BH-17) LOCATIONS ARE APPROXIMATE (± 10m).

4- LOCATIONS OF SURFACE WATER MONITORING STATIONS, MVC AND BLC ARE LABELED ON FIGURE NUMBER 2.

TSP #1 ELEV. 165.523
CUT CROSS ON CONCRETE MONUMENT
N: 5055090.783
E: 358719.224

TSP #2 ELEV. 164.885
CUT CROSS ON CONCRETE MONUMENT
N: 5055113.759
E: 358699.759

1:2 000
0 20 40 60 80 100 m
0 1:1 5 cm

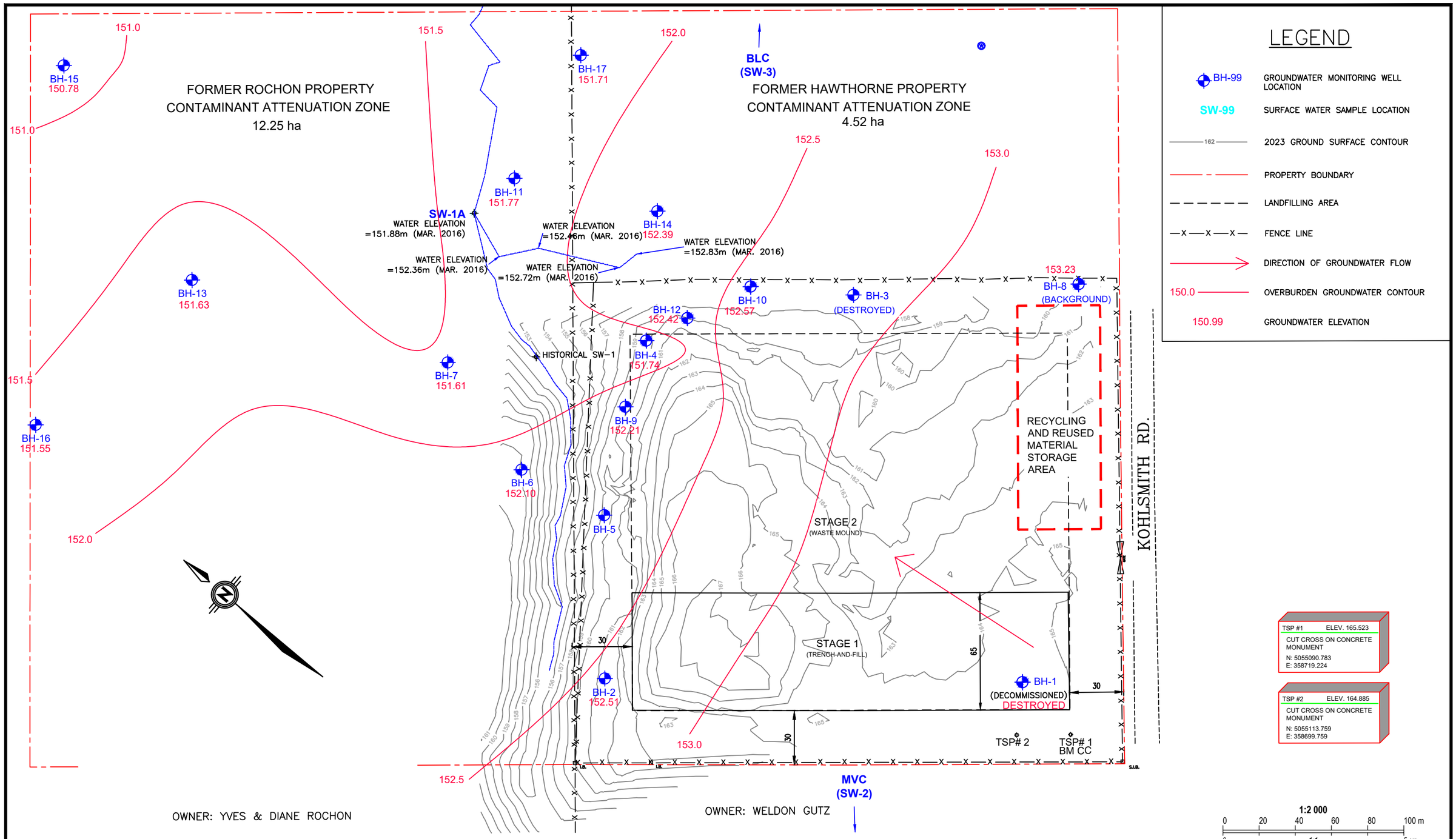
No.	DATE	BY	REVISIONS

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1150 MORRISON DRIVE, SUITE 410, OTTAWA, ON K2H 8S9
PHONE: 613-828-7800 FAX: 613-828-2600

DESIGNED	BWS
DRAWN	BWS
CHECKED	KM
APPROVED	KM
SCALE	1:2000

TOWNSHIP OF WHITEWATER REGION
ROSS WASTE DISPOSAL SITE
SITE PLAN 2024

PROJECT	17-6047I
PLOTTED	23-JAN-2025
FIGURE	3



LEGEND

- BH-99 — GROUNDWATER MONITORING WELL LOCATION
- SW-99 — SURFACE WATER SAMPLE LOCATION
- 162 — 2023 GROUND SURFACE CONTOUR
- PROPERTY BOUNDARY
- LANDFILLING AREA
- FENCE LINE
- DIRECTION OF GROUNDWATER FLOW
- 150.0 — OVERBURDEN GROUNDWATER CONTOUR
- 150.99 — GROUNDWATER ELEVATION

TSP #1 ELEV. 165.523
CUT CROSS ON CONCRETE MONUMENT
N: 5055090.783
E: 358719.224

TSP #2 ELEV. 164.885
CUT CROSS ON CONCRETE MONUMENT
N: 5055113.759
E: 358699.759

1:2 000
0 20 40 60 80 100 m
0 1:1 5 cm

No.	DATE	BY	REVISIONS

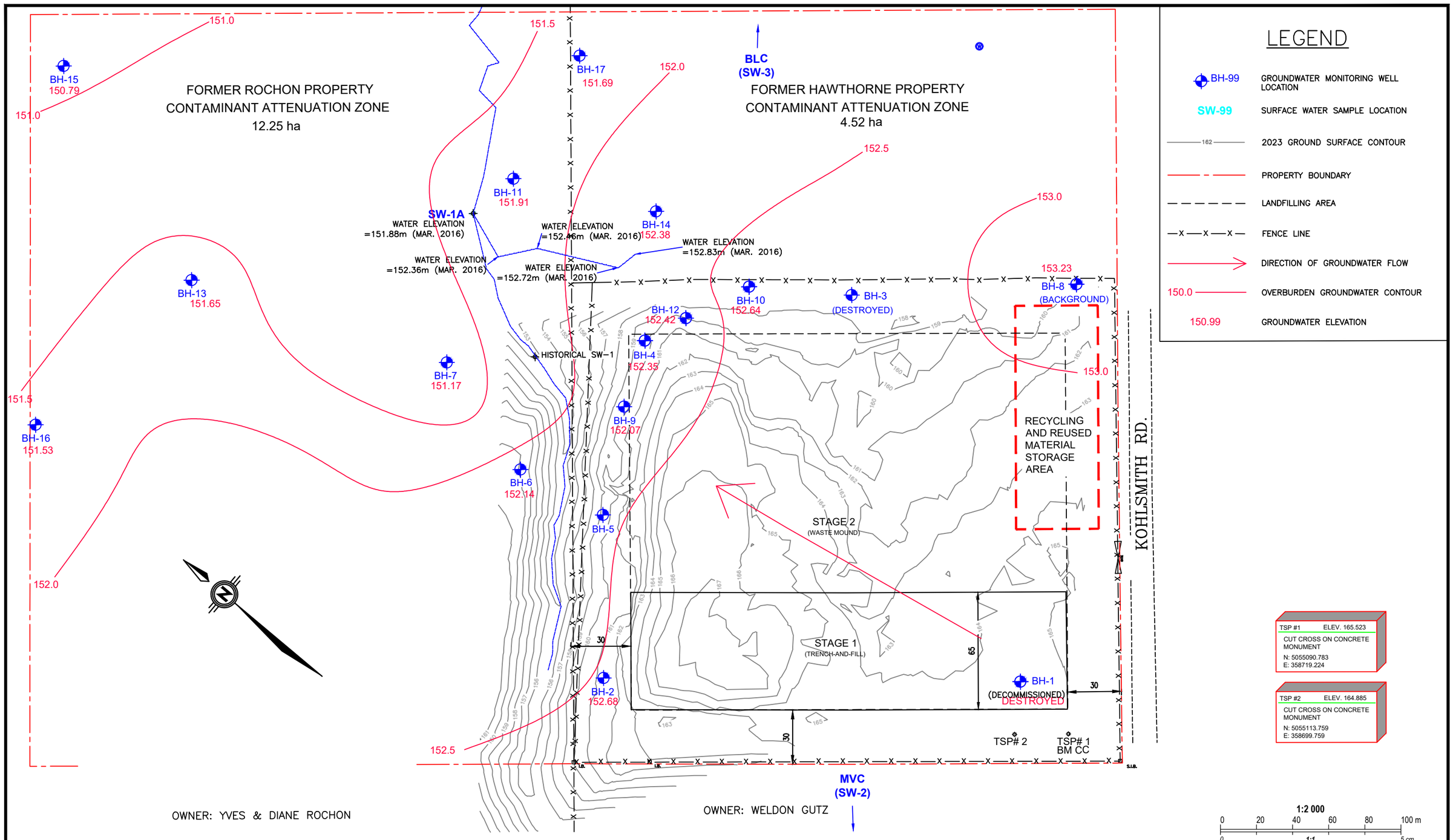
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1150 MORRISON DRIVE, SUITE 410, OTTAWA, ON K2H 8S9
PHONE: 613-828-7800 FAX: 613-828-2600

DESIGNED	BWS
DRAWN	GM/BWS
CHECKED	KM
APPROVED	KM
SCALE	1:2000

TOWNSHIP OF WHITEWATER REGION
ROSS WASTE DISPOSAL SITE

OCTOBER 2024 GROUNDWATER ELEVATIONS AND FLOW DIRECTION SHALLOW PIEZOMETER SETTING

PROJECT	17-6047I
PLOTTED	23-JAN-2025
FIGURE	4A



No.	DATE	BY	REVISIONS

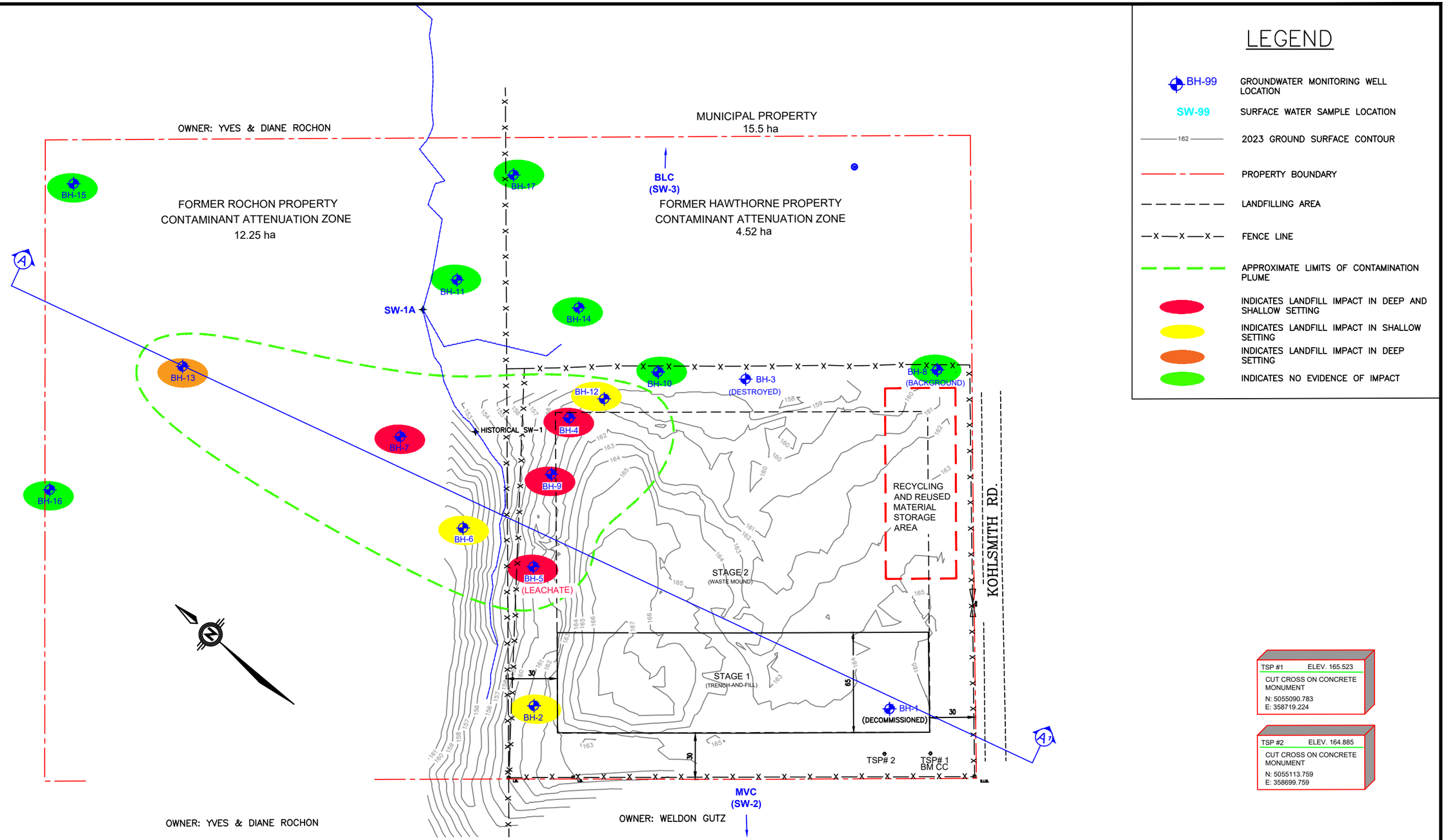
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ENGINEERS · PLANNERS · PROJECT MANAGERS
1150 MORRISON DRIVE, SUITE 410, OTTAWA, ON K2H 8S9
PHONE: 613-828-7800 FAX: 613-828-2600

DESIGNED	BWS
DRAWN	GM/BWS
CHECKED	KM
APPROVED	KM
SCALE	1:2000

TOWNSHIP OF WHITEWATER REGION
ROSS WASTE DISPOSAL SITE

OCTOBER 2024 GROUNDWATER ELEVATIONS AND FLOW DIRECTION
DEEP PIEZOMETER SETTING

PROJECT	17-6047I
PLOTTED	23-JAN-2025
FIGURE	4B



No.	DATE	BY	REVISIONS

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	BWS
DRAWN	GM/BWS
CHECKED	KM
APPROVED	KM
SCALE	1:2500

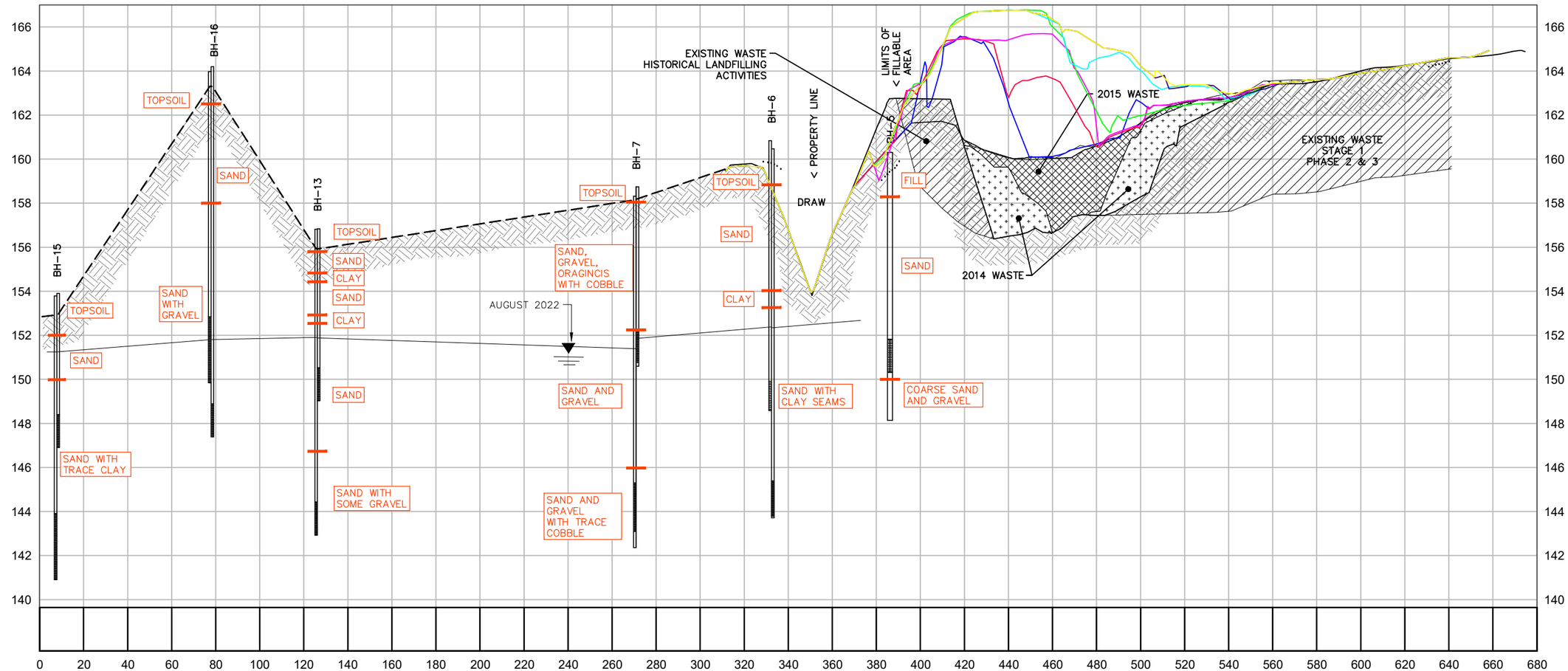
TOWNSHIP OF WHITEWATER REGION
ROSS WASTE DISPOSAL SITE
AREAS OF POTENTIAL IMPACT - 2024

PROJECT	17-6047I
PLOTTED	23-JAN-2025
FIGURE	5

A
NORTH

A'
SOUTH

VERTICAL ELEVATION (m)



HORIZONTAL DISTANCE (m)

NOTES:

1) MONITORING WELL INFORMATION OBTAINED FROM GOLDER ASSOCIATES LTD. GROUNDWATER AND SURFACE CONTOUR INFORMATION OBTAINED THROUGH ANNUAL FIELD WORK BY JP2G CONSULTANTS INC., THE LATEST OF WHICH WAS PERFORMED IN FEBRUARY 2024.
2) ALL ELEVATIONS ARE GEODETIC.

1:2 000
0 20 40 60 80 100 m
0 1:1 5 cm
HORIZONTAL 1:2000

1:200
0 2 4 6 8 10 m
0 1:1 5 cm
VERTICAL 1:200

LEGEND

- GROUND LEVEL (G/L) CONTOUR
- ESTIMATED G/L CONTOUR
- 2018 PROFILE
- 2019 PROFILE
- 2020 PROFILE
- 2021 PROFILE
- 2022 PROFILE
- 2023 PROFILE
- 2024 PROFILE
- GROUND WATER ELEVATION
- APPROXIMATE LIMITS OF EXISTING WASTE
- MONITORING WELL
- WELL SCREEN
- G/L AT MONITORING WELL

No.	DATE	BY	REVISIONS

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	RM
DRAWN	GM,QS
CHECKED	KM
APPROVED	KM
SCALE	AS NOTED

TOWNSHIP OF WHITEWATER REGION
ROSS WASTE DISPOSAL SITE
CROSS SECTION A-A'

PROJECT	17-60471
PLOTTED	23-JAN-2025
FIGURE	6

Appendix A
Environmental Compliance Approval

RECEIVED Jan 6/06

Ministry of the Environment
Environmental Assessment and
Approvals Branch
Floor 12A
2 St Clair Ave W
Toronto ON M4V 1L5
Fax: (416)314-8452
Telephone: (416) 314-7993

Ministère de l'Environnement
Direction des évaluations et des
autorisations environnementales
Étage 12A
2 av St Clair O
Toronto ON M4V 1L5
Télécopieur : (416)314-8452
Téléphone : (416) 314-7993

Ontario

December 23, 2005

Dean Sauriol, CAO/Clerk
The Corporation of the Township of Whitewater Region
PO Box 40
Cobden, Ontario
K0J 1K0

Dear Sir:

Re: Application for Approval of a Waste Disposal Site
Site Development and Operations Plan, Ross LFS, Condition No. 3
Whitewater Region Township, County of Renfrew
MOE Reference Number 9564-5E9QRQ

Please find attached the Provisional Certificate of Approval for a Waste Disposal Site for the construction, use and operation of Ross Landfill Site.

Also, please find attached Forms 4 and 5, which are to be used when preparing Certificates of Prohibition as required by Conditions 14 and 15.

As requested by the Township of Whitewater Region in the application for the certificate of approval, the Ministry's review and the subsequent approval only evaluated the proposed design and the resulting impacts from Stage 1 of the landfilling operations. Should the Municipality decide to proceed to Stage 2 of the landfill development, all applicable fees will have to be submitted with the Stage 2 application for a Certificate of Approval.

Condition 72 requires the Municipality to develop a surface water monitoring program. We recognize that it may be difficult to obtain surface water samples when a flowing, easy-to-sample surface water body is not readily available at all times. However, site-specific actions must be incorporated into the required plan to overcome these challenging circumstances in the best way possible in order to achieve the goals of protecting the surface water around the site.

As required by Condition 73, the Municipality is also required to develop a site-specific groundwater monitoring program that meets the Ministry's requirements. The Ministry's review of the monitoring program proposed at this time, found it inadequate. The Ministry's

Technical Support Section hydrogeologist concluded that additional wells are required to fully delineate the horizontal and vertical extend of the leachate migration resulting from the landfilling activities at the Site. The groundwater monitoring network should include at least one up-gradient or trans-gradient monitoring well measuring natural uncontaminated groundwater quality and at least one well measuring representative source leachate quality.

Also, the groundwater samples from all wells in the above-described monitoring network should be obtained and analyzed at least once during maximum water level conditions and at least once during the minimum water level conditions. Groundwater elevations in all monitoring wells should be measured during each monitoring event prior to obtaining water quality samples.

The Ministry's review of the currently proposed monitoring program also found that the monitoring parameters and the frequency of sampling are not adequate. Those parameters need to be changed to more accurately characterize the quality of the groundwater at and off-site.

In order to ensure that all new monitoring programs for the site meet the Ministry's requirements, the Municipality should undertake the revisions in consultation with the Ministry's staff of the local district office and the Technical Support Section staff of the local Regional Office.

The Municipality should also ensure that a certified Professional Geoscientist or Engineer possessing appropriate hydrogeologic training and experience is involved in the development of the groundwater monitoring program to ensure the quality of the submission.

If you have any questions regarding the above, please contact me at the above phone number.

Yours truly,

M Wojcik, P.Eng.

Margaret Wojcik, P.Eng.
Senior Waste Engineer

c: District Manager, MOE Ottawa
Mark A. Bruce, P.Eng., Jp2g Consultants Inc.
Kevin Mooder, P.Eng., Jp2g Consultants Inc. ✓

Additional Property Identifier(s) and/or Other Information
Cote(s) foncières additionnelle(s) et renseignements supplémentaires

SCHEDULE "A"

CERTIFICATE OF REQUIREMENT

s.197(2)
Environmental Protection Act

This is to certify that pursuant to a(n) [INSERT ORDER OR DECISION TYPE] [INSERT ORDER OR DECISION NUMBER or IDENTIFIER] issued by [INSERT NAME OF ISSUING PERSON, POSITION] dated [INSERT DATE] with respect to [INSERT DESCRIPTION, SUCH AS, CONTAMINATION, WASTE DISPOSAL SITE, ETC.] on the [INSERT REGISTRABLE DECRIPTION OF THE PROPERTY]. The following person(s):

[INSERT PERSON(S) NAMED IN INSTRUMENT]

and any other persons having an interest in the [INSERT REGISTRABLE DECRIPTION OF THE PROPERTY] are required, before dealing with the property in any way, to give a copy of the [INSERT ORDER OR DECISION TYPE] including any amendments that may be made thereto to every person who will acquire an interest in the property as a result of the dealing.

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

FOR OFFICE USE ONLY
USAGE INTERNE

OYE & GOODMAN CO. INC. — Form No. 587
Amended NOV. 1992

Document General
Form 4 — Land Registration Reform Act

Document général
Formule — Loi portant réforme de l'enregistrement immobilier

D

(1) Registry / Enregistrement des actes ☐ Land Titles / Enregistrement des droits immobiliers ☐

(2) Page 1 of/de 2 Pages

(3) Property Identifiers(s) / Cotes foncières — Block / Bloc — Property / Unité foncière — [insert PIN] — Additional: See Schedule / Supplément en annexe ☐

(4) Nature of Document / Nature du document
Certificate of Requirement - *Environmental Protection Act* - s.197(2)

(5) Consideration / Contrepartie
N/A----------S/O Dollars N/A----------S/O

(6) Description
[insert legal description]

See Property Identifiers / Nouvelles cotes foncières — Additional: See Schedule / Supplément en annexe ☐

Executions / Actes d'exécution — Additional: See Schedule / Supplément en annexe ☐

(7) This Document Contains: / Contenu du document: (a) Redescription / Nouvelle description ☐ New Easement / Nouvelle servitude ☐ Plan/Sketch / Plan croquis ☐ (b) Schedule for / Annexe — Description ☐ Additional Parties / Autres parties ☐ Other / Divers ☒

(8) This Document provides as follows: / Termes du document:

See Schedule "A" attached.

Continued on Schedule / Suite en annexe ☐

(9) This Document relates to instrument number(s) / Numéros des actes visés par ce document

(10) Party(ies) (Set out Status or Interest) / Partie(s) (Indiquer la qualité ou l'intérêt) — Name(s) / Nom(s) — Signature(s)	Y/A	M/M	D/J
Person with authority to issue Certificate pursuant to *Environmental Protection Act*, section 197(2) [insert name]			

(11) Address for Service / Domicile élu: Ministry of the Environment, [insert region and address]

(12) Party(ies) (Set out Status or Interest) / Partie(s) (Indiquer la qualité ou l'intérêt) — Name(s) / Nom(s) — Signature(s)	Y/A	M/M	D/J

(13) Address for Service / Domicile élu

(14) Municipal Address of Property / Adresse civique de l'unité foncière
[insert address or "Not assigned"]

(15) Document Prepared by: / Document préparé par:
[insert name of counsel]
Ministry of the Environment
Legal Services Branch, 10th Floor
135 St. Clair Avenue West
Toronto, Ontario M4V 1P5

FOR OFFICE USE ONLY / POUR USAGE INTERNE

Fees and Tax / Droits et taxes

Registration Fee / Droits d'enregistrement	
Total	

Ontario

Ministry of the Environment | Ministère de l'Environnement

AMENDED PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A413209
Issue Date: December 23, 2005

The Corporation of the Township of Whitewater Region
PO Box 40
Cobden, Ontario
K0J 1K0

Site Location: Ross Waste Disposal Site
990 Kohlsmith Road
Whitewater Region Township, County of Renfrew
K0J 1K0

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

the establishment, use and operation of a 5.4 hectare landfilling area and segregated waste storage and processing facilities all within an 8 hectare total site area

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

(a) "Additional Buffer" means the land required to establish a 30-meter buffer zone around the actual waste footprint at the Site and consisting of the lands which need to be added on to the buffer currently available within the property boundaries of the Site through an easement or a purchase;

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

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

(d) "District Manager" means Ottawa District Manager of the Ministry;

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

(f) "Municipality" means any person that is responsible for the establishment, operation/management or control of any aspect of the Site being approved by this Certificate, and is limited to the Corporation of the Township of Whitewater Region, its successors and assigns;

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

(h) "*OWRA*" means the *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, as amended from time to time;

(i) "Guideline B-7" means the Ministry's Guideline B-7 entitled "Incorporation of the Reasonable Use Concept into MOE Groundwater Management Activities", dated April 1994, as amended;

(j) "Noise Guidelines for Landfill Sites" means the Ministry document entitled "Noise Guidelines for Landfill Sites", dated June 1998, or as amended from time to time;

(k) "Provincial Officer" means any person designated in writing by the Minister as a provincial officer pursuant to Section 5 of the *OWRA* or Section 5 of the *EPA* or Section 17 of PA;

(l) "Regional Director" means the Regional Director of the Kingston Regional Office of the Ministry;

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

(n) "O. Reg. 903" means Regulation 903, R.R.O. 1990, made under the *OWRA*, as amended from time to time;

(o) "O. Reg. 189" means Ontario Regulation 189/94, amended to Ontario Regulation 238/01, entitled "Refrigerants";

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

(q) "White Goods" means household appliances which did not use refrigerants;

(r) "Site" means the entire waste disposal site located at 990 Kohlsmith Road in the Township of Whitewater Region, approved by this Certificate;

(s) "Ministry" means the Ministry of the Environment;

(t) "Trained personnel" means knowledgeable in the following through instruction and/or practice:

(i) relevant waste management legislation, regulations and guidelines;
(ii) major environmental concerns pertaining to the wastes to be handled;
(iii) occupational health and safety concerns pertaining to the processes and wastes to be handled;
(iv) management procedures including the use and operation of equipment for the processes and wastes to be handled;
(v) emergency response procedures and use of necessary equipment;
(vi) specific written procedures for the control of adverse effect conditions;
(vii) specific written procedures for refusal of unacceptable waste loads; and
(viii) the requirements of this Certificate.

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

TERMS AND CONDITIONS

GENERAL

Compliance

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

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

In Accordance ...

3. Except as otherwise provided for in this Certificate, the Site shall be designed, developed, built, operated and maintained in accordance with the application for this Certificate, dated August 31, 2001 and the supporting documentation listed in Schedule "A".

Interpretation

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

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

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

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

Other Legal Obligations

8. The issuance of, and compliance with, this Certificate does not:

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

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

Adverse Effect

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

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

CHANGE OF OWNERSHIP

11. The Municipality shall notify the Director, in writing, and forward a copy of the notification to the District Manager, within thirty (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 Municipality;
   (d) the partners, where the Municipality 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 Municipality unless the Director is notified in advance. In the event of any change in ownership of the Site, other than change to a successor municipality, the Municipality shall notify the successor of and provide the successor with a copy of this Certificate, and the Municipality shall provide a copy of the notification to the District Manager and to the Director.

CERTIFICATE OF REQUIREMENT / REGISTRATION ON TITLE

Site

13. Pursuant to Section 197 of the *EPA*, neither the Municipality nor any person having an interest in the Site, shall deal with the Site in any way without first giving a copy of this Certificate to each person acquiring an interest in the Site as a result of the dealing.

14. The Municipality shall:

(a) within sixty (60) calendar days of the date of this Certificate, submit to the Director for the Director's signature two (2) copies of a completed Certificate of Requirement containing a registerable description of the Site, in accordance with the form attached to the Certificate cover letter;

(b) within ten (10) calendar days of receiving the Certificate of Requirement signed by the Director, register the Certificate of Requirement in the appropriate Land Registry Office on title to the Site and submit to the Director immediately following registration the duplicate registered copy;

(c) within ten (10) calendar days of receiving the Certificate of Requirement signed by the Director, submit a copy of the Certificate of Requirement to the District Manager.

Additional Buffer/Contaminant Attenuation Zone

15. The Municipality shall:

(a) within sixty (60) calendar days of the date of the purchase or the easement agreement being signed with the property owner(s) of the land required for the Additional Buffer and the Contaminant Attenuation Zone, submit to the Director for the Director's signature two (2) copies of a completed Certificate of Requirement containing a registerable description of the land required for the Additional Buffer and the Contaminant Attenuation Zone, in accordance with the forms attached to the Certificate cover letter;

(b) within ten (10) calendar days of receiving the Certificate of Requirement signed by the Director, the Certificate of Requirement is registered in the appropriate Land Registry Office on title to the property containing the Additional Buffer and the Contaminant Attenuation Zone and submit to the Director immediately following registration the duplicate registered copy;

(c) within ten (10) calendar days of receiving the Certificate of Requirement signed by the Director, submit a copy of the Certificate of Requirement to the District Manager.

INSPECTIONS

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

(a) to enter upon the premises where the approved works are located, or the location where the records required by the conditions of this Certificate are kept;

(b) to have access to, inspect, and copy any records required to be kept by the conditions of this Certificate;

(c) to inspect the Site, related equipment and appurtenances;

(d) to inspect the practices, procedures, or operations required by the conditions of this Certificate; and

(e) to sample and monitor for the purposes of assessing compliance with the terms and conditions of this Certificate or the *EPA*, the *OWRA* or the *PA*.

INFORMATION AND RECORD RETENTION

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

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 Certificate or under any statute, regulation or other legal requirement, in relation to the information, shall not be construed as:

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

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

SERVICE AREA

19. Only waste that is generated in the Township of Whitewater Region shall be accepted at the Site.

APPROVED WASTE TYPES

20. Only solid non-hazardous waste limited to municipal waste shall be accepted at the Site for landfilling.

21. (a) The following types of waste are approved to be received, stored and processed at the Site for the purpose of recycling and/or landfill diversion to be transferred off-site for further re-use or processing:

(i) tires;
(ii) scrap metal;
(iii) White Goods and Refrigerant Appliances;
(iv) clean woodwaste and leaf and yard waste;
(v) propane cylinders;
(vi) batteries;
(vi) Blue Box recycling wastes, limited to newspaper, clear and coloured glass, aluminum/tin cans and plastic containers, fabrics and fibers, and
(vii) incidental hazardous waste recovered from the active face of the landfill.

(b) Additional wastes related to recycling and waste diversion from the landfill can be accepted and handled at the Site following a written approval from the District Manager.

22. No liquid industrial waste or hazardous wastes as defined under O.Reg. 347, other than specified in Condition 21, shall be received at the Site.

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

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

WASTE DIVERSION

24. The segregated wastes approved to be received and stored on Site for the purpose of recycling and/or landfill diversion shall be stored as follows:

(a) Blue Box recycling wastes shall be stored in bins;
(b) scrap metal, including White Goods shall be stored in a managed stockpile;
(c) brush, clean waste wood and leaf and yard waste shall be stored in a managed stockpile;
(d) tires shall be stored in a managed stockpile;
(e) propane tanks shall be stored in a storage bunker;
(f) Refrigerant Appliances shall be stored in a storage bunker;
(g) batteries shall be stored in a storage bunker;
(h) incidental hazardous waste shall be stored in a contained pre-fabricated steel shipping container;
(i) re-use wastes shall be stored within a contained trailer.

all shown on Figure A, listed as Item #8(f) on Schedule "A".

25. The Municipality shall ensure that:

(a) all bins and waste storage areas are clearly labeled;
(b) all lids or doors on bins shall be kept closed during non-operating hours and during the high wind events; and
(c) if necessary to prevent litter, waste storage areas shall be covered during the high winds events.

26. The Municipality shall ensure that brush, clean woodwaste and leaf and yard waste storage area is located with a minimum of 30-metre separation distance to the tree area, flammable materials, buildings and the waste footprint.

27. The Municipality shall provide a segregated area for the storage of Refrigerant Appliances so that the following are ensured:

(a) all Refrigerant Appliances have been tagged to indicate that the refrigerant has been removed by a licensed technician. The tag number shall be recorded in the log book required by Condition 88 and shall remain affixed to the appliance until transferred from the Site; or

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

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

28. The Municipality shall ensure that propane cylinders are stored in a single layer (i.e. no stacking), in a manner which prevents the cylinders from being knocked over or cylinder valves from breaking.

29. The Municipality shall ensure that batteries are stored in secure area apart from the other wastes and are stored in a single layer (i.e. no stacking), under a roof or cover and in a manner which provides for secondary containment in the event of leakage.

Storage of Incidental Hazardous Waste

30. (a) The Municipality shall ensure that the incidental hazardous waste is stored in a safe and secure manner, so that the storage does not interfere with any other activities undertaken at the Site and that the waste is properly handled, packaged or contained so as not to pose any threat to the general public, Site personnel and the environment.

(b) No storage facilities other than those approved under this Certificate shall be used and fixed storage facilities shall not be moved, replaced or altered.

(c) The incidental hazardous waste storage container shall be clearly marked indicating the type and nature of the hazardous waste stored. Smoking restrictions shall be adhered to and nonsmoking signs shall be posted.

(d) The incidental hazardous waste storage container shall be properly ventilated and shall be used and maintained in compliance with fire regulations, municipal by-laws and approvals and in accordance with Ministry of Labour guidelines.

(e) The incidental hazardous waste storage container shall be maintained under lock and key with its access limited to trained Site personnel.

Changes to the Storage Facilities

31. The Municipality shall not undertake any changes to the waste storage facilities, without prior written consent from the District Manager.

Woodwaste Chipping

32. Chipping of clean woodwaste, brush and leaf and yard waste shall be undertaken in the location shown on Figure A, listed as Item #8(f) on Schedule "A".

Waste Storage Duration

33. Once per month, the waste collected in the re-use area shall be landfilled or moved to the wood waste, metal or Refrigerant Appliances storage areas.

34. The Municipality shall transfer wastes from the Site in accordance with the following:

(a) Blue Box recyclable wastes shall be transferred off-site when their storage bins are full;
(b) scrap metal, including the White Goods and Refrigerant Appliances from which the refrigerant has been removed, shall be transferred off-site at least twice per year;
(c) tires shall be transferred off-site as soon as a load for the contractor hired by the Municipality has accumulated;
(d) propane cylinders shall be transferred off-site as soon as a load for the contractor hired by the Municipality has accumulated;
(e) transfer of all hazardous waste received at the Site (incidental hazardous waste, batteries, and propane cylinders) shall be manifested in accordance with O.Reg. 347; and
(f) immediately, in the event that waste is creating an odour, dust, vector or another adverse effect.

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

36. All waste collected shall be transported from the Site by an approved waste management system and disposed of at waste landfill, transfer and processing sites certified to accept these types of wastes.

CAPACITY

37. The maximum theoretical approved waste disposal volume of the Site, consisting of the waste, daily cover and intermediate cover, but excluding the final cover is 434,340 cubic metres.

38. (a) Notwithstanding Condition 37, this Certificate approves only the following:

(i) waste landfilled at the Site to-date, including 10,066 cubic metres of waste, daily cover and intermediate cover already landfilled in the area designated as Stage 1 in Item 2 of Schedule "A", shown on Item 5(c) of Schedule "A";

(ii) future landfilling operations referred to as Stage 1 in Item 2 of Schedule "A", shown on Item 5(c) of Schedule "A" and having a total capacity of 45,869 cubic metres of waste, daily cover and intermediate cover.

(b) This Certificate does not approve the remaining landfilling operations referred to as Stage 2 in Item 2 of Schedule "A" and shown on Item 5 (d) of Schedule "A".

39. Prior to proceeding with the design of Stage 2, the Municipality shall determine the total amount of waste landfilled at the Site.

WASTE PLACEMENT

40. Future disposal of waste approved by this Certificate shall only occur within the area referred to as Stage 1 area and delineated on Drawing 3, entitled "Waste Disposal Site, Stage 1", dated September 9, 2003.

41. No waste shall be placed below the level shown on Drawing No. Drawing 5, entitled "Cross Section", dated December 18, 2000 or above the final contours for Stage 1 shown on Drawing 5, entitled "Cross Section", dated December 18, 2000.

BURNING PROHIBITIONS

42. Burning of waste, including woodwaste and brush at the Site is prohibited.

COVERS

43. Waste shall be deposited in a manner that minimizes the exposure area at the landfill working face and it shall be compacted before the cover material is applied according to the procedure described in Item 6 of Schedule "A".

44. Cover material shall be applied over waste as follows:

(a) **Daily Cover:**
   (i) At the end of each working day, the entire working face shall be covered with a minimum thickness of 150 mm of cover material.
   (ii) Only clean permeable soil, wood chips or compost shall be used for daily cover.

(b) **Intermediate Cover:**
   (i) In areas where landfilling has been temporarily discontinued for six (6) months or more, a minimum thickness of 300 mm of cover material shall be placed.
   (ii) Only clean permeable soil shall be used for intermediate cover.

(c) **Final Cover:**

(i) If the landfilling operations at the Site do not proceed into Stage 2, the Municipality shall place 600 mm of soil final cover and 150 mm of top soil over waste landfilled in Stage 1.

(ii) Fill areas shall be progressively completed and covered as landfill development reaches contours approved in this Certificate.

(iii) Only clean permeable soil shall be used for final cover.

(iv) Seeding of the final cover shall be undertaken in the next growing season following the placement of the final cover.

(iv) Slopes of the final cover shall not be less than 5% or more than 25% to promote effective surface water run-off.

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

46. The Municipality shall ensure that sufficient amount of cover material is available for use during the winter season.

47. Use of snow as daily cover is prohibited.

48. Use of strontium residue waste from Timminco Metals as an alternative daily cover, as proposed in Item 2 of Schedule "A", is prohibited.

SITE ACCESS

49. (a) The normal operating hours of the Site shall be as follows:

(i) Public drop-off
- Wednesday - 8:00 am - 2:00 pm
- Saturday - 8:00 am - 2:00 pm

(ii) Municipal drop-off
- Monday through Saturday 7:00 am - 6:00 pm

(b) The Municipality 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.

(c) The Municipality 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 Municipality and the public's response to the proposal.

50. During non-operating hours, the Municipality may conduct equipment maintenance and on-site activities, as required, provided that these activities take place during the daylight hours.

51. (a) Access to and exit from the Site for the transportation of waste shall only be permitted from Kohlsmith Road.

(b) The access road and on-site roads shall be provided and maintained so that vehicles hauling waste to and on the Site may travel readily and safely on any operating day.

52. The Municipality shall post visible signs along the traffic route providing clear directions to the Site.

SITE SECURITY

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

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

SIGNS

55. A sign shall be installed and maintained at the main entrance/exit to the Site on which is legibly displayed the following up-to date information:

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

56. The Municipality shall install and maintain signs at the Site to direct vehicles to the working face, the recycling bins and the other disposal or storage areas designated for wastes requiring special handling procedures.

57. The Municipality shall regularly update the signs required by this Certificate in an effort to display up-to-date information to the Site users.

ADVERSE EFFECT

58. The Site shall be operated and maintained so that the operational impacts, including but not be limited to dust, litter, odour, contaminant emissions to the atmosphere, noise, vermin, vectors, animals and traffic, do not create an adverse effect.

Litter Control

59. (a) The Municipality shall take all practical steps to prevent the escape of litter from the Site. If necessary, litter fencing shall be erected around the working area of the landfill and the storage of recyclable materials.

(b) Litter shall be picked-up at the Site and along the access road in the vicinity of the Site once per week as described in Item 6 of Schedule "A".

Dust Control

60. The Municipality shall control fugitive dust emissions from the on-site sources including, but not be limited to the on-site roads, stockpiled cover material and closed landfill areas. If necessary, the major sources of dust shall be treated with water and/or dust suppression materials to minimize the overall dust emissions from the Site.

61. The Municipality shall ensure that reasonable efforts are made to keep the access road used by vehicles to leave the Site, free of mud, dirt and waste.

Noise

62. Noise from or related to the operation of the Site shall be kept to a minimum and in any event, the Municipality shall comply with the criteria set out in the Ministry's guideline entitled "Noise Guidelines for Landfill Sites".

Vermin

63. Vermin related to waste handling activities are to be adequately controlled at the Site. Should vermin become a problem, a licensed exterminator shall be engaged at a frequency necessary to bring the problem under control.

Visual Screening

64. The Municipality shall provide visual screening of the waste disposal activities undertaken at the Site from the traffic on Kohlsmith Road and from the residences that are located in the vicinity of the Site, in accordance with Item 2 of Schedule "A".

LANDFILL GAS

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

SURFACE WATER MANAGEMENT

66. The Municipality shall construct berms and/or ditches that may be necessary to prevent extraneous surface water from contacting waste in the active working face or waste storage areas, which may create contaminated surface water run-off.

SCAVENGING

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

EMPLOYEES AND TRAINING

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

WEEKLY INSPECTIONS OF THE OPERATIONS

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

(b) The inspection day shall be determined prior to the commencement of the operations at the Site and may be changed following a written consent from the District Manager.

70. The areas to be inspected shall include, but not be limited to the following:

(a) the condition of the active disposal areas, the recyclable bins, the wood waste pile, the scrap metal pile, the tire pile, the Refrigerant Appliances bunker, the propane tank bunker, the batteries bunker, the re-use area trailer and the incidental hazardous waste container;
(b) condition of the surface water drainage works;
(c) presence of any ponded water at the Site;
(d) condition of the on-site roads for evidence of excessive erosion, mud and/or waste and fugitive dust emissions;
(e) condition of any soil stock piles for evidence of excessive erosion;
(f) presence of litter at the Site's perimeter and litter fences;
(g) condition of the intermediate cover and of the final cover;
(h) presence of vector, vermin, scavenging birds and animals;
(i) condition of the on-site facilities, the gate and its lock and the signs required by this Certificate;

(j) condition of the groundwater monitoring wells required for the groundwater monitoring program approved by this Certificate; and

(k) amount of the cover material to ensure that sufficient daily cover is available at all times that the Site is in operation.

COMPLIANCE LIMITS

71. 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.

SURFACE WATER MONITORING PROGRAM

72. (a) The Municipality shall develop, in consultation with the appropriate Ministry staff, a surface water monitoring program to monitor the surface water sources located upstream and downstream from the Site.

(b) The proposed monitoring program shall be submitted to the District Manager for approval, within twelve (12) months from the date of this Certificate.

GROUNDWATER MONITORING PROGRAM

73. (a) The Municipality shall develop, in consultation with the appropriate Ministry staff, a groundwater monitoring program to monitor the groundwater resources located at the Site.

(b) The proposed monitoring program shall be submitted to the District Manager for approval, within twelve (12) months from the date of this Certificate.

GROUNDWATER WELLS / MONITORS

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

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

76. Any groundwater monitoring wells included in the on-going monitoring program that are damaged shall be assessed, repaired, replaced or decommissioned by the Municipality, as required.

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

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

BUFFER / CONTAMINANT ATTENUATION ZONE

77. The Municipality shall not landfill any more additional waste within the area considered the 30-metre buffer between the 5.03-ha footprint and the property line shown on Drawing 3, entitled "Waste Disposal Site, Stage 1" listed as Item 5(c) of Schedule "A".

78. (a) Within twelve (12) months from the date of this Certificate, the Municipality shall undertake closure of the area containing waste historically landfilled within the 30-metre buffer area.

(b) The area to be closed shall be covered with the final cover as described in Condition 44(c).

79. (a) Within twelve (12) months from the date of this Certificate, the Municipality shall purchase or obtain a written easement agreement with the property owner(s) of the land(s) required for the Additional Buffer and the Contaminant Attenuation Zone, which will provide the property rights necessary to establish the Additional Buffer and the Contaminant Attenuation Zone.

(b) The Municipality must continue to own the property rights to the Additional Buffer and the Contaminant Attenuation Zone for all of the contaminating life span of the Site.

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

(i) discharge contaminants from the operations at the Site into Additional Buffer and the Contaminant Attenuation Zone;

(ii) enter into the Additional Buffer and the Contaminant Attenuation Zone and onto the surface above the Additional Buffer and the Contaminant Attenuation Zone for purposes of testing, monitoring, intercepting contaminants and carrying out remedial work;

(iii) install, operate and maintain works, for the purposes mentioned in clause (ii), in or above the Additional Buffer and the Contaminant Attenuation Zone, including on the surface above the Additional Buffer and the Contaminant Attenuation Zone; and

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

(d) The Municipality shall notify the Director in writing within thirty (30) days after any change in his, her or its ownership of the property rights in the Additional Buffer and the Contaminant Attenuation Zone.

80. The Municipality shall ensure that the written easement agreement, specified in Condition 79(a) includes an agreement of the property owner(s) of the land(s) required for the Additional Buffer and the Contaminant Attenuation Zone, to register a Certificate of Requirement on title to the land(s) to be used as the Additional Buffer and the Contaminant Attenuation Zone.

TRIGGER MECHANISM AND CONTINGENCY PLANS

81. Notwithstanding the establishment of the Contaminant Attenuation Zone required by Condition 79(a), the Municipality within twelve (12) months from the date of this Certificate, shall establish and submit to the District Manager for approval, the site-specific trigger mechanism program for the groundwater at the Site.

82. If monitoring results, investigative activities and application of the trigger criteria indicate the need to implement contingency measures, the Municipality shall ensure that the following steps are taken:

(a) the District Manager shall be notified of the need to implement contingency measures in the next Annual Report that is to be submitted to the Ministry;

(b) detailed plans, specifications and descriptions for the design, operation and maintenance of the contingency measures and the implementation schedule shall be prepared and submitted to the Director for approval no later than six (6) months following the date that the contingency measures were judged necessary; and

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

COMPLAINTS PROCEDURE

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

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

(c) The Municipality 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.

(d) A summary of the complaints and their resolutions shall be provided in the Annual Report.

EMERGENCY SITUATIONS

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

(b) In addition, the Municipality 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.

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

86. All equipment and materials required to handle the emergency situations shall be:

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

(b) be adequately maintained and kept in good repair.

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

RECORDS KEEPING

Daily Operations Records

88. The Municipality shall establish a daily operating reports of the landfilling and waste diversion operations, in the form of a log or a dedicated electronic file and it shall include, as a minimum, the following information:

(a) type and estimated amount of waste received at the Site for landfilling;
(b) area of the Site in which landfilling operations are taking place;
(c) type, source and amount of daily or intermediate cover used;
(d) waste types and quantities recyclable/reusable wastes received at the Site;
(e) source of their generation;
(f) waste types and quantities of recyclable/reusable wastes transferred off the Site;
(g) destination of recyclable/reusable wastes transferred off the Site, including manifesting information required for movement of hazardous waste;
(h) Refrigerant Appliances' tag numbers from Condition 27 tagged at the Site;
(i) types of waste and quantity transferred from the re-use area into the landfilling area;
(j) summary of the wood waste chipping activities undertaken at the Site;
(k) records of litter pick-up activities and any dust suppression activities undertaken at the Site as required by Conditions 59 and 60;
(l) maintenance and repairs performed on the equipment used at the Site;
(m) records of complaints received and actions taken to resolve them as required by Condition 83;
(n) summary of emergency situations and actions taken to address them;
(o) any environmental and operational problems and the mitigative actions taken;
(p) any recommendations to minimize environmental impacts from the operation of the waste diversion areas to improve such operations in this regard; and
(q) any other information required by the District Manager.

Inspections Records

89. The Municipality shall establish and maintain a written record of the weekly Site inspections as required by Conditions 69 and 70. This record shall be in the form of a log or a dedicated electronic file and it shall include, as a minimum, the following information:

(a) date and time of inspection;
(b) name, title and signature of trained personnel conducting the inspection;
(c) a listing of all the areas inspected and any deficiencies observed; and
(d) recommendations for remedial action and the completion date of such action.

Waste Refusal Records

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

91. (a) The Municipality shall retain all documentation listed in Schedule "A" for as long as this Certificate is valid.

(b) The Municipality shall retain at the Site, all records required by this Certificate for a minimum of two (2) years from the date of their creation.

(c) As a minimum, the Municipality shall retain the employee training records for as long as the employee is working at the Site.

(d) The Municipality shall make all of the above documents and records available for inspection upon request by the staff of the Ministry.

ANNUAL REPORT

92. A written report on the development, operation and monitoring of the Site, shall be completed annually (the "Annual Report"). The Annual Report shall be submitted to the District Manager no later than March 31st of the year following the period being reported upon.

93. The Annual Report shall include the following:

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

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

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

(d) summary of cover stock piling activities including use, timing, locations and erosion protection;

(e) waste types and quantities recyclable/reusable wastes received and transferred off the Site;

(f) destinations of recyclable/reusable wastes transferred off the Site;

(g) types of waste and quantity transferred from the re-use area into the landfilling area;

(h) summary of the woodwaste chipping activities undertaken at the Site;

(i) summary of litter pick-up and any dust suppression activities undertaken at the Site;
(j) summary of maintenance and repairs performed on the equipment used at the Site;
(k) summary of inspections undertaken at the Site;
(l) summary of complaints received and actions taken to resolve them;
(m) summary emergency situations and actions taken to address them; and
(n) any environmental and operational problems and the mitigative actions taken;
(o) any recommendations to minimize environmental impacts from the operation of the landfill and waste diversion areas to improve such operations in this regard;
(p) the results and an interpretive analysis of the results of all leachate, groundwater and surface water monitoring, including an assessment of the need to amend the monitoring programs;
(q) an assessment of the operation of the Site, the need to amend the design or operation of the Site, and the adequacy of and need to implement the contingency plans;
(r) a report on the status of all monitoring wells and a statement as to compliance with O.Reg. 903; and
(s) any other information required by the District Manager.

CLOSURE PLAN

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

(a) a plan showing Site appearance after closure;

(b) a description of the proposed end use of the Site;

(c) a descriptions of the procedures for closure of the Site, including:
  (i) advance notification of the public of the landfill closure;
  (ii) posting of a sign at the Site entrance indicating the landfill is closed and identifying any alternative waste disposal arrangements;
  (iii) completion, inspection and maintenance of the final cover and landscaping;
  (iv) site security;
  (v) removal of unnecessary landfill-related structures, buildings and facilities; and
  (vi) final construction of any control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas;
  (vii) a schedule indicating the time-period for implementing sub-conditions (i) to (vi) above.

(d) descriptions of the procedures for post-closure care of the Site, including:
   (i) operation, inspection and maintenance of the control, treatment, disposal and monitoring facilities for leachate, groundwater, surface water and landfill gas;
   (ii) record keeping and reporting; and
   (iii) complaint contact and response procedures;

(e) an assessment of the adequacy of and need to implement the contingency plans for leachate and methane gas; and

(f) an updated estimate of the contaminating life span of the Site, based on the results of the monitoring programs to date.

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

SCHEDULE "A"

This Schedule "A" forms part of this Provisional Certificate of Approval for a Waste Disposal Site

Information relied upon in the issuance of this Certificate:

1. The Application for a Certificate of Approval for a Waste Disposal Site (Processing) dated August 31, 2001, signed by Dean Sauriol, the Corporation of Whitewater Region.

2. Report entitled "Township of Whitewater Region, Ross Waste Disposal Site, Site Development and Operations Plan", dated June 2001 and prepared by Jp2g Consultants Inc.

3. Letter dated August 13, 2002, to Heather Brodie-Brown, Ontario Ministry of the Environment, from Mark A. Bruce, Jp2g Consultants Inc. containing additional information on the operations at the site and including, but not limited to the following:
   (a) clarification on the landfill footprint and the site size

4. Letter dated September 13, 2002, to Heather Brodie-Brown, Ontario Ministry of the Environment, from Mark A. Bruce, Jp2g Consultants Inc. containing additional information on the operations at the site and including, but not limited to the following:
   (a) anticipated annual fill rate for the site
   (b) confirmation on the landfill footprint and the site size

5. Letter dated September 11, 2003, to Jim Hiraishi, Ontario Ministry of the Environment, from Mark A. Bruce, Jp2g Consultants Inc. containing additional information on the operations at the site and including, but not limited to the following:
   (a) Drawing 1, entitled "Site Plan", dated September 9, 2003
   (b) Drawing 2, entitled "Interim Plan", dated September 9, 2003

(c) Drawing 3, entitled "Waste Disposal Site, Stage 1", dated September 9, 2003
(d) Drawing 4, entitled "Proposed Final Contours", dated December 18, 2000
(e) Drawing 5, entitled "Cross Section" , dated December 18, 2000
(f) Waste-to-cover ratio

6. Letter dated June 16, 2005, to Margaret Wojcik, Ontario Ministry of the Environment, from Kevin J. Mooder, Jp2g Consultants Inc. containing additional information on the operations at the site and including, but not limited to the following:
   (a) Waste compaction procedures
   (b) Waste covering procedures
   (c) Litter pick-up schedule

7. Letter dated October 14, 2005, to Margaret Wojcik, Ontario Ministry of the Environment, from Steven Hodson, Landfill Operations Manager, and including, but not limited to the following:
   (a) Description of the storage facility of residential recyclable wastes
   (b) Proposed handling of white goods containing ozone-depleting gases

8. Letter dated November 4, 2005, to Margaret Wojcik, Ontario Ministry of the Environment, from Steven Hodson, Landfill Operations Manager, and including, but not limited to the following:
   (a) Proposed handling/processing of clean woodwaste, brush and leaf & yard waste
   (b) Proposed handling/storage of residential recyclable wastes
   (c) Proposed handling/storage of other wastes considered special segregated wastes
   (d) Schedule of removal from the site
   (e) Description of the proposed hazardous waste facility
   (f) Drwg entitled "Figure A, Ross Waste Disposal Site", dated Nov 2005

9. Email transmission dated December 9, 2005 from Kevin Mooder, Jp2g Consultants Inc., to Margaret Wojcik, Ontario Ministry of the Environment, containing the actual size of the waste footprint, including the proposed footprint for Stage 2 landfilling operations and the existing waste within the 30-m buffer area.

10. Email transmission dated December 13, 2005 from Kevin Mooder, Jp2g Consultants Inc., to Margaret Wojcik, Ontario Ministry of the Environment, confirming that no composting operations are proposed to be undertaken at the site.

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

GENERAL

1. Conditions 1, 2, 4, 5, 6, 7, 8, 9, 10, 17 and 18 are included to clarify the legal rights and responsibilities of the Municipality under this Certificate of Approval.

2. Condition 3 is included to ensure that the Site is designed, operated, monitored and maintained in accordance with the application and supporting documentation submitted by the Municipality and not in a manner which the Director has not been asked to consider.

CHANGE OF OWNERSHIP

3. Condition 11 is included to ensure that the Site is operated under the corporate name which appears on the application form submitted for this approval and to ensure that the Director is informed of any changes.

4. Condition 12 is included to restrict potential transfer or encumbrance of the Site without the approval of the Director and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this Certificate of Approval.

CERTIFICATE OF REQUIREMENT / REGISTRATION ON TITLE

5. Conditions 13, 14 and 15 are included, pursuant to subsection 197(1) of the *EPA*, to provide that any persons having an interest in the Site or lands required for the Additional Buffer and the Contaminant Attenuation Zone, are aware that the land has been approved and used for the purposes of waste disposal or attenuation of contamination resulting from the operation of a waste disposal site.

INSPECTIONS

6. Condition 16 is included to ensure that appropriate Ministry staff have ready access to the Site for inspection of facilities, equipment, practices and operations required by the conditions in this Certificate of Approval. This condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the *EPA* and *OWRA*.

SERVICE AREA

7. Condition 19 is included to specify the approved areas from which waste may be accepted at the, based on the application and supporting documentation listed in Schedule "A".

APPROVED WASTE TYPES

8. Conditions 20, 21 and 22 are included to specify the types of waste that may be accepted for disposal at the Site or transfer off the Site for further processing, based on the application and supporting documentation listed in Schedule "A".

9. Condition 23 is included to ensure that all incoming waste is inspected prior to acceptance at the Site to ensure that the waste handled at the Site is as indicated in the application and supporting documentation listed in Schedule "A".

WASTE DIVERSION

10. Conditions 24, 25, 26, 27, 28, 29, 30 and 31 are included to ensure that the wastes destined for off-site removal are stored in their temporary storage location in a manner as to minimize a likelihood of an adverse effect or a hazard the natural environment or any person.

11. Condition 32 is included to ensure that woodwaste chipping is undertaken in a location that would minimize a likelihood of an adverse effect or a hazard the natural environment or any person.

12. Conditions 33, 34, 35 and 36 are included to ensure that the wastes destined for off-site removal are transferred from their temporary storage location in a timely manner to minimize a likelihood of an adverse effect or a hazard the natural environment or any person.

CAPACITY

13. Condition 37 is included to specify the total capacity of the landfill at the Site, based on the Application for a Certificate of Approval dated November 17, 1972.

14. Condition 38 is included to specify the capacity of the landfill at the Site currently approved for landfilling based on the attenuation capability of the proposed Contaminant Attenuation Zone, proposed in the application and supporting documentation listed in Schedule "A".

15. Condition 39 is included to require the Municipality to accurately determine the waste landfilled at the Site prior to start-up of Stage 2 landfilling operations so that the remaining approved landfilling capacity can be estimated.

WASTE PLACEMENT

16. Conditions 40 and 41 are included to specify restrictions on the extent of landfilling at this Site approved by this Certificate and based on the attenuation capability of the proposed Contaminant Attenuation Zone, proposed in the application and supporting documentation listed in Schedule "A".

BURNING PROHIBITIONS

17. Condition 42 is included to prohibit open burning of municipal waste, including brush and woodwaste, because of concerns with air emissions, smoke and other adverse affects, and the potential fire hazard.

COVERS

18. Condition 43 is included to ensure that the size of the landfill working face is minimized so that the waste compaction and daily cover application can be facilitated to maximize the capacity of the Site and to provide environmental benefits associated with greater compaction of waste.

19. Conditions 44 and 45 are included to ensure that daily and intermediate cover is used to control potential adverse effects, to facilitate vehicle access on the site, and to ensure an acceptable site appearance is maintained. The proper closure of a landfill site requires the application of a final cover which is aesthetically pleasing, controls infiltration, and is suitable for the end use planned for the site.

20. Conditions 46 and 47 are included to ensure that the open face of the landfill is adequately covered during the winter season to minimize a likelihood of an adverse effect or a hazard the natural environment or any person.

21. Condition 48 is included to prohibit use of strontium waste as an alternative daily cover due to operational and landfill design problems associated with this waste.

SITE ACCESS

22. Conditions 49 and 50 are included to specify the hours of operation for the Site and a mechanism for amendment of the hours of operation.

23. Conditions 51 and 52 are included to insure that vehicular traffic related to the operation of the Site does not cause adverse effect or a hazard the natural environment or any person.

SECURITY

24. Conditions 53 and 54 are included to ensure that the Site access and integrity are controlled by preventing unauthorized access when the Site is closed and no Site attendant is on duty.

SIGNS

25. Condition 55, 56 and 57 are included to ensure that users of the Site are fully aware of important information and restrictions related to Site operations and access under this Certificate.

ADVERSE EFFECT

26. Conditions 58, 59, 60, 61, 63 and 64 and are included to ensure that the Site is designed and operated in a way that does not result in an adverse effect or hazard to the natural environment or any persons.

LANDFILL GAS

27. Condition 65 is included to ensure that all buildings at the Site are free of any landfill gas accumulation, which due to a methane gas component may be explosive and thus create a danger to any persons at the Site.

SURFACE WATER MANAGEMENT

28. Condition 66 is included to ensure that drainage onto or leaving the Site does not adversely affect Site operations or create an adverse effect or hazard to the natural environment or any persons.

SCAVENGING

29. Condition 67 is included to ensure protection of public health and safety, and minimization of potential damage to environmental controls, monitoring and other works at the Site due to uncontrolled/unsupervised removal of materials from waste at the Site.

EMPLOYEES AND TRAINING

30. Condition 68 is included 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.

WEEKLY INSPECTIONS OF THE OPERATIONS

31. Conditions 69 and 70 are included to ensure that the Site is inspected on each day of operation to verify that the Site is operated and maintained in an environmentally acceptable manner and does not result in an adverse effect or a hazard to the natural environment or any person.

COMPLIANCE LIMITS

32. Condition 71 is included to provide the groundwater and surface water limits to prevent water pollution at the Site.

MONITORING

33. Conditions 72 and 73 are included to require the Municipality 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.

GROUNDWATER WELLS / MONITORS

34. Conditions 74, 75 and 76 are included to ensure the integrity of the groundwater monitoring network so that accurate monitoring results are achieved and the natural environment is protected.

BUFFER / CONTAMINANT ATTENUATION ZONE

35. Condition 77 is included to require the Municipality to retain the existing buffer through discontinuation of landfilling within the 30-metre area from the property line to provide necessary separation from the waste to the property line.

36. Condition 78 is included to require proper closure of the 30-metre buffer area that contains waste with a final cover which is aesthetically pleasing, controls infiltration, and is suitable for the end use planned for the site.

37. Conditions 79 and 80 are included to require the Municipality to obtain property rights to a land that is required for a buffer that would extend 30 metres in all directions from the actual waste location and for a Contaminant Attenuation Zone that is necessary for attenuation of contamination resulting from the operation of the Site.

TRIGGER MECHANISM AND CONTINGENCY PLANS

38. Conditions 81 and 82 are included to ensure that the Municipality follows an approved plan with an organized set of procedures for identifying and responding to, in advance to creating a noncompliance situation, unexpected but possible problems at the Site. A remedial action/contingency plan is necessary to ensure protection of the natural environment.

COMPLAINTS PROCEDURE

39. Condition 83 is to ensure that any complaints regarding landfill operations at this Site are responded to in a timely and efficient manner.

EMERGENCY SITUATIONS

40. Condition 84 is included to ensure that emergency situations are reported to the Ministry to ensure public health and safety and environmental protection.

41. Condition 85, 86 and 87 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.

RECORDS KEEPING

42. Conditions 88, 89, 90, 91, 92 and 93 are included to ensure that accurate records are maintained to ensure compliance with the conditions in this Certificate, the *EPA* and its regulations.

CLOSURE PLAN

43. Conditions 94 and 95 are included to ensure that final closure of the Site is completed in an aesthetically pleasing manner, in accordance with Ministry standards, and to ensure the long-term protection of the health and safety of the public and the environment.

This Provisional Certificate of Approval revokes and replaces Certificate(s) of Approval No. A413209 issued on October 28, 1980

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

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

The Notice should also include:

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

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

This Notice must be served upon:

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

AND

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

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

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

DATED AT TORONTO this 23rd day of December, 2005

THIS CERTIFICATE WAS MAILED
ON Jan. 4, 2006
9c
(Signed)

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

MW/
c: District Manager, MOE Ottawa
Mark A. Bruce, P.Eng., Jp2g Consultants Inc.
Kevin Mooder, P.Eng., Jp2g Consultants Inc. ✓

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A413209
Notice No. 1
Issue Date: March 15, 2013

The Corporation of the Township of Whitewater Region
Post Office Box, No. 40
Cobden, Ontario
K0J 1K0

Site Location: Ross Waste Disposal Site
990 Kohlsmith Rd
Whitewater Region Township, County of Renfrew
K0J 1K0

You are hereby notified that I have amended Approval No. A413209 issued on December 23, 2005 for the establishment, use and operation of a 5.4 hectare landfilling area and segregated waste storage and processing facilities all within an 8 hectare total site area , *as follows:*

The definition of "Certificate" is here by amended as follows:

"Approval" or *"Certificate"* or "*ECA* " means this Environmental Compliance Approval and any Schedules to it, including the application and supporting documentation listed in Schedule "A".

Condition 96 is hereby added to this *Approval:*

96. Notwithstanding Condition 41, approval is hereby granted to deposit waste in Stage 1 area until **December 31, 2013**.

Schedule "A"

The following Item is added to this Schedule "A":

11. Letter dated March 8, 2013 from Steven Hodson, Environmental Services Manager, Township of Whitewater Region, to Dale Gable, Acting Supervisor, Ontario Ministry of the Environment.

Reasons

1. The reason for Condition 96 is to allow the Township to continue landfilling while the application for Stage 2 is being reviewed for approval.

This Notice shall constitute part of the approval issued under Approval No. A413209 dated December 23, 2005

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

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

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

The Notice should also include:

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

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

This Notice must be served upon:

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

AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-4506 or www.ert.gov.on.ca**

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

DATED AT TORONTO this 15th day of March, 2013

THIS NOTICE WAS MAILED
ON March 19, 2013
pc
(Signed)

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

RM/

c: District Manager, MOE Ottawa
Steven Hodson, The Corporation of the Township of Whitewater Region ✓

RECEIVED
Aug 12/14

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A413209
Notice No. 2
Issue Date: July 21, 2014

The Corporation of the Township of Whitewater Region
Post Office Box, No. 40
Cobden, Ontario
K0J 1K0

Site Location: Ross Waste Disposal Site
990 Kohlsmith Rd
Whitewater Region Township, County of Renfrew
K0J 1K0

You are hereby notified that I have amended Approval No. A413209 issued on December 23, 2005 for the use and operation of a 5.4 hectare landfilling area and segregated waste storage and processing facilities all within an 25 hectare total site area , as follows:

The definition of *"Certificate"* is hereby revoked and replaced with the following:

"Certificate" or "*Approval* " means this Environmental Compliance Approval and any Schedules to it, including the application and supporting documentation listed in Schedule "A";

Conditions 38 (b), 39, 40, 41, 44 (a) (ii), 72, 73, 79 (a) and 81 are revoked and replaced with the following:

38. (b) Development and operation of Stage 2 is hereby approved in accordance with the Item 12 of Schedule "A". This amendment approves the development of 375,400 cubic meters which includes 119,100 cubic meters of existing waste.

39. Total amount of waste deposited at the Site as of January 1, 2013 is 119,100 cubic meters.

40. Waste shall be placed in accordance with the Item 12 of Schedule "A".

41. No waste shall be placed below Drawing No. 2 entitled "Cross Section A" dated January 28, 2013 or above the final contours for Stage 2 shown on Drawing No. 3 entitled "Proposed Final Contours" dated January 28, 2013 in the Design and Operations Report, Item 12 of Schedule "A".

44. (a) (ii) Clean permeable soil, wood chips, compost, contaminated soil and ground C&D waste may be used as proposed in Item 12 of Schedule "A".

72. Surface water monitoring program shall be in accordance with the documents in Schedule "A".

73. Groundwater monitoring program shall be in accordance with the documents in Schedule "A".

79. (a) Seventeen hectares of Contaminant Attenuation Zone is hereby added to the total Site area of 8 hectares.

81. (a) Notwithstanding the establishment of the Contaminant Attenuation Zone as approved in Condition 79(a), By March 31, 2015, the Municipality shall establish and submit to the *Director* for approval, the site-specific trigger mechanism program for the groundwater at the Site. Alternatively the Municipality may propose Trigger Mechanism and Contingency Plans in the Annual Report and use the procedure in Condition 97 to obtain approval from the *Director*.

Condition 97 is hereby added:

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

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

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

Schedule "A"

12. Report titled "Design and Operations Report, Ross Waste Disposal Site" dated February 2013 and prepared by Jp2g Consultants Inc.

13. Report titled "Ross Landfill Site, Township of Whitewater Region, ECA A413209, Environmental Monitoring Report" dated February 2013 and prepared by Jp2g Consultants Inc.

14. Letter dated July 17, 2013 from Kevin Mooder, MCIP,RPP and Andrew Buzza, P.Geo, Jp2g Consultants Inc. to Emily Tieu, Sr. Environmental Officer, Ministry of the Environment, Ottawa District Office Re: Review of Groundwater Comments.

15. Letter dated August 2, 2013 from Kevin Mooder, MCIP, RPP and Andrew Buzza, P.Geo, Jp2g Consultants Inc. to Emily Tieu, Sr. Environmental Officer, Ministry of the Environment, Ottawa District Office Re: Review of Surface Water Comments.

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

1. The reasons for amending the conditions 38 (b), 40 and 41 are to approve the Development and Operation of Stage 2 and deposit waste within the approved limits.

2. Condition 44 (a) (ii) is amended to include additional alternative daily cover material.

3. Reasons for conditions 72 and 73 are to require the Municipality to monitor surface water and groundwater as proposed in the documents in Schedule "A".

4. The reason for the condition 79 (a) to add the Contaminant Attenuation Zone to the total Site area.

5. Condition 81 is added to ensure the *Owner* has a plan with an organized set of procedures for identifying and responding to potential issues relating to groundwater and surface water contamination at the *Site's* compliance point.

6. Condition 97 is included to streamline the approval of the changes to the monitoring plan.

This Notice shall constitute part of the approval issued under Approval No. A413209 dated December 23, 2005

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

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

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

The Notice should also include:

3. The name of the appellant;

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

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

This Notice must be served upon:

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

AND

The Director appointed for the purposes of
Part II.1 of the Environmental Protection Act
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-4506 or www.ert.gov.on.ca**

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

DATED AT TORONTO this 21st day of July, 2014

THIS NOTICE WAS MAILED
ON Aug. 7, 2014
DC
(Signed)

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

RM/
c: District Manager, MOE Ottawa
Kevin Mooder/Andrew Buzza, Jp2g Consultants Inc.

Appendix B
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	Ross Waste Disposal Site
Location (e.g. street address, lot, concession)	990 Kohlsmith Road, Pt. Lot 10, Con. 5, (Geo) TWP of Ross, TWP of Whitewater Region.
GPS Location (taken within the property boundary at front gate/ front entry)	45°38'08"N 76°48'42"W
Municipality	Township of Whitewater Region
Client and/or Site Owner	Township of Whitewater Region
Monitoring Period (Year)	2024
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval Number:	A413209
Director's Order No.:	N/A
Provincial Officer's Order No.:	N/A
Other:	N/A

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	375,400	*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)	0	*Units*	Cubic Metres
Total Waste Received within Monitoring Period (Year) *Methodology*	Estimated through survey		
Estimated Remaining Capacity	0	*Units*	Cubic Metres
Estimated Remaining Capacity *Methodology*	Estimation based on Waste Volumes		
Estimated Remaining Capacity *Date Last Determined*	February 2025		
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: See attachment A
Subject Waste Approved Waste Classes: Hazardous & Liquid Industrial *(separate waste classes by comma)*	Subject waste is not accepted at the Ross WDS		
Year Site Opened *(enter the Calendar Year only)*	2006	**Current ECA Issue Date**	Dec 23, 2005 amended July 21, 2014
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:	N/A

Has the nature of the operations at the site changed during this monitoring period?	○ **Yes** ◉ **No**
If yes, provide details:	N/A
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**	The monitoring program continues to effectively characterize the site conditions. All monitoring wells are in good condition. BH-1 was decommissioned in 2018 as originally proposed in the 2001 application. We are recommending the addition of a bi-level well between BH-5 and BH-16 to help evaluate the leachate plume.
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**
Table 3 in the report provides a description of all samples collected and whether or not they are a requirement of the ECA. Table 3 is provided in Attachment B to this schedule.		

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**

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**	Sampling completed in general as per Jp2g Consultants standard practices as described in report.

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**	See Attachment C.	
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**	N/A	
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**	MOE Guideline B-7 analysis indicates an exceedance of manganese at BH-16 shallow and deep (i.e. over four consecutive sampling events). Upon analysis of the downgradient monitoring wells, data suggests that there could be a potential differing natural mineralization of the groundwater in this area or a secondary source downgradient of the site. See Attachment C.	

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**	It is recommended that manganese be added to the fall analysis at BH-16 to further assess trends. It is recommended that a bi-level monitoring well be installed between BH-5 and BH-16 to determine the potential impact from landfilling.
◉ **The following change(s) to the monitoring program is/are recommended:**	
◉ **No Changes to site design and operation are recommended**	Note: The Township initiated contact with MECP on February 24, 2022, regarding a proposed redesign and expansion of the waste mound to accommodate a new access road, weigh scales and waste/recycling material storage facilities. The Township intends on filing an Application to Amend the ECA in 2025.
○ **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:**	
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)	Seasonal water course, "draw", and permanent stream near SW-1A
Distance(s)	Adjacent (north) of the landfill site limit and northeast of the site (60-70 meters)

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	
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
MVC (SW-2)	Dry	All events
BLC (SW-3)	Dry	Spring and Fall events

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

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**	Sampling completed in general as per Jp2g Consultants standard practices as described in report.

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
See Attachment D.		
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**	See Attachment E.

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**	Major annual and seasonal fluctuations are shown in the data, however, the monitoring results of SW-1 suggest a general decreasing trend in the chemical concentrations within the site's surface water.
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	Boron was found to exceed PWQO at monitoring wells BH-6 and BH-9 during both the spring and fall. As the groundwater table at these wells is below the elevation of the seasonal watercourse 'draw' there is no anticipated impact on surface water at these locations
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	○ **Yes** ◉ **No** ○ **Not Applicable**	SW trigger values were not exceeded in 2024.

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:

Select Date

Recommendations:

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

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

CEP Signature	
Relevant Discipline	Professional designation, education with 30 years experience
Date:	
CEP Contact Information:	Andrew Buzza
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**

Attachment A

Other non-hazardous approved waste types include; scrap metal, white goods, refrigerant appliances, propane cylinders, and batteries.

Attachment B

Monitoring Well	Required by ECA	Trigger Location	May Storm Event	Nov Storm Event	Jun-24		Oct-24	
					Water Level	Sampled	Water Level	Sampled
BH-1	Decommissioned							
BH-2B Shallow	√				√	NS	√	NS
BH-2A Deep	√				√	NS	√	NS
BH-3	Destroyed							
BH-4A Shallow	√	√			√	√ + VOCs	√	√
BH-4 Deep	√	√			√	√ + VOCs	√	√
BH-5	√				√	√ + VOCs	√	√
BH-6A Deep	√				√	√ + VOCs	√	√
BH-6B Shallow	√				√	√ + VOCs	√	√
BH-7A Deep	√				√	√ + VOCs	√	√
BH-7B Shallow	√				√	√ + VOCs	√	√
BH-8	√				√	√ + VOCs	√	√
BH-9A Deep	√				√	√ + VOCs	√	√
BH-9B Shallow	√				√	√ + VOCs	√	√
BH-10A Deep		√			√	√ + VOCs	√	√
BH-10B Middle	√	√			√	√ + VOCs	√	√
BH-10C Shallow	√	√			√	√ + VOCs	√	√
BH-11A Deep	√	√			√	√ + VOCs	√	√
BH-11B Shallow	√	√			√	√ + VOCs	√	√
BH-12	√				√	√ + VOCs	√	√
BH-13A Deep	√	√			√	√ + VOCs	√	√
BH-13B Shallow	√	√			√	√ + VOCs	√	√
BH-14A Deep	√	√			√	√ + VOCs	√	√
BH-14B Shallow	√	√			√	√ + VOCs	√	√
BH-15A Deep					√	√ + VOCs	√	√
BH-15B Shallow					√	√ + VOCs	√	√
BH-16A Deep					√	√ + VOCs + DUP	√	√ + DUP
BH-16B Shallow					√	√ + VOCs	√	√
BH-17A Deep					√	√ + VOCs	√	√
BH-17B Shallow					√	√ + VOCs	√	√
MVC (SW-2)	√		NS	NS		NS		NS
SW-1 Historical	Removed							
SW-1A Current	√		√	√ + DUP		√ + VOCs		√
BLC (SW-3)	√		√	√		NS		NS

Notes:

1) NS - No sample was taken as location was dry or inaccessible
2) DUP - Duplicate samples were taken
3) VOCs - Volatile Organic Compound Samples Collected
4) VOCs as listed in column 1 were analyzed

Monitoring well BH-10A (deep), though not stated to be a part of the monitoring program in the ECA and supporting documents, was sampled during both spring and fall monitoring events in

2024. In addition, wells BH-15A (deep), BH-15B (shallow), BH-16A (deep), BH-16B (shallow), BH-17A (deep), and BH-17B (shallow) were installed in 2013 and were sampled during both monitoring events in 2024 but have not yet been added to the MOE-approved monitoring program.

Monitoring well BH-1 was decommissioned in 2018, as originally proposed in the 2001 application.

Sampling of the wells was completed in general as per Jp2g Consultants standard practices as described in report.

Attachment C

As indicated in TSS review comments dated March 12, 2013, sampling has indicated that the contaminant plume has progressed beyond downgradient monitoring well, BH-13.

As such three new monitoring wells were installed near the downgradient extent of the site's CAZ to better monitor site compliance. In comparing the values of TDS, alkalinity, and DOC from wells BH-15 and BH-16 to wells that are located closer to the site (i.e. BH-6, BH-7, BH-11, BH-12, and BH-13), the values at the wells located furthest from the site (BH-15 and BH-16) reveal elevated parameters of DOC and TDS. This would suggest that the landfill site is not the source of the elevated concentrations.

Manganese, being analyzed in the spring monitoring event only, exceeded the trigger concentration at BH-16A and BH-16B in 2021, 2022, 2023 and 2024, i.e. four (4) consecutive event monitoring events. There is a slight increasing trend since 2020, however levels remain relatively low. In comparing the values of manganese from BH-16 to wells that are located closer to the site (i.e., BH-7, and BH-6), the concentrations in wells located closer to the landfill are an order of magnitude greater than values from BH-16. Intuitively it would be expected that levels would attenuate over the distance.

In evaluating the surficial geology, the esker located in the vicinity of BH-16 may result in a differing natural mineralization of the groundwater at this location. Accordingly, we would suggest that the far downgradient wells are not being severely impacted by the landfill operations.

It is our recommendation that manganese be added to the fall analysis at BH-16, and that a bi-level well be installed between BH-5 and BH-16 to determine the potential of the impact from landfilling.

Attachment D

Parameter		Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
SW-1A			
November 2024	Phosphorus	PWQO = 0.03 mg/L	0.032 mg/L (7%)
May 2024 (Storm) June 2024 October 2024 November 2024 (Storm)	Nitrate	CWQG = 3 mg/L	6.91 mg/L (130%) 7.9 mg/L (163%) 7.35 mg/L (145%) 5.62 mg/L (87%)
BLC			
May 2024 (Storm)	Nitrate	CWQG = 3 mg/L	4.33 mg/L (44%)

Attachment E

Total phosphorous (and historically zinc and iron) at upstream station MVC (SW-2) has been shown to be in excess of provincial limits from time to time. This location is not in the direct flow path from the site and accordingly, any exceedances are not anticipated to be a result of landfill impact. The elevated nitrate concentrations are attributed to the application of fertilizers on surrounding agricultural land.

Appendix C
Ministry Correspondence

TOWNSHIP OF WHITEWATER REGION

FAX COVER SHEET

TO: Kevin Mooder

FROM: Steven Hodson

DATE: February 24th 2009

SUBJECT: MOE Letter

PAGES: 9 including cover

FAX #:

MESSAGE:

Kevin,

Thought I would send you this for your comments.

Steven.

44 Main Street, Cobden, ON K0J 1K0
Phone: (613) 646-2282 Fax: (613) 646-2283

Ministry of the Environment
Ottawa District Office
2430 Don Reid Drive
Ottawa ON K1H 1E1
Telephone: (613) 521-3450
Fax: (613) 521-5437

Ministère de l'Environnement
Bureau de district d'Ottawa
2430, promenade Don Reid
Ottawa ON K1H 1E1
Téléphone: (613) 521-3450
Télécopieur: (613) 521-5437

Ontario

RECEIVED
FEB 24 2009

February 20, 2009

Mr. Steven Hodson, Landfill Operations Manager.
The Corporation of the Township of Whitewater Region
44 Main Street,
PO Box 40,
Cobden, ON, K0J 1K0

Re: Ross Waste Disposal Site - Certificate of Approval No. A413209.
Groundwater technical review

Dear Mr. Hodson:

I have attached for your perusal the Ministry's groundwater review of the 2007 annual report for the subject site.

The reviewer recommends significant changes to the groundwater monitoring program and the installation of additional monitoring wells. Please provide to the undersigned a letter by **March 31, 2009** confirming the implementation of the reviewer's recommendations.

Should you have any comments, questions or concerns, please contact me directly at (613) 521-3450 extension 229 (1-800-860-2195x229) or marc.lesieur@ontario.ca.

Sincerely,

Marc-Etienne LeSieur
Senior Environmental Officer

Attachments

c: file: SI RE RS C05 610
S. Kinney, MOE.

Ministry of the Environment

P.O. Box 22032
Kingston, Ontario
K7M 8S5
613/549-4000 or 1-800/267-0974
Fax: 613/548-6908

Ministère de l'Environnement

C.P. 22032
Kingston (Ontario)
K7M 8S5
613/549-4000 ou 1-800/267-0974
Fax: 613/548-6908

Ontario

MEMORANDUM

08 January 2009

TO: Marc-Etienne Lesieur
Senior Environmental Officer
Ottawa District Office
Eastern Region

MINISTRY OF THE ENVIRONMENT
JAN - 9 2009
OTTAWA

FROM: Shawn Kinney
Hydrogeologist
Water Resources Unit
Technical Support Section
Eastern Region

RE: 2007 Annual Monitoring Report, Ross Waste Disposal Site A413209
Part Lot 10 Concession 5, Geographic Township of Ross,
Township of Whitewater Region

I have reviewed the hydrogeologic aspects of the document entitled:

- *"Township of Whitewater Region, Ross Landfill Site, 2007 Annual Operations Report, Certificate of Approval #A413209"* Township of Whitewater Region Waste Management Department, March 2008.

Appendix A of the document includes the 2007 Environmental Monitoring Report entitled:

- *"Ross Landfill Site, Township of Whitewater Region, Certificate No. A413209, 2007 Water Quality Monitoring Report"* Jp2g Consultants Inc. March 2008.

Based upon the information provided, I submit the following comments for your consideration.

Summary

1. The site appears to comply with Reasonable Use Guideline B-7.

2. The horizontal extent of the leachate plume has migrated beyond the existing monitoring well network. Additional monitoring wells are required.

3. The primary pathway for migration of leachate is horizontally northward through the surficial sandy aquifer from the fill area towards monitor BH 13. The migration rate may be on the order of 30 to 40 metres per year.

4. The potential exists for surface water impacts to occur to an un-named surface water feature located immediately to the north of the fill area.

5. The most recently proposed groundwater monitoring program is unsatisfactory. A satisfactory monitoring program is recommended below. In view of the historical VOC impacts observed in several groundwater monitors, annual VOC sampling must occur at this site.

6. Some of the water level measurements presented in Table 2 of the Jp2g document are anomalous and may contain errors.

Certificate of Approval

The Ross Waste Disposal Site operates under Amended Certificate of Approval A413209. The site is licensed for the use and operation of a 5.4 hectare landfill site within a total site area of 8 hectares. The site is licensed to receive solid, non-hazardous municipal waste. Additional wastes such as tires, scrap metal, etc., can be received, stored and processed at the site for off-site transfer for the purpose of recycling and waste diversion. The trench disposal method is used. The landfill operates as a naturally attenuating site.

Geology

Ontario Geological Survey map P2366 depicts the fill area as situated upon shallow marine sand and silt deposits. The map depicts deeper marine clay, silty clay, and clayey silt deposits to the north and east of the site. The site is shown to be close to the contact between the two different overburden types.

Borehole information indicates the following on-site geology:

- Sand: up to 17 metres thick;
- Silty clay: avg. 1.4 meter thick layer 3 to 7 metres below grade, eastern half of site;
- Till: 12 metres below ground surface.

Bedrock was not encountered within the maximum depth of investigation. Geological Survey map P2730 depicts the bedrock underlying the site as undifferentiated metamorphic and igneous rock.

Hydrogeologic Conditions

Hydraulic Conductivity

A total of 23 rising head hydraulic conductivity tests were performed at the site since1990. Tests were conducted on all boreholes except BH-12. A previous consultant (Golder Associates) reported that rapid water level recovery prevented the measurement of hydraulic conductivity in 15 tests at 9 monitors. Golder suggested a hydraulic conductivity value of 0.0001 $m^3/m^2/s$, based upon grain size analysis.

Horizontal Hydraulic Gradient

Table 2 of the Jp2g report provides water level data from 65% of available monitors. A northward horizontal hydraulic gradient of 1 m per 200 m or 0.005 m/m existed in both the shallow and deep monitors during June 2007.

Table 2 of the Jp2g document reports an October 2007 BH-4B water level of 278.90 metres. This is approximately 9 metres lower than June levels and 1.9 metres below the bottom of the borehole. Similarly, the water level of 278.84 metres reported for BH-11A is 1.4 metres below the bottom of the borehole.

I question the reliability of the water level measurements presented in Table 2 of the Jp2g report. The consultant should address this.

Vertical gradient

Vertical gradient data provided for June 2007 indicates that horizontal groundwater flow dominated. Due to the above-noted issues with the October 2007 data, I am unable to advise you regarding vertical gradients during that time period.

Groundwater Flow Direction

Groundwater flow during June 2007 was horizontal northward away from Kohlsmith Road toward the northernmost monitor designated as BH 13. I am unable to advise you regarding groundwater flow directions during October 2007.

Hydrogeologic Units

The dominant hydrogeologic unit is the sand and silty-sand aquifer observed within the 17 metre depth of investigation. A discontinuous silty clay feature located beneath the eastern half of the site may curtail vertical groundwater flow in this area.

Conceptual Model

The primary pathway for migration of leachate is horizontally northward through the surficial sandy aquifer from the fill area towards monitor BH 13.

Background Water Quality

Background water quality was measured at monitor BH-1 and BH-8 located 140 metres south and 100 metres southeast of the fill area, respectively. I consider BH-1 to be more representative of vulnerable aquifer conditions than BH-8 because the latter is screened beneath a silt/clay layer.

Appendix B of the Jp2g report provides the water quality data for these monitors. I have examined the median water quality data from both monitors for the 5 most recent monitoring events.

Groundwater quality at BH1 conformed to provincial drinking water criteria with the following exception:

- *Hardness:* Median concentration 308 mg/l. This is 3 times greater than the 100 mg/l provincial drinking water criterion.

Groundwater quality at BH8 conformed to provincial drinking water criteria with the following exception:

- *Hardness:* Median concentration 180 mg/l. This is 1.8 times greater than the 100 mg/l provincial drinking water criterion.

Leachate Water Quality

Leachate water quality was determined at monitors BH-5, located at the western toe of the historical fill area and monitor BH-12 located at the north of the fill area. Recent samples from these wells were found to have the highest concentrations of total dissolved solids and VOC's.

Appendix B of the Jp2g report summarizes the groundwater water quality data. I have examined the most recent water quality data from both monitors. I note the following contaminants of concern:

- *Manganese.* 2.39 mg/l in BH-5. This is 47 times greater than the 0.05 mg/l provincial drinking water criterion.

- *1,4-Dichlorobenzene*: 0.0079 mg/l in BH-5 in September 2006. This is 7.9 times greater than the 0.001 mg/l provincial drinking water criterion. No VOC data is reported after this date.

- *Dissolved Organic Carbon*. 18 mg/l in BH-5 in September 2006. This was 3.6 times greater than the 5 mg/l drinking water criterion. No DOC data is reported after this date.

- *Hardness*. 830 mg/l in BH-5 in September 2006. This was 2.6 times greater than the 308 mg/l median concentration at BH1 and 4 times greater than the 180 mg/l median concentration at BH-8. No hardness data is reported after this date.

- *Nitrate*: 20.7 mg/l in BH-12. This is twice the 10 mg/l provincial drinking water criterion.

- *Total Dissolved Solids*. 663 mg/l in BH-5. This is 1.3 times greater than the 500 mg/l provincial drinking water criterion.

The September 2006 groundwater sample from BH-5 contained at least 5 dissolved chlorinated organic compounds. If a pure DNAPL source product exists, it could migrate independent of the hydraulic gradient and down the slope of the underlying till layer. The available borehole data infer that the till slopes downward in a north-northwest direction.

Downgradient Water Quality

The most distant downgradient monitor, BH-13, is located approximately 275 metres downgradient of the fill area. Concentrations of several leachate indicator parameters at deep monitor BH-13A were generally twice the background concentrations observed at monitor BH-8. Groundwater in the shallow monitor BH-13B is apparently not impacted. This suggests that the leachate plume is sinking lower as it migrates northward.

Leachate impacts extend at least 275 metres from the fill area and are beyond the existing monitoring network. Additional groundwater monitors are required hydraulically downgradient of monitor BH-13A to delineate the full extent of the groundwater impact contamination.

Ontario Base Map 10 18 3550 50550 depicts an un-named surface water feature located immediately north-west of the fill area. This feature is positioned between two of the more impacted groundwater monitors on the site, BH-5 and BH-7. The potential exists for impacts to this receiver. This issue is discussed by the Surface Water Scientist under separate cover.

Guideline B-7

The Ross landfill site operates under a Certificate of Approval. Condition 71 of amended Certificate of Approval A413209 mandates compliance with Reasonable Use Guideline B-7 within the boundaries of the Contaminant Attenuation Zone, or CAZ.

I have compared groundwater quality at monitors BH10, BH11 and BH13 to site-specific water quality criteria calculated according to Guideline B-7 and Procedure B-7-1. I note the following:

- BH-13A (deep): Nitrate concentration of 17.1 mg/l. This is 1.7 times greater than the 10 mg/l provincial drinking water criterion and therefore exceeds Guideline B-7 by definition.
- BH-13A (deep): Total dissolved solids concentration of 517 mg/l. This slightly exceeds the provincial drinking water criterion and therefore exceeds Guideline B-7 by definition.
- BH-10A (deep): Nitrate concentration of 12 mg/l. This is 1.2 times greater than the 10 mg/l provincial drinking water criterion.
- BH-10B (intermediate): Nitrate concentration of 10.9 mg/l. This is 1.1 times greater than the 10 mg/l provincial drinking water criterion.

The nitrate levels observed at boundary monitor BH-10 may be a result of up-gradient agricultural activities. The situation should continue to be monitored.

The 17 mg/l nitrate level observed at BH-13 is approximately twice the observed background concentration. The nitrate levels resemble those of leachate monitor BH-12.

Based on the information available, the site appears to comply with reasonable use guideline B-7 at this time. The monitoring network must be expanded downgradient of monitor BH-13 to conclusively verify the state of B-7 compliance at the northern limit of the attenuation zone.

Groundwater Monitoring Program and Reporting

This site is intended to be one of the municipality's main long term waste facilities and may eventually contain a large waste mass. Schedule 5 of the Landfill Standards Guideline is the appropriate parameter list for this site.

Section 9.1, Table 9 and Table 10, pages 14 to 16 of the Jp2g report describe the proposed groundwater monitoring program. I have compared the proposed monitoring program to Landfill Standards Guideline Schedule 5. I and conclude the following:

The spring and fall monitoring frequency is satisfactory. Water levels in every monitor must be measured and recorded prior to sampling.

The analytical parameters in "List A" and "List B" of Table 10 in the Jp2g report are mutually exclusive. If implemented, each water quality parameter will be measured only once per year in 70% of the site's monitors. This defeats the purpose of twice-annual monitoring, which is intended to examine seasonal water quality variations. This is unsatisfactory.

Column 1 (Comprehensive) of Schedule 5 should be implemented in every well during one of the two annual monitoring events. In view of the historical VOC impacts observed in several groundwater monitors, annual VOC sampling must occur at this site.

Either Column 1 or Column 2 (Indicator) should be implemented in every well during the other annual monitoring event. If the sampling program proceeds satisfactorily, the entire indicator list in Column 2 of Schedule 5 will be sampled twice annually.

I do not object to the addition of other analytical parameters by the certificate holder.

Shawn Kinney, P.Geo.,
SK/gl

c: Paul Kehoe (Ottawa District)
Peter Taylor (Water Resources Unit)
Dana Cruikshank (Surface Water Unit)
GW 03-03 WHIT Ross Landfill Site A413209, Township of Ross
SK #3483-7E6Q5C

March 30, 2009

Ministry of the Environment
Ottawa District Office
2430 Don Reid Drive
Ottawa, ON
K1H 1E1

Attention: Marc-Etienne LeSieur
Sr. Environmental Officer

Re: Ross Landfill Site
Certificate No. A4130209
Township of Whitewater Region
Our Project No. 2006047J

Dear Sir:

We acknowledge receipt of your letter dated February 20, 2009 to Steven Hodson and the attached memo from Shawn Kinney regarding comments on the 2007 monitoring report dated January 8, 2009. In consultation with Mr. Hodson and in preparation of the 2008 Annual Report we are pleased to provide the following in response to the reviewer's recommendations.

Background

Certificate No. A413209 issued October 28, 1980 was replaced by the Amended Certificate dated December 23, 2005 based on an Application dated August 31, 2001. Accompanying the Application was the Site Development and Operations Plan dated June 2001 (Jp2g 2001) which included as Appendix C the 2000 Hydrogeological Investigation and Monitoring Program dated June 2001 prepared by Golder Associates Ltd. (GAL 2001).

According to our file review this report was reviewed by MOE in development of the amended Certificate: D. Cruikshank Feb. 3/03, S. Kinney June 16/03, May 12/04 and Sept. 3/04. MOE approved the amendment subject to limiting the landfilling to Stage 1, an application of final cover over the historical disposal area and establishment of a 150m downgradient CAZ. Furthermore Golder recommended installation of additional boreholes. Boreholes BH13 and BH14 were completed in 2002 as reported '2001 Hydrogeological Investigation and 2001 and 2002 Monitoring Programs Ross Waste Disposal Site' (GAL, 2003).

As required under Conditions 72 and 73 a report entitled '2003, 2004 & 2005 Monitoring Programs Ross Waste Disposal Site' dated December 2006 (GAL 2006) was filed with the District Manager. This report detailed the proposed surface water and groundwater monitoring program. In addition, as required under Condition 81 this report established the site specific trigger mechanism for the site.

The September 2006 monitoring and reporting was completed by GAL (2007). On March 30, 2007 the 2006 Annual Report (Jp2g 2007) was filed with the District Manager as required under Conditions 92 and 93, representing the first annual report submission under the Amended Certificate. As requested, an additional copy of the report was filed with your office May 29, 2007 to permit TSS review.

During the 2007 monitoring season, Golder completed upgrades to the monitoring wells in accordance with O. Reg. 903 and S. Hodson conducted the June and October 2007 sampling events. The 2007 Water Quality Monitoring Report included in the 2007 Annual Report (Jp2g, 2008) acknowledged the GAL (2006) report as the basis of the monitoring and trigger mechanism program.

Purpose of This Submission

The intent of our response is not to dwell on past reviews and reports, although they formulated the 2007 monitoring and reporting requirements, but to establish in consultation with MOE a comprehensive monitoring program which will support the future use of the site. As stated by Mr. Kinney, the Ross Site is intended to be the municipality's long-term waste disposal solution, and the site's approved capacity (Conditions 37-41) acknowledges available capacity in Stage 2 but the current Certificate would need to be amended to permit landfilling beyond Stage 1. According to MOE comments five (5) key issues need to be addressed:

- Groundwater Flow
- Background Water Quality
- Surface Water Impact
- Additional Downgradient Monitors
- Groundwater Monitoring Program

Groundwater Flow

Groundwater levels were taken at all monitors as illustrated on Table 1. Table 2 summarized the key multi-level monitors and as noted there were two (2) typographical errors:

BH-4B Oct. 2007 – 278.90 should be 287.90, and
BH-11A Oct. 2007 – 278.84 should be 287.84

The 2008 Annual Report will include a record of all groundwater level measurements, however we trust Table 2 is satisfactory to illustrate vertical gradients at a select number of key monitors.

Background Water Quality

We acknowledge that BH-8 monitors below a silty clay deposit (6.2 to 9.1m depth) at a depth of approximately 11 metres, and may not represent background conditions as the majority of the site is underlain with a sand deposit. However, BH-1 is located in Stage 1 and currently the landfilling of waste is occurring adjacent to the borehole such that it will not exhibit background characteristics in the near future. Given that BH-8 values are generally less than BH-1, trusting BH-8 will be satisfactory fur future assessments.

Surface Water Impact

As noted, Golder was never successful in obtaining any surface water samples at the 3 locations identified in the monitoring program. However, as the Township staff are regularly on site Mr. Hodson collected samples at SW-1 (briefly discussed in Section 10.0 of the 2007 Annual Report). In 2008 another 2 samples were collected and summarized in the 2008 Annual Report. A photographic record and detailed characterization of this surface water feature will be provided in the 2009 Annual Report.

Additional Downgradient Monitors

BH-13 was installed as recommended by Golder to assess the performance of the proposed 150m CAZ. Due to accessibility restrictions and in consultation with the landowner the borehole was installed 190m from the 8.0 ha site (275m downgradient from the Stage 1 fill area, 230m from the historical disposal area near BH-9). Since 2004 the BH-13A nitrate concentrations have slightly exceeded ODWS/OG limit of 10 mg/L (in the 11.4 – 17.9 range). The TDS concentration of 522 and 517 mg/L in 2007 were the first ODWS/OG exceedences (although the values have been increasing since 2002) and nitrate ODWS/OG exceedances since 2004. The property acquired by the Township northwest of the site extends beyond the 150m CAZ proposal to the westerly limit of Lot 10, Concession 5 (approximately 400m+ downgradient distance from Stage 1 and the historical disposal area). We respectfully agree that the site is in compliance with Guideline B-7 as stated by Mr. Kinney.

GAL (2006) details the trigger mechanism for both the north and northwest (former Rochon) and the northeast (Hawthorn) properties. The list of parameters proposed by Golder included: Ba, B, Sr, TDS, Alkalinity, K, SO_4, Mn, excluding nitrate (GAL, 2006). If non-compliance occurred during 2 consecutive monitoring sessions, a 3-step process was defined.

Regarding the trigger locations to the northeast (Hawthorn), at BH-10B there is a recent occurrence of nitrate above ODWS/OG and at BH-10C, BH-14A and B there hasn't been any ODWS/OG exceedences (except hardness within the ranges at BH-8 background). The Township is pursuing further discussion with the landowner to establish a CAZ, recognizing the potential for leachate impact in the future. The trigger locations for the north and northwest area are at monitors 11A, 11B, 13A and 13B. No leachate impacts have been detected at BH-11, and as noted above BH-13A has elevated nitrate and recent TDS concentrations. If the current trigger mechanism program is unsatisfactory, we would be pleased to develop in consultation with MOE the locations, parameters and a phased remedial action plan.

While we agree that additional downgradient wells will be needed, and will certainly be required for Stage 2 approvals, the Township wishes to assess whether the TDS is partially or wholly explicable from landfill leachate or by other factors. Further monitoring is required to document any trends with other parameters, and assess in consultation with Mr. Rochon, if agricultural practices may have resulted in the elevated nitrate/TDS concentrations. All that being said, the Township acknowledges that additional wells will need to be installed, however additional analysis is required to locate and implement an appropriate downgradient groundwater monitoring network.

Groundwater Monitoring Program

The Golder monitoring program identified six (6) surveillance monitoring wells (key monitors) and the remainder as routine wells whereby the list of surveillance parameters were more comprehensive. The fall event for both monitoring well types proposed to add parameters. The intent of this program was to include the parameters as requested by MOE, sample all wells, and keep the cost reasonable.

Regardless, the Township agrees to implement the 'standard' groundwater monitoring program (MOE, 1998) comprising Column 1 of Schedule 5 for the spring event and Column 2 of Schedule 5 for the fall event as recommended by Mr. Kinney. As the VOC's in Column 1 generally represent the parameters previously found in BH5 and BH12 including that analysis for all wells at least once per year should assist in clearly determining the leachate characteristics.

The municipality acknowledges that future monitoring may comprise Column 2 (indicator) parameters per sampling event if results are satisfactory.

The only additional parameter from the MOE 2004 and 2008 review comments analyzed in the past and proposed by Golder was strontium. The rationale for this was the historical generation of a strontium residue material generated from the Timminco Metals plant in the municipality. This operation has since closed (note Condition 48 of the Certificate did not permit use of this material as an alternate cover). Continued analysis is not merited, and the list of 'standard' parameters is deemed acceptable as proposed by Mr. Kinney.

Pending further review and discussion, we trust the municipality can proceed accordingly as per the 2009 monitoring program presented in the 2008 Annual Report. The installation of additional monitors will be based on the results of further analysis and should be scheduled for 2010 or 2011.

Trusting this is satisfactory.

Yours very truly,
Jp2g Consultants Inc.
Engineers • Planners • Project Managers

Kevin Mooder
Senior Project Planner

KJM/dr

c.c.: - Steve Hodson

Ministry of the Environment

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Ministère de l'Environnement

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Ontario

M E M O R A N D U M

October 26, 2009

TO: Marc-Etienne Lesieur
Senior Environmental Officer
Ottawa District Office
Eastern Region

FROM: Gillian Dagg-Foster
Surface Water Specialist
Technical Support Section
Eastern Region

RE: 2007 Annual Monitoring Report
Ross Waste Disposal Site
Part Lot 10, Concession 5
Township of Whitewater Region
Certificate of Approval No. A413209

I have reviewed the above-noted report prepared by the Township of Whitewater Region dated March, 2008. The report includes as Appendix A a report entitled "2007 Water Quality Monitoring Report" prepared by Jp2g Consultants Inc. The following memorandum outlines my comments with respect to surface water issues.

I have also reviewed the comments provided to you on January 8, 2009 by Mr. S. Kinney regarding hydrogeological issues and on May 22, 2007 by Mr. D. Cruikshank on surface water issues with respect to this site.

Background Information

The Ross Disposal Site (WDS) operates under provisional Certificate of Approval (CofA) A413209 (amended December 23, 2005). This site is approved for a 5.4 ha landfilling area within an 8.0 ha property. An additional 12.25 ha property was purchased in 2007 for use as a contaminant attenuation zone (CAZ). The site has historically received municipal solid waste dating back to the 1970s. The site ceased to receive wastes for a four-year period (2002-06), but is now being used as the Township's long-term centralized facility.

The CofA approves the landfilling of a total volume of 45,869 m^3 of waste within the "Stage 1" portion of the property. The maximum theoretical volume is 434,340 m^3 (not approved by the CofA).

The CofA specifies that a surface water monitoring program is to be developed to monitor surface water sources upstream and downstream of the site (within 12 months, i.e. by December 23, 2006). As noted by Mr. Cruikshank in his review of monitoring reports up to 2006, no surface water monitoring was conducted, because there was no flow at the time of sampling (which was done in the fall only). Therefore, prior to 2007, there are no historical surface water quality data.

Site Description

The Operations Report estimates that there is remaining capacity of 38,542 m^3 within Stage 1 of the landfill site. No estimate of the lifespan of Stage 1 was provided.

No description of the surface drainage features in the vicinity of the site was provided. Based on a review of topographic mapping available for the location, I noted a small watercourse located immediately to the north and northwest of the site. This watercourse, likely intermittent, drains in a northeasterly direction until it joins Broomes Creek, which outlets to the Ottawa River.

Based on the comments provided by Mr. Kinney, in which he notes that the primary pathway for leachate migration is horizontally north through a surficial sandy aquifer, it is apparent that there is potential for surface water impacts on this surface water feature. Mr. Kinney notes that this watercourse is located between BH-5 and BH-7, which are two of the more impacted groundwater monitors on site.

None of the maps provided show the location of this watercourse with respect to the landfilled area. I reiterate the request previously made by Mr. Cruikshank that the surface water feature(s) are shown on a site diagram in the next monitoring report, as well as the locations of any surface water sampling stations.

2007 WATER QUALITY MONITORING REPORTS (Jp2g)

Leachate Monitoring

Detailed review comments have been provided on groundwater monitoring results by Mr. Kinney. However, leachate characterization is an important part of determining potential surface water impacts. Mr. Kinney commented that elevated levels of manganese, 1.4-dischlorobenzene, DOC, hardness, nitrate, and TDS are occurring in the leachate wells (BH-5 and BH-12).

Surface Water Monitoring

According to the Jp2g report, the only surface water location sampled in 2007 (referred to as SW-1) was described as “along the drain to the north of the site”. This description of sample location is inadequate, as I cannot determine whether this is upstream, adjacent to, or downstream of the landfill area. In the next monitoring report, it is imperative that sampling locations are shown on a site plan.

This location was sampled on two occasions in 2007, August and October (according to the text, but not according to Table 1, which indicates SW-1 was sampled in June only). No analytical results for the surface water samples were provided in Appendix B, in contradiction of the report. As such, I cannot provide review comments on the results of this sampling. Jp2g notes that exceedances of the Provincial Water Quality Objectives (PWQOs) for copper in one sample (2 times greater than the PWQO), iron in both samples (5 times and 70 times the PWQO), and phenols (17 times the PWQO). These elevated concentrations could be a result of landfill leachate, however without knowledge of background concentrations in the watercourse, no conclusions can be made about impact.

Monitoring Program

The surface water monitoring program conducted for this site appears to be inadequate. Recommendations made by Mr. Cruikshank to sample a minimum of three times per year, including after the spring freshet, and two more times during the year during wet weather, were not followed in 2007.

The program described in Section 9.2 indicates that three surface water sampling stations are to be included. It is not clear from the description of the stations which of these would represent background conditions for the watercourse. Sampling station locations must be provided on a site plan, and ideally UTM coordinates provided.

In reviewing the proposed sampling frequency, my understanding is that four surface water sampling events will be sampled per year (two "regular", and two storm-event related events). This would be sufficient provided that there is flowing water at the stations during at least three of these events. By sampling after the spring freshet (late March to early May), as recommended by Mr. Cruikshank, this would increase the likelihood of encountering flowing water conditions in the first sample. At least two more samples during wet weather during the course of the year are required.

The proposed surface water parameter list is insufficient. Due to the lack of surface water data for this location, and the fact that this site is intended for long-term use by the municipality, and has the potential to become a large landfill site, a thorough characterization of surface water quality both upstream and downstream of the site is required. Therefore, I recommend that the parameter list include, as a minimum, the comprehensive list for surface water (Column 3 in Schedule 5 of the MOE Landfill Standards). Note that this list also includes field-measured temperature, pH, conductivity, dissolved oxygen, and flow. Once a sufficient database exists to properly characterize the surface water quality (8 to 10 samples), the parameter list may be reduced with Ministry approval. As elevated VOCs have been observed in the leachate, a VOC scan of surface water is recommended. This should be done on at least one sample per year, until such time as results indicate that it is no longer required.

Data analysis must include calculation of un-ionized ammonia based on field pH and temperature.

Once a sufficient dataset exists, classify the Policy status of the receiver by calculating summary statistics (e.g. averages and percentiles) of all parameters and comparing to PWQOs and Canadian Water Quality Guidelines (for nitrate and nitrite), compare downstream to upstream water quality using appropriate statistical testing methods, and analyze trends in key parameters with time using both graphical and/or statistical methods.

Triggers/Contingency Plan

No trigger mechanisms and contingency plans in the event of significant surface water impact from leachate from the Ross WDS have been provided to date. These should be developed for the site and provided to the Ministry for review. Proposed trigger parameters, levels, and contingency planning measures are required.

SUMMARY OF COMMENTS

- The site plan must be amended to include the surface watercourse in the vicinity of the site, and to show locations of all surface water sampling stations.

- A background (upstream) surface water station must be included.

- The surface water monitoring program frequency should be increased to a minimum of three times per year, during the spring melt period, and wet weather to avoid stagnant conditions if possible.

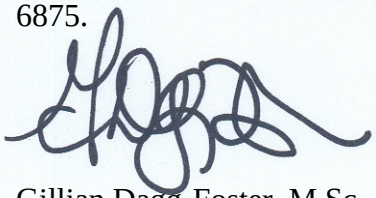
- Graphical and statistical analysis of the data should be conducted once a dataset of eight to 10 samples is available, which would include percentiles, statistical comparisons between downstream and upstream, and trends over time.

- All parameters listed in Column 3 (Comprehensive list) of Schedule 5 should be included. A VOC scan should be included on an annual basis for a minimum of three years.

- Trigger mechanisms and contingency plans must be developed for the site and provided to the Ministry for review.

- The data should be provided with the next report on a DVD to allow the reviewer to readily view and assess the data.

If you have any questions about these comments, please feel free to contact me at (613) 540-6875.



Gillian Dagg-Foster, M.Sc., P.Eng.
GDF/gl

c: S. Kinney
G. Faaren
File SW 05-04, Ross Waste Disposal Site, Township of Whitewater Region
File SW 13-01-02-01 Ottawa River Basin General (Upstream Ottawa)
GDF/IDS # 3550-7E6Q64

Kevin Mooder

From: Steven - Waste Management <shodson@whitewaterregion.ca>
Sent: Tuesday, November 03, 2009 12:22 PM
To: 'Larkin, Lance (ENE)'
Cc: 'Dean Sauriol'; 'Kevin Mooder'
Subject: RE: Ross Landfill Site Surface Water Comments A411902

Hello Lance,

I have reviewed the attached memo from Gillian Dagg-Foster. As I am the individual who personally "draws" the samples at our three Landfill Sites, I believe I can best comment and offer the following:

It is correct that until 2007, there had been no record of surface water samples at the Ross Site. Technical services offered by the Consulting Firm at the time saw well samples drawn during the Fall and resulted in the Technician being on-site two (2) days per year. Timing / circumstances seemed to never favour the locating and drawing of surface water within this "swale" to the North of the Site.

I began carrying out the sampling program in 2007. Being situated at Site each day, I have been fortunate enough to have located what I would best describe as nothing more than a large puddle within this Swale. The topography and geological characteristics of this Site would be best described as rolling hills of sand and gravel with periodic belts of clay within the overburden. As we excavated the Stage 1 trench we removed thousands of cubic meters of sand, some clay and course sand- gravel. There truly is no standing water within the approved landfilling are of this Site or immediately surrounding. Storm water percolates into the sand almost as fast as it falls. I will have to pull out a topographic map to locate Broomes Creek?

The "swale" so-to-speak to the North North-West is a rolling formation very prevalent to this geographic area. Its lowest area (just adjacent to the North-West corner of the landfill area) does, from time-to-time, during the Spring and Fall host some shallow standing water (few inches deep at best). I have been fortunate enough to grab some for sampling purposes.

I believe we are on track with Mr. Cruikshank and Mr Kinney's comments/suggestions, or at least moving towards a common goal of improving the Monitoring Program for the Ross Site. Surface Water has been drawn at this location by myself for the last three years. I am now sampling every Spring and Fall (just finished Ross last week). I have included VOC analysis in all Groundwater wells/boreholes as well as Surface Water Station #1 for 2009 and will be on-going for one sampling event per year. For example, VOC's analysis at the Ross Site was carried out at every borehole location as well as surface water station #1 in the Spring of 2009 and will be carried out again in the Spring of 2010. A Digital Photo Log of the Monitoring network for each Landfill site is currently being produced for inclusion in our annual reporting and/or made available to yourself.

Please note, I will be forwarding this memo to our Consulting Firm (Jp2G Consultants)for their review and comments. Specifically, trigger mechanisms and contingency plans, data inclusion for annual reporting.

Thank you for the correspondence and please feel free to contact me any time to discuss this matter.

Respectfully,

Steven Hodson, Landfill Operations Manager
Township of Whitewater Region

From: Larkin, Lance (ENE) [mailto:Lance.Larkin@ontario.ca]
Sent: November-02-09 1:54 PM
To: shodson@whitewaterregion.ca; Kevin Mooder
Cc: dsauriol@whitewaterregion.ca
Subject: Ross Landfill Site Surface Water Comments A411902
Importance: High

Dear Mr. Hodson,

This is in regards to comments received from the ministry's Technical Support Section pertaining to the Ross Waste Disposal Site "2007 Water Quality Monitoring Report" prepared by Jp2g.

I've attached a memorandum prepared by Gillian Dagg-Foster a reviewer from our Kingston Regional Office, dated October 26, 2009. Please review the attached and ensure that all seven of the recommendations listed under "Summary of Comments" are implemented as soon as practicable. The implementation of these seven recommendations should be itemized and discussed in your 2009 Annual Monitoring Report. If you encounter any problems with the voluntary implementation of these recommendations please contact me at the number below.

Please be advised that I have taken over for Marc-Etienne Lesieur who left the ministry in June 2009. If you need information or have any questions about environmental compliance please contact me at 613-521-3450, ext. 229.

Lance Larkin
Senior Environmental Officer
Ministry of the Environment
Ottawa District Office
2430 Don Reid Drive
Ottawa, ON K1H 1E1
tel: 613-521-3450 ext. 229
fax: 613-521-5437
toll free: 1-800-860-2195

_____ Information from ESET Smart Security, version of virus signature database 4568 (20091103)
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The message was checked by ESET Smart Security.

http://www.eset.com

Kevin Mooder

From: Kevin Mooder <kmooder@jp2g.com>
Sent: Friday, March 08, 2013 10:41 AM
To: Kevin Mooder
Subject: FW: Ross Waste Disposal Site Compliance
Attachments: image001.jpg

Importance: High

Kevin Mooder, MCIP, RPP
Jp2g Consultants Inc.
Engineers - Planners - Project Managers
1150 Morrison Drive, Suite 410
Ottawa, ON K2H 8S9
Tel: (613) 828-7800
Fax: (613) 828-2600

From: Larkin, Lance (ENE)
Sent: Thursday, November 10, 2011 3:41 PM
To: shodson@whitewaterregion.ca
Subject: Ross Waste Disposal Site Compliance

Dear Steven,

I trust Stage 1 at the Ross Waste Disposal Site is likely over capacity at this time. In a letter dated May 27, 2011, your consultant noted that Condition 38(a)(i) incorrectly cited 45,869 cubic metres as the remaining capacity in Stage 1. The consultant stated that 59,935 cubic metres was previously approved under the June 2001 Site Development and Operations Plan.

Until the Certificate of Approval is amended, the capacity specified in the approval still stands. The Town must submit an application for an approval of Stage II. Please call me next week to discuss.

Also an FYI that our surface water specialist is in the process of reviewing the 2010 annual report and noticed that no surface water samples were being obtained. This has prompted a follow inspection to be conducted in the near future following a rain event.

Regards,

Lance Larkin

Senior Environmental Officer
Ministry of the Environment, Ottawa District Office
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toll free: 1 800-860-219

Agent principal de l'environnement
Ministère de l'Environnement, District d'Ottawa
2430. promenade Don Reid, Ottawa (Ontario) K1H 1E1
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Ontario

M E M O R A N D U M

November 24, 2011

TO: Lance Larkin
Senior Environmental Officer
Ottawa District Office
Eastern Region

FROM: Gillian Dagg-Foster
Surface Water Specialist
Technical Support Section
Eastern Region

RE: 2010 Annual Operations Report
and
2010 Water Quality Monitoring Report
Ross Waste Disposal Site
Part Lot 10, Concession 5
Township of Whitewater Region
Certificate of Approval No. A413209

I have reviewed the above-noted reports prepared by the Township of Whitewater Region and Jp2g Consultants Inc., dated March, 2011. I previously provided comments on surface water issues with respect to this site on October 26, 2009. I have reviewed the most recent comments regarding hydrogeological issues, provided by Mr. S. Kinney on January 8, 2009. I also conducted a site visit on November 18, 2011.

The following memorandum outlines my comments with respect to surface water issues.

Background Information

The Ross Disposal Site (WDS) operates under provisional Certificate of Approval (CofA) A413209 (amended December 23, 2005). This site is approved for a 5.4 ha landfilling area within an 8.0 ha property. An additional 12.25 ha property was purchased in 2006, as well as an additional 18.5 ha property in 2009, for use as contaminant attenuation zones (CAZ). The site has historically received municipal solid waste dating back to the 1970s. The site ceased to receive wastes for a four-year period (2002-06), but is now being used as the Township's long-term centralized facility. Non-hazardous solid waste from both the residential and IC&I sectors within the Township are currently being accepted at the site.

According to Jp2g, the CofA (not provided) specifies that a surface water monitoring program is to include sampling during "two sampling events and after two storm events", implying four sampling events per year. Since sampling began in 2007, only two surface water sampling events have been conducted per year. In 2010, only one sampling event was conducted. No information was provided as to whether any of the sampling events were conducted during wet weather. Surface water is to be monitored upstream and downstream of the site.

Site Description

The Operations Report estimates that there is 43,655 m^3 of remaining capacity within Stage 1 of the landfill site. This is more than 5,000 m^3 greater than the estimate provided in the 2007 report. Further explanation of the increase in capacity is requested. No estimate of the lifespan of Stage 1 was provided, nor any information on the total capacity of the site.

No description of the surface drainage features in the vicinity of the site was provided. Based on a review of topographic mapping and aerial photographs available for the location, as well as observations during the site visit, I noted a small watercourse located immediately to the north and northwest of the site. This watercourse (intermittent) drains in a northeasterly direction until it joins Broomes Creek, approximately 8 km downstream. Broomes Creek continues for another 4 km in an easterly direction, until it outlets to the Ottawa River.

During the site visit, conducted after an extended period of dry weather, there was no water observed in the watercourse to the west (upstream) of the site, although there is a culvert at the Mine View Road crossing 500 m west of the WDS, indicating that at certain times of the year, water does flow in this watercourse. There was also no water observed in the low-lying area north of the site. There was water in the downstream watercourse, as it passed through a culvert located 700 m northeast of the WDS at Kohlsmith Road.

Based on the comments provided by Mr. Kinney, in which he notes that the primary pathway for leachate migration is horizontally north through a surficial sandy aquifer, it is apparent that there is potential for impacts on this surface water feature. Mr. Kinney notes that this watercourse is located between BH-5 and BH-7, which are two of the more impacted groundwater monitors on site.

None of the maps provided show the location of this watercourse (visible on imagery available from Google Earth, as well as observed during the site visit) with respect to the landfilled area. Surface water feature(s) should be shown on a site diagram in the next monitoring report.

2010 WATER QUALITY MONITORING REPORT (Jp2g)

Leachate Monitoring

There is one monitoring well constructed within the waste footprint at the site (BH-12). Water quality at this well is considered to be representative of leachate quality at the Ross WDS. Based

on the data from this well, leachate indicator parameters have been identified as manganese, nitrate, organic nitrogen, total dissolved solids (TDS), alkalinity, boron, conductivity, calcium, hardness, sodium, and strontium.

Groundwater quality should be compared to Provincial Water Quality Objectives (PWQOs) at monitoring wells (e.g. BH-5, BH-6, BH-7) located nearest to the watercourse on the north side of the site, where groundwater likely discharges to surface water. PWQO exceedances at these wells can serve as an early warning for potential water quality impacts to the stream.

Surface Water Monitoring

Only one surface water location has been sampled since 2007 (referred to as SW-1). This is located in a ponded area north of the site. The sampling program is supposed to include three stations (SW-1, as well as SW-2 and SW-3, upstream and downstream of the site). No sampling has been conducted at either of the other stations, and Jp2g indicates that they "do not exist". In reviewing the aerial photography available for the area, and based on the November 18, 2011 site visit, I note that a watercourse is evident both upstream and downstream of the WDS. While this watercourse is intermittently dry upstream of the site, there is expected to be flow during the spring freshet, and during and after rainfall events.

I recommend that all attempts are made to collect both upstream and downstream samples, during the spring freshet (late March to April), and again during wet weather in the late fall. Sampling locations should be located at the Mine View Road crossing upstream of the site, and the Blind Line or Kohlsmith Road culverts downstream of the site.

SW-1 was sampled on two occasions in each of 2007, 2008, and 2009, and on one occasion in 2010 (May). Results were provided in Appendix D.

According to the tabulated results, the PWQO for un-ionized ammonia has been exceeded in all but one sample (0.13 to 0.97 mg/L, significantly exceeding 0.02 mg/L). The highest levels exceed the level generally considered acutely toxic (0.1 mg/L). It is not clear how un-ionized ammonia was calculated in the earlier samples, in the absence of any temperature or pH measurements prior to 2009. Only the 2010 sampling included field-measured temperature and pH.

Since both field pH and temperature are essential for determining the un-ionized component of the total ammonia for comparison to the PWQO, subsequent sampling events must include pH and temperature. Field-measured conductivity and dissolved oxygen (DO) should be included as well.

The PWQO for total phosphorus has been exceeded in all three samples collected for this parameter (0.13 to 0.78 mg/L, exceeding 0.03 mg/L). The PWQO for phenols has been exceeded in two samples (0.017 and 0.013 mg/L, exceeding 0.005 mg/L).

The PWQO for iron has been exceeded in all samples (0.96 to 21.8 mg/L, significantly exceeding 0.3 mg/L). The PWQO for copper was exceeded in one sample (0.011 mg/L, exceeding 0.005 mg/L).

These elevated concentrations could be a result of landfill leachate, however without knowledge of background concentrations in the watercourse, no conclusions can be made about impact.

Monitoring Program

Jp2g recommends that surface water monitoring be removed from the program. I do not agree with this recommendation. Furthermore, I recommend that all attempts are made to sample at three locations (upstream, adjacent, and downstream of the site). In order to ensure flowing water conditions, sampling should be done during or immediately after the spring freshet, and at least one more time during the year during wet weather. This recommendation was made previously, and has not yet been implemented.

Once sampling of upstream and downstream locations has begun, I recommend that, due to the lack of data, the parameter list include, as a minimum, the comprehensive list for surface water (Column 3 in Schedule 5 of the MOE Landfill Standards). Note that this list also includes field-measured temperature, pH, conductivity, DO, and flow. Once a sufficient database exists to properly characterize the surface water quality (8 to 10 samples), the parameter list may be reduced with MOE approval. As elevated VOCs have been observed in the leachate, a VOC scan of surface water is recommended. This should be done on at least one sample per year, until such time as results indicate that it is no longer required.

Triggers/Contingency Plan

No trigger mechanisms and contingency plans in the event of significant surface water impact from leachate from the Ross WDS have been provided to date. Once the background surface water quality has been adequately characterized, these should be developed for the site and provided to the MOE for review.

SUMMARY OF COMMENTS

- The site plan must be amended to include the surface watercourse in the vicinity of the site, and to show locations of all surface water sampling stations. UTM coordinates of sampling locations should be provided.

- All attempts should be made to collect both upstream and downstream samples, during the spring freshet (late March to April), and again during wet weather in the late fall.

- Potentially toxic levels of un-ionized ammonia have been observed at SW-1.

- Since both field pH and temperature are essential for determining the un-ionized component of the total ammonia, for comparison to the PWQO, subsequent sampling events must include pH and temperature. Field-measured conductivity and DO should be included as well.

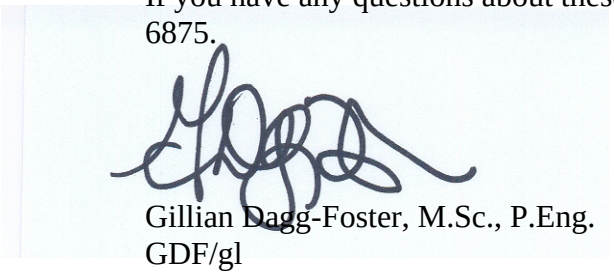
- Elevated concentrations of ammonia, phenols, iron, and copper at SW-1 could be a result of landfill leachate, however without knowledge of background concentrations in the watercourse, no conclusions can be made about impact.

- Surface water monitoring should not be removed from the monitoring program at the Ross WDS.

- All parameters listed in Column 3 (Comprehensive list) of Schedule 5 should be included. A VOC scan should be included on an annual basis for a minimum of three years.

- Once background surface water quality has been adequately characterized, trigger mechanisms and contingency plans should be developed for the site and provided to the Ministry for review.

If you have any questions about these comments, please feel free to contact me at (613) 540-6875.



Gillian Dagg-Foster, M.Sc., P.Eng.
GDF/gl

ec: P. Taylor
T. MacDonald

c: S. Kinney
File SW RE WH KO 03 06 Ross WDS
File SW 07 02 13-01-02-01 Ottawa River Basin General (Upstream Ottawa), Broomes Creek
GDF/IDS # 7427-8GHKMU

Jp2g Consultants Inc.
ENGINEERS ■ PLANNERS ■ PROJECT MANAGERS

J.M. Janota, P.Eng., M.Sc.
J.E. Hunton, MCIP, RPP

March 30, 2012

Ministry of the Environment
Ottawa District Office
2430 Don Reid Drive
Ottawa, ON K1H 1E1

Attention: Mr. Lance Larkin
Sr. Environmental Officer

Re: Ross Landfill Site
Certificate No. A413209
Township of Whitewater Region
Our Project No. 2006047M

Dear Lance:

Please find enclosed one (1) bound copy of the 2011 Annual Report, which includes a CD containing the report and excel spreadsheet of the compiled chemistry.

In reference to the recent TSS surface water review comments (November 24, 2011) on the 2010 Annual Report, and the lack of snow cover we conducted a photographic survey of the 'watercoarse' as defined by Gillian Dogg-Foster. I trust our findings and recommendations address her concerns.

In regards to the application for an Amendment To Environmental Compliance Approval, we are undertaking the necessary tasks to compile the supporting documentation for an early 2012 submission.

We trust this is satisfactory, and would be pleased to receive a more recent TSS groundwater review comments, the last review was conducted on the 2007 Annual Report.

Yours very truly,
Jp2g Consultants Inc.
Engineers • Planners • Project Managers

Kevin Mooder, MCIP, RPP
Project Manager

KJM/jlp

Encl.

c.c. Steven Hodson

Ministry of the Environment

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Ontario

M E M O R A N D U M 07 March 2013

TO: Emily Tieu
Senior Environmental Officer
Ottawa District Office
Eastern Region

FROM: Shawn Kinney
Hydrogeologist
Water Resources Unit
Technical Support Section
Eastern Region

RE: 2011 Annual Monitoring Report, Ross Waste Disposal Site A413209
Part Lot 10 Concession 5, Geographic Township of Ross
Township of Whitewater Region

I have reviewed the hydrogeologic aspects of the document entitled:

- "*Ross Landfill Site, Township of Whitewater Region, Certificate of Approval #A413209, 2011 Annual Report,* " Jp2g Consultants Inc., March 2012.

Part 2 of the document includes the 2011 Monitoring Report entitled:

- "*Ross Landfill Site, Township of Whitewater Region, Certificate No. A413209, 2011 Water Quality Monitoring Report*" Jp2g Consultants Inc. March 2012.

Based upon the information provided, I submit the following comments for your consideration.

Summary

1. I am unable to verify Guideline B-7 compliance given the limitations of the existing groundwater monitoring well network.

2. The horizontal extent of the leachate plume has migrated beyond the existing monitoring well network. Additional monitoring wells are required.

3. The primary pathway for migration of leachate is horizontally northward through the surficial sandy aquifer from the fill area and beyond monitor BH 13. The migration rate may be on the order of 10's of metres per year.

4. The potential exists for surface water impacts to occur to an un-named surface water feature located immediately to the north of the fill area.

5. The most recently proposed groundwater monitoring program will be satisfactory with the addition of the above-noted monitoring wells.

Certificate of Approval

The Ross Waste Disposal Site operates under Amended Certificate of Approval A413209. The site is licensed for the use and operation of a 5.4 hectare landfill site within a total site area of 8 hectares.

The site is licensed to receive solid, non-hazardous municipal waste. Additional wastes such as tires, scrap metal, etc., can be received, stored and processed at the site for off-site transfer for the purpose of recycling and waste diversion. The trench disposal method is used. The landfill operates as a naturally attenuating site.

Geology

Overburden

- Sand: up to 17 metres thick
- Silty clay: avg. 1.4 metre thick layer 3 to 7 metres below grade, eastern half of site.
- Till: 12 metres below ground surface

Ontario Geological Survey map P2366 depicts the fill area as situated upon shallow marine sand and silt deposits. The map depicts deeper marine clay, silty clay, and clayey silt deposits to the north and east of the site.

Bedrock

- Undifferentiated metamorphic and igneous rock. (ref Geological Survey map P2730)
- Auger refusal depths which may indicate top of bedrock ranged from 8 to 18 metres below ground surface.

Hydrogeologic Conditions

Hydraulic Conductivity

A total of 23 rising head hydraulic conductivity tests were performed at the site since 1990. Tests were conducted on all boreholes except BH-12. A previous consultant (Golder Associates) reported that rapid water level in 15 tests at 9 monitors. Golder derived a hydraulic conductivity value based upon grain size analysis of:

- 1×10^{-4} $m^3/m^2/s$.

This conforms to the mid-range of typical values for clean sand.

Horizontal Hydraulic Gradient

Table 1, page 9 of the report presents water level data acquired during May and November 2011. Report Figure 3 depicts the spatial distribution of the measurement points. I note the following horizontal hydraulic gradient:

- 0.002 m/m south to north. This is a relatively shallow hydraulic gradient.

Vertical Gradient

- Vertical gradients were upward over most of the site.

Groundwater Flow Direction

- The horizontal groundwater flow direction was northward away from Kohlsmith Road and toward the northern most monitor designated as BH 13.

- Darcy's Law predicts a horizontal groundwater flow velocity on the order of 10's of metres per year.

Hydrogeologic Units

The dominant hydrogeologic unit is the sand and silty-sand aquifer observed within the 17 metre depth of investigation. A discontinuous silty clay feature located beneath the eastern half of the site may curtail vertical groundwater flow in this area.

Conceptual Model

The primary pathway for migration of leachate is horizontally northward through the surficial sandy aquifer from the fill area towards monitor BH 13.

Background Water Quality

Monitor BH-8 is located 100 metres southeast of the fill area and consistently yields samples having relatively low concentrations of Total Dissolved Solids.

Report Appendix G presents the results of laboratory analyses of water samples collected from this monitor between December 1990 and November 2011. I have compared the median water quality data to the provincial drinking water criteria. Water quality conformed to the drinking water criteria for all measured parameters with the exception of the following:

Parameter	ODWS/O (mg/l)	BH-8 Conc. (mg/l)	Excess Factor
Hardness	100	176	2x

Leachate Water Quality

Monitor BH-5 is located at the western toe of the historical fill area and approximately 50 metres north, or downgradient of landfill Stage 1. Water quality data for this monitor is provided in Appendix G of the monitoring report. Water samples from this monitor had the highest concentrations of total dissolved solids during the 2011 monitoring year.

Site Specific Leachate Tracer Parameters

I have compared the median groundwater quality observed at background monitor BH-8 to the analytical results of water samples obtained from monitor BH-5 during 2011. The following water quality parameters were elevated by at least an order of magnitude at leachate monitor BH-5 relative to background monitor BH8.

Parameter	Maximum 2011 Leachate BH-5 (mg/l)	Median Background BH-8 (mg/l)	Leachate : Background Ratio
Ammonia	17.9	<0.02	895:1
Manganese	4.93	<0.01	493:1
TKN	17.9	<0.10	179:1
Boron	0.81	<0.01	81:1
Iron	1.24	<0.03	41:1
Potassium	21	1	21:1
Organic Nitrogen	1.7	<0.10	17:1
Dissolved Organic Carbon	11.4	0.8	14:1
Barium	0.39	0.03	13:1

I conclude that these above-listed parameters are promising tracers of leachate impacts in groundwater at this site.

Contaminants of Concern: Drinking Water Quality

I have compared the year 2011 maximum concentrations of water quality parameters measured in BH-5 samples to the Ontario Drinking Water Standards and Objectives (ODWS/O). I note the following leachate contaminants of concern for drinking water quality.

Parameter	ODWS/O (mg/l)	2011 Maximum Leachate Conc. (mg/l)	Excess Factor
Manganese	0.05	5.93	99 x
Organic Nitrogen	0.15	1.7	11 x
1,4-Dichlorobenzene	0.001	0.006	6 x
Iron	0.3	1.24	4 x
Hardness	176 (background)	666	4 x
Dissolved Organic Carbon	5	11.4	2 x
Total Dissolved Solids	500	942	2 x
Alkalinity	500	770	2 x

Contaminants of Concern: Surface Water Quality

I have compared the year 2011 maximum concentrations of water quality parameters measured in BH-5 samples to the Provincial Water Quality Objective (PWQO's). I note the following leachate contaminants of concern for drinking water quality.

Parameter	PWQO (mg/l)	2011 Maximum Leachate Conc. (mg/l)	Excess Factor
Ammonia	0.02 (un-ionized)	17.9 (total)	pH/temp variable
Boron	0.2	0.81	4 x
Iron	0.3	1.24	4 x
Copper	0.005	0.009	2 x
1,4-Dichlorobenzene	0.004	0.006	2 x

I defer to the opinions of the Regional Surface Water Scientist regarding the implications of this.

Downgradient Water Quality

Report Figure 3 depicts monitoring wells BH-13A and BH-13B as being the farthest downgradient monitors. These wells are located approximately 275 metres downgradient of the fill area.

I have compared the quality of the most recent water samples obtained from these monitors to the site specific leachate indicator parameters listed above. I note that the following leachate tracer parameters are elevated relative to background concentrations at BH-8:

Leachate Tracer Parameter	BH-13A (mg/l)	BH-13A: BH-8	BH-13B (mg/l)	BH-13B: BH-8
Boron	0.02	2:1	0.02	2:1
Iron	0.12	4:1	0.42	14:1
Potassium	2	2:1	<1	1:1
Dissolved Organic Carbon	1.2	2:1	1.4	2:1
Barium	0.07	2:1	0.02	1:1

This suggests mild leachate impacts existed at monitors BH-13A and BH-13B during the 2011 monitoring year.

GW/SW Interaction

Ontario Base Map 10 18 3550 50550 depicts an un-named surface water feature located immediately north-west of the fill area. This feature is positioned between two of the more impacted groundwater monitors on the site, BH-5 and BH-7. The potential exists for impacts to this receiver. This issue is discussed by the Surface Water Scientist under separate cover.

Guideline B-7

The Ross landfill site operates under a Certificate of Approval. Condition 71 of amended Certificate of Approval A413209 mandates compliance with Reasonable Use Guideline B-7 within the boundaries of the Contaminant Attenuation Zone, or CAZ.

I have compared groundwater quality at monitors BH-13A and BH-13B to site-specific Guideline B-7 water quality criteria calculated for the leachate contaminants of concern. I note the following excess concentrations:

Parameter	ODWS/O (mg/l)	Background Median BH-8 (mg/l)	B-7 Criterion (mg/l)	BH-13A (mg/l)	BH-13B (mg/l)
Hardness	100	176	176	**290**	**226**
TDS	500	236	368	**374**	289

Concentrations of hardness and TDS at the BH-13 location exceed the site specific B-7 criteria.

This monitoring location is located approximately 100 metres south of the existing Contaminant Attenuation Zone (CAZ) boundary. No monitoring wells exist beyond BH-13 at this time. I am unable to confirm that the site complies with Reasonable Use Guideline B-7.

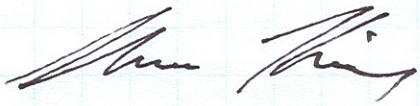
The groundwater monitoring network must be expanded downgradient (northward) of monitor BH-13 to conclusively verify the state of B-7 compliance at the northern limit of the CAZ.

Groundwater Monitoring Program and Reporting

Section 10.0, page 45 and Table 1, page 47 of the Water Quality Monitoring Report describes the proposed groundwater monitoring and reporting program. I note the following:

- The proposed spring and summer/fall sampling frequency is satisfactory.
- The proposed groundwater monitoring locations listed in Table 21 are satisfactory.
- The consultant proposes installation of additional groundwater monitoring wells north of the existing monitoring network if increasing chemical trends are noted. I disagree. The existing monitoring well network currently does not verify B-7 compliance. This should be addressed at this time. I had recommended the addition of additional monitoring wells in an earlier review memo addressed to Mr. Marc Etienne-Lesieur and dated 8 January 2009. I maintain this recommendation.
- Table 21, page 47 proposes water quality analyses which conform to Landfill Standards Guideline Schedule 5, Column 1 during the spring sampling event and Schedule 5, Column 2 during the summer/fall sampling event. This is satisfactory.
- The proposal to measure water levels at each well prior to sampling is satisfactory.

- I do not object to the addition of other analytical parameters by the certificate holder.



Shawn Kinney, P.Geo
SK/gl

c: Beth Gilbert (Surface Water Unit)
GW RE WH 01-02 Ross Landfill Site A413209, Lot 10, Con 5 Fmr. Ross Township
SK #4804-8V6S2D

ec: Gillian Dagg-Foster (Water Resources Unit)
Peter Taylor (Technical Support Section)
Tara MacDonald (Ottawa District Office)

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Ontario

M E M O R A N D U M

March 12, 2013

TO: Emily Tieu
Senior Environmental Officer
Ottawa District Office
Eastern Region

FROM: Beth Gilbert
Surface Water Specialist
Technical Support Section
Eastern Region

RE: 2011 Annual Operations Report
and
2011 Water Quality Monitoring Report
Ross Waste Disposal Site
Part Lot 10, Concession 5
Township of Whitewater Region
Certificate of Approval No. A413209

I have reviewed the above-noted reports prepared by the Township of Whitewater Region and Jp2g Consultants Inc., dated March, 2012. Gillian Dagg-Foster previously provided comments to you on surface water issues with respect to this site on November 24, 2011. I have reviewed the most recent comments regarding hydrogeological issues, provided by Mr. S. Kinney on March 7th, 2013.

The following memorandum outlines my comments with respect to surface water issues only.

Background Information

The Ross Disposal Site (WDS) operates under provisional Certificate of Approval (CofA) A413209 (amended December 23, 2005). This site is approved for a 5.4 ha land filling area within an 8.0 ha property. An additional 12.25 ha property was purchased in 2006, as well as an additional 18.5 ha property in 2009, for use as contaminant attenuation zones (CAZ). The site has historically received municipal solid waste dating back to the 1970s. The site ceased to receive wastes for a four-year period (2002-06), but is now being used as the Township's long-term centralized facility.

Condition 72 of the CofA specifies that a surface water monitoring program should be developed to monitor surface water upstream and downstream of the site. The 2011 monitoring program is based on the 2006 Golder Associates Limited report to satisfy condition 72 and includes sampling during “two sampling events and after two storm events”, implying four sampling events per year. In 2011, three sampling campaigns were conducted: one during spring freshet and one following a storm event in July; however, on the November occasion a sample was not collected due to dry conditions. To date, only one location (SW-1) adjacent to the site has been monitored.

Site Description

Photographs and a description of the small unnamed intermittent watercourse to the north and northwest of the site have been provided. Photographs taken in March 2012 indicate there was no water in the watercourse to the west (upstream) of the site, which conveys flow from agricultural fields toward a culvert at Mine View Road. The culvert at the Mine View Road crossing (500 m west of the WDS) indicates that at certain times of the year, water does flow in this watercourse. From Mine View Road to the north east, the photographs indicate there is not a defined channel; but rather, a low lying intermittent swale which continues in a north easterly direction across farm fields toward the site. The swale ends prior to reaching the northwest corner of the landfill. At this point, the intermittent watercourse consists of a ponded area within a ‘draw’ (i.e. ravine/gully) within the woodlot to the north of the site. Further north and east of the site, a defined channel emerges and flows toward the municipal ditch on the east side of the Blind Line road allowance where it continues south to cross Kohlsmith Road. The watercourse eventually drains in a north-easterly direction until it joins Broomes Creek, approximately 8 km downstream. Broomes Creek continues for another 4 km in an easterly direction, until it outlets to the Ottawa River.

Comments provided by Mr. Kinney indicate that the primary pathway for leachate migration is horizontally northward through a surficial sandy aquifer. Mr. Kinney notes that this watercourse is located between BH-5 and BH-7, which are two of the more impacted groundwater monitors on site and that there is potential for impacts on this surface water feature.

2011 WATER QUALITY MONITORING REPORT (Jp2g)

Leachate Monitoring

Mr. Kinney noted that ammonia, manganese, TKN, boron, iron, potassium, organic nitrogen, DOC, and barium are elevated at leachate monitor BH-5 relative to background monitor BH-8. Mr. Kinney also noted that (total) ammonia, boron, iron, copper, and 1,4- Dichlorobenzene are above the PWQO.

In Appendix G, Jp2g compared groundwater quality to Provincial Water Quality Objectives (PWQOs) at monitoring wells to serve as an early warning for potential water quality impacts to the stream. I recommend that Canadian Water Quality Guidelines (CWQGs) are also consulted, for parameters that do not have PWQOs (e.g. nitrate, nitrite, chloride). CWQGs for nitrate, nitrite, and chloride are 2.9 mg/L (NO_3-N) and 0.06 mg/L (NO_2-N), and 120 mg/L, respectively. The recently updated CWQG should be used for boron (1.5 mg/L) instead of the PWQO, as it is based on more up-to-date aquatic toxicological data. Additionally, in the absence of either a PWQO or a CWQG for sulphate, the draft British Columbia guidelines (65 mg/L long-term average, 250 mg/L maximum) may be consulted for assessing impact.

Surface Water Monitoring

One surface water location (SW-1), located in a ponded area north of the site, was sampled on two occasions, once in May and once in July, following a storm event. A third attempt was made in November; however, the site was dry. Since sampling began in 2007 at SW-1, only two surface water sampling events have been conducted per year. Sample results from 2007-2011 were provided in Appendix D.

The sampling program is supposed to include three stations (SW-1, as well as SW-2 and SW-3, upstream and downstream of the site). Jp2g indicates that two new surface water stations will be established following the recommendations of the previous surface water reviewer.

For the 2011 monitoring year, the PWQO for un-ionized ammonia was not exceeded, as it had been in past years (0.13 to 0.97 mg/L, significantly exceeding 0.02 mg/L). Using field pH and temperature, the calculated un-ionized ammonia value should be presented as a numerical value in the surface water data appendix, rather than a censored value (< 0.02 mg/L).

The PWQO for iron was exceeded on one occasion in 2011 (0.9 mg/L, slightly exceeding 0.3 mg/L). The PWQO for iron has been exceeded in eight of nine samples since August 2007 (0.96 to 21.8 mg/L, significantly exceeding 0.3 mg/L). Iron concentrations have generally decreased from the maximum recorded value of 21.8 mg/L in November 2007.

The PWQO for total phosphorus was exceeded on one occasion in 2011 (0.22 mg/L, exceeding 0.03 mg/L) by an order of magnitude. Four out of five sampling events since 2009 have resulted in exceedances of the PWQO.

In 2011, boron concentrations were below the CWQG (1.5 mg/L) and the PWQO (0.2 mg/L) and have not exceeded these guidelines in past monitoring events.

Copper concentrations were below PWQO in May 2011; however, the method detection limit exceeded the PWQO for the July sample, making an assessment of impact not possible. During the July sampling event, many metals in addition to copper (i.e. cadmium, chromium, lead, and zinc) were reported as censored values (i.e. less than values) which were greater than PWQO. Method detection limits should be less than relevant PWQOs or CWQGs. On one previous occasion, copper exceeded the PWQO (0.011 mg/L, exceeding 0.005 mg/L).

Although the PWQO has been exceeded for phenols in the past (0.017 and 0.013 mg/L, exceeding 0.005 mg/L), no exceedances were noted in 2011.

The PWQO exceedances for iron and phosphorus observed during the 2011 monitoring year and the elevated concentrations of ammonia, copper, and phenols in previous monitoring years could be a result of landfill leachate; however, without knowledge of background (i.e. upstream) concentrations in the watercourse, no conclusions can be made about impact.

Monitoring Program

Jp2g recommends that in addition to continued monitoring at SW-1 (adjacent to the site), two new stations will be established, upstream and downstream of the site. The upstream stations will be established at the Mine View Road culvert and the downstream station will be at the culvert which crosses an unopened road allowance (Blind Line) between Concession 5 and 6. These locations are acceptable. The next annual monitoring report should include UTMs for all surface water monitoring stations. Jp2g recommends spring and fall sampling at all surface water locations and two additional samples after any two storm events. This is acceptable and reflects recommendations provided by GAL in their 2006 report.

I recommend that, due to the lack of data, the parameter list include, as a minimum, the comprehensive list for surface water (Column 3 in Schedule 5 of the MOE Landfill Standards) for all sampling events. Jp2g proposed a reduction to Column 4, Schedule 5 parameters during the summer/fall events; however, I disagree with this reduced list as there is limited data available for this site. Note that the Column 3 list also includes field-measured temperature, pH, conductivity, DO, and flow. Hardness should be included in the parameter list in order to evaluate PWQOs.

Once a sufficient database exists to properly characterize the surface water quality (8 to 10 samples), the parameter list may be reduced with MOE approval. As elevated VOCs have been observed in the leachate, a VOC scan of surface water is recommended. This should be done on at least one sample per year, until such time as results indicate that it is no longer required.

Triggers/Contingency Plan

No trigger mechanisms and contingency plans in the event of significant surface water impact from leachate from the Ross WDS have been provided to date. Once the background surface water quality has been adequately characterized, these should be developed for the site and provided to the MOE for review.

SUMMARY OF COMMENTS

- The site plan must be amended to include the surface watercourse in the vicinity of the site, and to show locations of all surface water sampling stations. UTM coordinates of sampling locations should be provided.

- The surface water monitoring locations and frequency as proposed are acceptable and includes sampling at upstream, adjacent (SW-1), and downstream locations during two regular sampling events in the spring and fall, in addition to two events subsequent to storm events. The new locations upstream (Mine View Road culvert) and downstream (culvert which crosses the unopened road allowance [Blind Line] between Concession 5 and 6) are acceptable.

- All parameters listed in Column 3 (Comprehensive list) of Schedule 5 should be analyzed for all sampling events. Method detection limits should be less than relevant PWQOs or CWQGs. Hardness should be included in the parameter list in order to evaluate PWQOs. A VOC scan should be included on an annual basis for a minimum of three years, as elevated VOCs have been observed in the leachate.

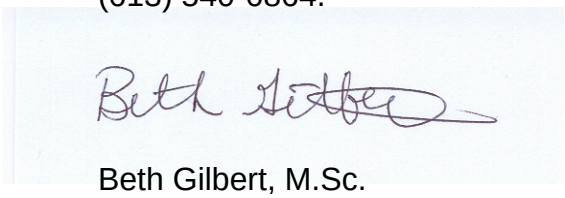
- Potentially toxic levels of un-ionized ammonia have been observed at SW-1.

- Elevated concentrations of ammonia, phosphorus, phenols, iron, and copper observed at SW-1 could be a result of landfill leachate, however without knowledge of background concentrations in the watercourse, no conclusions can be made about impact.

- The calculated un-ionized ammonia value should be presented as a numerical value in Appendix G, rather than a censored value (i.e. < 0.02 mg/L), using the field pH and temperature.

- Once background surface water quality has been adequately characterized (minimum of 8-10 data points), trigger mechanisms and contingency plans should be developed for the site and provided to the Ministry for review.

If you have any questions about these comments, please feel free to contact me at (613) 540-6864.



Beth Gilbert, M.Sc.
BG/gl

ec: G. Dagg-Foster
P. Taylor
T. MacDonald

c: S. Kinney
File SW RE WH KO 03 06 Ross WDS
File SW 07 02 13-01-02-01 Ottawa River Basin General (Upstream Ottawa), Broomes Creek
BG/IDS # 3880-8V6S3Q

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Ontario

M E M O R A N D U M

12 June 2013

TO: Emily Tieu
Senior Environmental Officer
Ottawa District Office
Eastern Region

FROM: Shawn Kinney
Hydrogeologist
Water Resources Unit
Technical Support Section
Eastern Region

RE: Design and Operations Report and 2012 Annual Monitoring Report, Ross Waste Disposal Site, A413209, Part Lot 10, Concession 5, Geographic Township of Ross, Township of Whitewater Region.

I have reviewed the hydrogeologic aspects of the documents entitled:

- *"Ross Landfill Site, Township of Whitewater Region, ECA No. A413209, 2012 Annual Report"* Jp2g Consultants Inc., March 2013.

  Part 2 of the document includes a report entitled:

  - *'Ross Landfill Site, Township of Whitewater Region, ECA No. A413209, 2012 Water Quality Monitoring Report"* Jp2g Consultants Inc., March 2013.

- "*Design and Operations Report, Ross Waste Disposal Site*" Jp2g Consultants Inc., February 2013.

- "*Ross Landfill Site, Township of Whitewater Region, ECA No. A413209, Environmental Monitoring Report*" Jp2g Consultants Inc., February 2013.

I also visited the site on April 24th, 2013. Based upon the information provided, I submit the following comments for your consideration.

Summary

1. I am unable to verify Guideline B-7 compliance given the limitations of the existing groundwater monitoring well network.

2. The horizontal extent of the leachate plume has migrated beyond the existing monitoring well network. Additional monitoring wells are required.

3. The primary pathway for migration of leachate is horizontally northward through the surficial sandy aquifer from the fill area and beyond monitor BH-13. The migration rate may be on the order of 10's of metres per year.

4. The potential exists for impacts to occur to surface water located within the Contaminant Attenuation Zone (CAZ) north of the fill area.

5. The most recently proposed groundwater monitoring program will be satisfactory with the addition of the above-noted monitoring wells.

6. Future site maps and figures should clearly depict the surface topography of the CAZ.

7. Methane concentrations were measured at 100% of the lower explosive limit at BH-1. The nearest enclosed structure to BH-1 is the Attendant's Office. An air quality expert should be consulted regarding the implications of this.

8. The existing CAZ size may be inadequate over the long-term. A low-permeability final cover might be required during site closure.

PART 1: ANNUAL COMPLIANCE MONITORING

Certificate of Approval

The Ross waste disposal site operates under Amended Certificate of Approval A413209. The site is licensed for the operation of a 5.4 hectare landfill. The total site area is 8 hectares.

The existing site is licensed to receive solid, non-hazardous municipal waste. Additional wastes such as tires, scrap metal, etc. can be received. These wastes are transferred off-site for recycling and waste diversion purposes. The trench disposal method is used. The landfill operates as a naturally attenuating site.

The existing Stage 1 of the landfill has reached capacity. The owners are applying for approval to deposit waste in landfill Stage 2.

Geology

Overburden

- Sand: up to 17 metres thick (Well Record A050847)
- Silty clay: avg. 1.4 metre thick layer 3 to 7 metres below grade, eastern half of site
- Till: 12 metres below ground surface

Ontario Geological Survey map P2366 depicts the fill area overlying shallow marine sand and silt. The map depicts deeper marine clay, silty clay and clayey silt deposits to the north and east of the site.

The ground surface north of the fill area is undulating. Multiple depressions exist without obvious surface outlets. These depressions appear capable of retaining precipitation, particularly snowmelt. The depressions may function as localized fresh water infiltration galleries. This may explain abrupt groundwater chemistry changes observed at some monitoring wells.

The CAZ topography cannot be inferred from the provided site diagrams. Future site maps and figures should clearly depict the surface topography of the CAZ.

Bedrock

Bedrock consists of undifferentiated metamorphic and igneous rock (ref. Geological Survey map P2730).

Hydrogeologic Conditions

Hydraulic Conductivity

Twenty three rising head hydraulic conductivity tests were performed on-site. Tests were conducted on all boreholes except BH-12. Golder Associates reported rapid water level recovery in 15 tests at 9 monitors. Golder derived a hydraulic conductivity value based upon grain size analysis of:

- 1×10^{-4} $m^3/m^2/s$.

This conforms to the mid-range of typical values for clean sand.

Horizontal Hydraulic Gradient

Table 1, page 9 of the 2012 Water Quality Monitoring Report provides groundwater level data for May and October 2012. I have compared water levels at BH-1 and BH-13. I note the following gradient:

- 0.004 m/m south to north.

This is a relatively shallow hydraulic gradient indicating low resistance to flow.

Vertical Gradient

Vertical gradients were upward over most of the site. Downward gradients existed north of the fill area at BH-7 and BH-14.

Groundwater Flow Direction

The horizontal groundwater flow direction was northward away from Kohlsmith Road. Flow is toward the northernmost monitor designated as BH-13. Darcy's Law predicts a groundwater flow velocity on the order of 10's of metres per year.

Hydrogeologic Units

The dominant hydrogeologic unit is the sand and silty-sand aquifer. A discontinuous silty clay layer exists beneath the eastern half of the site. This layer may curtail downward groundwater flow in this area.

Conceptual Model

The primary pathway for migration of leachate is horizontally northward. Groundwater flows through the surficial sandy aquifer from the fill area. Groundwater flows towards monitor BH-13.

Natural depressions located north of the fill area may affect groundwater chemistry. These depressions may act as infiltration galleries for spring snowmelt. This might cause temporary freshening of groundwater observed at some monitoring wells.

Background Water Quality

Monitor BH-8 is located 100 metres southeast of the fill area. It consistently yields samples having low concentrations of Total Dissolved Solids. It represents background groundwater quality monitor for this site.

I compared median BH-8 water quality values to the provincial drinking water criteria. Water quality conformed to drinking water criteria with the exception of the following:

Parameter	ODWS/O* (mg/l)	BH-8 Conc. (mg/l)	Excess Factor
Hardness	100	172	2x

*ODWS/O - Ontario Drinking Water Standards and Objectives

Leachate Water Quality

Monitor BH-5 is located at the western toe of the historical fill area. It is approximately 50 metres north and downgradient of landfill Stage 1. Water samples from BH-5 had the highest concentrations of total dissolved solids during 2012. I have used BH-5 data to represent the site's source leachate.

Site Specific Leachate Tracer Parameters

I compared maximum background groundwater concentrations at BH-8 to minimum BH-5 leachate chemical concentrations for 2012. This is a conservative approach. I note the following:

Parameter	Minimum 2012 Leachate BH-5 (mg/l)	Maximum 2012 Background BH-8 (mg/l)	Leachate: Background Ratio
Ammonia	12.4	<0.02	620
Manganese	2.43	<0.01	243
TKN	16.5	<0.10	165
Organic Nitrogen	2.8	<0.02	140
Boron	0.74	<0.01	74
Potassium	30	1	30
Iron	1.19	0.1	12
Barium	0.32	0.03	11
Copper	0.01	<0.001	10

These above-listed parameters are promising indicators of leachate impacts to local groundwater.

Contaminants of Concern: Drinking Water Quality

Leachate constituents at concentrations above the Ontario Drinking Water Standards and Objectives (ODWS/O) are potential drinking water contaminants of concern. I have compared the 2012 BH-5 leachate quality to the ODWS/O. I note the following potential drinking water quality contaminants of concern in leachate during 2012:

Parameter	ODWS/O (mg/l)	2012 Maximum Leachate Conc. (mg/l)	Excess Factor
Manganese	0.05	2.43	49 x
Organic Nitrogen	0.15	2.8	19 x
Iron	0.3	1.44	5 x
Hardness	172 (background)	637	4 x
1,4-Dichlorobenzene	0.001	0.0031	3 x
Dissolved Organic Carbon	5	12.1	2 x
Total Dissolved Solids	500	897	2 x
Alkalinity	500	664	1 x

Contaminants of Concern: Surface Water Quality

Chemical constituents at concentrations above the Provincial Water Quality Objectives (PWQO's) are potential surface water contaminants of concern. I have compared the 2012 BH-5 leachate quality to the PWQO's. I note the following potential leachate contaminants of concern for surface water quality:

Parameter	PWQO (mg/l)	2012 Maximum Leachate Conc. (mg/l)	Excess Factor
Ammonia	0.02 (un-ionized)	12.4 (total)	pH/temp variable
Iron	0.3	1.44	5 x
Boron	0.2	0.81	4 x
Copper	0.005	0.01	2 x

I defer to the opinions of the Regional Surface Water Scientist regarding the implications of this.

Downgradient Water Quality

Report Figure 3 depicts wells BH-13A and BH-13B as the farthest downgradient monitors. These wells are located approximately 275 metres downgradient of the fill area.

I compared the 2012 BH-13 water quality to the site's leachate indicators. The following leachate indicators were elevated relative to background concentrations:

Leachate Tracer Parameter	BH-13A (deep)		BH-13B (shallow)	
	(mg/l)	Excess over background	(mg/l)	Excess over background
Ammonia	<0.02	-	0.03	2x
Manganese	<0.01	-	0.03	3x
TKN	<0.01	-	<0.01	-
Organic Nitrogen	<0.02	-	-	-
Boron	0.02	2x	0.03	3x
Potassium	2	2x	<1	-
Iron	0.05	-	0.22	2x
Barium	0.07	2x	0.04	1x
Copper	<0.001	-	0.001	-

A mild leachate influence exists at monitors BH-13A and BH-13B. Groundwater quality has improved since peak impacts occurred at BH-13 during 2008.

Groundwater/Surface Water Interaction

Ontario Base Map 10 18 3550 50550 depicts a surface water feature immediately north-west of the fill area. Groundwater is within 1 metre of ground surface at the BH 11 location. The potential for surface water impacts exists. The Surface Water Scientist discusses this under separate cover.

Guideline B-7

The Ross landfill site operates under a Certificate of Approval. Condition 71 of ECA A413209 mandates compliance with Reasonable Use Guideline B-7.

I compared groundwater quality at BH-13A and BH-13B to the site's Guideline B-7 criteria. I note the following:

Parameter	**B-7 Criterion (mg/l)**	**BH-13A (deep) May / Oct**		**BH-13B (shallow) May / Oct**	
		(mg/l)	**Excess factor**	**(mg/l)**	**Excess factor**
Manganese	0.03	0.02	-	**0.03**	**1x**
Iron	0.165	0.06 / 0.03	-	**0.22 / 0.17**	**1x**
Hardness	172	**174 / 191**	1x	61 / **327**	2x
TDS	367	242 / 241	-	99 / **394**	1x

Leachate impacts exceeded Guideline B-7 for multiple parameters at the BH-13 location. A pulse of more potent leachate migrated northward past this point during 2008. The fate of this leachate is unknown.

These monitors are approximately 100 metres south and upgradient of the CAZ boundary. No monitoring wells exist beyond BH-13 at this time. I cannot confirm that the site complies with Reasonable Use Guideline B-7.

The groundwater monitoring network must be augmented. This is necessary to verify B-7 compliance at the CAZ boundaries.

Landfill Gas

Appendix H presents landfill gas monitoring results from May 2011 until October 2012. Methane concentrations at 100% of the lower explosive limit were measured at BH-1.

There are no nearby residences. The nearest enclosed structure to BH-1 is the Attendant's Office. An air quality expert should be consulted regarding the implications of this.

PART 2: DESIGN AND OPERATIONS REPORT

Design and Operations

Separation Distance: Waste to Water Table

D & O Report Drawing 2 depicts the lowest waste elevation as 292 metres above datum. The site's highest reported groundwater elevation is 289.71 metres above datum. This value was measured at monitor BH-1 during May 2011. The separation distance between the waste and the high water table exceeds 2 metres. This is satisfactory.

Buffer Zone

The buffer zone must facilitate contaminant attenuation, monitoring, maintenance and environmental control activities. A 30 metre wide buffer is the minimum that is acceptable. A 100 metre wide buffer is optimal.

D & O Report Drawing 3 depicts a 30 metre operational buffer around the perimeter of the proposed fill limits. This is the minimum acceptable width for the buffer.

D & O Report Figure 1 depicts areas of historical "Fill Beyond Approved Limits" (FBAL). D & O Report Figure 4 infers that the FBAL is contained by the Contaminant Attenuation Zone (or CAZ). The FBAL has not impeded groundwater monitoring activities. I do not believe that the FBAL at this site exacerbates off-site groundwater impacts.

Contaminant Attenuation Zone (CAZ)

I have compared historical data from the BH-4 (deep) and BH-13A (deep) locations. BH-4 is located at the fill area. BH-13A is located 250 metres to the north. Peak TDS concentrations occurred at BH-4 during 2002. Similar peak TDS concentrations occurred at BH-13A during 2008.

The peak TDS concentration appears to have migrated 250 metres in 6 years. This suggests a plume travel time of approximately 40 m/yr. This conforms to estimates based on Golder's earlier hydraulic testing. If the plume velocity estimate is correct, then leachate impacts may already exist at the proposed CAZ boundary.

I cannot advise you about the future effectiveness of the proposed CAZ given the information provided. Such assessments require representative groundwater quality data from the property boundary. Multi-level groundwater monitors should be installed along the northern property boundaries to address this. Monitors must be optimally located to intersect a potential leachate plume.

Daily/Intermediate Cover Material

Daily landfill cover is intended to perform several functions. These include control of vermin, blowing litter, dust, noxious odours, scavenging and fires. Daily cover should not impede the proper management of leachate and gasses. My comments relate to issues of leachate and gas management.

D & O Report Section 5.4, page 16 describes the proposed daily cover. I note the following:

- Daily Cover minimum thickness = 150 mm. This is satisfactory.
- Intermediate Cover minimum thickness = 300 mm. This is satisfactory,
- Cover material: aggregate, non-hazardous contaminated soils, woodchips and construction/demolition waste. This is satisfactory.

Contaminated soils and construction/demolition waste may influence the leachate's composition. The groundwater monitoring program must account for this accordingly.

Final Cover

D & O Report Sections 5.5 and 5.6, page 17 describe the final cover. Report Drawings 3 and 4 depict final contours. I note the following:

- Slope: 4H: 1V (maximum), 20H: 1V (minimum). This is satisfactory.
- Cover thickness: 600 mm soil plus 150 mm topsoil vegetated. This is satisfactory.

With respect to the proposed final cover material, Paragraph 1, page 18 of the D & O Report states:

> *"The site is a natural attenuation site and it is expected that the leachate-impacted groundwater plume exceeding MOE Guideline B-7 will be contained within the boundary of the current contaminant attenuation zone. With an adequate sized contaminant attenuation zone, limiting infiltration of precipitation into the waste mound is not considered to be a requirement of the final cover at this site."*

I disagree. Section 6:11 of the 1998 Landfill Standards Guideline states the following:

> *'A low permeability soil and vegetative cover is typically used for a natural attenuation landfill where a reduced rate of infiltration and leachate generation is normally desirable."*

The full extent of the existing leachate plume is unknown. The adequacy of the CAZ at the full proposed landfill capacity is unsubstantiated. The CAZ size may be inadequate during the long-term. A low-permeability final cover might be required during site closure.

Groundwater Monitoring Program and Reporting

D & O Report Section 7.0, page 28 refers the reader to the 2013 Environmental Monitoring Report (EMR) for a detailed description of the Monitoring Program. I have examined Section 10.1, page 44 of the EMR. I note the following.

Groundwater Monitoring Locations

EMR Report Table 21, page 45 summarizes the proposed monitoring locations. EMR Report Figure 3 depicts the groundwater monitor locations.

I have recommended additional monitoring wells in an earlier review memo (Kinney to Lesieur, 8 January 2009). I maintain this recommendation.

The existing monitoring network is unsatisfactory. The leachate plume has migrated beyond the most distant monitors (BH-13). Guideline B-7 compliance cannot be verified at this time. Additional multi-level groundwater monitors are required along the northern property boundaries. These monitors must be optimally located to intersect a potential leachate plume.

Groundwater Monitoring Frequency

EMR Report Table 21, page 45 specifies a twice-per year sampling frequency. Sample collection is proposed for the spring and summer/autumn. The proposed groundwater sampling frequency is satisfactory.

D & O Report Section 7.1, page 28 states that monitoring will be performed throughout the life of the site and after closure. Post closure monitoring will continue until the waste mound no longer poses a risk to the environment. This is satisfactory.

Groundwater Analytical Parameters

EMR Report Table 21, page 45 presents the proposed water quality analyses. The table specifies Landfill Standards Guideline Schedule 5, Column 1 for springtime samples. The table specifies Schedule 5, Column 2 for summer/fall samples. This is satisfactory. I do not object to the addition of other analytical parameters by the certificate holder.

The proposal to measure water levels at each well prior to sampling is also satisfactory.

Landfill Gas Monitoring

D & O Report Section 7.3, page 30 states that methane gas monitoring will be conducted at the monitoring wells prior to water quality sampling. This is satisfactory.

Section 7.3 also proposes methane gas sampling in the on-site buildings during the twice per year water sampling events. The adequacy of this should be assessed by an air quality expert.

Reporting Frequency

D & O Report Section 7.1, page 28 specifies an annual reporting frequency. This is satisfactory. Monitoring reports must conform to the document entitled;

- *"Monitoring and Reporting for Waste Disposal Sites, Groundwater and Surface Water Technical Guidance Document"* Ministry of the Environment Operations Division, November 2010

Contingency Plan and Trigger Mechanism

The proposed trigger mechanism described on page 28 of the D & O plan is obsolete. Peak strength leachate migrated past the BH-13 location during 2008. The new wells positioned along the CAZ limits should be installed forthwith, as proposed on page 29 of the D & O Report.

Section 7.1, page 30 lists the following contingency actions:

- Additional CAZ lands
- Groundwater control / treatment

The proposed contingency actions are satisfactory. The site can also be permanently closed at any time if necessary.



Shawn Kinney, P.Geo
SK/sh

ec: Gillian Dagg-Foster (Water Resources Unit)
Peter Taylor (Technical Support Section)
Tara MacDonald (Ottawa District Office)

c: Beth Gilbert (Surface Water Unit)
File GW RE WH 01 02, Ross Landfill Site A413209, Lot 10, Con 5, Fmr. Ross Township
SK/IDS #1473-95DN5R

From: Tieu, Emily (ENE)
To: Kevin Mooder
Cc: andrewb@jp2g.com; Steven - Environmental Services
Subject: RE: Tech Support Groundwater Memo - Ross WDS A413209
Date: Monday, June 24, 2013 4:16:48 PM

Hi Kevin,

Thank you for confirming that I will receive an action plan, in consultation by the municipality, by July 17, 2013 with respect to the groundwater memo.

I forwarded your email below to Shawn Kinney for his comments. Mr. Kinney agrees that your predictions would benefit from stronger down-gradient information. He also indicated that the precipitation mixing mechanism proposed does not simulate any hydrogeological process that he is aware of. He recommends that you provide a published reference for this technique if you make further submissions of this kind.

Thanks,

Emily Tieu
Senior Environmental Officer
Ontario Ministry of the Environment
Ottawa District Office
2430 Don Reid Drive
Ottawa ON K1H 1E1
tel: 613-521-3450 ext. 235
fax: 613-521-5437
toll free: 1-800-860-2195


Please consider the environment before printing this email

From: Kevin Mooder [mailto:kmooder@jp2g.com]
Sent: June 19, 2013 12:26 PM
To: Tieu, Emily (ENE)
Cc: andrewb@jp2g.com
Subject: FW: Tech Support Groundwater Memo - Ross WDS A413209

Hello Emily
I would confirm that we will provide an action plan in consultation with the municipality to address the memo by July 17th.
Although we have not conducted a thorough review of the comments, it appears that Shawn did not comment on our preliminary Predictive Leachate Model described in Section 8.9 and presented in Appendix G of the EMR.
We recognize the limitations of such a prediction (often conservative), and suggest that the installation of the additional monitoring wells may assist in refining some of the input parameters.
Any comments in this regard would be appreciated.

Kevin Mooder, MCIP, RPP
Jp2g Consultants Inc.
Engineers - Planners - Project Managers
1150 Morrison Drive, Suite 410
Ottawa, ON K2H 8S9
Tel: (613) 828-7800
Fax: (613) 828-2600

From: Steven - Environmental Services [mailto:shodson@whitewaterregion.ca]
Sent: Wednesday, June 19, 2013 8:34 AM
To: Kevin Mooder
Subject: Fw: Tech Support Groundwater Memo - Ross WDS A413209

Hey Kevin,

Please see attached report from Shawn Kinney. I replied briefly to Emily Tieu and reiterated that the intent is to have the three (3) new monitors installed this year.

Please respond as you see fit.

Cheers,

Steven

From: Tieu, Emily (ENE)
Sent: Tuesday, June 18, 2013 3:28 PM
To: Steven - Environmental Services
Cc: Munasinghe, Ranjani (ENE)
Subject: Tech Support Groundwater Memo - Ross WDS A413209

Hello Steven,

Please find attached a copy of the Technical Support Memorandum, prepared by Shawn Kinney, dated June 12, 2013, for the groundwater review of the following reports:

- 2012 Annual Report, dated March 2013;
- 2012 Water Quality Monitoring Report, dated March 2013;
- Design and Operations Report, dated February 2013; and
- Environmental Monitoring Report, dated February 2013

By no later than **July 17, 2013**, please submit in writing to the undersigned, an action plan outlining how the Township plans to address the comments and recommendations outlined in the memo.

If you have any questions, please don't hesitate to contact me.

Regards,

Emily Tieu
Senior Environmental Officer
Ontario Ministry of the Environment
Ottawa District Office
2430 Don Reid Drive
Ottawa ON K1H 1E1
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Ontario

M E M O R A N D U M

July 8, 2013

TO: Emily Tieu
Senior Environmental Officer
Ottawa District Office
Eastern Region

FROM: Beth Gilbert
Surface Water Specialist
Technical Support Section
Eastern Region

RE: Design and Operations Report (February 2013)
Environmental Monitoring Report (February 2013)
2012 Annual Operations Report (March 2013)
Ross Waste Disposal Site
Part Lot 10, Concession 5
Township of Whitewater Region
Certificate of Approval No. A413209

I have reviewed the three above-noted reports prepared by Jp2g Consultants Inc. for the Township of Whitewater Region. I have reviewed the most recent comments regarding hydrogeological issues, provided by Mr. S. Kinney on June 12th 2013. I also visited the site on April 24th 2013.

I previously provided comments to you on surface water issues with respect to this site on March 11th 2013. The following memorandum outlines my comments with respect to surface water issues on the Design and Operations Report, the Environmental Monitoring Report, and the 2012 Annual Operations Report. Part 2 of the 2012 Annual Operations report contains the 2012 Water Quality Monitoring Report.

Background Information

The Ross Disposal Site (WDS) operates under Certificate of Approval (CofA) A413209, issued on December 5 2005. The C of A was amended on March 15 2013 to allow the Township to continue landfilling in Stage 1 while the application for Stage 2 is being reviewed for approval. This site is approved for a 5.4 ha land filling area within an 8.0 ha property. An additional 12.25 ha property was purchased in 2006, as well as an additional 18.5 ha property in 2009, for use as contaminant attenuation zones (CAZ).

The site has historically received municipal solid waste dating back to the 1970s. The site ceased to receive wastes for a four-year period (2002-06), but is now being used as the Township's long-term centralized facility.

PART A: DESIGN AND OPERATIONS REPORT (February 2013)

Assessment of Potential Impacts (Section 4)

The conceptual model of contaminant transport at this landfill site is from south to north through the overburden toward the watercourse north of the landfill. Jp2G indicates that based on the surface water quality data and flow monitoring, the ephemeral surface water features do not appear to be impacted by the site. I agree there is minimal adverse impact on the water course adjacent to the site; however, my review of the limited data available (comments provided below, beginning on page 4) indicates that leachate indicator parameters boron, barium, and iron are slightly elevated relative to background, indicating there is evidence of mild leachate influence on the watercourse adjacent to the site.

I note that potentially toxic levels of un-ionized ammonia have been observed at SW-1 (adjacent to the landfill) in the past. With expansion of the landfill, there is potential for greater leachate generation rates and greater potential for impacts to the surface water feature adjacent to the site.

Proposed Design (Section 5)

Cover

It is proposed that 150 mm of approved cover material will be placed over the active face on a daily basis. An intermediate cover thickness of 300 mm will be applied to areas which will not receive wastes for more than three months. This is acceptable.

It is proposed that the intent of final cover material is to isolate waste from surface exposure and improve aesthetics, rather than to limit infiltration of precipitation into the waste mound. I defer to the opinions of the Regional Hydrogeologist regarding the permeability of final cover material.

Leachate Management

It is proposed that leachate will continue to be managed by means of natural attenuation and a contaminant attenuation zone. There is a groundwater monitoring program in place. I defer to the opinions of the Regional Hydrogeologist regarding the groundwater monitoring program and contaminant attenuation zone.

Stormwater Management

There are presently no stormwater management or drainage controls at the site and no changes to this are proposed. This is acceptable. The site is situated on topographic high. At the time of my site visit on April 24th 2013, there was no surface water ponding evident at the site. Precipitation which falls on the site has the potential to infiltrate quickly due to the high porosity of the sandy soils.

Site Operations (Section 6)

Landfill Development

Stage 2 landfilling will proceed in a phased approach and will use the area method of landfilling to produce a three-sided final waste mound within the approved 5.03 ha area. The waste mound will be built up from north to south in a series of lifts to reach the final contour elevations.

Drawing 4 in the D&O report indicates that final cover will be placed upon existing waste beyond the 30m buffer area. The owner of the landfill should ensure that placement and grading of final cover material does not encroach upon, or cause impacts to, the watercourse to the north of the site.

Annual Report

An annual report is to be prepared describing the annual surface and groundwater monitoring programs, results, and conclusions. This is acceptable.

Monitoring Programs, Trigger Mechanisms, and Contingencies (Section 7)

Groundwater monitoring wells have been installed between the landfill and the watercourse to the north of the site which will serve as an early warning for potential water quality impacts to the watercourse. Jp2G provides a brief description of the surface water monitoring program in the D&O report. Jp2G refers the reader of the D&O report to the Environmental Monitoring Report (EMR) for a detailed description of the surface water monitoring program. I have reviewed section 10.2, of the EMR and note the following:

Surface Water Sampling Locations

Figure 2 in the EMR depicts three surface water monitoring locations as follows: SW-3 (upstream of the landfill, at the culvert under Mineview Road), SW-1 (in the watercourse north/adjacent to the landfill), and SW-2 (downstream of the landfill, at the culvert under the unopened Blind Line road allowance. This is acceptable. I note that Figure 2 within the 2012 Annual Monitoring Report, however depicts SW-2 as upstream and SW-3 as

downstream. Surface water sampling stations should be clearly labelled and UTM coordinates provided within the Annual Monitoring Reports.

Surface Water Monitoring Frequency

As the watercourse is a first order stream, and is intermittently dry upstream of the site, there is expected to be flow during the spring freshet, after heavy precipitation events, and in the late fall. Two monitoring events will be completed during the spring and fall at all three locations, and after any two storm events, for a total of 4 events per year. This is acceptable.

Surface Water Analytical Parameters

Table 21 on page 45 of the EMR specifies Landfill Standards Guideline Column 3, Schedule for spring samples and the two samples following storm events. This is acceptable, provided hardness is added to the list to evaluate PWQOs for metals. Column 4, Schedule 5 parameters are proposed for the fall sampling event. As limited monitoring data exists, a reduction in the parameter list to Column 4, Schedule 5 for fall sampling events is not advised. All sampling events should be analyzed for Column 3, Schedule 5 parameters. Although Table 21 does not specify measurement of field parameters, note that the Column 3, Schedule 5 list also includes field measured parameters: temperature, pH, conductivity, DO, and flow.

Surface Water Contingency Plan & Trigger Mechanism

A trigger mechanism and contingency plan in the event of significant surface water impact from leachate from the Ross WDS has not been presented. Once the background surface water quality has been adequately characterized (minimum 8-10 sampling events), these should be developed for the site and provided to the MOE for review.

I note on page 29 and 30 of the D&O plan that gaining control over and treatment of contaminated groundwater is described as an option for bringing the site into compliance. This is important to note because of the northerly groundwater flow direction toward the surface water feature to the immediate north of the site. It should be noted that the site can also be permanently closed at any time if necessary.

Part B: 2012 WATER QUALITY MONITORING REPORT (Jp2g, March 2013)

Condition 72 of the CofA specifies that a surface water monitoring program should be developed to monitor surface water upstream and downstream of the site. The 2012 monitoring program is based on the 2006 Golder Associates Limited report to satisfy condition 72 and includes sampling during “two sampling events and after two storm events”, implying four sampling events per year.

Site Description

Surface water in the vicinity of the Ross WDS is characterized by an intermittent watercourse north of the site in a cedar dominated ravine. To the west of the site, there is a low lying intermittent swale. At the time of my site visit on April 24 2013, the swale was dry; however, water was present within the culvert which crosses Mineview Road. Northeast of BH-6, the intermittent watercourse consists of a ponded area. Further north and east of BH-11 within the ravine, a defined channel emerges and flows toward the municipal ditch on the east side of the Blind Line road allowance where it continues south to cross Kohlsmith Road. The watercourse eventually drains in a north-easterly direction until it joins Broomes Creek, approximately 8 km downstream. Broomes Creek continues for another 4 km in an easterly direction, until it outlets to the Ottawa River.

Leachate Monitoring

Mr. Kinney noted that ammonia, manganese, TKN, organic nitrogen, boron, potassium iron, barium, and copper are elevated at leachate monitor BH-5 relative to background monitor BH-8. Mr. Kinney also noted that (total) ammonia, iron, boron, and copper were elevated above PWQO in BH-5.

In Appendix G, Jp2g compared groundwater quality to Provincial Water Quality Objectives (PWQOs) at monitoring wells to serve as an early warning for potential water quality impacts to the watercourse. I recommend that Canadian Water Quality Guidelines (CWQGs) are also consulted, for parameters that do not have PWQOs (e.g. nitrate, nitrite, chloride). CWQGs for nitrate, nitrite, and chloride are 2.9 mg/L (NO_3-N) and 0.06 mg/L (NO_2-N), and 120 mg/L, respectively. The recently updated CWQG should be used for boron (1.5 mg/L) instead of the PWQO, as it is based on more up-to-date aquatic toxicological data. Additionally, in the absence of either a PWQO or a CWQG for sulphate, the draft British Columbia guidelines (65 mg/L long-term average, 250 mg/L maximum) may be consulted for assessing impact.

Groundwater – Surface Water Interaction

Comments provided by Mr. Kinney indicate that the primary pathway for leachate migration is horizontally northward through a surficial sandy aquifer. Mr. Kinney notes that groundwater is within 1 metre of ground surface at the BH-11 location and indicates there is potential for impacts on the surface water feature to the north of the site.

Surface Water Monitoring

The 2012 sampling program included three stations (SW-1, SW-2 and SW-3). Sampling was conducted once in the spring, after one storm event in July, and once in the fall. All locations were successfully sampled in the spring. Dry conditions in July prevented samples from being collected. During the fall, only SW-1 was sampled.

Precipitation records indicate that 2012 was a very dry year. Sampling efforts should continue to be made to target spring freshet, following two heavy rain events, and in the late fall in order to avoid dry conditions.

Jp2G indicates that the location of SW-1 was moved further north (i.e. downstream) along the watercourse to accommodate sampling in 2012 due to dry conditions. I note that 2012 was an exceptionally dry year. Jp2G indicates that the permanent relocation of SW-1 will be discussed in the future as limited water at SW-1 is a common occurrence. Any proposed changes to the sampling location for SW-1 should be discussed with MOE.

Detection limits of certain metals are greater than the relevant PWQO (i.e. cadmium and zinc during October 2009 and July 2011) and prevent the user of the data from making conclusions regarding potential impact. Method detection limits should be selected to be 1/5th of relevant PWQOs or CWQGs.

Jp2G indicates that VOC analysis would be conducted at surface water sampling locations if there are increasing trends noted at groundwater monitors north of the 'draw'. I generally agree with the approach to initiate VOC analysis at surface water locations, provided that any PWQO exceedances within groundwater monitors upgradient of the surface water feature are also considered, in addition to any increasing trends.

SW-2 (background station)

Note: this location is identified as SW-3 in Figure 2 of the EMR.

Based on one sample event, water quality at the background station during spring 2012 was characterized as having alkalinity 115 mg/L, total suspended solids (TSS) 1 mg/L, conductivity 358 µS/cm, BOD 1 mg/L, COD 11 mg/L, chloride 37 mg/L, total phosphorus (TP) 0.02 mg/L, total ammonia 0.02 mg/L, nitrate-nitrogen <0.1 mg/L, nitrite-nitrogen < 0.1 mg/L, and sulphate 11 mg/L, TDS 233 mg/L and phenols <1 µg/L. Metals concentrations were very low and were below PWQOs.

SW-1 (adjacent station)

SW-1 is located in a low lying ponded area north of the site. Between five and eleven sample events are available for this location, depending upon the parameter. Water quality at SW1 is characterized as having alkalinity 119 to 368 mg/L, TSS <2 to 294 mg/L, conductivity 308 to 923 µS/cm, BOD <1 to 11 mg/L, COD 6 to 117 mg/L, chloride 9 to 44 mg/L, TP 0.01 to 0.71 mg/L, total ammonia <0.02 to 0.28 mg/L, nitrate-nitrogen <0.1 to 6.9 mg/L, nitrite-nitrogen <0.1 to 0.13 mg/L, sulphate 9 to 66 mg/L, TDS 200 to 600 mg/L, and phenols <1 to 17 µg/L.

For the 2012 monitoring year, PWQOs were exceeded for phosphorus on one occasion (0.04 mg/L slightly exceeding 0.03 mg/L) and for nitrate-nitrogen on two occasions (3.49 and 5.18 mg/L exceeding the Canadian Water Quality Guideline of 2.93 mg/L). Un-ionized ammonia concentrations did not exceed PWQO in 2012, as it had in past years (i.e. 0.13 to 0.97 mg/L, significantly exceeding 0.02 mg/L).

The PWQO for iron was not exceeded in 2012 as it had in past years (in approximately 70% of samples since 2007). Concentrations have generally decreased from the maximum recorded value of 21.8 mg/L in November 2007. Copper and boron concentrations in 2012 were also below the PWQO in 2012. Although the PWQO has been exceeded for phenols in the past (0.017 and 0.013 mg/L, exceeding 0.005 mg/L), no exceedances have been noted since 2010.

Monitoring of volatile organic compounds listed in Column 1 of Schedule 5 took place at SW-1 during the fall 2012 sampling event. Analysis of VOCs showed that concentrations were less than PWQOs.

Based on the very limited background dataset available to date (1 sample), comparisons between background water quality and SW-1 show that leachate indicator parameters boron, barium, and iron were slightly elevated during 2012 indicating there is a slight leachate influence on the watercourse adjacent to the site. Boron, barium, and iron were below relevant PWQO or CWQG for the 2012 monitoring year, suggesting minimal impact. Future monitoring events from the background station will help to better characterize background water quality.

SW-3 (downgradient station)

Note: this location is identified as SW-2 in Figure 2 of the EMR.

SW-3 is located downstream of the site at an unopened road allowance called the Blind Line Road. Based on one sample event, water quality at the background station during spring 2012 was characterized as having alkalinity 125 mg/L, TSS 1 mg/L, conductivity 309 µS/cm, BOD 1 mg/L, COD 20 mg/L, chloride 7 mg/L, total phosphorus 0.01 mg/L, total ammonia 0.02 mg/L, nitrate-nitrogen < 0.8 mg/L, nitrite-nitrogen <0.1 mg/L, and sulphate 24 mg/L, TDS 201 mg/L and phenols 1 µg/L. Metals concentrations were very low and were below PWQOs.

Based on the very limited background dataset available to date (1 sample), comparisons between background water quality and SW-3 show that water chemistry was similar to the background station for most key leachate indicator parameters indicating that there appears to be little impact at SW-3 to date from landfill leachate.

SUMMARY OF COMMENTS

- Based on the very limited background dataset available to date (1 sample), comparisons between background water quality at SW-2 and SW-1 (adjacent) show that leachate indicator parameters boron, barium, and iron were slightly elevated during 2012 indicating there is evidence of mild leachate influence on the watercourse adjacent to the site. Boron and iron were below relevant PWQO or CWQG for the 2012 monitoring year, suggesting minimal impact.

- Potentially toxic levels of un-ionized ammonia have been observed at SW-1 in the past, although concentrations were < PWQO in 2012.

- Once the background surface water quality has been adequately characterized (minimum 8-10 sampling events), a trigger mechanism and contingency plan should be developed for the site and provided to the MOE for review.

- Jp2G indicates that the permanent relocation of SW-1 will be discussed in the future as limited water at SW-1 is a common occurrence. Any future changes to the location of SW-1 should be discussed with MOE.

- As proposed in Table 21 on page 45 of the EMR, the surface water monitoring locations and frequency are acceptable and includes sampling at upstream (SW-2), adjacent (SW-1), and downstream (SW-3) locations during two regular sampling events in the spring and fall, in addition to two events subsequent to major storm events.

- Sampling early in the spring following freshet and late in the fall should help avoid stagnant and dry conditions. Similarly, sampling following two major rain events will help avoid dry conditions.

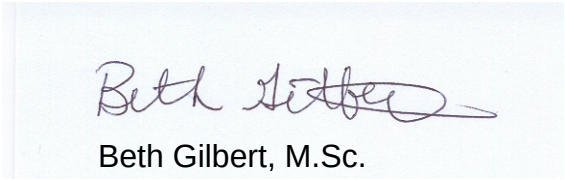
- Parameters in Column 3 (Comprehensive list) of Schedule 5 should be analyzed for all sampling events and includes field parameters (pH, temperature, conductivity, DO, and flow). The parameter list for surface water should also include hardness. A reduction in the parameter list would be subject to MOE approval.

- Method detection limits should be selected to be 1/5th of relevant PWQOs or CWQGs.

- All surface water monitoring stations should be clearly labelled to ensure consistency of station locations. UTMs for each location should be provided in subsequent monitoring reports.

- Using field pH and temperature, the calculated un-ionized ammonia value should be presented as a numerical value in the surface water data appendix, rather than as a 'less than' value (i.e. < 0.02 mg/L).

If you have any questions about these comments, please feel free to contact me at (613) 540-6864.



Beth Gilbert, M.Sc.
BG/gl

ec: G. Dagg-Foster
P. Taylor
T. MacDonald

c: S. Kinney
File SW RE WH KO 03 06 Ross WDS
File SW 07 02 13-01-02-01 Ottawa River Basin General (Upstream Ottawa), Broomes Creek
BG/IDS # 1780-95DN6B

Jp2g Consultants Inc.

ENGINEERS ■ PLANNERS ■ PROJECT MANAGERS

J.M. Janota, P.Eng., M.Sc.
J.E. Hunton, MCIP, RPP

July 17, 2013

Ministry of the Environment
Ottawa District Office
2430 Don Reid Drive
Ottawa, ON K1H 1E1

Via Email Only
emily.tieu@ontario.ca

Attention: Emily Tieu
Sr. Environmental Officer

Re: Ross Landfill Site
Review of Groundwater Comments
ECA No. A413209
Township of Whitewater Region
Our Project No. 2006047N

Dear Ms Tieu:

We acknowledge receipt of the TSS groundwater review comments by Shawn Kinney dated June 12, 2013, and as requested, we provide the following response and action plan (attached as Table 1). The memo indicates review of the following:

Part 2 of the 2012 Annual Report (2012 AMR March 2013)
The Design & Operations Report (D&O, February 2013) and
The Environmental Monitoring Report (EMR, February 2013).

With regard to the comments provided, we are pleased to respond to the eight (8) issues summarized by Mr. Kinney in his memo of June 12, 2013 and your response regarding the Predictive Leachate Model as item No. 9. For convenience they are reproduced (in italics) for reference.

1. *I am unable to verify Guideline B-7 compliance given the limitations of the existing groundwater monitoring well network.*

   The 2012 Annual Monitoring Report (AMR) includes a groundwater trigger mechanism based on Golder Associates Limited (GAL), 2006. Since the 2007 AMR, Jp2g has presented the trigger monitoring wells which have concentrations of the trigger parameters that exceed the Reasonable Use Criteria. The monitoring well of concern, based on the direction of groundwater flow from the fill area, is BH-13. Monitoring well BH-13 is located approximately 100m from the downgradient CAZ limit in this direction. The following table summarizes the results as presented in the 2007 to 2012 AMR's (bold values indicates RUC exceedances)

SUMMARY OF TRIGGER VALUES AT BH-13

AMR	Parameter	C_{allow}	BH-13A Deep	BH-13B Shallow
2007	TDS	413	**522**-**517**	111
2008	TDS	385	**493**-**537**	108
2009	TDS	368	**423**-**457**	75-86
2010	TDS	368	365	69-108
2011	TDS Fe	368 0.17	83-289 **0.42**-0.15	320-**374** 0.12-0.1
2012	Mg TDS Hardness Fe	0.03 368 136 0.2	0.03 99-**394** 61-**327** **0.22**-0.17	<0.01 343-361 **256**-**294** 0.03-0.05

A detailed review of the monitoring results at BH-13 (shallow and deep), and compliance with the RUPO is presented in the 2012 AMR. Based on the results, we have recommended that at a minimum, two additional monitoring wells be installed along the downgradient property boundary. The potential location of the proposed wells was provided as Figure 5 (Areas of Potential Impact – 2012) in our 2012 AMR dated March 2013. We have provided Figure 5 attached.

2. *The horizontal extent of the leachate plume has migrated beyond the existing monitoring well network. Additional monitoring wells are required.*

   See item 1. We have, in consultation with the adjacent landowner, and the municipality, confirmed access to the location of proposed wells BH-15 and BH-16 along the northwest CAZ limit as shown on the attached plan (Figure 5). At this time we propose to defer the construction of a potential well to be located along the northeast CAZ limit (shown as BH-17) until such time that any impacts are detected at monitoring well BH-14.

3. *The primary pathway for migration of leachate is horizontally northward through the surficial sandy aquifer from the fill area beyond monitor BH-13. The migration rate may be on the order of 10's of metres per year.*

   Statement.

4. *The potential exists for impacts to occur to surface water located within the Contaminant Attenuation Zone (CAZ) north of the fill area.*

   Based on the cross-section (Figure 6, AMR 2013,) the groundwater table appears to be lower than the invert or bottom of the "draw" that runs along the northern limit of the site (i.e. slightly west of Surface water location SW-1). We will conduct additional elevation surveys along this feature to confirm if, and where the water table and flow from the site would contribute to this feature. In accordance with recent TSS surface water review comments we have mapped and photographed this feature, and established surface water monitoring locations to determine if there is any measureable impact from the landfill.

5. *The most recently proposed groundwater monitoring program will be satisfactory with the addition of the above noted monitoring wells.*

   Agreed

6. *Future site maps and figures should clearly depict the surface topography of the CAZ.*

   The surface topography data provided in "Figure 2 - Regional Map" (AMR, March 2013) is based on Land Information Ontario (LI0) mapping and illustrates the surface topography based on a 5m contour interval. As much of the CAZ is heavily tree and shrub covered it is difficult to get better resolution than 5 metres.

7. *Methane concentrations were measured at 100% of the lower explosive limit at BH-1. The nearest enclosed structure to BH-1 is the Attendants' Office. An air quality expert should be consulted regarding the implications of this.*

   We have, in 2011, completed a review of the construction details of the of the "Attendants' Office" with regard to potential methane build-up (letter dated May 26, 2011, provided in Appendix A of Part 1- Site Development and Operations) of the 2012 Annual Report. Recommendations were provided. We will continue to monitor methane at the site.

8. *The existing CAZ may be inadequate over the long-term. A low-permeability final cover might be required during site closure.*

   Statement. We will evaluate the need for a low permeability cover through monitoring prior to site closure.

9. *The precipitation mixing mechanism proposed in the Predictive Leachate Model does not simulate any hydrogeological process that he is aware of. Recommends providing a published reference.*

   One published reference is the "Ministry of the Environment Procedure D-5-4 Technical Guideline For Individual On-site Sewage Systems: Water Quality Impact Risk Assessment. Section 5.6.2 (b) Contaminant Attenuation".

   The transport of chemical compounds through the subsurface is based on three main principles: advection, dispersion, and diffusion. All of these components are, in part, dependent on the properties of the medium through which the chemicals travel – groundwater. This being said, in order to successfully model chemical transport, the movement of groundwater must also be considered. A groundwater model is usually based on a budget-approach which generally acknowledges groundwater inflow and outflow, infiltration (infiltration = precipitation – runoff – evapotranspiration), and groundwater recharge and discharge. Similarly, dilution, sorption, and chemical and biochemical reactions are the main mechanisms that define decreases in chemical concentration. Of these mechanisms, dilution typically has the most measurable effect on the concentration of species within the groundwater. Though all three of these mechanisms occur to some extent in every situation, a dilution model produces a conservative result by neglecting sorption and reactions. As discussed in MOE Procedure D-5-4, dilution models "involve the dilution [of chemical parameters] with infiltrating precipitation."

It is therefore concluded that the precipitation mixing mechanism in question is necessary for the accurate modeling contaminant transport as it both defines the movement and the downgradient concentration of the chemicals.

In addition we are aware of several other landfill sites where “dilution models” have been used as the premise for discussion and assessment of landfill impact and compliance. We would look forward to Mr. Kinney’s review of the model.

We trust that the above information is satisfactory, and addresses yours and Mr. Kinney’s concerns. We have copied this response and action plan to Mr. Kinney to expedite MOE review of our comments and approval of the action plan. We look forward to your comments.

Yours very truly,
Jp2g Consultants Inc.
Engineers • Planners • Project Managers





Kevin Mooder, MCIP, RPP
Project Manager

Andrew Buzza, P.Geo
Sr. Hydrogeologist

KJM/AB/jlp

Encl.

c.c. Mr. Shawn Kinney; Ministry of the Environment (shawn.kinney@ontario.ca)
S. Hodson; Township of Whitewater Region (shodson@whitewaterregion.ca)

TABLE 1
SUMMARY OF WORK PLAN AND SCHEDULE TO ADDRESS MOE EASTERN REGION TECHNICAL COMMENTS
ROSS WASTE DISPOSAL SITE
ECA NO. A413209
TWP OF WHITEWATER REGION

Schedule	Description of Work	Party	Status
Summer 2013	• Received Groundwater TSS comments • Preparation of a Work Plan to address Eastern Region comments • Review with Owner and Submission to MOE • Obtain MOE response	Jp2g Jp2g Jp2g MOE	June 19, 2013 July, 2013 July 17, 2013 July, 2013
Summer/fall 2013	• Site potential monitoring well locations • Install overburden groundwater monitoring wells at the site[1] • Complete environmental monitoring[2] • Evaluate potential groundwater to surface water impacts.	Jp2g Jp2g/driller Jp2g	
March 2014	• Submission of annual report [3] • Complete environmental monitoring.	Jp2g/GG GG	

Notes:

1. The overburden wells will be located north of the current fill area along the CAZ boundary (refer to attached Figure 5). Timing for the wells is proposed for the summer/fall of 2013 but is contingent on drill rig availability and access

2. Environmental monitoring will be completed as outlined in Table 22 of the AMR dated March 2013.

3. The annual report will be submitted to update the results of the water quality monitoring and address issues as identified in the recent MOE correspondence.

OWNER: YVES & DIANE ROCHON

PROPOSED WELL
BH-16

PROPOSED WELL
BH-17
WHEN IMPACT DETECTED
AT BH-14

APPROXIMATE BOUNDARY OF
FORMER ROCHON PROPERTY
(12.5ha PARCEL)

CONTAMINANT ATTENUATION ZONE
4.52 ha

BH-11 -A (Deep)
288.48 -B (Shallow)

BH-14 -A (Deep)
292.37 -B (Shallow)

BH-13 -A (Deep)
291.29 -B (Shallow)

PROPOSED WELL
BH-15

BH-10 -A (Deep)
293.37 -B (Middle)
-C (Shallow)

BH-3
(DESTROYED)

BH-8
296.70

BH-12
295.40

BH-4
294.55 (Deep) -A (Shallow)

BH-7 -A (Deep)
293.56 -B (Shallow)

BH-9 -A (Deep)
294.44 -B (Shallow)

RECYCLING AND
REUSED MATERIAL
STORAGE AREA

BH-6 -A (Deep)
295.19 -B (Shallow)

BH-5
294.79

STAGE 2
(WASTE MOUND)

KOHLSMITH RD.

CONTAMINANT ATTENUATION ZONE
12.25 ha

30

STAGE 1
(TRENCH & FILL)

65

299.68
BH-1

BH-2 -A (Deep)
296.77 -B (Shallow)

30

30

I.B.

I.B.

S.I.B.

OWNER: YVES & DIANE ROCHON

OWNER: WELDON GUTZ

LEGEND

BH-8	GROUNDWATER MONITORING LOCATION IN PLAN
294.44	GROUND ELEVATION AT BOREHOLE (m)
294	2012 GROUND SURFACE CONTOURS
– –	PROPERTY BOUNDARY
—x—x—x—	FENCE LINE
	TREE LINE
-A (Deep)	INDICATES POTENTIAL LANDFILL IMPACT
-B (Shallow)	INDICATES NO LANDFILL IMPACT

CONCRETE MONUMENT NO. 1	
ELEV. 300.884	(CM1)
N 1000.000	
E 2000.000	

CONCRETE MONUMENT NO. 2	
N 1000.000	(CM2)
E 1969.877	

40 0 20 40 80 120 160 200

METERS

No.	DATE	BY		REVISIONS

Jp2g Consultants Inc.
ENGINEERS ■ PLANNERS ■ PROJECT MANAGERS

DRAWN	RM
CHECKED	AB
APPROVED	AB
SCALE	1 : 2000

ROSS TOWNSHIP WASTE DISPOSAL SITE

AREAS OF POTENTIAL IMPACT – 2012

DATE	JULY 2013
PROJECT	2006047N
PLOT DATE	15–JULY–13
DRAWING	FIG. 5

Jp2g Consultants Inc.

ENGINEERS ■ PLANNERS ■ PROJECT MANAGERS

J.M. Janota, P.Eng., M.Sc.
J.E. Hunton, MCIP, RPP

August 2, 2013

Ministry of the Environment
Ottawa District Office
2430 Don Reid Drive
Ottawa, ON K1H 1E1

Via Email Only
emily.tieu@ontario.ca

Attention: Emily Tieu
Sr. Environmental Officer

Re: Ross Landfill Site
Review of Surface Water Comments
ECA No. A413209
Township of Whitewater Region
Our Project No. 2006047N

Dear Ms Tieu:

We acknowledge receipt of the TSS surface water review comments by Ms Beth Gilbert dated July 8, 2013, and as requested, we provide the following response. The memo indicates review of the following:

Design and Operations Report (D&O, February 2013)
The Environmental Monitoring Report (EMR, February 2013), and
The 2012 Annual Monitoring Report (AMR, March 2013)

With regard to the comments provided, we are pleased to respond to ten (10) issues summarized by Ms Gilbert in her memo of July 8, 2013. For convenience they are numbered and reproduced (in italics) for reference.

1. *Based on the very limited background data set available to date (1 sample) comparisons between background water quality and SW-2 and SW-1 (adjacent) show that leachate indicator parameters boron, barium, and iron were slightly elevated during 2012 indicating there is evidence of mild leachate influence on the watercourse adjacent to the site. Boron and iron were below relevant PWQO or CWQO for the 2012 monitoring year, suggesting minimal impact.*

   Statement

2. *Potentially toxic levels of un-ionized ammonia have been observed at SW-1 in the past, although concentrations were <PWQO in 2012.*

   Statement

3. *Once background surface water quality has been adequately characterized (minimum 8-10 sampling events), a trigger mechanism and contingency plan should be developed for the site and provided to the MOE for review.*

   Agreed

4. *Jp2g indicates that the permanent relocation of SW-1 will be discussed in the future as limited water at SW-1 is a current occurrence. Any future changes to the location of SW-1 should be discussed with the MOE.*

   Agreed. The former SW-1 was located in the "draw" north of the site. This area was not a water course but a low area that at times accumulated snowmelt and storm water. The new location is further to the northeast in a defined watercourse feature.

5. *As proposed in Table 21 on page 45 of the EMR, the surface water monitoring locations and frequency are acceptable and includes sampling upstream (SW-2), adjacent (SW-1), and downstream (SW-3) locations during two regular sampling events in the spring and fall, in addition to two events subsequent to major storm events.*

   Statement, agreed

6. *Sampling early in spring following freshet and late in the fall should help avoid stagnant and dry condition. Similarly, sampling following two major rain events will help avoid dry conditions.*

   Agreed, we will continue to sample during wet periods in an attempt to avoid dry conditions. We note that in 2012, we sampled after a major storm event and the surface water locations were still dry. This is due to the fact that the "swale" and or "draw" area is not a water course, but a low area that at times captures surface water runoff.

7. *Parameters listed in Column 3 (comprehensive list) of Schedule 5 should be analysed for all sampling events and include field parameters (pH, temperature, conductivity, DO and flow). The parameter list for surface water should also include hardness. A reduction in the parameter list would be subject of MOE approval.*

   Agreed, hardness will be included. We note that all field parameters are currently collected and we will continue to do so.

8. *Method detection limits should be selected to be be 1/5th of the relevant PWQOs or CWQGs.*

   We will ask the lab for detection limits as requested (1/5th of relevant PWQOs or CWQGs). Alternatively we will use methods with the lowest reporting detection limit (RDL) available.

9. *All surface water monitoring stations should be clearly labelled to ensure consistency of station locations. UTMs for each station location should be provided in subsequent monitoring reports.*

   Agreed. The 2012 AMR correctly illustrated the locations of the stations, the EMR will be corrected. SW-2 upgradient at the Mineview culvert and SW-3 downgradient at the Blind Line culvert. GPS locations will be provided in the 2013 AMR.

10. *Using field pH and temperature, the calculated un-ionized ammonia value should be presented as a numerical value in the surface water data appendix, rather than as a "less than" value (i.e. <0.02) mg/L)*

    This does not seem practical given the fact that the MRL (method reporting limit) for ammonia is on balance 0.02 mg/L, and values less than this are reported as "<0.02 mg/L". Typically, samples with ammonia values of less than 0.02 mg/L will report un-ionized ammonia to be less than 0.02 mg/L. A numerical value in this instance is not possible nor is it necessary. Further to item 8 above, we will inquire with the lab to report the "lowest reporting detection limit".

We trust that the above information is satisfactory, and addresses Ms. Gilbert's comments and concerns. Please do not hesitate to contact our office should you have any further comments or questions.

Yours very truly,
Jp2g Consultants Inc.
Engineers • Planners • Project Managers





Kevin Mooder, MCIP, RPP
Project Manager

Andrew Buzza, P.Geo
Sr. Hydrogeologist

KJM/AB/jlp

Encl.

c.c. Beth Gilbert; Ministry of the Environment (beth.gilbert@ontario.ca)
Shawn Kinney: Ministry of the Environment (shawn.kinney@ontario.ca)
S. Hodson; Township of Whitewater Region (shodson@whitewaterregion.ca)

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Ontario

M E M O R A N D U M 05 May 2014

TO: Emily Tieu
Senior Environmental Officer
Ottawa District Office
Eastern Region

FROM: Shawn Kinney
Hydrogeologist
Water Resources Unit
Technical Support Section
Eastern Region

RE: Jp2g Consultants Inc. Letter, Ross Waste Disposal Site A413209, Part Lot 10 Concession 5, Geographic Township of Ross, Township of Whitewater Region

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I have reviewed the hydrogeologic aspects of the document entitled:

- *"Re: Ross Landfill Site, Review of Groundwater Comments, ECA No. A413209, Township of Whitewater Region, Our Project No. 2006047N"* Letter from Kevin Mooder and Andrew Buzza (Jp2g Consultants Inc.) to Emily Tieu (MOE Ottawa District). July 17 2013.

Based upon the information provided, I submit the following comments for your consideration.

Summary

1. The horizontal extent of the leachate plume has migrated beyond the existing monitoring well network. Additional monitoring wells are required. The proposed new groundwater monitoring locations designated as BH-15 and BH-16 as depicted along the CAZ boundaries in the provided Figure 5 are satisfactory.

2. The consultant proposes a third new monitoring location, designated BH-17 to be installed north of existing monitor BH-14 in the event that impacts are detected at BH-14. The proposed BH-17 location is satisfactory.

3. I had earlier identified the potential for impacts to occur to a mapped surface water feature located within the CAZ north of the fill area. In letter item #4, the consultant proposes an elevation, mapping and photographic survey along this feature and the establishment of surface water monitoring locations. This is satisfactory from my perspective, however I will defer to the opinions of the Regional Surface Water Scientist on this aspect.

4. I maintain my recommendation for a topographic survey of the contaminant attenuation zone. During our April 2013 site visit, it was readily apparent that significant elevation changes exist within the CAZ which are not depicted on the diagrams submitted for review. For example, a reader of the annual monitoring reports cannot infer the existence of the substantial topographic low area located between the fill area and the BH-14 monitors. Such depressions may act as infiltration galleries for spring snowmelt. This level of detail affects the interpretation of the seasonal groundwater monitoring data from the CAZ and must be addressed.

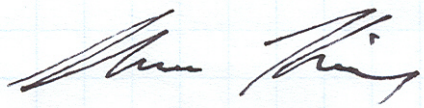
Precipitation Mixing Model

Item 9 of the Jp2g letter discusses a predictive leachate migration model based upon a precipitation mixing mechanism. I have challenged this. The mathematical dilution of subsurface contaminants using infiltrated precipitation does not simulate any actual hydrogeological process that I am aware of. I had requested published references supporting the use of such a model.

In defence of the precipitation dilution model, the consultant refers the reader to the following document:

- *"Procedure D-5-4, Technical Guideline for Individual On-Site Sewage Systems: Water Quality Impact Risk Assessment"* MOE, August 1996

The above-captioned procedure was a historical planning aid used to estimate the appropriate lot densities of subdivisions serviced by individual septic systems. Procedure D-5-4 contains no technical rationale to support its application to landfill contaminant modelling problems. Based upon the information provided, I cannot conclude that the dilution technique under discussion would yield realistic simulations of leachate plume behaviour. Other validated and widely accepted numerical models exist for this purpose.



Shawn Kinney, P.Geo
SK/gl

c: Beth Gilbert (Surface Water Unit)
GW RE WH 01-02 Ross Landfill Site A413209, Lot 10, Con 5 Fmr. Ross Township
SK #1473-95DN5R

ec: Gillian Dagg-Foster (Water Resources Unit)
Peter Taylor (Technical Support Section)
Tara MacDonald (Ottawa District Office)

Jp2g Consultants Inc.
ENGINEERS ■ PLANNERS ■ PROJECT MANAGERS

J.M. Janota, P.Eng., M.Sc.
J.E. Hunton, MCIP, RPP

May 20, 2014

Ministry of the Environment
Environmental Approvals Branch
Toronto, ON M4V 1L5

Via Email

Attention: Ranjani Munasinghe, Ph.D, P.Eng.
Senior Engineer, Waste Unit

Re: Ross Landfill Site Expansion
MOE Reference No. 4480-94VPKJ
Our Reference File No. 2006047O

Dear Ranjani:

Further to your email of April 29, 2014 and receipt of the TSS Groundwater review comments dated May 5, 2014 by email May 7, 2014 we provide the following response:

D&O Report – Final Cover

Section 5.6 describes the proposed final cover characteristics. Reference to the 'contaminated levels' is intended to restrict the use of contaminated soils as final cover as per the limits stated. This statement is based on the D&O Report format from the ECA Waste Disposal Site Application Package.

Environmental Monitoring Report – Landfill Gas

As presented in the EMR Section 10.3 Jp2g has been conducting landfill gas monitoring at the site since May 2011. A prediction of gas migration has been presented in accordance with the MOE Guideline for Assessing Methane Hazards from Landfill Sites.

As noted in Appendix H, overburden monitoring well BH-1 regularly exhibits methane (CH_4) concentrations that are greater than or equal to its lower explosive limit (LEL). The lower explosive limit of methane is 50,000ppm, the upper explosive limit is 150,000ppm. Within this range (50,000 to 150,000ppm), there is risk of ignition.

As per Section 4.10 of the MOE guidance document entitled Landfill Standards a Guideline on the Regulatory and Approval Requirements for New or Expanding Landfilling Sites, 1998, Regulation 232/98 specifies maximum allowable methane concentration limits of 25,000ppm at the property boundary, 10,000ppm in and around on-site buildings, and 500ppm in and around off-site buildings. Methane concentrations at the Ross WDS appear only to be significant at well BH-1. BH-1 is drilled directly into the waste and sees the highest concentrations at the site. Monitoring wells located downgradient of the waste mound have seen maximum methane concentrations of 1,000ppm at monitoring well BH-5 in October 2012, and 3,000ppm at monitoring well BH-12 in October 2012. This dramatic decrease in concentration helps to support the conclusions of the initial landfill gas assessment (provided in Section 10.3 of the 2013 EMR) which stated that the sandy overburden present at the site will provide adequate ventilation of landfill-generated gases and prevent the buildup of methane around the site.

No detectable traces of methane have been measured at any of the boundary or far-field downgradient wells. There is no hazard.

The following table presents the results of the landfill gas monitoring program between November 2011 and October 2013.

Test Location	Date of Sampling Event and Methane Concentration				
	Nov-2011	May-2012	Oct-2012	Apr-2013	Oct-2013
Attendant's Office	N/M	x	x	N/M	N/M
BH#1	≥ 50,000ppm	≥ 50,000ppm	42,500ppm	≥ 50,000ppm	≥ 50,000ppm
BH#5	N/M	x	1,000ppm	N/M	N/M
BH#7-S	N/M	N/M	x	N/M	N/M
BH#12	N/M	x	3,000ppm	N/M	N/M

NOTES:

1) ppm - Parts Per Million

2) N/M - No methane concentrations detected.

3) X - No sample taken.

4) The lower explosive limit of methane is 50,000ppm; the upper explosive limit of methane is 150,000ppm.

Please note through the MOE Ottawa District Office inspections this issue was raised and addressed. See attached correspondence.

- May 2, 2011 Site Inspection Report
- May 26, 2011 Jp2g Gas Monitoring Report
- May 27, 2011 Jp2g Response to MOE

In accordance with O.Reg 232/98 Sections 14 and 15 (Subsection 4.10.1 and 4.10.2 of the MOE Landfill Standards Guidelines, 1998) the site is in compliance with the Regulation.

TSS Review of Jp2g July 17, 2013

The following provides a response to the four (4) issues identified by Shawn Kinney in the Summary of the May 5, 2014 memo and further comments regarding the leachate migration model.

1. BH-15 and BH-16 have been installed and were sampled once in 2013. These wells will be incorporated into the 2014 monitoring program.

2. Monitoring well BH-17 was installed.

3. Agreed, a detailed analysis is provided in the 2012 and 2013 Annual Reports regarding the assessment of potential surface water impacts.

4. The recommendation to perform a full topographical survey of the CAZ is noted. As the area is heavily forested in places, we do not fully support this recommendation due to the practical difficulties of the task. We do however recognize the merit to this information, and as such, suggest that main topographical features of the CAZ are surveyed.

Precipitation Mixing Model

We do not disagree that Procedure D-5-4 is a planning tool historically and current used to determine lot densities based on potential septic system impacts. We cited the precipitation dilution model as an example of a contaminant transport model, regardless of its intended application. From a theoretical perspective, there is no reason why the basic theory of this tool cannot be retrofitted to apply to any contaminant transport situation.

Another Ministry document that authorizes only the use of dilution is the “Design Guidelines for Sewage Works 2008”, Chapter 22, Section 22.5.8 - Prediction of Contaminant Attenuation which outlines the basic calculation (i.e. reasonable use) of effluent impact on groundwater quality at receivers such as property boundaries or surface water bodies. It suggests that “a constant quantity of dilution, which is a surrogate for all attenuative mechanisms, should be used in most cases”. It further suggests a yearly quantity of precipitation that infiltrates into a sand unit that mixes with, and dilutes a contaminant plume.

Regardless, the predictive fate and transport model presented for the Ross Site was not intended to hold any weight towards the future site compliance or expansion approval. It was simply intended to provide an estimated likely outcome if site development was to continue as planned. Not to defend its future compliance to MOE Guideline B-7.

The level of compliance in the present-day and the future at the site will be determined, in full, by the in-place monitoring well network and trigger mechanism.

Trusting this is satisfactory.

Yours truly,

Jp2g Consultants Inc.

ENGINEERS · PLANNERS · PROJECT MANAGERS





Kevin Mooder, MCIP RPP
Sr. Project Manager

Andrew Buzza, P.Geo
Sr. Hydrogeologist

KJM/jlp

Encl.

c.c. S. Hodson, Township
E. Diamond, MOE

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Ontario

M E M O R A N D U M

March 9, 2017

TO: T. Watson
Senior Environmental Officer
Ottawa District Office
Eastern Region

FROM: B. Gilbert
Surface Water Specialist
Technical Support Section, Water Resources Unit
Eastern Region

RE: 2013 to 2015 Water Quality Monitoring Reports
Ross Waste Disposal Site
Part Lot 10, Concession 5; 990 Kohlsmith Road
Township of Whitewater Region
County of Renfrew
Certificate of Approval No. A413209

As requested I have reviewed:

- "*Ross Landfill Site Township of Whitewater Region ECA No. A413209 2015 Water Quality Monitoring Report*". Prepared for the Township of Whitewater Region, dated March 2016 prepared by Jp2g Consultants Inc. signed and stamped by Andrew Buzza, P.Geo*. Contained in*: Ross Landfill Site Township of Whitewater Region ECA No. A413209 Annual Report. Prepared for the Township of Whitewater Region, dated March 2016 prepared by Jp2g Consultants Inc.
- Ross Landfill Site Township of Whitewater Region ECA No. A413209 2014 Water Quality Monitoring Report. Prepared for the Township of Whitewater Region, dated March 2015 prepared by Jp2g Consultants Inc. signed and stamped by Andrew Buzza, P.Geo*. in*: Ross Landfill Site Township of Whitewater Region ECA No. A413209 Annual Report. Prepared for the Township of Whitewater Region, dated March 2015 prepared by Jp2g Consultants Inc.
- Ross Landfill Site Township of Whitewater Region ECA No. A413209 2013 Water Quality Monitoring Report. Prepared for the Township of Whitewater Region, dated March 2014 prepared by Jp2g Consultants Inc. (Andrew Buzza, P.Geo.) *in*: Ross Landfill Site Township of Whitewater Region ECA No. A413209 Annual Report. Prepared for the Township of Whitewater Region, dated March 2014 prepared by Jp2g Consultants Inc.

I have consulted the groundwater memorandum dated June 12, 2013, (S. Kinney) on the 2012 Annual Report and subsequent correspondence dated May 5, 2014. I offer the following comments for your consideration with respect to surface water concerns only.

Comments regarding groundwater issues are addressed under separate cover by a Regional Hydrogeologist.

Summary

- The reviewer agrees with Jp2g's assessment that landfilling activities are not having an adverse effect on the local surface water regime; however, the reviewer notes there is some influence of leachate impacted groundwater on surface water chemistry downstream of the WDS at SW-1 and BLC.
- The quality of groundwater discharging to surface water must be determined in the vicinity of the defined watercourse channel which originates northeast of the WDS.
- Jp2g reports the estimated site life is approximately 28 years or more. It is recommended that a trigger mechanism is put in place that is designed to initiate a contingency plan for protection of the receiving watercourse. This should be provided for review in the next annual monitoring report.
- The most recently proposed surface water monitoring program is satisfactory.
- Clarity should be provided regarding the former location SW-1 as compared to the present SW-1 location. These locations should be clearly distinguished on a map, accompanied by UTM coordinates. Additionally, the surface water chemistry dataset should distinguish these two differing locations.
- A description of the site, surrounding land use, topography, and site drainage is needed in future reports.
- Graphical and statistical analysis of data should be conducted in future reports. This would include summary statistics (e.g. min, max, means, and percentiles), statistical comparisons between downstream and upstream stations, and trends over time.

Background

The Ross Waste Disposal Site (WDS) operates under Certificate of Approval No. A413209, dated December 23, 2005 and Notice No. 2 dated July 21, 2014 which permits the use and operation of a 5.4 ha landfilling area and segregated waste storage and processing facilities within a site area of 25 ha. Notice No. 2 permitted development and operation of Stage 2.

The site is licenced to receive solid, non-hazardous municipal waste and recyclables (tires, scrap metal and other recyclables) that are stored and processed on-site. The site operates as a natural attenuation facility. Jp2g estimates that the remaining site capacity may be in excess of 28 years.

Site Description

The site is located at 990 Kohlsmith Road. The road to the immediate west of the site is Mineview Road and to the immediate east of the site is an unopened road allowance known as Blind Line.

The reports do not include a description of the area, surrounding land uses, or topographical features. Based on a site visit in April 2013, the surrounding area is largely rural and agricultural in nature. The area to the immediate north of the site is an undulating hilly landscape with a mix of forest and some cedar swamp in low lying areas. Areas to the immediate west and east are agricultural. Examination of aerial imagery indicates agricultural land and what appears to be a pit to the immediate south.

Topographic mapping on Figure 2 and examination of Figure 1 indicates that the northern edge of the disposal area footprint slopes northerly down toward a seasonally wet area and unnamed watercourse that originates to the northeast of the WDS.

Jp2g reports that the groundwater flow direction is interpreted to be northward, consistent with previous years.

Surface Water Regime

Jp2g reports that: a swale meanders northeast across a farm field toward Mineview Road and crosses under the road; from Mineview Road to the north-east there is no defined channel, this swale is intermittent and meanders north-east through a grassy field; the swale disappears to the north-west of the WDS; there is a 'draw' in the woodlot to the north of the WDS that experiences seasonal surface ponding during wet periods of the year but is dry for the most part; north east of BH-6 some stagnant puddles exist; further to the north-east a defined watercourse channel emerges and flows to a municipal ditch on the east side of Blind Line (unopened road allowance); from Blind Line surface water flows south under Kohlsmith Road.

From Kohlsmith Road, examination of topographic mapping indicates that the watercourse eventually drains in a north-easterly direction until it joins Broomes Creek, approximately 8km downstream. Broomes Creek continues for another 4km in an easterly direction until it outlets to the Ottawa River.

Leachate Characteristics

The groundwater unit indicated that ammonia, manganese,TKN, organic nitrogen, boron, potassium, iron, barium, and copper were elevated by at least an order of magnitude at BH-5 relative to background monitor BH-8 during the 2012 monitoring year.

Jp2g reports in Table 5 of the 2015 Water Quality Report that leachate indicators for this site in 2015 were manganese, boron, barium, TDS, chloride, sulphate, nitrate, alkalinity, sodium, manganese, and calcium.

Surface Water Monitoring Program

Jp2g reports that there are three active surface water stations (MVC, SW-1, and BLC) based on previous reviews and guidance from MOECC in recent years. Table 24 of the 2015 Water Quality Report summarizes the surface water monitoring program. Samples are collected two times per year (spring and fall) and following any two storm events. Samples are analyzed for the comprehensive list (Schedule 5, Column 3) of parameters for all four sampling events. A Volatile Organic Carbon (VOC) scan is completed once per year at SW-1.

Jp2g describes the sampling locations as follows: MVC (SW-2) - Mineview Road culvert, upstream of landfilling area; SW2-1 - the 'draw' north of the site, adjacent to and slightly downstream of the landfilling area; BLC (SW-3) - Blind Line Culvert (unopened road allowance between Concession 5 and 6), downstream of the landfilling area.

Surface Water Monitoring Results

Review of surface water monitoring results is summarized below and includes the entire historical dataset provided for review on the enclosed CD.

MVC (SW-2)

MVC is identified as a background station west of the landfill for evaluating impacts. Up to eight sets of water quality results are available at this location between 2012 and 2015, depending on the parameter. MVC is characterized as having TDS 56 - 270 mg/L, chloride 3.9 – 69 mg/L, sulphate 1 – 14 mg/L, nitrate <0.1 – 0.1 mg/L, barium 0.018 -0 0.031 mg/L, boron < 0.005 – 0.009 mg/L, calcium 37.8 – 40 mg/L, ammonia <0.01 – 0.19 mg/L, total kjeldahl nitrogen 0.25 – 1.2 mg/L, iron 0.035 – 0.63 mg/L, copper <0.001 – 0.0014 mg/L, biochemical oxygen demand (BOD_5) <1 – 3 mg/L, total suspended solids (TSS) <2 – 11 mg/L, and hardness 39 – 165 mg/L.

The Provincial Water Quality Objective (PWQO) was exceeded five times (62% of the time) for total phosphorus (0.03 – 0.09 mg/L, exceeding 0.03 mg/L). The PWQO was exceeded three times (37% of the time) for zinc (0.046 – 0.102 mg/L, exceeding 0.02 mg/L) and twice for iron (0.61 and 0.63, exceeding 0.3 mg/L).

SW-1

SW-1 is downgradient of the disposal area within the watercourse where it forms a defined channel, approximately 80m northeast of the site. Up to twenty five sets of water quality results are available at this location between 2007 and 2015, depending on the parameter. SW-1 is characterized as having TDS 115 - 600 mg/L, chloride 2.7 – 44 mg/L, sulphate 2 – 66 mg/L, nitrate <0.1 – 6.89 mg/L, barium 0.029 -0 0.18 mg/L, boron < 0.009 – 0.09 mg/L, calcium 36 – 123 mg/L, ammonia <0.01 – 0.28 mg/L, total kjeldahl nitrogen 0.11 – 2.88 mg/L, iron 0.007 – 21.8 mg/L, copper <0.0001 – 0.011 mg/L, biochemical oxygen demand (BOD_5) <1 – 11 mg/L, total suspended solids (TSS) <2 – 294 mg/L, and hardness 118 – 232 mg/L.

The PWQO was exceeded seven times (28% of the time) for iron (0.38 – 12.6 mg/L, exceeding 0.3 mg/L). Peak concentrations of iron occurred in 2009. Phenol exceeded the PWQO once in 2009 (0.013 mg/L, exceeding 0.005 mg/L). The PWQO was exceeded for total phosphorus (0.03 – 0.09 mg/L, exceeding 0.03 mg/L) 52% of the time and once for zinc in 2015.

Concentrations of leachate indicator parameters at SW-1 were compared to background (MVC) on the same date from 2012 through 2015. Barium and boron are typically elevated above background concentrations, suggesting a slight leachate influence on surface water quality at this location.

The VOC scan showed non-detectable concentrations at SW-1 in 2013 and 2014; however VOC's were not analyzed in 2015. A VOC scan should occur in 2016 as per the proposed monitoring plan shown in Table 24 in the 2015 report.

BLC (SW-3)

BLC is downstream of SW-1 where the watercourse crosses the unopened road allowance known as Blind Line, approximately 200m north of Kohlsmith Road. Up to fourteen sets of water quality results are available at this location between 2012 and 2015, depending on the parameter. BLC is characterized as having TDS 70-242 mg/L, chloride 1.3– 7.5 mg/L, sulphate 2 – 63 mg/L, nitrate <0.1 – 3 mg/L, barium 0.02 – 0.313 mg/L, boron 0.005 – 0.028 mg/L, calcium 41.8 – 45.4 mg/L, ammonia <0.01 – 0.07 mg/L, total kjeldahl nitrogen 0.3 – 2.39 mg/L, iron 0.005 – 34.4 mg/L, copper <0.0000 – 0.0224 mg/L, biochemical oxygen demand (BOD_5) <1 – 6 mg/L, total suspended solids (TSS) <3 – 1430 mg/L, and hardness 52 – 198 mg/L.

PWQO's were exceeded twice for total phosphorus (0.03 – 0.09 mg/L, exceeding 0.03 mg/L), and zinc (0.074 and 0.132 mg/L, exceeding 0.02 mg/L). The PWQO was exceeded three times for iron (1.57 – 34.4 mg/L, exceeding 0.3 mg/L) and once for lead (0.0054, exceeding 0.005 mg/L).

Concentrations of leachate indicator parameters at BLC were compared to background (MVC) on the same date from 2012 through 2015. Boron and iron are typically elevated above background concentrations and occasionally copper and TKN suggesting some leachate influence on surface water quality at this location.

Surface Water Impact Assessment

The reviewer would agree that MVC represents background water quality.

Jp2g concludes that overall the surface water monitoring at the site did not suggest that the landfilling activities are having an adverse effect on the local surface water regime. The reviewer is in general agreement with this conclusion, although there is some influence of leachate impacted groundwater on surface water chemistry downstream of the WDS at SW-1 and BLC.

The responses provided by Jp2g in a letter dated August 2, 2013 regarding surface water review comments dated July 8, 2013 are acceptable to the reviewer.

Trigger/Contingency Plan

There is no trigger mechanism or contingency plan for protection of the surface water receiver.

Future Surface Water Monitoring Program

With respect to the surface water monitoring program, Jp2g recommends continuing the surface water monitoring program at the existing monitoring locations, frequencies, and parameters outlined in Table 24. This is acceptable provided that all samples are analyzed for Column 3, Schedule 5 parameters (outlined the MOE *Landfill Standards*, 1998) for each event. Any reduction in the parameter list must be accompanied by a proposal which includes the rationale for the elimination of a specific parameter(s).

Jp2g also recommends clearly labelling all surface water monitoring locations. I concur.

Reviewer's Recommendations:

The above recommendations by Jp2g are reasonable; however additional recommendations are provided below for your consideration that would add value to the monitoring program, annual reporting, and trigger mechanism.

1. The quality of groundwater discharging to surface water must be determined in the vicinity of the defined watercourse channel that originates northeast of the WDS.

2. Ground water quality should be compared to PWQO's where groundwater is interpreted to discharge to surface water.

3. I recommend that a trigger mechanism is established for this site that is designed to initiate a contingency plan for protection of the receiving watercourse. This should be provided for review in the next annual monitoring report.

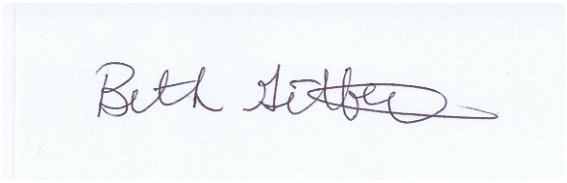
4. Clarity needs to be provided on the former location SW-1 as compared to the present SW-1 location. These locations need to be clearly distinguished on a map, accompanied by UTM coordinates. Additionally, the surface water chemistry dataset should distinguish these two different locations. It is the reviewers understanding that former SW-1 location was in a 'draw', whereas SW-1 is presently located further northeast in the defined watercourse channel.

5. In the next annual monitoring report, graphical and statistical analysis of data should be conducted which would include summary statistics (e.g. min, max, mean, percentiles), statistical comparisons between downstream and upstream, and trends over time.

6. The next monitoring report should include a description of the site, surrounding land use, topography, and site drainage.

7. It should be noted that any proposal to reduce the parameter list must be accompanied by rationale for the elimination of specific parameters.

Please do not hesitate to contact me if you have any questions regarding these comments.



B. Gilbert

ec: G. Faaren, Water Resources Unit Supervisor
P. Taylor, Technical Support Section Manager
R. Sacilotto, Kingston District Office Supervisor

c: Groundwater Unit Files
File SW RE WH 03 06 C5, Ross WDS
File SW 07 02 13-01-02-01, Ottawa River Basin General (Upstream Ottawa), Broomes Creek
BG/IDS #0461-9K6PCW (2013), 3745-9WANA3 (2014), 1716-ABSN7C (2015)

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M E M O R A N D U M

July 26, 2022

TO: Thandeka Ponalo
Sr. Environmental Officer
Ottawa District Office
Eastern Region

FROM: Thomas Guo
Hydrogeologist
Technical Support Section
Eastern Region

RE: 2021 Monitoring Report and Proposed Operation Changes
Ross Landfill Site
Part Lot 10, Concession 5, Geographic Township of Ross
Township of Whitewater Region
County of Renfrew

Environmental Compliance Approval # A413209

I have reviewed the following documents:

- "Ross Landfill Site, Township of Whitewater Region, Environmental Compliance Approval No. A413209, 2021 Monitoring Report", prepared by Jp2g Consultants Inc (Jp2g) and dated March 2022; and
- "Ross Landfill Site, Township of Whitewater Region, ECA No. A413209, Change of Operations", prepared by Jp2g, sent to Tracy Hart, District Manager, and dated June 21, 2022.

The first report was provided on behalf of Township of Whitewater Region to document site condition in 2021. The second report is to seek the District Manager's approval for the proposed operation changes.

With reference to the previous annual monitoring reports and according the Ministry's comments, I offer the following comments for your consideration from groundwater perspective.

Summary

- Reasonable Use Guideline B-7 (RUG) applies to operating waste disposal and processing sites. Ross Waste Disposal Site (WDS) is an active site; therefore, RUG applies to this site;
- Two (2) compliance locations were detected to exceed the RUG limits for several parameters. However, the consultant concludes that these exceedances are not attributed to the leachate. Accordingly, the site is deemed to be in compliance with the RUG. Continued monitoring is required;
- Currently, no groundwater trigger mechanism needs to be triggered;

- The potential exists for impacts to occur to surface water located within the Contaminant Attenuation Zone (CAZ) north of the fill area. The Surface Water Specialist discusses this issue under separate cover;
- In 2021, the wells that showed the highest signs of leachate impact in groundwater samples also appear to show the presence of methane. None of the on-site structures such as the office building or attendant's shelter were found to contain detectable quantities of methane at the time of sampling;
- I have no concerns for the proposed operation changes; and
- The proposed groundwater monitoring program is acceptable.

Environmental Compliance Approval (ECA)

The Ross WDS operates under ECA No. A413209. The site is licensed for the operation of a 5.4 hectare landfill.

In 2006 the Township purchased the adjacent Rochon property (12.25ha) for use as a contaminant attenuation zone (CAZ) to the north and north-west. In 2009, the Municipality purchased the Hawthorne farm (18.5ha) located immediately north-east of the Site, 4.52 ha of which is to be used as part of the CAZ. The entire 24.77 ha landholding is located in Part Lot 10, Concession 5, in the geographic Township of Ross, Township of Whitewater Region.

The existing site is licensed to receive solid, non-hazardous municipal waste. Additional wastes such as tires, scrap metal, etc. can be received. These wastes are transferred off-site for recycling and waste diversion purposes. The trench disposal method is used. The landfill operates as a naturally attenuating site.

Site Settings

The Site is located at 990 Kohlsmith Road. The ground surface north of the fill area is undulating. Multiple depressions exist without obvious surface outlets. These depressions appear capable of retaining precipitation, particularly snowmelt. The depressions may function as localized fresh water infiltration galleries.

Geology

The consultant determined the geology of the site as follows:

- Overburden
    - Sand: up to 17 metres thick (Well Record A050847)
    - Silty clay: avg. 1.4 metre thick layer 3 to 7 metres below grade, eastern half of site
    - Till: 12 metres below ground surface
- Bedrock consists of undifferentiated metamorphic and igneous rock

Hydrogeology

- The main aquifers exist in overburden.
- The primary pathway for migration of leachate is horizontally northward. Groundwater flows through the surficial sandy aquifer from the fill area.
- The horizontal groundwater flow direction was northward away from Kohlsmith Road. Groundwater flows towards monitor BH-13.

- The hydraulic conductivity was determined to be 1 x 10^{-4} m/s.

Natural depressions located north of the fill area may affect groundwater chemistry. These depressions may act as infiltration galleries for spring snowmelt. This might cause temporary freshening of groundwater observed at some monitoring wells.

Background Water Quality

Monitor BH-1 is located on site in the southwestern corner and has historically been interpreted to be representative of background conditions. However, as landfilling within Stage 1 surrounded this well, it no longer became reliable as a background location. This well was decommissioned in the fall of 2018.

Monitor BH-8 is located 100 metres southeast of the fill area. It consistently yields samples having low concentrations of Total Dissolved Solids (TDS). In 2021, all parameters in this well met Ontario Drinking Water Quality Standards (ODWQS) except hardness.

Leachate Water Quality

Monitor BH-5 is located at the western toe of the historical fill area. It is approximately 50 metres north and downgradient of landfill Stage 1. Water samples from BH-5 had the highest concentrations of total dissolved solids during 2021.

The consultant chose the following parameters as leachate indicator parameters (LIPs): alkalinity, chloride, boron, barium, iron, manganese, sodium, sulphate, dissolved organic carbon (DOC) and TDS.

Downgradient Water Quality

A number of monitoring wells both on-site and in the near vicinity of the site show evidence of varying levels of leachate impact. The monitoring results indicate a diffuse plume present to the north that is characterized by decreasing chemical concentrations with separation distance from the fill area.

Specially, the following monitoring wells show the leachate impacts:

- Shallow aquifer: BH-2B, BH-4B, BH-6B, BH-7B and BH9B; and
- Deep aquifer: BH-4A, BH-7A, BH-9A, BH-12A and BH-13A

In the summer of 2013, three bi-level groundwater monitoring wells were constructed to act as “Point of Compliance” (POC) wells (i.e., wells BH-15, BH-16 and BH-17). Monitoring wells, BH-15A and B, BH-16A and B, and BH-17A and B are located at the downgradient extent of the municipally owned contaminant attenuation zone. They are located roughly north, north-west, and northeast (respectively) of the existing fill area.

The consultant compared the monitoring results of these compliance wells to those of other monitoring wells, as well as conducted tri-linear plot analysis. The consultant concluded that:

- For both the shallow and deep piezometer settings, water quality from the downgradient boundary wells (BH-15, BH-16 and BH-17) plots closely to the background water quality and mid field water quality from BH-8 and BH-13 respectively; and
- Overall, the graphing suggests that the downgradient wells align more closely with background groundwater than the leachate water quality suggesting that these areas are not impacted.

Groundwater/Surface Water Interaction

The potential exists for impacts to occur to surface water located within the Contaminant Attenuation Zone (CAZ) north of the fill area.. The Surface Water Specialist discusses this under separate cover.

Guideline B-7

Reasonable Use Guideline B-7 (RUG) applies to operating waste disposal and processing sites.

In 2021, the following monitoring wells were assessed to exceed the RUG limits:

- Shallow aquifer: BH-15B (TDS), BH-16B (manganese, TDS, alkalinity, and DOC); and
- Deep aquifer: BH-15A (TDS), BH-16A (manganese, TDS, alkalinity, and DOC)

In comparing the values of TDS, alkalinity, and DOC from BH-16 to wells that are located closer to the site (i.e., BH-13, and BH-6), the concentrations in wells located furthest from the fill area are on balance greater than values from wells located closer to the site. In the Tri-Linear Plot, BH-16 plots more closely to the background water quality from BH-8 than the leachate water quality from at BH-5. Accordingly, Jp2g concludes that the far downgradient wells are not being severely impacted by the landfill operations and continued monitoring is recommended.

Currently, the site is deemed to be in compliance with the RUG.

Groundwater Trigger Mechanism

The results from the 2021 monitoring reveals all parameters to be below the trigger median value with exception of TDS at BH17-B. These values are however low and do not reveal any significant increasing trends in concentration. It should be noted that active fertilizer and manure application has been observed from time to time in the agricultural fields located immediately adjacent to monitoring well BH-15 and BH-16.

At this time there are no downgradient users and further investigation at this time is not recommended. If concentrations from these locations continue to rise and there are lines of evidence that suggest that they may landfill related, additional action will be required.

Landfill Gas

A landfill gas monitoring program was established in the spring of 2011. Landfill gas measurements at the Ross WDS are collected from all wells and the on-site buildings.

In 2021, the wells that showed the highest signs of leachate impact in groundwater samples also appear to show the presence of methane, CH3 – an indicator of landfill gas. None of the on-site structures such as the office building or attendant’s shelter were found to contain detectable quantities of methane at the time of sampling.

Operation Changes

The Township has installed weigh scales and is proposing changes to the location of storage facilities and stockpiles for various waste types. These changes will result in the following operation changes:

- new ingress/egress location at Kohlsmith Road
- weigh scales adjacent to the existing attendants building

- zig zag retaining wall for 40m^3 and 20 yd^3 containers
- designated storage areas for various recyclable materials
- stockpile areas for C&D and bulky waste and brush

In order to accommodate these changes, the waste disposal design must be changed within the approved 5.03 ha landfilling area to maintain the sites total approved capacity of 434,340 m^3. The proposal is to relocate the waste disposal capacity from the area required for the new internal road, weigh scales and waste storage areas over the approved design contours on the remaining landfill area.

These changes will trigger to amend the ECA. The consultant states that:

> *Pre-submission consultation with the Ottawa District Office and TSS Regional Office is required prior to the application to amend the ECA.*

I have no concerns for these changes from groundwater perspective.

Groundwater Monitoring Program in 2022

The consultant proposed the groundwater monitoring program in 2022 as follows:

- Two monitoring events: (spring and fall) monitoring of groundwater levels at all monitoring locations;
- The completion of groundwater sampling according to the schedule provided in Table 24;
- Annual reporting of the chemical results and a yearly assessment of the need to amend the monitoring program. Any deviations from the monitoring program must be approved in accordance with ECA Condition 97;
- All groundwater monitoring stations should be clearly marked, have adequate access, and be maintained in good working order;
- In the event that a monitoring well becomes disabled, an assessment should be provided as to whether or not the well is to be replaced or decommissioned; and
- Record the status of all monitoring wells and a statement on the well's compliance with O.Reg. 903.

The proposed groundwater monitoring program is acceptable.

Thomas Guo, M. Eng, P. Geo.
TG/

cc: Beth Gilbert, Surface Water Specialist
File No.: GW RE WH 01 02 (Ross WDS, A413209)
TG/ECHO# 1-113143122

ec: Victor Castro, Water Resources Supervisor
Christina Klein, Technical Support Section Manager

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M E M O R A N D U M

September 7, 2022

TO: T. Ponalo, Senior Environmental Officer
Ottawa District Office, Eastern Region

FROM: B. Gilbert, Surface Water Specialist
Technical Support Section, Eastern Region

RE: Ross Landfill Site
2020 and 2021 Monitoring Reports and Feasibility Study
Part Lot 10, Concession 5; 990 Kohlsmith Road
Township of Whitewater Region
County of Renfrew
Certificate of Approval No. A413209

As requested by you, I have reviewed the surface water related aspects of the following documents:

- Ross Landfill Site, Township of Whitewater Region, Environmental Compliance Approval No. A413209, 2021 Monitoring Report (Part 2). Prepared for Township of Whitewater Region. Prepared by Jp2g Consultants Inc. Dated March 2022.
- Ross Landfill Site, Township of Whitewater Region, Environmental Compliance Approval No. A413209, 2020 Monitoring Report (Part 2). Prepared for Township of Whitewater Region. Prepared by Jp2g Consultants Inc. Dated March 2021.
- Letter dated June 21, 2022, to Tracy Hart, District Manager. Re: Ross Landfill Site Change of Operations.
- Letter dated February 24, 2022, to Thandeka Ponalo, Sr. Environmental Officer. Re: Ross Landfill Site Change of Operations Feasibility Study.

The 2020 and 2021 Monitoring Reports summarize the site conditions in 2021 and 2021 whereas the two letters provide details on proposed operational changes at the site to change the waste mound and facilitate pre-submission consolation with Technical Support Section reviewers.

I offer the following comments for your consideration relating to surface water impacts only. I have reviewed the groundwater unit memorandum dated July 26, 2022, on the 2021 Annual Report and proposed operational changes.

Background Information

The Ross Waste Disposal Site (WDS) operates under Environmental Compliance Approval (ECA) No. A413209, dated December 23, 2005, as amended March 15, 2013, and Notice No. 2 dated July 21, 2014 which permits the use and operation of a 5.4 ha

landfilling area and segregated waste storage and processing facilities within a site area of 25 ha. Notice No. 2 permitted development and operation of Stage 2.

The site has been in operation since the early 1970's. The site started filling Stage 2 in July 2014. The intermediate cover applied on Stage 1 is reported as in good condition. An area of historical deposit of waste beyond approved limits exists in the 30m buffer area along the north corner of the site.

The site is licenced to receive solid, non-hazardous municipal waste and recyclables (tires, scrap metal and other recyclables) that are stored and processed on-site. The site operates as a natural attenuation facility. Jp2g estimates that the remaining site capacity is approximately 21 years.

Site Description

The site is located at 990 Kohlsmith road. The road to the immediate west of the site is Mineview Road and to the immediate east of the site is an unopened road allowance known as Blind Line.

A description of the area, surrounding land uses, or topographical features is not provided. Based on a site visit in April 2013, the surrounding area is largely rural and agricultural in nature. The area to the immediate north of the site is an undulating hilly landscape with a mix of forest and some cedar swamp in low lying areas. Areas to the immediate west and east are agricultural. Examination of aerial imagery indicates agricultural land and what appears to be a pit to the immediate south.

The groundwater unit reports that the ground surface north of the fill area is undulating and multiple depressions exist without obvious surface outlets. According to the groundwater unit, these depressions appear capable of retaining precipitation, particularly snowmelt. The groundwater unit indicates the depressions may function as localized freshwater infiltration galleries.

Surface Water Features

Jp2g reports that: a swale meanders northeast across a farm field toward Mineview Road and crosses under the road; from Mineview Road to the north-east there is no defined channel, this swale is intermittent and meanders north-east through a grassy field; the swale disappears prior to reaching the north-west corner of the WDS; there is a 'draw' (ravine) in the woodlot to the north of the WDS that experiences seasonal surface ponding during wet periods of the year but is dry for the most part; north-east of BH-6 some stagnant puddles exist; further to the north-east a defined watercourse channel emerges and flows to a municipal ditch on the east side of Blind Line (unopened road allowance); from Blind Line surface water flows south under Kohlsmith Road.

Examination of topographic mapping indicates that the watercourse eventually drains in a north-easterly direction until it joins Broomes Creek, approximately 8km downstream. Broomes Creek continues for another 4km in an easterly direction until it outlets to the Ottawa River.

Leachate Characteristics

Monitor BH-5 is located at the western toe of the historical fill area and is used to characterize leachate. The consultant identified the following parameters as having elevated concentrations relative to background concentrations: TDS, chloride, sulphate, alkalinity, sodium, manganese, barium, boron, and calcium.

Groundwater Surface Water Interaction

The groundwater unit indicates that the potential exists for impacts to occur to surface water located within the Contaminant Attenuation Zone (CAZ) north of the fill area.

Surface Water Monitoring Program

Jp2g reports that there are three active surface water stations MVC (SW-2), SW-1, and BLC (SW-3). MVC is the upstream sampling location to the southwest of the site at the Mine View Road culvert. SW-1A is immediately north of the site, 25 m west of BH-11. SW-1A was moved to this location in 2012 to an area in the vicinity where the groundwater is anticipated to discharge to the surface water. The historical location is termed SW-1. BLC is northeast of the site at the Blind Line culvert, downstream of the stie.

Samples are collected two times per year (spring and fall) and following two storm events. Samples are analyzed for the comprehensive list (Schedule 5, Column 3) of parameters for all four sampling events. A Volatile Organic Carbon (VOC) scan is completed once per year at SW-1.

2021 Surface Water Monitoring Results

The consultant reports the following for 2021:

-Samples were collected in spring and late summer and following two storm events in September and November.
-MVC had insufficient water during the August event and November storm event.
-All parameters reveal concentrations less than Provincial Water Quality Objectives (PWQOs), Canadian Water Quality Guidelines for protection of aquatic life (CWQGs), and Aquatic Protection Values (APVs) except for:

- MVC exceeded PWQO for total phosphorus (0.88 mg/L) in September
- SW1A exceeded PWQP for total phosphorus (0.46 mg/L) in September

-Examination of mean concentrations since 2012 (along with error bars representing one standard deviation) show some elevated parameters; however, the data does not indicate any impact on the nearby surface water as a result of landfilling activities.

2020 Surface Water Monitoring Results

The consultant reports the following for 2020:

-Samples were collected from all three stations in May 2020 and after a storm event in May 2020.
-No sample was collected at MVC during the August storm event due to insufficient water.
-All parameters reveal concentrations less than PWQOs, CWQGs, and Aquatic Protection Values (APVs) except for:

- MVC exceeded PWQO for iron (1.07 mg/L), total phosphorus (0.05 and 0.06 mg/L) and zinc (0.047 mg/L).
- SW-1A exceeded PWQO for chromium (0.09 mg/L, considered anomalous), total phosphorus (0.04, 0.05, and 0.06 mg/L) and zinc (0.054 mg/L).
- BLC exceeded PWQO for iron (0.467 mg/L) and total phosphorus (0.06 and 0.04 mg/L).

-Examination of mean concentrations since 2012 (along with error bars representing one standard deviation) show some elevated parameters; however, the data does not indicate any impact on the nearby surface water as a result of landfilling activities.
-For 2021, the proposed trigger mechanism was not initiated as there were no instances where the calculated 75th percentile concentrations exceed the compliance values (i.e., the higher of the PWQO, CWQG, and or the APV values) for any one of the trigger parameters (un-ionized ammonia, phenols, boron, and chloride.
-There were no observable increases in leachate indicator parameters versus historical values or clear apparent increases in indicator parameter concentrations over time.

Trigger Mechanism and Contingency Plans

Jp2g recommends the following trigger mechanism:

- Parameters: unionized ammonia, phenols, boron, and chloride
- Location: SW-1A
- Trigger Concentrations: are the higher of the respective PWQOs, CWQGs, or APVs for the individual trigger parameter. Compliance evaluation is done by comparing the 75th percentile concentration at the trigger location to either the PWQO, CWQG or APV. The 75th percentile concentrations are calculated for each of the trigger parameters on the entire sampling history.
- Trigger Mechanism: contingency measures would be implemented if the calculated 75th percentile concentrations (taken over the entire sampling history) exceed the compliance values (i.e., the higher of the PWQO, CWQG, and or the APV values) for any one of the trigger parameters at the trigger location over four consecutive sampling events and/or there are significant changes to the surface water quality (i.e., increase in leachate indicator parameters versus historical values or clear apparent increases in indicator parameter concentrations over time).

The proposed surface water contingency plan includes: increased sampling frequency; analysis of additional indicator parameters such as toxicity testing; increased number of sampling locations; use of cover material to influence leachate generation or surface water flow patterns; and remedial alternatives.

Consultant's Proposed 2022 Surface Water Monitoring Program (Table 24)

- Sample the three surface water stations during spring and fall and after any two storm events.
- Completion of surface water sampling according to the schedule provided in Table 24.
- Annual reporting of chemical results and yearly assessment of the need to amend the surface water sampling program. Any deviations from the monitoring program must be approved in accordance with ECA Condition 97.
- All surface water stations should be clearly labelled.

Proposed Operational Changes

The following is a brief summary of what Jp2g reports in the letter dated February 24, 2022:

-The Township has installed weigh scales and is proposing changes to the location of storage facilities and stockpiles for various wastes.
-The proposed changes include: a new ingress/egress location at Kohlsmith Road, weigh scales adjacent to the attendants building, zig zag retaining wall for 40 m^3 and 20 yd^3 containers, designated storage areas for various recyclables, stockpile areas for C&D and bulky waste and brush.
-To accommodate the changes the design must be changed within the approved 5.03ha landfilling area to maintain the sites total approved capacity of 434,340 m^3.
-The preliminary design is illustrated on Drawing No. 2, the contours outside the approved landfilling area will comprise clean fill to establish the toe of slope.
-Pre-submission consultation with the Ottawa District Office and TSS Regional Office is required prior to the application to amend the ECA. The letter combined with the recent Annual Report is anticipated to facilitate pre-submission consultation.

Reviewer's Comments:

The consultant's interpretation of surface water impact is reasonable in that the landfill is not having an adverse effect on surrounding surface water; however, there are elevated leachate indicator parameters in the 'draw' (ravine) feature north of the site at SW-1A and BLC relative to background concentrations at MVC. For example, in 2021, median concentrations at SW1-A were two to three times higher than background median concentrations for alkalinity, un-ionized ammonia, barium, boron, sulphate, nitrate, and total dissolved solids. However, the concentrations of the elevated values are not of concern at this time.

The consultant compared nitrate-nitrogen concentrations to the CWQG of 13 mg/L which is intended for the nitrate ion (NO_3^-). The reports from Caduceon (2020 AMR) and Eurofins (2021 AMR) report units of nitrate nitrogen (NO_3 -N). Therefore, the applicable (long term) CWQG for nitrate nitrogen is 3 mg/L.

The leachate well (BH-5) has consistent detectable concentrations of volatile organic carbons. There were no detectable concentrations of VOCs in surface water stations since VOC monitoring began in 2012.

The proposed surface water monitoring program for 2022 is acceptable provided that sodium, strontium, and manganese are added to the list of Column 3, Schedule 5 parameters.

The proposed trigger mechanism should consider that phenol is not identified as a leachate indicator parameter. I would recommend removing phenol from the trigger parameter list.

The trigger concentrations for chloride and boron should be either the 75th percentile of background concentration or the Canadian Water Quality Guideline for long term exposures (120 mg/L and 1.5 mg/L, respectively), whichever is higher as the CWQG are newer than the PWQOs for these two parameters. The APV values proposed in the trigger mechanism are not intended to protect aquatic life.

The contingency plan should be triggered if there is an exceedance of trigger concentrations for any one of the trigger parameters over four consecutive events (i.e., one monitoring year) and/or there are significant changes to the surface water quality (i.e., increase in leachate indicator parameters versus historical values or clear apparent increases in indicator parameter concentrations over time). The trigger mechanism (as written by the consultant) appears to consider if the calculated 75th percentile values for the entire period of record at the trigger location exceed the higher of the PWQO, CWQG and/or APV values.

An Approvals Branch waste engineer should be consulted on the proposed change to the 30 m buffer as this may not meet minimum regulatory requirements in O. Reg. 232/98. The proposed changes would result in the 30m buffer area being impinged upon along three sides of the waste disposal site. The north side of the waste disposal site has steep topography along with a tree line which the reconfigured waste mound would abut.

Summary of Reviewer's Recommendations

1. The proposed surface water monitoring program for 2022 is acceptable provided that sodium, strontium, and manganese are added to the list of Column 3, Schedule 5 parameters.

2. The applicable (long term) CWQG for nitrate-nitrogen is 3 mg/L based on 2021 and 2020 lab reports. The lab reports should be examined to see if the lab has reported nitrate or nitrate-nitrogen so the applicable CWQG can be applied.

3. The proposed trigger mechanism should consider that phenol is not identified as a leachate indicator parameter. I would recommend removing phenol from the trigger parameter list.

4. The trigger concentrations for chloride and boron should be either the 75th percentile of background concentration (using the entire data set) or the Canadian Water Quality Guideline for long term exposures (120 mg/L and 1.5 mg/L, respectively), whichever is higher. The concentrations observed at the trigger location (SW-1A) on each sampling event would then be compared to the

trigger concentration value for each parameter. The contingency plan should be triggered if there is an exceedance of trigger concentrations for any one of the trigger parameters over four consecutive events (i.e., one monitoring year) and/or there are significant changes to the surface water quality (i.e., increase in leachate indicator parameters versus historical values or clear apparent increases in indicator parameter concentrations over time).

5. An Approvals Branch waste engineer should be consulted on the proposed change to the 30 m buffer as this may not meet minimum regulatory requirements in O. Reg. 232/98.

6. A description of the site, surrounding land use, and topography is needed in future reports

Please do not hesitate to contact me if you have any questions about these comments.

"*Original Signed by"*

Beth Gilbert, M.Sc.

BG/bg

ec: V. Castro, Water Resources Unit Supervisor (Acting)
C. Klein, Technical Support Section Manager
E. Tieu, Ottawa District Supervisor

c: T. Guo, Regional Hydrogeologist
File SW RE WH 03 06 C5 Ross WDS
SW 07 02 13-01-02-01 Ottawa River Basin General (Upstream Ottawa), Broomes Creek
BG/ECHO# 1-113143143 (2021 AMR), 1-99434171 (2020 AMR)

Ministry of the Environment, Conservation and Parks
Eastern Region
1259 Gardiners Road, Unit 3
Kingston ON K7P 3J6
Phone: 613.549.4000
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Ministère de l'Environnement, de la Protection de la nature et des Parcs
Région de l'Est
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ou 1 800 267-0974

Ontario

M E M O R A N D U M

October 31, 2024

TO: T. Ponalo, Senior Environmental Officer
Ottawa District Office, Eastern Region

FROM: B. Gilbert, Surface Water Specialist
Technical Support Section, Eastern Region

RE: Ross Landfill Site
2023 Monitoring Report
Part Lot 10, Concession 5; 990 Kohlsmith Road
Township of Whitewater Region
County of Renfrew
Certificate of Approval No. A413209

As requested by you, I have reviewed the surface water related aspects of the following document:

- Ross Landfill Site, Township of Whitewater Region, Environmental Compliance Approval No. A413209, 2023 Annual Monitoring Report (Part 2). Prepared for Township of Whitewater Region. Prepared by Jp2g Consultants Inc. Dated March 26, 2024.

My previous correspondence to you on this file was dated September 7, 2022. That memorandum provided review comments on the 2020 and 2021 Monitoring Reports along with two letters that provided details on proposed operational changes at the site to change the waste mound and 30m buffer zone to accommodate weigh scales.

I offer the following comments for your consideration relating to surface water impacts only. I have reviewed the most recent groundwater unit memorandum dated July 26, 2022, on the 2021 Annual Report and proposed operational changes.

Background Information

The Ross Waste Disposal Site (WDS) operates under Environmental Compliance Approval (ECA) No. A413209, dated December 23, 2005, as amended March 15, 2013, and Notice No. 2 dated July 21, 2014 which permits the use and operation of a 5.4 ha landfilling area and segregated waste storage and processing facilities within a site area of 25 ha. Notice No. 2 permitted development and operation of Stage 2.

The site has been in operation since the early 1970's. The site started filling Stage 2 in July 2014. The intermediate cover applied on Stage 1 is reported as in good condition. An area of historical deposit of waste beyond approved limits exists in the 30m buffer area along the north corner of the site.

The site is licenced to receive solid, non-hazardous municipal waste and recyclables (tires, scrap metal and other recyclables) that are stored and processed on-site. The site operates as a natural attenuation facility. Jp2g estimates that the remaining site capacity is approximately 20 years.

Site Description

The site is located at 990 Kohlsmith road. The road to the immediate west of the site is Mineview Road and to the immediate east of the site is an unopened road allowance known as Blind Line.

Based on a site visit in April 2013, the surrounding area is largely rural and agricultural in nature. The area to the immediate north of the site is an undulating hilly landscape with a mix of forest and some cedar swamp in low lying areas. Areas to the immediate west and east are agricultural. Examination of aerial imagery indicates agricultural land and what appears to be a pit to the immediate south.

The groundwater unit reports that the ground surface north of the fill area is undulating and multiple depressions exist without obvious surface outlets. According to the groundwater unit, these depressions appear capable of retaining precipitation, particularly snowmelt. The groundwater unit indicates the depressions may function as localized freshwater infiltration galleries.

Surface Water Features

Jp2g reports that: a swale meanders northeast across a farm field toward Mineview Road and crosses under the road; from Mineview Road to the north-east there is no defined channel, this swale is intermittent and meanders north-east through a grassy field; the swale disappears prior to reaching the north-west corner of the WDS; there is a ‘draw’ (ravine) in the woodlot to the north of the WDS that experiences seasonal surface ponding during wet periods of the year but is dry for the most part; north-east of BH-6 some stagnant puddles exist; further to the north-east a defined watercourse channel emerges and flows to a municipal ditch on the east side of Blind Line (unopened road allowance); from Blind Line surface water flows south under Kohlsmith Road.

Examination of topographic mapping indicates that the watercourse eventually drains in a north-easterly direction until it joins Broomes Creek, approximately 8km downstream. Broomes Creek continues for another 4km in an easterly direction until it outlets to the Ottawa River.

Leachate Characteristics

Monitor BH-5 is located at the western toe of the historical fill area and is used to characterize leachate. The consultant identified the following parameters as having elevated concentrations relative to background concentrations: TDS, chloride, sulphate, alkalinity, sodium, manganese, barium, boron, and calcium.

Groundwater Surface Water Interaction

The groundwater unit indicates that the potential exists for impacts to occur to surface water located within the Contaminant Attenuation Zone (CAZ) north of the fill area.

Surface Water Monitoring Program

Jp2g reports that there are three active surface water stations MVC (SW-2), SW-1, and BLC (SW-3). MVC is the upstream sampling location to the southwest of the site at the Mine View Road culvert. SW-1A is immediately north of the site, 25 m west of BH-11. SW-1A was moved to this location in 2012 to an area in the vicinity where the groundwater is anticipated to discharge to the surface water. The historical location is termed SW-1. BLC is northeast of the site at the Blind Line culvert, downstream of the site.

Samples are collected two times per year (spring and fall) and following two storm events. Samples are analyzed for the comprehensive list (Schedule 5, Column 3) of parameters for all four sampling events. A Volatile Organic Carbon (VOC) scan is completed once per year at SW-1.

2023 Surface Water Monitoring Results

The consultant reports the following for 2023:

-Samples were collected in spring (June), summer (August), and fall (October) and following two storm events in September and May.
-MVC had insufficient water during the June, August and November sampling events.
-All parameters reveal concentrations less than Provincial Water Quality Objectives (PWQOs), Canadian Water Quality Guidelines for protection of aquatic life (CWQGs), and Aquatic Protection Values (APVs) except for:

- SW1A exceeded PWQO for total phosphorus (0.058 mg/L) on one occasion and the CWQG for nitrate was exceeded routinely (3.97 – 6.38 mg/L)
- BLC exceeded the PWQO for un-ionized ammonia on two occasions (0.0197 and 0.02 mg/L).

Jp2g are of the opinion that elevated nitrate and chlorides are entirely landfill related as there are agricultural activities and road maintenance activities that can influence these parameters.

Jp2g concluded that the data does not indicate any impact on the nearby surface water as a result of landfilling activities.

Trigger Mechanism and Contingency Plans

Jp2g recommends the following trigger mechanism:

- Parameters: unionized ammonia, phenols, boron, and chloride
- Location: SW-1A

- Trigger Concentrations: are the higher of the respective PWQOs, CWQGs, or APVs for the individual trigger parameter. Compliance evaluation is done by comparing the 75th percentile concentration at the trigger location to either the PWQO, CWQG or APV. The 75th percentile concentrations are calculated for each of the trigger parameters on the entire sampling history.
- Trigger Mechanism: contingency measures would be implemented if the calculated 75th percentile concentrations (taken over the entire sampling history) exceed the compliance values (i.e., the higher of the PWQO, CWQG, and or the APV values) for any one of the trigger parameters at the trigger location over four consecutive sampling events and/or there are significant changes to the surface water quality (i.e., increase in leachate indicator parameters versus historical values or clear apparent increases in indicator parameter concentrations over time).

Jp2g indicates the trigger mechanism was not triggered in 2023.

The surface water contingency plan includes: increased sampling frequency; analysis of additional indicator parameters such as toxicity testing; increased number of sampling locations; use of cover material to influence leachate generation or surface water flow patterns; and remedial alternatives.

Consultant's Proposed 2024 Surface Water Monitoring Program (Table 24)

- Sample the three surface water stations during spring and fall and after any two storm events.
- Completion of surface water sampling according to the schedule provided in Table 24.
- Annual reporting of chemical results and yearly assessment of the need to amend the surface water sampling program. Any deviations from the monitoring program must be approved in accordance with ECA Condition 97.
- All surface water stations should be clearly labelled.

Reviewer's Comments:

The consultant's interpretation of surface water impact is reasonable in that the landfill is not having an adverse effect on surrounding surface water; however, there are increasing concentrations of leachate indicator parameters at BH-5 (leachate well) beginning in around 2015. Concentrations of TAN, boron, chloride, iron and copper in BH-5 have the potential to impair surface waters.

Careful examination of surface water quality data relative to PWQOs and CWQGs should continue and should include trend plots of key leachate indicator parameters over time to visualize if parameter concentrations are increasing. Notably, there was a sudden elevation in un-ionized ammonia concentrations at BLC in June and August 2023 (greater than PWQO) when normally un-ionized ammonia concentrations at this location are 2 orders of magnitude lower.

In Section 2.1, the consultant has provided a response to previous comments on the 2021/22 annual reports. Moving forward:

- the consultant will compare surface water quality data to the CWQG of 3 mg/L for nitrate-nitrogen.
- sodium, strontium, and manganese will be added to the surface water parameter list.
- phenols will be removed from the trigger mechanism.
- the trigger concentrations for chloride and boron will be changed to the CWQG values.

The above responses are acceptable. The proposed surface water monitoring program for 2024 is acceptable.

The contingency plan should be triggered if there is an exceedance of trigger concentrations for any one of the trigger parameters over four consecutive events (i.e., one monitoring year) and/or there are significant changes to the surface water quality (i.e., increase in leachate indicator parameters versus historical values or clear apparent increases in indicator parameter concentrations over time). The trigger mechanism (as written by the consultant) appears to consider if the calculated 75th percentile values for the entire period of record at the trigger location exceed the higher of the PWQO, CWQG and/or APV values. This comment has not been addressed.

Regarding the proposed changes to the site buffer to accommodate weigh scales, the response in Section 2.1 indicates that the buffer along the south side of the site is proposed to be increased from 30m to 60m and the buffer along the other sides (east, west and north) will be maintained the same (presumably 30m). If a 30m minimum buffer is maintained this would address the previous concern regarding conformance with minimum buffers in O.Reg.232/98. The ECA application should be reviewed by Approvals Branch to make sure minimum buffer requirements are met.

Summary of Reviewer's Recommendations

1. The proposed surface water monitoring program for 2024 is acceptable.

2. The concentrations observed at the trigger location (SW-1A) on each sampling event should be compared to the trigger concentration value for each parameter. The contingency plan should be triggered if there is an exceedance of trigger concentrations for any one of the trigger parameters over four consecutive events (i.e., one monitoring year) and/or there are significant changes to the surface water quality (i.e., increase in leachate indicator parameters versus historical values or clear apparent increases in indicator parameter concentrations over time). The trigger mechanism should be reviewed annually to ensure it is still relevant to the site-specific leachate indicators and conceptual site model.

3. Careful examination of surface water quality data relative to PWQOs and CWQGs should continue and should include trend plots of key leachate indicator parameters over time to visualize if parameter concentrations are increasing in surface water locations adjacent to the site.

4. It appears the consultant has considered the previous comments about not impinging on the 30m buffer on the north side of the site. They indicate waste was removed from the south portion of the mound and placed on top of the mound. The consultant should probably confirm that this would conform to the approved elevations for the site.

5. The ECA application should be reviewed by Approvals Branch to make sure minimum buffer requirements are met.

Please do not hesitate to contact me if you have any questions about these comments.

"*Original Signed by"*

Beth Gilbert, M.Sc.

BG/bg

ec: V. Castro, Water Resources Unit Supervisor
C. Klein, Technical Support Section Manager
E. Tieu, Ottawa District Supervisor

c: T. Guo, Regional Hydrogeologist
File SW RE WH 03 06 C5 Ross WDS
SW 07 02 13-01-02-01 Ottawa River Basin General (Upstream Ottawa), Broomes Creek
BG/ECHO# 1-631206956

Appendix D
Borehole Logs

PROJECT: 901-2842

RECORD OF BOREHOLE 1

SHEET 1 OF 2

LOCATION: See Figure 2

BORING DATE: Aug.15,1990

DATUM: LOCAL

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m; SHEAR STRENGTH Cu, kPa (nat.V- + Q-●, rem.V- ⊕ U-○)	HYDRAULIC CONDUCTIVITY, k, cm/s; WATER CONTENT, PERCENT (Wp, W, WL)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger 200mm Diam (Hollow Stem)	Ground Surface		300.21							Cement Seal
		Dark brown sandy TOPSOIL		299.97 / 0.24							
		Yellow brown fine to coarse SAND, trace to some silt		299.45 / 0.76							
1		Brown fine to coarse SAND, trace gravel		298.69 / 1.52							Native Backfill
2		Compact brown stratified fine to medium SAND			1	50 DO	11				
				297.47 / 2.74	2	50 DO	17				
3											
					3	50 DO	20				32mm PVC Riser Pipe
4											
5		Compact brown stratified fine SAND, trace silt, occasional thin (2.5 to 5.0cm) silty fine sand layers			4	50 DO	23				
6											
7					5	50 DO	22				
8											
9				291.37 / 8.84	6	50 DO	23				
		Compact brown fine to coarse SAND									
10		CONTINUED ON NEXT PAGE									

SHEAR STRENGTH Cu, kPa: 20 40 60 80 (nat.V- + Q-●, rem.V- ⊕ U-○)

WATER CONTENT, PERCENT: Wp W WL; 20 40 60 80

5 0 5 PERCENT AXIAL STRAIN AT FAILURE 10

DEPTH SCALE

1 to 50

LOGGED: S.Leighton

Golder Associates

PROJECT: 901-2842

RECORD OF BOREHOLE 1

SHEET 2 OF 2

LOCATION: See Figure 2

BORING DATE: Aug.15,1990

LOCAL

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m; SHEAR STRENGTH Cu, kPa (nat.V - + Q - ● rem.V - ⊕ U - O)	HYDRAULIC CONDUCTIVITY, k, cm/s; WATER CONTENT, PERCENT (Wp, W, Wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	Power Auger 200mm Diam (Hollow Stem)	CONTINUED FROM PREVIOUS PAGE									
		Compact brown fine to coarse SAND			7	SS DO	12				Bentonite Seal; Native Backfill
11											
				288.83 / 11.58							
12		Loose brown fine to coarse SAND, scattered trace gravel			8	SS DO	8			M	
13											32mm PVC #6 Slot Screen
				286.19 / 14.02	9	SS DO	24				
14		Compact brown fine to coarse SAND, some gravel and silt									
15											
		Very stiff grey brown SILTY CLAY to CLAYEY SILT with sand seams		284.82 / 15.39	10	SS DO	20				
		Probably silty sand (GLACIAL TILL)		284.57 / 15.64							
16		End of Hole		15.78							W.L in Well Screen at Elev.288.01 Jan.2,1990
17											
18											
19											
20											

0 / 15 ◆ 5 / 10 PERCENT AXIAL STRAIN AT FAILURE

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: S.Leighton

CHECKED:

PROJECT: 901-2842

RECORD OF BOREHOLE 2

SHEET 1 OF 2

LOCATION: See Figure 2

BORING DATE: Aug.16,1990

LOCAL:

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m; SHEAR STRENGTH Cu, kPa (nat.V- + Q-●; rem.V- ⊕ U-○) 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s; WATER CONTENT, PERCENT Wp W Wl 20 40 60 80	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger 200mm Diam (Hollow Stem)	Ground Surface		296.83 / 0.00							Cement Seal
1		Very loose brown fine sand, trace paper, plastic, ash, metal and glass (FILL)			1	SS DO	1				Native Backfill
2		Very loose brown fine to medium SAND		294.91 / 1.92							
3		Loose brown stratified fine SAND, trace silt		294.09 / 2.74	2	SS DO	8				
4											32mm PVC Riser Pipe
5				292.56 / 4.27	3	SS DO	7				
6		Loose to compact brown faintly stratified fine SAND, trace silt									
7					4	SS DO	11				Bentonite Seal
8		Loose brown stratified fine SAND, trace silt		289.36 / 7.47	5	SS DO	9				Native Backfill
9				288.30 / 8.53							32mm PVC #6 Slot Screen B
10		Loose brown fine to medium SAND			6	SS DO	6			M	
		CONTINUED ON NEXT PAGE									

0 5 10 15 5 PERCENT AXIAL STRAIN AT FAILURE

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: S.Leighton

CHECKED:

PROJECT: 901-2842

RECORD OF BOREHOLE 2

SHEET 2 OF 2

LOCATION: See Figure 2

BORING DATE: Aug.16,1990

DATUM: LOCAL

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH scale METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	Power Auger 200mm Diam. (Hollow Stem)	CONTINUED FROM PREVIOUS PAGE						SHEAR STRENGTH Cu, kPa: nat.V - + Q - ● rem.V - ⊕ U - O (20, 40, 60, 80)	WATER CONTENT, PERCENT: Wp, W, Wl (20, 40, 60, 80)		
		Loose brown fine to medium SAND		286.47 / 10.36							
11		Very stiff grey SILTY CLAY to CLAYEY SILT, occasional silty sand layer		285.25 / 11.58	7	50 DO	4			MH	Bentonite Seal; 32mm PVC #6 Slot Screen A
12		Probably fine Sand, trace silt		284.70 / 12.13							
		Grey SILTY CLAY		284.48 / 12.34	8	50 DO	> 50				
		Grey silty sand (TILL)									
		Fractured GRANITIC BEDROCK		12.47							
13		End of Hole Auger Refusal									W.L in Well Screen A at Elev.288.06 Screen B at Elev.287.90 Jan.2,1991
14											
15											
16											
17											
18											
19											
20											

0 / 15 ◆ 5 PERCENT AXIAL STRAIN AT FAILURE / 10

DATA IN

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: S.Leighton

CHECKED:

PROJECT: 901-2842

RECORD OF BOREHOLE 3

SHEET 1 OF 2

LOCATION: See Figure 2

BORING DATE: Aug 16&17 19,90

DATUM: LOCAL

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m; SHEAR STRENGTH Cu, kPa (nat.V - +, rem.V - ⊕, Q - ●, U - O)	HYDRAULIC CONDUCTIVITY, k, cm/s; WATER CONTENT, PERCENT (Wp, W, Wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		Ground Surface		294.80							
		Brown fine sand (FILL)		0.00 294.56							Cement Seal
		Dark brown sandy TOPSOIL		0.21 294.37							
				0.43							
1		Brown fine SAND									Native Backfill
				293.52 1.28							
		Loose brown fine to medium SAND			1	SS	4				
2				292.73 2.07							
		Loose brown fine SAND, trace silt, occasional 2.5cm silty fine sand seam									
3											32mm PVC Riser Pipe
				291.45 3.35	2	SS	7				
4		Loose brown fine to medium SAND									
				290.08 4.72							
	Power Auger 200mm Diam (Hollow Stem)	Compact brown stratified fine SAND, some silt		289.77 5.03	3	SS	17				
5											
6		Very stiff grey brown SILTY CLAY to CLAYEY SILT (Weathered Crust)			4	SS	8				Bentonite Seal
7				287.79 7.01							
		Probably brown fine SAND		287.48 7.32							
8		Compact brown fine to coarse SAND, occasional thin fine sand layers with depth, trace gravel			5	SS	13				Native Backfill
9											32mm PVC #6 Slot Screen
					6	SS	13			M	
10		CONTINUED ON NEXT PAGE									

0 15 10 5 PERCENT AXIAL STRAIN AT FAILURE

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: S. Leighton

CHECKED:

PROJECT: 901-2842

RECORD OF BOREHOLE 3

SHEET 2 OF 2

LOCATION: See Figure 2

BORING DATE: Aug.16&17,1990

DATUM: LOCAL

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	SHEAR STRENGTH Cu, kPa (nat.V- + Q-●, rem.V- ⊕ U-O)	HYDRAULIC CONDUCTIVITY, k, cm/s	WATER CONTENT, PERCENT (Wp, W, Wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10	Power Auger 200mm Diam (Hollow Stem)	CONTINUED FROM PREVIOUS PAGE											
11		Compact brown fine to coarse SAND, occasional thin fine sand layers with depth, trace gravel			7	50 DO	22						
				283.22 11.58									
		Brown fine to coarse SAND		282.91 11.89									
12		Very dense brown fine to coarse SAND and GRAVEL, occasional cobble			8	50 DO	56						
13				281.39 13.41									
14		Loose brown stratified fine SAND, occasional 7.5 to 10 cm seam of fine to coarse sand with trace gravel and silt			9	50 DO	6						
15					10	50 DO	7						
16		End of Hole		278.95 15.85									W.L in Well Screen at Elev.286.04 Jan.2,1991
17													
18													
19													
20													

0 15 5 10 PERCENT AXIAL STRAIN AT FAILURE

DATA

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: S.Leighton

CHECKED:

PROJECT: 901-2642

RECORD OF BOREHOLE 4

SHEET 1 OF 2

LOCATION: See Figure 2

BORING DATE: Aug-19&20-1990

LOCAL

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger 200mm Diam. (Hollow Stem)	Ground Surface		294.52 / 0.00				SHEAR STRENGTH Cu, kPa: nat.V- + Q-● rem.V- ⊕ U-O (20, 40, 60, 80)	WATER CONTENT, PERCENT Wp W Wl (20, 40, 60, 80)		Bentonite Seal
		Brown sand, trace gravel (FILL)		294.22 / 0.30							
		Red brown SAND and GRAVEL, trace roots		293.91 / 0.61							
1		Brown fine to medium SAND		293.61 / 0.91							Native Backfill
		Compact brown fine to coarse SAND and GRAVEL, some cobbles and boulders			1	50 DO	14				
2											
3		Compact brown fine to coarse SAND, some gravel, occasional cobble		291.76 / 2.74	2	50 DO	10				32mm PVC Riser Pipe
					3	50 DO	11				
4											
5		Brown SAND and GRAVEL, some cobbles and boulders		289.19 / 5.33							
				288.58 / 5.94	4	50 DO	6				Bentonite Seal
6		Loose brown fine to coarse SAND, trace gravel									Native Backfill
7											
					5	50 DO	7			M	
8											
9					6	50 DO	7				Bentonite Seal
10		CONTINUED ON NEXT PAGE									Native Backfill

0 5 10 5 PERCENT AXIAL STRAIN AT FAILURE

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: S. Leighton

CHECKED:

PROJECT: 901-2842

RECORD OF BOREHOLE 4

SHEET 2 OF 2

LOCATION: See Figure 2

BORING DATE: Aug. 19&20,1990

LOCAL

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m; SHEAR STRENGTH Cu, kPa (natV - +, remV - ⊕, Q - ●, U - O)	HYDRAULIC CONDUCTIVITY, k, cm/s; WATER CONTENT, PERCENT (Wp, W, Wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10		CONTINUED FROM PREVIOUS PAGE									
		Loose brown fine to coarse SAND, trace gravel		283.70							
11	Power Auger 200mm Diam (Hollow Stem)			10.82	7	SS DO	36				
12		Dense brown fine to coarse SAND and GRAVEL			8	SS DO	46			M	32mm PVC #6 Slot Screen
13											
				280.80							
14		End of Hole		13.72							W.L in Well Screen at Elev.287.81 Jan.2,1991
15											
16											
17											
18											
19											
20											

DATA

0 / 15 ◆ 5 / 10 PERCENT AXIAL STRAIN AT FAILURE

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: S.Leighton

CHECKED:

PROJECT: 901-2842

RECORD OF BOREHOLE 4A

SHEET 1 OF 1

LOCATION: See Figure 2

BORING DATE: Aug.19,20,1990

LOCAL

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m; SHEAR STRENGTH Cu, kPa (nat.V- +, rem.V- ⊕, Q-●, U-O)	HYDRAULIC CONDUCTIVITY, k, cm/s; WATER CONTENT, PERCENT (Wp, W, Wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger 200mm Diam (Hollow Stem)	Ground Surface		294.52							
		Brown sand, trace gravel (FILL)		0.00 / 294.22							Bentonite Seal
		Red brown SAND and GRAVEL, trace roots		0.30 / 293.91							Native Backfill
		Brown fine to medium SAND		0.61 / 293.61							
1		Compact brown fine to coarse SAND and GRAVEL, some cobbles and boulders		0.91 / 291.78							
2											
3		Compact brown fine to coarse SAND, some gravel, occasional cobble		2.74 / 289.19							32mm PVC Riser Pipe
4											
5											
		Brown SAND and GRAVEL, some cobbles and boulders		5.33 / 286.58							Bentonite Seal
6		Loose brown fine to coarse SAND, trace gravel		5.94							Native Backfill
7											
8											32mm PVC #6 Slot Screen
9				285.38							
		End of Hole		9.14							W.L in Screen at elev. 287.80m Jan. 2, 1991
10											

0 5 10 PERCENT AXIAL STRAIN AT FAILURE

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: S.Leighton

CHECKED:

PROJECT: 901-2842

RECORD OF BOREHOLE 5

SHEET 1 OF 2

LOCATION: See Figure 2

BORING DATE: Aug.21,1990

DATUM: LOCAL

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m; SHEAR STRENGTH Cu, kPa (nat.V - +, rem.V - ⊕, Q - ●, U - O)	HYDRAULIC CONDUCTIVITY, k, cm/s; WATER CONTENT, PERCENT (Wp, W, Wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		Ground Surface		294.79 / 0.00							
		Brown fine sand, trace plastic (FILL)		294.36 / 0.43							Cement Seal
		Brown fine to medium SAND, trace to some silt									Native Backfill
1				293.57 / 1.22							
		Loose brown stratified fine SAND			1	50 DO	6				
2											
				292.05 / 2.74							
3		Loose brown fine to medium SAND			2	50 DO	4				32mm PVC Riser Pipe
4				290.68 / 4.11							
					3	50 DO	6				
5	Power Auger 200mm Diam (Hollow Stem)	Loose brown fine to coarse SAND, scattered trace gravel									
6					4	50 DO	5				Bentonite Seal
7				287.32 / 7.47							Native Backfill
8					5	50 DO	9			MH	32mm PVC #6 Slot Screen
		Loose to compact brown fine SAND, occasional silty sand seam and layer									
9											
					6	50 DO	17				
10		CONTINUED ON NEXT PAGE									

DATA

0 15 ◆ 5 PERCENT AXIAL STRAIN AT FAILURE 10

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: S.Leighton

CHECKED:

PROJECT: 901-2842

RECORD OF BOREHOLE 5

SHEET 2 OF 2

LOCATION: See Figure 2

BORING DATE: Aug.21,1990

DATUM: LOCAL

SAMPLER HAMMER, 63.5kg; DROP, 760mm

PENETRATION TEST HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m	HYDRAULIC CONDUCTIVITY, k, cm/s	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
10		CONTINUED FROM PREVIOUS PAGE						SHEAR STRENGTH Cu, kPa nat.V- + Q-● rem.V- ⊕ U-○ 20 40 60 80	WATER CONTENT, PERCENT Wp W Wl 20 40 60 80		
	Power Auger 200mm Diam (Hollow Stem)	Loose to compact brown fine SAND, occasional silty sand seam and layer		283.97							
11		Compact brown fine to coarse SAND and GRAVEL		10.82 283.51	7	SS DO	25				W.L in Well Screen at Elev.287.88 Jan.2,1991
		End of Hole		11.28							
12											
13											
14											
15											
16											
17											
18											
19											
20											

0 15 5 10 PERCENT AXIAL STRAIN AT FAILURE

DEPTH SCALE

1 to 50

Golder Associates

LOGGED: S.Leighton

CHECKED:

DATA II

PROJECT: 901-2842

LOCATION: See Figure 2

DIP:

RECORD OF BOREHOLE 6

BORING DATE: Nov.28,29,1990

SHEET 1 OF 2

DATUM: Local

SAMPLER HAMMER, 63.5 kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	LAB. TESTING	GAS CONCENTRATION (20 40 60 80) / % LEL	HYDRAULIC CONDUCTIVITY, k, cm/s / WATER CONTENT, PERCENT Wp W Wl	INSTALLATIONS
0	Power Auger 200mm Diam. (Hollow Stem)	Ground Surface		295.19								
		TOPSOIL		0.10								
1		Very loose to loose brown stratified fine to coarse SAND, scattered trace gravel			1	50 DO	2					Bentonite Seal
2												51mm PVC Riser Pipe
3					2	50 DO	7					
4				290.92 / 4.27								Native Sand Backfill
5					3	50 DO	7					
6		Loose to compact brown stratified fine to medium SAND, some coarse sand and gravel			4	50 DO	10					
7												
8				287.27 / 7.92	5	50 DO	5					
		Grey SILTY CLAY to CLAYEY SILT with occasional silty sand seam		286.66 / 8.53								
9		Very loose to compact grey to brown, fine to coarse SAND, some gravel, trace to some silt, occasional silty clay seams			6	50 DO	17					Bentonite Seal
10		CONTINUED ON NEXT PAGE										

DEPTH SCALE (ALONG HOLE)

1 to 50

Golder Associates

LOGGED: K.A.M.

CHECKED:

DATA ENTRY: J.COBB

PROJECT: 901-2842

RECORD OF BOREHOLE 6

SHEET 2 OF 2

LOCATION: See Figure 2

BORING DATE: Nov.28,29,1990

DATUM: Local

DIP:

SAMPLER HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	LAB. TESTING	GAS CONCENTRATION ⊕ ( ) 20 40 60 80 / % LEL □ 20 40 60 80	HYDRAULIC CONDUCTIVITY, k, cm/s / WATER CONTENT, PERCENT Wp W Wl 20 40 60 80	INSTALLATIONS A B C
10		CONTINUED FROM PREVIOUS PAGE										
11					7	50 DO	8					
12		Very loose to compact grey to brown fine to coarse SAND, some gravel, trace to some silt, occasional silty clay seams			8	50 DO	11					Bentonite Seal
13												Native Sand Backfill
14					9	50 DO	8					
15				279.95 15.24								51mm PVC #10 Slot Screen
16		Loose grey SILTY fine SAND, occasional silty clay and sand seams		279.11 16.08	10	50 DO	7					
17		End of Hole Auger Refusal										W.L in Screen A at Elev.287.67 Screen B at Elev.287.57 Jan.2,1991
18												
19												
20												

DEPTH SCALE (ALONG HOLE)

1 to 50

Golder Associates

LOGGED: K.A.M.

CHECKED:

PROJECT: 901-2842

LOCATION: See Figure 2

DIP:

RECORD OF BOREHOLE 7

BORING DATE: NOV. 30, 1990

SHEET 1 OF 2

DATUM: Local

SAMPLER HAMMER, 63.5 kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	LAB. TESTING
0	Power Auger 200mm Diam. (Hollow Stem)	Ground Surface		293.56					
		TOPSOIL		0.08					
1		Compact brown stratified fine to coarse SAND, some gravel, trace silt, occasional cobble and organics			1	SS	50 DO 12		
2									
3					2	SS	50 DO 10		
4									
5					3	SS	50 DO 17		
6				287.46					
				6.10	4	SS	50 DO 19		
7									
8		Compact brown fine to coarse SAND and GRAVEL, trace to some silt			5	SS	50 DO 20		
9									
					6	SS	50 DO 20		
10		CONTINUED ON NEXT PAGE							

ORGANIC VAPOUR ( ) ⊕ — 20 40 60 80

% LEL □ — 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s

WATER CONTENT, PERCENT — Wp W Wl — 20 40 60 80

INSTALLATIONS

A B C

Bentonite Seal

Native Sand Backfill

Bentonite Seal

Native Sand Backfill

DEPTH SCALE (ALONG HOLE)

1 to 50

Golder Associates

LOGGED: K.A.M.

CHECKED:

DATA J.CO 3C 3

PROJECT: 901-2842

RECORD OF BOREHOLE 7

SHEET 2 OF 2

LOCATION: See Figure 2

BORING DATE: NOV. 30, 1990

DATUM: Local

DIP:

SAMPLER HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	LAB. TESTING
10		CONTINUED FROM PREVIOUS PAGE							
11		Compact brown fine to coarse SAND and GRAVEL, trace to some silt		281.67 / 11.89	7	50 DO	16		
12		Compact brown fine to coarse SAND, trace to some gravel, trace silt, occasional cobble		280.61 / 12.95	8	50 DO	23		
13									
14		Compact to dense brown fine to coarse SAND and GRAVEL, trace to some silt, occasional cobble			9	50 DO	22		
15									
16				277.72 / 15.84	10	50 DO	46		
		End of Hole *							
17									
18									
19									
20									

ORGANIC VAPOUR ( ) ⊕ — 20 40 60 80

% LEL □ — 20 40 60 80

HYDRAULIC CONDUCTIVITY, k, cm/s

WATER CONTENT, PERCENT — Wp ⊢ W ⊣ Wl — 20 40 60 80

INSTALLATIONS — A B C

W.L. in Screen A at Elev.287.56 Screen B at Elev.287.56 Jan.2,1991

DEPTH SCALE (ALONG HOLE)

1 to 50

Golder Associates

LOGGED: K.A.M.

CHECKED:

J.COD IC3 DATA

PROJECT: 901-2842

LOCATION: See Figure 2

DIP:

RECORD OF BOREHOLE 8

BORING DATE: NOV. 28, 1990

SHEET 1 OF 2

DATUM: Local

SAMPLER HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	LAB. TESTING	ORGANIC VAPOUR (20 40 60 80)	% LEL (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s	WATER CONTENT, PERCENT Wp W Wl (20 40 60 80)	INSTALLATIONS
0	Power Auger 200mm Diam. (Hollow Stem)	Ground Surface		296.70										A B C
		TOPSOIL		0.10										
1		Loose brown stratified fine to coarse SAND, trace silt and gravel, occasional thin silty sand seam			1	SS	50 DO 7							Bentonite Seal
2														
3					2	SS	50 DO 7							
4														Native Sand Backfill
5					3	SS	50 DO 9							
6				290.46 6.24	4	SS	50 DO 18							
7		Grey brown SILTY CLAY to CLAYEY SILT, occasional 2.5cm sand seam												
8					5	SS	50 DO 16							Bentonite Seal
9				287.56 9.14										
		Compact to dense brown stratified fine to medium SAND, trace to some silt, trace clay			6	SS	50 DO 32							Native Sand Backfill
10		CONTINUED ON NEXT PAGE												

DEPTH SCALE (ALONG HOLE)

1 to 50

Golder Associates

LOGGED: K.A.M.

CHECKED:

SC3 J.CO DATA

PROJECT: 901-2842

RECORD OF BOREHOLE 8

SHEET 2 OF 2

LOCATION: See Figure 2

BORING DATE: NOV. 26, 1990

DATUM: Local

DIP:

SAMPLER HAMMER, 63.5 kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	LAB. TESTING	ORGANIC VAPOUR (20 40 60 80) / % LEL (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s / WATER CONTENT, PERCENT Wp W Wl (20 40 60 80)	INSTALLATIONS: A B C
10		CONTINUED FROM PREVIOUS PAGE										
11		Compact to dense brown stratified fine to medium SAND, trace to some silt, trace clay			7	50 DO	11					
12					6	WS						
				284.51 / 12.19								
		End of Hole										
13												W.L in Screen at Elev.286.38 Jan.2,1991
14												
15												
16												
17												
18												
19												
20												

DEPTH SCALE (ALONG HOLE)

1 to 50

Golder Associates

LOGGED: K.A.M.

CHECKED:

PROJECT: 911-2864

RECORD OF BOREHOLE 91-9

SHEET 1 OF 2

LOCATION: See Figure 2

BORING DATE: Sept. 12, 1991

DATUM: Geodetic

DIP:

SAMPLER HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	LAB. TESTING	COMBUSTIBLE VAPOUR ⊕ ( ) 50 100 150 200 % LEL □ 50 100 150 200	HYDRAULIC CONDUCTIVITY, k, cm/s	WATER CONTENT, PERCENT Wp W Wl 20 40 60 80	INSTALLATIONS A B C
0		Ground Surface		294.43 / 0.00									
		Brown fine to medium sand, trace garbage (FILL)		294.13 / 0.30									
1		Loose to compact light brown to brown fine to medium SAND, trace silt			1	50 DO	13						Bentonite Seal
2													
3				291.38 / 3.05	2	50 DO	15						
4		Compact light brown fine stratified SAND, trace to some silt											
5	Power Auger 200mm Diam. (Hollow Stem)			289.86 / 4.57	3	50 DO	6						Native Backfill
6		Loose to compact light brown fine to medium SAND, occasional coarse sand and fine gravel			4	50 DO	10						
7													Well Screen B 38mm PVC #10 Slot Screen
8				286.81 / 7.62	5	50 DO	6		M				
9		Loose brown fine SAND, trace silt											
10					6	50 DO	6						
		CONTINUED ON NEXT PAGE											

DEPTH SCALE (ALONG HOLE)

1 to 50

Golder Associates

LOGGED: M.A.S.

CHECKED:

PROJECT: 911-2864

RECORD OF BOREHOLE 91-9

SHEET 2 OF 2

LOCATION: See Figure 2

BORING DATE: Sept. 12, 1991

DATUM: Geodetic

DIP:

SAMPLER HAMMER, 63.5kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	LAB. TESTING	COMBUSTIBLE VAPOUR @ ( ) 50 100 150 200 / % LEL 50 100 150 200	HYDRAULIC CONDUCTIVITY, k, cm/s / WATER CONTENT, PERCENT Wp W Wl 20 40 60 80	INSTALLATIONS A B C
10	Power Auger 200mm Diam. (Hollow Stem)	CONTINUED FROM PREVIOUS PAGE										
		Loose brown fine SAND, trace silt		283.77 10.66	7	SS DO	7					Bentonite Seal
11		Loose brown fine to medium SAND, trace silt, occasional coarse sand										
12				282.24 12.19	8	SS DO	8					Silica Sand Backfill
13		Loose brown fine to medium SAND, trace coarse sand and gravel, trace silt		280.72 13.71								Well Screen A 50mm PVC #10 Slot Screen
14		End of Hole Auger Refusal										W.L. in Screen A at elev. 288.19m W.L. in Screen B at elev. 288.19m Oct. 1, 1991
15												
16												
17												
18												
19												
20												

DEPTH SCALE (ALONG HOLE)

1 to 50

Golder Associates

LOGGED: M.A.S.

CHECKED:

PROJECT: 911-2864

RECORD OF BOREHOLE 91-10

SHEET 1 OF 2

LOCATION: See Figure 2

BORING DATE: Sept. 13, 1991

DATUM: Geodetic

DIP:

SAMPLER HAMMER: 63.5kg; DROP: 760 mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	LAB. TESTING	GAS CONCENTRATION ⊕ ( ) 50 100 150 200 / % LEL □ 50 100 150 200	HYDRAULIC CONDUCTIVITY, k, cm/s / WATER CONTENT, PERCENT Wp W Wl 20 40 60 80	INSTALLATIONS A B C
0	Power Auger 200mm Diam. (Hollow Stem)	Ground Surface		293.37 / 0.00								
1		Red brown silty fine sand (FILL)										Bentonite Seal
		TOPSOIL		291.85 / 1.57	1	50 DO	11					
2		Compact light brown stratified fine to medium SAND, trace silt										Native Backfill
3				290.02 / 3.35	2	50 DO	20					
		Mottled grey SILTY CLAY to CLAYEY SILT, trace fine sand		289.41 / 3.96								Bentonite Seal
4												
5		Loose to compact brown fine to medium SAND, trace silt			3	50 DO	16					
6					4	50 DO	7					Native Backfill
7				285.75 / 7.62								Well Screen C 38mm PVC #10 Slot Screen
					5	50 DO	14					
8		Compact brown medium to coarse SAND, trace to some fine gravel, trace silt										
9					6	50 DO	15					
10		CONTINUED ON NEXT PAGE										

DEPTH SCALE (ALONG HOLE)

1 to 50

Golder Associates

LOGGED: M.A.S.

CHECKED:

PROJECT: 911-2864

RECORD OF BOREHOLE 91-10

SHEET 2 OF 2

LOCATION: See Figure 2

BORING DATE: Sept. 13, 1991

DATUM: Geodetic

DIP:

SAMPLER HAMMER, 63.5kg; DROP, 760 mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	LAB. TESTING	GAS CONCENTRATION ⊕ ( ) 50 100 150 200 / % LEL □ 50 100 150 200	HYDRAULIC CONDUCTIVITY, K, cm/s	WATER CONTENT, PERCENT Wp W Wl 20 40 60 80	INSTALLATIONS
10		CONTINUED FROM PREVIOUS PAGE											
11	Power Auger 200mm Diam. (Hollow Stem)	Compact brown medium to coarse SAND, trace some fine gravel, trace silt			7	50 DO	19						Well Screen B 38mm PVC #10 Slot Screen
12				261.18									
				12.19									
13					8	50 DO	29						
14		Compact brown fine to coarse SAND, trace to some fine to coarse gravel and silt, iron stained			9	50 DO	20		M				Bentonite Seal
15				276.28									
		Grey SILTY CLAY seam		15.09									Silica Sand Backfill
				15.24									
16		Compact brown fine to coarse SAND, trace silt			10	50 DO	16						Well Screen A 50mm PVC #10 Slot Screen
17					11	50 DO	17						Caved Material
				276.00									
		End of Hole		17.37									
18													W.L. in Screen A at elev. 288.29m W.L. in Screen B at elev. 288.29m W.L. in Screen C at elev. 288.30m Oct. 1, 1991
19													
20													

DEPTH SCALE (ALONG HOLE)

1 to 50

Golder Associates

LOGGED: M.A.S.

CHECKED:

PROJECT: 911-2864

RECORD OF BOREHOLE 91-11

SHEET 1 OF 1

LOCATION: See Figure 2

BORING DATE: Sept. 17, 1991

DATUM: Geodetic

DIP:

SAMPLER HAMMER: 63.5 kg; DROP: 760 mm

DEPTH SCALE Metres	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	RECOVERY %	LAB. TESTING	GAS CONCENTRATION ⊕ ( ) 50 100 150 200 % LEL □ 50 100 150 200	HYDRAULIC CONDUCTIVITY, k, cm/s	WATER CONTENT, PERCENT Wp W Wl 20 40 60 80	INSTALLATIONS A B C
0	Power Auger 200mm Diam. (Hollow Stem)	Ground Surface		288.48									
		PEAT		0.10									
		Red brown silty fine SAND to fine SAND, some silt		287.65									
1				0.83									
2		Compact light brown to brown fine to medium SAND, trace to some silt. Frequent silt layers between elevations 284.82 and 285.13 metres.			1	50 DO	13						
3					2	50 DO	21						
4				283.91									
		Loose mottled CLAYEY SILT to SILTY CLAY, occasional fine sand seams		4.57	3	50 DO	9						
5													
6				282.08	4	50 DO	14						
		Compact brown fine to medium SAND, occasional silt seam		6.40									
7				280.86									
		Loose grey brown silty sand with some gravel, trace clay (GLACIAL TILL)		7.62	5	50 DO	7						
8				280.26									
		End of Hole Auger Refusal		8.22									
9													
10													

INSTALLATIONS:
- Bentonite Seal
- Native Backfill
- Silica Sand Backfill
- Well Screen B 38mm PVC Ø10 Slot Screen
- Bentonite Seal
- Silica Sand Backfill
- Well Screen A 38mm PVC Ø10 Slot Screen

W.L. in Screen A at elev. 287.71m
W.L. in Screen B at elev. 287.81m
Oct. 1, 1991

DEPTH SCALE (ALONG HOLE)

1 to 50

Golder Associates

LOGGED: M.A.S.

CHECKED:

PROJECT: 001-2817

RECORD OF BOREHOLE: BH-12

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: December 13, 2000

DATUM: Local

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	SAMPLES: TYPE	SAMPLES: BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m; SHEAR STRENGTH Cu, kPa (nat V. +, rem V. ⊕, Q - ●, U - ○)	HYDRAULIC CONDUCTIVITY, k, cm/s; WATER CONTENT PERCENT (Wp, W, Wl)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		295.40							
0	Power Auger 200mm DIA. (Hollow Stem)	Plastic wire, paper, rags with sand (REFUSE FILL)		0.00							Bentonite Seal
1											
2											
3											
4											Native Backfill
5		Grey brown fine SAND		290.52 4.88	1	50 DO	-				
				289.91							
		Brown fine to coarse SAND, some gravel		5.49							
6					2	50 DO	18				
7											▽
8					3	50 DO	38				Granular Filter
9											50mm PVC Slot Screen
				285.65							
10		END OF BOREHOLE		9.75							W.L in well screen at elev. 288.06 Dec. 22, 2000
11											
12											
13											
14											
15											

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.J.S.
CHECKED:

BOREHOLE 001-2817.GPJ GLDR_CAN.GDT 5.14.01 Ken Taylor

PROJECT: 021-2796-6000

RECORD OF BOREHOLE: BH 13

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: Sept. 12, 13, 2002

DATUM: Local

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. / DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q- ●, rem V. ⊕ U- ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT Wp W Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger 200mm Diam (Hollow Stem)	GROUND SURFACE		292.48							
		TOPSOIL		0.00							
		Yellow brown SILTY fine SAND		0.12 / 292.05							
		Brown fine SAND, trace silt		0.43							
1				291.14							
		Grey brown CLAYEY SILT and SILTY CLAY, trace gravel		1.34 / 290.80							
		Brown stratified SILTY fine SAND		1.68	1	50 DO	18				
2				289.58							Native Backfill
		Grey brown SILTY CLAY and CLAYEY SILT		2.90 / 289.28							
		Brown SILTY fine SAND		3.20	2	50 DO	17				
3				288.21							
		Brown fine SAND		4.27							Native and Caved Backfill
4					3	50 DO	3				
5											Silica Sand
6											32mm PVC #10 Slot Screen B
				286.47							Silica Sand
7		Brown fine to medium SAND, some silt		7.01							Bentonite Seal
8											Caved Material
9											Bentonite Seal
				282.73							
10		Probably brown fine to coarse SAND, trace gravel		9.75							Caved Material
11											
12											32mm PVC #10 Slot Screen A
13				279.26							Caved Material
		END OF BOREHOLE		13.22							
14											W.L. in Screen A at Elev. 288.52m and Screen B at Elev. 288.50 m Oct. 23, 2002
15											

BOREHOLE 021-2796.GPJ GLDR_CAN.GDT 14/1/03

DEPTH SCALE

1 : 75

Golder Associates

LOGGED: D.J.S.

CHECKED: AH

PROJECT: 021-2796-6000

RECORD OF BOREHOLE: BH 14

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: Sept. 12, 2002

DATUM: Local

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	SOIL PROFILE: DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	SAMPLES: NUMBER	TYPE	BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80) / SHEAR STRENGTH Cu, kPa (nat V. + Q- ● / rem V. ⊕ U- ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3}) / WATER CONTENT PERCENT (Wp — W — Wl) (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		293.45							
		TOPSOIL		0.00							Protective Pipe and Casing Set in Bentonite Seal
		Yellow brown SILTY fine SAND		0.12							
				292.84							
		Brown stratified fine SAND, trace silt		0.61							
1					1	50 DO	14				
2											Native Backfill
3				290.25							
		Brown stratified fine to medium SAND		3.20	2	50 DO	6				
4											
5					3	50 DO	5				
6											Caved Material
7	Power Auger 200mm Diam (Hollow Stem)			286.44							
		Probably brown SILTY SAND		7.01							32mm PVC #10 Slot Screen B
8											
				284.92							
		Probably brown SILTY SAND with some silty clay		8.53							Silica Sand
9											
10											Bentonite Seal
				282.78							
		Probably SAND AND GRAVEL, occasional cobble		10.67							Caved Material
11											
12											32mm PVC #10 Slot Screen A
13											Caved Material
				279.73							
		END OF BOREHOLE		13.72							
14											W.L. in Screen A at Elev. 289.05m and Screen B at Elev. 289.10 m Oct. 23, 2002
15											

DEPTH SCALE

1 : 75

Golder Associates

LOGGED: D.J.S.

CHECKED: AH

BOREHOLE 021-2796.GPJ GLDR_CAN.GDT 14/1/03

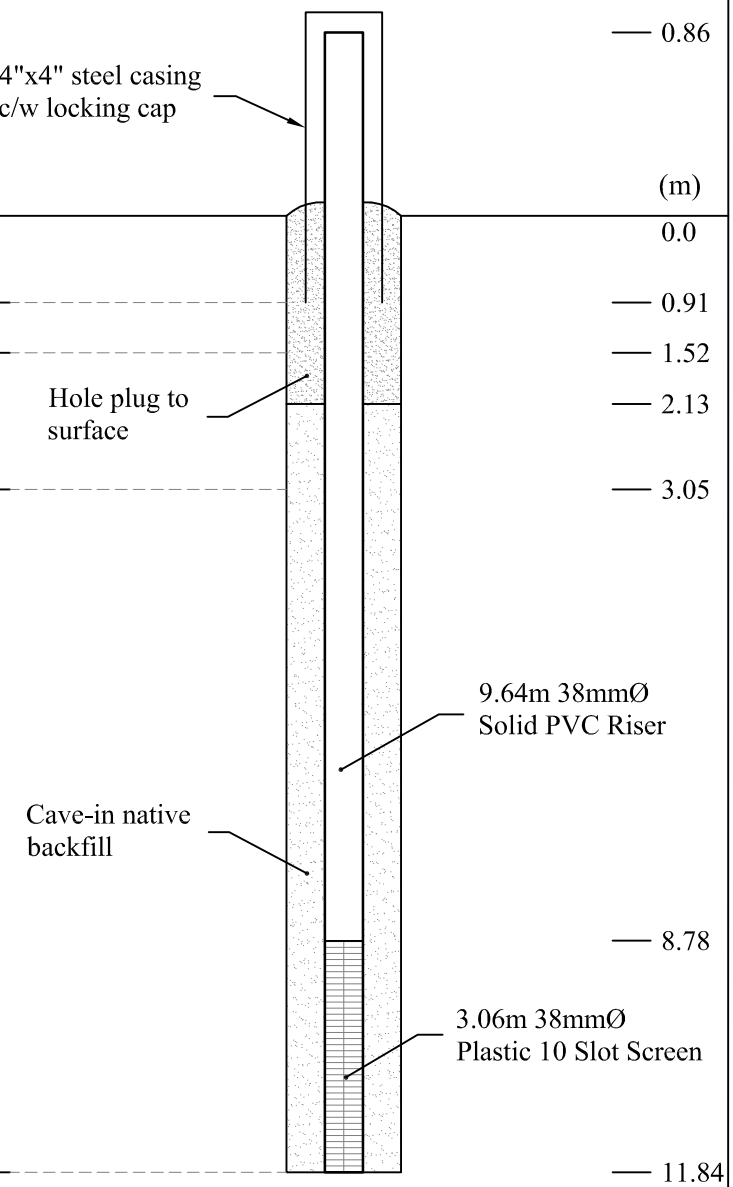
BH-15 Deep

BOREHOLE LOG

PROJECT No.: 2006047O
CLIENT: Township of Whitewater Region
PROJECT: Ross Landfill
LOCATION: BH-15 Deep
STATION: ---
DATE: September 25, 2013

DRILLING DATA
METHOD: Auger
DEPTH OF HOLE: 6.10m
TOP OF PIEZOMETER: 289.146m
GROUND ELEVATION: 288.282m

ELEV (m)	DEPTH (m)	PROFILE	DESCRIPTION
	0.0		Dry, dark brown rich topsoil
	0.91		Damp, brown medium-grained sand
	1.52		Wet, brown medium-grained sand
	3.05		Saturated, brown and gray sand with traces of gray clay
	11.84		Refused, end of borehole



GROUND-WATER MONITORING WELL

SCALE: N.T.S.

REMARKS:

1) Borehole log based on field notes recorded by Jp2g Consultants field technician.

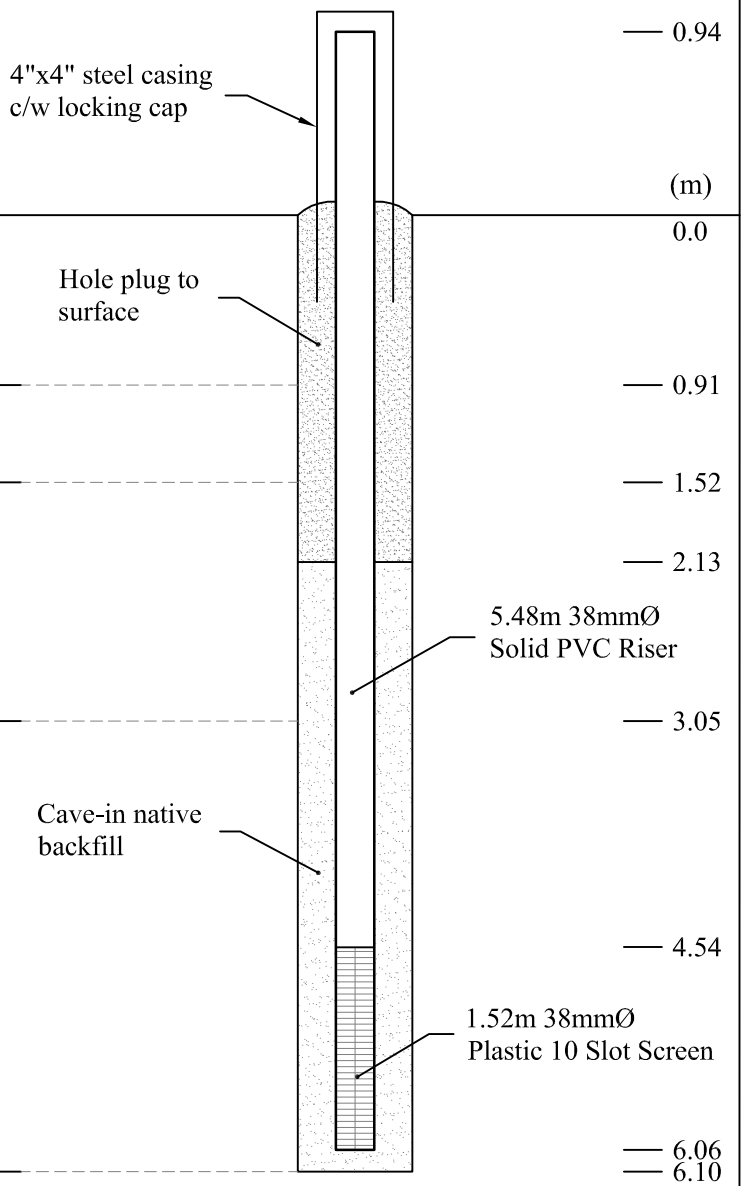
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BH-15 Shallow BOREHOLE LOG

PROJECT No.: 2006047O
CLIENT: Township of Whitewater Region
PROJECT: Ross Landfill
LOCATION: BH-15 Shallow
STATION: ---
DATE: September 25, 2013

DRILLING DATA
METHOD: Auger
DEPTH OF HOLE: 6.10m
TOP OF PIEZOMETER: 289.266m
GROUND ELEVATION: 288.326m

ELEV (m)	DEPTH (m)	PROFILE	DESCRIPTION
	0.0		Dry, dark brown rich topsoil
	0.91		Damp, brown medium-grained sand
	1.52		Wet, brown medium-grained sand
	3.05		Saturated, brown and gray sand with traces of gray clay
	6.10		End of borehole



GROUND-WATER MONITORING WELL

SCALE: N.T.S.

REMARKS:

1) Borehole log based on field notes recorded by Jp2g Consultants field technician.

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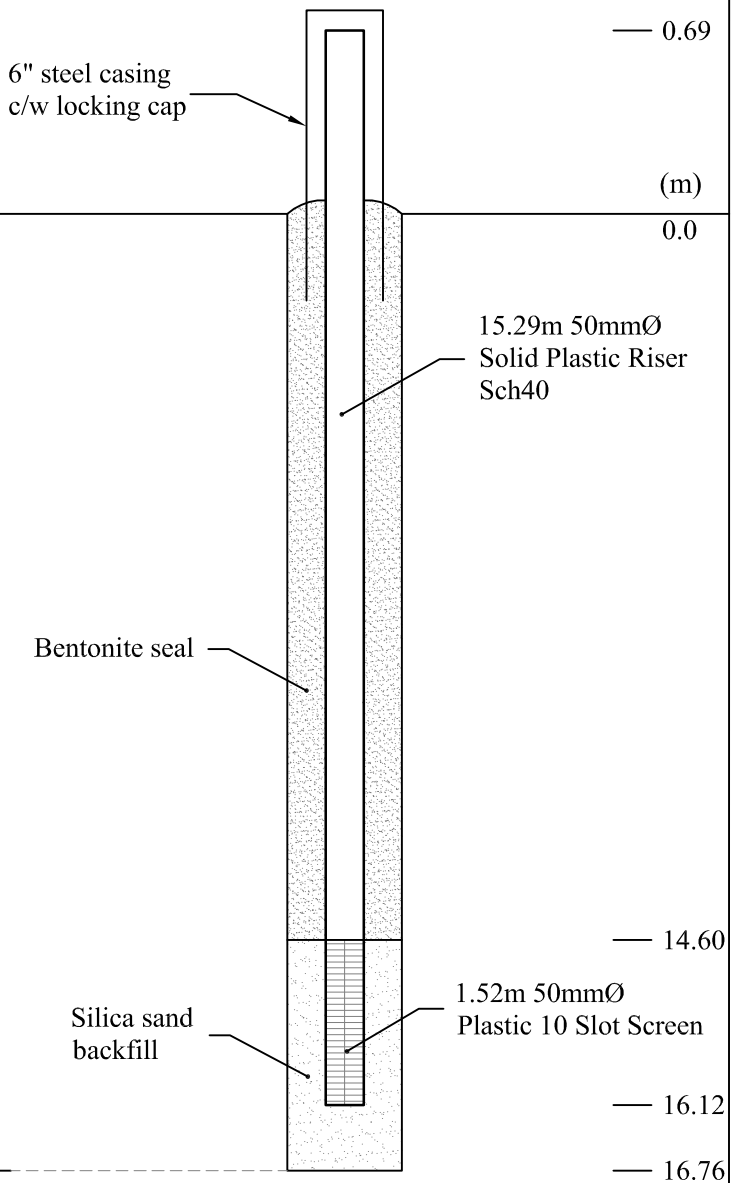
BH-16 Deep

BOREHOLE LOG

PROJECT No.: 2006047O
CLIENT: Township of Whitewater Region
PROJECT: Ross Landfill
LOCATION: BH-16 Deep
STATION: ---
DATE: October 03, 2013

DRILLING DATA
METHOD: Hollow Stem Auger
DEPTH OF HOLE: 16.76m
TOP OF PIEZOMETER: 299.326m
GROUND ELEVATION: 298.636m

ELEV (m)	DEPTH (m)	PROFILE	DESCRIPTION
	0.0		Loose sand with intermixed gravel
	16.76		End of borehole



GROUND-WATER MONITORING WELL

SCALE: N.T.S.

REMARKS:

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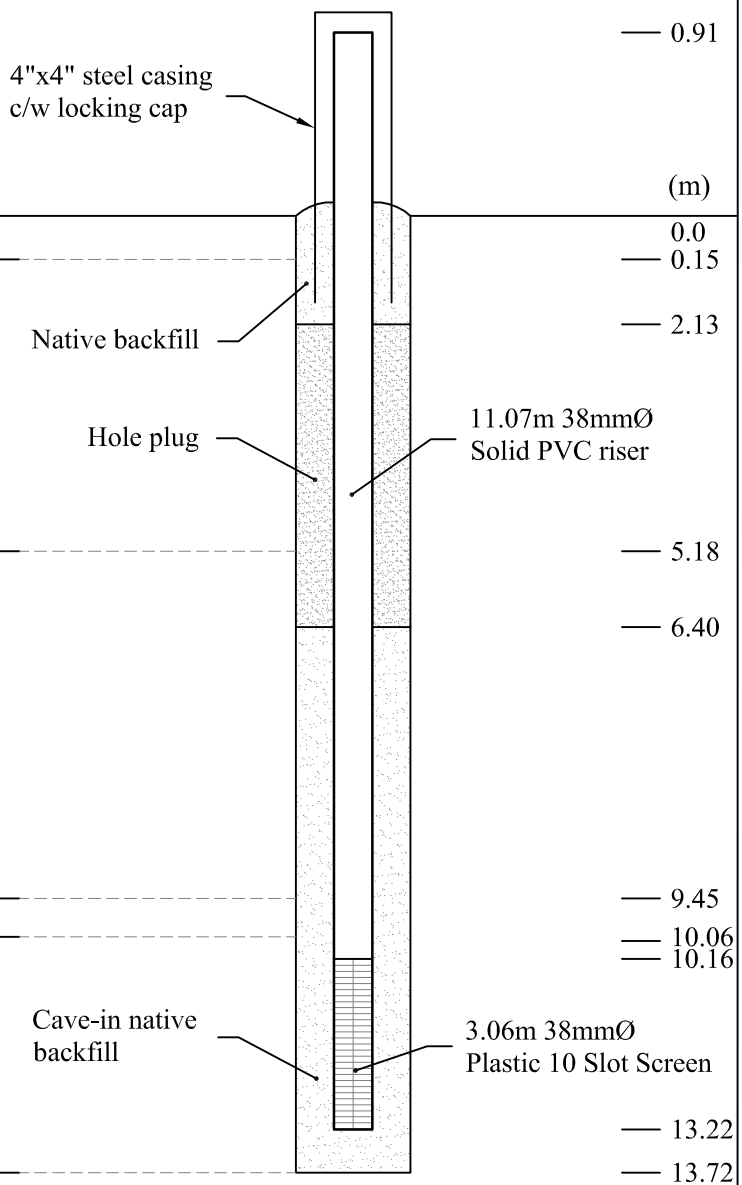
BH-16 Shallow

BOREHOLE LOG

PROJECT No.: 2006047O
CLIENT: Township of Whitewater Region
PROJECT: Ross Landfill
LOCATION: BH-16 Shallow
STATION: ---
DATE: September 25, 2013

DRILLING DATA
METHOD: Auger
DEPTH OF HOLE: 13.72m
TOP OF PIEZOMETER: 299.326m
GROUND ELEVATION: 298.649m

ELEV (m)	DEPTH (m)	PROFILE	DESCRIPTION
	0.0		Dry sandy topsoil
	0.15		Dry brown mixed-grained sand with intermixed stones
	5.18		Dry coarse-grained sand and gravel
	9.45		Dry fine-grained sand and gravel
	10.06		Dry coarse-grained sand and gravel
	13.72		End of borehole



GROUND-WATER MONITORING WELL

SCALE: N.T.S.

REMARKS:

1) Borehole log based on field notes recorded by Jp2g Consultants field technician.

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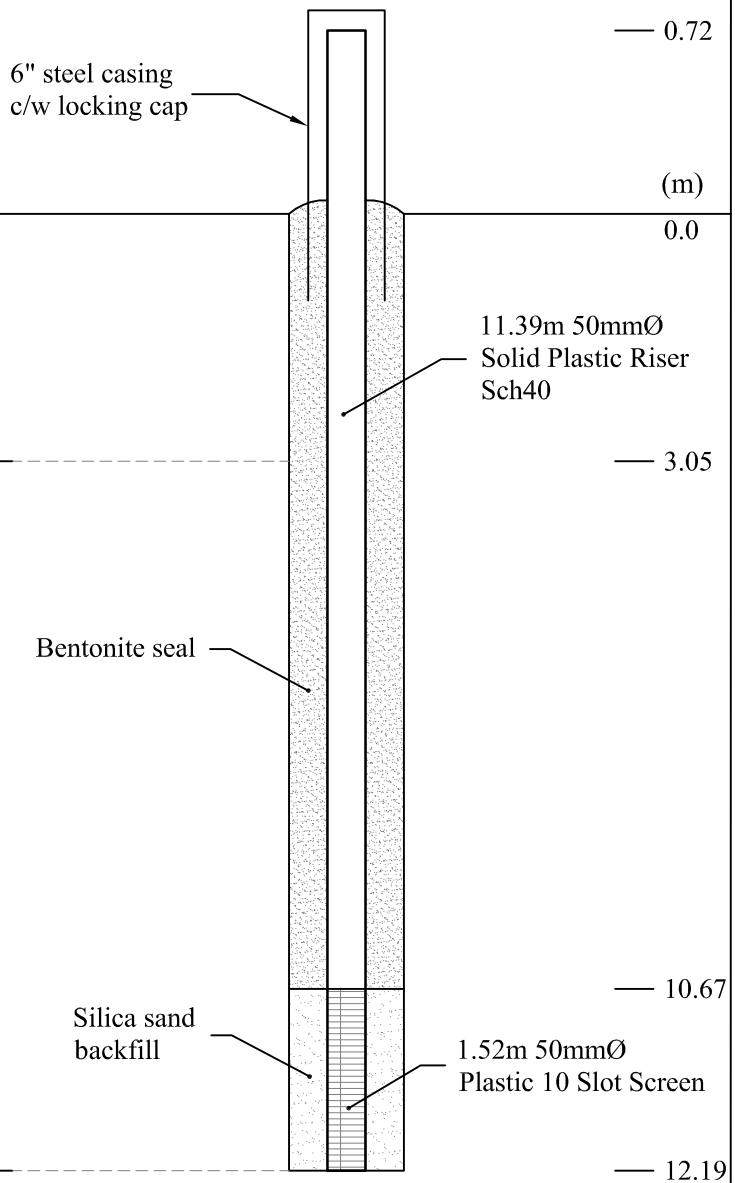
BH-17 Deep

BOREHOLE LOG

PROJECT No.: 2006047O
CLIENT: Township of Whitewater Region
PROJECT: Ross Landfill
LOCATION: BH-17 Deep
STATION: ---
DATE: October 04, 2013

DRILLING DATA
METHOD: Hollow Stem Auger
DEPTH OF HOLE: 12.19m
TOP OF PIEZOMETER: 290.085m
GROUND ELEVATION: 289.365m

ELEV (m)	DEPTH (m)	PROFILE	DESCRIPTION
	0.0		Soft sandy clay
	3.05		Loose silty sand
	12.19		End of borehole



GROUND-WATER MONITORING WELL

SCALE: N.T.S.

REMARKS:

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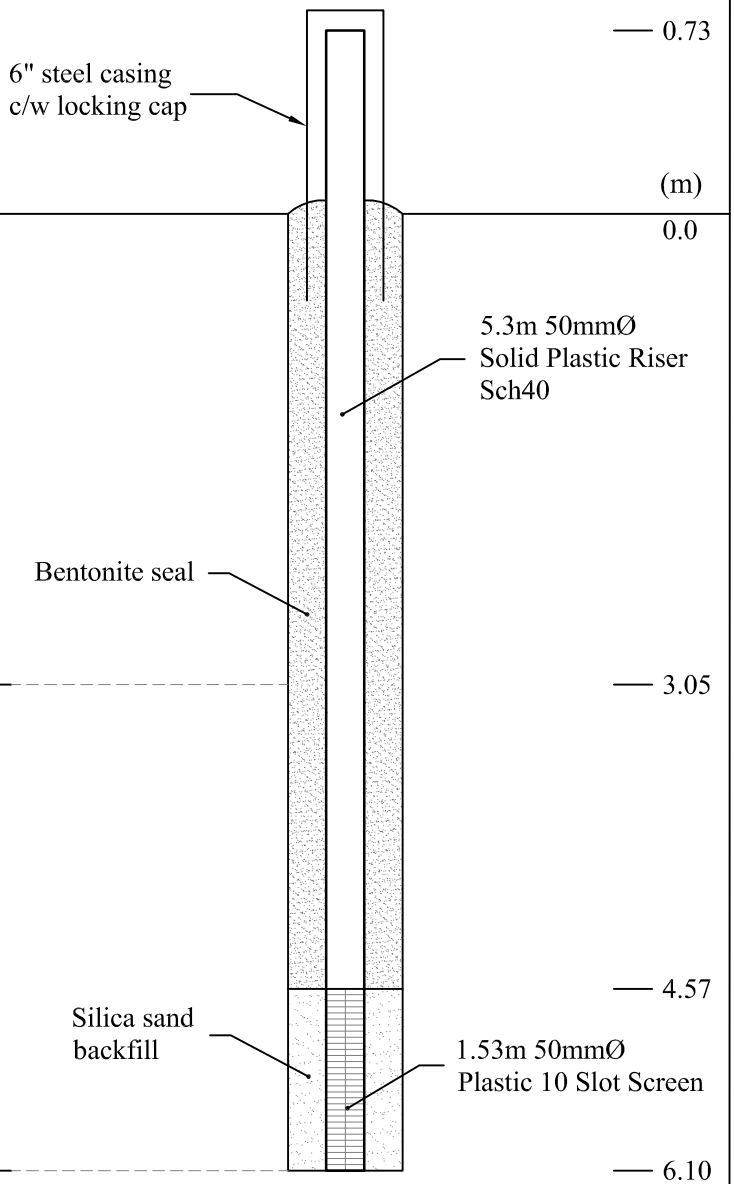
BH-17 Shallow

BOREHOLE LOG

PROJECT No.: 2006047O
CLIENT: Township of Whitewater Region
PROJECT: Ross Landfill
LOCATION: BH-17 Shallow
STATION: ---
DATE: October 04, 2013

DRILLING DATA
METHOD: Hollow Stem Auger
DEPTH OF HOLE: 6.10m
TOP OF PIEZOMETER: 290.316m
GROUND ELEVATION: 289.591m

ELEV (m)	DEPTH (m)	PROFILE	DESCRIPTION
	0.0		Soft sandy clay
	3.05		Loose silty sand
	6.10		End of borehole



GROUND-WATER MONITORING WELL

SCALE: N.T.S.

REMARKS:

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Appendix E
Site Photographs



BLC (Blind Line Culvert)



SW 1A



MVC (Mine View Culvert)

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Ross Waste Disposal Site

Surface Water Monitoring Locations

DATE	Jun-24
PROJECT	17-6047I
FIGURE	1



BH 2



BH 4 Shallow



BH 4 Deep



BH 5



BH 6 Shallow and Deep



BH 7 Shallow

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Ross Waste Disposal Site

Groundwater Monitoring Locations

DATE	Jun-24
PROJECT	17-6047I
FIGURE	2



BH 7 Deep



BH 8



BH 9 Shallow



BH 9 Deep



BH 10 Shallow and Medium



BH 10 Deep

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Ross Waste Disposal Site

Groundwater Monitoring Locations

DATE	Jun-24
PROJECT	17-6047I
FIGURE	3



BH 11 Shallow and Deep



BH 12



BH 13 Shallow and Deep



BH 14 Shallow and Deep



BH 15 Shallow



BH 15 Deep

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Ross Waste Disposal Site

Groundwater Monitoring Locations

DATE	Jun-24
PROJECT	17-6047I
FIGURE	4



BH 16 Shallow



BH 16 Deep



BH 17 Shallow



BH 17 Deep

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Ross Waste Disposal Site

Groundwater Monitoring Locations

DATE	Jun-24
PROJECT	17-6047I
FIGURE	5

Appendix F
Standard Sampling Procedures

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 (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)

always take water level measurements prior to purging or sampling;

do not move dedicated sampling devices such as the "Waterra" inertial pump prior to measuring the water level; 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" 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 Certificate of Approval or the approved monitoring program.

Well Sampling

collect the water sample as soon as practical (not more than 48 hours) after purging starting at the least contaminated 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;

for samples that require filtering, attach the disposable filter onto the end of the tubing (a 0.45 micron membrane filter 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;

conduct field measurements (these typically include: temperature, pH and conductivity; and

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.

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 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:

where groundwater or surface water samples are taken, 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 at least one sample set per sampling event or 1 duplicate for every 10 groundwater samples (do not identify the well 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 annual report or the Certificate of Approval.

Analytical Parameters

Analysis will be as recommended in either the annual report or the Certificate of Approval.

Gas Detection of On-site Buildings

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

Appendix G
Compiled Chemical Analysis

Water Quality Notes

Surface Water

CWQG	CCME Water Quality Guidelines for the Protection of Aquatic Life	
PWQO	Provincial Water Quality Objectives	
IPWQO	Interim Water Quality Objectives	
"a"	*Alkalinity*	Should not be decreased by more than 25%
"b"	*Beryllium*	If hardness <75 then 0.011 mg/L
		If hardness >75 then 1.1 mg/L
"c"	*Cadmium*	
	PWQO	0.0002 mg/L
	IPWQO	If hardness 0-100 mg/L then 0.0001 mg/L
		If hardness >100 mg/L then 0.0005 mg/L
	CWQG	Cadmium concentration = $10^{0.86[\log10(\text{hardness})]-3.2}$ µg/L
"d"	*Copper*	
	PWQO	0.005 mg/L
	IPWQO	If hardness 0 –20 mg/L then 0.001 mg/L
		If hardness >20 mg/L then 0.005 mg/L
	CWQG	Copper concentration = $e^{0.8545[\ln(\underline{\text{hardness}})]-1.465} * 0.2$ µg/L
"e"	*Lead*	
	PWQO	If alkalinity <20 then 0.005 mg/L
		If alkalinity 20 - 40 mg/L then 0.010 mg/L
		If alkalinity 40 - 80 mg/L then 0.02 mg/L
		If alkalinity > 80 mg/L then 0.025 mg/L
	IPWQO	If hardness <30 mg/L then 0.001 mg/L
		If hardness 30 - 80 mg/L then 0.003 mg/L
		If hardness > 80 mg/L then 0.005 mg/L
	CWQG	Lead concentration = $e^{1.273[\ln(\underline{\text{hardness}})]-4.705}$ µg/L
"f"	*DO*	
	PWQO	Varies with temperature
"g"	*Nickel*	
	CWQG	Nickel concentration = $e^{0.76[\ln(\underline{\text{hardness}})]+1.06}$ µg/L

Groundwater

MAC	Maximum Acceptable Concentration
IMAC	Interim Maximum Acceptable Concentration
OG	Operational Guideline (non health related)
MDC	Maximum Desirable Concentration
AO	Aesthetic Objective

Groundwater

Ross WDS
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Groundwater Quality

			BH 1					
				Aug-90	Dec-90	Aug-91	Oct-91	Oct-91(2)	Nov-98
PARAMETER	ODWQS	PWQO							
Alkalinity (as CaCO3)	30-500				128	134	136	136	139
Aluminum	0.1	0.075 (i)			<0.030	<0.030	0.04	<0.030	<0.030
Ammonia (as N)					<0.10	<0.10	<0.10		<0.02
Arsenic	0.01	0.1 - 0.005(i)							
Barium	1				0.02	0.02	0.02	0.02	<0.010
Beryllium		0.011			<0.010	<0.010	<0.010	<0.010	<0.010
BOD					1	2	2	2	
Boron	5	0.2(i)			<0.010	<0.010	<0.010	<0.010	<0.010
Bromide					<0.50	<0.50	<0.50	0.6	
Cadmium	0.005	0.0002			<0.0020	<0.0020	<0.0020	<0.0020	<0.0050
Calcium					46	52	72	75	73
Chloride	250				26	28	27	28	64
Chromium	0.05	0.009			<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Cobalt		0.0009(i)			<0.0200	<0.0100	<0.0100	<0.0100	<0.0100
COD					<3	17	<3	<3	<3
Conductivity (µS/cm)				400	450	400	445	445	440
Copper	1	0.005			<0.0100	<0.0100	<0.0100	<0.0100	<0.0050
DOC	5								
Fluoride	1.5				0.09	0.11	0.11	0.11	
Hardness (as CaCO3)	500				176	191	253	256	263
Iron	0.3	0.3			0.11	0.02	0.05	0.05	<0.01
Lead	0.01				<0.0100	<0.0020	0.002	<0.0020	<0.0020
Magnesium					15	15	18	17	20
Manganese	0.05				<0.010	<0.010	<0.010	<0.010	<0.010
Mercury		0.0002							
Molybdenum		0.04(i)			<0.010	<0.010	<0.010	<0.010	<0.010
Nickel					<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate (as N)	10				7.09	8.15	8.4	7.8	6.13
Nitrite (as N)	1				<0.10	0.25	<0.10	<0.10	
Organic Nitrogen	0.15				<0.10	<0.10	<0.10	<0.10	
pH (pH units)	6.5-8.5			7.5	8.2	8	7.5	7.5	7.1
Phenols					<0.002	<0.002	<0.002	<0.002	
Phosphate (as P)					0.36	0.38	0.25	0.28	
Phosphorus (total)					<0.100	<0.100	<0.100	<0.100	
Potassium					2	2	1	1	1
Silicon					8.6	7.9	9.3	9.5	7.1
Silver		0.0001			<0.01000	<0.01000	<0.01000	<0.01000	<0.01000
Sodium	200				6	7	5	5	8
Strontium					0.14	0.11	0.15	0.14	0.17
Sulphate	500				26	35	59		25
Sulphur					9	9	11	11	9
Total Sus. Solids									
TDS	500				278	260	254	252	344
Temperature (°C)	15			8	7	13.4	9.5	9.5	5
Thallium		0.0003(i)			<0.01000	<0.05000	<0.05000	<0.05000	<0.20000
Tin					0.2	<0.050	<0.050	<0.050	<0.050
Titanium					<0.010	<0.010	<0.010	<0.010	<0.010
TKN					<0.10	<0.10	<0.10	<0.10	
Vanadium		(0.006(i)			<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Zinc	5	0.03 - 0.02(i)			0.02	<0.010	<0.010	<0.010	<0.010
Ion Balance									
Field Parameters									
Temperature (°C)									
pH									
Conductivity (µS/cm)									

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

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			BH 1					
			Apr-99	Oct-99	Dec-00	Nov-01	Oct-02	Oct-03
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		145		144	144	116	152
Aluminum	0.1	0.075 (i)	<0.030	0.08		<0.050	<0.010	<0.010
Ammonia (as N)			0.03	<0.02		<0.02	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.03	NA	0.03	0.02	0.03	0.03
Beryllium		0.011	<0.010	<0.010		<0.002	<0.001	<0.001
BOD								
Boron	5	0.2(i)	<0.010	NA	<0.010	0.11	<0.050	<0.010
Bromide								
Cadmium	0.005	0.0002	<0.0050	<0.0050		<0.0001	<0.0001	<0.0001
Calcium			73	75	76	70	87	87
Chloride	250		53	77	79	72	74	72
Chromium	0.05	0.009	<0.0100	<0.0100		0.001	0.004	0.001
Cobalt		0.0009(i)	<0.0100	<0.0100		<0.0002	<0.0002	<0.0002
COD			12		8	<5	<5	<5
Conductivity (µS/cm)			550	490	550	610	590	500
Copper	1	0.005	<0.0050	<0.0100		0.002	<0.0010	<0.0010
DOC	5					1.2	1	<0.5
Fluoride	1.5							
Hardness (as CaCO3)	500		267	268	275	252	298	306
Iron	0.3	0.3	<0.01	0.24	0.02	<0.01	<0.01	<0.01
Lead	0.01		<0.0020	<0.0020		<0.0010	<0.0010	<0.0010
Magnesium			21	20	21	19	20	22
Manganese	0.05		<0.010	<0.010	<0.010	<0.010	<0.005	<0.005
Mercury		0.0002						
Molybdenum		0.04(i)	<0.010	<0.010		<0.010	<0.005	<0.005
Nickel			<0.010	<0.010		<0.010	<0.005	<0.005
Nitrate (as N)	10		7.66	6.89	6.97	8.63	8.01	9.78
Nitrite (as N)	1					<0.10	<0.10	<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8	7.2	7.9	7.7	7.6	7.6
Phenols						<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)								
Potassium			2	1	2	2	2	2
Silicon			8.8	8.9		7.12	6.5	8.3
Silver		0.0001	<0.01000	<0.01000		<0.00010	<0.00010	<0.00010
Sodium	200		10	10	10	9	12	12
Strontium			0.18	0.212	0.207	0.16	0.192	0.23
Sulphate	500		24	29	23	24	79	33
Sulphur			8	8				
Total Sus. Solids								
TDS	500		388	364	416	484	438	428
Temperature (°C)	15		7	6	10	6	8	7.3
Thallium		0.0003(i)	<0.20000	<0.20000		<0.00100	<0.00100	<0.00100
Tin			<0.050	<0.050		<0.010	<0.010	<0.010
Titanium			<0.010	<0.010		<0.010	<0.010	<0.010
TKN								
Vanadium		(0.006(i)	<0.0100	<0.0100		0.003	0.004	0.003
Zinc	5	0.03 - 0.02(i)	0.02	0.06		<0.010	<0.005	<0.010
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

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			BH 1					
			Oct-04	Nov-05	Sep-06	Aug-07	Oct-07	Oct-08
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		145	164	167	147	167	173
Aluminum	0.1	0.075 (i)	<0.005	<0.005	<0.005			
Ammonia (as N)			<0.03	<0.05	<0.05	0.05	0.06	0.04
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.034	0.036	0.036			
Beryllium		0.011	<0.001	<0.001	<0.001			
BOD								
Boron	5	0.2(i)	<0.005	0.012	<0.010	<0.01	<0.01	0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001	<0.0001			
Calcium			81.9	95	91	79	82	87
Chloride	250		80	102	117	71	84	80
Chromium	0.05	0.009	<0.0050	<0.0050	<0.0050			
Cobalt		0.0009(i)	<0.0001	<0.0005	<0.0005			
COD			6	<4	<4	<5	<5	5
Conductivity (µS/cm)			490	500	500	644	679	687
Copper	1	0.005	<0.0005	0.002	0.001	0.002	0.001	0.002
DOC	5		1.3	1.1	1.1			
Fluoride	1.5							
Hardness (as CaCO3)	500		292	343	329	286	294	
Iron	0.3	0.3	<0.03	<0.05	<0.05	<0.03	<0.03	<0.03
Lead	0.01		0.001	<0.0005	<0.0005			
Magnesium			21.5	26	25	22	22	
Manganese	0.05		<0.005	<0.002	<0.002	<0.01	<0.01	<0.01
Mercury		0.0002						
Molybdenum		0.04(i)	<0.001	<0.001	<0.001			
Nickel			<0.001	<0.001	<0.001			
Nitrate (as N)	10		9.7	7.3	6.8	10.3	0.71	16.3
Nitrite (as N)	1		<0.20	0.02	<0.01	<0.10	<0.10	<0.10
Organic Nitrogen	0.15					0.07	0.16	0.09
pH (pH units)	6.5-8.5		7.4	7.5	8.4			
Phenols			<0.001		<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)								
Potassium			1.5		2.3	2	2	2
Silicon			8.37	10	9.7			
Silver		0.0001	<0.00010	<0.00050	<0.00010			
Sodium	200		11.6	17	17	13	14	15
Strontium			0.225	0.21	0.25	0.246	0.242	0.240
Sulphate	500		27.7	28	35	22	21	22
Sulphur								
Total Sus. Solids								
TDS	500		450	284	475	419	441	447
Temperature (°C)	15		13	9.6	8.9			
Thallium		0.0003(i)	<0.00005	<0.00005	<0.00005			
Tin			<0.001	<0.001	<0.001			
Titanium			<0.005	<0.005	<0.005			
TKN						0.12	0.22	0.15
Vanadium		(0.006(i)	0.0035	0.003	0.003			
Zinc	5	0.03 - 0.02(i)	<0.005	0.007	<0.005			
Ion Balance								0.95
Field Parameters								
Temperature (°C)								9.4
pH								--
Conductivity (µS/cm)								680

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

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			BH 1					
			May-09	Nov-09	May-10	Oct-10	Jun-11	Nov-11
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		170	172	215	452	742	197
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.02	0.03	0.29	0.18	0.44	0.11
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001	<0.01	<0.01	<0.01	
Barium	1		0.04	0.03	0.08	0.1	0.22	0.06
Beryllium		0.011						
BOD			<1	<1				
Boron	5	0.2(i)	0.01	<0.01	0.02	0.02	0.14	<0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium			88	84	85	135	246	92
Chloride	250		91	101	98	109	124	101
Chromium	0.05	0.009	0.003	0.004	0.005	0.003	<0.005	
Cobalt		0.0009(i)						
COD			65	30	15	250	750	15
Conductivity (µS/cm)			723	742	786	1170	1750	771
Copper	1	0.005	0.002	<0.001	0.001	0.002	<0.001	
DOC	5		4.3	2.7	3.3	79.9	264	1.9
Fluoride	1.5							
Hardness (as CaCO3)	500		305	299	310	524	873	331
Iron	0.3	0.3	0.08	<0.03	6.40	4.93	30	0.59
Lead	0.01		<0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium			21	22	24	46	64	25
Manganese	0.05		0.04	0.07	1.35	1.94	2.63	
Mercury		0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		6.72	7.65	1.45	0.79	0.3	4.35
Nitrite (as N)	1		<0.10	<0.10	<0.10	<0.10	<0.10	
Organic Nitrogen	0.15		≤ 0.13	<0.10	0.50	1.17	1.3	1.19
pH (pH units)	6.5-8.5		8	8.1	7.83	8.03	7.31	7.72
Phenols			<0.001	<0.001	0.004	0.041	0.315	
Phosphate (as P)								
Phosphorus (total)			1.77	2.58	0.77	0.39	1.24	
Potassium			1	2	2	2	3	
Silicon								
Silver		0.0001						
Sodium	200		12	17	17	33	54	20
Strontium			0.253	0.258				
Sulphate	500		23	22	23	10	6	24
Sulphur								
Total Sus. Solids			2370	5320				
TDS	500		470	482	511	761	1140	501
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.13	<0.10	0.79	1.35	1.74	1.3
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01	<0.01	<0.01	<0.01	
Ion Balance								
Field Parameters								
Temperature (°C)			11.3	8.7	12.0	9.5	10	9.4
pH			6.9	9.58	9.7	7.12	7.3	7.5
Conductivity (µS/cm)			715	729	8.12	1257	1055	786

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
Groundwater Quality

			BH 1					
			May-12	Oct-12	Apr-13	Oct-13	Jul-14	Jul-14 Dup
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		182	366	331	354	179	182
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.06	0.05	0.10	0.11	<0.01	<0.01
Arsenic	0.01	0.1 - 0.005(i)	<0.001		<0.001		0.0006	0.0004
Barium	1		0.04	0.1	0.07	0.08	0.053	0.054
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	0.032	<0.01	0.06	0.006	0.006
Bromide								
Cadmium	0.005	0.0002	<0.0001		<0.0001		0.00003	0.00003
Calcium			90	134	118	122	94.9	95.4
Chloride	250		95	94	74	74	79.6	79.6
Chromium	0.05	0.009	0.002		<0.001		0.013	<0.002
Cobalt		0.0009(i)						
COD			<5	14	8	<5	<5	<5
Conductivity (µS/cm)			784	1040	939	1000	750	750
Copper	1	0.005	0.001		0.001		<0.0001	<0.0001
DOC	5		1.7	4.8	<0.01	2.8	2.0	2.1
Fluoride	1.5							
Hardness (as CaCO3)	500		318	476	428	434	336	337
Iron	0.3	0.3	0.1	0.06	<0.03	0.05	0.025	0.019
Lead	0.01		<0.001		<0.001		0.00006	0.00006
Magnesium			23	35	33	32	24.4	24.3
Manganese	0.05		0.69		1.15		0.314	0.35
Mercury		0.0002	<0.0001		<0.0001		<0.00002	<0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		8.88	4.47	6.65	10.80	16.3	16.2
Nitrite (as N)	1		0.93		3.81		<0.10	<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.91	7.79	7.89	7.72	7.96	7.97
Phenols			<0.001		<0.001		<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)			0.75		0.31		0.3	0.67
Potassium			2		3		2.4	2.4
Silicon								
Silver		0.0001						
Sodium	200		21	27	25	27	23.6	23.6
Strontium								
Sulphate	500		27	17	22	17	26	26
Sulphur								
Total Sus. Solids								
TDS	500		510	676	610	650	431	433
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.17		<0.10		0.14	0.29
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01		<0.01		<0.005	<0.005
Ion Balance							0.961	0.964
Field Parameters								
Temperature (°C)			10	9.6	10.3	10.6	10.6	
pH			7.5	7.1	7.5	7.3	8.0	
Conductivity (µS/cm)			768	1020	926	926	650	

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
Groundwater Quality

			BH 1					
			Oct-14	Apr-15	Sep-15	Apr-16	Apr-16 Dup BH 18	Sep-16
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		164	276	193	230	230	166
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)		0.0002		0.0001	< 0.0001	
Barium	1		0.05	0.068	0.053	0.06	0.059	0.039
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.008	0.061	0.03	< 0.005	< 0.005	< 0.005
Bromide								
Cadmium	0.005	0.0002		0.00003		< 0.00002	< 0.00002	
Calcium			89.1	118	95.7	109	109	72.5
Chloride	250		90.3	81.6	98.3	100	100	106
Chromium	0.05	0.009		< 0.002		< 0.002	< 0.002	
Cobalt		0.0009(i)						
COD			5	5	5	10	12	7
Conductivity (µS/cm)			735	846	771	866	871	724
Copper	1	0.005		0.004		0.0014	0.0009	
DOC	5		2.2	3.7	0.9	1.1	1.1	0.8
Fluoride	1.5							
Hardness (as CaCO3)	500		316	424	338			
Iron	0.3	0.3	0.047	0.01	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01			0.00002		0.00002	< 0.00002	
Magnesium			23.1	31.9	24.4	29.9	30.2	21.4
Manganese	0.05			0.073		0.012	0.01	
Mercury		0.0002		< 0.00002		< 0.00002	< 0.00002	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		14.3	13.5	13.1	15.9	15.9	10.4
Nitrite (as N)	1			< 0.1		< 0.1	< 0.1	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.03	7.8	7.85	8.07	8.09	7.89
Phenols				< 0.001		< 0.001	< 0.001	
Phosphate (as P)								
Phosphorus (total)				0.21		0.23	0.33	
Potassium				2.5		2.2	2.3	
Silicon								
Silver		0.0001						
Sodium	200		24.1	32.9	27.5	31.2	31.6	23.4
Strontium								
Sulphate	500		26	22	26	23	23	27
Sulphur								
Total Sus. Solids								
TDS	500		417	515	524	503	505	397
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.44		0.3	0.36	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		0.005	< 0.005	
Ion Balance			0.992	0.926	1.01			
Field Parameters								
Temperature (°C)			10.1	9.8	10	9.8	10.6	
pH			7.5	7.4	7.9	7.7	7.7	
Conductivity (µS/cm)			708	962	698	828	811	

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted
Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
Groundwater Quality

			BH 1			Decommissioned		
			May-17	Aug-17	Apr-18	Sep-18		
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		178	163	171	170		
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			< 0.01	< 0.01	< 0.01	< 0.01		
Arsenic	0.01	0.1 - 0.005(i)	0.0004		0.0001			
Barium	1		0.045	0.046	0.046	0.041		
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.012	0.009	0.011	0.006		
Bromide								
Cadmium	0.005	0.0002	< 0.000014		< 0.000014			
Calcium			85.2	81.7	89.4	80.2		
Chloride	250		83.9	73.9	96.9	78.4		
Chromium	0.05	0.009	0.002		0.002			
Cobalt		0.0009(i)						
COD			6	14	< 5	10		
Conductivity (µS/cm)			776	722	766	679		
Copper	1	0.005	0.0021		0.0009			
DOC	5		1.3	0.9	1.5	1.2		
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.06	< 0.005	< 0.005	< 0.005		
Lead	0.01		0.00004		0.00002			
Magnesium			23.9	23.9	25.6	23.8		
Manganese	0.05		0.013		< 0.001			
Mercury		0.0002	< 0.02		< 0.00002			
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		11	10.6	6.82	7.76		
Nitrite (as N)	1		< 0.05		< 0.05			
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.04	8.04	8.1	8		
Phenols			0.001		< 0.001			
Phosphate (as P)								
Phosphorus (total)			0.23		0.13			
Potassium			1.7		2			
Silicon								
Silver		0.0001						
Sodium	200		30.4	25.8	30.7	31.8		
Strontium								
Sulphate	500		22	17	22	24		
Sulphur								
Total Sus. Solids								
TDS	500		354	321	369	342		
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.3		0.2			
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005		< 0.005			
Ion Balance								
Field Parameters								
Temperature (°C)			10	9.8	8.8	9.5		
pH			7.7	7.7	7.7	7.8		
Conductivity (µS/cm)			762	692	664	500		

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
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			BH 2A (deep)					
			Aug-90	Aug-91	Nov-01	Oct-02	Oct-03	Oct-04
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500			108	106	113	112	105
Aluminum	0.1	0.075 (i)		0.31				
Ammonia (as N)				<0.10			0.07	
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1			0.03	0.02	0.02	0.02	0.015
Beryllium		0.011		<0.010				
BOD				2				
Boron	5	0.2(i)		<0.010	<0.050	<0.050	<0.050	<0.010
Bromide				<0.50				
Cadmium	0.005	0.0002		<0.0020				
Calcium				35	31	30	33	34.3
Chloride	250			1			2	
Chromium	0.05	0.009		<0.0100				
Cobalt		0.0009(i)		<0.0100				
COD				20			<5	
Conductivity (µS/cm)			320	215	260	310	260	300
Copper	1	0.005		<0.0100				
DOC	5						<0.5	2.4
Fluoride	1.5			0.2				
Hardness (as CaCO3)	500			128	114	111	123	125
Iron	0.3	0.3		0.32				
Lead	0.01			<0.0020				
Magnesium				10	9	9	10	9.66
Manganese	0.05			<0.010	0.04	0.012	0.05	<0.005
Mercury		0.0002						
Molybdenum		0.04(i)		<0.010				
Nickel				<0.010				
Nitrate (as N)	10			<0.10	<0.10	0.12	<0.10	0.2
Nitrite (as N)	1			<0.10			<0.10	
Organic Nitrogen	0.15			<0.13				
pH (pH units)	6.5-8.5		7.5	8.2	7	6.8	7.9	7.3
Phenols				<0.002			<0.001	
Phosphate (as P)				0.68				
Phosphorus (total)				<0.100				
Potassium				2	2	2	2	1
Silicon				8.7				
Silver		0.0001		<0.01000				
Sodium	200			2				
Strontium				0.08	0.096	0.118	0.127	0.123
Sulphate	500			25	25	37	19	23.5
Sulphur				7				
Total Sus. Solids								
TDS	500			148	172	170	177	168
Temperature (°C)	15		9	12	6	9	7.5	12
Thallium		0.0003(i)		<0.05000				
Tin				<0.050				
Titanium				<0.010				
TKN				0.13				
Vanadium		(0.006(i)		<0.0100				
Zinc	5	0.03 - 0.02(i)		<0.010				
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 2A (deep)					
			Nov-05	Sep-06	Aug-07	May-08	Oct-08	May-09
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		115	117	107	110	119	113
Aluminum	0.1	0.075 (i)						
Ammonia (as N)					0.14	0.12	0.07	0.04
Arsenic	0.01	0.1 - 0.005(i)						<0.001
Barium	1		0.03	0.04				0.02
Beryllium		0.011						
BOD								1
Boron	5	0.2(i)	<0.020	0.1	0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002						<0.0001
Calcium			35.3		36	37	35	35
Chloride	250				7	8	8	8
Chromium	0.05	0.009						<0.001
Cobalt		0.0009(i)						
COD					6	<5	5	15
Conductivity (µS/cm)			220	180	277	281	297	288
Copper	1	0.005			0.001	0.002	0.004	<0.001
DOC	5		0.7	0.8				1
Fluoride	1.5							
Hardness (as CaCO3)	500		128		130	137	124	128
Iron	0.3	0.3			<0.03	0.91	0.04	<0.03
Lead	0.01							<0.001
Magnesium			9.91		10	11	9	10
Manganese	0.05		0.04		0.02	0.04	0.03	0.02
Mercury		0.0002						<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	<0.10	<0.10	0.21	0.15	0.22
Nitrite (as N)	1				<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15				0.19	0.18	0.05	0.09
pH (pH units)	6.5-8.5		7.4	8.2				8.03
Phenols					<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)								2.28
Potassium			2	2	3	3	2	2
Silicon								
Silver		0.0001						
Sodium	200				7	7	9	6
Strontium			0.13	0.15	0.149	0.129	0.139	0.136
Sulphate	500		23	26	24	22	23	22
Sulphur								
Total Sus. Solids								2600
TDS	500		258	194	180	183	193	187
Temperature (°C)	15		12	11.1				
Thallium		0.0003(i)						
Tin								
Titanium								
TKN					0.33	0.3	0.12	0.13
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						<0.01
Ion Balance						1.08	0.95	
Field Parameters								
Temperature (°C)						10.7	10.6	No
pH						7.97	--	Data
Conductivity (µS/cm)						287	282	Collected

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 2A (deep)					
			Oct-09	May-10	Oct-10	Jun-11	Nov-11	May-12
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		112	109	111	112	116	115
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.03	<0.02	<0.02	<0.02	<0.02	0.02
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001	<0.001	<0.001		<0.001
Barium	1		0.02	0.03	0.02	0.03	0.03	0.05
Beryllium		0.011						
BOD			3					
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Calcium			33	32	37	38	36	38
Chloride	250		8		9	9	9	9
Chromium	0.05	0.009	<0.001	0.002	0.001	0.004		0.003
Cobalt		0.0009(i)						
COD			6	15	13	35	22	6
Conductivity (µS/cm)			289	280	275	282	287	290
Copper	1	0.005	<0.001	0.002	<0.001	0.002		0.004
DOC	5		1.4	1.2	1.8	2.1	1	3.5
Fluoride	1.5							
Hardness (as CaCO3)	500		123	116	133	140	130	135
Iron	0.3	0.3	<0.03	0.69	<0.03	0.03	0.51	1.52
Lead	0.01		<0.001	<0.001	<0.001	<0.001		0.001
Magnesium			10	9	10	11	10	10
Manganese	0.05		0.02	0.04	0.02	0.05		0.09
Mercury		0.0002	<0.0001	<0.0001	<0.0001	<0.0001		
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	0.19	<0.10	0.13	<0.10	<0.10
Nitrite (as N)	1		<0.10	<0.10	<0.10	<0.10		<0.10
Organic Nitrogen	0.15		<0.10	<0.10	≤ 0.20			
pH (pH units)	6.5-8.5		8.17	8.06	8.04	8	8	8.02
Phenols			<0.001		<0.001	<0.001		<0.001
Phosphate (as P)								
Phosphorus (total)			1.16	0.40	0.68	1.2		2.38
Potassium			2	2	2	2		2
Silicon								
Silver		0.0001						
Sodium	200		6	5	6	8	7	8
Strontium			0.136					
Sulphate	500		23	23	24	25	24	23
Sulphur								
Total Sus. Solids			1650					
TDS	500		188	182	179	183		188
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.10	<0.10	0.2	<0.1		<0.10
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01	<0.01	<0.01		<0.01
Ion Balance								
Field Parameters								
Temperature (°C)			8.5	12	9.8	11.0	10.0	11.5
pH			8.86	8.73	8.04	7.6	8.0	7.9
Conductivity (µS/cm)				293	298	214	279	293

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 2A (deep)					
			Oct-12	Apr-13	Oct-13	Jul-14	Oct-14	Apr-15
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		117	114	113	106	107	111
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.03	0.03	0.04	<0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)		<0.001		0.0002		0.0002
Barium	1		0.04	0.02	0.04	0.024	0.028	0.034
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.005	0.006	0.006
Bromide								
Cadmium	0.005	0.0002		<0.0001		<0.00002		< 0.00002
Calcium			41	36	38	37.2	38.1	41.4
Chloride	250		9	10	10	8.7	8.6	9
Chromium	0.05	0.009		<0.001		<0.002		< 0.002
Cobalt		0.0009(i)						
COD			<5	<5	<5	<5	< 5	125
Conductivity (µS/cm)			294	287	291	275	281	278
Copper	1	0.005		<0.001		0.0008		< 0.002
DOC	5		1.1	1.1	0.8	1.3	1.4	1.6
Fluoride	1.5							
Hardness (as CaCO3)	500		147	130	140	137	138	151
Iron	0.3	0.3	0.62	0.18	1.36	0.112	0.146	0.675
Lead	0.01			<0.001		0.00027		0.00044
Magnesium			11	10	11	10.8	10.5	11.8
Manganese	0.05			0.02		0.023		0.028
Mercury		0.0002		<0.0001		<0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	<0.10	0.11	0.1	< 0.10	0.1
Nitrite (as N)	1			<0.10		<0.10		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.86	7.99	7.63	8.01	8.01	7.72
Phenols				<0.001		<0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				1.01		0.46		1.13
Potassium				2		1.9		2.2
Silicon								
Silver		0.0001						
Sodium	200		7	6	6	7.2	6.7	7.3
Strontium								
Sulphate	500		21	23	21	23	23	23
Sulphur								
Total Sus. Solids								
TDS	500		191	187	189	153	154	162
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				<0.10		<0.05		0.15
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.001		<0.005		< 0.005
Ion Balance						0.915	0.922	0.857
Field Parameters								
Temperature (°C)			10	10.4	11.5	10.3	12.2	10.7
pH			7.4	7.8	7.7	8.4	8	8.2
Conductivity (µS/cm)			280	300	270	252	269	310

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
Groundwater Quality

			BH 2A (deep)					
			Sep-15	Apr-16	Aug-16	May-17	Aug-17	Apr-18
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		112	115	115	425	228	109
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.12
Arsenic	0.01	0.1 - 0.005(i)		0.0001		0.0002		0.0001
Barium	1		0.024	0.024	0.027	0.07	0.037	0.022
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	< 0.005	< 0.005	0.007	0.02	0.013	0.009
Bromide								
Cadmium	0.005	0.0002		< 0.00002		0.00002		< 0.000014
Calcium			38.2	38.9	38.6	116	67	37.5
Chloride	250		8.9	9	8.9	4	5.4	8.7
Chromium	0.05	0.009		< 0.002		< 0.002		< 0.002
Cobalt		0.0009(i)						
COD			< 5	129	< 5	< 5	< 5	33
Conductivity (µS/cm)			277	290	288	802	484	283
Copper	1	0.005		0.0005		0.0005		0.0004
DOC	5		0.4	0.6	0.8	1.2	0.9	1.3
Fluoride	1.5							
Hardness (as CaCO3)	500		139					
Iron	0.3	0.3	0.02	0.015	0.006	0.027	0.071	< 0.005
Lead	0.01			0.00002		< 0.00002		0.00003
Magnesium			10.7	11.2	11.2	33.7	20.7	11.1
Manganese	0.05			0.009		0.532		0.033
Mercury		0.0002		< 0.00002		< 0.02		< 0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		0.1	0.1	0.1	< 0.05	< 0.05	< 0.05
Nitrite (as N)	1			< 0.1		< 0.05		< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.77	8.05	7.86	7.97	8.17	8.11
Phenols				< 0.001		< 0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				0.99		1.35		3.04
Potassium				1.8		2.8		1.9
Silicon								
Silver		0.0001						
Sodium	200		6.9	7.5	7.3	8.1	6.4	7.2
Strontium								
Sulphate	500		24	22	23	15	13	20
Sulphur								
Total Sus. Solids								
TDS	500		176	160	161	435	252	152
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.26		< 1		0.3
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		0.005		< 0.005		< 0.005
Ion Balance			0.955					
Field Parameters								
Temperature (°C)			11.7	10.5	12	10.2	12.9	8.1
pH			7.7	8	7.8	7.3	7.8	7.9
Conductivity (µS/cm)			258	275	315	777	464	252

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted
Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
Groundwater Quality

			BH 2A (deep)					
			Sep-18	Jun-19	Oct-19	May-20	Sep-20	Apr-21
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		107	105	103	102	98	109
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.09	0.05	0.03	0.02	0.03	<0.010
Arsenic	0.01	0.1 - 0.005(i)		0.0001		0.0001		<0.001
Barium	1		0.023	0.019	0.024	0.023	0.02	0.02
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.011	0.01	0.009	0.008	0.007	0.01
Bromide								
Cadmium	0.005	0.0002		< 0.000015		< 0.000015		<0.0001
Calcium			38.2	36.6	36.5	37.1	35.3	36
Chloride	250		10.2	10.3	9.8	10.5	10.3	12
Chromium	0.05	0.009		< 0.001		< 0.001		<0.001
Cobalt		0.0009(i)						
COD			< 5	< 5	11	7	83	7
Conductivity (µS/cm)			290	298	294	281	280	291
Copper	1	0.005		0.0005		0.0011		0.005
DOC	5		1.1	1.3	2	1.1	2.1	1.4
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.007	< 0.005	0.025	0.016	0.04	<0.03
Lead	0.01			0.00005		0.00003		<0.001
Magnesium			12.2	11.5	11.1	10.9	10.2	9
Manganese	0.05			0.016	0.011	0.008		0.02
Mercury		0.0002		< 0.00002		< 0.00002		<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		0.08	< 0.05	0.06	0.11	< 0.05	<0.10
Nitrite (as N)	1			< 0.05		< 0.05		<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.74	8.08	7.96	7.88	7.92	8.05
Phenols				< 0.002		< 0.002		<0.010
Phosphate (as P)								
Phosphorus (total)				0.44		1.23		1.28
Potassium				1.8		1.8		2
Silicon								
Silver		0.0001						
Sodium	200		7.8	7.1	7.2	6.6	6.1	7
Strontium								
Sulphate	500		22	23	22	21	23	24
Sulphur								
Total Sus. Solids								
TDS	500		157	153	150	149	145	189
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium						0.3		
TKN				0.2				<0.100
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		< 0.005		<0.01
Ion Balance				0.911	0.901			
Field Parameters								
Temperature (°C)			11.6	12.3	11.1	9.7	9.8	10.4
pH			7.5	8	7.9	7.8	7.5	7.3
Conductivity (µS/cm)			218	295	287	278	456	299

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted
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Ross WDS
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			BH 2A (deep)					
			Sep-21	May-22	Aug-22 BROKEN	Jun-23	Oct-23	Jun-24
PARAMETER	ODWQS	PWQO					DRY	DRY
Alkalinity (as CaCO3)	30-500		115	112		126		
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.010	0.027		<0.020		
Arsenic	0.01	0.1 - 0.005(i)		<0.001		<0.001		
Barium	1		0.02	0.03		0.03		
Beryllium		0.011						
BOD			3					
Boron	5	0.2(i)	<0.01	<0.01		<0.01		
Bromide								
Cadmium	0.005	0.0002		<0.0001		<0.0001		
Calcium			40	36		36		
Chloride	250		13	15		14		
Chromium	0.05	0.009		<0.001		<0.001		
Cobalt		0.0009(i)						
COD			<5	31		<5		
Conductivity (µS/cm)			288	236		240		
Copper	1	0.005		<0.001		0.001		
DOC	5		1.2	1.4		1.9		
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.44	0.05		0.06		
Lead	0.01			<0.001		<0.001		
Magnesium			11	10		10		
Manganese	0.05			0.03		0.02		
Mercury		0.0002		<0.0001		<0.0001		
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	<0.10		<0.10		
Nitrite (as N)	1			<0.10		<0.10		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.88	7.84		7.99		
Phenols				<0.001		<0.001		
Phosphate (as P)								
Phosphorus (total)				0.621		0.746		
Potassium				2		2		
Silicon								
Silver		0.0001						
Sodium	200		7	7		7		
Strontium								
Sulphate	500		24	25		25		
Sulphur								
Total Sus. Solids			849					
TDS	500		187	153		156		
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.118		0.307		
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.01		
Ion Balance								
Field Parameters								
Temperature (^{o}C)			12.4	11		10.8		
pH			7.1	7.8		7.6		
Conductivity (µS/cm)			294	310		350		

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted
Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
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BH 2A (deep)
Oct-24

PARAMETER	ODWQS	PWQO	DRY					
Alkalinity (as CaCO3)	30-500							
Aluminum	0.1	0.075 (i)						
Ammonia (as N)								
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1							
Beryllium		0.011						
BOD								
Boron	5	0.2(i)						
Bromide								
Cadmium	0.005	0.0002						
Calcium								
Chloride	250							
Chromium	0.05	0.009						
Cobalt		0.0009(i)						
COD								
Conductivity (µS/cm)								
Copper	1	0.005						
DOC	5							
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3						
Lead	0.01							
Magnesium								
Manganese	0.05							
Mercury		0.0002						
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10							
Nitrite (as N)	1							
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5							
Phenols								
Phosphate (as P)								
Phosphorus (total)								
Potassium								
Silicon								
Silver		0.0001						
Sodium	200							
Strontium								
Sulphate	500							
Sulphur								
Total Sus. Solids								
TDS	500							
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN								
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						
Ion Balance								
Field Parameters								
Temperature (^{o}C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted
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Ross WDS
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Groundwater Quality

			BH 2B (shallow)					
			Aug-91	Nov-01	Oct-02	Oct-03	Oct-04	Nov-05
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		268	139	356	361	279	482
Aluminum	0.1	0.075 (i)	<0.030					
Ammonia (as N)			<0.10			<0.02		
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.09	0.02	0.06	0.1	0.069	0.12
Beryllium		0.011	<0.010					
BOD			1					
Boron	5	0.2(i)	<0.010	<0.050	<0.050	0.1	0.03	0.08
Bromide			<0.50					
Cadmium	0.005	0.0002	<0.0020					
Calcium			93	41	122	143	99.6	166
Chloride	250		9			30		
Chromium	0.05	0.009	<0.0100					
Cobalt		0.0009(i)	<0.0100					
COD			17			<5		
Conductivity (µS/cm)			650	290	780	550	600	600
Copper	1	0.005	<0.0100					
DOC	5					0.9	1.8	3
Fluoride	1.5		0.07					
Hardness (as CaCO3)	500		321	135	401	453	301	499
Iron	0.3	0.3	0.08					
Lead	0.01		<0.0020					
Magnesium			22	8	24	24	13.2	21.2
Manganese	0.05		0.13	<0.010	<0.005	<0.010	<0.005	<0.010
Mercury		0.0002						
Molybdenum		0.04(i)	<0.010					
Nickel			<0.010					
Nitrate (as N)	10		12.2	2.05	7.03	1.33	3.4	2.2
Nitrite (as N)	1		<0.10			<0.10		
Organic Nitrogen	0.15		<0.10					
pH (pH units)	6.5-8.5		7.3	6.9	6.9	7.2	7	7.1
Phenols			<0.002			<0.001		
Phosphate (as P)			0.28					
Phosphorus (total)			<0.100					
Potassium			12	3	3	8	5	7
Silicon			8.4					
Silver		0.0001	<0.01000					
Sodium	200		8					
Strontium			0.2	0.074	0.22	0.296	0.221	0.37
Sulphate	500		39	14	23	35	12	34
Sulphur			15					
Total Sus. Solids								
TDS	500		374	212	491	529	328	382
Temperature (°C)	15		11.8	8	10	7.3	13	12.1
Thallium		0.0003(i)	<0.05000					
Tin			<0.050					
Titanium			<0.010					
TKN			<0.10					
Vanadium		(0.006(i)	<0.0100					
Zinc	5	0.03 - 0.02(i)	<0.010					
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inorganic
Groundwater Quality

			BH 2B (shallow)					
			Sep-06	Aug-07	Oct-07	May-08	Oct-08	May-09
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		573	490	408	449	465	390
Aluminum	0.1	0.075 (i)						
Ammonia (as N)				0.18	0.22	0.42	0.24	0.19
Arsenic	0.01	0.1 - 0.005(i)						<0.001
Barium	1		0.13					0.09
Beryllium		0.011						
BOD								2
Boron	5	0.2(i)	0.14	0.1	0.03	0.11	0.06	0.05
Bromide								
Cadmium	0.005	0.0002						0.00020
Calcium				170	136	149	152	129
Chloride	250			4	3	6	3	4
Chromium	0.05	0.009						0.002
Cobalt		0.0009(i)						
COD				19	<5	<5	<5	20
Conductivity (µS/cm)			850	994	766	857	852	768
Copper	1	0.005		0.009	0.007	0.007	0.009	0.008
DOC	5		4					2.1
Fluoride	1.5							
Hardness (as CaCO3)	500			537	411	456	455	398
Iron	0.3	0.3		0.25	<0.03	<0.03	<0.03	<0.03
Lead	0.01							<0.001
Magnesium				28	18	21	19	19
Manganese	0.05			1.33	0.99	3.66	1.52	2.43
Mercury		0.0002						<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		1.2	1.56	2.16	1.44	1.17	2.93
Nitrite (as N)	1			<0.10	0.13	<0.10	<0.10	0.14
Organic Nitrogen	0.15			0.89	0.29	0.27	0.10	0.16
pH (pH units)	6.5-8.5		6.9					7.37
Phenols				<0.001	<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)								1.64
Potassium			7	7	5	9	5	7
Silicon								
Silver		0.0001						
Sodium	200			9	8	9	10	7
Strontium			0.41	0.467	0.322	0.451	0.381	0.389
Sulphate	500		27	60	17	22	18	21
Sulphur								
Total Sus. Solids								1880
TDS	500		669	646	498	557	554	499
Temperature (°C)	15		10.4					
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				1.07	0.51	0.69	0.34	0.35
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						0.01
Ion Balance						1.01	0.99	
Field Parameters								
Temperature (°C)						11.3	10.8	12.7
pH						6.6	--	6.9
Conductivity (µS/cm)						839	820	740

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 2B (shallow)					
			Oct-09	May-10	Oct-10	Jun-11	Nov-11	May-12
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		443	372	405	482	613	502
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.25	0.17	0.45	0.77	2.82	1.22
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001	<0.001	<0.001		<0.001
Barium	1		0.09	0.08	0.09	0.12	0.19	0.12
Beryllium		0.011						
BOD			<1					
Boron	5	0.2(i)	0.06	0.09	0.13	0.1	0.12	0.11
Bromide								
Cadmium	0.005	0.0002	0.00020	0.00020	0.00020	<0.0001		0.00020
Calcium			137	115	123	128	159	136
Chloride	250		4	11	17	25	32	14
Chromium	0.05	0.009	0.004	0.002	0.003	<0.005		0.003
Cobalt		0.0009(i)						
COD			6	10	8	15	18	5
Conductivity (µS/cm)			848	735	777	906	1160	919
Copper	1	0.005	0.013	0.007	0.012	0.009		0.008
DOC	5		2.7	2.2	2.8	3.5	3.6	4
Fluoride	1.5							
Hardness (as CaCO3)	500		414	355	408	478	592	481
Iron	0.3	0.3	<0.03	<0.03	<0.03	0.06	0.39	<0.03
Lead	0.01		<0.001	<0.001	<0.001	<0.001		<0.001
Magnesium			18	17	25	39	48	35
Manganese	0.05		2.11	1.90	2.49	4.04		4.52
Mercury		0.0002	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		2.17	0.67	0.48	0.39	1.56	<0.10
Nitrite (as N)	1		<0.10	<0.10	<0.10	<0.10		<0.10
Organic Nitrogen	0.15		0.18	0.42	0.05			
pH (pH units)	6.5-8.5		7.67	7.36	7.54	7.35	7.18	7.34
Phenols			<0.001	<0.001	<0.001	<0.001		<0.001
Phosphate (as P)								
Phosphorus (total)			0.69	0.61	0.54	1.8		0.28
Potassium			4	4	6	6		11
Silicon								
Silver		0.0001						
Sodium	200		10	8	13	10	13	9
Strontium			0.384					
Sulphate	500		22	13	11	8	24	10
Sulphur								
Total Sus. Solids			1140					
TDS	500		551	478	505	589	754	597
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.43	0.59	0.50	0.88		1.45
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	0.02	0.02	0.02	0.02		0.02
Ion Balance								
Field Parameters								
Temperature (°C)			8.7	12.7	9.6	12.2	9.4	10.9
pH			8.5	8.64	7.56	6.7	6.8	7
Conductivity (µS/cm)			828	770	814	575	1118	893

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 2B (shallow)					
			Oct-12	Apr-13	Oct-13	Jul-14	Oct-14	Apr-15
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		420	482	584	429	506	482
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			1.56	1.96	1.26	1.18	1.21	3.44
Arsenic	0.01	0.1 - 0.005(i)		<0.001		0.0003		0.0003
Barium	1		0.1	0.12	0.14	0.125	0.118	0.182
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.12	0.15	0.31	0.137	0.087	0.203
Bromide								
Cadmium	0.005	0.0002		0.00020		0.00020		0.00021
Calcium			117	127	177	134	126	123
Chloride	250		15	13	35	24	4.8	18.5
Chromium	0.05	0.009		<0.001		<0.002		0.004
Cobalt		0.0009(i)						
COD			<5	<5	<5	119	< 5	7
Conductivity (µS/cm)			793	923	1150	925	959	887
Copper	1	0.005		0.012		0.0125		0.012
DOC	5		3.3	3.4	5.9	4.9	7.2	9.9
Fluoride	1.5							
Hardness (as CaCO3)	500		405	463	587	480	450	505
Iron	0.3	0.3	0.14	0.09	0.05	0.033	0.037	0.018
Lead	0.01			<0.001		0.00024		0.00007
Magnesium			28	36	36	35.8	33.4	48.7
Manganese	0.05			4.79		3.56		4.69
Mercury		0.0002		<0.0001		<0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		0.26	4.38	1.06	1.2	1.2	0.1
Nitrite (as N)	1			<0.1		<0.1		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.63	7.15	7.13	7.69	7.72	7.38
Phenols				<0.001		<0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				2.37		1.12		0.27
Potassium				8		9.3		24.8
Silicon								
Silver		0.0001						
Sodium	200		8	9	19	12.2	8.3	12.8
Strontium								
Sulphate	500		12	14	22	16	20	18
Sulphur								
Total Sus. Solids								
TDS	500		515	600	748	499	549	544
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				2.22		1.98		4.07
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		0.02		0.012		0.013
Ion Balance						0.908	0.927	0.897
Field Parameters								
Temperature (°C)			9.5	10.7	11.1	11.2	10.2	10.5
pH			6.4	6.7	6.7	7.2	6.8	6.9
Conductivity (µS/cm)			755	908	1057	773	901	996

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
Groundwater Quality

			BH 2B (shallow)					
			Sep-15	Apr-16	Aug-16	May-17	Aug-17	Apr-18
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		505	236	379	292	267	502
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			1.34	1.13	0.91	< 0.01	0.13	1.13
Arsenic	0.01	0.1 - 0.005(i)		< 0.0001		0.0001		0.0006
Barium	1		0.119	0.065	0.084	0.044	0.047	0.145
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.056	0.036	0.027	0.023	0.021	0.065
Bromide								
Cadmium	0.005	0.0002		0.00008		0.00008		0.00027
Calcium			148	71.9	121	98.4	95.3	172
Chloride	250		7.8	4.7	2.1	3.9	2.2	6.1
Chromium	0.05	0.009		< 0.002		< 0.002		< 0.002
Cobalt		0.0009(i)						
COD			< 5	32	5	< 5	< 5	52
Conductivity (µS/cm)			873	454	688	587	540	986
Copper	1	0.005		0.0046		0.0066		0.0165
DOC	5		2.5	1.8	1.7	1.9	1.5	7.1
Fluoride	1.5							
Hardness (as CaCO3)	500		492					
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01			0.00004		< 0.00002		0.0001
Magnesium			30.4	14.5	21.1	15.4	12.3	26.8
Manganese	0.05			1.3		1.12		5.6
Mercury		0.0002		< 0.00002		< 0.02		< 0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		0.3	1.3	0.8	0.91	1.64	0.6
Nitrite (as N)	1			0.2		0.07		< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.45	7.84	7.54	7.83	7.76	7.37
Phenols				< 0.001		< 0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				0.5		0.54		0.78
Potassium				9.3		4.1		14.3
Silicon								
Silver		0.0001						
Sodium	200		6.3	3.1	5.5	2.9	2.2	6.5
Strontium								
Sulphate	500		16	18	11	11	8	19
Sulphur								
Total Sus. Solids								
TDS	500		594	271	401	312	284	551
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				1.66		0.6		1.4
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		0.011		0.006		0.008
Ion Balance			1.01					
Field Parameters								
Temperature (°C)			10.4	10.5	11.0	10.0	9.5	9.6
pH			6.8	7.3	6.8	7.3	7.1	6.7
Conductivity (µS/cm)			786	436	735	536	502	841

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
Groundwater Quality

			BH 2B (shallow)					
			Sep-18	Jun-19	Oct-19	May-20	Sep-20	Apr-21
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		548	391	468	520	483	487
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.89	1.07	0.34	1.27	1.3	1.45
Arsenic	0.01	0.1 - 0.005(i)		< 0.0001		0.0001		<0.001
Barium	1		0.124	0.092	0.101	0.159	0.131	0.13
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.055	0.069	0.037	0.136	0.083	0.09
Bromide								
Cadmium	0.005	0.0002		0.00018		0.00022		0.00020
Calcium			183	146	175	191	173	142
Chloride	250		7.5	8.9	4.5	12.5	6.4	17
Chromium	0.05	0.009		< 0.001		0.009		<0.001
Cobalt		0.0009(i)						
COD			6	9	9	15	45	<5
Conductivity (µS/cm)			982	799	920	1040	972	931
Copper	1	0.005		0.0101		0.0179		0.019
DOC	5		6.7	3.9	4.6	6.9	7.9	3.4
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	0.067	< 0.005	< 0.005	0.007	0.04
Lead	0.01			0.00009		0.00011		<0.001
Magnesium			27.4	19.9	24.4	28.9	26.7	24
Manganese	0.05			3.33	1.3	5		4.5
Mercury		0.0002		< 0.00002		< 0.00002		<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		0.55	3.62	0.96	2.79	0.58	0.16
Nitrite (as N)	1			0.24		0.06		<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.38	7.46	7.7	7.46	7.45	7.35
Phenols				< 0.002		< 0.002		<0.010
Phosphate (as P)								
Phosphorus (total)				0.47		0.36		0.396
Potassium				5.9		9		7
Silicon								
Silver		0.0001						
Sodium	200		10.3	5.4	6.8	12.5	10.8	9
Strontium								
Sulphate	500		15	22	18	13	21	11
Sulphur								
Total Sus. Solids								
TDS	500		585	448	516	585	533	605
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium						1.6		
TKN				1.1				1.64
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		0.005		0.013		0.02
Ion Balance				0.923	0.883			
Field Parameters								
Temperature (°C)			9.5	10.2	9.6	10.0	9.6	10
pH			7.1	6.7	6.9	7	6.3	6.7
Conductivity (µS/cm)			628	839	915	990	998	938

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 2B (shallow)					
			Sep-21	May-22	Aug-22	Jun-23	Oct-23	Jun-24
PARAMETER	ODWQS	PWQO					DRY	DRY
Alkalinity (as CaCO3)	30-500		500	487	485	270		
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			1.69	1.33	1.26	0.44		
Arsenic	0.01	0.1 - 0.005(i)		<0.001		<0.001		
Barium	1		0.1	0.15	0.12	0.05		
Beryllium		0.011						
BOD			4		5			
Boron	5	0.2(i)	0.13	0.06	0.08	0.02		
Bromide								
Cadmium	0.005	0.0002		0.00030		<0.0001		
Calcium			150	138	147	82		
Chloride	250		9	5	10	11		
Chromium	0.05	0.009		<0.001		<0.001		
Cobalt		0.0009(i)						
COD			5	<5	23	5		
Conductivity (µS/cm)			870	842	859	521		
Copper	1	0.005		0.018		0.007		
DOC	5		4.3	3.5	3.5	3.6		
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	0.06	0.04	<0.03		
Lead	0.01			<0.001		<0.001		
Magnesium			25	24	26	15		
Manganese	0.05			4.1		0.33		
Mercury		0.0002		<0.0001		<0.0001		
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		0.19	<0.10	3.08	1.88		
Nitrite (as N)	1					<0.10		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.13	7.25	7.36	7.09		
Phenols				<0.001		<0.001		
Phosphate (as P)								
Phosphorus (total)				0.385		0.085		
Potassium				6		3		
Silicon								
Silver		0.0001						
Sodium	200		15	8	9	7		
Strontium								
Sulphate	500		11	7	12	14		
Sulphur								
Total Sus. Solids			387		635			
TDS	500		566	547	558	339		
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				1.65		0.784		
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		0.02		<0.01		
Ion Balance								
Field Parameters								
Temperature (°C)			10	10.9	11	12.6		
pH			6.5	6.6	7.24	7.1		
Conductivity (µS/cm)			866	890	900			

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

BH 2B (shallow)
Oct-24

PARAMETER	ODWQS	PWQO	DRY					
Alkalinity (as CaCO3)	30-500							
Aluminum	0.1	0.075 (i)						
Ammonia (as N)								
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1							
Beryllium		0.011						
BOD								
Boron	5	0.2(i)						
Bromide								
Cadmium	0.005	0.0002						
Calcium								
Chloride	250							
Chromium	0.05	0.009						
Cobalt		0.0009(i)						
COD								
Conductivity (µS/cm)								
Copper	1	0.005						
DOC	5							
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3						
Lead	0.01							
Magnesium								
Manganese	0.05							
Mercury		0.0002						
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10							
Nitrite (as N)	1							
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5							
Phenols								
Phosphate (as P)								
Phosphorus (total)								
Potassium								
Silicon								
Silver		0.0001						
Sodium	200							
Strontium								
Sulphate	500							
Sulphur								
Total Sus. Solids								
TDS	500							
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN								
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						
Ion Balance								
Field Parameters								
Temperature (^{o}C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted
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Ross WDS
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			BH 3					
			Aug-90	Dec-90	Aug-91	Nov-98	DESTROYED	
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500			138	146			
Aluminum	0.1	0.075 (i)		<0.030	<0.030			
Ammonia (as N)				<0.10	<0.10			
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1			0.03	0.03			
Beryllium		0.011		<0.010	<0.010			
BOD				<1.0	3			
Boron	5	0.2(i)		<0.010	<0.010			
Bromide				<0.50	<0.50			
Cadmium	0.005	0.0002		<0.0020	<0.0020			
Calcium				47	63			
Chloride	250			12	12			
Chromium	0.05	0.009		<0.0100	<0.0100			
Cobalt		0.0009(i)		<0.0200	<0.0100			
COD				<3	14			
Conductivity (µS/cm)			340	365	320			
Copper	1	0.005		<0.0100	<0.0100			
DOC	5							
Fluoride	1.5			0.08	0.07			
Hardness (as CaCO3)	500			170	206			
Iron	0.3	0.3		0.03	0.03			
Lead	0.01			<0.0100	<0.0020			
Magnesium				13	12			
Manganese	0.05			<0.010	<0.010			
Mercury		0.0002						
Molybdenum		0.04(i)		0.06	<0.010			
Nickel				<0.010	<0.010			
Nitrate (as N)	10			5.5	12.6			
Nitrite (as N)	1			<0.10	<0.10			
Organic Nitrogen	0.15			<0.10	<0.10			
pH (pH units)	6.5-8.5		6.7	7.6	7.8			
Phenols				<0.002	<0.002			
Phosphate (as P)				0.18	0.15			
Phosphorus (total)				<0.100	<0.100			
Potassium				2	2			
Silicon				5.6	5.4			
Silver		0.0001		<0.01000	<0.01000			
Sodium	200			6	1			
Strontium				0.09	0.06			
Sulphate	500			14	13			
Sulphur				5	3			
Total Sus. Solids								
TDS	500			256	222			
Temperature (°C)	15		8	7	10.7			
Thallium		0.0003(i)		<0.01000	<0.05000			
Tin				0.05	<0.050			
Titanium				<0.010	<0.010			
TKN				<0.10	<0.10			
Vanadium		(0.006(i)		<0.0100	<0.0100			
Zinc	5	0.03 - 0.02(i)		0.01	<0.010			
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inorganic
Groundwater Quality

			BH 4A (shallow)					
			Aug-90	Dec-90	Aug-91	Oct-91	Nov-98	Apr-99
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500			176	230	230	317	261
Aluminum	0.1	0.075 (i)		<0.030	<0.030	<0.030	<0.030	<0.030
Ammonia (as N)				<0.10	<0.10	<0.10	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1			0.04	0.06	0.07	0.11	0.1
Beryllium		0.011		<0.010	<0.010	<0.010	<0.010	<0.010
BOD				<1.0	4	<1.0		
Boron	5	0.2(i)		<0.010	<0.010	0.003	0.06	0.05
Bromide				0.6	<0.50	<0.50		
Cadmium	0.005	0.0002		<0.0020	<0.0020	<0.0020	<0.0050	<0.0050
Calcium				60	78	82	139	108
Chloride	250			11	20	20	40	18
Chromium	0.05	0.009		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Cobalt		0.0009(i)		<0.0200	<0.0100	<0.0100	<0.0100	<0.0100
COD				<3	17	12	5	7
Conductivity (µS/cm)			490	470	550	625	715	750
Copper	1	0.005		<0.0100	<0.0100	0.01	<0.0050	<0.0050
DOC	5							
Fluoride	1.5			0.08	0.06	0.06		
Hardness (as CaCO3)	500			211	284	290	485	379
Iron	0.3	0.3		0.02	<0.01	<0.01	<0.01	<0.01
Lead	0.01			<0.0100	<0.0020	<0.0020	<0.0020	<0.0020
Magnesium				15	22	21	34	27
Manganese	0.05			<0.010	<0.010	<0.010	<0.010	<0.010
Mercury		0.0002						
Molybdenum		0.04(i)		0.1	<0.010	<0.010	<0.010	<0.010
Nickel				<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate (as N)	10			5.92	8.88	15.2	14.2	15.5
Nitrite (as N)	1			<0.10	0.12	<0.10		
Organic Nitrogen	0.15			0.28	<0.10	<0.10		
pH (pH units)	6.5-8.5		7.7	7.8	7.7	7.5	7.1	7.3
Phenols				<0.002	<0.002	<0.002		
Phosphate (as P)				0.1	0.24	0.2		
Phosphorus (total)				<0.100	<0.100	<0.100		
Potassium				2	2	2	7	4
Silicon				5.4	5.7	6.6	5.5	6.5
Silver		0.0001		<0.01000	<0.01000	<0.01000	<0.01000	<0.01000
Sodium	200			5	5	6	11	9
Strontium				0.12	0.14	0.19	0.264	0.189
Sulphate	500			21	32	38	81	39
Sulphur				8	13	13	26	12
Total Sus. Solids								
TDS	500			288	340	318	536	392
Temperature (°C)	15		8	7	13.7	8.8	6	7
Thallium		0.0003(i)		<0.01000	<0.05000	<0.05000	<0.20000	<0.20000
Tin				<0.050	<0.050	<0.050	<0.050	<0.050
Titanium				<0.010	<0.010	<0.010	<0.010	<0.010
TKN				0.28	<0.10	<0.10		
Vanadium		(0.006(i)		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Zinc	5	0.03 - 0.02(i)		<0.010	<0.010	<0.010	<0.010	<0.010
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 4A (shallow)					
			Oct-99	Apr-00	Dec-00	Nov-01	Oct-02	Oct-03
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500				322	285	326	315
Aluminum	0.1	0.075 (i)	0.05	<0.050				
Ammonia (as N)			0.05	0.06				<0.02
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		NA	0.15	0.11	0.07	0.11	0.1
Beryllium		0.011	<0.010	<0.002				
BOD								
Boron	5	0.2(i)	NA	0.12	0.07	0.06	<0.050	0.07
Bromide								
Cadmium	0.005	0.0002	<0.0050	<0.0050				
Calcium			114	144	121	109	132	136
Chloride	250		26	40	32			33
Chromium	0.05	0.009	<0.0100	<0.0100				
Cobalt		0.0009(i)	<0.0100	0.008				
COD					8			<5
Conductivity (µS/cm)			840	700	700	725	700	550
Copper	1	0.005	<0.0100	0.012				
DOC	5							0.5
Fluoride	1.5							
Hardness (as CaCO3)	500		394	501	423	373	447	469
Iron	0.3	0.3	0.12	0.13	0.03			
Lead	0.01		<0.0020	<0.0010				
Magnesium			27	35	30	25	29	32
Manganese	0.05		<0.010	<0.010	<0.010	<0.010	<0.005	<0.010
Mercury		0.0002						
Molybdenum		0.04(i)	<0.010	<0.010				
Nickel			<0.010	<0.010				
Nitrate (as N)	10		16.9	15	12.8	15	16.7	16.2
Nitrite (as N)	1							<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.2	7.4	7.6	7.6	7.4	7.3
Phenols								<0.001
Phosphate (as P)								
Phosphorus (total)								
Potassium			4	8	5	4	4	6
Silicon			6.6	6.04				
Silver		0.0001	<0.01000	<0.01000				
Sodium	200		8	16	11			
Strontium			0.234	0.266	0.233	0.16	0.234	0.218
Sulphate	500		43	59	36	36	46	37
Sulphur			12	19				
Total Sus. Solids								
TDS	500		452	580	532	464	571	540
Temperature (°C)	15		7	7	6	8	9.8	8.5
Thallium		0.0003(i)	<0.20000	<0.20000				
Tin			<0.050	<0.050				
Titanium			<0.010	<0.010				
TKN								
Vanadium		(0.006(i)	<0.0100	0.04				
Zinc	5	0.03 - 0.02(i)	0.07	<0.010				
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 4A (shallow)					
			Oct-04	Nov-05	Sep-06	Oct-07	May-08	Oct-08
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		300	334	345	305	267	303
Aluminum	0.1	0.075 (i)						
Ammonia (as N)						0.03	0.35	0.03
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.114	0.14	0.15			
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.1	0.11	0.09	0.09	0.07	0.11
Bromide								
Cadmium	0.005	0.0002						
Calcium			126	135		132	122	133
Chloride	250					31	32	28
Chromium	0.05	0.009						
Cobalt		0.0009(i)						
COD						<5	<5	<5
Conductivity (µS/cm)			600	650	750	941	858	951
Copper	1	0.005				0.003	0.002	0.002
DOC	5		1.7	1.6	1.9			
Fluoride	1.5							
Hardness (as CaCO3)	500		442	477		463	426	470
Iron	0.3	0.3				<0.03	<0.03	<0.03
Lead	0.01							
Magnesium			31.6	34.5		33	30	34
Manganese	0.05		<0.005	0.03		<0.01	<0.01	<0.01
Mercury		0.0002						
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		20.2	25	21	23.8	25.1	25.1
Nitrite (as N)	1					<0.10	<0.10	<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.2	7.3	7.3			
Phenols						<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)								
Potassium			3	7	7	6	6	6
Silicon								
Silver		0.0001						
Sodium	200						11	12
Strontium			0.237	0.28	0.31	0.267	0.243	0.250
Sulphate	500		56	57	79	67	41	74
Sulphur								
Total Sus. Solids								
TDS	500		556	358	627	612	558	618
Temperature (°C)	15		12	13.3	8.9			
Thallium		0.0003(i)						
Tin								
Titanium								
TKN						0.43	0.6	0.37
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						
Ion Balance							1.03	0.99
Field Parameters								
Temperature (°C)							10.5	9.4
pH							8.2	--
Conductivity (µS/cm)							860	940

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted
Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
Groundwater Quality

			BH 4A (shallow)					
			May-09	Oct-09	May-10	Oct-10	May-11	Nov-11
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		283	299	277	283	298	306
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.02	0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001	<0.001	<0.001	<0.001	
Barium	1		0.11	0.1	0.1	0.11	0.1	0.1
Beryllium		0.011						
BOD			2	<1				
Boron	5	0.2(i)	0.06	0.05	0.05	0.04	0.04	0.04
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium			119	122	110	126	122	120
Chloride	250		28	30	25	26	27	24
Chromium	0.05	0.009	0.002	0.002	0.002	0.003	0.008	
Cobalt		0.0009(i)						
COD			8	7	5	20	10	<5
Conductivity (µS/cm)			870	893	818	805	825	833
Copper	1	0.005	0.002	0.002	0.001	0.001	0.001	
DOC	5		1.8	2.1	2	2	2.1	1.6
Fluoride	1.5							
Hardness (as CaCO3)	500		402	422	376	831	410	409
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	0.05	0.13
Lead	0.01		<0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium			26	29	25	126	26	27
Manganese	0.05		<0.01	<0.01	<0.01	<0.01	<0.01	
Mercury		0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		22.1	15.8	21.4	18.9	20.5	15.4
Nitrite (as N)	1		<0.10	<0.10	<0.10	<0.10	<0.10	
Organic Nitrogen	0.15				≤ 0.15	≤ 0.11	<0.1	
pH (pH units)	6.5-8.5		7.81	8.04	7.89	7.92	8.13	7.81
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	
Phosphate (as P)								
Phosphorus (total)			0.42	0.02	0.03	0.24	0.08	
Potassium			4	4	3	5	4	
Silicon								
Silver		0.0001						
Sodium	200		8	10	8	8	9	9
Strontium			0.268	0.258				
Sulphate	500		46	53	38	42	33	44
Sulphur								
Total Sus. Solids			534	52				
TDS	500		565	580	532	523	536	541
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.15	0.26	0.15	0.11	<0.10	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01	<0.01	<0.01	<0.01	
Ion Balance								
Field Parameters								
Temperature (°C)			13	8.2		9.2	10.8	8.8
pH			6.9	8.05		7.37	7.8	7.5
Conductivity (µS/cm)			941	902		834	559	831

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 4A (shallow)					
			May-12	Oct-12	Apr-13	Oct-13	Jul-14	Oct-14
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		287	300	277	321	275	300
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.02	<0.02	<0.02	<0.02	<0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)	<0.001		<0.001		<0.0001	
Barium	1		0.09	0.1	0.08	0.09	0.049	0.096
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.04	0.04	0.03	0.03	0.029	0.04
Bromide								
Cadmium	0.005	0.0002	<0.0001		<0.0001		<0.00002	
Calcium			120	120	105	122	99.7	128
Chloride	250		24	22	21	23	22.9	24.1
Chromium	0.05	0.009	0.002		<0.001		<0.002	
Cobalt		0.0009(i)						
COD			<5	<5	<5	<5	<5	< 5
Conductivity (µS/cm)			782	799	735	824	774	818
Copper	1	0.005	<0.001		<0.001		<0.0001	
DOC	5		3.2	2.1	1.6	1.4	2.8	3.7
Fluoride	1.5							
Hardness (as CaCO3)	500		409	405	363	418	350	440
Iron	0.3	0.3	0.05	0.05	0.03	<0.03	0.005	0.007
Lead	0.01		<0.001		<0.001		<0.00002	
Magnesium			27	26	25	28	25	29.7
Manganese	0.05		0.02		0.02		0.008	
Mercury		0.0002	<0.0001		<0.0001		<0.00002	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		16.5	15.8	15.5	15.5	18.9	17.5
Nitrite (as N)	1		<0.10		<0.10		<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.94	7.92	7.93	7.7	8.02	8.05
Phenols			<0.001		<0.005		<0.001	
Phosphate (as P)								
Phosphorus (total)			0.06		0.21		0.04	
Potassium			3		3		2.9	
Silicon								
Silver		0.0001						
Sodium	200			7	6	8	7.7	9.4
Strontium			10					
Sulphate	500		33	34	27	31	27	32
Sulphur								
Total Sus. Solids								
TDS	500		508	519	478	598	434	483
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.22		0.15		<0.05	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01		<0.01		<0.005	
Ion Balance							1.08	0.924
Field Parameters								
Temperature (°C)			10.9	9.3	9.7	10.7	10	9.8
pH			7.4	7.3	7.5	7.4	7.8	7.4
Conductivity (µS/cm)			778	770	723	743	674	779

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 4A (shallow)					
			Apr-15	Sep-15	Apr-16	Sep-16	May-17	Aug-17
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		300	309	327	371	362	424
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)	0.0001		< 0.0001		0.0005	
Barium	1		0.095	0.091	0.097	0.106	0.12	0.174
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.047	0.035	0.037	0.051	0.089	0.292
Bromide								
Cadmium	0.005	0.0002	< 0.00002		< 0.00002		0.00003	
Calcium			128	123	130	132	151	176
Chloride	250		23.1	26.5	29.1	43.3	53.5	60.5
Chromium	0.05	0.009	< 0.002		< 0.002		< 0.002	
Cobalt		0.0009(i)						
COD			< 5	< 5	10	5	< 5	< 5
Conductivity (µS/cm)			765	782	846	1000	1070	1260
Copper	1	0.005	< 0.002		0.0009		0.0026	
DOC	5		3.9	1.7	1.5	2.1	2.3	4.8
Fluoride	1.5							
Hardness (as CaCO3)	500		440	423			524	
Iron	0.3	0.3	0.009	< 0.005	0.013	< 0.005	< 0.005	0.011
Lead	0.01		0.00002		0.00002		< 0.00002	
Magnesium			29.8	28.6	31	33.8	35.8	44.6
Manganese	0.05		0.008		0.005		< 0.001	
Mercury		0.0002	< 0.00002		< 0.00002		< 0.02	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		29.8	19.5	21	21.1	19.4	18
Nitrite (as N)	1		< 0.1		< 0.1		< 0.05	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.84	7.89	8.06	7.81	7.92	7.85
Phenols			< 0.001		< 0.001		0.005	
Phosphate (as P)								
Phosphorus (total)			0.04		0.03		0.03	
Potassium			3		2.7		2.6	
Silicon								
Silver		0.0001						
Sodium	200		9.4	9.5	10.9	15	17.1	35.3
Strontium								
Sulphate	500		30	29	31	57	39	61
Sulphur								
Total Sus. Solids								
TDS	500		535	532	523	600	516	636
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.19		0.24		0.3	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005		< 0.005		< 0.005	
Ion Balance			1.01	0.993				
Field Parameters								
Temperature (°C)			9.6	9.5	9.7	10.5	9.9	9.9
pH			7.5	7.5	7.5	7.4	7.1	7.1
Conductivity (µS/cm)			851	719	794	1092	1046	1203

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 4A (shallow)					
			Apr-18	Sep-18	Jun-19	Oct-19	May-20	Sep-20
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		360	461	345	354	336	326
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.04	0.05	0.04	0.03	< 0.01	0.03
Arsenic	0.01	0.1 - 0.005(i)	< 0.0001		< 0.0001		< 0.0001	
Barium	1		0.136	0.169	0.129	0.164	0.148	0.139
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.19	0.314	0.133	0.226	0.161	0.147
Bromide								
Cadmium	0.005	0.0002	0.00002		< 0.000015		< 0.000015	
Calcium			149	175	147	156	151	146
Chloride	250		41.8	76.7	56	44.3	43.3	53.4
Chromium	0.05	0.009	< 0.002		< 0.001		< 0.001	
Cobalt		0.0009(i)						
COD			7	18	5	9	< 5	7
Conductivity (µS/cm)			1040	1260	947	982	992	1020
Copper	1	0.005	0.0025		0.0023		0.0031	
DOC	5		4.7	5.8	4	5.4	3.5	4
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	0.007	< 0.005	0.009	< 0.005	0.005
Lead	0.01		0.00004		0.00003		0.00003	
Magnesium			37.5	47	38.9	40.8	35.7	35.9
Manganese	0.05		0.002		< 0.001	< 0.001	< 0.001	
Mercury		0.0002	< 0.00002		< 0.00002		< 0.00002	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		23.5	18.1	21.9	20.4	20.3	19.5
Nitrite (as N)	1		< 0.05		< 0.05		< 0.05	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.84	7.76	7.83	7.82	7.88	7.66
Phenols			< 0.001		< 0.002		< 0.002	
Phosphate (as P)								
Phosphorus (total)			0.03		0.02		0.03	
Potassium			3.5		4.4		4.5	
Silicon								
Silver		0.0001						
Sodium	200		25.6	49	25.4	28	21	22.2
Strontium								
Sulphate	500		41	53	39	62	40	56
Sulphur								
Total Sus. Solids								
TDS	500		514	682	518	548	497	513
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium							0.4	
TKN			0.5		0.4			
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005		< 0.005		< 0.005	
Ion Balance					0.924	0.887		
Field Parameters								
Temperature (°C)			9.8	9.9	10.1	9.4	9.9	9.3
pH			7.1	7.6	7.1	7.4	7.4	6.8
Conductivity (µS/cm)			896	682	1083	1084	964	1074

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 4A (shallow)					
			Apr-21	Sep-21	May-22	Aug-22	Jun-23	Oct-23
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		301	323	286	316	303	359
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.010	<0.010	0.019	<0.020	<0.020	<0.020
Arsenic	0.01	0.1 - 0.005(i)	<0.001		<0.001		<0.001	
Barium	1		0.11	0.1	0.11	0.11	0.11	0.12
Beryllium		0.011						
BOD				2		<1		3
Boron	5	0.2(i)	0.12	0.08	0.05	0.06	0.06	0.09
Bromide								
Cadmium	0.005	0.0002	<0.0001		<0.0001		<0.0001	
Calcium			109	127	108	115	110	128
Chloride	250		31	30	25	27	26	27
Chromium	0.05	0.009	<0.001		<0.001		<0.001	
Cobalt		0.0009(i)						
COD			6	<5	<5	<5	<5	11
Conductivity (µS/cm)			848	833	724	775	750	838
Copper	1	0.005	0.005		0.001		0.003	
DOC	5		2	2.4	2.8	2.2	2.9	9.0
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	<0.03	<0.03	0.03	<0.03	<0.03
Lead	0.01		<0.001		<0.001		<0.001	
Magnesium			24	29	24	26	25	29
Manganese	0.05		<0.02		<0.01		<0.01	
Mercury		0.0002	<0.0001		<0.0001		<0.0001	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		18.1	17.7	20.9	18.0	18.0	14.8
Nitrite (as N)	1		<0.10		<0.10		<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.89	7.75	7.49	7.68	7.67	7.48
Phenols			<0.010		<0.001		<0.001	
Phosphate (as P)								
Phosphorus (total)			0.026		0.034		0.04	
Potassium			4		3		2	
Silicon								
Silver		0.0001						
Sodium	200		17	16	11	11	11	13
Strontium								
Sulphate	500		34	33	26	29	25	40
Sulphur								
Total Sus. Solids				48		41		34
TDS	500		551	541	471	504	488	545
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.28		0.365		0.415	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01		<0.01		<0.01	
Ion Balance								
Field Parameters								
Temperature (^{o}C)			8.6	9.9	10.3	10.6	12.4	9.3
pH			7.6	7.2	7.6	7.7	7.4	7.6
Conductivity (µS/cm)			880	838	852	800	880	980

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
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			BH 4A (shallow)					
			Jun-24	Oct-24				
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		273	284				
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.020	<0.020				
Arsenic	0.01	0.1 - 0.005(i)	<0.001					
Barium	1		0.09	0.09				
Beryllium		0.011						
BOD				2				
Boron	5	0.2(i)	0.05	0.04				
Bromide								
Cadmium	0.005	0.0002	<0.0001					
Calcium			113	117				
Chloride	250		23	23				
Chromium	0.05	0.009	<0.001					
Cobalt		0.0009(i)						
COD			<5	<5				
Conductivity (µS/cm)			714	727				
Copper	1	0.005	0.002					
DOC	5		1.4	1.8				
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	<0.03				
Lead	0.01		<0.001					
Magnesium			25	26				
Manganese	0.05		<0.01					
Mercury		0.0002	<0.0001					
Molybdenum		0.04(i)						
Nickel			<0.10					
Nitrate (as N)	10		15.3	16.9				
Nitrite (as N)	1							
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.59	7.79				
Phenols			<0.001					
Phosphate (as P)								
Phosphorus (total)			0.046					
Potassium			3					
Silicon								
Silver		0.0001						
Sodium	200		10	9				
Strontium								
Sulphate	500		26	21				
Sulphur								
Total Sus. Solids				45				
TDS	500		464	473				
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.1					
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01					
Ion Balance								
Field Parameters								
Temperature (°C)			12.6	10.4				
pH			7.3	7.3				
Conductivity (µS/cm)			770	820				

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
Groundwater Quality

			BH 4 (deep)					
			Aug-90	Dec-90	Oct-91	Nov-98	Apr-99	Oct-99
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500			148	288	303	297	
Aluminum	0.1	0.075 (i)		<0.030	0.06	<0.030	<0.030	0.11
Ammonia (as N)				<0.01	<0.10	<0.02	0.14	<0.02
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1			0.08	0.12	0.11	0.13	NA
Beryllium		0.011		<0.010	<0.010	<0.010	<0.010	<0.010
BOD				2	<1.0			
Boron	5	0.2(i)		0.03	0.06	<0.010	0.09	NA
Bromide				0.7	0.6			
Cadmium	0.005	0.0002		<0.0020	<0.0020	<0.0050	<0.0050	<0.0050
Calcium				53	126	132	122	121
Chloride	250			32	48	32	25	32
Chromium	0.05	0.009		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Cobalt		0.0009(i)		0.04	<0.0100	<0.0100	<0.0100	<0.0100
COD				<3	6	<3	7	
Conductivity (µS/cm)			700	600	950	720	820	725
Copper	1	0.005		<0.0100	<0.0100	<0.0050	<0.0050	<0.0100
DOC	5							
Fluoride	1.5			0.08	0.06			
Hardness (as CaCO3)	500			238	448	463	430	423
Iron	0.3	0.3		0.05	0.22	<0.01	<0.01	0.3
Lead	0.01			<0.0100	0.002	<0.0020	<0.0020	<0.0020
Magnesium				26	33	33	31	30
Manganese	0.05			0.02	<0.010	<0.010	<0.010	<0.010
Mercury		0.0002						
Molybdenum		0.04(i)		0.07	<0.010	<0.010	<0.010	<0.010
Nickel				0.03	<0.010	<0.010	<0.010	<0.010
Nitrate (as N)	10			8.58	15.2	15.4	15	16
Nitrite (as N)	1			<0.10	<0.10			
Organic Nitrogen	0.15			0.76	<0.10			
pH (pH units)	6.5-8.5		7.4	7.4	7.5	6.8	7.4	6.9
Phenols				<0.002	<0.002			
Phosphate (as P)				0.13	0.2			
Phosphorus (total)				<0.100	<0.100			
Potassium				4	4	5	7	6
Silicon				6.2	6.8	5.3	6.6	6.9
Silver		0.0001		<0.01000	<0.01000	<0.01000	<0.01000	<0.01000
Sodium	200			15	16	10	13	11
Strontium				0.2	0.27	0.242	0.231	0.27
Sulphate	500			45	110	65	59	56
Sulphur				18	35	23	18	17
Total Sus. Solids								
TDS	500			378	488	504	428	528
Temperature (°C)	15		8	7	8.8	5.5	7.5	6
Thallium		0.0003(i)		<0.01000	<0.05000	<0.20000	<0.20000	<0.20000
Tin				<0.050	<0.050	<0.050	<0.050	<0.050
Titanium				<0.010	<0.010	<0.010	<0.010	<0.010
TKN				0.76	<0.10			
Vanadium		(0.006(i)		<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Zinc	5	0.03 - 0.02(i)		<0.010	<0.010	<0.010	<0.010	0.13
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
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			BH 4 (deep)					
			Apr-00	Dec-00	Nov-01	Oct-02	Oct-03	Oct-04
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500			352	316	351	341	324
Aluminum	0.1	0.075 (i)	<0.050					
Ammonia (as N)			0.07				0.23	
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.1	0.15	0.11	0.17	0.16	0.147
Beryllium		0.011	<0.002					
BOD								
Boron	5	0.2(i)	0.06	0.12	0.09	0.09	0.13	0.14
Bromide								
Cadmium	0.005	0.0002	<0.0050					
Calcium			120	135	128	147	151	134
Chloride	250		21	42			45	
Chromium	0.05	0.009	<0.0100					
Cobalt		0.0009(i)	0.012					
COD				8			<5	
Conductivity (µS/cm)			550	800	900	800	700	680
Copper	1	0.005	0.008					
DOC	5						1.1	2.1
Fluoride	1.5							
Hardness (as CaCO3)	500		413	475	457	509	531	472
Iron	0.3	0.3	0.05	0.04				
Lead	0.01		<0.0010					
Magnesium			28	34	34	35	38	34
Manganese	0.05		<0.010	<0.010	<0.010	0.015	0.02	0.029
Mercury		0.0002						
Molybdenum		0.04(i)	<0.010					
Nickel			<0.010					
Nitrate (as N)	10		16.5	13.7	15.6	16.7	16.6	18.6
Nitrite (as N)	1						<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.5	7.6	7.4	7.3	7.3	7.4
Phenols							<0.001	
Phosphate (as P)								
Phosphorus (total)								
Potassium			5	8	8	8	10	6
Silicon			5.73					
Silver		0.0001	<0.01000					
Sodium	200		10	15				
Strontium			0.201	0.284	0.203	0.302	0.295	0.271
Sulphate	500		31	60	83	107	66	68.8
Sulphur			9					
Total Sus. Solids								
TDS	500		448	668	628	708	616	588
Temperature (°C)	15		8	8	6	8.7	7.8	13
Thallium		0.0003(i)	<0.20000					
Tin			<0.050					
Titanium			<0.010					
TKN								
Vanadium		(0.006(i)	0.01					
Zinc	5	0.03 - 0.02(i)	<0.010					
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 4 (deep)					
			Nov-05	Sep-06	Aug-07	Oct-07	May-08	Oct-08
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		314	322	291	294	283	292
Aluminum	0.1	0.075 (i)						
Ammonia (as N)					0.13	<0.02	0.15	<0.02
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.12	0.12				
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.09	0.07	0.11	0.09	0.08	0.09
Bromide								
Cadmium	0.005	0.0002						
Calcium			130		128	132	130	143
Chloride	250				34	31	33	30
Chromium	0.05	0.009						
Cobalt		0.0009(i)						
COD					<5	<5	<5	5
Conductivity (µS/cm)			600	700	932	966	900	941
Copper	1	0.005			0.003	0.002	0.002	0.002
DOC	5		1.5	1.5				
Fluoride	1.5							
Hardness (as CaCO3)	500		459		449	463	454	499
Iron	0.3	0.3			<0.03	0.03	<0.03	<0.03
Lead	0.01							
Magnesium			33.1		32	33	32	35
Manganese	0.05		<0.010		<0.01	<0.01	<0.01	<0.01
Mercury		0.0002						
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		26	11	23.9	5.55	25.7	25.2
Nitrite (as N)	1				<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15				0.18	≤ 0.34	0.28	≤ 0.27
pH (pH units)	6.5-8.5		7.4	7.4				
Phenols					<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)								
Potassium			5	5	6	4	6	5
Silicon								
Silver		0.0001						
Sodium	200				12	12	12	12
Strontium			0.26	0.27	0.247	0.249	0.265	0.268
Sulphate	500		51	60	60	65	48	76
Sulphur								
Total Sus. Solids								
TDS	500		296	613	606	602	585	612
Temperature (°C)	15		12.3	9.3				
Thallium		0.0003(i)						
Tin								
Titanium								
TKN					0.31	0.34	0.43	0.27
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						
Ion Balance							1.04	1.06
Field Parameters								
Temperature (°C)							9.9	9.2
pH							8.46	--
Conductivity (µS/cm)							892	934

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 4 (deep)					
			May-09	Oct-09	May-10	Oct-10	May-11	Nov-11
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		274	303	280	282	298	310
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001	<0.001	<0.001	<0.001	
Barium	1		0.1	0.11	0.11	0.09	0.11	0.12
Beryllium		0.011						
BOD			1	<1				
Boron	5	0.2(i)	0.05	0.06	0.06	0.03	0.04	0.04
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium			118	119	118	125	116	128
Chloride	250		29	26	25	24	27	25
Chromium	0.05	0.009	0.001	0.002	0.002	0.002	0.006	
Cobalt		0.0009(i)						
COD			23	<5	5	10	10	10
Conductivity (µS/cm)			862	892	825	793	829	854
Copper	1	0.005	<0.001	0.002	0.001	0.001	0.001	
DOC	5		1.6	2.1	2	2.1	2.2	1.8
Fluoride	1.5							
Hardness (as CaCO3)	500		400	414	404	425	411	437
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	0.07	0.11
Lead	0.01		<0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium			26	29	27	28	30	29
Manganese	0.05		<0.01	<0.01	<0.01	<0.01	0.02	
Mercury		0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		22.1	23	20.8	18.4	19.1	15
Nitrite (as N)	1		<0.10	<0.10	<0.10	<0.10	<0.10	
Organic Nitrogen	0.15		<0.10	≤ 0.19	≤ 0.31	<0.10	0.22	
pH (pH units)	6.5-8.5		7.83	7.94	7.78	7.95	8.13	7.87
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	
Phosphate (as P)								
Phosphorus (total)			0.03	0.31	0.22	0.04	0.95	
Potassium			3	5	4	4	4	
Silicon								
Silver		0.0001						
Sodium	200		8	10	9	8	10	10
Strontium			0.258	0.264				
Sulphate	500		49	54	39	39	33	48
Sulphur								
Total Sus. Solids			110	697				
TDS	500		560	580	536	515	539	555
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.10	0.19	0.31	<0.10	0.24	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01	<0.01	<0.01	<0.01	
Ion Balance								
Field Parameters								
Temperature (°C)			11.4	8.7	10.1	9.6	9.5	8.8
pH			7.3	8.05	8.71	7.32	7.8	7.4
Conductivity (µS/cm)			865	951	819	828	568	844

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 4 (deep)					
			May-12	Oct-12	Apr-13	Oct-13	Jul-14	Oct-14
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		288	308	314	356	341	370
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.02	<0.02	<0.02	0.04	<0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)	<0.001		<0.001		<0.0001	
Barium	1		0.1	0.11	0.1	0.12	0.114	0.13
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.04	0.04	0.04	0.04	0.057	0.068
Bromide								
Cadmium	0.005	0.0002	<0.0001		<0.0001		<0.00002	
Calcium			119	126	120	134	143	155
Chloride	250		27	26	29	32	40.3	47
Chromium	0.05	0.009	0.002		<0.001		<0.002	
Cobalt		0.0009(i)						
COD			<5	<5	<5	<5	<5	11
Conductivity (µS/cm)			800	833	831	920	939	1000
Copper	1	0.005	0.001		0.001		0.0004	
DOC	5		3.1	1.9	1.8	1.4	3.3	4.8
Fluoride	1.5							
Hardness (as CaCO3)	500		410	428	417	464	494	537
Iron	0.3	0.3	0.11	0.11	0.07	0.06	0.022	0.069
Lead	0.01		<0.001		<0.001		0.00008	
Magnesium			28	28	29	32	33.8	37.1
Manganese	0.05		0.01		0.02		0.009	
Mercury		0.0002	<0.0001		<0.0001		<0.00002	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		16.7	17.1	15.8	15.8	16.7	15
Nitrite (as N)	1		<0.10		<0.10		<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.91	7.87	7.85	7.74	7.97	7.96
Phenols			<0.001		<0.005		<0.001	
Phosphate (as P)								
Phosphorus (total)			0.46		0.9		0.88	
Potassium			4		4		4.3	
Silicon								
Silver		0.0001						
Sodium	200		9	8	8	10	12	14.1
Strontium								
Sulphate	500		37	39	36	37	37	40
Sulphur								
Total Sus. Solids								
TDS	500		520	541	540	598	549	587
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.10		0.24		0.17	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01		<0.01		<0.005	
Ion Balance							0.941	0.922
Field Parameters								
Temperature (°C)			9.6	9	9.4	10	10.1	9.5
pH			7.4	7.2	7.3	7.3	7.9	7.3
Conductivity (µS/cm)			796	811	806	866	807	952

Exceeds ODWS
Exceeds PWQO

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Ross WDS
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			BH 4 (deep)					
			Oct-14 Dup	Apr-15	Sep-15	Apr-16	Sep-16	May-17
PARAMETER	ODWQS	PWQO	BH 20					
Alkalinity (as CaCO3)	30-500		355	427	423	477	464	501
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			< 0.01	< 0.01	< 0.01	0.02	< 0.01	0.07
Arsenic	0.01	0.1 - 0.005(i)		0.0002		0.0002		0.0007
Barium	1		0.129	0.151	0.14	0.166	0.142	0.165
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.068	0.111	0.094	0.133	0.111	0.213
Bromide								
Cadmium	0.005	0.0002		0.00002		0.00003		0.00005
Calcium			156	179	162	185	156	187
Chloride	250		46.9	57.1	65.7	77.2	83.6	95.7
Chromium	0.05	0.009		< 0.002		< 0.002		0.033
Cobalt		0.0009(i)						
COD			< 5	21	9	16	15	15
Conductivity (µS/cm)			995	1050	1060	1220	1210	1400
Copper	1	0.005		0.003		0.0028		0.005
DOC	5		5	6.4	2.3	3.4	3.2	4.8
Fluoride	1.5							
Hardness (as CaCO3)	500		540	620	562			
Iron	0.3	0.3	0.051	0.019	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01			0.00005		< 0.00002		< 0.00002
Magnesium			37.1	42.9	39	46.4	41.3	46.2
Manganese	0.05			0.007		0.005		0.019
Mercury		0.0002		< 0.00002		< 0.00002		< 0.02
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		15	14.1	14.8	14	15.6	12.6
Nitrite (as N)	1			< 0.1		< 0.1		0.09
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.95	7.75	7.84	7.98	7.81	7.78
Phenols				< 0.001		< 0.001		0.003
Phosphate (as P)								
Phosphorus (total)				2.5		0.59		0.4
Potassium				5		5		4.3
Silicon								
Silver		0.0001						
Sodium	200		14.1	18.8	19.2	26.9	26.2	38.8
Strontium								
Sulphate	500		40	45	41	41	56	42
Sulphur								
Total Sus. Solids								
TDS	500		578	666	726	729	714	715
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.4		0.57		1.4
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		< 0.005		< 0.005
Ion Balance			0.896	0.902	0.998			
Field Parameters								
Temperature (°C)				9.5	9.5	9.7	9.6	9.9
pH				7.4	7.4	7.4	7	7.2
Conductivity (µS/cm)				1165	953	1133	1341	1359

Exceeds ODWS
Exceeds PWQO

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Ross WDS
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			BH 4 (deep)					
			Aug-17	Apr-18	Sep-18	Jun-19	Oct-19	May-20
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		530	461	344	476	421	418
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.01	0.04	0.01	0.05	0.03	0.02
Arsenic	0.01	0.1 - 0.005(i)		0.0001		< 0.0001		< 0.0001
Barium	1		0.203	0.169	0.137	0.171	0.188	0.173
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.361	0.344	0.158	0.353	0.394	0.329
Bromide								
Cadmium	0.005	0.0002		0.00006		0.00007		0.00005
Calcium			206	172	151	179	176	170
Chloride	250		103	77.4	44.2	94.9	67.3	64.5
Chromium	0.05	0.009		< 0.002		< 0.001		< 0.001
Cobalt		0.0009(i)						
COD			15	17	5	12	16	24
Conductivity (µS/cm)			1510	1280	1040	1259	1165	1170
Copper	1	0.005		0.005		0.0055		0.0055
DOC	5		6.2	7.4	3.9	6.8	11.9	4.8
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.009	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01			0.00002		0.00002		0.00005
Magnesium			53.9	44.3	39.5	48.5	45.6	42.8
Manganese	0.05			0.079		0.14	0.136	0.142
Mercury		0.0002		< 0.00002		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		11.2	17	24.1	14.2	15	15.1
Nitrite (as N)	1			< 0.05		< 0.05		0.08
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.81	7.79	7.79	7.77	7.9	7.8
Phenols				< 0.001		< 0.002		< 0.002
Phosphate (as P)								
Phosphorus (total)				0.5		0.28		0.42
Potassium				4.6		5.1		5.2
Silicon								
Silver		0.0001						
Sodium	200		51.8	52.9	23.5	54.4	50.4	44
Strontium								
Sulphate	500		51	38	50	43	58	41
Sulphur								
Total Sus. Solids								
TDS	500		789	666	519	710	656	618
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								0.6
TKN				0.7		0.7		
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		< 0.005		< 0.005
Ion Balance						0.913	0.846	
Field Parameters								
Temperature (°C)			9.7	9.6	9.9	10	9.4	9.6
pH			7.0	6.9	7.8	7	7.3	7.1
Conductivity (µS/cm)			1418	1093	778	1375	1243	1125

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
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			BH 4 (deep)					
			Sep-20	Apr-21	Sep-21	May-22	Aug-22	Jun-23
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		399	413	432	394	420	430
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.03	0.013	0.039	0.023	<0.020	<0.020
Arsenic	0.01	0.1 - 0.005(i)		<0.001		<0.001		<0.001
Barium	1		0.159	0.14	0.13	0.15	0.15	0.15
Beryllium		0.011						
BOD					3		<1	
Boron	5	0.2(i)	0.275	0.25	0.2	0.17	0.19	0.22
Bromide								
Cadmium	0.005	0.0002		<0.0001		<0.0001		<0.0001
Calcium			158	136	157	132	143	140
Chloride	250		75.4	64	55	51	51	51
Chromium	0.05	0.009		<0.001		<0.001		<0.001
Cobalt		0.0009(i)						
COD			18	12	<5	<5	32	8
Conductivity (µS/cm)			1180	1100	1090	946	996	988
Copper	1	0.005		0.005		0.004		0.004
DOC	5		4.4	3.5	4	3.9	2.1	3
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.037	<0.03	<0.03	<0.03	<0.03	0.03
Lead	0.01			<0.001		<0.001		<0.001
Magnesium			40.4	32	38	32	34	33
Manganese	0.05			0.11		0.07		0.06
Mercury		0.0002		<0.0001		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		15.6	14.6	14.2	17.6	14.6	14.5
Nitrite (as N)	1			<0.50		<0.10		<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.65	7.85	7.7	7.35	7.59	7.66
Phenols				<0.010		<0.001		<0.001
Phosphate (as P)								
Phosphorus (total)				0.275		0.542		0.855
Potassium				4		4		4
Silicon								
Silver		0.0001						
Sodium	200		39.4	37	34	28	26	29
Strontium								
Sulphate	500		60	40	46	38	39	35
Sulphur								
Total Sus. Solids					150		834	
TDS	500		618	715	708	615	647	642
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.468		0.526		0.477
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.01		<0.01
Ion Balance								
Field Parameters								
Temperature (°C)			9.3	8.8	10	9.6	10.2	11
pH			6.8	7.4	6.8	7.2	7.6	7.4
Conductivity (µS/cm)			1242	1142	1076	1107	1020	1100

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 4 (deep)					
			Oct-23	Jun-24	Oct-24			
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		464	366	357			
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.04	0.023	<0.020			
Arsenic	0.01	0.1 - 0.005(i)		<0.001				
Barium	1		0.15	0.13	0.13			
Beryllium		0.011						
BOD			3		<1			
Boron	5	0.2(i)	0.23	0.25	0.22			
Bromide								
Cadmium	0.005	0.0002		<0.0001				
Calcium			154	141	138			
Chloride	250		48	47	43			
Chromium	0.05	0.009		<0.001				
Cobalt		0.0009(i)						
COD			51	9	11			
Conductivity (µS/cm)			1020	916	899			
Copper	1	0.005		0.003				
DOC	5		11.3	1.9	2.9			
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	<0.03	<0.03			
Lead	0.01			<0.001				
Magnesium			37	32	32			
Manganese	0.05			0.09				
Mercury		0.0002		<0.0001				
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		11.6	12.9	15.0			
Nitrite (as N)	1			<0.10				
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.36	7.52	7.71			
Phenols				<0.001				
Phosphate (as P)								
Phosphorus (total)				1.06				
Potassium				4				
Silicon								
Silver		0.0001						
Sodium	200		29	26	22			
Strontium								
Sulphate	500		50	36	28			
Sulphur								
Total Sus. Solids			544		475			
TDS	500		663	595	584			
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.472				
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01				
Ion Balance								
Field Parameters								
Temperature (°C)			9.4	11.6	9.8			
pH			7.4	7	7.2			
Conductivity (µS/cm)			1180	940	510			

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 5					
			Aug-90	Dec-90	Aug-91	Oct-91	Apr-00	Dec-00
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500			62	104	124		678
Aluminum	0.1	0.075 (i)		0.07	<0.030	0.14	<0.050	
Ammonia (as N)				<0.10	<0.10	<0.10	0.04	
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1			<0.010	0.02	0.05	0.16	0.18
Beryllium		0.011		<0.010	<0.010	<0.010	<0.002	
BOD				<1.0	2	<1.0		
Boron	5	0.2(i)		<0.010	<0.010	0.08	0.14	0.2
Bromide				0.6	<0.50	<0.50		
Cadmium	0.005	0.0002		<0.0020	<0.0020	<0.0020	<0.0050	
Calcium				23	47	65	209	219
Chloride	250			3	13	12	55	140
Chromium	0.05	0.009		<0.0100	<0.0100	<0.0100	<0.0100	
Cobalt		0.0009(i)		<0.0200	<0.0100	<0.0100	<0.0100	
COD				<3	11	<3		51
Conductivity (µS/cm)			200	150	265	450	900	1200
Copper	1	0.005		<0.0100	<0.0100	<0.0100	0.011	
DOC	5							
Fluoride	1.5			0.14	0.09	0.08		
Hardness (as CaCO3)	500			69	154	215	650	691
Iron	0.3	0.3		0.07	0.14	0.16	0.04	0.02
Lead	0.01			<0.0100	<0.0020	0.003	<0.0010	
Magnesium				3	9	13	32	36
Manganese	0.05			<0.010	<0.010	<0.010	0.03	0.1
Mercury		0.0002						
Molybdenum		0.04(i)		<0.010	<0.010	<0.010	0.03	
Nickel				<0.010	<0.010	<0.010	<0.010	
Nitrate (as N)	10			1.35	3	6	0.71	0.65
Nitrite (as N)	1			<0.10	<0.10	<0.10		
Organic Nitrogen	0.15			<0.10	<0.10	<0.10		
pH (pH units)	6.5-8.5		7.6	8.7	8.2	7.6		7.1
Phenols				<0.002	<0.002	<0.002		
Phosphate (as P)				0.33	0.31	0.22		
Phosphorus (total)				<0.100	<0.100	<0.100		
Potassium				2	2	4	5	5
Silicon				5.1	5.2	6	9.3	
Silver		0.0001		<0.01000	<0.01000	<0.01000	<0.01000	
Sodium	200			4	1	4	42	55
Strontium				0.04	0.06	0.17	0.476	0.63
Sulphate	500			9	32	91	26	30
Sulphur				<3	8	30	9	
Total Sus. Solids								
TDS	500			94	152	234	728	896
Temperature (°C)	15		9	7	17	8.8	9	10
Thallium		0.0003(i)		<0.01000	<0.05000	<0.05000	<0.20000	
Tin				<0.050	<0.050	<0.050	<0.050	
Titanium				<0.010	<0.010	<0.010	0.02	
TKN				0.26	<0.10	0.13		
Vanadium		(0.006(i)		<0.0100	<0.0100	<0.0100	0.02	
Zinc	5	0.03 - 0.02(i)		<0.010	<0.010	<0.010	<0.010	
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 5					
			Nov-01	Oct-02	Oct-03	Oct-04	Nov-05	Dec-05
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		233	466	994	698		1100
Aluminum	0.1	0.075 (i)	<0.050	<0.010	<0.010	<0.005		<0.100
Ammonia (as N)			<0.02	0.1	0.05	0.04		
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.05	0.13	0.31	0.189		0.35
Beryllium		0.011	<0.002	<0.001	<0.001	<0.001		<0.005
BOD								
Boron	5	0.2(i)	0.08	0.22	0.22	0.256		0.36
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001	0.00010	<0.0001		<0.0050
Calcium			78	198	309	178		188
Chloride	250		18	76	187	153		
Chromium	0.05	0.009	<0.0010	0.014	0.001	<0.0050		<0.0100
Cobalt		0.0009(i)	0.0005	0.0028	0.036	0.0461		0.07
COD			<5	15	63	57		
Conductivity (µS/cm)			550	800	1700	1710	1300	
Copper	1	0.005	0.003	0.004	0.022	0.0174		<0.0200
DOC	5		2.4	5.2	20.9	20.2		24.9
Fluoride	1.5							
Hardness (as CaCO3)	500		239	569	1030	722		868
Iron	0.3	0.3	<0.01	<0.01	0.02	<0.03		0.21
Lead	0.01		<0.0010	<0.0010	<0.0010	0.0005		<0.0500
Magnesium			11	19	64	68.2		97.5
Manganese	0.05		<0.010	0.247	1.77	5.93		8.73
Mercury		0.0002						
Molybdenum		0.04(i)	<0.010	<0.005	<0.005	0.005		<0.020
Nickel			<0.010	<0.005	0.04	0.036		0.06
Nitrate (as N)	10		3.61	4.46	<0.10	<0.20		<0.10
Nitrite (as N)	1		<0.10	<0.10	<0.10	<0.20		
Organic Nitrogen	0.15		<0.10	<0.10	<0.10	<0.20		
pH (pH units)	6.5-8.5		6.9	7.2	6.9	6.8	6.9	
Phenols			<0.001	<0.001	0.003	<0.001		
Phosphate (as P)								
Phosphorus (total)								
Potassium			3	4	8	4.1		14
Silicon			6.27	6.5	10	10		18.1
Silver		0.0001	<0.00010	<0.00010	<0.00010	<0.00010		<0.01000
Sodium	200		10	17	107	60.1		64.9
Strontium			0.182	0.503	0.911	0.683		1.09
Sulphate	500		12	22	30	10.7		21
Sulphur								
Total Sus. Solids								
TDS	500		304	735	1390	1024		1070
Temperature (°C)	15		7	12.1	9.6	14	12.3	
Thallium		0.0003(i)	<0.00100	<0.00100	<0.00100	<0.00005		
Tin			<0.010	<0.010	<0.010	<0.001		<0.200
Titanium			<0.010	<0.010	<0.010	<0.005		<0.010
TKN								
Vanadium		(0.006(i)	<0.0010	0.004	0.001	0.0017		<0.0100
Zinc	5	0.03 - 0.02(i)	<0.010	<0.005	<0.010	<0.005		<0.010
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

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			BH 5					
			Sep-06	Aug-07	Oct-07	May-08	Oct-08	May-09
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		979	425	439	594	599	930
Aluminum	0.1	0.075 (i)	0.016					
Ammonia (as N)			16.1	5.14	4.79	4.75	3.26	2.43
Arsenic	0.01	0.1 - 0.005(i)						0.001
Barium	1		0.46					0.35
Beryllium		0.011	<0.001					
BOD								7
Boron	5	0.2(i)	0.78	0.25	0.12	0.33	0.19	0.6
Bromide								
Cadmium	0.005	0.0002	0.00010					0.00020
Calcium			170	91	97	204	212	310
Chloride	250		43	60	63	84	97	211
Chromium	0.05	0.009	<0.0050					0.009
Cobalt		0.0009(i)	0.062					
COD			48	12	7	<5	28	78
Conductivity (µS/cm)			1500	1020	1020	1360	1450	2260
Copper	1	0.005	0.032	0.008	0.006	0.01	0.007	0.023
DOC	5		18					24.7
Fluoride	1.5							
Hardness (as CaCO3)	500		833	448	483	699	711	987
Iron	0.3	0.3	0.05	<0.03	<0.03	<0.03	1.03	0.05
Lead	0.01		<0.0005					<0.001
Magnesium			100	54	59	47	45	53
Manganese	0.05		5.4	2.61	2.39	3.42	3.01	5.04
Mercury		0.0002						0.0003
Molybdenum		0.04(i)	0.011					
Nickel			0.057					
Nitrate (as N)	10		<0.10	<0.10	<0.10	<0.10	0.13	<0.10
Nitrite (as N)	1		<0.01	<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15			0.70	0.98	0.16	1.96	1.35
pH (pH units)	6.5-8.5		6.8					7.33
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)								0.25
Potassium			30	21	21	18	16	11
Silicon			20					
Silver		0.0001	<0.00010					
Sodium	200		86	22	17	33	34	77
Strontium			1.2	0.708	0.683	1.2	1.11	1.22
Sulphate	500		8	35	37	57	74	31
Sulphur								
Total Sus. Solids								677
TDS	500		909	663	663	884	943	1470
Temperature (°C)	15		11.5					
Thallium		0.0003(i)	<0.00005					
Tin			<0.001					
Titanium			<0.005					
TKN				5.84	5.77	4.91	5.22	3.78
Vanadium		(0.006(i)	0.002					
Zinc	5	0.03 - 0.02(i)	0.02					<0.01
Ion Balance								
Field Parameters								
Temperature (°C)						12	11.5	15
pH						8.34	--	6.9
Conductivity (µS/cm)						1388	1431	2250

Exceeds ODWS
Exceeds PWQO

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			BH 5					
			Oct-09	May-10	Oct-10	Jun-11	Jun-11	Nov-11
PARAMETER	ODWQS	PWQO					QA/QC	
Alkalinity (as CaCO3)	30-500		694	689	708	756	770	674
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			1.96	4.30	5.97	15.2	15	17.9
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001	<0.001	<0.001	<0.001	
Barium	1		0.25	0.24	0.29	0.36	0.39	0.32
Beryllium		0.011						
BOD			4					
Boron	5	0.2(i)	0.52	0.84	0.95	0.75	0.81	0.79
Bromide								
Cadmium	0.005	0.0002	0.00010	0.00010	0.00010	<0.0001	<0.0001	
Calcium			232	222	198	165	166	143
Chloride	250		116	38	28	37	36	25
Chromium	0.05	0.009	0.009	0.005	0.005	0.008	<0.005	
Cobalt		0.0009(i)						
COD			44	25	43	45	40	32
Conductivity (µS/cm)			1660	1380	1430	1440	1450	1270
Copper	1	0.005	0.011	0.007	0.010	0.009	0.009	
DOC	5		14.4	8.6	11.9	11.4	11.4	8.3
Fluoride	1.5							
Hardness (as CaCO3)	500		732	682	684	636	667	536
Iron	0.3	0.3	0.11	0.18	0.45	0.67	0.62	1.24
Lead	0.01		<0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium			38	32	47	55	62	44
Manganese	0.05		3.08	3.85	4.41	4.65	4.93	
Mercury		0.0002	0.0002	<0.0001	0.0002	<0.0001	<0.0001	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	<0.10	0.13	<0.10	<0.10	<0.10
Nitrite (as N)	1		<0.10	<0.10	<0.10	<0.10	<0.10	
Organic Nitrogen	0.15		0.77	1.43	1.09		1.7	
pH (pH units)	6.5-8.5		7.59	7.15	7.21	7.04	7.27	7.13
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	
Phosphate (as P)								
Phosphorus (total)			0.69	1.1	0.43	0.41	0.28	
Potassium			9	9	14	21	21	
Silicon								
Silver		0.0001						
Sodium	200		68	27	30	23	26	23
Strontium			0.805					
Sulphate	500		74	41	60	36	37	28
Sulphur								
Total Sus. Solids			487					
TDS	500		1080	897	930	936	942	826
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			2.73	5.73	7.06	17.9	16.7	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01		<0.01	<0.01	<0.01	
Ion Balance								
Field Parameters								
Temperature (°C)			8.9	14.7	10.7	10.9		10.9
pH			8.2	8.77	6.79	6.8		6.7
Conductivity (µS/cm)			768	1394	1491	904		1242

Exceeds ODWS
Exceeds PWQO

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Ross WDS
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			BH 5					
			May-12	Oct-12	Apr-13	Oct-13	Jul-14	Oct-14
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		645	664	674	650	708	681
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			13.7	12.4	10.1	9.88	11.8	16.9
Arsenic	0.01	0.1 - 0.005(i)	<0.001		<0.001		0.0009	
Barium	1		0.34	0.32	0.29	0.32	0.355	0.525
Beryllium		0.011						
BOD							8	3
Boron	5	0.2(i)	0.74	0.81	0.59	0.89	0.55	0.787
Bromide								
Cadmium	0.005	0.0002	<0.0001		0.00010		0.00012	
Calcium			164	162	164	162	153	158
Chloride	250		60	35	25	37	62.7	107
Chromium	0.05	0.009	0.005		0.002		0.002	
Cobalt		0.0009(i)						
COD			36	26	24	<5	35	64
Conductivity (µS/cm)			1380	1300	1260	1340	1480	1580
Copper	1	0.005	0.01		0.011		0.0103	
DOC	5		12.1	8.5	9.2	11	15.4	29.4
Fluoride	1.5							
Hardness (as CaCO3)	500		637	603	600	620	665	673
Iron	0.3	0.3	1.19	1.44	0.78	1.98	0.631	6.54
Lead	0.01		<0.001		<0.001		<0.00002	
Magnesium			56	49	47	53	69.5	68.3
Manganese	0.05		2.43		2.16		1.78	
Mercury		0.0002	<0.0001		<0.0001		0.00002	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	<0.10	0.83	0.11	0.1	< 0.10
Nitrite (as N)	1		<0.10				<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.29	7.52	7.24	7.04	7.43	7.73
Phenols			<0.001		<0.005		<0.001	
Phosphate (as P)								
Phosphorus (total)			0.14		0.18		0.18	
Potassium			30		22		32.2	
Silicon								
Silver		0.0001						
Sodium	200		30	16	21	24	30.6	55.2
Strontium								
Sulphate	500		46	31	24	52	23	32
Sulphur								
Total Sus. Solids							51	68
TDS	500		897	845	819	871	815	874
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			16.5		10.3		14	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01		<0.01		<0.005	
Ion Balance							0.998	1
Field Parameters								
Temperature (°C)			11.6	10.5	10.9	11.8	12.5	11.8
pH			6.8	6.5	6.7	6.5	6.8	6.6
Conductivity (µS/cm)			1355	1209	1207	1230	1244	1481

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
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			BH 5					
			Apr-15	Sep-15	Apr-16	Sep-16	May-17	Aug-17
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		833	1070	643	1290	889	1370
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			19.4	32.6	16.2	21.5	5.14	6.36
Arsenic	0.01	0.1 - 0.005(i)	0.0016		0.0008		0.0019	
Barium	1		0.914	1.24	0.869	1.46	0.886	1.44
Beryllium		0.011						
BOD			< 3	6	5	97	5	8
Boron	5	0.2(i)	0.911	2.63	1.82	1.24	2.12	3.08
Bromide								
Cadmium	0.005	0.0002	0.00025		0.00023		0.00025	
Calcium			211	250	163	297	234	322
Chloride	250		150	442	202	324	172	231
Chromium	0.05	0.009	< 0.002		< 0.002		< 0.002	
Cobalt		0.0009(i)						
COD			85	153	84	163	135	182
Conductivity (µS/cm)			1820	2940	1780	2860	2310	2980
Copper	1	0.005	0.013		0.0137		0.0157	
DOC	5		23.1	12.9	15.3	11.4	48	57.4
Fluoride	1.5							
Hardness (as CaCO3)	500		897	1040				
Iron	0.3	0.3	13.3	15.9	9	22.5	17	25.5
Lead	0.01		0.00006		0.00005		< 0.00002	
Magnesium			90.9	102	77.9	78.8	74.2	122
Manganese	0.05		2.39		0.934		2.62	
Mercury		0.0002	0.00003		0.00005		0.03	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		< 0.1	0.1	< 0.1	0.1	< 0.05	< 0.05
Nitrite (as N)	1		< 0.1		< 0.1		< 0.05	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.5	7.51	7.72	7.46	7.6	7.65
Phenols			< 0.001		< 0.001		0.026	
Phosphate (as P)								
Phosphorus (total)			0.61		0.3		0.25	
Potassium			46.4		32.7		15.1	
Silicon								
Silver		0.0001						
Sodium	200		65.6	186	113	141	170	225
Strontium								
Sulphate	500		33	23	26	125	58	72
Sulphur								
Total Sus. Solids			130	148	120	144	122	208
TDS	500		1110	2120	1010	1820	1280	1846
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			20.6		19.4		9.7	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	0.005		0.011		< 0.005	
Ion Balance			0.936	1.1				
Field Parameters								
Temperature (°C)			12.2	11.8	11.5	11.7	10.8	11.6
pH			6.7	6.7	6.9	6.8	6.7	7.0
Conductivity (µS/cm)			2030	2480	1640	3070	2210	3050

Exceeds ODWS
Exceeds PWQO

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			BH 5					
			Apr-18	Sep-18	Jun-19	Oct-19	May-20	Sep-20
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		1440	1180	1440	1480	1080	1220
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			26.5	23.1	55.9	86.9	48.8	66.3
Arsenic	0.01	0.1 - 0.005(i)	0.0007		0.0008		0.0016	
Barium	1		1.59	1.63	1.91	1.12	1.75	2.13
Beryllium		0.011						
BOD			9	9	5	5	< 3	5
Boron	5	0.2(i)	3.08	2.47	3.15	3.81	3.11	4.98
Bromide								
Cadmium	0.005	0.0002	0.00016		0.00015		0.00054	
Calcium			250	233	220	212	179	217
Chloride	250		237	261	255	250	165	208
Chromium	0.05	0.009	0.002		0.003		0.003	
Cobalt		0.0009(i)						
COD			179	206	247	245	143	193
Conductivity (µS/cm)			3130	2950	3041	3205	2480	2820
Copper	1	0.005	0.0138		0.0196		0.311	
DOC	5		66.7	61	70	31	22.8	22
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	37	36.9	33.7	0.104	46.9	68.4
Lead	0.01		< 0.00002		0.00008		0.00406	
Magnesium			138	134	158	141	129	113
Manganese	0.05		1.3		0.32	0.153	0.265	
Mercury		0.0002	< 0.00002		< 0.00002		0.00009	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		< 0.5	0.06	< 0.05	< 0.5	0.09	1
Nitrite (as N)	1		< 0.5		< 0.05		0.15	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.46	7.66	7.57	7.49	7.5	7.26
Phenols			< 0.001		< 0.002		< 0.002	
Phosphate (as P)								
Phosphorus (total)			0.34		1.12		0.32	
Potassium			24.3		61.6		58.4	
Silicon								
Silver		0.0001						
Sodium	200		217	235	259	275	190	190
Strontium								
Sulphate	500		24	74	36	33	23	43
Sulphur								
Total Sus. Solids			196	272	310	520	280	290
TDS	500		1825	1743	1961	1989	1456	1651
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium							54.2	
TKN			34.1		65.7			
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	0.01		< 0.005		< 0.005	
Ion Balance					0.864	0.885		
Field Parameters								
Temperature (°C)			11	11.2	11.5	11	10.8	11.2
pH			6.5	6.9	6.7	6.8	6.7	6.7
Conductivity (µS/cm)			2500	1445	3330	3570	2430	3010

Exceeds ODWS
Exceeds PWQO

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Ross WDS
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			BH 5					
			Apr-21	Sep-21	May-22	Aug-22	Jun-23	Oct-23
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		187	2110	1020	1640	1250	1510
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			103	90.9	70.2	126	84.4	44.1
Arsenic	0.01	0.1 - 0.005(i)	0.001		0.002		<0.01	
Barium	1		2.79	2.9	1.7	2.6	2.3	1.61
Beryllium		0.011						
BOD				12		3		4
Boron	5	0.2(i)	5.3	7.1	4.1	5.1	5.0	4.1
Bromide								
Cadmium	0.005	0.0002	<0.0001		<0.0001		<0.001	
Calcium			194	287	89	182	137	173
Chloride	250		489	620	165	239	261	177
Chromium	0.05	0.009	0.004		0.002		<0.01	
Cobalt		0.0009(i)						
COD			317	369	126	264	333	210
Conductivity (µS/cm)			4400	4990	2170	3380	2760	2830
Copper	1	0.005	0.006		0.002		0.02	
DOC	5		86	170	56	36.4	70	56.2
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	80.7	98.1	44.8	69.4	51.3	68.3
Lead	0.01		<0.001		<0.001		<0.01	
Magnesium			98	154	46	90	64	76
Manganese	0.05		0.07		0.06		0.10	
Mercury		0.0002	<0.0001		<0.0001		<0.001	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<2.5	<0.10	<0.10	<0.10	<0.10	0.70
Nitrite (as N)	1		<2.5		<0.10		<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.37	6.85	7.02	7.22	7.11	6.98
Phenols			<0.010		0.003		0.005	
Phosphate (as P)								
Phosphorus (total)			0.359		0.377		1.27	
Potassium			107		79		79	
Silicon								
Silver		0.0001						
Sodium	200		434	525	200	255	268	240
Strontium								
Sulphate	500		16	5	23	40	20	36
Sulphur								
Total Sus. Solids				314		478		916
TDS	500		2860	3240	1410	2200	1790	1840
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			121		106		108	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01		<0.01		<0.1	
Ion Balance								
Field Parameters								
Temperature (°C)			10.7	12.4	12	12.9	14.4	11.9
pH			6.8	6.2	6.9	7.1	6.8	6.8
Conductivity (µS/cm)			4530	4840	2626	3590	3640	3220

Exceeds ODWS
Exceeds PWQO

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Ross WDS
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			BH 5					
			Jun-24	Oct-24				
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		1740	2010				
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			116	0.724				
Arsenic	0.01	0.1 - 0.005(i)	<0.005					
Barium	1		1.76	2				
Beryllium		0.011						
BOD				20				
Boron	5	0.2(i)	5.9	9.7				
Bromide								
Cadmium	0.005	0.0002	<0.0005					
Calcium			253	195				
Chloride	250		411	622				
Chromium	0.05	0.009	<0.005					
Cobalt		0.0009(i)						
COD			334	480				
Conductivity (µS/cm)			4040	4770				
Copper	1	0.005	<0.005					
DOC	5		66.1	140				
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	56	4.4				
Lead	0.01		<0.005					
Magnesium			104	93				
Manganese	0.05		0.19					
Mercury		0.0002	<0.0005					
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		0.13	0.28				
Nitrite (as N)	1		<0.10					
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.22	7.21				
Phenols			0.005					
Phosphate (as P)								
Phosphorus (total)			0.608					
Potassium			109					
Silicon								
Silver		0.0001						
Sodium	200		435	561				
Strontium								
Sulphate	500		9	5				
Sulphur								
Total Sus. Solids				231				
TDS	500		2630	3100				
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			116					
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.05					
Ion Balance								
Field Parameters								
Temperature (^{o}C)			13.5	13.1				
pH			6.5	6.9				
Conductivity (µS/cm)			3650	5270				

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inorganic
Groundwater Quality

			BH 6A (deep)					
			Dec-90	Aug-91	Nov-98	Apr-99	Oct-99	Apr-00
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		92	98	106	105		
Aluminum	0.1	0.075 (i)	0.31	0.26	<0.030	<0.030	1.36	0.24
Ammonia (as N)			<0.10	<0.10	0.05	0.04	0.06	0.06
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.03	0.02	<0.010	0.02	NA	0.02
Beryllium		0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.002
BOD			<1.0	2				
Boron	5	0.2(i)	0.01	<0.010	<0.010	<0.010	NA	<0.010
Bromide			0.6	<0.50				
Cadmium	0.005	0.0002	<0.0020	<0.0020	<0.0050	<0.0050	<0.0050	<0.0050
Calcium			34	34	33	32	31	32
Chloride	250		26	5	3	2	4	3
Chromium	0.05	0.009	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Cobalt		0.0009(i)	0.05	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
COD			<3	20	5	38		
Conductivity (µS/cm)			330	210	190	300	220	200
Copper	1	0.005	<0.0100	<0.0100	<0.0050	<0.0050	<0.0100	<0.0050
DOC	5							
Fluoride	1.5		0.18	0.2				
Hardness (as CaCO3)	500		121	121	119	116	110	116
Iron	0.3	0.3	0.48	0.28	<0.01	0.2	1.53	0.44
Lead	0.01		<0.0100	<0.0020	<0.0020	<0.0020	<0.0020	<0.0010
Magnesium			9	9	9	9	8	9
Manganese	0.05		0.05	<0.010	<0.010	0.02	0.02	0.02
Mercury		0.0002						
Molybdenum		0.04(i)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nickel			0.02	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate (as N)	10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite (as N)	1		<0.10	<0.10				
Organic Nitrogen	0.15		<0.10	<0.10				
pH (pH units)	6.5-8.5		8	8.3	7.6	7.9	7.1	7.4
Phenols			<0.002	<0.002				
Phosphate (as P)			0.3	0.54				
Phosphorus (total)			<0.100	<0.100				
Potassium			5	2	1	2	1	2
Silicon			7.3	7.3	6	7.5	9.4	6.74
Silver		0.0001	<0.01000	<0.01000	<0.01000	<0.01000	<0.01000	<0.01000
Sodium	200		19	3	5	8	7	8
Strontium			0.1	0.06	0.09	0.102	0.132	0.104
Sulphate	500		37	28	25	25	29	22
Sulphur			11	8	8	8	8	8
Total Sus. Solids								
TDS	500		218	146	152	176	148	136
Temperature (°C)	15		7	12.7	5	6	7	
Thallium		0.0003(i)	<0.01000	<0.05000	<0.20000	<0.20000	<0.20000	<0.20000
Tin			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Titanium			<0.010	<0.010	<0.010	<0.010	0.08	0.02
TKN			<0.10	<0.10				
Vanadium		(0.006(i)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.01
Zinc	5	0.03 - 0.02(i)	<0.010	<0.010	<0.010	<0.010	0.03	<0.010
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 6A (deep)					
			Nov-01	Oct-02	Oct-03	Oct-04	Nov-05	Sep-06
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		108	113	109	102	117	118
Aluminum	0.1	0.075 (i)						
Ammonia (as N)					<0.02			
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.01	0.02	0.02	0.015	<0.020	<0.020
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.050	<0.050	<0.050	<0.010	<0.020	<0.020
Bromide								
Cadmium	0.005	0.0002						
Calcium			29	30	31	32.5	34.3	
Chloride	250				2			
Chromium	0.05	0.009						
Cobalt		0.0009(i)						
COD					<5			
Conductivity (µS/cm)			330	260	240	310	240	190
Copper	1	0.005						
DOC	5				<0.5	1.1	0.7	0.8
Fluoride	1.5							
Hardness (as CaCO3)	500		105	103	114	118	124	
Iron	0.3	0.3						
Lead	0.01							
Magnesium			8	7	9	9.09	9.46	
Manganese	0.05		<0.010	0.011	0.01	0.01	0.01	
Mercury		0.0002						
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	<0.10	<0.10	<0.20	<0.10	<0.10
Nitrite (as N)	1				<0.10			
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.5	7.4	7.8	7.5	6.6	8.1
Phenols					<0.001			
Phosphate (as P)								
Phosphorus (total)								
Potassium			2	2	2	2	2	2
Silicon								
Silver		0.0001						
Sodium	200							
Strontium			0.083	0.104	0.11	0.106	0.12	0.13
Sulphate	500		25	22	18	22.3	22	25
Sulphur								
Total Sus. Solids								
TDS	500		152	167	174	166	250	173
Temperature (°C)	15		7	8	6.7	14	6.6	8.9
Thallium		0.0003(i)						
Tin								
Titanium								
TKN								
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

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Ross WDS
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			BH 6A (deep)					
			Aug-07	Oct-07	May-08	Oct-08	May-09	Oct-09
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		109	113	109	112	109	112
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.13	0.02	0.03	0.04	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)					<0.001	<0.001
Barium	1						0.02	0.02
Beryllium		0.011						
BOD							1	<1
Boron	5	0.2(i)	0.01	0.01	<0.01	0.01	0.02	0.01
Bromide								
Cadmium	0.005	0.0002					<0.0001	<0.0001
Calcium			34	34	35	36	33	35
Chloride	250		6	6	5	5	5	6
Chromium	0.05	0.009					<0.001	0.001
Cobalt		0.0009(i)						
COD			<5	<5	<5	<5	5	<5
Conductivity (µS/cm)			278	272	270	276	273	281
Copper	1	0.005	<0.001	0.002	<0.001	<0.001	<0.001	<0.001
DOC	5						0.9	1.4
Fluoride	1.5							
Hardness (as CaCO3)	500		121	125	128	130	119	128
Iron	0.3	0.3	<0.03	0.04	<0.03	0.03	<0.03	<0.03
Lead	0.01						<0.001	<0.001
Magnesium			9	10	10	10	9	10
Manganese	0.05		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury		0.0002					<0.0001	<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite (as N)	1		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15		0.08	0.38	<0.10	0.09	<0.10	<0.10
pH (pH units)	6.5-8.5						8.01	8.17
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)							2.05	1.14
Potassium			2	2	2	2	2	2
Silicon								
Silver		0.0001						
Sodium	200		8	8	9	8	6	10
Strontium			0.134	0.134	0.120	0.119	0.123	0.13
Sulphate	500		23	21	22	22	23	22
Sulphur								
Total Sus. Solids							853	1150
TDS	500		181	177	176	179	177	183
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.21	0.4	<0.10	0.13	<0.10	<0.10
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)					<0.01	<0.01
Ion Balance					1.08	1.06		
Field Parameters								
Temperature (°C)					9.7	9.1	10	8.5
pH					10.29	--	7.9	9.52
Conductivity (µS/cm)					237	272	264	308

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
Groundwater Quality

			BH 6A (deep)					
			May-10	Oct-10	Jun-11	Nov-11	May-12	Oct-12
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		107	108	109	111	111	115
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001	<0.001		<0.001	
Barium	1		0.02	0.02	0.02	0.02	0.02	0.02
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001	<0.0001		<0.0001	
Calcium			34	34	30	33	34	38
Chloride	250		7	8	8	8	8	9
Chromium	0.05	0.009	0.001	0.001	0.002		0.001	
Cobalt		0.0009(i)						
COD			10	10	10	<5	<5	<5
Conductivity (µS/cm)			275	269	275	28-	284	290
Copper	1	0.005	<0.001	<0.001	<0.001		<0.001	
DOC	5		1.1	1.3	1.1	0.9	1.1	0.9
Fluoride	1.5							
Hardness (as CaCO3)	500		125	121	116	119	121	135
Iron	0.3	0.3	<0.03	0.05	0.2	0.05	0.06	0.07
Lead	0.01		<0.001	<0.001	<0.001		<0.001	
Magnesium			10	9	10	9	9	10
Manganese	0.05		<0.01	<0.01	0.03		0.01	
Mercury		0.0002	<0.0001	<0.0001	<0.0001		<0.0001	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite (as N)	1		<0.10	<0.10	<0.10		<0.10	
Organic Nitrogen	0.15		≤ 0.34	<0.10	<0.1			
pH (pH units)	6.5-8.5		8.09	8.07	8.07	8.08	8.1	7.92
Phenols			<0.001	<0.001	<0.001		<0.001	
Phosphate (as P)								
Phosphorus (total)			1.42	0.75	1.38		<0.01	
Potassium			2	2	1		2	
Silicon								
Silver		0.0001						
Sodium	200		8	8	8	8	7	8
Strontium								
Sulphate	500		24	25	25	24	24	22
Sulphur								
Total Sus. Solids								
TDS	500		179	175	179	182	185	188
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.34	<0.10	<0.10		<0.10	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01	<0.01		<0.01	
Ion Balance								
Field Parameters								
Temperature (°C)			10.5	8.7	9.0	8.6	9.5	8.8
pH			9.83	8.11	7.5	8.1	8.1	7.4
Conductivity (µS/cm)			280	288	209	282	279	283

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted
Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
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			BH 6A (deep)					
			Oct-12	Apr-13	Oct-13	Jul-14	Oct-14	Apr-15
PARAMETER	ODWQS	PWQO	BH 15 QA/QC					
Alkalinity (as CaCO3)	30-500		114	114	113	105	106	109
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.02	<0.02	<0.02	<0.01	<0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)		<0.001		0.0004		0.0005
Barium	1		0.02	0.02	0.02	0.017	0.017	0.018
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.01	<0.01	0.007	0.009	0.008
Bromide								
Cadmium	0.005	0.0002		<0.0001		<0.00002		< 0.00002
Calcium			38	35	35	36.2	36.3	39.9
Chloride	250		<1	8	9	7.8	8.5	8.1
Chromium	0.05	0.009		<0.001		<0.002		< 0.002
Cobalt		0.0009(i)						
COD			<5	<5	<5	<5	< 5	< 5
Conductivity (µS/cm)			289	284	290	279	281	277
Copper	1	0.005		<0.001		<0.0001		< 0.002
DOC	5		0.9	0.9	0.9	1.4	1.3	1.9
Fluoride	1.5							
Hardness (as CaCO3)	500		135	128	128	130	131	144
Iron	0.3	0.3	0.08	0.04	0.06	0.029	0.065	0.023
Lead	0.01			<0.001		0.00003		< 0.00002
Magnesium			10	10	10	9.83	9.88	10.9
Manganese	0.05			<0.01		0.01		0.012
Mercury		0.0002		<0.0001		<0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	<0.10	<0.10	<0.10	<0.10	< 0.1
Nitrite (as N)	1			<0.10		<0.10		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.92	8.08	7.67	8.1	8.13	7.94
Phenols				<0.001		<0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				0.02		0.02		0.01
Potassium				2		1.9		2
Silicon								
Silver		0.0001						
Sodium	200		8	7	8	8.5	8.8	9.1
Strontium								
Sulphate	500		22	23	22	24	25	24
Sulphur								
Total Sus. Solids								
TDS	500		188	185	188	151	154	160
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				<0.10		<0.06		< 0.05
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.005		< 0.005
Ion Balance						0.924	0.945	0.873
Field Parameters								
Temperature (°C)				9.1	8.6	9.3	9	9.3
pH				7.9	7.8	8.4	8	7.9
Conductivity (µS/cm)				284	273	252	272	309

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
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			BH 6A (deep)					
PARAMETER	ODWQS	PWQO	Apr-15 BH 18 QA/QC	Sep-15	Sep-15 BH 19 QA/QC	Apr-16	Sep-16	Sep-16 QA/QC
Alkalinity (as CaCO3)	30-500		110	111	109	112	111	109
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)	0.0006			0.0005		
Barium	1		0.018	0.018	0.017	0.016	0.015	0.015
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.008	0.008	0.008	< 0.005	< 0.005	< 0.005
Bromide								
Cadmium	0.005	0.0002	< 0.00002			< 0.00002		
Calcium			40.3	35.8	35.9	35.6	30.2	30.5
Chloride	250		8.1	8.3	8.6	8.3	8.6	8.7
Chromium	0.05	0.009	< 0.002			< 0.002		
Cobalt		0.0009(i)						
COD			< 5	< 5	< 5	< 5	5	< 5
Conductivity (µS/cm)			281	272	275	279	280	276
Copper	1	0.005	< 0.002			0.0001		
DOC	5		1.9	0.4	0.3	0.6	0.9	0.8
Fluoride	1.5							
Hardness (as CaCO3)	500		145	130	131			
Iron	0.3	0.3	0.026	0.051	0.053	0.031	0.023	0.025
Lead	0.01		< 0.00002			< 0.00002		
Magnesium			11	9.97	10.1	10.1	9.27	9.34
Manganese	0.05		0.012			0.013		
Mercury		0.0002	< 0.00002			< 0.00002		
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		< 0.1	< 0.1	< 0.1	0.1	< 0.1	< 0.1
Nitrite (as N)	1		< 0.1			< 0.1		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.96	7.72	7.78	8.1	7.89	7.92
Phenols			< 0.001			< 0.001		
Phosphate (as P)								
Phosphorus (total)			0.01			0.03		
Potassium			2			1.7		
Silicon								
Silver		0.0001						
Sodium	200		9.2	9.4	9.4	9	8.9	9.1
Strontium								
Sulphate	500		24	25	25	24	25	25
Sulphur								
Total Sus. Solids								
TDS	500		160	173	175	157	150	150
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.06			< 0.05		
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005			< 0.005		
Ion Balance			0.865	0.969	0.958			
Field Parameters								
Temperature (°C)				7.8		8.9	8.7	
pH				8.4		8	7.8	
Conductivity (µS/cm)				255		271	310	

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
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			BH 6A (deep)					
			May-17	May-17 BH 18 QA/QC	Aug-17	Aug-17 BH 20 QA/QC	Apr-18	Sep-18
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		126	104	103	106	Frozen	Broken
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			< 0.01	< 0.01	< 0.01	< 0.01	NO	NO
Arsenic	0.01	0.1 - 0.005(i)	0.0008	0.0008			SAMPLE	SAMPLE
Barium	1		0.017	0.014	0.019	0.018		
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.011	< 0.005	0.01	0.011		
Bromide								
Cadmium	0.005	0.0002	0.00001	< 0.000014				
Calcium			34	28.8	36.5	35.3		
Chloride	250		8.5	8.6	8.5	8.7		
Chromium	0.05	0.009	< 0.002	< 0.002				
Cobalt		0.0009(i)						
COD			< 5	< 5	< 5	< 5		
Conductivity (µS/cm)			283	280	292	289		
Copper	1	0.005	< 0.0001	< 0.0001				
DOC	5		0.7	0.6	0.7	0.7		
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.03	0.025	0.031	0.029		
Lead	0.01		< 0.00002	< 0.00002				
Magnesium			9.6	8.9	10.5	10.5		
Manganese	0.05		0.009	0.009				
Mercury		0.0002	< 0.02	< 0.02				
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		< 0.05	< 0.05	< 0.05	< 0.05		
Nitrite (as N)	1		< 0.05	< 0.05				
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.96	8.02	8.04	8.05		
Phenols			0.006	0.002				
Phosphate (as P)								
Phosphorus (total)			0.02	0.02				
Potassium			1.6	1.4				
Silicon								
Silver		0.0001						
Sodium	200		9	7.9	8.8	8.9		
Strontium								
Sulphate	500		21	21	20	20		
Sulphur								
Total Sus. Solids								
TDS	500		159	139	148	149		
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.2	< 0.1				
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005	< 0.005				
Ion Balance								
Field Parameters								
Temperature (°C)			8.7		8.8			
pH			8.2		8.0			
Conductivity (µS/cm)			280		281			

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 6A (deep)					
			Jun-19		Oct-19	May-20	Sep-20	
PARAMETER	ODWQS	PWQO		BH 19 QA/QC				QA/QC DUP
Alkalinity (as CaCO3)	30-500		122	123	221	213	169	167
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.05	0.04	0.04	0.03	0.03	0.01
Arsenic	0.01	0.1 - 0.005(i)	0.4	0.3		0.0004		
Barium	1		0.013	0.013	0.042	0.047	0.03	0.027
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.014	0.014	0.139	0.237	0.115	0.085
Bromide								
Cadmium	0.005	0.0002	< 0.015	< 0.015		< 0.000015		
Calcium			34.1	33.9	66.4	70.1	49.4	44.7
Chloride	250		22.6	22.8	49.5	33.8	23.6	23.7
Chromium	0.05	0.009	< 0.0002	< 0.0002		< 0.001		
Cobalt		0.0009(i)						
COD			9	13	14	10	< 5	16
Conductivity (µS/cm)			342	343	598	561	455	449
Copper	1	0.005	< 0.0001	< 0.0001		0.0011		
DOC	5		2.5	2.2	4.1	4.7	2.6	2.3
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	0.101	0.139	0.099	0.107
Lead	0.01		< 0.02	< 0.02		0.00006		
Magnesium			11.3	11.3	20.5	20.8	14.1	13
Manganese	0.05		0.007	0.006	0.02	0.027		
Mercury		0.0002	< 0.00002	< 0.00002		< 0.00002		
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		< 0.05	< 0.05	< 0.05	0.09	< 0.05	< 0.05
Nitrite (as N)	1		< 0.05	< 0.05		< 0.05		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.05	8.09	8.12	8.11	8.04	8.01
Phenols			< 0.002	< 0.002		< 0.002		
Phosphate (as P)								
Phosphorus (total)			0.9	0.85		0.05		
Potassium			2.3	2.3		3.2		
Silicon								
Silver		0.0001						
Sodium	200		11.6	11.7	21.8	28.5	19.6	17.8
Strontium								
Sulphate	500		26	26	25	21	22	22
Sulphur								
Total Sus. Solids								
TDS	500		181	182	319	305	233	224
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium						0.3		
TKN			0.3	0.2				
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005	< 0.005		< 0.005		
Ion Balance			1.13	1.14	1.05			
Field Parameters								
Temperature (°C)			9.3	9.3	8.6	8.7	8.3	8.3
pH			8.1	8.1	7.9	7.7	7.3	7.3
Conductivity (µS/cm)			418	418	642	553	480	480

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 6A (deep)					
			Apr-21	Apr-21 QA/QC	Sep-21	May-22	Aug-22	Jun-23
PARAMETER	ODWQS	PWQO		DUP				
Alkalinity (as CaCO3)	30-500		159	161	162	200	189	182
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.010	0.065	<0.010	<0.010	<0.020	<0.020
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001		<0.001		<0.001
Barium	1		0.02	0.02	0.02	0.04	0.03	0.03
Beryllium		0.011						
BOD					4		3	
Boron	5	0.2(i)	0.09	0.08	0.09	0.17	0.14	0.12
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001		<0.0001		<0.0001
Calcium			44	43	49	58	52	48
Chloride	250		18	18	18	28	22	20
Chromium	0.05	0.009	<0.001	<0.001		<0.001		<0.001
Cobalt		0.0009(i)						
COD			9	<5	<5	<5	<5	<5
Conductivity (µS/cm)			394	398	384	470	434	315
Copper	1	0.005	0.002	<0.001		<0.001		<0.001
DOC	5		1.4	1.7	2.2	3.7	--	2.9
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.11	0.12	0.13	0.19	0.11	0.11
Lead	0.01		<0.001	<0.001		<0.001		<0.001
Magnesium			12	12	14	16	15	14
Manganese	0.05		0.02	0.02		0.03		0.02
Mercury		0.0002	<0.0001	<0.0001		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite (as N)	1		<0.10	<0.10		<0.10		<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.09	8.08	7.92	7.79	7.86	7.94
Phenols			<0.010	<0.010		<0.001		<0.001
Phosphate (as P)								
Phosphorus (total)			2.29	2.77		0.343		1.23
Potassium			2	2		2		2
Silicon								
Silver		0.0001						
Sodium	200		16	16	15	17	16	16
Strontium								
Sulphate	500		21	21	22	24	24	23
Sulphur								
Total Sus. Solids					278		418	
TDS	500		256	259	250	306	282	205
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.100	0.16		0.194		0.284
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01		<0.01		<0.01
Ion Balance								
Field Parameters								
Temperature (°C)			8.1	10.4		9.5	9.3	10.8
pH			7.9	7.3		7.5	8.1	7.7
Conductivity (µS/cm)			419	299		522	450	480

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
Groundwater Quality

			BH 6A (deep)					
			Oct-23	Jun-24	Oct-24			
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		155	141	141			
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.020	0.024	<0.020			
Arsenic	0.01	0.1 - 0.005(i)		<0.001				
Barium	1		0.03	0.03	0.02			
Beryllium		0.011						
BOD			1		2			
Boron	5	0.2(i)	0.09	0.10	0.08			
Bromide								
Cadmium	0.005	0.0002		<0.0001				
Calcium			41	44	43			
Chloride	250		14	16	15			
Chromium	0.05	0.009		<0.001				
Cobalt		0.0009(i)						
COD			40	<5	5			
Conductivity (µS/cm)			280	274	268			
Copper	1	0.005		<0.001				
DOC	5		5.3	1.1	1.3			
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.07	0.08	0.06			
Lead	0.01			<0.001				
Magnesium			12	12	12			
Manganese	0.05			0.02				
Mercury		0.0002		<0.0001				
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	<0.10	<0.10			
Nitrite (as N)	1			<0.10				
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.92	7.69	7.88			
Phenols				<0.001				
Phosphate (as P)								
Phosphorus (total)				0.558				
Potassium				2				
Silicon								
Silver		0.0001						
Sodium	200		14	13	12			
Strontium								
Sulphate	500		22	23	22			
Sulphur								
Total Sus. Solids			254		253			
TDS	500		182	178	174			
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.207				
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01				
Ion Balance								
Field Parameters								
Temperature (°C)			9.1	10.3	10.3			
pH			7.4	7	7.3			
Conductivity (µS/cm)			440	700	390			

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
Groundwater Quality

			BH 6B (shallow)					
			Dec-90	Aug-91	Oct-91	Nov-98	Apr-99	Oct-99
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		92	102	96	91	105	
Aluminum	0.1	0.075 (i)	0.06	0.17	0.2	<0.030	<0.030	0.1
Ammonia (as N)			<0.10	<0.10	<0.10	0.03	0.03	<0.02
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.02	0.01	0.01	<0.010	0.02	NA
Beryllium		0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
BOD			<1.0	2	<1.0			
Boron	5	0.2(i)	<0.010	<0.010	0.02	<0.010	0.01	NA
Bromide			0.5	<0.50	<0.50			
Cadmium	0.005	0.0002	<0.0020	<0.0020	<0.0020	<0.0050	<0.0050	<0.0050
Calcium			31	35	30	32	35	33
Chloride	250		7	5	3	11	8	6
Chromium	0.05	0.009	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Cobalt		0.0009(i)	0.07	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
COD			<3	17	3	21	7	
Conductivity (µS/cm)			250	210	220	180	300	200
Copper	1	0.005	<0.0100	<0.0100	0.01	<0.0050	<0.0050	<0.0100
DOC	5							
Fluoride	1.5		0.15	0.14	0.14			
Hardness (as CaCO3)	500		106	128	107	116	128	119
Iron	0.3	0.3	0.07	0.18	0.51	<0.01	0.05	0.25
Lead	0.01		<0.0100	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Magnesium			7	10	8	9	10	9
Manganese	0.05		0.11	<0.010	0.02	<0.010	<0.010	<0.010
Mercury		0.0002						
Molybdenum		0.04(i)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nickel			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate (as N)	10		0.16	0.14	0.2	0.56	0.6	0.52
Nitrite (as N)	1		<0.10	<0.10	<0.10			
Organic Nitrogen	0.15		<0.10	<0.10	<0.10			
pH (pH units)	6.5-8.5		8.4	8.3	7.6	7.4	8.1	7.3
Phenols			<0.002	<0.002	<0.002			
Phosphate (as P)			0.33	0.39	0.21			
Phosphorus (total)			<0.100	<0.100	<0.100			
Potassium			4	2	2	1	2	1
Silicon			6.9	7	8	5.8	7.4	7.7
Silver		0.0001	<0.01000	<0.01000	<0.01000	<0.01000	<0.01000	<0.01000
Sodium	200		11	2	6	4	6	6
Strontium			0.08	0.05	0.08	0.072	0.082	0.101
Sulphate	500		31	26	20	16	19	28
Sulphur			8	8	9	6	6	7
Total Sus. Solids								
TDS	500		172	130	136	144	204	152
Temperature (°C)	15		7	10.2	7.5	5.5	5	6
Thallium		0.0003(i)	<0.01000	<0.05000	<0.05000	<0.20000	<0.20000	<0.20000
Tin			0.1	<0.050	<0.050	<0.050	<0.050	<0.050
Titanium			<0.010	<0.010	0.01	<0.010	<0.010	<0.010
TKN			<0.10	<0.10	<0.10			
Vanadium		(0.006(i)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Zinc	5	0.03 - 0.02(i)	<0.010	<0.010	<0.010	<0.010	<0.010	0.02
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
Groundwater Quality

			BH 6B (shallow)					
			Apr-00	Nov-01	Oct-02	Oct-03	Oct-04	Nov-05
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500			143	129	121	141	211
Aluminum	0.1	0.075 (i)	0.05					
Ammonia (as N)			0.02			<0.02		
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.02	0.02	0.02	0.02	0.024	0.04
Beryllium		0.011	<0.002					
BOD								
Boron	5	0.2(i)	<0.010	<0.050	<0.050	<0.050	0.02	0.04
Bromide								
Cadmium	0.005	0.0002	<0.0050					
Calcium			38	40	34	35	51.1	78.3
Chloride	250		5			2		
Chromium	0.05	0.009	<0.0100					
Cobalt		0.0009(i)	<0.0100					
COD						<5		
Conductivity (µS/cm)			230	270	290	260	372	540
Copper	1	0.005	<0.0050					
DOC	5					<0.5	1.8	3.2
Fluoride	1.5							
Hardness (as CaCO3)	500		135	144	125	128	182	276
Iron	0.3	0.3	0.2					
Lead	0.01		<0.0010					
Magnesium			10	11	10	10	13.5	20
Manganese	0.05		<0.010	<0.010	0.01	<0.010	0.023	0.04
Mercury		0.0002						
Molybdenum		0.04(i)	<0.010					
Nickel			<0.010					
Nitrate (as N)	10		0.18	0.24	0.17	<0.10	<0.20	<0.10
Nitrite (as N)	1					<0.10		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8	7.4	7.1	7.6	7.4	6.7
Phenols						<0.001		
Phosphate (as P)								
Phosphorus (total)								
Potassium			2	2	2	2	2	2
Silicon			6.62					
Silver		0.0001	<0.01000					
Sodium	200		8					
Strontium			0.088	0.092	0.097	0.101	0.137	0.22
Sulphate	500		22	22	23	18	23.5	23
Sulphur			7					
Total Sus. Solids								
TDS	500		152	180	189	186	222	320
Temperature (°C)	15			8	9	6.7	14	10.2
Thallium		0.0003(i)	<0.20000					
Tin			<0.050					
Titanium			<0.010					
TKN								
Vanadium		(0.006(i)	0.02					
Zinc	5	0.03 - 0.02(i)	<0.010					
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 6B (shallow)					
			Sep-06	Aug-07	Oct-07	May-08	Oct-08	May-09
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		144	254	280	328	326	366
Aluminum	0.1	0.075 (i)						
Ammonia (as N)				0.08	0.03	0.05	0.03	<0.02
Arsenic	0.01	0.1 - 0.005(i)						<0.001
Barium	1		0.03					0.06
Beryllium		0.011						
BOD								2
Boron	5	0.2(i)	<0.020	0.23	0.31	0.51	0.51	0.29
Bromide								
Cadmium	0.005	0.0002						<0.0001
Calcium				95	103	110	104	100
Chloride	250			67	72	37	33	27
Chromium	0.05	0.009						0.002
Cobalt		0.0009(i)						
COD				<5	<5	<5	<5	18
Conductivity (µS/cm)			600	740	770	746	720	783
Copper	1	0.005		0.002	0.002	0.003	0.002	0.002
DOC	5		1					3.7
Fluoride	1.5							
Hardness (as CaCO3)	500			338	367	396	369	359
Iron	0.3	0.3		0.09	0.06	0.09	0.08	0.12
Lead	0.01							<0.001
Magnesium				25	27	30	27	27
Manganese	0.05			0.2	0.21	0.29	0.48	1.1
Mercury		0.0002						<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite (as N)	1			<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15			0.08	0.11	0.15	0.28	<0.10
pH (pH units)	6.5-8.5		7.4					7.66
Phenols				<0.001	<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)								0.13
Potassium			2	2	3	3	3	2
Silicon								
Silver		0.0001						
Sodium	200			15	15	19	17	16
Strontium			0.19	0.326	0.314	0.313	0.294	0.342
Sulphate	500		26	27	23	23	22	27
Sulphur								
Total Sus. Solids								65
TDS	500		364	481	501	485	468	509
Temperature (°C)	15		9.4					
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.16	0.14	0.2	0.31	<0.10
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						<0.01
Ion Balance						1.10	1.04	
Field Parameters								
Temperature (°C)						8.7	9.1	9.2
pH						10.1	--	7.6
Conductivity (µS/cm)						709	684	803

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 6B (shallow)					
			Oct-09	May-10	Oct-10	Jun-11	Nov-11	May-12
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		218	172	163	288	185	222
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.02	<0.02	<0.02	<0.02	0.05	0.03
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001	<0.001	<0.001		<0.001
Barium	1		0.04	0.04	0.03	0.05	0.04	0.04
Beryllium		0.011						
BOD			<1					
Boron	5	0.2(i)	0.17	0.16	0.08	0.14	0.07	0.07
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Calcium			60	54	51	88	52	68
Chloride	250		17	12	14	22	16	25
Chromium	0.05	0.009	0.001	0.001	0.001	0.101		0.002
Cobalt		0.0009(i)						
COD			<5	5	15	125	<5	6
Conductivity (µS/cm)			501	415	389	623	412	525
Copper	1	0.005	0.002	0.001	<0.001	0.002		0.001
DOC	5		2.2	1.9	1.7	3	1.7	2
Fluoride	1.5							
Hardness (as CaCO3)	500		215	200	184	309	195	247
Iron	0.3	0.3	0.05	0.04	0.08	0.23	0.05	0.05
Lead	0.01		<0.001	<0.001	<0.001	<0.001		<0.001
Magnesium			16	16	14	22	16	19
Manganese	0.05		0.46	0.42	0.21	0.63		0.37
Mercury		0.0002	<0.0001		<0.0001	<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	<0.10	<0.10	<0.10	0.12	0.12
Nitrite (as N)	1		<0.10	<0.10	<0.10	<0.02		<0.10
Organic Nitrogen	0.15		≤0.42	<0.19	<0.10	<0.1		
pH (pH units)	6.5-8.5		8	7.92	8.02	7.66	7.85	7.96
Phenols			<0.001	<0.001	<0.001	<0.001		<0.001
Phosphate (as P)								
Phosphorus (total)			0.13	0.19	0.14			0.3
Potassium			2	2	2	2		3
Silicon								
Silver		0.0001						
Sodium	200		13	10	9	12	11	10
Strontium			0.235					
Sulphate	500		22	24	24	29	21	25
Sulphur								
Total Sus. Solids			139					
TDS	500		326	270	253	405	268	341
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.42	<0.10	<0.10	<0.10		<0.10
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01	<0.01	<0.01		<0.01
Ion Balance								
Field Parameters								
Temperature (°C)			8.9	11.2	9.2	8.2	8.8	9.4
pH			9.23	9.1	8.02	7.5	7.6	7.6
Conductivity (µS/cm)			403	373	389	465	409	513

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 6B (shallow)					
			Oct-12	Apr-13	Oct-13	Jul-14	Oct-14	Apr-15
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		190	207	160	234	157	184
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.04	0.06	0.06	0.12	0.03	0.04
Arsenic	0.01	0.1 - 0.005(i)		<0.001		0.0004		0.0004
Barium	1		0.04	0.05	0.03	0.06	0.035	0.047
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.06	0.08	0.06	0.132	0.062	0.066
Bromide								
Cadmium	0.005	0.0002		<0.0001		<0.00002		< 0.00002
Calcium			62	64	51	80.3	52.3	71.2
Chloride	250		19	28	16	22.9	17.8	26.8
Chromium	0.05	0.009		<0.001		<0.002		< 0.002
Cobalt		0.0009(i)						
COD			<5	<5	<5	<5	< 5	< 5
Conductivity (µS/cm)			454	509	399	590	396	470
Copper	1	0.005		0.001		0.0001		< 0.002
DOC	5		1.5	2.2	1.6	3.1	2.5	4.7
Fluoride	1.5							
Hardness (as CaCO3)	500		224	237	188	297	191	260
Iron	0.3	0.3	0.11	<0.03	0.12	0.027	0.069	0.016
Lead	0.01			<0.001		0.00005		0.00009
Magnesium			17	19	15	23.9	14.9	20.3
Manganese	0.05			0.43		0.481		0.259
Mercury		0.0002		<0.0001		<0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		0.19	0.19	0.25	0.3	0.3	0.3
Nitrite (as N)	1			<0.10		<0.10		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.01	7.87	7.64	7.81	7.98	7.87
Phenols				<0.001		<0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				0.04		0.23		0.12
Potassium				3		3.5		2.9
Silicon								
Silver		0.0001						
Sodium	200		9	11	10	13.9	10.7	13.6
Strontium								
Sulphate	500		22	23	20	40	22	27
Sulphur								
Total Sus. Solids								
TDS	500		295	331	259	327	216	274
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.24		0.26		0.21
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.005		< 0.005
Ion Balance						0.923	0.942	0.849
Field Parameters								
Temperature (°C)			9.5	9.2	8.3	8.5	9	9.3
pH			7.2	7.4	7.5	8	7.6	7.5
Conductivity (µS/cm)			417	514	371	495	384	513

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inorganic
Groundwater Quality

			BH 6B (shallow)					
			Sep-15	Apr-16	Sep-16	May-17	Aug-17	Apr-18
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		294	373	382	527	453	624
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.71	0.53	0.27	0.44	0.09	0.24
Arsenic	0.01	0.1 - 0.005(i)		0.0005		0.0005		0.0004
Barium	1		0.181	0.241	0.178	0.354	0.27	0.212
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.161	0.521	0.643	1.16	1.18	1.33
Bromide								
Cadmium	0.005	0.0002		0.00004		0.00007		0.00007
Calcium			104	132	124	153	186	168
Chloride	250		110	145	175	222	197	189
Chromium	0.05	0.009		< 0.002		< 0.002		< 0.002
Cobalt		0.0009(i)						
COD			19	34	44	50	43	75
Conductivity (µS/cm)			877	1140	1210	1800	1600	1800
Copper	1	0.005		0.0097		0.0151		0.0145
DOC	5		4	8.8	6.9	10.3	9	17.5
Fluoride	1.5							
Hardness (as CaCO3)	500		413					
Iron	0.3	0.3	0.037	0.015	0.025	0.059	0.196	0.091
Lead	0.01			0.00003		< 0.00002		0.00006
Magnesium			37.7	43.1	45	53.8	62.8	63
Manganese	0.05			1.3		1.52		0.962
Mercury		0.0002		< 0.00002		0.03		0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		0.3	0.3	0.2	0.24	0.06	< 0.05
Nitrite (as N)	1			< 0.1		< 0.05		< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.57	7.79	7.5	7.62	7.59	7.58
Phenols				< 0.001		0.013		< 0.001
Phosphate (as P)								
Phosphorus (total)				0.25		0.24		0.05
Potassium				5.6		5.4		6.6
Silicon								
Silver		0.0001						
Sodium	200		25.4	49.8	47.8	92.4	89.6	159
Strontium								
Sulphate	500		32	40	33	44	35	31
Sulphur								
Total Sus. Solids								
TDS	500		596	642	660	888	847	993
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				1.41		1.8		1.9
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		0.005		< 0.005		< 0.005
Ion Balance			1					
Field Parameters								
Temperature (°C)			8.1	8.9	8.0	8.0	8.8	7.9
pH			7.1	7.2	6.9	6.8	7.2	7.0
Conductivity (µS/cm)			778	1044	1324	1677	1476	1503

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
Groundwater Quality

			BH 6B (shallow)					
			Apr-18 BH 19	Sep-18	Jun-19	Oct-19	May-20	Sep-20
PARAMETER	ODWQS	PWQO	QA/QC					
Alkalinity (as CaCO3)	30-500		603	231	731	675	662	602
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.23	< 0.01	0.56	7.51	5.55	5.79
Arsenic	0.01	0.1 - 0.005(i)	0.0005		0.4		0.0003	
Barium	1		0.205	0.051	0.226	0.484	0.454	0.3
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	1.26	0.308	1.6	1.79	1.7	1.43
Bromide								
Cadmium	0.005	0.0002	0.00007		0.13500		0.00011	
Calcium			162	77.7	147	171	169	156
Chloride	250		184	71.8	190	161	125	142
Chromium	0.05	0.009	< 0.002		0.0008		< 0.001	
Cobalt		0.0009(i)						
COD			80	9	96	97	81	71
Conductivity (µS/cm)			1760	745	1789	1775	1640	1570
Copper	1	0.005	0.0145		0.0325		0.0173	
DOC	5		17.8	4.8	24.1	20.8	20.1	17.5
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.088	0.122	< 0.005	0.506	0.515	0.663
Lead	0.01		0.00007		< 0.02		0.00014	
Magnesium			60.9	26.4	67.6	68.8	67.5	55.9
Manganese	0.05		0.931		1.22	1.53	1.46	
Mercury		0.0002	< 0.00002		< 0.00002		< 0.00002	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		< 0.05	< 0.05	< 0.05	0.06	0.08	< 0.05
Nitrite (as N)	1		< 0.05		< 0.05		0.13	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.57	7.94	7.49	7.77	7.62	7.58
Phenols			< 0.001		< 0.002		< 0.002	
Phosphate (as P)								
Phosphorus (total)			0.04		0.37		0.18	
Potassium			6.5		7.1		12.2	
Silicon								
Silver		0.0001						
Sodium	200		152	40.7	175	161	143	118
Strontium								
Sulphate	500		31	23	37	30	26	23
Sulphur								
Total Sus. Solids								
TDS	500		960	382	1065	1026	948	868
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium							7.4	
TKN			1.8		2.9			
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005		< 0.005		< 0.005	
Ion Balance					0.999	0.839		
Field Parameters								
Temperature (°C)				8.3	7.8	8.8	7.1	7.1
pH				7.6	6.7	7.2	7.1	6.7
Conductivity (µS/cm)				535	1946	1756	1549	1640

Exceeds ODWS
Exceeds PWQO

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Ross WDS
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			BH 6B (shallow)					
			Apr-21	Sep-21	May-22	Aug-22	Jun-23	Oct-23
PARAMETER	ODWQS	PWQO					Damaged	Damaged
Alkalinity (as CaCO3)	30-500		556	816	482	264		
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			6.48	28.1	8.11	0.677		
Arsenic	0.01	0.1 - 0.005(i)	<0.001		<0.001			
Barium	1		0.27	0.59	0.37	0.08		
Beryllium		0.011						
BOD				6		<1		
Boron	5	0.2(i)	1.4	2.5	1.18	0.58		
Bromide								
Cadmium	0.005	0.0002	<0.0001		<0.0001			
Calcium			118	157	97	66		
Chloride	250		124	199	100	38		
Chromium	0.05	0.009	<0.001		<0.001			
Cobalt		0.0009(i)						
COD			67	95	42	30		
Conductivity (µS/cm)			1410	2040	1110	595		
Copper	1	0.005	0.011		0.005			
DOC	5		22.7	42	21.4	4.3		
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.91	2.09	1.39	0.45		
Lead	0.01		<0.001		<0.001			
Magnesium			42	63	34	20		
Manganese	0.05		0.75		0.56			
Mercury		0.0002	<0.001		<0.0001			
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	<0.10	<0.10	<0.10		
Nitrite (as N)	1		<0.10		<0.10			
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.56	7.37	7.26	7.69		
Phenols			<0.010		<0.001			
Phosphate (as P)								
Phosphorus (total)			0.483		0.605			
Potassium			9		10			
Silicon								
Silver		0.0001						
Sodium	200		102	167	90	30		
Strontium								
Sulphate	500		18	16	23	21		
Sulphur								
Total Sus. Solids				119		232		
TDS	500		916	1330	722	387		
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			7.43		11.7			
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01		<0.01			
Ion Balance								
Field Parameters								
Temperature (°C)			8	8.4	9.2	9		
pH			7.1	6.6	6.8	7.9		
Conductivity (µS/cm)			1400	1922	1206	550		

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 6B (shallow)					
			Jun-24	Oct-24				
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		473	232				
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			17.2	4.02				
Arsenic	0.01	0.1 - 0.005(i)	<0.001					
Barium	1		0.45	0.10				
Beryllium		0.011						
BOD				2				
Boron	5	0.2(i)	1.89	0.65				
Bromide								
Cadmium	0.005	0.0002	<0.0001					
Calcium			95	58				
Chloride	250		107	45				
Chromium	0.05	0.009	0.001					
Cobalt		0.0009(i)						
COD			59	21				
Conductivity (µS/cm)			1220	590				
Copper	1	0.005	0.007					
DOC	5		19.6	7.6				
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	5.18	1.05				
Lead	0.01		<0.001					
Magnesium			36	18				
Manganese	0.05		0.62					
Mercury		0.0002	<0.0001					
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	<0.10				
Nitrite (as N)	1		<0.10					
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.39	7.73				
Phenols			<0.001					
Phosphate (as P)								
Phosphorus (total)			0.41					
Potassium			17					
Silicon								
Silver		0.0001						
Sodium	200		104	37				
Strontium								
Sulphate	500		18	18				
Sulphur								
Total Sus. Solids				84				
TDS	500		793	384				
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			22.4					
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01					
Ion Balance								
Field Parameters								
Temperature (^{o}C)			11.2	12.4				
pH			7	7.6				
Conductivity (µS/cm)			1190	700				

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inorganic
Groundwater Quality

			BH 7A (deep)					
			Dec-90	Aug-91	Nov-98	Apr-99	Oct-99	Apr-00
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		140	212	246	206		
Aluminum	0.1	0.075 (i)	<0.030	<0.030	<0.030	<0.030	<0.030	<0.050
Ammonia (as N)			<0.10	<0.10	<0.02	0.03	0.03	0.1
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.03	0.05	0.06	0.06	NA	0.06
Beryllium		0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.002
BOD			1	2				
Boron	5	0.2(i)	<0.010	<0.010	0.03	0.03	NA	0.03
Bromide			<0.50	<0.50				
Cadmium	0.005	0.0002	<0.0020	<0.0020	<0.0050	<0.0050	<0.0050	<0.0050
Calcium			60	75	99	81	79	79
Chloride	250		14	20	20	11	15	11
Chromium	0.05	0.009	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Cobalt		0.0009(i)	0.02	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
COD			<3	14	24	5		
Conductivity (µS/cm)			350	550	520	640	530	400
Copper	1	0.005	<0.0100	<0.0100	<0.0050	<0.0050	<0.0100	0.012
DOC	5							
Fluoride	1.5		0.11	0.07				
Hardness (as CaCO3)	500		202	281	344	283	270	270
Iron	0.3	0.3	0.04	0.03	<0.01	<0.01	<0.01	0.1
Lead	0.01		<0.0100	<0.0020	<0.0020	<0.0020	<0.0020	<0.0010
Magnesium			13	23	24	20	18	18
Manganese	0.05		<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Mercury		0.0002						
Molybdenum		0.04(i)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nickel			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate (as N)	10		7.09	7.6	11.2	10.9	10.9	11.3
Nitrite (as N)	1		<0.10	<0.10				
Organic Nitrogen	0.15		<0.10	<0.10				
pH (pH units)	6.5-8.5		8	7.9	7.1	7.2	7.1	7.5
Phenols			<0.002	<0.002				
Phosphate (as P)			0.2	0.17				
Phosphorus (total)			<0.100	<0.100				
Potassium			2	2	2	3	2	2
Silicon			5.7	5.9	5.4	6.5	6.3	5.38
Silver		0.0001	<0.01000	<0.01000	<0.01000	<0.01000	<0.01000	<0.01000
Sodium	200		4	4	7	6	6	6
Strontium			0.09	0.13	0.187	0.164	0.165	0.141
Sulphate	500		30	32	39	25	27	19
Sulphur			6	11	13	8	6	6
Total Sus. Solids								
TDS	500		232	278	392	352	316	308
Temperature (°C)	15		7	10.8	5	4	6	6
Thallium		0.0003(i)	<0.01000	<0.05000	<0.20000	<0.20000	<0.20000	<0.20000
Tin			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Titanium			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TKN			<0.10	<0.10				
Vanadium		(0.006(i)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.02
Zinc	5	0.03 - 0.02(i)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inorganic
Groundwater Quality

			BH 7A (deep)					
			Nov-01	Oct-02	Oct-03	Oct-04	Nov-05	Sep-06
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		217	272	233	368	326	343
Aluminum	0.1	0.075 (i)				<0.005		
Ammonia (as N)					<0.02	<0.03		
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.05	0.09	0.08	0.159	0.15	0.16
Beryllium		0.011				<0.001		
BOD								
Boron	5	0.2(i)	<0.050	<0.050	<0.050	0.117	0.1	0.09
Bromide								
Cadmium	0.005	0.0002				<0.0001		
Calcium			82	99	96	136	130	
Chloride	250				19	42.2		
Chromium	0.05	0.009				<0.0050		
Cobalt		0.0009(i)				0.0006		
COD					<5	7		
Conductivity (µS/cm)			575	760	500	980	575	700
Copper	1	0.005				0.0028		
DOC	5				<0.5	2.5	1.9	1.9
Fluoride	1.5							
Hardness (as CaCO3)	500		273	344	324	470	454	
Iron	0.3	0.3				<0.03		
Lead	0.01					<0.0005		
Magnesium			17	24	21	32.2	32.1	
Manganese	0.05		<0.010	<0.005	<0.010	<0.005	<0.010	
Mercury		0.0002						
Molybdenum		0.04(i)				<0.001		
Nickel						0.002		
Nitrate (as N)	10		11.8	13.4	12.9	14.6	21	20
Nitrite (as N)	1				<0.10	<0.20		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.3	6.9	7.4	7.2	7.1	7.2
Phenols					<0.001	<0.001		
Phosphate (as P)								
Phosphorus (total)								
Potassium			3	3	4	4.9	6	7
Silicon						7.23		
Silver		0.0001				<0.00010		
Sodium	200					18.6		
Strontium			0.128	0.199	0.184	0.305	0.28	0.29
Sulphate	500		24	46	24	65.8	45	51
Sulphur								
Total Sus. Solids								
TDS	500		360	465	417	600	288	602
Temperature (°C)	15		7	8	7.3	14	9.2	8.7
Thallium		0.0003(i)				<0.00005		
Tin						<0.001		
Titanium						<0.005		
TKN								
Vanadium		(0.006(i)				0.001		
Zinc	5	0.03 - 0.02(i)				<0.005		
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted
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Ross WDS
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			BH 7A (deep)					
			Oct-07	May-08	Oct-08	May-09	Oct-09	May-10
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		359	363	345	330	331	302
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.89	<0.02	1.14	0.77	0.82	0.41
Arsenic	0.01	0.1 - 0.005(i)				<0.001	<0.001	<0.001
Barium	1					0.19	0.2	0.18
Beryllium		0.011						
BOD						5	7	
Boron	5	0.2(i)	0.16	0.21	0.14	0.12	0.09	0.09
Bromide								
Cadmium	0.005	0.0002				<0.0001	<0.0001	<0.0001
Calcium			131	89	135	128	119	125
Chloride	250		38	37	35	31	29	24
Chromium	0.05	0.009				0.001	0.003	0.002
Cobalt		0.0009(i)						
COD			<5	<5	5	13	8	5
Conductivity (µS/cm)			1010	1060	1000	950	939	859
Copper	1	0.005	0.004	0.006	0.003	0.003	0.003	0.002
DOC	5					2.3	2.5	1.9
Fluoride	1.5							
Hardness (as CaCO3)	500		473	324	487	461	435	438
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01					<0.001	<0.001	<0.001
Magnesium			36	25	37	35	34	31
Manganese	0.05		<0.01	0.09	<0.01	<0.01	<0.01	0.06
Mercury		0.0002				<0.0001	<0.0001	<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		18.9	21.5	22.7	21.2	20.2	20.8
Nitrite (as N)	1		0.13	<0.10	<0.10	0.57	<0.10	0.12
Organic Nitrogen	0.15		0.41	<u>≤</u>3.29	0.03	0.24	0.17	0.44
pH (pH units)	6.5-8.5					7.57	7.81	7.7
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)						0.25	0.66	0.19
Potassium			13	13	14	8	10	9
Silicon								
Silver		0.0001						
Sodium	200		19	105	20	11	12	11
Strontium			0.336	0.397	0.314	0.341	0.327	
Sulphate	500		60	64	58	47	53	45
Sulphur								
Total Sus. Solids						265	369	
TDS	500		657	689	650	618	610	558
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			1.3	3.29	1.17	1.01	0.99	0.85
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)				<0.01	<0.01	<0.01
Ion Balance				1.02	1.03			
Field Parameters								
Temperature (°C)				11.2	9	10.4	8.7	9.8
pH				9.5	--	7.3	8.51	9.23
Conductivity (µS/cm)				994	995	951	956	868

Exceeds ODWS
Exceeds PWQO

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Ross WDS
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			BH 7A (deep)					
			Oct-10	Jun-11	Nov-11	May-12	Oct-12	Apr-13
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		258	309	304	287	284	233
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.15	0.17	0.11	0.06	0.08	0.03
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001		<0.001		<0.001
Barium	1		0.14	0.14	0.16	0.13	0.14	0.10
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.05	0.06	0.05	0.05	0.05	0.03
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001		<0.0001		<0.0001
Calcium			105	105	117	105	111	85
Chloride	250		19	25	23	21	20	15
Chromium	0.05	0.009	0.002	0.009		0.002		<0.001
Cobalt		0.0009(i)						
COD			8	40	5	<5	7	<5
Conductivity (µS/cm)			690	831	780	766	746	619
Copper	1	0.005	0.002	0.001		0.001		<0.001
DOC	5		1.9	2.1	1.7	1.9	1.9	1.6
Fluoride	1.5							
Hardness (as CaCO3)	500		367	388	409	367	386	301
Iron	0.3	0.3	<0.03	0.09	<0.03	<0.03	<0.03	<0.03
Lead	0.01		<0.001	<0.001		<0.001		<0.001
Magnesium			26	31	29	26	27	22
Manganese	0.05		0.09	0.1		0.09		0.04
Mercury		0.0002	<0.0001	<0.0001		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		14.5	17.8	13.2	14.7	14.9	12.7
Nitrite (as N)	1		<0.10	<0.10		<0.10		<0.10
Organic Nitrogen	0.15		0.12	0.31				
pH (pH units)	6.5-8.5		7.91	7.68	7.71	7.8	7.83	7.87
Phenols			<0.001	<0.001		<0.001		<0.001
Phosphate (as P)								
Phosphorus (total)			0.12	0.6		<0.01		<0.01
Potassium			8	6		6		5
Silicon								
Silver		0.0001						
Sodium	200		7	8	11	8	8	5
Strontium								
Sulphate	500		31	38	39	39	31	25
Sulphur								
Total Sus. Solids								
TDS	500		449	540	507	498	485	402
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.27	0.48		<0.10		0.21
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01		<0.01		<0.01
Ion Balance								
Field Parameters								
Temperature (°C)			8.7	8.8	8.8	9.4	8.8	8.8
pH			7.69	7.5	7.3	7.4	6.9	7.4
Conductivity (µS/cm)			713	578	780	765	725	613

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
Groundwater Quality

			BH 7A (deep)					
			Oct-13	Jul-14	Oct-14	Apr-15	Sep-15	Apr-16
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		297	287	300	329	338	365
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.08	<0.01	<0.01	< 0.01	< 0.01	0.01
Arsenic	0.01	0.1 - 0.005(i)		0.0002		0.0002		< 0.0001
Barium	1		0.14	0.129	0.143	0.157	0.146	0.149
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.05	0.038	0.059	0.065	0.07	0.066
Bromide								
Cadmium	0.005	0.0002		<0.00002		< 0.00002		< 0.00002
Calcium			109	117	123	138	126	136
Chloride	250		22	22.5	24.5	26.1	27.8	34.6
Chromium	0.05	0.009		<0.002		< 0.002		< 0.002
Cobalt		0.0009(i)						
COD			<5	<5	< 5	< 5	< 5	5
Conductivity (µS/cm)			772	790	815	845	834	914
Copper	1	0.005		<0.0001		< 0.002		0.0017
DOC	5		1.7	2.8	3.9	4.7	1.6	1.6
Fluoride	1.5							
Hardness (as CaCO3)	500		386	409	431	480	440	
Iron	0.3	0.3	<0.03	<0.005	<0.005	0.008	< 0.005	< 0.005
Lead	0.01			<0.00002		< 0.00002		< 0.00002
Magnesium			28	28.9	30.6	33.5	31	33.2
Manganese	0.05			0.043		0.063		0.035
Mercury		0.0002		<0.00002		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		15.2	16.6	16.3	15.7	16.3	17
Nitrite (as N)	1			<0.10		< 0.1		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.6	7.97	7.91	7.79	7.72	7.98
Phenols				<0.001		< 0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				0.04		0.04		0.01
Potassium				5.9		6.6		5.7
Silicon								
Silver		0.0001						
Sodium	200		8	8.2	9.6	11.1	11.2	12.2
Strontium								
Sulphate	500		31	36	36	38	36	38
Sulphur								
Total Sus. Solids								
TDS	500		502	464	482	521	567	555
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.06		0.2		0.28
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.005		< 0.005		< 0.005
Ion Balance				0.948	0.932	0.895	0.995	
Field Parameters								
Temperature (°C)			9	9.8	9.7	9.3	9.0	9
pH			7.2	7.8	7.3	7.4	7.2	7.5
Conductivity (µS/cm)			730	693	769	929	755	877

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 7A (deep)					
			Sep-16	May-17	Aug-17	Apr-18	Sep-18	Sep-18 BH 18 QA/QC
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		399	432	474	375	354	352
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.05	0.59	0.83	0.66	0.98	0.99
Arsenic	0.01	0.1 - 0.005(i)		0.0002		0.0001		
Barium	1		0.161	0.182	0.254	0.208	0.226	0.215
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.076	0.132	0.254	0.172	0.171	0.162
Bromide								
Cadmium	0.005	0.0002		0.00005		0.00004		
Calcium			126	134	163	146	152	145
Chloride	250		40.7	58.6	62	44.3	50.4	50.5
Chromium	0.05	0.009		< 0.002		0.025		
Cobalt		0.0009(i)						
COD			7	11	11	7	12	9
Conductivity (µS/cm)			984	1150	1200	1040	1100	1110
Copper	1	0.005		0.0037		0.0038		
DOC	5		2.5	3.7	5	5.9	4.8	4.7
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	0.008	< 0.005	< 0.005	< 0.005
Lead	0.01			< 0.00002		< 0.00002		
Magnesium			34.2	36.3	42.8	36.8	41.6	39.7
Manganese	0.05			0.081		0.051		
Mercury		0.0002		< 0.02		< 0.00002		
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		17.6	11.8	6.46	19.1	21.6	21.6
Nitrite (as N)	1			< 0.05		< 0.05		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.67	7.7	7.67	7.72	7.68	7.72
Phenols				0.004		< 0.001		
Phosphate (as P)								
Phosphorus (total)				0.02		0.01		
Potassium				7.9		9.8		
Silicon								
Silver		0.0001						
Sodium	200		14.6	19.9	37.2	27.3	26.4	25
Strontium								
Sulphate	500		49	39	35	34	48	48
Sulphur								
Total Sus. Solids								
TDS	500		589	555	637	524	544	532
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				1.4		1.1		
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		< 0.005		
Ion Balance								
Field Parameters								
Temperature (°C)			9.4	9.5	9.6	9.1	9.7	
pH			7.1	7.1	7.1	7.2	7.2	
Conductivity (µS/cm)			1085	1109	1143	901	716	

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 7A (deep)					
			Jun-19	Oct-19	May-20	Sep-20	Apr-21	Sep-21
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		427	403	372	360	384	419
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			1.17	1.27	0.93	0.92	0.771	0.832
Arsenic	0.01	0.1 - 0.005(i)	< 0.1		< 0.0001		<0.001	
Barium	1		0.196	0.27	0.223	0.215	0.21	0.19
Beryllium		0.011						
BOD								2
Boron	5	0.2(i)	0.156	0.244	0.213	0.202	0.21	0.18
Bromide								
Cadmium	0.005	0.0002	0.02800		0.00006		<0.0001	
Calcium			144	160	146	140	126	144
Chloride	250		72.1	53.8	48.6	52.8	59	45
Chromium	0.05	0.009	< 0.0002		< 0.001		<0.001	
Cobalt		0.0009(i)						
COD			14	33	19	< 5	12	9
Conductivity (µS/cm)			1060	1068	1020	1030	1040	1020
Copper	1	0.005	0.0041		0.0051		0.008	
DOC	5		6.2	5.6	4.7	4.4	3	3.9
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	0.024	<0.03	0.04
Lead	0.01		< 0.02		0.00005		<0.001	
Magnesium			40.6	43.6	37.8	36.1	30	36
Manganese	0.05		0.268	0.446	0.437		0.48	
Mercury		0.0002	< 0.00002		< 0.00002		<0.0001	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		12.7	14.7	14.1	14.6	15.3	14.6
Nitrite (as N)	1		< 0.05		0.06		<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.72	7.9	7.87	7.76	7.72	7.6
Phenols			< 0.002		< 0.002		<0.010	
Phosphate (as P)								
Phosphorus (total)			0.02		0.41		0.191	
Potassium			11.9		10.4		9	
Silicon								
Silver		0.0001						
Sodium	200		28.1	32.8	28.3	26.6	29	29
Strontium								
Sulphate	500		44	45	35	43	45	42
Sulphur								
Total Sus. Solids								613
TDS	500		598	593	530	526	676	663
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium					1.4			
TKN			1.9				0.86	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005		< 0.005		<0.01	
Ion Balance			1.02	0.86				
Field Parameters								
Temperature (°C)			9.9	9.1	9.1	9.2	8.4	9.4
pH			6.9	7.2	7.2	6.8	7.3	6.8
Conductivity (µS/cm)			1212	1135	992	1075	1076	1023

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted
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			BH 7A (deep)					
			May-22	Aug-22	Jun-23	Oct-23	Jun-24	Oct-24
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		354	397	419	434	292	279
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.569	0.738	0.408	0.497	0.386	0.027
Arsenic	0.01	0.1 - 0.005(i)	<0.001		<0.001		<0.001	
Barium	1		0.20	0.18	0.19	0.18	0.12	0.11
Beryllium		0.011						
BOD				<1		4		1
Boron	5	0.2(i)	0.15	0.17	0.17	0.2	0.11	0.09
Bromide								
Cadmium	0.005	0.0002	<0.0001		<0.0001		<0.0001	
Calcium			122	130	135	137	115	109
Chloride	250		37	37	38	37	25	23
Chromium	0.05	0.009	<0.001		<0.001		<0.001	
Cobalt		0.0009(i)						
COD			<5	10	<5	21	93	19
Conductivity (µS/cm)			857	909	945	954	758	714
Copper	1	0.005	0.004		0.003		0.002	
DOC	5		3.6	2	3.9	11	1.5	1.9
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	<0.03	0.05	<0.03	<0.03	0.6
Lead	0.01		<0.001		<0.001		<0.001	
Magnesium			30	31	32	33	26	25
Manganese	0.05		0.48		0.41		0.45	
Mercury		0.0002	<0.0001		<0.0001		<0.0001	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		18.2	15.0	15.4	12.7	14.0	15.3
Nitrite (as N)	1		<0.10		<0.10		<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.4	7.44	7.47	7.42	7.56	7.69
Phenols			<0.001		<0.001		<0.001	
Phosphate (as P)								
Phosphorus (total)			0.142		2.08		0.421	
Potassium			8		7		6	
Silicon								
Silver		0.0001						
Sodium	200		22	21	27	24	15	13
Strontium								
Sulphate	500		38	37	37	38	33	25
Sulphur								
Total Sus. Solids				1650		1460		496
TDS	500		557	591	614	620	493	464
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.781				0.415	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01				<0.01	
Ion Balance								
Field Parameters								
Temperature (°C)			9.7	10	9.6	9.5	10.1	10.1
pH			6.9	7.3	7.2	7	7.3	7.3
Conductivity (µS/cm)			1007	1010	1080	1090	810	810

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 7B (shallow)					
			Dec-90	Aug-91	Oct-91	Nov-98	Apr-99	Oct-99
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		190	300	320	382	368	
Aluminum	0.1	0.075 (i)	<0.030	<0.030	<0.030	<0.030	<0.030	<0.030
Ammonia (as N)			<0.10	<0.10	<0.10	0.34	0.33	0.25
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.05	0.13	0.12	0.17	0.18	NA
Beryllium		0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
BOD			<1.0	2	<1.0			
Boron	5	0.2(i)	0.01	0.02	0.13	0.08	0.07	NA
Bromide			<0.50	0.7	0.6			
Cadmium	0.005	0.0002	<0.0020	<0.0020	<0.0020	<0.0050	<0.0050	<0.0050
Calcium			62	111	121	146	137	136
Chloride	250		9	38	33	34	26	32
Chromium	0.05	0.009	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Cobalt		0.0009(i)	0.02	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
COD			<3	14	9	8	10	
Conductivity (µS/cm)			470	875	870	775	1400	810
Copper	1	0.005	<0.0100	<0.0100	0.01	<0.0050	<0.0050	<0.0100
DOC	5							
Fluoride	1.5		0.11	0.06	0.07			
Hardness (as CaCO3)	500		224	411	415	490	467	452
Iron	0.3	0.3	0.02	0.07	<0.01	<0.01	<0.01	<0.01
Lead	0.01		<0.0100	<0.0020	<0.0020	<0.0020	<0.0020	<0.0020
Magnesium			17	33	28	31	31	28
Manganese	0.05		<0.010	<0.010	<0.010	0.05	0.13	0.14
Mercury		0.0002						
Molybdenum		0.04(i)	0.07	<0.010	<0.010	<0.010	<0.010	<0.010
Nickel			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrate (as N)	10		6.7	9.6	12.6	11.8	12.2	13.9
Nitrite (as N)	1		<0.10	<0.10	<0.10			
Organic Nitrogen	0.15		<0.10	<0.10	<0.10			
pH (pH units)	6.5-8.5		7.7	7.2	7.3	6.8	7.1	7
Phenols			<0.002	<0.002	<0.002			
Phosphate (as P)			0.14	0.24	0.18			
Phosphorus (total)			<0.100	<0.100	<0.100			
Potassium			3	6	6	13	13	12
Silicon			5.4	6.4	7.4	5.5	6.5	6.9
Silver		0.0001	<0.01000	<0.01000	<0.01000	<0.01000	<0.01000	<0.01000
Sodium	200		6	24	22	13	12	13
Strontium			0.13	0.2	0.23	0.267	0.264	0.285
Sulphate	500		21	101	90	52	47	51
Sulphur			8	36	30	16	13	14
Total Sus. Solids								
TDS	500		286	436	468	552	564	540
Temperature (°C)	15		7	13.8	7.5	6	5	8
Thallium		0.0003(i)	<0.01000	<0.05000	<0.05000	<0.20000	<0.20000	<0.20000
Tin			0.05	<0.050	<0.050	<0.050	<0.050	<0.050
Titanium			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TKN			<0.10	<0.10	<0.10			
Vanadium		(0.006(i)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Zinc	5	0.03 - 0.02(i)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 7B (shallow)					
			Apr-00	Dec-00	Nov-01	Oct-02	Oct-03	Oct-04
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500			376	308	378	378	366
Aluminum	0.1	0.075 (i)	<0.050		<0.050	<0.010	<0.010	<0.005
Ammonia (as N)			0.12		0.24	0.43	0.31	2.18
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.16	0.19	0.11	0.18	0.2	0.202
Beryllium		0.011	<0.002		<0.002	<0.001	<0.001	<0.001
BOD								
Boron	5	0.2(i)	0.09	0.11	0.08	0.12	0.12	0.12
Bromide								
Cadmium	0.005	0.0002	<0.0050		<0.0001	<0.0001	<0.0001	0.00010
Calcium			131	138	117	153	158	138
Chloride	250		33	16	30	52	56	44.5
Chromium	0.05	0.009	<0.0100		<0.0010	0.008	<0.0010	<0.0050
Cobalt		0.0009(i)	<0.0100		0.0003	0.0006	0.0005	0.0007
COD				<4	<5	<5	<5	11
Conductivity (µS/cm)			650	850	825	1060	800	490
Copper	1	0.005	<0.0100		0.002	0.003	0.003	0.0041
DOC	5				3.6	3.1	1.6	3.3
Fluoride	1.5							
Hardness (as CaCO3)	500		444	470	393	507	532	480
Iron	0.3	0.3	0.05	0.01	<0.01	<0.01	<0.01	<0.03
Lead	0.01		<0.0010		<0.0010	<0.0010	<0.0010	0.0008
Magnesium			29	31	25	31	34	33.6
Manganese	0.05		0.12	0.29	0.18	0.31	0.164	0.762
Mercury		0.0002						
Molybdenum		0.04(i)	<0.010		<0.010	<0.005	<0.005	<0.001
Nickel			<0.010		<0.010	<0.005	0.006	0.008
Nitrate (as N)	10		13.6	4.99	15.4	15.2	14.8	18.7
Nitrite (as N)	1				0.25	<0.10	<0.10	<0.20
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.3	7	7.5	7	7.1	7
Phenols					<0.001	<0.001	<0.001	<0.005
Phosphate (as P)								
Phosphorus (total)								
Potassium			12	12	11	11	12	13
Silicon			5.45		5.31	5.2	7.1	6.91
Silver		0.0001	<0.01000		<0.00010	<0.00010	<0.00010	<0.00010
Sodium	200		15	18	9	24	22	19.2
Strontium			0.236	0.279	0.185	0.289	0.324	0.287
Sulphate	500		45	15	38	68	53	42
Sulphur			14					
Total Sus. Solids								
TDS	500		524	552	528	683	670	652
Temperature (°C)	15		7	9	8	9	8.4	12
Thallium		0.0003(i)	<0.20000		<0.00100	<0.00100	<0.00100	0.00008
Tin			<0.050		<0.010	<0.010	<0.010	<0.001
Titanium			<0.010		<0.010	<0.010	<0.010	<0.005
TKN								
Vanadium		(0.006(i)	0.04		<0.0010	0.003	<0.0010	0.0011
Zinc	5	0.03 - 0.02(i)	<0.010		<0.010	<0.005	<0.010	0.006
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 7B (shallow)					
			Nov-05	Sep-06	Oct-07	May-08	Oct-08	May-09
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		410	416	320	270	345	319
Aluminum	0.1	0.075 (i)	<0.005	<0.005				
Ammonia (as N)			1.6	1.55	1.34	1.04	0.86	0.71
Arsenic	0.01	0.1 - 0.005(i)						<0.001
Barium	1		0.21	0.21				0.13
Beryllium		0.011	<0.001	<0.001				
BOD								4
Boron	5	0.2(i)	0.13	0.15	0.07	0.05	0.08	0.07
Bromide								
Cadmium	0.005	0.0002	0.00010	0.00010				<0.0001
Calcium			150	150	121	115	133	110
Chloride	250		43	47	44	48	40	44
Chromium	0.05	0.009	<0.0050	<0.0050				0.001
Cobalt		0.0009(i)	0.0006	0.0007				
COD			16	10	<5	<5	10	18
Conductivity (µS/cm)			700	800	902	844	952	905
Copper	1	0.005	0.007	0.006	0.006	0.005	0.004	0.003
DOC	5		3.2	2.9				2.5
Fluoride	1.5							
Hardness (as CaCO3)	500		520	537	419	400	461	380
Iron	0.3	0.3	<0.05	<0.05	<0.03	<0.03	<0.03	<0.03
Lead	0.01		<0.0005	<0.0005				<0.001
Magnesium			36	40	29	28	32	26
Manganese	0.05		1	1.1	0.87	0.78	0.96	0.82
Mercury		0.0002						<0.0001
Molybdenum		0.04(i)	<0.001	<0.001				
Nickel			0.009	0.01				
Nitrate (as N)	10		21	14	16.9	15.6	18.7	14.7
Nitrite (as N)	1		0.06	<0.10	<0.10	<0.10	0.18	<0.10
Organic Nitrogen	0.15				0.29	0.48	0.32	0
pH (pH units)	6.5-8.5		6.8	7				7.59
Phenols				<0.001	<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)								0.13
Potassium				14	9	8	9	6
Silicon			8	8.3				
Silver		0.0001	<0.00050	<0.00010				
Sodium	200		22	26	18	18	17	15
Strontium			0.27	0.34	0.29	0.257	0.286	0.295
Sulphate	500		44	51	32	40	34	41
Sulphur								
Total Sus. Solids								221
TDS	500		276	667	586	549	619	588
Temperature (°C)	15		9.8	9.3				
Thallium		0.0003(i)	0.00006	0.00009				
Tin			<0.001	<0.001				
Titanium			<0.005	<0.005				
TKN					1.63	1.52	1.18	0.58
Vanadium		(0.006(i)	<0.0010	<0.0010				
Zinc	5	0.03 - 0.02(i)	0.007	0.015				<0.01
Ion Balance						1.04	1.02	
Field Parameters								
Temperature (°C)						9.4	9.1	8.8
pH						9.99	--	7.4
Conductivity (µS/cm)						844	944	905

Exceeds ODWS
Exceeds PWQO

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			BH 7B (shallow)					
			Oct-09	May-10	Oct-10	Jun-11	Nov-11	May-12
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		371	355	365	353	370	367
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.82	0.86	0.63	0.54	0.68	0.66
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001	<0.001	<0.001		<0.001
Barium	1		0.17	0.15	0.15	0.14	0.15	0.14
Beryllium		0.011						
BOD			3					
Boron	5	0.2(i)	0.11	0.08	0.07	0.12	0.1	0.06
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Calcium			126	119	151	140	136	140
Chloride	250		39	37	32	46	34	34
Chromium	0.05	0.009	0.002	0.002	0.002	0.063		0.003
Cobalt		0.0009(i)						
COD			16	5	10	25	5	<5
Conductivity (µS/cm)			984	972	938	979	926	974
Copper	1	0.005	0.004	0.004	0.003	0.003		0.003
DOC	5		2.9	2.8	2.7	3.6	2.3	2.9
Fluoride	1.5							
Hardness (as CaCO3)	500		419	402	506	487	461	475
Iron	0.3	0.3	<0.03	<0.03	<0.03	0.03	0.1	<0.03
Lead	0.01		<0.001	<0.001	<0.001	<0.001		<0.001
Magnesium			26	26	32	34	30	31
Manganese	0.05		1.02	0.91	0.83	0.79		0.67
Mercury		0.0002	<0.0001	<0.0001	<0.0001	<0.001		<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		18.4	<0.10	16.2	12.3	14	13.9
Nitrite (as N)	1		<0.10	<0.10	<0.10	<0.10		<0.10
Organic Nitrogen	0.15		0	0.46	0.14	0.36		
pH (pH units)	6.5-8.5		7.78	7.58	7.75	7.73	7.5	7.65
Phenols			<0.001	<0.001	<0.001	<0.001		<0.001
Phosphate (as P)								
Phosphorus (total)			0.19	0.23	0.16	2.8		0.57
Potassium			7	6	8	8		7
Silicon								
Silver		0.0001						
Sodium	200		15	13	13	18	16	13
Strontium			0.366					
Sulphate	500		39	50	43	62	43	61
Sulphur								
Total Sus. Solids			700					
TDS	500		640	632	610	636	602	633
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.82	1.32	0.77	0.9		0.83
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01	<0.01	<0.01		<0.01
Ion Balance								
Field Parameters								
Temperature (°C)			8.9	9.6	9.1	8.6	9.7	8.8
pH			8.35	8.69	7.25	7.3	7.1	7.0
Conductivity (µS/cm)			978	987	979	671	931	966

Exceeds ODWS
Exceeds PWQO

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			BH 7B (shallow)					
			Oct-12	Apr-13	Oct-13	Jul-14	Oct-14	Apr-15
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		380	322	393	378	374	369
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.5	0.24	0.46	0.36	0.46	0.63
Arsenic	0.01	0.1 - 0.005(i)		<0.001		0.0003		0.0002
Barium	1		0.16	0.11	0.18	0.15	0.157	0.15
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.08	0.05	0.13	0.092	0.145	0.099
Bromide								
Cadmium	0.005	0.0002		<0.0001		0.00007		0.00007
Calcium			148	117	149	154	156	153
Chloride	250		27	24	33	35.8	35.2	30.5
Chromium	0.05	0.009		<0.001		<0.002		< 0.002
Cobalt		0.0009(i)						
COD			14	<5	<5	<5	< 5	< 5
Conductivity (µS/cm)			963	815	1020	1010	1010	932
Copper	1	0.005		0.002		<0.0018		0.002
DOC	5		2.5	2.2	2.4	4.1	5.4	5.7
Fluoride	1.5							
Hardness (as CaCO3)	500		499	401	505	522	528	521
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.005	<0.005	< 0.005
Lead	0.01			<0.001		0.00003		< 0.00002
Magnesium			32	27	33	34	34.4	34.3
Manganese	0.05			0.25		0.409		0.482
Mercury		0.0002		<0.0001		<0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		16.6	13.2	15.6	14.1	15.9	16.1
Nitrite (as N)	1			<0.10		<0.10		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.62	7.67	7.39	7.57	7.84	7.7
Phenols				<0.001		<0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				0.03		0.76		0.4
Potassium				6		8.2		8.7
Silicon								
Silver		0.0001						
Sodium	200		13	7	15	15.9	18.8	16.4
Strontium								
Sulphate	500		36	37	61	68	66	37
Sulphur								
Total Sus. Solids								
TDS	500		626	530	663	605	615	574
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.41		0.9		1.01
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.005		< 0.005
Ion Balance						0.96	0.94	0.885
Field Parameters								
Temperature (°C)			10.2	7.6	9.9	9.6	10.9	8.4
pH			6.8	7.2	7.2	7.6	7.1	7.2
Conductivity (µS/cm)			924	810	960	874	950	1039

Exceeds ODWS
Exceeds PWQO

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Ross WDS
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			BH 7B (shallow)					
			Sep-15	Apr-16	Sep-16	May-17	Aug-17	Apr-18
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		381	436	463	535	457	430
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.97	0.85	0.89	1.55	1.87	2.66
Arsenic	0.01	0.1 - 0.005(i)		0.0001		0.0002		0.0001
Barium	1		0.154	0.161	0.144	0.168	0.19	0.181
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.101	0.103	0.122	0.329	0.272	0.21
Bromide								
Cadmium	0.005	0.0002		0.00007		0.00009		0.00007
Calcium			144	159	135	147	160	152
Chloride	250		32.3	65.4	51.4	70.9	63.3	55.2
Chromium	0.05	0.009		< 0.002		< 0.002		< 0.002
Cobalt		0.0009(i)						
COD			< 5	5	17	19	10	13
Conductivity (µS/cm)			951	1070	1040	1270	1190	1120
Copper	1	0.005		0.0034		0.0086		0.0041
DOC	5		2.4	4.7	4.6	5.8	4.9	6.8
Fluoride	1.5							
Hardness (as CaCO3)	500		491					
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01			0.00002		< 0.00002		< 0.00002
Magnesium			32.6	36.7	33.7	37.6	39	37.8
Manganese	0.05			0.574		0.659		1.67
Mercury		0.0002		< 0.00002		< 0.02		< 0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		19.3	9.5	6.2	1.58	7.5	13.5
Nitrite (as N)	1			< 0.1		< 0.05		< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.54	7.85	7.62	7.6	7.65	7.65
Phenols				< 0.001		0.003		< 0.001
Phosphate (as P)								
Phosphorus (total)				0.47		0.1		0.02
Potassium				8.8		9.6		12.4
Silicon								
Silver		0.0001						
Sodium	200		16.4	21.5	23.2	45.7	40.1	35.2
Strontium								
Sulphate	500		49	47	57	39	30	29
Sulphur								
Total Sus. Solids								
TDS	500		647	643	615	671	620	584
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				1.47		2.2		3.1
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		< 0.005		< 0.005
Ion Balance			1.01					
Field Parameters								
Temperature (°C)			10.0	8.8	9.9	10.0	10.0	8.8
pH			7.0	7.1	6.9	7.0	7.1	6.8
Conductivity (µS/cm)			865	1029	1162	1226	1120	970

Exceeds ODWS
Exceeds PWQO

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			BH 7B (shallow)					
			Sep-18	Jun-19	Oct-19	May-20	Sep-20	Apr-21
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		337	410	338	492	318	373
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			1.84	1.91	1.78	3.02	2.06	2.24
Arsenic	0.01	0.1 - 0.005(i)		< 0.1		< 0.0001		<0.001
Barium	1		0.134	0.112	0.157	0.206	0.136	0.14
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.113	0.278	0.163	0.304	0.152	0.14
Bromide								
Cadmium	0.005	0.0002		0.04000		0.00009		<0.0001
Calcium			116	117	133	178	122	121
Chloride	250		40.4	61.4	38	71.4	38.6	35
Chromium	0.05	0.009		< 0.0002		< 0.001		<0.001
Cobalt		0.0009(i)						
COD			< 5	13	12	22	< 5	7
Conductivity (µS/cm)			1020	966	875	1220	900	941
Copper	1	0.005		0.0051		0.0073		0.008
DOC	5		4.6	6	4.5	6.8	5.3	2.8
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	1.24	< 0.005	0.01	<0.03
Lead	0.01			< 0.02		0.00004		<0.001
Magnesium			36.5	31.9	34.1	41.8	28.7	26
Manganese	0.05			1.4	2.32	2.37		1.48
Mercury		0.0002		< 0.00002		< 0.00002		<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		21.2	6.73	12.4	2.75	13.8	12.2
Nitrite (as N)	1			< 0.05		0.06		<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.63	7.57	7.92	7.77	7.7	7.65
Phenols				< 0.002		< 0.002		<0.010
Phosphate (as P)								
Phosphorus (total)				0.36		0.13		0.326
Potassium				9.1		11.8		9
Silicon								
Silver		0.0001						
Sodium	200		20.9	41.6	23.4	36.8	20.5	20
Strontium								
Sulphate	500		36	37	31	38	34	34
Sulphur								
Total Sus. Solids								
TDS	500		467	548	477	679	444	612
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium						3.4		
TKN				2.5				2.3
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		< 0.005		<0.01
Ion Balance				1.05	0.851			
Field Parameters								
Temperature (°C)			9.9	9.7	9.3	8.8	9.5	7.8
pH			7.5	6.9	7.2	7.0	6.7	7.3
Conductivity (µS/cm)			645	1119	924	1175	942	973

Exceeds ODWS
Exceeds PWQO

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Ross WDS
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			BH 7B (shallow)					
			Sep-21	May-22	Aug-22	Jun-23	Oct-23	Jun-24
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		393	388	445	531	425	381
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			1.87	1.1	1.14	1.2	1.14	1.49
Arsenic	0.01	0.1 - 0.005(i)		<0.001		<0.001		<0.001
Barium	1		0.13	0.16	0.16	0.20	0.16	0.15
Beryllium		0.011						
BOD			2		<1		4	
Boron	5	0.2(i)	0.12	0.11	0.18	0.27	0.25	0.13
Bromide								
Cadmium	0.005	0.0002		<0.0001		<0.0001		<0.0001
Calcium			140	134	139	178	141	150
Chloride	250		40	39	45	78	46	37
Chromium	0.05	0.009		<0.001		<0.001		<0.001
Cobalt		0.0009(i)						
COD			<5	<5	19	15	22	9
Conductivity (µS/cm)			951	893	1030	1170	984	929
Copper	1	0.005		0.003		0.006		0.003
DOC	5		3.6	3.9	2.6	7.1	11.4	2.1
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	<0.03	0.03	<0.03	<0.03	<0.03
Lead	0.01			<0.001		<0.001		<0.001
Magnesium			31	29	29	36	29	30
Manganese	0.05			1.26		1.55		0.97
Mercury		0.0002		<0.0001		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		12.7	15.7	11.1	6.49	11.0	13.5
Nitrite (as N)	1			<0.10		<0.10		<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.48	7.24	7.27	7.3	7.46	7.36
Phenols				<0.001		<0.001		<0.001
Phosphate (as P)								
Phosphorus (total)				0.142		0.182		0.172
Potassium				8		8		9
Silicon								
Silver		0.0001						
Sodium	200		20	18	19	29	27	18
Strontium								
Sulphate	500		38	35	43	47	41	42
Sulphur								
Total Sus. Solids			24		199		127	
TDS	500		618	580	670	760	640	604
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				1.22		1.93		2
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.01		<0.01
Ion Balance								
Field Parameters								
Temperature (°C)			10.3	9	10.6	9.4	10.0	10.7
pH			6.7	7	7.49	7.3	7.1	7
Conductivity (µS/cm)			945	1044	1010	1330	1110	990

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
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Groundwater Quality

BH 7B (shallow)
Oct-24

PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		378					
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			1.18					
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.15					
Beryllium		0.011						
BOD			<1					
Boron	5	0.2(i)	0.14					
Bromide								
Cadmium	0.005	0.0002						
Calcium			148					
Chloride	250		32					
Chromium	0.05	0.009						
Cobalt		0.0009(i)						
COD			8					
Conductivity (µS/cm)			917					
Copper	1	0.005						
DOC	5		3.0					
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03					
Lead	0.01							
Magnesium			30					
Manganese	0.05							
Mercury		0.0002						
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		15.4					
Nitrite (as N)	1							
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.6					
Phenols								
Phosphate (as P)								
Phosphorus (total)								
Potassium								
Silicon								
Silver		0.0001						
Sodium	200		17					
Strontium								
Sulphate	500		38					
Sulphur								
Total Sus. Solids			33					
TDS	500		596					
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN								
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						
Ion Balance								
Field Parameters								
Temperature (^{o}C)			10.7					
pH			7					
Conductivity (µS/cm)			990					

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted
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Ross WDS
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			BH 8					
			Dec-90	Aug-91	Nov-01	Oct-02	Oct-03	Oct-04
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		142	136	133	138	138	128
Aluminum	0.1	0.075 (i)	<0.030	<0.030	<0.050	<0.010	0.02	<0.005
Ammonia (as N)			<0.10	<0.10	<0.02	0.02	<0.02	<0.03
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.03	0.02	0.02	0.02	0.03	0.024
Beryllium		0.011	<0.010	<0.010	<0.002	<0.001	<0.001	<0.001
BOD			<1.0	2				
Boron	5	0.2(i)	0.01	<0.01	<0.05	<0.05	0.01	<0.005
Bromide			<0.50	<0.50				
Cadmium	0.005	0.0002	<0.0020	<0.0020	<0.0001	<0.0001	<0.0001	<0.0001
Calcium			50	49	47	49	52	46.1
Chloride	250		44	27	9	12	12	7.1
Chromium	0.05	0.009	<0.0100	<0.0100	<0.0010	0.011	<0.0010	<0.0050
Cobalt		0.0009(i)	<0.0200	<0.0100	<0.0002	0.0007	<0.0002	<0.0001
COD			<3	17	<5	<5	<5	<5
Conductivity (µS/cm)			500	350	340	490	315	325
Copper	1	0.005	<0.0100	<0.0100	0.001	0.002	<0.0010	<0.0005
DOC	5				< 0.5	1	< 0.5	0.6
Fluoride	1.5		0.14	0.08				
Hardness (as CaCO3)	500		165	175	162	167	178	155
Iron	0.3	0.3	0.03	0.04	<0.01	<0.01	0.02	<0.03
Lead	0.01		<0.0100	<0.0020	<0.0010	<0.0010	<0.0010	0.0009
Magnesium			10	13	11	11	12	10
Manganese	0.05		0.02	<0.01	<0.01	<0.005	<0.005	<0.005
Mercury		0.0002						
Molybdenum		0.04(i)	<0.010	<0.010	<0.010	<0.005	<0.005	<0.001
Nickel			<0.010	<0.010	<0.010	<0.005	<0.005	<0.001
Nitrate (as N)	10		2.31	3.8	5.82	5.67	4.95	5.2
Nitrite (as N)	1		<0.10	<0.10	<0.10	<0.10	<0.10	<0.20
Organic Nitrogen	0.15		<0.10	<0.10				
pH (pH units)	6.5-8.5		6.8	8	7.4	7.7	7.7	7.5
Phenols			0.003	<0.002	<0.001	<0.001	<0.001	<0.001
Phosphate (as P)			0.25	0.17				
Phosphorus (total)			<0.100	<0.100				
Potassium			7	3	1	1	2	1
Silicon			6	5.9	4.97	4.6	6.2	5.46
Silver		0.0001	<0.01000	<0.01000	<0.00010	<0.00010	<0.00010	<0.00010
Sodium	200		26	6	3	8	5	4.1
Strontium			0.11	0.06	0.075	0.091	0.109	0.088
Sulphate	500		34	18	16	16	24	17.1
Sulphur			7	4				
Total Sus. Solids								
TDS	500		344	218	220	236	237	204
Temperature (°C)	15		7	11.8	7	10	7.1	14
Thallium		0.0003(i)	<0.01000	<0.05000	<0.00100	<0.00100	<0.00100	<0.00005
Tin			<0.050	<0.050	<0.010	<0.010	<0.010	<0.001
Titanium			<0.010	<0.010	<0.010	<0.010	<0.010	<0.005
TKN			<0.10	<0.10				
Vanadium		(0.006(i)	<0.0100	<0.0100	0.001	<0.0050	0.001	0.0011
Zinc	5	0.03 - 0.02(i)	<0.010	<0.010	<0.010	<0.005	<0.010	<0.005
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 8					
			Nov-05	Nov-05	Sep-06	Aug-07	Oct-07	May-08
PARAMETER	ODWQS	PWQO		DUP				
Alkalinity (as CaCO3)	30-500		142	143	146	133	138	136
Aluminum	0.1	0.075 (i)	0.005	<0.005	0.005			
Ammonia (as N)			<0.05	<0.05	<0.05	0.05	0.16	0.08
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.024	0.025	0.027			
Beryllium		0.011	<0.001	<0.001	<0.001			
BOD								
Boron	5	0.2(i)	0.014	0.013	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001	<0.0001			
Calcium			53	52	52	51	50	53
Chloride	250		6	6	7	7	6	8
Chromium	0.05	0.009	<0.0050	<0.0050	<0.0050			
Cobalt		0.0009(i)	<0.0005	<0.0005	<0.0005			
COD			<4	7	<4	<5	<5	<5
Conductivity (µS/cm)			290		230	355	353	355
Copper	1	0.005	<0.0010	0.001	<0.0010	0.002	0.001	0.001
DOC	5		0.7	0.6	0.6			
Fluoride	1.5							
Hardness (as CaCO3)	500		177	174	178	172	169	181
Iron	0.3	0.3	<0.05		<0.05	0.26	<0.03	<0.03
Lead	0.01		<0.0005	<0.0005	<0.0005			
Magnesium			11	11	12	11	11	12
Manganese	0.05		<0.002	<0.002	<0.002	0.01	<0.01	<0.01
Mercury		0.0002						
Molybdenum		0.04(i)	<0.001	<0.001	<0.001			
Nickel			<0.001	<0.001	<0.001			
Nitrate (as N)	10		6.2	6.4	6.5	5.83	5.19	6.04
Nitrite (as N)	1		<0.01	<0.01	<0.01	<0.10	<0.10	<0.10
Organic Nitrogen	0.15					0.09	0.10	≤ 0.32
pH (pH units)	6.5-8.5		7.6		8.9			
Phenols					<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)								
Potassium					1.7	1	1	1
Silicon			6.8	6.7	6.4			
Silver		0.0001	<0.00050	<0.00050	<0.00010			
Sodium	200		3.6	6.2	4.5	4	3	4
Strontium			0.085	0.084	0.1	0.1	0.103	0.104
Sulphate	500		17	18	18	17	16	16
Sulphur								
Total Sus. Solids								
TDS	500		250	242	256	231	229	231
Temperature (°C)	15		9.5		8			
Thallium		0.0003(i)	<0.00005	<0.00005	<0.00005			
Tin			<0.001	<0.001	<0.001			
Titanium			<0.005	<0.005	<0.005			
TKN						0.14	0.26	0.32
Vanadium		(0.006(i)	0.001	0.001	0.001			
Zinc	5	0.03 - 0.02(i)	<0.005	<0.005	<0.005			
Ion Balance								1.05
Field Parameters								
Temperature (°C)								10.6
pH								--
Conductivity (µS/cm)								353

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 8					
			Oct-08	May-09	Oct-09	May-10	Oct-10	Jun-11
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		145	139	147	137	143	139
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.02		<0.02	<0.02	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)		<0.001	<0.001	<0.001	<0.001	<0.001
Barium	1			0.03	0.03	0.03	0.03	0.03
Beryllium		0.011						
BOD				<1	<1			
Boron	5	0.2(i)	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium			54	51	49	48	57	45
Chloride	250		7	6	7	5	7	8
Chromium	0.05	0.009		<0.001	0.001	0.002	0.001	0.004
Cobalt		0.0009(i)						
COD			8	5	<5	10	8	10
Conductivity (µS/cm)			376	359	385	363	359	350
Copper	1	0.005	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
DOC	5			0.8	1.4	1.2	1.1	1
Fluoride	1.5							
Hardness (as CaCO3)	500		183	168	171	164	191	161
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01			<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium			12	10	12	11	12	12
Manganese	0.05		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury		0.0002		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		6.59	6.39	7.48	6.39	7.20	5.81
Nitrite (as N)	1		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15		<0.10	<0.10	≤ 0.33	≤ 0.31	<0.10	
pH (pH units)	6.5-8.5			8.06	8.19	8.09	8.13	8.05
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)				0.69	0.42	0.49	0.91	0.36
Potassium			1	1	1	1	1	1
Silicon								
Silver		0.0001						
Sodium	200		2	2	2	2	3	4
Strontium			0.104	0.104	0.108			
Sulphate	500		17	14	17	16	18	15
Sulphur								
Total Sus. Solids				462	258			
TDS	500		244	233	250	236	233	228
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.10	<0.10	0.33	0.31	<0.10	<0.10
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01	<0.01	<0.01	<0.01	<0.01
Ion Balance			0.97					
Field Parameters								
Temperature (°C)			9.4	11.5	No	10.3	9.2	9.4
pH			--	7.1	Data	9.79	7.9	7.7
Conductivity (µS/cm)			368	460		370	384	273

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 8					
			Nov-11	May-12	May-12	Oct-12	Oct-12	Apr-13
PARAMETER	ODWQS	PWQO			QA/QC		QA/QC	
Alkalinity (as CaCO3)	30-500		148	137	137	142	143	135
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)		<0.001	<0.001			<0.001
Barium	1		0.03	0.03	0.03	0.03	0.03	0.03
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002		<0.0001	<0.0001			<0.0001
Calcium			58	47	51	56	56	50
Chloride	250		9	7	7	7	7	6
Chromium	0.05	0.009		0.002	0.002			0.001
Cobalt		0.0009(i)						
COD			<5	<5	<5	<5	<5	<5
Conductivity (µS/cm)			379	355	356	374	373	350
Copper	1	0.005		<0.001	<0.001			<0.001
DOC	5		0.8	0.8	1	1.1	1	0.9
Fluoride	1.5							
Hardness (as CaCO3)	500		197	158	172	184	184	169
Iron	0.3	0.3	<0.03	0.1	0.1	<0.03	<0.03	<0.03
Lead	0.01			<0.001	<0.001			<0.001
Magnesium			13	10	11	11	11	11
Manganese	0.05			<0.01	<0.01			<0.01
Mercury		0.0002		<0.0001	<0.0001			<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		6.1	5.68	5.66	7.09	6.69	6.30
Nitrite (as N)	1			<0.10	<0.10			<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.05	8.12	8.11	8.01	7.99	8.00
Phenols				<0.001	<0.001			<0.001
Phosphate (as P)								
Phosphorus (total)				0.02	0.24			0.12
Potassium				1	1			1
Silicon								
Silver		0.0001						
Sodium	200		4	3	3	3	3	3
Strontium								
Sulphate	500		17	16	17	17	17	16
Sulphur								
Total Sus. Solids								
TDS	500		246	231	231	243	242	237
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				<0.10	<0.10			<0.10
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01	<0.01			<0.01
Ion Balance								
Field Parameters								
Temperature (°C)			8.4	9.9		8.7		9.4
pH			7.9	8.0		8.3		7.6
Conductivity (µS/cm)			379	355		364		355

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 8					
			Oct-13	Oct-13	Jul-14	Oct-14	Oct-14	Apr-15
PARAMETER	ODWQS	PWQO		QA/QC			QA/QC	
Alkalinity (as CaCO3)	30-500		138	136	129	126	127	138
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.02	<0.02	<0.01	<0.01	<0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)			0.0001			0.0002
Barium	1		0.04	<0.04	0.031	0.03	0.031	0.029
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.01	<0.005	0.008	0.008	0.007
Bromide								
Cadmium	0.005	0.0002			<0.00002			< 0.00002
Calcium			78	56	52.5	53.3	53.2	51.6
Chloride	250		17	18	10.3	9.7	10.1	7.8
Chromium	0.05	0.009			<0.002			< 0.002
Cobalt		0.0009(i)						
COD			<5	<5	<5	< 5	< 5	6
Conductivity (µS/cm)			385	386	367	348	348	350
Copper	1	0.005			0.0006			< 0.0001
DOC	5		0.7	0.7	1.5	1.4	1.5	0.4
Fluoride	1.5							
Hardness (as CaCO3)	500		300	188	180	180	180	177
Iron	0.3	0.3	0.4	0.31	0.019	0.081	0.122	0.007
Lead	0.01				0.00005			< 0.00002
Magnesium			26	12	12	11.7	11.7	11.9
Manganese	0.05				0.008			0.002
Mercury		0.0002			<0.00002			< 0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		5.49	5.34	6.1	5.9	5.8	6.3
Nitrite (as N)	1				<0.10			< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.82	7.82	8.09	8.08	8.1	8.01
Phenols					<0.001			< 0.001
Phosphate (as P)								
Phosphorus (total)					0.46			0.05
Potassium					1.3			1.2
Silicon								
Silver		0.0001						
Sodium	200		4	4	6.2	5.1	5.1	4.3
Strontium								
Sulphate	500		14	14	15	14	14	16
Sulphur								
Total Sus. Solids								
TDS	500		250	251	201	197	197	204
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN					<0.05			< 0.05
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)			<0.005			< 0.005
Ion Balance					0.921	0.904	0.91	
Field Parameters								
Temperature (°C)			9.4		9.9	9.4		9.6
pH			7.8		8.5	7.9		7.8
Conductivity (µS/cm)			357		323	342		399

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 8					
			Sep-15	Apr-16	Aug-16	Aug-16	May-17	Aug-17
PARAMETER	ODWQS	PWQO				QA/QC		
Alkalinity (as CaCO3)	30-500		136	137	136	137	134	144
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)		0.0001			0.0001	
Barium	1		0.031	0.029	0.035	0.035	0.025	0.033
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	< 0.005	< 0.005	0.009	0.008	< 0.005	0.009
Bromide								
Cadmium	0.005	0.0002		< 0.00002			< 0.000014	
Calcium			54	53	58.1	58.7	42.4	54.2
Chloride	250		5.5	6.6	18.1	17.9	7.7	6.8
Chromium	0.05	0.009		0.002			< 0.002	
Cobalt		0.0009(i)						
COD			< 5	< 5	< 5	< 5	< 5	< 5
Conductivity (µS/cm)			343	349	380	382	358	387
Copper	1	0.005		0.0003			0.0005	
DOC	5		1.1	2.3	0.7	0.7	0.5	0.9
Fluoride	1.5							
Hardness (as CaCO3)	500		183					
Iron	0.3	0.3	0.005	0.005	0.005	0.005	0.005	0.296
Lead	0.01			< 0.00002			< 0.00002	
Magnesium			12	12.1	13.5	13.6	10.6	13
Manganese	0.05			< 0.001			< 0.001	
Mercury		0.0002		< 0.00002			< 0.02	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		6.5	6.4	5.9	5.9	6.45	7.55
Nitrite (as N)	1			< 0.1			< 0.05	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.83	8.12	7.91	7.93	8.11	8.08
Phenols				< 0.001			0.004	
Phosphate (as P)								
Phosphorus (total)				0.47			1.14	
Potassium				1.1			0.9	
Silicon								
Silver		0.0001						
Sodium	200		4.6	4.3	4.9	4.9	4.6	5.5
Strontium								
Sulphate	500		16	16	14	14	13	12
Sulphur								
Total Sus. Solids								
TDS	500		226	204	218	219	159	180
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.09			0.1	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005			< 0.005	
Ion Balance								
Field Parameters								
Temperature (°C)			10.7	9.4	10.3		9.8	9.9
pH			7.8	8	7.8		7.9	7.7
Conductivity (µS/cm)			325	340	415		358	379

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted
Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
Groundwater Quality

			BH 8					
			Aug-17	Apr-18	Apr-18 BH 18	Sep-18	Sep-18 BH 19	Jun-19
PARAMETER	ODWQS	PWQO	QA/QC		QA/QC		QA/QC	
Alkalinity (as CaCO3)	30-500		145	145	145	144	146	140
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.04
Arsenic	0.01	0.1 - 0.005(i)		0.0001	0.0002			< 0.1
Barium	1		0.033	0.034	0.034	0.033	0.033	0.019
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.008	0.011	0.011	< 0.005	< 0.005	< 0.005
Bromide								
Cadmium	0.005	0.0002		< 0.000014	< 0.000014			< 0.015
Calcium			54.4	54.8	54.3	55.7	56.8	44
Chloride	250		6.8	5.6	5.5	7.4	7.4	7.7
Chromium	0.05	0.009		< 0.002	< 0.002			0.0005
Cobalt		0.0009(i)						
COD			< 5	< 5	< 5	< 5	< 5	< 5
Conductivity (µS/cm)			386	379	375	385	383	317
Copper	1	0.005		0.0004	0.0016			0.0002
DOC	5		0.8	1.3	1.5	1	1	1.3
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.154	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01			< 0.00002	0.00004			< 0.02
Magnesium			13	12.9	13	13.6	13.7	11.5
Manganese	0.05			< 0.001	< 0.001			< 0.001
Mercury		0.0002		< 0.00002	< 0.00002			< 0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		7.57	6.59	6.61	7.51	7.52	8.23
Nitrite (as N)	1			< 0.05	< 0.05			< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.1	8.14	8.16	7.82	8.02	8.01
Phenols				< 0.001	< 0.001			< 0.002
Phosphate (as P)								
Phosphorus (total)				0.41	0.4			2.29
Potassium				1.4	1.5			1.2
Silicon								
Silver		0.0001						
Sodium	200		5.2	4.3	4.4	4.4	4.4	4
Strontium								
Sulphate	500		12	11	11	14	14	14
Sulphur								
Total Sus. Solids								
TDS	500		180	177	177	183	185	166
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.2	0.1			0.2
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005	< 0.005			< 0.005
Ion Balance								1.16
Field Parameters								
Temperature (°C)				9.4		9.6		9.9
pH				7.7		7.8		7.9
Conductivity (µS/cm)				327		306		466

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inorganic
Groundwater Quality

			BH 8					
			Jun-19	Oct-19	May-20	May-20	Sep-20	Sep-20
			BH 18					
PARAMETER	ODWQS	PWQO	QA/QC			QA/QC		QA/QC
Alkalinity (as CaCO3)	30-500		141	146	141	141	137	137
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.04	0.01	< 0.01	< 0.01	< 0.01	0.01
Arsenic	0.01	0.1 - 0.005(i)	< 0.1		0.0002	0.0001		
Barium	1		0.019	0.039	0.047	0.04	0.034	0.034
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	< 0.005	0.009	0.008	0.007	0.008	0.013
Bromide								
Cadmium	0.005	0.0002	< 0.015		< 0.000015	< 0.000015		
Calcium			44.1	59.8	60.2	60.6	57.5	57.4
Chloride	250		7.6	7.4	6.9	7.2	10.2	10.2
Chromium	0.05	0.009	0.0004		0.001	0.001		
Cobalt		0.0009(i)						
COD			< 5	< 5	7	9	10	14
Conductivity (µS/cm)			318	372	381	380	401	398
Copper	1	0.005	0.0002		0.0049	0.0015		
DOC	5		1.2	2.4	1.1	1.1	1.8	2.9
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	0.369	0.4	< 0.005	0.02
Lead	0.01		< 0.02		0.00035	0.00026		
Magnesium			11.6	14.2	13.7	14.1	13.5	13.5
Manganese	0.05		< 0.001	< 0.001	0.012	0.013		
Mercury		0.0002	< 0.00002		< 0.00002	< 0.00002		
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		8.1	7.34	7.47	7.49	8.03	8
Nitrite (as N)	1		< 0.05		< 0.05	< 0.05		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.07	8.08	8.11	8.08	8.14	7.92
Phenols			< 0.002		< 0.002	< 0.002		
Phosphate (as P)								
Phosphorus (total)			3.14		0.47	0.6		
Potassium			1.3		1.5	1.5		
Silicon								
Silver		0.0001						
Sodium	200		4.1	3.8	3.8	3.8	3.6	3.6
Strontium								
Sulphate	500		14	15	12	12	15	15
Sulphur								
Total Sus. Solids								
TDS	500		167	189	183	184	183	183
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium					0.2	0.2		
TKN			0.2					
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005		< 0.005	< 0.005		
Ion Balance			1.16	0.909				
Field Parameters								
Temperature (°C)			9.9	9.4	9.1	9.1	8.8	8.8
pH			7.9	8	7.7	7.7	7.4	7.4
Conductivity (µS/cm)			466	402	369	369	420	420

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inorganic
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			BH 8					
			Apr-21	Apr-21	Aug-21	Aug-21	May-22	Aug-22
PARAMETER	ODWQS	PWQO		QA/QC		QA/QC		
Alkalinity (as CaCO3)	30-500		143	145	157	159	153	182
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.010	<0.010	<0.010	<0.010	0.015	<0.020
Arsenic	0.01	0.1 - 0.005(i)	<0.01	<0.01			<0.001	
Barium	1		<0.1	<0.1	0.03	0.03	0.04	0.04
Beryllium		0.011						
BOD					3	2		<1
Boron	5	0.2(i)	<0.1	<0.1	0.01	<0.01	0.01	<0.01
Bromide								
Cadmium	0.005	0.0002	<0.001	<0.001			<0.0001	
Calcium			53	53	60	60	55	61
Chloride	250		8	8	8	8	6	6
Chromium	0.05	0.009	<0.01	<0.01			<0.001	
Cobalt		0.0009(i)						
COD			<5	<5	<5	<5	<5	<5
Conductivity (µS/cm)			372	373	385	385	295	422
Copper	1	0.005	<0.01	<0.01			<0.001	
DOC	5		0.6	0.9	1.5	1.3	1.8	--
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.4	<0.3	<0.03	<0.03	0.04	<0.03
Lead	0.01		<0.01	<0.01			<0.001	
Magnesium			11	11	14	14	12	14
Manganese	0.05		<0.1	<0.1			<0.01	
Mercury		0.0002	<0.001	<0.0001			<0.0001	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		6.87	6.96	7.42	7.58	9.39	7.81
Nitrite (as N)	1		<0.10	<0.10				
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.08	8.1	7.85	7.97	7.80	7.86
Phenols			<0.010	<0.010			<0.001	
Phosphate (as P)								
Phosphorus (total)			0.99	1.87			1.94	
Potassium			1	1			1	
Silicon								
Silver		0.0001						
Sodium	200		4	4	4	4	3	3
Strontium								
Sulphate	500		13	13	14	14	14	13
Sulphur								
Total Sus. Solids					1580	524		498
TDS	500		242	242	250	250	192	274
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.104	<0.100			0.204	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.1	<0.1			<0.01	
Ion Balance								
Field Parameters								
Temperature (°C)			9.6		9.6		11.1	9.9
pH			6.7		7		7.68	8.1
Conductivity (µS/cm)			391		393		440	430

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inorganic
Groundwater Quality

			BH 8					
			Aug-22	Jun-23	Oct-23	Jun-24	Oct-24	Median All Events
PARAMETER	ODWQS	PWQO	QA/QC					
Alkalinity (as CaCO3)	30-500		184	205	252	191	182	141
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.054	<0.020	<0.020	<0.020	<0.020	
Arsenic	0.01	0.1 - 0.005(i)		<0.001		<0.001		
Barium	1		0.04	0.06	0.06	0.04	0.04	0.03
Beryllium		0.011						
BOD			<1		1		<1	
Boron	5	0.2(i)	0.02	<0.01	0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002		<0.0001		<0.0001		
Calcium			60	66.0	78.0	72.0	69.0	54.0
Chloride	250		7	8	7	7	7	7.2
Chromium	0.05	0.009		<0.001		<0.001		
Cobalt		0.0009(i)						
COD			<5	<5	13	<5	<5	
Conductivity (µS/cm)			421	452	521	340	428	
Copper	1	0.005		0.002		0.001		
DOC	5		--	2.4	6.0	1.2	1.1	1.1
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.05	<0.03	<0.03	<0.03	<0.03	0.05
Lead	0.01			<0.001		<0.001		
Magnesium			14	15	18	16	15	
Manganese	0.05			<0.01		<0.01		<0.01
Mercury		0.0002		<0.0001		<0.0001		
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		7.79	7.72	6.91	7.01	7.99	6.50
Nitrite (as N)	1			<0.10		<0.10		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.91	7.97	7.91	7.79	7.89	
Phenols				<0.001				
Phosphate (as P)								
Phosphorus (total)				0.671		0.388		
Potassium				1		1		
Silicon								
Silver		0.0001						
Sodium	200		3	4	4	4	4	4
Strontium								
Sulphate	500		14	13	14	16	15	15
Sulphur								
Total Sus. Solids			496		585		123	
TDS	500		274	294	339	221	278	231
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.317		0.411		
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.01		
Ion Balance								
Field Parameters								
Temperature (°C)			9.9	11.5	9.1	11.3	10.5	
pH			8.1	7.7	7.6	7.2	7.7	
Conductivity (µS/cm)			430	540	610	500	500	

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inorganic
Groundwater Quality

			BH 9A (deep)					
			Oct-91	Dec-00	Nov-01	Oct-02	Oct-03	Oct-04
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		252	235	222	223	257	206
Aluminum	0.1	0.075 (i)	<0.030					
Ammonia (as N)			<0.10				<0.02	
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.06	0.06	0.05	0.06	0.08	0.059
Beryllium		0.011	<0.010					
BOD			<1.0					
Boron	5	0.2(i)	0.07	0.02	<0.050	<0.050	0.06	0.03
Bromide			0.5					
Cadmium	0.005	0.0002	<0.0020					
Calcium			78	92	87	86	122	91.9
Chloride	250		30	43			52	
Chromium	0.05	0.009	<0.0100					
Cobalt		0.0009(i)	<0.0100					
COD			3	8			<5	
Conductivity (µS/cm)			515	600	675	420	600	580
Copper	1	0.005	0.02					
DOC	5						<0.5	1.3
Fluoride	1.5		0.09					
Hardness (as CaCO3)	500		267	315	290	287	410	312
Iron	0.3	0.3	<0.01	0.02				
Lead	0.01		0.004					
Magnesium			18	21	18	18	26	20.5
Manganese	0.05		<0.010	<0.010	<0.010	<0.005	<0.010	<0.005
Mercury		0.0002						
Molybdenum		0.04(i)	<0.010					
Nickel			<0.010					
Nitrate (as N)	10		5	6.76	10.3	9.56	12.7	11
Nitrite (as N)	1		<0.10				<0.10	
Organic Nitrogen	0.15		<0.27					
pH (pH units)	6.5-8.5		7.5	7.8	7.8	7.7	7.4	7.1
Phenols			<0.002				<0.001	
Phosphate (as P)			0.36					
Phosphorus (total)			<0.100					
Potassium			4	5	4	3	4	3
Silicon			7.8					
Silver		0.0001	<0.01000					
Sodium	200		18	11				
Strontium			0.19	0.177	0.142	0.172	0.217	0.173
Sulphate	500		29	21	27	26	39	27.2
Sulphur			10					
Total Sus. Solids								
TDS	500		316	448	456	445	522	442
Temperature (°C)	15		11.5	7	6	9.4	6.9	13
Thallium		0.0003(i)	<0.05000					
Tin			<0.050					
Titanium			<0.010					
TKN			0.27					
Vanadium		(0.006(i)	<0.0100					
Zinc	5	0.03 - 0.02(i)	0.01					
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 9A (deep)					
			Nov-05	Sep-06	Oct-07	May-08	Oct-08	May-09
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		218	217	417	319	319	344
Aluminum	0.1	0.075 (i)						
Ammonia (as N)					<0.02	0.05	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)						<0.001
Barium	1		0.06	0.06				0.08
Beryllium		0.011						
BOD								<1
Boron	5	0.2(i)	<0.020	0.12	0.02	0.05	0.02	0.02
Bromide								
Cadmium	0.005	0.0002						<0.0001
Calcium			96.5		166	136	138	137
Chloride	250				50	47	49	49
Chromium	0.05	0.009						0.002
Cobalt		0.0009(i)						
COD					<5	<5	<5	10
Conductivity (µS/cm)			400	500	966	812	858	888
Copper	1	0.005			0.004	0.003	0.003	0.002
DOC	5		1	1.1				1.8
Fluoride	1.5							
Hardness (as CaCO3)	500		327		502	420	424	447
Iron	0.3	0.3			0.003	<0.03	<0.03	<0.03
Lead	0.01							<0.001
Magnesium			21.4		22	20	20	26
Manganese	0.05		<0.010		0.81	1.12	1.06	0.93
Mercury		0.0002						<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		14	9	5.55	5.26	9.8	6.48
Nitrite (as N)	1				<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.3	7.5				7.61
Phenols					<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)								0.9
Potassium			3	3	3	4	4	4
Silicon								
Silver		0.0001						
Sodium	200				16	16	16	17
Strontium			0.19	0.19	0.259	0.224	0.216	0.233
Sulphate	500		27	31	24	33	29	33
Sulphur								
Total Sus. Solids								1260
TDS	500		274	437	628	528	558	577
Temperature (°C)	15		8	9.9				
Thallium		0.0003(i)						
Tin								
Titanium								
TKN					0.4	0.36	0.3	0.12
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						<0.01
Ion Balance						1.05	1.03	
Field Parameters								
Temperature (°C)						10.8	10.5	11.7
pH						8.37	--	6.8
Conductivity (µS/cm)						801	822	879

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inorganic
Groundwater Quality

			BH 9A (deep)					
			Oct-09	May-10	Oct-10	May-11	Nov-11	May-12
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		299	409	449	423	471	492
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001	<0.001	<0.001		<0.001
Barium	1		0.07	0.09	0.09	0.11	0.13	0.13
Beryllium		0.011						
BOD			<1					
Boron	5	0.2(i)	0.03	0.09	0.12	0.1	0.11	0.12
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Calcium			124	159	135	155	174	185
Chloride	250		56	57	67	73	81	88
Chromium	0.05	0.009	0.003	0.003	0.004	<0.005		0.004
Cobalt		0.0009(i)						
COD			6	5	10	10	10	8
Conductivity (µS/cm)			862	1020	1070	1060	1170	1210
Copper	1	0.005	0.002	0.002	0.002	0.002		0.003
DOC	5		1.7	1.9	2.1	2.8	2.9	4.6
Fluoride	1.5							
Hardness (as CaCO3)	500		382	509	479	541	584	623
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	0.03
Lead	0.01		<0.001	<0.001	<0.001	<0.001		<0.001
Magnesium			18	28	35	38	37	40
Manganese	0.05		0.49	0.49	0.30	<0.01		<0.01
Mercury		0.0002	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		10.2	6.77	5.29	8.45	4.86	5.7
Nitrite (as N)	1		<0.10	<0.10	<0.10	<0.10		<0.10
Organic Nitrogen	0.15		0.10	<0.10	≤ 0.20	<0.1		
pH (pH units)	6.5-8.5		7.85	7.38	7.68	7.58	7.53	7.6
Phenols			<0.001	<0.001	<0.001	<0.001		<0.001
Phosphate (as P)								
Phosphorus (total)			1.65	0.73	0.65	0.5		0.02
Potassium			3	3	3	4		4
Silicon								
Silver		0.0001						
Sodium	200		15	17	21	20	20	28
Strontium			0.234					
Sulphate	500		33	33	27	39	40	32
Sulphur								
Total Sus. Solids			4890					
TDS	500		560	663	696	689	760	786
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.3	<0.10	0.20	<0.10		0.24
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01	<0.01	<0.01		<0.01
Ion Balance								
Field Parameters								
Temperature (°C)			8.7	11.1	9.6	9.8	8.8	10.4
pH			8.16	8.72	6.97	7.4	7.0	7.1
Conductivity (µS/cm)			894	1021	1112	699	1162	1181

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inorganic
Groundwater Quality

			BH 9A (deep)					
			Oct-12	Apr-13	Oct-13	Jul-14	Oct-14	Apr-15
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		529	483	470	427	447	482
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.02	<0.02	0.04	<0.01	0.01	0.08
Arsenic	0.01	0.1 - 0.005(i)		<0.001		0.0003		0.0003
Barium	1		0.14	0.12	0.14	0.129	0.135	0.146
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.14	0.16	0.18	0.222	0.232	0.323
Bromide								
Cadmium	0.005	0.0002		<0.0001		0.00003		0.00004
Calcium			183	167	166	167	175	183
Chloride	250		96	90	92	93.2	108	103
Chromium	0.05	0.009		0.002		<0.002		< 0.002
Cobalt		0.0009(i)						
COD			12	<5	<5	9	13	10
Conductivity (µS/cm)			1260	1200	1200	1180	1210	1130
Copper	1	0.005		0.004		0.0054		0.007
DOC	5		4.4	4.1	4.2	5.9	7.1	7.2
Fluoride	1.5							
Hardness (as CaCO3)	500		614	570	564	565	594	620
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.005	< 0.005	< 0.005
Lead	0.01			<0.001		<0.00002		< 0.00002
Magnesium			39	38	37	36.7	38.8	40.5
Manganese	0.05			<0.01		0.016		0.038
Mercury		0.0002		<0.0001		<0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		3.84	5.21	4.66	4.9	3.6	3.5
Nitrite (as N)	1			<0.10		<0.10		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.63	7.46	7.33	7.63	7.8	7.54
Phenols				<0.001		<0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				0.02		<0.01		0.03
Potassium				3		3.9		4.3
Silicon								
Silver		0.0001						
Sodium	200		30	33	33	40.8	42.3	50.8
Strontium								
Sulphate	500		26	38	36	50	40	36
Sulphur								
Total Sus. Solids								
TDS	500		819	780	780	669	691	723
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.4		0.48		0.63
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.005		< 0.005
Ion Balance						0.951	0.94	0.915
Field Parameters								
Temperature (°C)			9.1	10.3	9.7	10.8	9.8	10.4
pH			6.7	6.9	6.7	7.3	7	7
Conductivity (µS/cm)			1205	1188	1121	1016	1150	1337

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 9A (deep)					
			Sep-15	Apr-16	Sep-16	Sep-16 DUP BH 20	May-17	May-17 DUP BH 20
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		468	458	559	599	488	580
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.1	0.21	0.33	0.34	0.79	0.83
Arsenic	0.01	0.1 - 0.005(i)		0.0002			0.0006	0.0006
Barium	1		0.134	0.142	0.14	0.139	0.171	0.17
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.286	0.285	0.286	0.284	0.382	0.381
Bromide								
Cadmium	0.005	0.0002		0.00005			0.00008	0.00008
Calcium			164	164	156	155	184	184
Chloride	250		94.8	91	103	103	74.6	74.8
Chromium	0.05	0.009		< 0.002			< 0.002	< 0.002
Cobalt		0.0009(i)						
COD			11	9	21	22	22	18
Conductivity (µS/cm)			1160	1170	1280	1300	1390	1380
Copper	1	0.005		0.0051			0.0112	0.0117
DOC	5		2.8	4	5	5	8.8	9
Fluoride	1.5							
Hardness (as CaCO3)	500		559					
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01			0.00002			< 0.00002	< 0.00002
Magnesium			36.9	38	38.8	38.5	43.3	43.2
Manganese	0.05			0.065			0.472	0.469
Mercury		0.0002		< 0.00002			< 0.02	< 0.02
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		5.2	4.4	0.8	0.8	0.52	0.57
Nitrite (as N)	1			< 0.1			< 0.05	< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.69	7.8	7.6	7.6	7.62	7.72
Phenols				< 0.001			0.004	0.007
Phosphate (as P)								
Phosphorus (total)				< 0.01			0.02	0.02
Potassium				4.4			5.8	5.8
Silicon								
Silver		0.0001						
Sodium	200		48.6	50	44.3	43.9	57.1	56.8
Strontium								
Sulphate	500		39	37	52	52	60	60
Sulphur								
Total Sus. Solids								
TDS	500		795	679	738	760	718	773
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.71			1.4	1.4
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		0.007			< 0.005	< 0.005
Ion Balance			0.982					
Field Parameters								
Temperature (°C)			9.8	10.5	10.2		10.0	
pH			7.3	7.1	6.5		6.8	
Conductivity (µS/cm)			1013	1092	1361		1328	

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 9A (deep)					
			Aug-17	Apr-18	Sep-18	Sep-18 BH 20 QA/QC	Jun-19	Oct-19
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		502	469	384	405	415	403
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.96	1.3	1.3	1.29	1.77	1.63
Arsenic	0.01	0.1 - 0.005(i)		0.0001			< 0.0001	
Barium	1		0.179	0.162	0.146	0.144	0.15	0.172
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.352	0.361	0.204	0.201	0.372	0.274
Bromide								
Cadmium	0.005	0.0002		0.00007			0.00006	
Calcium			172	149	139	136	144	150
Chloride	250		78.4	69.6	69.6	69.6	67.5	75.3
Chromium	0.05	0.009		< 0.002			< 0.001	
Cobalt		0.0009(i)						
COD			9	10	11	< 5	17	10
Conductivity (µS/cm)			1290	1110	1030	1040	1065	1068
Copper	1	0.005		0.0048			0.0062	
DOC	5		5.4	6.4	4.2	4.1	6.6	4.7
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	0.005	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01			< 0.00002			0.00004	
Magnesium			43.5	35.6	34.7	34.3	37	36.7
Manganese	0.05			1.41			1.85	2.03
Mercury		0.0002		< 0.00002			< 0.00002	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		4.36	4.03	7.47	7.46	5.43	3.68
Nitrite (as N)	1			< 0.05			< 0.05	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.63	7.69	7.71	7.78	7.69	7.8
Phenols				< 0.001			< 0.002	
Phosphate (as P)								
Phosphorus (total)				0.01			0.02	
Potassium				8.3			8	
Silicon								
Silver		0.0001						
Sodium	200		46	48.1	37.6	37.2	44	41.6
Strontium								
Sulphate	500		32	26	30	30	46	31
Sulphur								
Total Sus. Solids								
TDS	500		682	621	553	561	599	589
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				1.7			2.3	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005			< 0.005	
Ion Balance							0.919	0.87
Field Parameters								
Temperature (°C)			9.8	9.4	9.8		10.6	9.2
pH			7.1	6.7	7.3		6.8	7.1
Conductivity (µS/cm)			1219	933	684		1145	1069

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 9A (deep)					
			May-20	Sep-20	Apr-21	Aug-21	May-22	Aug-22
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		426	376	424	441	446	458
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			1.69	1.73	2.26	2.12	1.7	2.06
Arsenic	0.01	0.1 - 0.005(i)	< 0.0001		<0.001		<0.001	
Barium	1		0.177	0.142	0.15	0.14	0.19	0.17
Beryllium		0.011						
BOD						3		<1
Boron	5	0.2(i)	0.273	0.212	0.21	0.2	0.22	0.27
Bromide								
Cadmium	0.005	0.0002	0.00007		<0.0001		<0.0001	
Calcium			160	132	131	152	144	149
Chloride	250		75.4	78.5	77	77	90	86
Chromium	0.05	0.009	< 0.001		<0.001		<0.001	
Cobalt		0.0009(i)						
COD			15	6	7	5	<5	16
Conductivity (µS/cm)			1110	1020	1080	1060	1050	1070
Copper	1	0.005	0.0053		0.004		0.006	
DOC	5		5.1	4.6	3.2	3.8	4.3	1.8
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	0.005	<0.03	<0.03	<0.03	0.03
Lead	0.01		0.00049		<0.001		<0.001	
Magnesium			36.5	31.6	28	33	31	31
Manganese	0.05		2.19		2.01		2.21	
Mercury		0.0002	< 0.00002		<0.0001		<0.0001	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		3.13	3.95	3.68	4.28	2.86	3.35
Nitrite (as N)	1		0.08		<0.50		<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.75	7.59	7.7	7.46	7.13	7.48
Phenols			< 0.002		<0.010		<0.001	
Phosphate (as P)								
Phosphorus (total)			0.01		0.935		0.225	
Potassium			8		7		8	
Silicon								
Silver		0.0001						
Sodium	200		40.3	33.8	36	36	38	37
Strontium								
Sulphate	500		35	31	29	30	32	32
Sulphur								
Total Sus. Solids						70		232
TDS	500		614	539	702	689	682	696
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium			2					
TKN					2.24		2.57	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005		<0.01		<0.01	
Ion Balance								
Field Parameters								
Temperature (°C)			9	9.4	8.7		10.5	9.9
pH			7.2	6.6	7.2		6.9	7.4
Conductivity (µS/cm)			1079	1051	1110		1221	1090

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 9A (deep)					
			Jun-23	Oct-23	Jun-24	Oct-24		
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		607	492	459	429		
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			2.71	2.26	2.71	2.64		
Arsenic	0.01	0.1 - 0.005(i)	<0.001		<0.001			
Barium	1		0.25	0.18	0.18	0.17		
Beryllium		0.011						
BOD				9		2		
Boron	5	0.2(i)	0.46	0.33	0.4	0.32		
Bromide								
Cadmium	0.005	0.0002	<0.0001		<0.0001			
Calcium			207	157	164	157		
Chloride	250		122	105	100	107		
Chromium	0.05	0.009	<0.001		<0.001			
Cobalt		0.0009(i)						
COD			22	24	5	16		
Conductivity (µS/cm)			1390	1130	1150	1110		
Copper	1	0.005	0.009		0.005			
DOC	5		10.2	12.5	3.2	4.3		
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03		
Lead	0.01		<0.001		<0.001			
Magnesium			42	33	33	32		
Manganese	0.05		3.31		2.3			
Mercury		0.0002	<0.0001		<0.0001			
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		0.84	1.87	2.63	2.18		
Nitrite (as N)	1		<0.10		<0.10			
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.08	7.12	7.43	7.58		
Phenols			<0.001		<0.001			
Phosphate (as P)								
Phosphorus (total)			0.197		1.21			
Potassium			8		8			
Silicon								
Silver		0.0001						
Sodium	200		50	45	47	43		
Strontium								
Sulphate	500		66	34	33	28		
Sulphur								
Total Sus. Solids				160		86		
TDS	500		904	734	748	722		
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			3.4		3.03			
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01		<0.01			
Ion Balance								
Field Parameters								
Temperature (°C)			9.9	9.5	11.1	10		
pH			6.8	7	7	6.9		
Conductivity (µS/cm)			1540	1310	1150	1250		

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
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			BH 9B (shallow)					
			Oct-91	Nov-98	Apr-99	Oct-99	Apr-00	Dec-00
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		284	417	361			488
Aluminum	0.1	0.075 (i)	0.05	<0.030	<0.030	0.03	<0.050	
Ammonia (as N)			<0.10	<0.02	0.04	0.57	0.05	
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.08	0.09	0.09	NA	0.08	0.11
Beryllium		0.011	<0.010	<0.010	<0.010	<0.010	<0.002	
BOD			<1.0					
Boron	5	0.2(i)	0.06	<0.010	<0.010	NA	0.02	0.01
Bromide			<0.50					
Cadmium	0.005	0.0002	<0.0020	<0.0050	<0.0050	<0.0050	<0.0050	
Calcium			99	181	146	169	140	183
Chloride	250		27	35	33	42	38	44
Chromium	0.05	0.009	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	
Cobalt		0.0009(i)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	
COD			9	<3	10			73
Conductivity (µS/cm)			530	770	855	795	600	700
Copper	1	0.005	0.01	<0.0050	<0.0050	<0.0100	<0.0050	
DOC	5							
Fluoride	1.5		0.11					
Hardness (as CaCO3)	500		307	535	448	514	421	552
Iron	0.3	0.3	<0.01	<0.01	<0.01	0.12	0.04	0.04
Lead	0.01		0.003	<0.0020	<0.0020	<0.0020	<0.0010	
Magnesium			15	21	21	23	18	24
Manganese	0.05		0.03	0.06	<0.010	0.05	0.04	0.07
Mercury		0.0002						
Molybdenum		0.04(i)	<0.010	<0.010	<0.010	<0.010	<0.010	
Nickel			<0.010	<0.010	<0.010	<0.010	<0.010	
Nitrate (as N)	10		6.6	6.47	6.86	5.33	6.09	5.94
Nitrite (as N)	1		<0.10					
Organic Nitrogen	0.15		<0.14					
pH (pH units)	6.5-8.5		7.4	6.5	7.2	6.5	7	7.3
Phenols			<0.002					
Phosphate (as P)			0.31					
Phosphorus (total)			<0.100					
Potassium			5	4	5	4	4	4
Silicon			7.7	6.4	7.4	8	6.22	
Silver		0.0001	<0.01000	<0.01000	<0.01000	<0.01000	<0.01000	
Sodium	200		18	7	9	9	10	10
Strontium			0.22	0.262	0.234	0.293	0.213	0.298
Sulphate	500		30	22	23	29	21	19
Sulphur			10	7	7	7	8	
Total Sus. Solids								
TDS	500		372	560	540	568	468	696
Temperature (°C)	15		10.5	6	6.5	7	8	7
Thallium		0.0003(i)	<0.05000	<0.20000	<0.20000	<0.20000	<0.20000	
Tin			<0.050	<0.050	<0.050	<0.050	<0.050	
Titanium			<0.010	<0.010	<0.010	<0.010	<0.010	
TKN			0.14					
Vanadium		(0.006(i)	<0.0100	<0.0100	<0.0100	<0.0100	0.02	
Zinc	5	0.03 - 0.02(i)	<0.010	<0.010	<0.010	0.03	<0.010	
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inorganic
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			BH 9B (shallow)					
			Nov-01	Oct-02	Oct-03	Oct-04	Nov-05	Sep-06
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		486	397	434	254	442	269
Aluminum	0.1	0.075 (i)						
Ammonia (as N)					<0.02			
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.08	0.08	0.09	0.062	0.11	0.07
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.050	<0.050	<0.050	0.01	<0.020	<0.020
Bromide								
Cadmium	0.005	0.0002						
Calcium			187	153	195	118	183	
Chloride	250				55			
Chromium	0.05	0.009						
Cobalt		0.0009(i)						
COD					<5			
Conductivity (µS/cm)			1025	700	700	710	675	550
Copper	1	0.005						
DOC	5				<0.5	1.4	1.3	1.2
Fluoride	1.5							
Hardness (as CaCO3)	500		554	462	574	349	536	
Iron	0.3	0.3						
Lead	0.01							
Magnesium			22	20	22	13.6	20	
Manganese	0.05		0.05	0.135	0.21	0.115	0.81	
Mercury		0.0002						
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		5.75	7.04	4.66	9.3	9.8	10
Nitrite (as N)	1				0.4			
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.3	7.1	7.1	7	7	7.2
Phenols					<0.001			
Phosphate (as P)								
Phosphorus (total)								
Potassium			3	3	4	2	5	3
Silicon								
Silver		0.0001						
Sodium	200							
Strontium			0.221	0.241	0.269	0.181	0.29	0.2
Sulphate	500		23	23	24	26.5	26	32
Sulphur								
Total Sus. Solids								
TDS	500		680	603	632	480	298	497
Temperature (°C)	15		8	9.3	8.3	12	10.6	9.3
Thallium		0.0003(i)						
Tin								
Titanium								
TKN								
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 9B (shallow)					
			Oct-07	May-08	Oct-08	May-09	Oct-09	May-10
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		201	203	208	247	257	337
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.19	0.22	0.03	<0.02	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)				<0.001	<0.001	<0.001
Barium	1					0.07	0.07	0.09
Beryllium		0.011						
BOD						<1	<1	
Boron	5	0.2(i)	0.02	0.02	0.02	0.01	0.02	0.06
Bromide								
Cadmium	0.005	0.0002				<0.0001	<0.0001	<0.0001
Calcium			89	94	98	105	98	121
Chloride	250		49	48	50	47	56	57
Chromium	0.05	0.009				0.002	0.003	0.003
Cobalt		0.0009(i)						
COD			<5	<5	<5	8	<5	5
Conductivity (µS/cm)			652	685	697	756	797	935
Copper	1	0.005	0.002	0.002	0.002	0.001	0.001	0.001
DOC	5					1.5	1.6	1.6
Fluoride	1.5							
Hardness (as CaCO3)	500		303	324	334	359	338	407
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01					<0.001	<0.001	<0.001
Magnesium			20	22	22	24	23	26
Manganese	0.05		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury		0.0002				<0.0001	<0.0001	<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		10.5	12.4	13	13	11	9.98
Nitrite (as N)	1		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15		0.33	0.28	0.14	≤ 0.15	< 0.10	≤ 0.22
pH (pH units)	6.5-8.5					7.91	8.08	7.77
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)						0.73	0.63	0.09
Potassium			3	4	4	4	4	3
Silicon								
Silver		0.0001						
Sodium	200		14	14	15	16	15	16
Strontium			0.172	0.193	0.198	0.221	0.23	
Sulphate	500		25	34	29	31	32	34
Sulphur								
Total Sus. Solids						635	268	
TDS	500		424	445	453	491	518	608
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.52	0.50	0.17	0.15	<0.10	0.22
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)				<0.01	<0.01	<0.01
Ion Balance				1.03	1.05			
Field Parameters								
Temperature (°C)				10.6	9.4	11.1	8.7	10
pH				9.34	--	7.6	8.16	8.31
Conductivity (µS/cm)				672	677	743	800	933

Exceeds ODWS
Exceeds PWQO

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Ross WDS
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			BH 9B (shallow)					
			Oct-10	May-11	Nov-11	May-12	Oct-12	Apr-13
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		387	501	480	502	591	537
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.02	<0.02	<0.02	<0.02	0.04	0.13
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001		<0.001		<0.001
Barium	1		0.1	0.11	0.11	0.10	0.12	0.11
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.1	0.1	0.12	0.15	0.16	0.17
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001		<0.0001		0.00010
Calcium			161	169	184	193	200	178
Chloride	250		67	72	88	84	93	86
Chromium	0.05	0.009	0.003	0.009		0.006		0.002
Cobalt		0.0009(i)						
COD			10	35	12	<5	9	9
Conductivity (µS/cm)			995	1110	1170	1190	1330	1240
Copper	1	0.005	0.002	0.003		0.005		0.004
DOC	5		1.7	3.9	3	4.3	4.4	3.9
Fluoride	1.5							
Hardness (as CaCO3)	500		539	575	596	643	661	594
Iron	0.3	0.3	<0.03	0.15	0.06	0.58	0.18	
Lead	0.01		<0.001	<0.001		<0.001		<0.001
Magnesium			34	38	34	40	40	37
Manganese	0.05		<0.01	0.29		0.56		0.02
Mercury		0.0002	<0.0001	<0.0001		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		8.23	1.09	3.25	2.87	0.25	2.20
Nitrite (as N)	1		<0.10	<0.10		<0.10		<0.10
Organic Nitrogen	0.15		<0.10	0.24				
pH (pH units)	6.5-8.5		7.86	7.33	7.42	7.45	7.55	7.32
Phenols			<0.001	<0.001		<0.001		<0.005
Phosphate (as P)								
Phosphorus (total)			0.08	12.3		0.29		4.54
Potassium			4	4		4		4
Silicon								
Silver		0.0001						
Sodium	200		19	21	22	28	32	32
Strontium								
Sulphate	500		30	38	42	28	24	33
Sulphur								
Total Sus. Solids								
TDS	500		647	722	760	774	864	806
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.10	0.26		0.40		0.44
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01		<0.01		<0.01
Ion Balance								
Field Parameters								
Temperature (°C)			9.2	10.4	9.6	10.2	10.1	10.6
pH			6.97	7.0	6.8	7.9	6.6	6.7
Conductivity (µS/cm)			1031	730	1165	348	1251	1214

Exceeds ODWS
Exceeds PWQO

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			BH 9B (shallow)					
			Oct-13	Jul-14	Oct-14	Apr-15	Sep-15	Apr-16
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		516	485	453	554	521	507
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.14	0.06	0.03	0.09	0.16	0.28
Arsenic	0.01	0.1 - 0.005(i)		0.0004		0.0004		0.0002
Barium	1		0.11	0.105	0.101	0.129	0.111	0.121
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.2	0.208	0.234	0.354	0.301	0.279
Bromide								
Cadmium	0.005	0.0002		0.00010		0.00013		0.00015
Calcium			179	182	176	201	172	175
Chloride	250		91	89.4	109	102	92.9	91.5
Chromium	0.05	0.009		<0.002		< 0.002		< 0.002
Cobalt		0.0009(i)						
COD			<5	11	16	30	18	16
Conductivity (µS/cm)			1260	1200	1200	1260	1200	1200
Copper	1	0.005		0.0035		0.006		0.0045
DOC	5		4.5	6.5	7.5	8.2	2.8	4
Fluoride	1.5							
Hardness (as CaCO3)	500		588	606	582	676	575	
Iron	0.3	0.3	<0.03	0.007	0.028	0.009	< 0.005	0.009
Lead	0.01			0.00003		0.00004		0.00013
Magnesium			35	37.6	35.3	43.2	36.2	38.2
Manganese	0.05			1.5		2.13		3.61
Mercury		0.0002		<0.00002		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		1.2	0.2	1.2	0.2	0.9	0.6
Nitrite (as N)	1			<0.10		< 0.1		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.21	7.62	7.78	7.45	7.68	7.72
Phenols				<0.001		< 0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				3.86		0.64		1.15
Potassium				3.5		4.6		4.7
Silicon								
Silver		0.0001						
Sodium	200		35	38.4	40.6	52.8	48	47.9
Strontium								
Sulphate	500		35	47	39	35	34	36
Sulphur								
Total Sus. Solids								
TDS	500		819	692	683	774	822	704
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.74		0.35		0.68
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.005		< 0.005		< 0.005
Ion Balance				0.943	0.955	0.913	0.998	
Field Parameters								
Temperature (°C)			10.4	12	10.4	11.2	10.4	10.7
pH			6.8	7	7.1	7	6.9	6.9
Conductivity (µS/cm)			1160	1046	1131	1393	1064	1104

Exceeds ODWS
Exceeds PWQO

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			BH 9B (shallow)					
			Sep-16	May-17	Aug-17	Apr-18	Sep-18	Jun-19
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		578	510	576	495	404	411
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			0.24	0.8	1.09	1.29	1.2	1.14
Arsenic	0.01	0.1 - 0.005(i)		0.0006		0.0002		0.0001
Barium	1		0.107	0.124	0.169	0.15	0.133	0.117
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.337	0.44	0.467	0.525	0.243	0.347
Bromide								
Cadmium	0.005	0.0002		0.00015		0.00010		0.00010
Calcium			156	150	180	157	148	136
Chloride	250		91.5	65.9	84.8	67.5	72.3	67.8
Chromium	0.05	0.009		< 0.002		< 0.002		< 0.001
Cobalt		0.0009(i)						
COD			27	17	25	14	< 5	26
Conductivity (µS/cm)			1280	1190	1390	1170	1060	1026
Copper	1	0.005		0.0078		0.0048		0.0059
DOC	5		5.8	5.9	7.4	7.9	4.7	6.4
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	0.053	0.009	0.005	< 0.005
Lead	0.01			< 0.00002		< 0.00002		0.00004
Magnesium			34.4	35.7	46.8	38.4	36.3	33.3
Manganese	0.05			5.9		4.1		2.97
Mercury		0.0002		< 0.02		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		0.1	< 0.05	< 0.05	< 0.05	0.26	0.15
Nitrite (as N)	1			< 0.05		< 0.05		< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.49	7.55	7.57	7.6	7.58	7.58
Phenols				0.004		< 0.001		< 0.002
Phosphate (as P)								
Phosphorus (total)				1.22		0.61		0.47
Potassium				7		10.8		8
Silicon								
Silver		0.0001						
Sodium	200		42.9	50.7	54.9	53	40.8	43.2
Strontium								
Sulphate	500		37	25	35	22	29	37
Sulphur								
Total Sus. Solids								
TDS	500		718	646	758	652	584	576
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				1.2		1.6		1.5
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		0.005		0.006		< 0.005
Ion Balance								0.923
Field Parameters								
Temperature (°C)			10.4	10.4	10.0	9.8	10	10
pH			6.7	6.6	6.8	7	6.9	6.8
Conductivity (µS/cm)			1336	1160	1280	973	686	1064

Exceeds ODWS
Exceeds PWQO

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			BH 9B (shallow)					
			Oct-19	May-20	Sep-20	Apr-21	Aug-21	May-22
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		453	448	414	502	474	517
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			1.73	1.48	1.69	1.56	1.76	1.46
Arsenic	0.01	0.1 - 0.005(i)		0.0002		<0.001		<0.001
Barium	1		0.178	0.17	0.187	0.22	0.18	0.28
Beryllium		0.011						
BOD							3	
Boron	5	0.2(i)	0.309	0.538	0.245	0.24	0.21	0.23
Bromide								
Cadmium	0.005	0.0002		0.00011		0.00010		0.00010
Calcium			162	147	151	149	160	160
Chloride	250		76.6	60.5	79.2	78	78	88
Chromium	0.05	0.009		< 0.001		<0.001		<0.001
Cobalt		0.0009(i)						
COD			17	16	19	8	5	<5
Conductivity (µS/cm)			1140	1050	1070	1180	1090	1120
Copper	1	0.005		0.0066		0.006		0.003
DOC	5		6.3	5.9	5.5	3.6	4.2	4.3
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.007	< 0.005	0.016	0.61	0.66	1.38
Lead	0.01			0.00004		<0.001		<0.001
Magnesium			37.4	33.8	31.8	30	31	32
Manganese	0.05		3.67	3.11		2.94		3.59
Mercury		0.0002		< 0.00002		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		0.08	0.11	< 0.05	<0.50	<0.10	<0.10
Nitrite (as N)	1			0.06		<0.50		<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.6	7.58	7.41	7.45	7.33	6.93
Phenols				< 0.002		<0.010		<0.001
Phosphate (as P)								
Phosphorus (total)				1.15		0.244		1.84
Potassium				9.7		10		8
Silicon								
Silver		0.0001						
Sodium	200		43.4	41.2	35.3	36	36	38
Strontium								
Sulphate	500		30	19	29	29	29	30
Sulphur								
Total Sus. Solids							174	
TDS	500		637	585	585	767	708	728
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium				1.7				
TKN						1.67		2.18
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		<0.01		<0.01
Ion Balance			0.871					
Field Parameters								
Temperature (°C)			9.6	9.9	9.5	8.8	10.4	10.6
pH			7.2	6.8	6.1	7.1	6.7	6.8
Conductivity (µS/cm)			1097	1014	1128	1204	1069	1311

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 9B (shallow)					
			Aug-22	Jun-23	Oct-23	Jun-24	Oct-24	
PARAMETER	ODWQS	PWQO						
Alkalinity (as CaCO3)	30-500		510	587	495	456	472	
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			1.84	2.19	1.84	2.1	1.99	
Arsenic	0.01	0.1 - 0.005(i)		<0.001		<0.001		
Barium	1		0.25	0.30	0.24	0.23	0.23	
Beryllium		0.011						
BOD			<1		3		5	
Boron	5	0.2(i)	0.26	0.30	0.33	0.41	0.33	
Bromide								
Cadmium	0.005	0.0002		0.00020		<0.0001		
Calcium			169	196	168	159	168	
Chloride	250		88	119	103	100	105	
Chromium	0.05	0.009		<0.001		<0.001		
Cobalt		0.0009(i)						
COD			15	11	29	10	28	
Conductivity (µS/cm)			1130	1300	1130	1110	1160	
Copper	1	0.005		0.005		0.005		
DOC	5		1.7	7.0	14.8	3.2	4.4	
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	2.78	0.57	0.92	0.73	1.00	
Lead	0.01			<0.001		<0.001		
Magnesium			28	38	29	32	34	
Manganese	0.05			4.79		4.00		
Mercury		0.0002		<0.0001		<0.0001		
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	<0.10	<0.10	0.18	<0.10	
Nitrite (as N)	1			<0.10		<0.10		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.34	6.95	7.02	7.27	7.44	
Phenols				<0.001				
Phosphate (as P)								
Phosphorus (total)				5.5		7.01		
Potassium				8		9		
Silicon								
Silver		0.0001						
Sodium	200		35	42	43	47	43	
Strontium								
Sulphate	500		31	47	32	32	27	
Sulphur								
Total Sus. Solids			1130		1350		751	
TDS	500		734	845	734	722	754	
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				2.6		2.47		
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.01		
Ion Balance								
Field Parameters								
Temperature (°C)			11.3	11.8	10.2	13.2	11.4	
pH			7.2	6.7	7.4	6.9	6.9	
Conductivity (µS/cm)			1160	1450	1300	1140	1270	

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted
Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 199

Ross WDS
Report of Inoganic
Groundwater Quality

			BH 10A (deep)					
			Oct-91	Sep-06	Aug-07	Oct-07	May-08	Oct-08
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		146	181	170	178	175	184
Aluminum	0.1	0.075 (i)	0.07					
N-NH3 (Ammonia)			<0.10		0.06	0.05	<0.02	0.02
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.03	0.04				
Beryllium		0.011	<0.010					
BOD			<1.0					
Boron	5	0.2(i)	<0.010	<0.020	0.01	<0.01	<0.01	0.01
Bromide			<0.50					
Cadmium	0.005	0.0002	<0.0020					
Calcium			50		69	68	73	69
Chloride	250		5		10	11	8	9
Chromium	0.05	0.009	<0.0100					
Cobalt		0.0009(i)	<0.0100					
COD			6		<5	<5	<5	<5
Conductivity (µS/cm)			330	300	484	490	475	479
Copper	1	0.005	<0.0100		0.001	0.003	0.002	<0.001
DOC	5			0.9				
Fluoride	1.5		0.08					
Hardness (as CaCO3)	500		169		233	230	247	233
Iron	0.3	0.3	<0.01		<0.03	<0.03	<0.03	<0.03
Lead	0.01		<0.0020					
Magnesium			11		15	15	16	15
Manganese	0.05		0.03		<0.01	<0.01	<0.01	<0.01
Mercury	0.001	0.0002						
Molybdenum		0.04(i)	<0.010					
Nickel			<0.010					
N-NO3 (Nitrate)	10		9.6	11	12	12	11.9	11.1
N-NO2 (Nitrite)	1		<0.10		<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15		<0.10		0.19	< 0.10	≤ 0.13	0.26
pH (pH units)	6.5-8.5		7.7	7.7				
Phenols			<0.002		<0.001	<0.001	<0.001	<0.001
Phosphate (as P)			0.24					
Phosphorus (total)			<0.100					
Potassium			1	1	1	1	2	1
Silicon			5.9					
Silver		0.0001	<0.01000					
Sodium	200		3		4	4	4	3
Strontium			0.1	0.14	0.145	0.143	0.138	0.133
Sulphate	500		16	20	19	18	19	17
Sulphur			10					
Total Sus. Solids								
TDS	500		188	308	315	319	309	311
Temperature (°C)	15		8.3	8.9				
Thallium		0.0003(i)	<0.05000					
Tin			<0.050					
Titanium			<0.010					
TKN			<0.10		0.25	<0.10	0.13	0.28
Vanadium		(0.006(i)	<0.0100					
Zinc	5	0.03 - 0.02(i)	<0.010					
Ion Balance							1.04	0.95
Field Parameters								
Temperature (°C)							8.9	9
pH							9	ot Measure
Conductivity (µS/cm)							488	478

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
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			BH 10A (deep)					
			May-09	Oct-09	May-10	Oct-10	May-11	Nov-11
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		178	177	165	166	166	170
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.02	<0.02	0.05	<0.02	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001	<0.001	<0.001	<0.001	
Barium	1		0.04	0.04	0.04	0.04	0.04	0.04
Beryllium		0.011						
BOD			3	<1				
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium			68	63	60	64	64	63
Chloride	250		8	7	8	6	9	8
Chromium	0.05	0.009	<0.001	0.001	0.002	0.002	0.003	
Cobalt		0.0009(i)						
COD			5	<5	5	35	<5	<5
Conductivity (µS/cm)			467	447	437	426	429	433
Copper	1	0.005	<0.001	0.001	<0.001	<0.001	<0.001	
DOC	5		1	1.2	1.1	3.2	1.2	1
Fluoride	1.5							
Hardness (as CaCO3)	500		226	210	202	212	216	214
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01		<0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium			14	13	13	13	14	14
Manganese	0.05		<0.01	<0.01	<0.01	<0.01	<0.01	
Mercury	0.001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		9.01	9.12	8.94	7.89	8.8	7.47
N-NO2 (Nitrite)	1		<0.10	<0.10	<0.10	<0.10	<0.10	
Organic Nitrogen	0.15		<0.10	≤ 0.40	0.31	<0.10	<0.15	
pH (pH units)	6.5-8.5		8.04	8.17	8.03	8.10	8	8.1
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	
Phosphate (as P)								
Phosphorus (total)			0.36	0.67	0.16	0.25	0.05	
Potassium			<1	1	1	1	1	
Silicon								
Silver		0.0001						
Sodium	200		<2	4	3	3	3	3
Strontium			0.132	0.127				
Sulphate	500		17	16	18	16	18	16
Sulphur								
Total Sus. Solids			265	655				
TDS	500		304	291	284	277	279	281
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.10	0.4	0.36	<0.10	0.14	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01	<0.01	<0.01	<0.01	
Ion Balance								
Field Parameters								
Temperature (°C)			10.4	8.1	10.1	9.5	9.1	8.5
pH			7.1	8.6	9.56	7.53	8.1	7.9
Conductivity (µS/cm)			506	451	450	435	318	427

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inoganic
Groundwater Quality

			BH 10A (deep)					
			May-12	Oct-12	Apr-13	Oct-13	Jul-14	Oct-14
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		163	168	163	164	154	152
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.02	<0.02	<0.02	<0.02	<0.01	<0.01
Arsenic	0.01	0.1 - 0.005(i)	<0.001		<0.001		0.0002	
Barium	1		0.04	0.04	0.04	0.04	0.038	0.038
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.005	0.008
Bromide								
Cadmium	0.005	0.0002	<0.0001		<0.0001		<0.00002	
Calcium			63	66	61	64	65.6	67.9
Chloride	250		9	8	8	9	8.1	8
Chromium	0.05	0.009	<0.001		<0.001		<0.002	
Cobalt		0.0009(i)						
COD			<5	<5	<5	<5	<5	< 5
Conductivity (µS/cm)			431	436	429	444	443	434
Copper	1	0.005	<0.001		<0.001		0.0004	
DOC	5		2.3	1.2	1.1	0.6	1.6	1.8
Fluoride	1.5							
Hardness (as CaCO3)	500		210	221	209	216	224	230
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.005	<0.005
Lead	0.01		<0.001		<0.001		0.00004	
Magnesium			13	14	14	14	15	14.9
Manganese	0.05		<0.01		<0.01		<0.001	
Mercury	0.001	0.0002	<0.0001		<0.0001		<0.00002	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		8.19	8.95	8.9	9.93	10.2	10.4
N-NO2 (Nitrite)	1		<0.10		<0.10		<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.11	7.95	8.06	7.94	8.12	8.14
Phenols			<0.001		<0.001		<0.001	
Phosphate (as P)								
Phosphorus (total)			0.01		0.02		0.04	
Potassium			1		1		1.3	
Silicon								
Silver		0.0001						
Sodium	200		5	3	3	4	4	4
Strontium								
Sulphate	500		18	17	17	17	18	18
Sulphur								
Total Sus. Solids								
TDS	500		280	283	279	289	250	251
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.12		0.11		<0.05	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01		<0.01		<0.005	
Ion Balance							0.936	0.908
Field Parameters								
Temperature (°C)			9.5	8.9	9.5	9.8	9.5	9.2
pH			7.9	7.5	7.7	7.7	8.3	7.9
Conductivity (µS/cm)			437	423	427	422	386	416

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 10A (deep)					
			Apr-15	Sep-15	Apr-16	Aug-16	May-17	Aug-17
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		159	165	166	170	164	165
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)	0.0002		< 0.0001		0.0001	
Barium	1		0.036	0.039	0.042	0.045	0.041	0.047
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.007	< 0.005	< 0.005	0.008	0.01	0.009
Bromide								
Cadmium	0.005	0.0002	< 0.00002		< 0.00002		< 0.000014	
Calcium			62.8	67.8	70	73.8	69.4	74.7
Chloride	250		7.8	8.1	8.6	9.1	9.3	10.3
Chromium	0.05	0.009	< 0.002		< 0.002		< 0.002	
Cobalt		0.0009(i)						
COD			10	< 5	5	< 5	51	< 5
Conductivity (µS/cm)			429	431	449	466	501	514
Copper	1	0.005	0.0001		0.0005		0.0004	
DOC	5		1.9	< 0.2	0.8	0.8	0.7	< 0.2
Fluoride	1.5							
Hardness (as CaCO3)	500		215	231				
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01		< 0.00002		< 0.00002		< 0.00002	
Magnesium			14.4	15.2	16.1	17.2	16.3	17.7
Manganese	0.05		0.006		< 0.001		< 0.001	
Mercury	0.001	0.0002	< 0.00002		< 0.00002		< 0.02	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		10	10.7	11.4	13.1	15.5	16.3
N-NO2 (Nitrite)	1		< 0.1		< 0.1		< 0.05	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.05	7.92	8.13	8.02	8.11	8.1
Phenols			< 0.001		< 0.001		0.002	
Phosphate (as P)								
Phosphorus (total)			0.04		0.02		0.02	
Potassium			1.2		1.2		1.1	
Silicon								
Silver		0.0001						
Sodium	200		3.9	4.1	4.4	4.5	4.3	4.4
Strontium								
Sulphate	500		16	17	17	17	16	14
Sulphur								
Total Sus. Solids								
TDS	500		246	289	267	282	214	222
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.08		0.15		< 0.1	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005		0.007		< 0.005	
Ion Balance			0.986	0.96				
Field Parameters								
Temperature (^{o}C)			9.6	9.1	10	10	9.3	9.5
pH			7.8	7.8	7.9	7.8	7.8	7.9
Conductivity (µS/cm)			476	399	435	508	484	504

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 10A (deep)					
			Apr-18	Sep-18	Jun-19	Oct-19	May-20	Sep-20
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		167	170	166	164	169	161
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			< 0.01	< 0.01	0.04	0.02	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)	0.0004		< 0.0001		< 0.0001	
Barium	1		0.047	0.045	0.036	0.036	0.048	0.042
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.011	0.005	0.007	0.005	0.01	0.011
Bromide								
Cadmium	0.005	0.0002	< 0.000014		< 0.000015		< 0.000015	
Calcium			73.3	76	68.3	61.2	72.6	67.2
Chloride	250		8.7	10.6	9.8	9.6	9.7	9.2
Chromium	0.05	0.009	< 0.002		< 0.001		< 0.001	
Cobalt		0.0009(i)						
COD			< 5	< 5	< 5	32	< 5	< 5
Conductivity (µS/cm)			489	499	421	388	462	456
Copper	1	0.005	0.001		0.0006		0.0015	
DOC	5		1.6	1.2	1.8	2.1	1.2	2.5
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.011
Lead	0.01		0.00003		0.00003		0.00006	
Magnesium			17.2	18.1	17.2	14.2	16.6	16.1
Manganese	0.05		< 0.001		< 0.001	< 0.001	< 0.001	
Mercury	0.001	0.0002	< 0.00002		< 0.00002		< 0.00002	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		14.4	13.5	12.3	10.6	11	11.2
N-NO2 (Nitrite)	1		< 0.05		< 0.05		< 0.05	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.11	8.02	8.03	8.07	8.12	8.03
Phenols			< 0.001		< 0.002		< 0.002	
Phosphate (as P)								
Phosphorus (total)			0.02		0.01		0.09	
Potassium			1.5		1.3		1.5	
Silicon								
Silver		0.0001						
Sodium	200		4.6	4.5	3.8	3.4	3.7	3.5
Strontium								
Sulphate	500		14	15	15	13	13	14
Sulphur								
Total Sus. Solids								
TDS	500		220	228	215	201	219	208
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium							0.2	
TKN			0.1		0.2			
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005		< 0.005		< 0.005	
Ion Balance					0.952	1.04		
Field Parameters								
Temperature (^{o}C)			9.2	9.8	9.9	9.6	9.2	9.1
pH			7.7	7.9	7.9	8	7.6	7.4
Conductivity (µS/cm)			430	377	491	472	457	487

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 10A (deep)					
			Apr-21	Sep-21	May-22	Aug-22	Jun-23	Oct-23
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		173	182	169	182	188	193
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.010	<0.010	<0.010	<0.020	0.053	<0.020
Arsenic	0.01	0.1 - 0.005(i)	<0.001		<0.001		<0.001	
Barium	1		0.04	0.04	0.05	0.04	0.06	0.05
Beryllium		0.011						
BOD				3		<1		4
Boron	5	0.2(i)	0.01	0.01	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001		<0.0001		<0.0001	
Calcium			63	71	64	65	64	64
Chloride	250		10	10	11	8	10	9
Chromium	0.05	0.009	<0.001		<0.001		<0.001	
Cobalt		0.0009(i)						
COD			<5	<5	<5	<5	<5	11
Conductivity (µS/cm)			463	448	327	449	449	333
Copper	1	0.005	0.002		0.002		0.002	
DOC	5		1	1.8	1.9	--	2.1	5
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01		<0.001		<0.001		<0.001	
Magnesium			14	16	14	15	14	15
Manganese	0.05		<0.01		<0.01		<0.01	
Mercury	0.001	0.0002	<0.0001		<0.0001		<0.0001	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		9.72	10.1	12.7	11.1	11.4	10.3
N-NO2 (Nitrite)	1		<0.10		<0.10		<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.14	7.96	7.76	7.91	8.01	7.85
Phenols			<0.010		<0.001		<0.001	
Phosphate (as P)								
Phosphorus (total)			0.024		0.209		0.531	
Potassium			1		1		<1	
Silicon								
Silver		0.0001						
Sodium	200		4	4	3	3	4	4
Strontium								
Sulphate	500		14	14	15	15	15	14
Sulphur								
Total Sus. Solids				102		540		502
TDS	500		301	291	213	292	292	216
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.118		0.195		0.29	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01		<0.01		<0.01	
Ion Balance								
Field Parameters								
Temperature (^{o}C)			8.2	9.7	9.5	9.8	12.6	9.5
pH			8	7.3	7.6	8.2	7.9	7.7
Conductivity (µS/cm)			480	451	507	460	520	530

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inoganic
Groundwater Quality

			BH 10A (deep)					
			Jun-24	Oct-24				
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		169	166				
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.020	<0.020				
Arsenic	0.01	0.1 - 0.005(i)	<0.001					
Barium	1		0.04	0.04				
Beryllium		0.011						
BOD				<1				
Boron	5	0.2(i)	<0.01	<0.01				
Bromide								
Cadmium	0.005	0.0002	<0.0001					
Calcium			70	68				
Chloride	250		9	9				
Chromium	0.05	0.009	<0.001					
Cobalt		0.0009(i)						
COD			<5	<5				
Conductivity (µS/cm)			341	436				
Copper	1	0.005	0.001					
DOC	5		0.9	1.4				
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	<0.03				
Lead	0.01		<0.001					
Magnesium			15	15				
Manganese	0.05		<0.01					
Mercury	0.001	0.0002	<0.0001					
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		11.9	11.2				
N-NO2 (Nitrite)	1		<0.10					
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.78	7.92				
Phenols								
Phosphate (as P)								
Phosphorus (total)			0.261					
Potassium			1					
Silicon								
Silver		0.0001						
Sodium	200		4	4				
Strontium								
Sulphate	500		11	13				
Sulphur								
Total Sus. Solids				258				
TDS	500		222	283				
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.379					
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01					
Ion Balance								
Field Parameters								
Temperature (^{o}C)			10.4	10.8				
pH			7.6	7.8				
Conductivity (µS/cm)			500	500				

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 10B (middle)					
			Oct-91	Nov-98	Apr-99	Oct-99	Apr-00	Nov-01
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		152	151	153			156
Aluminum	0.1	0.075 (i)	0.15	<0.030	<0.030	0.06	<0.050	
N-NH3 (Ammonia)			<0.10	<0.02	0.14	0.03	<0.02	
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.03	0.01	0.03	NA	0.03	0.03
Beryllium		0.011	<0.010	<0.010	<0.010	<0.010	<0.002	
BOD			<1.0					
Boron	5	0.2(i)	<0.010	<0.010	<0.010	NA	<0.010	<0.050
Bromide			<0.50					
Cadmium	0.005	0.0002	<0.0020	<0.0050	<0.0050	<0.0050	<0.0050	
Calcium			57	63	61	59	61	57
Chloride	250		5	11	8	11	7	
Chromium	0.05	0.009	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	
Cobalt		0.0009(i)	<0.0100	0.01	<0.0100	<0.0100	<0.0100	
COD			3	<3	<3			
Conductivity (µS/cm)			330	310	390	315	320	420
Copper	1	0.005	<0.0100	<0.0050	<0.0050	<0.0100	<0.0050	
DOC	5							
Fluoride	1.5		0.08					
Hardness (as CaCO3)	500		191	218	209	200	205	195
Iron	0.3	0.3	0.22	<0.01	<0.01	0.12	0.05	
Lead	0.01		<0.0020	<0.0020	<0.0020	<0.0020	<0.0010	
Magnesium			12	15	14	13	13	13
Manganese	0.05		<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Mercury	0.001	0.0002						
Molybdenum		0.04(i)	<0.010	<0.010	<0.010	0.03	<0.010	
Nickel			<0.010	<0.010	<0.010	<0.010	<0.010	
N-NO3 (Nitrate)	10		9.6	8.99	9.03	9.02	9.12	9.67
N-NO2 (Nitrite)	1		<0.10					
Organic Nitrogen	0.15		<0.10					
pH (pH units)	6.5-8.5		7.6	6.8	8	6.7	7.9	7.4
Phenols			<0.002					
Phosphate (as P)			0.15					
Phosphorus (total)			<0.100					
Potassium			1	1	1	1	1	1
Silicon			6	4.7	5.8	6.1	4.93	
Silver		0.0001	<0.01000	<0.01000	<0.01000	<0.01000	<0.01000	
Sodium	200		3	2	4	3	4	
Strontium			0.09	0.107	0.109	0.131	0.1	0.089
Sulphate	500		40	15	15	22	14	15
Sulphur			8	5	5	5	5	
Total Sus. Solids								
TDS	500		182	248	300	252	220	260
Temperature (°C)	15		8.3	5	5.5	6	8	7
Thallium		0.0003(i)	<0.05000	<0.20000	<0.20000	<0.20000	<0.20000	
Tin			<0.050	<0.050	<0.050	<0.050	<0.050	
Titanium			<0.010	<0.010	<0.010	<0.010	<0.010	
TKN			<0.10					
Vanadium		(0.006(i)	<0.0100	<0.0100	<0.0100	<0.0100	0.02	
Zinc	5	0.03 - 0.02(i)	<0.010	<0.010	<0.010	0.06	<0.010	
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 10B (middle)					
			Oct-02	Oct-03	Oct-04	Nov-05	Sep-06	Aug-07
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		162	159	161	176	177	170
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)				<0.02				0.05
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.03	0.04	0.038	0.04	0.04	
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.050	<0.050	<0.010	<0.020	0.13	<0.01
Bromide								
Cadmium	0.005	0.0002						
Calcium			58	66	67.2	73.2		69
Chloride	250			3				12
Chromium	0.05	0.009						
Cobalt		0.0009(i)						
COD				<5				<5
Conductivity (µS/cm)			300	365	346	400	300	490
Copper	1	0.005						0.001
DOC	5			<0.5	0.7	0.8	0.7	
Fluoride	1.5							
Hardness (as CaCO3)	500		197	221	228	248		233
Iron	0.3	0.3						<0.03
Lead	0.01							
Magnesium			13	14	15	16.1		15
Manganese	0.05		<0.005	<0.010	<0.005	<0.010		<0.01
Mercury	0.001	0.0002						
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		9.84	7.96	11.2	14	11	12.1
N-NO2 (Nitrite)	1			<0.10				<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.1	7.6	7.7	7.4	7.6	
Phenols				<0.001				<0.001
Phosphate (as P)								
Phosphorus (total)								
Potassium			1	2	1	1	1	1
Silicon								
Silver		0.0001						
Sodium	200							5
Strontium			0.112	0.12	0.122	0.14	0.14	0.145
Sulphate	500		15	13	17.9	17	20	18
Sulphur								
Total Sus. Solids								
TDS	500		281	276	280	256	307	319
Temperature (^{o}C)	15		13.3	6.6	12	8.8	9.3	
Thallium		0.0003(i)						
Tin								
Titanium								
TKN								0.13
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						
Ion Balance								
Field Parameters								
Temperature (^{o}C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 10B (middle)					
			Oct-07	May-08	Oct-08	May-09	Oct-09	May-10
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		178	175	182	182	176	167
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.17	0.08	0.02	<0.02	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)				<0.001	<0.001	<0.001
Barium	1					0.04	0.04	0.04
Beryllium		0.011						
BOD						<1	<1	
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002				<0.0001	<0.0001	<0.0001
Calcium			71	73	71	61	59	66
Chloride	250		13	11	11	9	8	8
Chromium	0.05	0.009				<0.001	0.002	0.002
Cobalt		0.0009(i)						
COD			<5	<5	<5	13	<5	<5
Conductivity (µS/cm)			497	473	482	471	449	440
Copper	1	0.005	0.006	0.001	<0.001	0.001	<0.001	0.001
DOC	5					1	1.3	1.3
Fluoride	1.5							
Hardness (as CaCO3)	500		242	247	238	213	204	225
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01					<0.001	<0.001	<0.001
Magnesium			16	16	15	15	14	15
Manganese	0.05		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	0.001	0.0002				<0.0001	<0.0001	< 0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		10.9	10.9	10.5	8.7	9.04	8.9
N-NO2 (Nitrite)	1		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15							<0.10
pH (pH units)	6.5-8.5					8.03	8.19	7.99
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)						0.08	0.03	0.06
Potassium			1	1	1	<1	1	1
Silicon								
Silver		0.0001						
Sodium	200		5	5	4	3	4	4
Strontium			0.142	0.136	0.129	0.139		
Sulphate	500		18	18	16	16	15	17
Sulphur								
Total Sus. Solids						196	96	
TDS	500		323	307	313	306	292	286
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.42	0.30	0.20	<0.10	0.34	<0.10
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)				<0.01		< 0.01
Ion Balance				1.05	0.99			
Field Parameters								
Temperature (^{o}C)				8.9	9.2	10	8.3	9.4
pH				9.33	Not Measure	7.5	8.7	9.19
Conductivity (µS/cm)				486	480	472	454	447

Exceeds ODWS
Exceeds PWQO

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			BH 10B (middle)					
			Oct-10	May-11	Nov-11	May-12	Oct-12	Apr-13
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		164	175	169	166	165	160
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001		<0.001		<0.001
Barium	1		0.04	0.04	0.04	0.04	0.04	0.03
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001			<0.0001		<0.0001
Calcium			66	67	65	66	65	61
Chloride	250		8	10	9	9	8	8
Chromium	0.05	0.009	0.002	0.003		0.007		<0.001
Cobalt		0.0009(i)						
COD			8	5	<5	<5	<5	<5
Conductivity (µS/cm)			419	442	426	435	424	424
Copper	1	0.005	<0.001	<0.001		<0.001		<0.001
DOC	5		1.2	1.4	1	2.3	1.2	1.0
Fluoride	1.5							
Hardness (as CaCO3)	500		221	228	219	221	215	209
Iron	0.3	0.3	<0.03	0.05	0.06	0.03	0.03	<0.03
Lead	0.01		<0.001	<0.001		<0.001		<0.001
Magnesium			14	15	14	14	13	14
Manganese	0.05		<0.01	0.03		<0.01		0.01
Mercury	0.001	0.0002	<0.0001	<0.0001		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.71	8.8	4.8	8.40	8.64	9.50
N-NO2 (Nitrite)	1		<0.10	<0.10		<0.10		<0.10
Organic Nitrogen	0.15		<0.10	0.18				
pH (pH units)	6.5-8.5		8.11	7.96	8.08	8.11	7.9	8.09
Phenols			<0.001	0.001		<0.001		<0.001
Phosphate (as P)								
Phosphorus (total)			0.02	0.18		0.14		0.18
Potassium			1	1		1		1
Silicon								
Silver		0.0001						
Sodium	200		3	4	4	4	3	3
Strontium								
Sulphate	500		16	16	15	18	16	18
Sulphur								
Total Sus. Solids								
TDS	500		272	287	277	283	276	276
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.10	0.2		<0.10		<0.10
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01		<0.01		<0.01
Ion Balance								
Field Parameters								
Temperature (^{o}C)			9.0	9.4	8.6	10.0	9.1	8.8
pH			7.85	8.1	7.9	7.9	7.6	7.6
Conductivity (µS/cm)			427	331	426	433	411	418

Exceeds ODWS
Exceeds PWQO

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			BH 10B (middle)					
			Oct-13	Jul-14	Oct-14	Apr-15	Sep-15	Apr-16
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		166	154	151	154	164	170
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.02	<0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)		0.0002		0.0002		< 0.0001
Barium	1		0.04	0.038	0.036	0.034	0.038	0.042
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.005	0.008	0.007	0.005	< 0.005
Bromide								
Cadmium	0.005	0.0002		<0.00002		< 0.00002		< 0.00002
Calcium			63	66.2	65.7	61	66.6	72.5
Chloride	250		9	8.3	8.1	7.5	9	10.1
Chromium	0.05	0.009		<0.002		< 0.002		< 0.002
Cobalt		0.0009(i)						
COD			<5	<5	< 5	6	< 5	< 5
Conductivity (µS/cm)			438	442	419	410	421	459
Copper	1	0.005		0.0006		0.0001		0.0004
DOC	5		0.7	2.1	1.9	1.8	< 0.2	0.9
Fluoride	1.5							
Hardness (as CaCO3)	500		214	226	222	209	226	
Iron	0.3	0.3	<0.03	0.005	0.008	< 0.005	< 0.005	< 0.005
Lead	0.01			0.00008		< 0.00002		< 0.00002
Magnesium			14	15	14.4	14	14.8	16.7
Manganese	0.05			0.006		0.005		0.001
Mercury	0.001	0.0002		<0.00002		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		9.04	10	9.5	9.3	10.3	12.2
N-NO2 (Nitrite)	1			<0.10		< 0.1		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.95	8.1	8.14	8.07	7.87	8.13
Phenols				<0.001		< 0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				0.29		0.13		0.1
Potassium				1.3		1.2		1.3
Silicon								
Silver		0.0001						
Sodium	200		4	4.2	4.1	4	4.5	5
Strontium								
Sulphate	500		15	17	16	16	16	16
Sulphur								
Total Sus. Solids								
TDS	500		285	248	242	237	283	278
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				<0.05		0.09		0.5
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.005		< 0.005		< 0.005
Ion Balance				0.919	0.912	0.975	0.964	
Field Parameters								
Temperature (^{o}C)			9.8	9.6	9.2	9.6	9	9.4
pH			7.8	8.3	7.8	7.9	7.7	7.9
Conductivity (µS/cm)			412	385	407	461	388	446

Exceeds ODWS
Exceeds PWQO

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			BH 10B (middle)					
			Aug-16	May-17	Aug-17	Apr-18	Sep-18	Jun-19
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		158	161	162	160	173	166
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.03
Arsenic	0.01	0.1 - 0.005(i)		0.0002		0.0003		< 0.0001
Barium	1		0.047	0.039	0.046	0.045	0.047	0.036
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.009	0.01	0.011	0.01	0.006	0.007
Bromide								
Cadmium	0.005	0.0002		< 0.000014		< 0.000014		< 0.000015
Calcium			76.2	67.6	73	70.2	77.8	68.6
Chloride	250		17.4	11.3	18.3	11.5	15.1	13.5
Chromium	0.05	0.009		< 0.002		< 0.002		< 0.001
Cobalt		0.0009(i)						
COD			< 5	< 5	20	6	< 5	6
Conductivity (µS/cm)			485	490	524	480	512	429
Copper	1	0.005		0.0018		0.0006		0.0005
DOC	5		0.8	0.7	0.9	1.5	1.4	1.6
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01			< 0.00002		< 0.00002		< 0.00002
Magnesium			17.5	15.5	17.7	16.3	18.6	17.1
Manganese	0.05			< 0.001		< 0.001		< 0.001
Mercury	0.001	0.0002		< 0.02		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		12.3	14.2	14.7	13	13.6	11.6
N-NO2 (Nitrite)	1			< 0.05		< 0.05		< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.03	8.09	8.08	8.11	8.01	8.09
Phenols				0.002		< 0.001		< 0.002
Phosphate (as P)								
Phosphorus (total)				0.01		0.06		0.04
Potassium				1		1.6		1.3
Silicon								
Silver		0.0001						
Sodium	200		5.9	5.6	6.1	6.9	7.1	4.7
Strontium								
Sulphate	500		15	13	13	13	14	14
Sulphur								
Total Sus. Solids								
TDS	500		283	211	227	216	238	218
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.2		0.4		0.2
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		< 0.005		< 0.005
Ion Balance								0.948
Field Parameters								
Temperature (^{o}C)			9.7	9.2	9.3	9.0	9.9	9.7
pH			7.7	7.8	7.6	7.6	7.7	7.7
Conductivity (µS/cm)			530	489	518	418	388	498

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
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Groundwater Quality

			BH 10B (middle)					
			Oct-19	May-20	Sep-20	Apr-21	Sep-21	May-22
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		163	165	157	170	180	168
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.01	< 0.01	< 0.01	0.08	<0.010	<0.010
Arsenic	0.01	0.1 - 0.005(i)		< 0.0001		<0.001		<0.001
Barium	1		0.048	0.047	0.041	0.04	0.04	0.05
Beryllium		0.011						
BOD							3	
Boron	5	0.2(i)	0.01	0.008	0.011	0.01	0.01	<0.01
Bromide								
Cadmium	0.005	0.0002		< 0.000015		<0.0001		<0.0001
Calcium			72.3	71.6	66	62	70	64
Chloride	250		14.6	11.8	13.8	11	12	12
Chromium	0.05	0.009		< 0.001		<0.001		<0.001
Cobalt		0.0009(i)						
COD			< 5	6	9	<5	<5	<5
Conductivity (µS/cm)			441	466	457	460	449	440
Copper	1	0.005		0.0016		0.004		<0.001
DOC	5		2.3	1.5	2.4	1	1.4	1.7
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	0.009	<0.03	<0.03	<0.03
Lead	0.01			0.00004		<0.001		<0.001
Magnesium			17.2	16.2	15.6	14	16	14
Manganese	0.05		< 0.001	< 0.001		<0.01		<0.01
Mercury	0.001	0.0002		< 0.00002		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		10.8	10.2	10.8	10.2	9.86	13.2
N-NO2 (Nitrite)	1			< 0.05		<0.10		<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.12	8.09	8.03	8.14	7.95	7.73
Phenols				< 0.002		<0.010		<0.001
Phosphate (as P)								
Phosphorus (total)				0.12		0.036		0.66
Potassium				1.4		1		1
Silicon								
Silver		0.0001						
Sodium	200		6.4	5.3	5.1	5	4	4
Strontium								
Sulphate	500		13	12	13	13	12	14
Sulphur								
Total Sus. Solids							107	
TDS	500		222	218	209	299	292	286
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium				0.2				
TKN						0.156		0.158
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		<0.01		<0.01
Ion Balance			0.88					
Field Parameters								
Temperature (^{o}C)			9.5	9.2	9	8.4	9.5	9.5
pH			7.9	7.6	7.4	7.4	7.6	7.7
Conductivity (µS/cm)			485	457	488	483	458	508

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 10B (middle)				
			Aug-22	Jun-23	Oct-23	Jun-24	Oct-24
PARAMETER	ODWSOG	PWQO					
Alkalinity (as CaCO3)	30-500		180	183	179	172	167
Aluminum	0.1	0.075 (i)					
N-NH3 (Ammonia)			<0.020	0.039	<0.020	<0.020	<0.020
Arsenic	0.01	0.1 - 0.005(i)		<0.001		<0.001	
Barium	1		0.04	0.06	0.04	0.04	0.04
Beryllium		0.011					
BOD			<1		7		1
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide							
Cadmium	0.005	0.0002		<0.0001		<0.0001	
Calcium			66	66	64	69	68
Chloride	250		10	12	10	9	9
Chromium	0.05	0.009		<0.001		<0.001	
Cobalt		0.0009(i)					
COD			<5	5	23	<5	<5
Conductivity (µS/cm)			452	459	333	337	430
Copper	1	0.005		0.002		0.001	
DOC	5		--	2.5	4.7	0.8	1.3
Fluoride	1.5						
Hardness (as CaCO3)	500						
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01			<0.001		<0.001	
Magnesium			15	15	14	15	15
Manganese	0.05			<0.01		<0.01	
Mercury	0.001	0.0002		<0.0001		<0.0001	
Molybdenum		0.04(i)					
Nickel							
N-NO3 (Nitrate)	10		11.1	11.7	10.1	10.0	10.9
N-NO2 (Nitrite)	1			<0.10		<0.10	
Organic Nitrogen	0.15						
pH (pH units)	6.5-8.5		7.93	8.03	7.87	7.76	7.93
Phenols				<0.001		<0.001	
Phosphate (as P)							
Phosphorus (total)				0.233		0.161	
Potassium				<1		1	
Silicon							
Silver		0.0001					
Sodium	200		4	4	4	4	4
Strontium							
Sulphate	500		14	14	13	16	12
Sulphur							
Total Sus. Solids			113		428		100
TDS	500		294	298	216	219	280
Temperature (^{o}C)	15						
Thallium		0.0003(i)					
Tin							
Titanium							
TKN				0.241		0.173	
Vanadium		(0.006(i)					
Zinc	5	0.03 - 0.02(i)		<0.01		<0.01	
Ion Balance							
Field Parameters							
Temperature (^{o}C)			9.3	10.3	9.7	10.5	10.5
pH			8.2	7.8	7.7	7.5	7.8
Conductivity (µS/cm)			460	520	480	490	500

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 10C (shallow)					
			Oct-91	Nov-98	Apr-99	Oct-99	Apr-00	Dec-00
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		116	150	143			126
Aluminum	0.1	0.075 (i)	0.15	<0.030	<0.030	0.12	<0.050	
N-NH3 (Ammonia)			<0.10	0.02	0.04	0.02	<0.02	
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.02	<0.010	0.02	NA	0.02	0.02
Beryllium		0.011	<0.010	<0.010	<0.010	<0.010	<0.002	
BOD			<1.0					
Boron	5	0.2(i)	<0.010	<0.010	<0.010	NA	<0.010	<0.010
Bromide			<0.50					
Cadmium	0.005	0.0002	<0.0020	<0.0050	<0.0050	<0.0050	<0.0050	
Calcium			40	51	56	54	51	43
Chloride	250		6	12	8	12	7	9
Chromium	0.05	0.009	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	
Cobalt		0.0009(i)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	
COD			9	32	12			24
Conductivity (µS/cm)			270	260	355	250	260	350
Copper	1	0.005	<0.0100	<0.0050	<0.0050	<0.0100	0.005	
DOC	5							
Fluoride	1.5		0.07					
Hardness (as CaCO3)	500		132	180	188	179	172	144
Iron	0.3	0.3	0.28	<0.01	<0.01	0.48	0.04	0.03
Lead	0.01		0.002	<0.0020	<0.0020	<0.0020	<0.0010	
Magnesium			8	13	12	11	11	9
Manganese	0.05		<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Mercury	0.001	0.0002						
Molybdenum		0.04(i)	<0.010	<0.010	<0.010	<0.010	<0.010	
Nickel			<0.010	<0.010	<0.010	<0.010	<0.010	
N-NO3 (Nitrate)	10		8.40	6.12	7.34	6.60	6.06	5.59
N-NO2 (Nitrite)	1		<0.10					
Organic Nitrogen	0.15		<0.10					
pH (pH units)	6.5-8.5		7.7	7.3	8	7.3	7.7	8
Phenols			<0.002					
Phosphate (as P)			0.18					
Phosphorus (total)			<0.100					
Potassium			1	1	1	1	<1.0	1
Silicon			6	4.9	5.7	6.4	4.74	
Silver		0.0001	<0.01000	<0.01000	<0.01000	<0.01000	<0.01000	
Sodium	200		3	3	4	4	4	4
Strontium			0.07	0.098	0.105	0.124	0.087	0.093
Sulphate	500		10	12	13	19	12	12
Sulphur			6	4	4	4	4	
Total Sus. Solids								
TDS	500		158	220	196	224	200	260
Temperature (^{o}C)	15		8.8	7	5	8	6	8
Thallium		0.0003(i)	<0.05000	<0.20000	<0.20000	<0.20000	<0.20000	
Tin			<0.050	<0.050	<0.050	<0.050	<0.050	
Titanium			<0.010	<0.010	<0.010	<0.010	<0.010	
TKN			<0.10					
Vanadium		(0.006(i)	<0.0100	<0.0100	<0.0100	<0.0100	0.04	
Zinc	5	0.03 - 0.02(i)	<0.010	<0.010	<0.010	0.05	<0.010	
Ion Balance								
Field Parameters								
Temperature (^{o}C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inoganic
Groundwater Quality

			BH 10C (shallow)					
			Nov-01	Oct-02	Oct-03	Oct-04	Nov-05	Sep-06
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		147	142	127	126	146	160
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)					0.03			
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.02	0.02	0.02	0.025	0.03	0.03
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.050	<0.050	<0.050	<0.010	<0.020	<0.020
Bromide								
Cadmium	0.005	0.0002						
Calcium			48	48	49	58	57.6	
Chloride	250				3			
Chromium	0.05	0.009						
Cobalt		0.0009(i)						
COD					<5			
Conductivity (µS/cm)			380	260	290	342	350	300
Copper	1	0.005						
DOC	5				<0.5	0.7	0.7	0.8
Fluoride	1.5							
Hardness (as CaCO3)	500		164	168	163	192	191	
Iron	0.3	0.3						
Lead	0.01							
Magnesium			11	12	10	11.7	11.8	
Manganese	0.05		<0.010	<0.005	<0.010	<0.005	<0.010	
Mercury	0.001	0.0002						
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		6.87	6.44	4.14	7.20	8.20	9.30
N-NO2 (Nitrite)	1				<0.10			
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.8	8.1	7.6	7.4	7.5	7.3
Phenols					<0.001			
Phosphate (as P)								
Phosphorus (total)								
Potassium			1	1	1	<1.0	1	2
Silicon								
Silver		0.0001						
Sodium	200							
Strontium			0.085	0.1	0.094	0.107	0.11	0.13
Sulphate	500		13	12	10	14	14	17
Sulphur								
Total Sus. Solids								
TDS	500		224	239	217	230	256	264
Temperature (^{o}C)	15		8	10.3	7.7	11	9.9	9.3
Thallium		0.0003(i)						
Tin								
Titanium								
TKN								
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						
Ion Balance								
Field Parameters								
Temperature (^{o}C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 10C (shallow)					
			Aug-07	Oct-07	May-08	Oct-08	May-09	Oct-09
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		144	152	157	162	156	165
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.06	0.07	0.08	0.18	<0.02	0.04
Arsenic	0.01	0.1 - 0.005(i)					<0.001	<0.001
Barium	1						0.03	0.03
Beryllium		0.011						
BOD							3	<1
Boron	5	0.2(i)	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002					<0.0001	<0.0001
Calcium			57	58	59	68	55	56
Chloride	250		13	15	10	16	10	13
Chromium	0.05	0.009					<0.001	0.002
Cobalt		0.0009(i)						
COD			<5	<5	<5	<5	<5	<5
Conductivity (µS/cm)			410	421	401	451	396	432
Copper	1	0.005	0.001	0.005	0.001	0.001	<0.001	<0.001
DOC	5						0.9	1.2
Fluoride	1.5							
Hardness (as CaCO3)	500		191	193	196	226	186	188
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01						<0.001	<0.001
Magnesium			12	12	12	14	12	12
Manganese	0.05		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	0.001	0.0002				<0.0001	<0.0001	<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.52	8.45	6.53	8.45	6.19	7.44
N-NO2 (Nitrite)	1		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5						8.07	8.22
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)							0.02	0.06
Potassium			1	1	1	2	<1	1
Silicon								
Silver		0.0001						
Sodium	200		6	7	6	10	4	6
Strontium			0.116	0.12	0.119	0.119	0.117	0.129
Sulphate	500		16	15	14	15	13	14
Sulphur								
Total Sus. Solids							73	42
TDS	500		267	274	261	293	257	281
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.14	0.17	0.34	0.41	0.1	0.34
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)					<0.01	<0.01
Ion Balance					1.01	1.09		
Field Parameters								
Temperature (^{o}C)					8.0	9.8	9.4	8.3
pH					9.52	lot Measure	7.6	8.6
Conductivity (µS/cm)					488	447	384	437

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 10C (shallow)					
			May-10	Oct-10	May-11	Nov-11	May-12	May-12 BH 15 Dup
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		146	145	153	148	140	144
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001	<0.001		<0.001	<0.001
Barium	1		0.03	0.03	0.03	0.03	0.03	0.03
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001
Calcium			49	53	51	58	52	51
Chloride	250		8	9	10	13	6	7
Chromium	0.05	0.009	0.002	0.002	0.003		0.023	0.006
Cobalt		0.0009(i)						
COD			5	33	10	5	<5	6
Conductivity (µS/cm)			372	357	377	386	337	347
Copper	1	0.005	<0.001	<0.001	<0.001		0.002	0.002
DOC	5		1.2	1.1	1.3	1.6	2.4	4.1
Fluoride	1.5							
Hardness (as CaCO3)	500		167	177	176	197	170	168
Iron	0.3	0.3	<0.03	0.12	0.08	0.07	0.56	0.57
Lead	0.01		<0.001	<0.001	<0.001		0.002	0.002
Magnesium			11	11	12	13	10	10
Manganese	0.05		<0.01	<0.01	0.03		0.04	0.05
Mercury	0.001	0.0002	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		6.40	6.00	6.23	5.16	4.38	4.95
N-NO2 (Nitrite)	1		<0.10	<0.10	<0.10		<0.10	<0.10
Organic Nitrogen	0.15		<0.10	<0.10	<0.1			
pH (pH units)	6.5-8.5		8.02	8.11	7.95	8.09	8.11	8.10
Phenols			<0.001	<0.001	<0.001		<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)			0.31	0.05	0.3		0.07	0.10
Potassium			<1	1	1		1	1
Silicon								
Silver		0.0001						
Sodium	200		5	5	5	6	6	6
Strontium								
Sulphate	500		14	14	14	13	13	13
Sulphur								
Total Sus. Solids								
TDS	500		242	232	245	251	219	226
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.10	<0.10	0.12		0.10	0.12
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01	<0.01		<0.01	<0.01
Ion Balance								
Field Parameters								
Temperature (^{o}C)			9.3	9.6	9.0	9.1		
pH			8.98	7.7	8.0	8.0		
Conductivity (µS/cm)			366	384	287	382		

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 10C (shallow)					
			Oct-12	Apr-13	Oct-13	Jul-14	Oct-14	Apr-15
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		151	150	140	134	128	137
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.02	<0.02	0.03	<0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)		<0.001		0.0002		0.0002
Barium	1		0.03	0.03	0.03	0.025	0.026	0.024
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.005	0.007	0.007
Bromide								
Cadmium	0.005	0.0002		<0.0001		<0.00002		< 0.00002
Calcium			57	53	52	51.7	52.4	50.6
Chloride	250		9	6	10	4.2	7.4	6.4
Chromium	0.05	0.009		<0.001		<0.002		< 0.002
Cobalt		0.0009(i)						
COD			7	<5	6	6	< 5	11
Conductivity (µS/cm)			374	372	366	336	338	347
Copper	1	0.005		<0.001		0.0008		< 0.0001
DOC	5		1	1	0.8	1.7	1.6	1.5
Fluoride	1.5							
Hardness (as CaCO3)	500		187	181	174	175	174	171
Iron	0.3	0.3	<0.03	0.05	0.04	0.014	0.058	0.078
Lead	0.01			<0.001		0.00013		0.00007
Magnesium			11	12	11	11.4	10.8	11
Manganese	0.05			0.02		0.01		0.006
Mercury	0.001	0.0002		<0.0001		<0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		5.89	6.52	5.58	4.1	5.6	5.8
N-NO2 (Nitrite)	1			<0.10		<0.10		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.86	8.1	7.76	8.08	8.01	8.06
Phenols				<0.001		<0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				0.57		0.2		0.14
Potassium				<1		1.1		1.1
Silicon								
Silver		0.0001						
Sodium	200		4	3	4	4.2	4.3	4.4
Strontium								
Sulphate	500		14	14	13	10	12	12
Sulphur								
Total Sus. Solids								
TDS	500		243	242	238	182	190	193
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				<0.10		<0.05		0.05
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.005		< 0.005
Ion Balance						0.889	0.918	0.977
Field Parameters								
Temperature (^{o}C)			9.6	7.9	10	9	9.4	8.8
pH			7.7	7.9	7.7	8.3	7.9	7.9
Conductivity (µS/cm)			365	368	348	298	325	385

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
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			BH 10C (shallow)					
			Sep-15	Apr-16	Aug-16	May-17	Aug-17	Apr-18
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		145	165	151	147	146	150
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			< 0.01	< 0.01	< 0.01	< 0.01	0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)		< 0.0001		0.0005		0.0005
Barium	1		0.029	0.031	0.034	0.03	0.032	0.03
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	< 0.005	< 0.005	0.008	0.01	0.012	0.011
Bromide								
Cadmium	0.005	0.0002		< 0.00002		0.00002		< 0.000014
Calcium			56.9	63.4	63.3	53.5	60.4	58.9
Chloride	250		10.3	8.2	13.9	8.7	11.4	11.4
Chromium	0.05	0.009		< 0.002		< 0.002		< 0.002
Cobalt		0.0009(i)						
COD			< 5	9	< 5	< 5	< 5	< 5
Conductivity (µS/cm)			366	400	409	401	425	411
Copper	1	0.005		0.0004		0.0023		0.0008
DOC	5		0.4	0.8	0.8	0.7	0.9	1.5
Fluoride	1.5							
Hardness (as CaCO3)	500		190			182		
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	0.625	< 0.005	< 0.005
Lead	0.01			< 0.00002		0.00169		0.00003
Magnesium			12	13.8	13.6	11.9	12.6	13.1
Manganese	0.05			< 0.001		0.032		< 0.001
Mercury	0.001	0.0002		< 0.00002		< 0.02		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		6.7	6.5	7.7	8.49	9.92	7.4
N-NO2 (Nitrite)	1			< 0.1		< 0.05		< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.88	8.15	8	8.05	8.06	8.13
Phenols				< 0.001		< 0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				0.22		2.25		0.15
Potassium				1.2		1		1.3
Silicon								
Silver		0.0001						
Sodium	200		5.5	5.8	7.3	6.3	6.8	7.3
Strontium								
Sulphate	500		13	10	13	9	11	11
Sulphur								
Total Sus. Solids								
TDS	500		238	231	237	179	191	192
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.16		< 0.1		0.2
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		0.006		0.005		< 0.005
Ion Balance			0.963					
Field Parameters								
Temperature (^{o}C)			9.5	8.8	9.7	8.3	9.4	8.7
pH			7.8	7.9	7.9	8.0	7.9	7.7
Conductivity (µS/cm)			342	382	433	392	407	358

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 10C (shallow)					
			Sep-18	Jun-19	Oct-19	May-20	Sep-20	Apr-21
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		157	142	155	159	149	158
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.04	0.08	0.01	< 0.01	< 0.01	<0.010
Arsenic	0.01	0.1 - 0.005(i)		< 0.0001		0.0001		<0.001
Barium	1		0.038	0.025	0.045	0.038	0.032	0.03
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.006	0.008	0.009	0.008	0.008	0.02
Bromide								
Cadmium	0.005	0.0002		< 0.000015		< 0.000015		<0.0001
Calcium			73.5	57.5	67.1	66.4	59.7	58
Chloride	250		18.8	16.9	19.2	12.8	15	14
Chromium	0.05	0.009		< 0.001		< 0.001		0.002
Cobalt		0.0009(i)						
COD			< 5	< 5	7	< 5	< 5	<5
Conductivity (µS/cm)			497	384	433	432	428	426
Copper	1	0.005		0.0009		0.0018		0.006
DOC	5		1.3	1.7	2.5	1	2.4	0.9
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	0.007	0.006	< 0.005	< 0.005	<0.03
Lead	0.01			0.00005		0.00003		<0.001
Magnesium			17.3	14.4	15.6	14.6	13.6	12
Manganese	0.05			< 0.001	< 0.001	< 0.001		<0.01
Mercury	0.001	0.0002		< 0.00002		< 0.00002		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		12.2	8.5	9.09	7.34	8.82	7.98
N-NO2 (Nitrite)	1			< 0.05		< 0.05		<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.9	7.88	8.13	8.07	8.1	8.16
Phenols				< 0.002		< 0.002		<0.010
Phosphate (as P)								
Phosphorus (total)				0.15		0.16		0.172
Potassium				1.1		1.4		1
Silicon								
Silver		0.0001						
Sodium	200		8.9	7	9.1	8.3	7.5	8
Strontium								
Sulphate	500		19	12	13	11	12	11
Sulphur								
Total Sus. Solids								
TDS	500		234	194	219	210	199	277
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium						0.2		
TKN				0.2				<0.100
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		0.007		<0.01
Ion Balance				0.949	0.904			
Field Parameters								
Temperature (^{o}C)			10	8.9	9.9	8.1	9.1	7.4
pH			7.7	7.9	7.9	7.8	7.4	8.1
Conductivity (µS/cm)			374	433	480	428	456	450

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 10C (shallow)					
			Sep-21	May-22	Aug-22	Jun-23	Jun-23 Dup#1 QA/QC	Oct-23
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		162	154	160	174	180	161
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.010	0.051	<0.020	<0.020	0.091	<0.020
Arsenic	0.01	0.1 - 0.005(i)		<0.001		<0.001	<0.001	
Barium	1		0.03	0.03	0.03	0.05	0.04	0.04
Beryllium		0.011						
BOD			2		<1			1
Boron	5	0.2(i)	0.01	<0.01	<0.01	<0.01	0.01	<0.01
Bromide								
Cadmium	0.005	0.0002		<0.0001		<0.0001	<0.0001	
Calcium			62	56	57	58	64	55
Chloride	250		17	14	15	12	10	16
Chromium	0.05	0.009		<0.001		<0.001	<0.001	
Cobalt		0.0009(i)						
COD			<5	<5	<5	<5	<5	13
Conductivity (µS/cm)			416	302	307	311	445	309
Copper	1	0.005		<0.001		0.002	<0.001	
DOC	5		1.6	1.8	--	1.9	2.0	5.1
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	0.29
Lead	0.01			<0.001		<0.001	<0.001	
Magnesium			14	12	12	13	14	12
Manganese	0.05			<0.01		<0.01	<0.01	
Mercury	0.001	0.0002		<0.0001		<0.0001	<0.0001	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.58	10.3	8.08	8.04	11.6	6.99
N-NO2 (Nitrite)	1			<0.10		<0.10	<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.94	7.79	7.92	7.99	7.94	7.78
Phenols				<0.001		<0.001	<0.001	
Phosphate (as P)								
Phosphorus (total)				0.037		0.594	0.588	
Potassium				1		<1	<1	
Silicon								
Silver		0.0001						
Sodium	200		8	6	6	6	4	7
Strontium								
Sulphate	500		10	10	11	10	15	10
Sulphur								
Total Sus. Solids			79		211			335
TDS	500		270	196	200	202	289	201
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.171		0.195	0.304	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.01	<0.01	
Ion Balance								
Field Parameters								
Temperature (^{o}C)			9.8	8.8	10.4	10.9		9.7
pH			7.7	7.6	8.3	7.7		7.7
Conductivity (µS/cm)			428	456	410	480		500

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 10C (shallow)					
			Jun-24	Oct-24				
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		153	170				
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.045	<0.020				
Arsenic	0.01	0.1 - 0.005(i)	<0.001					
Barium	1		0.03	0.03				
Beryllium		0.011						
BOD				6				
Boron	5	0.2(i)	<0.01	0.01				
Bromide								
Cadmium	0.005	0.0002	<0.0001					
Calcium			60	66				
Chloride	250		8	12				
Chromium	0.05	0.009	<0.001					
Cobalt		0.0009(i)						
COD			<5	68				
Conductivity (µS/cm)			301	424				
Copper	1	0.005	0.002					
DOC	5		0.8	1.3				
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	0.13				
Lead	0.01		<0.001					
Magnesium			12	14				
Manganese	0.05		<0.01					
Mercury	0.001	0.0002	<0.0001					
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.36	8.5				
N-NO2 (Nitrite)	1		<0.10					
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.75	7.81				
Phenols			<0.001					
Phosphate (as P)								
Phosphorus (total)			0.366					
Potassium			1					
Silicon								
Silver		0.0001						
Sodium	200		5	5				
Strontium								
Sulphate	500		11	10				
Sulphur								
Total Sus. Solids				253				
TDS	500		196	276				
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.258					
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01					
Ion Balance								
Field Parameters								
Temperature (^{o}C)			11.2	11.3				
pH			7.5	7.8				
Conductivity (µS/cm)			430	490				

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 11A (deep)					
			Oct-91	Nov-98	Apr-99	Oct-99	Apr-00	Nov-01
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		146	137	137			132
Aluminum	0.1	0.075 (i)	0.11	<0.030	<0.030	<0.030	0.05	
N-NH3 (Ammonia)			<0.10	0.06	0.07	<0.02	0.11	
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.03	<0.010	0.03	NA	0.03	0.03
Beryllium		0.011	<0.010	<0.010	<0.010	<0.010	<0.002	
BOD			<1.0					
Boron	5	0.2(i)	<0.010	<0.010	<0.010	NA	<0.010	<0.050
Bromide			<0.50					
Cadmium	0.005	0.0002	<0.0020	<0.0050	<0.0050	<0.0050	<0.0050	
Calcium			47	52	53	51	52	48
Chloride	250		4	6	5	8	5	
Chromium	0.05	0.009	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	
Cobalt		0.0009(i)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	
COD			3	8	12			
Conductivity (µS/cm)			320	250	325	265	270	340
Copper	1	0.005	<0.0100	<0.0050	<0.0050	<0.0100	<0.0050	
DOC	5							
Fluoride	1.5		0.12					
Hardness (as CaCO3)	500		162	182	185	172	178	168
Iron	0.3	0.3	0.08	<0.01	<0.01	0.02	0.07	
Lead	0.01		0.002	<0.0020	<0.0020	<0.0020	<0.0010	
Magnesium			11	13	13	11	12	12
Manganese	0.05		<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Mercury	0.001	0.0002						
Molybdenum		0.04(i)	0.02	<0.010	<0.010	<0.010	<0.010	
Nickel			<0.010	<0.010	<0.010	<0.010	<0.010	
N-NO3 (Nitrate)	10		6.00	5.35	6.08	5.72	5.27	5.79
N-NO2 (Nitrite)	1		<0.10					
Organic Nitrogen	0.15		<0.10					
pH (pH units)	6.5-8.5		7.4	7.6	8	7.5	8.2	7.3
Phenols			<0.002					
Phosphate (as P)			0.2					
Phosphorus (total)			<0.100					
Potassium			2	1	1	1	<1.0	2
Silicon			5.9	5.1	6	6.3	5.02	
Silver		0.0001	<0.01000	<0.01000	<0.01000	<0.01000	<0.01000	
Sodium	200		4	2	4	4	4	
Strontium			0.1	0.095	0.094	0.104	0.089	0.069
Sulphate	500		23	20	20	26	17	21
Sulphur			11	7	6	6	6	
Total Sus. Solids								
TDS	500		168	212	200	208	204	228
Temperature (^{o}C)	15		9.4	6	5.5	7	6	7
Thallium		0.0003(i)	<0.05000	<0.20000	<0.20000	<0.20000	<0.20000	
Tin			<0.050	<0.050	<0.050	<0.050	<0.050	
Titanium			<0.010	<0.010	<0.010	<0.010	<0.010	
TKN			<0.10					
Vanadium		(0.006(i)	<0.0100	<0.0100	<0.0100	<0.0100	0.01	
Zinc	5	0.03 - 0.02(i)	<0.010	<0.010	<0.010	<0.010	<0.010	
Ion Balance								
Field Parameters								
Temperature (^{o}C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Groundwater Quality

			BH 11A (deep)					
			Oct-02	Oct-03	Oct-04	Nov-05	Sep-06	Aug-07
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		152	137	131	143	141	130
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)				0.03				0.06
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.04	0.03	0.03	0.03	0.03	
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.050	<0.050	0.01	<0.020	<0.020	<0.01
Bromide								
Cadmium	0.005	0.0002						
Calcium			50	51	50.9	51.7		51
Chloride	250			2				6
Chromium	0.05	0.009						
Cobalt		0.0009(i)						
COD				<5				<5
Conductivity (µS/cm)			380	300	355	290	220	357
Copper	1	0.005						0.002
DOC	5			<0.5	0.9	1	0.6	
Fluoride	1.5							
Hardness (as CaCO3)	500		173	176	175	178		176
Iron	0.3	0.3						<0.03
Lead	0.01							
Magnesium			12	12	11.9	12.1		12
Manganese	0.05		0.035	<0.010	0.011	<0.010		<0.01
Mercury	0.001	0.0002						
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		3.89	3.68	5.00	5.50	5.90	5.88
N-NO2 (Nitrite)	1			<0.10				<0.10
Organic Nitrogen	0.15							0.15
pH (pH units)	6.5-8.5		7.4	7.7	7	7.5	8.1	
Phenols				<0.001				<0.001
Phosphate (as P)								
Phosphorus (total)								
Potassium			2	2	<1.0	2	2	2
Silicon								
Silver		0.0001						
Sodium	200							4
Strontium			0.088	0.098	0.096	0.1	0.11	0.112
Sulphate	500		18	18	22.5	21	24	21
Sulphur								
Total Sus. Solids								
TDS	500		233	225	208	227	255	232
Temperature (^{o}C)	15		10	6.7	11	8.5	8.5	
Thallium		0.0003(i)						
Tin								
Titanium								
TKN								0.21
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						
Ion Balance								
Field Parameters								
Temperature (^{o}C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 11A (deep)					
			Oct-07	May-08	Oct-08	May-09	Oct-09	May-10
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		136	133	138	137	139	133
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.08	0.21	0.04	<0.02	0.03	0.03
Arsenic	0.01	0.1 - 0.005(i)				<0.001	<0.001	<0.001
Barium	1					0.03	0.03	0.03
Beryllium		0.011						
BOD						<1	<1	
Boron	5	0.2(i)	<0.01	<0.01	0.01	0.02	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002				<0.0001	<0.0001	<0.0001
Calcium			52	51	53	53	53	47
Chloride	250		6	6	6	6	7	7
Chromium	0.05	0.009				0.001	0.003	0.001
Cobalt		0.0009(i)						
COD			<5	<5	<5	10	7	5
Conductivity (µS/cm)			350	351	364	361	378	368
Copper	1	0.005	0.001	0.001	0.001	<0.001	<0.001	<0.001
DOC	5					1	1.2	1.2
Fluoride	1.5							
Hardness (as CaCO3)	500		178	176	181	177	181	162
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01					<0.001	<0.001	<0.001
Magnesium			12	12	12	11	12	11
Manganese	0.05		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	0.001	0.0002				<0.0001	<0.0001	<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		5.21	5.96	6.12	6.17	6.72	6.39
N-NO2 (Nitrite)	1		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15		0.29	0.34	0.19	<0.10	0.36	0.31
pH (pH units)	6.5-8.5					8.08	8.13	8.03
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)						1.29	5.15	1.39
Potassium			2	2	2	1	2	1
Silicon								
Silver		0.0001						
Sodium	200		4	4	2	3	5	3
Strontium			0.103	0.108	0.097	0.105	0.11	
Sulphate	500		19	20	20	20	19	21
Sulphur								
Total Sus. Solids						1480	22800	
TDS	500		228	228	237	235	246	239
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.37	0.55	0.23	<0.10	0.39	0.34
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)				<0.01	<0.01	<0.01
Ion Balance				1.03	1.00			
Field Parameters								
Temperature (^{o}C)				8.0	9.4	9.1	8.5	8.9
pH				8.71	lot Measure	7.3	8.71	9.1
Conductivity (µS/cm)				390	361	368	398	387

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inoganic
Groundwater Quality

			BH 11A (deep)					
			Oct-10	Jun-11	Nov-11	May-12	Oct-12	Apr-13
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		138	135	139	137	141	135
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.02	0.04	<0.02	<0.02	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001		<0.001		<0.001
Barium	1		0.03	0.04	0.03	0.04	0.04	0.03
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001		<0.0001		<0.0001
Calcium			57	49	51	56	58	52
Chloride	250		7	8	8	8	7	7
Chromium	0.05	0.009	0.002	0.004		0.012		0.001
Cobalt		0.0009(i)						
COD			13	10	8	<5	13	<5
Conductivity (µS/cm)			376	360	370	372	378	364
Copper	1	0.005	<0.001	0.002		<0.001		<0.001
DOC	5		1.2	1.8	0.9	2.7	0.8	0.8
Fluoride	1.5							
Hardness (as CaCO3)	500		191	171	176	188	197	178
Iron	0.3	0.3	<0.03	0.4	0.13	0.19	0.41	0.17
Lead	0.01		<0.001	<0.001		<0.001		<0.001
Magnesium			12	12	12	12	13	12
Manganese	0.05		<0.01	0.02		<0.01		0.01
Mercury	0.001	0.0002	<0.0001	<0.0001		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		6.72	7.11	5.80	6.26	6.39	6.34
N-NO2 (Nitrite)	1		<0.10	<0.10		<0.10		<0.10
Organic Nitrogen	0.15		<0.10	<0.15				
pH (pH units)	6.5-8.5		8.11	7.98	8.08	8.17	8.05	8.02
Phenols			<0.001	<0.001		<0.001		<0.001
Phosphate (as P)								
Phosphorus (total)			2.52	1.38		1.56		1.45
Potassium			2	1		2		2
Silicon								
Silver		0.0001						
Sodium	200		3	3	4	5	4	3
Strontium								
Sulphate	500		22	21	22	22	21	22
Sulphur								
Total Sus. Solids								
TDS	500		244	234	240	242	246	237
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.10	<0.10		<0.10		<0.10
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01		<0.01		<0.01
Ion Balance								
Field Parameters								
Temperature (^{o}C)			8.8	10.0	9.1	9.6	8.9	8.6
pH			7.52	8.3	8.0	8.2	7.5	7.9
Conductivity (µS/cm)			387	276	378	374	365	366

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 11A (deep)					
			Oct-13	Jul-14	Oct-14	Apr-15	Sep-15	Apr-16
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		135	124	126	128	134	136
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.02	<0.01	<0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)		0.0002		0.0002		0.0001
Barium	1		0.04	0.037	0.041	0.032	0.032	0.032
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.005	0.009	0.007	< 0.005	< 0.005
Bromide								
Cadmium	0.005	0.0002		<0.00002		< 0.00002		0.00003
Calcium			53	54.5	55.2	51.6	55.3	55.6
Chloride	250		7	6.6	6.3	6.2	5.8	6.6
Chromium	0.05	0.009		<0.002		< 0.002		< 0.002
Cobalt		0.0009(i)						
COD			<5		< 5	138	< 5	52
Conductivity (µS/cm)			369	372	355	364	357	365
Copper	1	0.005		0.0013		0.0004		0.0005
DOC	5		0.7	1.6	1.4	1.2	1.1	0.7
Fluoride	1.5							
Hardness (as CaCO3)	500		181	188	188	179	189	
Iron	0.3	0.3	0.18	0.169	0.363	0.194	< 0.005	< 0.005
Lead	0.01			0.00015		0.00004		< 0.00002
Magnesium			12	12.9	12.5	12.3	12.7	13.2
Manganese	0.05			0.012		0.016		< 0.001
Mercury	0.001	0.0002		<0.00002		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		6.7	7.2	7.1	6.8	7	7.2
N-NO2 (Nitrite)	1			<0.1		< 0.1		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.9	8.1	8.1	8.07	7.88	8.12
Phenols				<0.001		< 0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				3.08		4.77		1.32
Potassium				1.6		1.4		1.4
Silicon								
Silver		0.0001						
Sodium	200		4	4.2	4.1	4.1	4.5	4.4
Strontium								
Sulphate	500		19	23	22	22	22	22
Sulphur								
Total Sus. Solids								
TDS	500		240	209	209	205	236	217
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.09		0.26		0.27
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		0.005		< 0.005		< 0.005
Ion Balance				0.911	0.911	0.966		
Field Parameters								
Temperature (^{o}C)			9	12.8	10.6	8.5	9.7	7.6
pH			7.9	8.3	8	8.0	7.9	8
Conductivity (µS/cm)			346	326	349	394	328	352

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 11A (deep)					
			Aug-16	May-17	Aug-17	Apr-18	Sep-18	Jun-19
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		134	129	153	135	138	131
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			< 0.01	< 0.01	0.58	0.01	0.02	0.06
Arsenic	0.01	0.1 - 0.005(i)		0.0002		0.0002		0.1
Barium	1		0.039	0.028	0.032	0.032	0.031	0.018
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.01	0.011	0.008	0.007	< 0.005	< 0.005
Bromide								
Cadmium	0.005	0.0002		< 0.000014		< 0.000014		< 0.015
Calcium			57.5	50.7	52.6	54.7	55.9	42.9
Chloride	250		6.3	6.1	6	5.3	7	7.2
Chromium	0.05	0.009		< 0.002		< 0.002		0.0005
Cobalt		0.0009(i)						
COD			82	< 5	173	114	35	6
Conductivity (µS/cm)			362	370	377	366	375	315
Copper	1	0.005		0.0006		0.0003		0.0002
DOC	5		0.6	0.5	1	1.2	0.9	1.1
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.167	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01			< 0.00002		< 0.00002		< 0.02
Magnesium			13.7	12.1	12.9	13.1	13.4	11.4
Manganese	0.05			< 0.001		< 0.001		< 0.001
Mercury	0.001	0.0002		< 0.02		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.3	8.22	8.13	7.15	7.09	8.15
N-NO2 (Nitrite)	1			< 0.05		< 0.05		< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8	8.07	8.12	8.19	8.04	8.08
Phenols				< 0.001		< 0.001		< 0.002
Phosphate (as P)								
Phosphorus (total)				0.76		1.3		0.89
Potassium				1.2		1.6		1.4
Silicon								
Silver		0.0001						
Sodium	200		4.6	4.1	4.3	4.5	4.4	4.3
Strontium								
Sulphate	500		22	18	17	15	20	21
Sulphur								
Total Sus. Solids								
TDS	500		218	169	187	176	185	166
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.2		0.2		0.2
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		< 0.005		< 0.005
Ion Balance								1.16
Field Parameters								
Temperature (^{o}C)			11.1	9.1	10.7	7.3	10	9.7
pH			7.9	8.0	7.8	7.9	8	8
Conductivity (µS/cm)			396	366	370	324	291	400

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 11A (deep)					
			Oct-19	May-20	Sep-20	Apr-21	Aug-21	May-22
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		130	131	127	139	148	140
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.03	< 0.01	0.02	<0.010	<0.010	0.016
Arsenic	0.01	0.1 - 0.005(i)		0.0002		<0.001		<0.001
Barium	1		0.037	0.042	0.033	0.03	0.03	0.04
Beryllium		0.011						
BOD							3	
Boron	5	0.2(i)	0.009	0.008	0.008	0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002		< 0.000015		<0.0001		<0.0001
Calcium			55.9	59.6	55.8	53	59	54
Chloride	250		6.9	7.2	6.8	8	8	7
Chromium	0.05	0.009		0.001		<0.001		<0.001
Cobalt		0.0009(i)						
COD			58	< 5	114	<5	<5	<5
Conductivity (µS/cm)			355	382	382	388	383	293
Copper	1	0.005		0.002		0.003		<0.001
DOC	5		1.4	1	1.8	0.9	1.2	1.5
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.032	0.305	0.015	<0.03	<0.03	0.05
Lead	0.01			0.00017		<0.001		<0.001
Magnesium			13.7	14.1	13	12	14	12
Manganese	0.05		0.001	0.007		<0.01		<0.01
Mercury	0.001	0.0002		< 0.00002		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.46	7.96	8.2	7.33	7.41	9.56
N-NO2 (Nitrite)	1			< 0.05		<0.10		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.07	8.08	8.15	8.12	8	7.76
Phenols				< 0.002		<0.010		<0.001
Phosphate (as P)								
Phosphorus (total)				0.82		0.488		0.734
Potassium				1.7		1		1
Silicon								
Silver		0.0001						
Sodium	200		4.4	4.1	3.8	4	4	4
Strontium								
Sulphate	500		20	19	21	21	21	21
Sulphur								
Total Sus. Solids							1070	
TDS	500		181	185	178	252	249	190
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium				0.2				
TKN						<0.100		<0.100
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		<0.01		<0.01
Ion Balance			0.901					
Field Parameters								
Temperature (^{o}C)			10	8.2	10.5	9	10.7	9
pH			7.9	7.8	7.5	7.2	7.4	7.9
Conductivity (µS/cm)			390	378	402	400	391	390

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 11A (deep)				
			Aug-22	Jun-23	Oct-23	Jun-24	Oct-24
PARAMETER	ODWSOG	PWQO					
Alkalinity (as CaCO3)	30-500		149	149	153	140	150
Aluminum	0.1	0.075 (i)					
N-NH3 (Ammonia)			<0.020	<0.020	0.047	0.022	<0.020
Arsenic	0.01	0.1 - 0.005(i)		<0.001		<0.001	
Barium	1		0.04	0.05	0.04	0.03	0.04
Beryllium		0.011					
BOD			<1		1		2
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide							
Cadmium	0.005	0.0002		<0.0001		<0.0001	
Calcium			54	53	53	59	60
Chloride	250		6	6	6	7	7
Chromium	0.05	0.009		<0.001		<0.001	
Cobalt		0.0009(i)					
COD			5	<5	10	<5	<5
Conductivity (µS/cm)			294	295	291	299	296
Copper	1	0.005		0.002		0.001	
DOC	5		--	1.8	5.3	1.2	1.0
Fluoride	1.5						
Hardness (as CaCO3)	500						
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	0.06
Lead	0.01			<0.001		<0.001	
Magnesium			12	12	13	13	13
Manganese	0.05			<0.01		<0.01	
Mercury	0.001	0.0002		<0.0001		<0.0001	
Molybdenum		0.04(i)					
Nickel							
N-NO3 (Nitrate)	10		7.89	7.81	6.94	6.69	7.24
N-NO2 (Nitrite)	1			<0.10		<0.10	
Organic Nitrogen	0.15						
pH (pH units)	6.5-8.5		7.96	8.09	7.86	8	7.93
Phenols				<0.001		<0.001	
Phosphate (as P)							
Phosphorus (total)				1.15		1.78	
Potassium				1		1	
Silicon							
Silver		0.0001					
Sodium	200		4	4	4	4	4
Strontium							
Sulphate	500		22	20	22	24	22
Sulphur							
Total Sus. Solids			2670		1200		942
TDS	500		191	192	189	194	192
Temperature (^{o}C)	15						
Thallium		0.0003(i)					
Tin							
Titanium							
TKN				0.274		0.244	
Vanadium		(0.006(i)					
Zinc	5	0.03 - 0.02(i)		<0.01		<0.01	
Ion Balance							
Field Parameters							
Temperature (^{o}C)			10.6	9.3	9.4	9.2	9.9
pH			7.7	7.7	7.7	8	7.9
Conductivity (µS/cm)			390	440	460	410	440

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 11B (shallow)					
			Oct-91	01-Oct-91(2	Nov-98	Apr-99	Oct-99	Apr-00
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		152	150	141	139		
Aluminum	0.1	0.075 (i)	0.12	0.1	<0.030	<0.030	<0.030	0.16
N-NH3 (Ammonia)			0.23		<0.02	<0.02	<0.02	0.03
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.03	0.03	<0.010	0.03	NA	0.03
Beryllium		0.011	<0.010	<0.010	<0.010	<0.010	<0.010	<0.002
BOD			<1.0	<1.0				
Boron	5	0.2(i)	<0.010	0.05	<0.010	<0.010	NA	0.01
Bromide			<0.50	<0.50				
Cadmium	0.005	0.0002	<0.0020	0.00300	<0.0050	<0.0050	<0.0050	<0.0050
Calcium			57	63	52	52	50	51
Chloride	250		4	4	6	5	7	5
Chromium	0.05	0.009	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
Cobalt		0.0009(i)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100
COD			12	9	21	14		
Conductivity (µS/cm)			360	360	260	310	270	280
Copper	1	0.005	<0.0100	0.01	<0.0050	<0.0050	<0.0100	0.011
DOC	5							
Fluoride	1.5		0.15	0.15				
Hardness (as CaCO3)	500		187	210	182	182	173	176
Iron	0.3	0.3	0.09	0.08	<0.01	<0.01	<0.01	0.15
Lead	0.01		0.004	0.003	<0.0020	<0.0020	<0.0020	<0.0010
Magnesium			11	13	13	13	12	12
Manganese	0.05		<0.010	<0.010	<0.010	<0.010	<0.010	0.03
Mercury	0.001	0.0002						
Molybdenum		0.04(i)	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nickel			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
N-NO3 (Nitrate)	10		15.40	15.20	4.87	5.43	5.85	5.18
N-NO2 (Nitrite)	1		<0.10	<0.10				
Organic Nitrogen	0.15		0					
pH (pH units)	6.5-8.5		7.5	7.5	7.9	7.6	7.6	8.3
Phenols			<0.002	<0.002				
Phosphate (as P)			0.21	0.27				
Phosphorus (total)			<0.100	<0.100				
Potassium			1	1	1	2	1	2
Silicon			5.3	6.3	4.8	5.9	5.9	5.23
Silver		0.0001	<0.01000	<0.01000	<0.01000	<0.01000	<0.01000	<0.01000
Sodium	200		14	13	2	4	3	4
Strontium			0.12	0.12	0.093	0.09	0.101	0.089
Sulphate	500		67		21	21	26	20
Sulphur			16	14	7	7	6	7
Total Sus. Solids								
TDS	500		194	186	208	304	200	196
Temperature (^{o}C)	15		8.3	8.3	5	6	7	7
Thallium		0.0003(i)	<0.05000	<0.05000	<0.20000	<0.20000	<0.20000	<0.20000
Tin			<0.050	<0.050	<0.050	<0.050	<0.050	<0.050
Titanium			<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
TKN			0.23	0.24				
Vanadium		(0.006(i)	<0.0100	<0.0100	<0.0100	<0.0100	<0.0100	0.02
Zinc	5	0.03 - 0.02(i)	<0.010	0.02	<0.010	0.03	<0.010	0.01
Ion Balance								
Field Parameters								
Temperature (^{o}C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inoganic
Groundwater Quality

			BH 11B (shallow)					
			Dec-00	Nov-01	Oct-02	Oct-03	Oct-04	Nov-05
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		NS	135	139	136	112	141
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)						<0.02		
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1			0.02	0.03	0.03	0.028	0.03
Beryllium		0.011						
BOD								
Boron	5	0.2(i)		<0.050	<0.050	<0.050	0.01	<0.020
Bromide								
Cadmium	0.005	0.0002						
Calcium				47	47	52	41.6	51.3
Chloride	250					2		
Chromium	0.05	0.009						
Cobalt		0.0009(i)						
COD						<5		
Conductivity (µS/cm)				360	320	300	320	290
Copper	1	0.005						
DOC	5					<0.5	1.2	0.9
Fluoride	1.5							
Hardness (as CaCO3)	500			170	162	178	143	175
Iron	0.3	0.3						
Lead	0.01							
Magnesium				13	11	12	9.58	11.7
Manganese	0.05			<0.010	<0.005	<0.010	0.007	<0.010
Mercury	0.001	0.0002						
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10			5.32	5.67	3.92	5.10	5.40
N-NO2 (Nitrite)	1					<0.10		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5			7.1	7.3	7.6	6.9	7.5
Phenols						<0.001		
Phosphate (as P)								
Phosphorus (total)								
Potassium				1	1	2	2	2
Silicon								
Silver		0.0001						
Sodium	200							
Strontium				0.074	0.092	0.097	0.077	0.1
Sulphate	500			21	19	16	17.7	19
Sulphur								
Total Sus. Solids								
TDS	500			228	226	221	188	222
Temperature (^{o}C)	15			9	11	7.8	11	9.1
Thallium		0.0003(i)						
Tin								
Titanium								
TKN								
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						
Ion Balance								
Field Parameters								
Temperature (^{o}C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 11B (shallow)					
			Sep-06	Aug-07	Oct-07	May-08	Oct-08	May-09
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		145	131	136	136	140	140
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)				0.71	0.08	0.08	0.04	<0.02
Arsenic	0.01	0.1 - 0.005(i)						<0.001
Barium	1		0.03					0.03
Beryllium		0.011						
BOD								<1
Boron	5	0.2(i)	<0.020	<0.01	<0.01	<0.01	0.01	0.02
Bromide								
Cadmium	0.005	0.0002						<0.0001
Calcium				50	51	55	52	50
Chloride	250			6	8	6	7	6
Chromium	0.05	0.009						<0.001
Cobalt		0.0009(i)						
COD				<5	<5	<5	<5	10
Conductivity (µS/cm)			220	360	358	359	367	367
Copper	1	0.005		0.002	0.001	0.002	0.002	<0.001
DOC	5		0.9					0.9
Fluoride	1.5							
Hardness (as CaCO3)	500			169	176	190	174	169
Iron	0.3	0.3		<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01							<0.001
Magnesium				11	12	13	11	11
Manganese	0.05			<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	0.001	0.0002						<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		5.90	6.04	5.46	6.08	6.44	6.76
N-NO2 (Nitrite)	1			<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.1					8.05
Phenols				<0.001	<0.01	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)								0.64
Potassium			2	2	2	2	2	1
Silicon								
Silver		0.0001						
Sodium	200			4	4	4	3	2
Strontium			0.11	0.095	0.104	0.105	0.110	0.104
Sulphate	500		23	20	17	19	19	19
Sulphur								
Total Sus. Solids								1060
TDS	500		265	234	233	233	239	239
Temperature (^{o}C)	15		9.1					
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.83	<0.10	0.12	0.24	<0.10
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						<0.01
Ion Balance						1.09	0.96	
Field Parameters								
Temperature (^{o}C)						8	8.6	9.4
pH						9.1	lot Measure	7.4
Conductivity (µS/cm)						371	371	377

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 11B (shallow)					
			Oct-09	May-10	Oct-10	Jun-11	Nov-11	May-12
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		142	137	141	136	141	140
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.07	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001	<0.001	<0.001		<0.001
Barium	1		0.03	0.03	0.03	0.04	0.03	0.03
Beryllium		0.011						
BOD			<1					
Boron	5	0.2(i)	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Calcium			51	48	54	50	55	52
Chloride	250		7	6	7	7	7	8
Chromium	0.05	0.009	0.001	0.002	0.001	0.012		<0.001
Cobalt		0.0009(i)						
COD			13	10	5	35	15	<5
Conductivity (µS/cm)			378	369	373	363	369	372
Copper	1	0.005	<0.001	<0.001	<0.001	0.001		<0.001
DOC	5		1.2	1.2	1.1	2		1.9
Fluoride	1.5							
Hardness (as CaCO3)	500		176	164	183	173	190	174
Iron	0.3	0.3	<0.03	<0.03	0.05	0.27	0.1	0.1
Lead	0.01		<0.001	<0.001	<0.001	<0.001		<0.001
Magnesium			12	11	12	12	13	11
Manganese	0.05		<0.01	<0.01	<0.01	<0.01		0.02
Mercury	0.001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		6.57	6.53	6.87	6.92	6.00	6.24
N-NO2 (Nitrite)	1		<0.10	<0.10	<0.10	<0.10		<0.10
Organic Nitrogen	0.15			<0.10	<0.10	<0.15		
pH (pH units)	6.5-8.5		8.24	8.04	8.15	8.12	8.06	8.16
Phenols			<0.001	<0.001	<0.001	0.001		<0.001
Phosphate (as P)								
Phosphorus (total)			0.6	0.53	2.09	3.17		0.48
Potassium			1	1	1	1		1
Silicon								
Silver		0.0001						
Sodium	200		2	2	3	3	4	4
Strontium			0.108					
Sulphate	500		18	18	19	20	21	20
Sulphur								
Total Sus. Solids			1620					
TDS	500		246	240	242	236	240	242
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.10	<0.10	<0.10	<0.10		<0.10
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01	<0.01	<0.01		<0.01
Ion Balance								
Field Parameters								
Temperature (^{o}C)			8.9	8.6	9.8	9.1	9.6	9.3
pH			8.59	8.78	7.47	8.1	8.0	8.1
Conductivity (µS/cm)			377	377	386	278	376	376

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 11B (shallow)					
			Oct-12	Apr-13	Oct-13	Jul-14	Oct-14	Apr-15
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		141	138	136	126	128	131
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.02	<0.02	<0.02	<0.01	<0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)		<0.001		0.0002		0.0002
Barium	1		0.04	0.03	0.03	0.033	0.034	0.03
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.005	0.009	0.006
Bromide								
Cadmium	0.005	0.0002		<0.0001		<0.00002		< 0.00002
Calcium			58	52	51	55.3	55.6	51.7
Chloride	250		7	7	7	6.6	6.3	6.8
Chromium	0.05	0.009		0.001		<0.002		< 0.002
Cobalt		0.0009(i)						
COD			8	<5	<5	<5	< 5	46
Conductivity (µS/cm)			373	365	366	366	356	353
Copper	1	0.005		<0.001		0.0006		< 0.0001
DOC	5		0.8	0.9	0.8	1.6	1.4	1
Fluoride	1.5							
Hardness (as CaCO3)	500		193	178	176	190	188	178
Iron	0.3	0.3	0.15	0.11	0.11	0.028	0.105	0.125
Lead	0.01			<0.001		0.00007		0.00016
Magnesium			12	12	12	12.8	12.3	12.1
Manganese	0.05			0.01		0.01		0.01
Mercury	0.001	0.0002		<0.0001		<0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		6.62	6.99	6.85	7.2	7.1	7
N-NO2 (Nitrite)	1			<0.10		<0.1		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.01	8.07	7.79	8.1	8.09	8.06
Phenols				<0.001		<0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				1.61		1		1.11
Potassium				1		1.4		1.3
Silicon								
Silver		0.0001						
Sodium	200		3	3	4	4	4	4
Strontium								
Sulphate	500		19	20	18	20	20	20
Sulphur								
Total Sus. Solids								
TDS	500		242	237	231	208	208	205
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				<0.10		0.08		0.11
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.005		< 0.005
Ion Balance						0.904	0.918	0.981
Field Parameters								
Temperature (^{o}C)			9	8.9	9.2	10.6	9.6	8.5
pH			7.5	7.8	7.9	8.1	8	8.0
Conductivity (µS/cm)			365	372	349	333	348	404

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 11B (shallow)					
			Sep-15	Apr-16	Aug-16	May-17	Aug-17	Apr-18
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		135	137	135	132	132	137
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			< 0.01	< 0.01	< 0.01	< 0.01	0.04	0.01
Arsenic	0.01	0.1 - 0.005(i)		< 0.0001		0.0002		< 0.0001
Barium	1		0.033	0.033	0.035	0.029	0.033	0.034
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	< 0.005	< 0.005	0.01	0.012	0.006	0.007
Bromide								
Cadmium	0.005	0.0002		< 0.00002		0.00002		< 0.000014
Calcium			55.3	56.7	56.9	51.3	52.4	56.8
Chloride	250		6.7	6.6	6.3	6	6.3	5.7
Chromium	0.05	0.009		< 0.002		< 0.002		< 0.002
Cobalt		0.0009(i)						
COD			< 5	7	33	< 5	11	< 5
Conductivity (µS/cm)			356	362	361	372	381	372
Copper	1	0.005		0.0005		0.0009		0.0005
DOC	5		1.1	0.6	0.6	0.6	0.7	1.5
Fluoride	1.5							
Hardness (as CaCO3)	500		189					
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01			0.00003		< 0.00002		< 0.00002
Magnesium			12.5	13.1	13.2	11.9	12.7	13.2
Manganese	0.05			< 0.001		< 0.001		< 0.001
Mercury	0.001	0.0002		< 0.00002		< 0.02		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.1	6.9	7.3	8.31	8.13	7.66
N-NO2 (Nitrite)	1			< 0.1		< 0.05		< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.88	8.11	7.99	8.07	8.12	8.16
Phenols				< 0.001		< 0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				0.23		0.47		0.35
Potassium				1.3		1		1.6
Silicon								
Silver		0.0001						
Sodium	200		4.1	4.4	4.4	4	4.3	4.6
Strontium								
Sulphate	500		20	19	20	16	17	15
Sulphur								
Total Sus. Solids								
TDS	500		235	215	216	170	173	179
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.12		1.1		0.2
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		0.007		< 0.005		0.006
Ion Balance								
Field Parameters								
Temperature (^{o}C)			10	7.1	10.5	8.8	10.0	7.6
pH			7.8	8	7.9	7.4	7.9	7.8
Conductivity (µS/cm)			333	341	395	371	369	330

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 11B (shallow)					
			Sep-18	Jun-19	Oct-19	May-20	Sep-20	Apr-21
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		138	134	135	136	131	145
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.02	0.08	0.02	< 0.01	0.01	<0.010
Arsenic	0.01	0.1 - 0.005(i)		0.1		0.0001		<0.001
Barium	1		0.033	0.019	0.044	0.038	0.037	0.03
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	< 0.005	< 0.005	0.009	0.007	0.008	0.01
Bromide								
Cadmium	0.005	0.0002		< 0.015		< 0.000015		<0.0001
Calcium			56.5	43.8	58.4	59.8	57	55
Chloride	250		7.2	7.3	6.9	7.5	6.8	8
Chromium	0.05	0.009		0.0004		< 0.001		<0.001
Cobalt		0.0009(i)						
COD			5	7	5	5	44	<5
Conductivity (µS/cm)			381	319	364	387	388	391
Copper	1	0.005		0.0002		0.0012		0.006
DOC	5		1	1.1	1.8	1.5	2.2	1
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	0.005	< 0.005	0.084	<0.03
Lead	0.01			< 0.02		0.00004		<0.001
Magnesium			14	11.7	13.8	14	12.9	12
Manganese	0.05			< 0.001	< 0.001	< 0.001		<0.01
Mercury	0.001	0.0002		< 0.00002		< 0.00002		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.69	8.25	7.78	8.03	8.25	7.31
N-NO2 (Nitrite)	1			< 0.05		< 0.05		<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.02	8.05	8.13	8.07	8.12	8.1
Phenols				< 0.002		< 0.002		<0.010
Phosphate (as P)								
Phosphorus (total)				1.2		0.45		0.209
Potassium				1.4		1.5		1
Silicon								
Silver		0.0001						
Sodium	200		4.7	4.1	4.1	3.8	3.6	4
Strontium								
Sulphate	500		18	20	19	17	19	17
Sulphur								
Total Sus. Solids								
TDS	500		185	168	185	185	179	254
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium						0.3		
TKN				0.2				0.112
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		< 0.005		<0.01
Ion Balance				1.15	0.904			
Field Parameters								
Temperature (^{o}C)			10	9.3	10.1	8	9.7	8.3
pH			8	7.9	7.9	7.9	7.5	7.2
Conductivity (µS/cm)			303	403	397	385	406	405

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 11B (shallow)					
			Aug-21	May-22	Aug-22	Jun-23	Oct-23	Jun-24
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		154	147	154	158	199	209
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.010	0.093	<0.020	<0.020	0.023	<0.02
Arsenic	0.01	0.1 - 0.005(i)		<0.001		<0.001		<0.001
Barium	1		0.03	0.04	0.04	0.05	0.03	0.05
Beryllium		0.011						
BOD			3		<1		3	
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002		<0.0001		<0.0001		<0.0001
Calcium			60	56	55	55	62	79
Chloride	250		8	7	6	6	6	8
Chromium	0.05	0.009		0.001		<0.001		<0.001
Cobalt		0.0009(i)						
COD			15	<5	28	<5	21	<5
Conductivity (µS/cm)			389	294	295	300	434	493
Copper	1	0.005		0.001		0.002		0.001
DOC	5		1.3	1.6	--	2	5.3	1.1
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	<0.03	<0.03	0.08	<0.03	<0.03
Lead	0.01			<0.001		<0.001		<0.001
Magnesium			14	13	12	13	15	18
Manganese	0.05			<0.01		<0.01		<0.01
Mercury	0.001	0.0002		<0.0001		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.42	9.37	8.28	7.90	7.09	7.07
N-NO2 (Nitrite)	1					<0.10		<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8	7.82	7.96	8.02	8.01	7.74
Phenols				<0.001		<0.001		<0.001
Phosphate (as P)								
Phosphorus (total)				0.506		0.794		3.22
Potassium				2		1		2
Silicon								
Silver		0.0001						
Sodium	200		4	4	3	4	5	4
Strontium								
Sulphate	500		18	17	19	18	19	20
Sulphur								
Total Sus. Solids			656		990		1610	
TDS	500		253	191	192	195	282	320
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.148		0.205		0.315
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.01		<0.01
Ion Balance								
Field Parameters								
Temperature (^{o}C)			10.7	9.1	10.1	9.7	9.5	10
pH			7.4	8	8.45	7.3	7.7	8
Conductivity (µS/cm)			390	800	390	460	510	580

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
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BH 11B (shallow)
Oct-24

PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		192					
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.020					
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.05					
Beryllium		0.011						
BOD			1					
Boron	5	0.2(i)	<0.01					
Bromide								
Cadmium	0.005	0.0002						
Calcium			73					
Chloride	250		7					
Chromium	0.05	0.009						
Cobalt		0.0009(i)						
COD			<5					
Conductivity (µS/cm)			445					
Copper	1	0.005						
DOC	5		1.1					
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03					
Lead	0.01							
Magnesium			16					
Manganese	0.05							
Mercury	0.001	0.0002						
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.37					
N-NO2 (Nitrite)	1							
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.89					
Phenols								
Phosphate (as P)								
Phosphorus (total)								
Potassium								
Silicon								
Silver		0.0001						
Sodium	200		4					
Strontium								
Sulphate	500		19					
Sulphur								
Total Sus. Solids			903					
TDS	500		289					
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN								
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						
Ion Balance								
Field Parameters								
Temperature (^{o}C)			10.7					
pH			7.7					
Conductivity (µS/cm)			510					

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 12					
			Dec-00	Nov-01	Oct-02	Oct-03	Oct-04	Nov-05
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		498	453	458	494	462	
Aluminum	0.1	0.075 (i)		<0.050	<0.010	0.07	<0.005	
N-NH3 (Ammonia)				0.45	1.05	1.12	2.58	
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.27	0.19	0.3	0.32	0.352	
Beryllium		0.011		<0.002	<0.001	<0.001	<0.001	
BOD								
Boron	5	0.2(i)	0.16	0.16	0.18	0.18	0.274	
Bromide								
Cadmium	0.005	0.0002		<0.0001	<0.0001	<0.0001	<0.0001	
Calcium			145	141	167	184	159	
Chloride	250		25	45	50	57	43.4	
Chromium	0.05	0.009		<0.0010	0.01	<0.0010	<0.0050	
Cobalt		0.0009(i)		0.0108	0.0116	0.0119	0.0115	
COD			46	6	18	16	18	
Conductivity (µS/cm)			1000	1000	850	800	1080	900
Copper	1	0.005		0.006	0.005	0.006	0.0055	
DOC	5			4.7	4.8	4	5.6	
Fluoride	1.5							
Hardness (as CaCO3)	500		491	469	538	596	535	
Iron	0.3	0.3	0.02	<0.01	<0.01	0.01	<0.03	
Lead	0.01			<0.0010	<0.0010	<0.0010	0.001	
Magnesium			32	29	30	34	34.2	
Manganese	0.05		2.69	1.62	1.93	2.13	1.78	
Mercury	0.001	0.0002						
Molybdenum		0.04(i)		<0.010	<0.005	<0.005	<0.001	
Nickel				<0.010	<0.005	0.021	0.017	
N-NO3 (Nitrate)	10		3.19	8.57	10.7	9.73	12.8	
N-NO2 (Nitrite)	1			<0.10	<0.10	<0.10	<0.20	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.3	7.2	6.9	7.2	7	7.1
Phenols				<0.001	<0.001	<0.001	<0.001	
Phosphate (as P)								
Phosphorus (total)								
Potassium			11	11	12	13	14.5	
Silicon				6.64	6	8	7.56	
Silver		0.0001		<0.00010	<0.00010	<0.00010	<0.00010	
Sodium	200		24	23	24	25	26.2	
Strontium			0.473	0.337	0.433	0.495	0.465	
Sulphate	500		13	31	34	36	72.4	
Sulphur								
Total Sus. Solids								
TDS	500		760	656	708	754	728	
Temperature (^{o}C)	15		8	8	10	7.8	14	10.2
Thallium		0.0003(i)		<0.00100	<0.00100	<0.00100	<0.00005	
Tin				<0.010	<0.010	<0.010	<0.001	
Titanium				<0.010	<0.010	<0.010	<0.005	
TKN								
Vanadium		(0.006(i)		<0.0010	0.003	<0.0010	0.001	
Zinc	5	0.03 - 0.02(i)		<0.010	<0.005	<0.010	<0.005	
Ion Balance								
Field Parameters								
Temperature (^{o}C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 12					
			Dec-05	Sep-06	Aug-07	Oct-07	May-08	Oct-08
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		566	556	360	405	351	411
Aluminum	0.1	0.075 (i)	<0.100	<0.005				
N-NH3 (Ammonia)				3.06	2.83	3.1	2.4	0.96
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.43	0.46				
Beryllium		0.011	<0.005	<0.001				
BOD								
Boron	5	0.2(i)	0.32	0.31	0.18	0.2	0.15	0.3
Bromide								
Cadmium	0.005	0.0002	<0.0050	0.00010				
Calcium			177	180	131	146	133	144
Chloride	250			43	36	35	32	30
Chromium	0.05	0.009	<0.0100	<0.0050				
Cobalt		0.0009(i)	<0.0200	0.013				
COD				23	<5	<5	<5	5
Conductivity (µS/cm)				1000	1060	1140	1030	1100
Copper	1	0.005	<0.0200	0.008	0.004	0.006	0.004	0.004
DOC	5		5	5.1				
Fluoride	1.5							
Hardness (as CaCO3)	500		625	669	485	543	507	551
Iron	0.3	0.3	<0.02	0.06	<0.03	<0.03	<0.03	<0.03
Lead	0.01		<0.0500	<0.0005				
Magnesium			45.2	54	39	44	43	47
Manganese	0.05		1.69	1.8	1.04	1.12	1.15	1.2
Mercury	0.001	0.0002						
Molybdenum		0.04(i)	<0.020	0.001				
Nickel			<0.050	0.018				
N-NO3 (Nitrate)	10		16	14	20.1	20.7	24.4	21.4
N-NO2 (Nitrite)	1			<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15				0.16	<0.10	0.43	0.44
pH (pH units)	6.5-8.5			6.9				
Phenols				<0.001	<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)								
Potassium			25	31	22	21	26	24
Silicon			8.8	9.1				
Silver		0.0001	<0.01000	<0.00010				
Sodium	200		29.4	34	16	19	15	18
Strontium			0.5	0.55	0.431	0.442	0.367	0.352
Sulphate	500		71	97	73	98	56	74
Sulphur								
Total Sus. Solids								
TDS	500		810	848	689	741	670	715
Temperature (^{o}C)	15			9.1				
Thallium		0.0003(i)		<0.00005				
Tin			<0.200	<0.001				
Titanium			<0.010	<0.005				
TKN					2.99	3.08	2.83	1.4
Vanadium		(0.006(i)	<0.0100	<0.0010				
Zinc	5	0.03 - 0.02(i)	<0.010	0.02				
Ion Balance							1.06	1.03
Field Parameters								
Temperature (^{o}C)							9.0	10.0
pH							8.53	lot Measure
Conductivity (µS/cm)							1040	1085

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 12					
			May-09	Oct-09	May-10	Oct-10	May-11	Nov-11
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		412	423	399	400	463	470
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			1.28	0.98	0.6	0.85	0.84	1.38
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001	<0.001	<0.001	<0.001	
Barium	1		0.29	0.27	0.24	0.26	0.28	0.3
Beryllium		0.011						
BOD			<1	<1				
Boron	5	0.2(i)	0.15	0.18	0.19	0.13	0.16	0.18
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium			126	130	136	141	146	157
Chloride	250		26	28	23	23	27	22
Chromium	0.05	0.009	0.002	0.004	0.002	0.002	<0.005	
Cobalt		0.0009(i)						
COD			18	13	15	20	15	8
Conductivity (µS/cm)			1040	1060	966	948	1040	1060
Copper	1	0.005	0.004	0.004	0.003	0.003	0.004	
DOC	5		3.2	3.6	3.3	1.2	4.2	3.3
Fluoride	1.5							
Hardness (as CaCO3)	500		485	487	490	498	527	537
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	0.12	0.06
Lead	0.01		<0.001	<0.001	<0.001	<0.001	<0.001	
Magnesium			42	40	37	36	40	36
Manganese	0.05		1.24	1.31	1.23	1.10	1.3	
Mercury	0.001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		15.7	16.3	15.9	15.5	11.8	10.6
N-NO2 (Nitrite)	1		<0.10	<0.10	<0.10	<0.10	<0.10	
Organic Nitrogen	0.15		0.23	0.63	0.9	0.01	0.44	
pH (pH units)	6.5-8.5		7.69	7.83	7.52	7.71	8.08	7.58
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	
Phosphate (as P)								
Phosphorus (total)			0.08	0.35	0.28	0.47	3.82	
Potassium			20	19	15	18	17	
Silicon								
Silver		0.0001						
Sodium	200		11	15	11	12	15	15
Strontium			0.39	0.406				
Sulphate	500		45	62	41	40	34	57
Sulphur								
Total Sus. Solids			244	706				
TDS	500		676	689	628	616	676	689
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			1.51	1.61	0.96	0.86	1.28	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01		<0.01	<0.01	<0.01	
Ion Balance								
Field Parameters								
Temperature (^{o}C)			12.5	8.4	10.6	9.5	10.1	8.8
pH			6.8	7.9	8.78	7.08	7.2	7
Conductivity (µS/cm)			1019	1100	1002	976	688	1068

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 12					
			May-12	Oct-12	Apr-13	Oct-13	Jul-14	Oct-14
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		396	409	387	444	366	407
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.89	1.46	1.34	1.23	1.03	0.88
Arsenic	0.01	0.1 - 0.005(i)	<0.001		<0.001		0.0002	
Barium	1		0.23	0.24	0.19	0.22	0.139	0.205
Beryllium		0.011						
BOD			<1	<1	<1	<1		
Boron	5	0.2(i)	0.11	0.12	0.09	0.11	0.064	0.105
Bromide								
Cadmium	0.005	0.0002	<0.0001		<0.0001		0.00006	
Calcium			133	138	123	147	127	157
Chloride	250		22	20	17	23	19.4	22.2
Chromium	0.05	0.009	0.002		<0.001		<0.002	
Cobalt		0.0009(i)						
COD			12	5	<5	<5	5	8
Conductivity (µS/cm)			912	930	868	996	904	975
Copper	1	0.005	0.003		0.003		0.0028	
DOC	5		4.8	3.3	2.6	2.8	4.2	6.8
Fluoride	1.5							
Hardness (as CaCO3)	500		453	466	420	496	433	519
Iron	0.3	0.3	0.04	<0.03	0.18	<0.03	0.008	0.058
Lead	0.01		<0.001		<0.001		0.00124	
Magnesium			30	30	28	32	28.7	31.6
Manganese	0.05		1.04		1.13		0.867	
Mercury	0.001	0.0002	<0.0001		<0.0001		<0.00002	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		12.5	12.8	11.1	11.2	13.1	12.8
N-NO2 (Nitrite)	1		<0.10		<0.10		<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.71	7.46	7.54	7.41	7.89	7.88
Phenols			<0.001		<0.001		<0.001	
Phosphate (as P)								
Phosphorus (total)			0.45		0.47		0.52	
Potassium			15		11		9.4	
Silicon								
Silver		0.0001						
Sodium	200		12	12	8	12	10.1	14.1
Strontium								
Sulphate	500		29	28	24	30	26	34
Sulphur								
Total Sus. Solids			2020	320	382	182		
TDS	500		593	604	564	647	501	570
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			1.41		1.49		1.49	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01		<0.01		<0.005	
Ion Balance							0.984	0.917
Field Parameters								
Temperature (^{o}C)			10.2	9.2	9.8	10.4	10.1	9.5
pH			7.2	6.9	7	6.9	7.4	7.1
Conductivity (µS/cm)			895	899	859	933	771	935

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 12					
			Apr-15	Apr-15 BH 19 QA/QC	Sep-15	Sep-15 BH 20 QA/QC	Apr-16	Aug-16
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		393	390	377	380	385	414
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.88	0.88	0.85	0.85	1.11	1.25
Arsenic	0.01	0.1 - 0.005(i)	0.0001	0.0002			< 0.0001	
Barium	1		0.194	0.193	0.177	0.176	0.199	0.245
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.094	0.093	0.095	0.096	0.091	0.202
Bromide								
Cadmium	0.005	0.0002	0.00005	0.00006			0.00006	
Calcium			152	152	140	139	151	181
Chloride	250		18.3	18.3	20.9	20.9	23.6	45.2
Chromium	0.05	0.009	< 0.002	< 0.002			< 0.002	
Cobalt		0.0009(i)						
COD			< 5	5	< 5	9	6	9
Conductivity (µS/cm)			873	880	883	884	933	1120
Copper	1	0.005	0.002	0.003			0.0024	
DOC	5		6.5	7.2	3.1	3	2.5	3.1
Fluoride	1.5							
Hardness (as CaCO3)	500		501	501	460	458		
Iron	0.3	0.3	0.02	0.013	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01		< 0.00002	< 0.00002			0.00004	
Magnesium			30.2	30.2	27.5	27.6	30.1	38.2
Manganese	0.05		1.14	1.14			1.08	
Mercury	0.001	0.0002	< 0.00002	< 0.00002			< 0.00002	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		14.3	14.3	16.6	16.7	18.6	19.8
N-NO2 (Nitrite)	1		< 0.1	< 0.1			< 0.1	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.58	7.57	7.72	7.64	7.83	7.74
Phenols			< 0.001	< 0.001			< 0.001	
Phosphate (as P)								
Phosphorus (total)			0.38	0.49			0.19	
Potassium			8.9	8.9			8.8	
Silicon								
Silver		0.0001						
Sodium	200		12.2	12.2	11.8	11.7	12.8	25
Strontium								
Sulphate	500		31	31	29	29	30	87
Sulphur								
Total Sus. Solids								
TDS	500		554	552	600	601	571	724
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			1.3	1.28			1.56	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005	< 0.005			0.012	
Ion Balance			0.916	0.911	0.992	1		
Field Parameters								
Temperature (^{o}C)			9.8		9.3		10.5	10.3
pH			7.3		7.2		7.2	6.9
Conductivity (µS/cm)			974		770		882	1216

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
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			BH 12					
			May-17	Aug-17	Apr-18	Apr-18 BH 20 QA/QC	Sep-18	Jun-19
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		468	427	394	370	416	579
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			2.44	1.67	5.92	5.86	4.1	3.37
Arsenic	0.01	0.1 - 0.005(i)	0.0006		< 0.0001	0.0001		0.0001
Barium	1		0.254	0.253	0.276	0.279	0.303	0.35
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.183	0.402	0.187	0.188	0.254	0.276
Bromide								
Cadmium	0.005	0.0002	0.00009		0.00006	0.00006		0.00009
Calcium			188	163	137	140	154	193
Chloride	250		95.3	76.8	61.8	61.9	87.4	90.3
Chromium	0.05	0.009	< 0.002		< 0.002	< 0.002		< 0.001
Cobalt		0.0009(i)						
COD			16	12	16	12	11	20
Conductivity (µS/cm)			1340	1330	1160	1170	1310	1402
Copper	1	0.005	0.005		0.0038	0.0034		0.0066
DOC	5		5.3	4.6	5.4	5.7	5.3	8.6
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	< 0.005	0.009	< 0.005
Lead	0.01		< 0.00002		< 0.00002	< 0.00002		0.00005
Magnesium			40.2	39.2	41.1	41.3	51.1	56.2
Manganese	0.05		1.19		0.687	0.693		1.06
Mercury	0.001	0.0002	< 0.02		< 0.00002	< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		10.6	14	23.1	23.2	20.4	9.6
N-NO2 (Nitrite)	1		< 0.05		< 0.05	< 0.05		< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.8	7.77	7.83	7.81	7.74	7.74
Phenols			0.005		< 0.001	< 0.001		< 0.002
Phosphate (as P)								
Phosphorus (total)			0.71		0.62	0.62		0.19
Potassium			11		24.8	24.6		25.9
Silicon								
Silver		0.0001						
Sodium	200		22.2	65.6	33.4	33.4	59	41.7
Strontium								
Sulphate	500		55	72	47	47	69	53
Sulphur								
Total Sus. Solids								
TDS	500		694	688	590	579	702	813
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			3.3		6	6.1		4.5
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005		< 0.005	< 0.005		< 0.005
Ion Balance								0.935
Field Parameters								
Temperature (^{o}C)			9.8	10.3	10.0		10.1	10.1
pH			6.8	7.1	7.1		7.7	6.7
Conductivity (µS/cm)			1296	1278	1004		821	1482

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
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			BH 12					
			Oct-19	Oct-19 BH 19 QA/QC	May-20	QA/QC	Sep-20	Apr-21
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		425	430	385	383	462	452
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.39	3.8	5.82	5.76	6.48	7.16
Arsenic	0.01	0.1 - 0.005(i)			< 0.0001	< 0.0001		<0.001
Barium	1		0.239	0.261	0.313	0.313	0.341	0.3
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.357	0.37	0.313	0.314	0.369	0.33
Bromide								
Cadmium	0.005	0.0002			0.00006	0.00007		<0.0001
Calcium			109	115	149	150	166	144
Chloride	250		58.4	58.4	76.5	76.5	113	101
Chromium	0.05	0.009			< 0.001	< 0.001		<0.001
Cobalt		0.0009(i)						
COD			13	19	18	14	22	13
Conductivity (µS/cm)			994	1033	1140	1150	1420	1310
Copper	1	0.005			0.0067	0.0057		0.009
DOC	5		6.7	6	4.3	5.2	6.2	4.2
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	0.009	0.054	0.04
Lead	0.01				0.00006	< 0.00004		<0.001
Magnesium			35.8	36.8	36.7	36.1	40.8	31
Manganese	0.05		0.09	0.123	0.856	0.862		1.18
Mercury	0.001	0.0002			< 0.00002	< 0.00002		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		11.9	11.9	14.4	14.4	10.5	12.7
N-NO2 (Nitrite)	1				0.07	0.07		<0.50
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.96	7.95	7.79	7.76	7.48	7.62
Phenols					< 0.002	< 0.002		<0.010
Phosphate (as P)								
Phosphorus (total)					0.09	0.17		0.325
Potassium					27.5	26.9		20
Silicon								
Silver		0.0001						
Sodium	200		37	38.6	35.8	35.1	71.4	50
Strontium								
Sulphate	500		64	64	32	33	81	42
Sulphur								
Total Sus. Solids								
TDS	500		584	601	597	595	776	852
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium					6.2	6.2		
TKN								6.85
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)			< 0.005	< 0.005		<0.01
Ion Balance			1.16	1.09				
Field Parameters								
Temperature (^{o}C)			9.3	9.3	9.5	9.4		8.7
pH			7.1	7.1	7.1	6.6		7.2
Conductivity (µS/cm)			1205	1205	1106	1487		452

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 12					
			Sep-21	Sep-21	May-22	May-22	Aug-22	Jun-23
PARAMETER	ODWSOG	PWQO		QA/QC		QA/QC		
Alkalinity (as CaCO3)	30-500		491	494	403	401	439	407
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			5.82	5.87	2.59	2.57	2.24	1.56
Arsenic	0.01	0.1 - 0.005(i)			<0.001	<0.001		<0.001
Barium	1		0.26	0.27	0.24	0.24	0.22	0.21
Beryllium		0.011						
BOD			3	4			<1	
Boron	5	0.2(i)	0.27	0.31	0.12	0.13	0.14	0.09
Bromide								
Cadmium	0.005	0.0002			<0.0001	<0.0001		<0.0001
Calcium			156	160	139	139	140	141
Chloride	250			96	56	57	63	43
Chromium	0.05	0.009			<0.001	<0.001		<0.001
Cobalt		0.0009(i)						
COD			<5	7	<5	<5	<5	<5
Conductivity (µS/cm)			1310	1320	979	991	1070	960
Copper	1	0.005			0.003	0.003		0.004
DOC	5		5.3	5.6	3.9	4.2	2.1	3.8
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01				<0.001	<0.001		<0.001
Magnesium			34	35	29	29	28	28
Manganese	0.05				1.36	1.35		1.55
Mercury	0.001	0.0002			<0.0001	<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		12.8	12.6	18.1	18.0	16.1	16.2
N-NO2 (Nitrite)	1				<0.10	<0.10		<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.4	7.45	7.16	7.09	7.48	7.53
Phenols					<0.001	<0.001		<0.001
Phosphate (as P)								
Phosphorus (total)					0.243	0.502		1.05
Potassium					14	14		10
Silicon								
Silver		0.0001						
Sodium	200		69	70	23	22	41	19
Strontium								
Sulphate	500		45	45	30	30	35	27
Sulphur								
Total Sus. Solids			131	163			249	
TDS	500		852	858	636	644	696	624
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN					3.32	3.38		1.63
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)			<0.01	<0.01		<0.01
Ion Balance								
Field Parameters								
Temperature (^{o}C)			9.8		10.1		10.6	11.1
pH			6.7		7.2		7.48	7.3
Conductivity (µS/cm)			1313		1146		1100	1080

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 12					
			Oct-23	Jun-24	Oct-24			
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		462	368	382			
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			1.11	1	0.776			
Arsenic	0.01	0.1 - 0.005(i)		<0.001				
Barium	1		0.20	0.16	0.16			
Beryllium		0.011						
BOD			3		2			
Boron	5	0.2(i)	0.18	0.09	0.08			
Bromide								
Cadmium	0.005	0.0002		<0.0001				
Calcium			153	142	146			
Chloride	250		33	42	43			
Chromium	0.05	0.009		<0.001				
Cobalt		0.0009(i)						
COD			49	6	6			
Conductivity (µS/cm)			991	900	933			
Copper	1	0.005		0.003				
DOC	5		11.3	1.9	2.9			
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	<0.03	<0.03			
Lead	0.01			<0.001				
Magnesium			31	27	28			
Manganese	0.05			1.29				
Mercury	0.001	0.0002		<0.0001				
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		12.3	13.7	15.4			
N-NO2 (Nitrite)	1			<0.10				
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.22	7.4	7.73			
Phenols				<0.001				
Phosphate (as P)								
Phosphorus (total)				0.729				
Potassium				8				
Silicon								
Silver		0.0001						
Sodium	200		24	21	25			
Strontium								
Sulphate	500		46	29	25			
Sulphur								
Total Sus. Solids			691		231			
TDS	500		644	585	606			
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				1.18				
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01				
Ion Balance								
Field Parameters								
Temperature (^{o}C)			5.3	11.6	10.2			
pH			7.4	7	7.2			
Conductivity (µS/cm)			1140	940	1040			

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 13A (deep)					
			Oct-02	Oct-03	Oct-04	Nov-05	Sep-06	Aug-07
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		198	194	218	246	234	287
Aluminum	0.1	0.075 (i)	<0.010					
N-NH3 (Ammonia)			<0.02	<0.02				0.14
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.05	0.05	0.062	0.07	0.06	
Beryllium		0.011	<0.001					
BOD								
Boron	5	0.2(i)	<0.050	<0.050	0.02	0.02	0.03	0.05
Bromide								
Cadmium	0.005	0.0002	<0.0001					
Calcium			67	74	88.4	97.4		117
Chloride	250		11	14				22
Chromium	0.05	0.009	0.005					
Cobalt		0.0009(i)	0.0003					
COD			<5	<5				<5
Conductivity (µS/cm)			475	435	571	450	370	803
Copper	1	0.005	<0.0010					0.002
DOC	5		1.3	<0.5	1	1.1	0.9	
Fluoride	1.5							
Hardness (as CaCO3)	500		228	249	303	333		401
Iron	0.3	0.3	<0.01					<0.03
Lead	0.01		<0.0010					
Magnesium			15	16	20.4	22.3		27
Manganese	0.05		0.009	<0.010	<0.005	<0.010		<0.01
Mercury	0.001	0.0002						
Molybdenum		0.04(i)	<0.005					
Nickel			<0.005					
N-NO3 (Nitrate)	10		8.08	8.2	11.4	16	12	17.9
N-NO2 (Nitrite)	1		<0.10	<0.10				<0.10
Organic Nitrogen	0.15							0.33
pH (pH units)	6.5-8.5		7.2	7.7	7.5	7	7.6	
Phenols			<0.001	<0.001				<0.001
Phosphate (as P)								
Phosphorus (total)								
Potassium			3	2	1	2	2	2
Silicon			5.1					
Silver		0.0001	<0.00010					
Sodium	200		7					9
Strontium			0.138	0.137	0.163	0.19	0.18	0.249
Sulphate	500		18	17	23.3	25	21	36
Sulphur								
Total Sus. Solids								
TDS	500		318	321	372	293	403	522
Temperature (^{o}C)	15		8	7.5	14	7.8	8.3	
Thallium		0.0003(i)	<0.00100					
Tin			<0.010					
Titanium			<0.010					
TKN								0.47
Vanadium		(0.006(i)	0.002					
Zinc	5	0.03 - 0.02(i)	<0.005					
Ion Balance								
Field Parameters								
Temperature (^{o}C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 13A (deep)					
			Oct-07	May-08	Oct-08	May-09	Oct-09	May-10
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		293	274	296	249	261	217
Aluminum	0.1	0.075 (i)						<0.02
N-NH3 (Ammonia)			0.05	0.04	0.03	<0.02	0.07	
Arsenic	0.01	0.1 - 0.005(i)				<0.001	<0.001	<0.001
Barium	1					0.07	0.09	0.06
Beryllium		0.011						
BOD						2	<1	
Boron	5	0.2(i)	0.05	0.07	0.09	0.06	0.05	0.05
Bromide								
Cadmium	0.005	0.0002				<0.0001	<0.0001	<0.0001
Calcium			119	116	132	101	93	76
Chloride	250		23	19	23	14	16	11
Chromium	0.05	0.009				<0.001	0.001	0.001
Cobalt		0.0009(i)						
COD			<5	<5	5	15	<5	5
Conductivity (µS/cm)			795	759	826	651	703	561
Copper	1	0.005	0.003	0.004	0.002	0.001	0.001	<0.001
DOC	5					1.2	1.6	1.4
Fluoride	1.5							
Hardness (as CaCO3)	500		406	395	451	325	317	258
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01					<0.001	<0.001	<0.001
Magnesium			27	26	30	18	21	17
Manganese	0.05		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	0.001	0.0002				<0.0001	<0.0001	<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		17.1	16.8	20.4	12.4	17.1	9.7
N-NO2 (Nitrite)	1		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15		0.27	<0.10	0.17	<0.10	0.3	≤ 0.13
pH (pH units)	6.5-8.5					7.85	8.02	7.91
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)						0.64	0.91	0.45
Potassium			2	2	2	1	2	2
Silicon								
Silver		0.0001						
Sodium	200		10	11	13	5	7	8
Strontium			0.25	0.238	0.248	0.208	0.234	
Sulphate	500		37	38	40	30	28	25
Sulphur								
Total Sus. Solids						389	409	
TDS	500		517	493	537	423	457	365
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.32	<0.10	0.20	<0.10	0.37	0.13
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)				<0.01	<0.01	<0.01
Ion Balance				1.06	1.09			
Field Parameters								
Temperature (°C)				9.4	9.1	10.3	8.6	10.3
pH				9.81	lot Measure	7.3	9.2	8.97
Conductivity (µS/cm)				724	816	649	695	551

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 13A (deep)					
			Oct-10	Jun-11	Nov-11	May-12	Oct-12	Apr-13
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		223	198	238	214	226	213
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001		<0.001		<0.001
Barium	1		0.06	0.05	0.07	0.06	0.07	0.06
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.03	0.02	0.02	0.02	0.02	0.02
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001		<0.0001		<0.0001
Calcium			88	70	83	75	87	75
Chloride	250			10	13	10	11	10
Chromium	0.05	0.009	0.002	0.005		0.011		<0.001
Cobalt		0.0009(i)						
COD				<5	5	<5	<5	<5
Conductivity (µS/cm)				493	576	527	555	519
Copper	1	0.005	0.001	<0.001		<0.001		<0.001
DOC	5			1.2	1.2	1.4	1.4	1.1
Fluoride	1.5							
Hardness (as CaCO3)	500		296	244	288	256	294	260
Iron	0.3	0.3	<0.03	0.12	0.1	0.03	0.05	0.05
Lead	0.01		<0.001	<0.001		<0.001		<0.001
Magnesium			19	17	20	17	19	18
Manganese	0.05		<0.01	0.01		<0.01		0.02
Mercury	0.001	0.0002	<0.0001	<0.0001		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10			8.41	9.2	8.13	9.22	8.90
N-NO2 (Nitrite)	1			<0.10		<0.10		<0.10
Organic Nitrogen	0.15			<0.15				
pH (pH units)	6.5-8.5			8.01	7.91	7.95	8.02	7.97
Phenols				<0.001		<0.001		<0.001
Phosphate (as P)								
Phosphorus (total)			0.29	6.51		0.24		2.96
Potassium			2	2		2		2
Silicon								
Silver		0.0001						
Sodium	200		5	5	6	4	5	4
Strontium								
Sulphate	500			20	22	22	20	20
Sulphur								
Total Sus. Solids								
TDS	500			320	374	343	361	337
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				<0.10		<0.10		0.15
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01		<0.01		<0.01
Ion Balance								
Field Parameters								
Temperature (^{o}C)			8.4	9.0	8.4	9.8	8.6	9.1
pH			8.45	7.8	7.6	7.6	7.3	7.6
Conductivity (µS/cm)			563	367	570	525	540	517

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
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			BH 13A (deep)					
			Oct-13	Jul-14	Oct-14	Apr-15	Sep-15	Apr-16
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		198	186	183	186	203	191
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.04	<0.001	<0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)		<0.0001		< 0.0001		< 0.0001
Barium	1		0.06	0.056	0.057	0.059	0.06	0.053
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.02	0.012	0.02	0.02	0.015	0.014
Bromide								
Cadmium	0.005	0.0002		<0.00002		< 0.00002		< 0.00002
Calcium			72	73.4	73.8	80.2	77.6	71.7
Chloride	250		10	8.6	9.2	9.1	10.1	8.8
Chromium	0.05	0.009		<0.002		< 0.002		< 0.002
Cobalt		0.0009(i)						
COD			<5	<5	< 5	< 5	< 5	< 5
Conductivity (µS/cm)			492	503	489	476	491	475
Copper	1	0.005		0.001		< 0.002		0.0009
DOC	5		0.9	1.7	1.9	2.8	1.1	0.6
Fluoride	1.5							
Hardness (as CaCO3)	500		248	256	256	275	269	
Iron	0.3	0.3	0.05	0.026	0.049	0.019	< 0.005	< 0.005
Lead	0.01			0.00011		0.00002		< 0.00002
Magnesium			17	17.9	17.8	18.6	18.6	17.3
Manganese	0.05			0.01		0.006		< 0.001
Mercury	0.001	0.0002		<0.00002		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		9.21	8.9	9.7	9.1	9.9	9.6
N-NO2 (Nitrite)	1			<0.1		< 0.1		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.79	8.12	8.08	8	7.9	8.12
Phenols				<0.001		< 0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				1.27		0.47		0.24
Potassium				2.2		2.4		2.1
Silicon								
Silver		0.0001						
Sodium	200		5	5.2	5	5.3	5.4	5.3
Strontium								
Sulphate	500		17	18	19	18	19	19
Sulphur								
Total Sus. Solids								
TDS	500		320	277	280	286	330	282
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.07		0.09		0.11
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.005		< 0.005		< 0.005
Ion Balance				0.918	0.923	0.861		
Field Parameters								
Temperature (^{o}C)			8.6	9.3	9.3	9.3	8.8	8.9
pH			7.5	8	7.7	7.8	7.7	7.7
Conductivity (µS/cm)			472	435	471	525	434	461

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 13A (deep)					
			Sep-16	May-17	Aug-17	Apr-18	Sep-18	Jun-19
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		212	245	296	398	320	246
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			< 0.01	< 0.01	< 0.01	0.02	< 0.01	0.04
Arsenic	0.01	0.1 - 0.005(i)		< 0.0001		< 0.0001		< 0.1
Barium	1		0.056	0.064	0.108	0.142	0.124	0.074
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	< 0.005	0.011	0.034	0.131	0.141	0.067
Bromide								
Cadmium	0.005	0.0002		0.00001		0.00004		< 0.015
Calcium			72.3	80.3	127	150	127	95.3
Chloride	250		13.1	18	27.1	38.8	34.4	29.5
Chromium	0.05	0.009		0.003		< 0.002		< 0.0002
Cobalt		0.0009(i)						
COD			< 5	< 5	< 5	8	8	< 5
Conductivity (µS/cm)			540	671	840	1030	947	650
Copper	1	0.005		0.0008		0.0026		0.001
DOC	5		1.1	1	1.4	4.8	3.2	2.3
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01			< 0.00002		0.00008		< 0.02
Magnesium			19	21.8	32.2	38.9	35.3	26.6
Manganese	0.05			< 0.001		0.001		< 0.001
Mercury	0.001	0.0002		< 0.02		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		13.2	15.3	17.6	15.2	19.9	18.6
N-NO2 (Nitrite)	1			< 0.05		< 0.05		< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.92	7.97	8	7.85	7.82	7.96
Phenols				< 0.001		< 0.001		< 0.002
Phosphate (as P)								
Phosphorus (total)				0.71		0.87		0.44
Potassium				2		3.8		3.2
Silicon								
Silver		0.0001						
Sodium	200		5	6.6	7.6	24.4	25.6	13.7
Strontium								
Sulphate	500		20	22	27	36	35	34
Sulphur								
Total Sus. Solids								
TDS	500		317	298	402	531	453	350
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.2		0.4		0.3
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		0.006		< 0.005
Ion Balance								1.02
Field Parameters								
Temperature (^{o}C)			8.8	9.5	9.3	8.5	9.6	9.8
pH			7.3	7.5	7.4	7.1	7.7	7.7
Conductivity (µS/cm)			607	673	809	894	642	815

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 13A (deep)					
			Oct-19	May-20	Sep-20	Apr-21	Sep-21	May-22
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		299	293	268	252	270	215
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.01	< 0.01	< 0.01	<0.010	<0.010	0.023
Arsenic	0.01	0.1 - 0.005(i)		< 0.0001		<0.001		<0.001
Barium	1		0.127	0.126	0.105	0.09	0.08	0.08
Beryllium		0.011						
BOD							2	
Boron	5	0.2(i)	0.085	0.086	0.09	0.09	0.06	0.05
Bromide								
Cadmium	0.005	0.0002		< 0.000015		<0.0001		<0.0001
Calcium			129	132	113	90	100	75
Chloride	250		35.3	31	28.9	24	21	16
Chromium	0.05	0.009		< 0.001		<0.001		<0.001
Cobalt		0.0009(i)						
COD			6	15	13	<5	<5	<5
Conductivity (µS/cm)			801	842	793	675	666	524
Copper	1	0.005		0.0027		0.005		0.002
DOC	5		3.2	3	3.5	1.7	1.6	2.1
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	0.016	<0.03	0.03	<0.03
Lead	0.01			0.00004		<0.001		<0.001
Magnesium			33.1	32.9	27.7	20	24	18
Manganese	0.05		< 0.001	< 0.001		<0.01		<0.01
Mercury	0.001	0.0002		< 0.00002		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		15.3	15.5	16.6	11.2	12.2	12.2
N-NO2 (Nitrite)	1			< 0.05		<0.10		<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.02	7.99	7.95	7.91	7.76	7.65
Phenols				< 0.002		<0.010		<0.001
Phosphate (as P)								
Phosphorus (total)				0.56		0.658		4.06
Potassium				3.7		3		3
Silicon								
Silver		0.0001						
Sodium	200		15.5	14.8	14.4	11	12	10
Strontium								
Sulphate	500		33	35	34	26	23	18
Sulphur								
Total Sus. Solids							290	
TDS	500		429	426	382	439	433	341
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium				0.3				
TKN						0.379		0.16
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		<0.01		<0.01
Ion Balance			0.881					
Field Parameters								
Temperature (^{o}C)			8.9	8.6	8.7	8.3	9.1	9.1
pH			7.4	7	7	7.2	7	6.8
Conductivity (µS/cm)			869	847	830	701	675	617

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 13A (deep)				
			Aug-22	Jun-23	Oct-23	Jun-24	Oct-24
PARAMETER	ODWSOG	PWQO					
Alkalinity (as CaCO3)	30-500		228	216	231	214	183
Aluminum	0.1	0.075 (i)					
N-NH3 (Ammonia)			<0.020	<0.020	<0.020	0.021	<0.020
Arsenic	0.01	0.1 - 0.005(i)		<0.001		<0.001	
Barium	1		0.07	0.08	0.08	0.07	0.06
Beryllium		0.011					
BOD			1		1		1
Boron	5	0.2(i)	0.05	0.03	0.03	0.03	0.03
Bromide							
Cadmium	0.005	0.0002		<0.0001		<0.0001	
Calcium			27	71	79	80	71
Chloride	250		12	13	14	12	11
Chromium	0.05	0.009		<0.001		<0.001	
Cobalt		0.0009(i)					
COD			13	<5	31	<5	<5
Conductivity (µS/cm)			551	513	560	524	463
Copper	1	0.005		0.002		0.001	
DOC	5		--	2.5	6.0	1.0	1.2
Fluoride	1.5						
Hardness (as CaCO3)	500						
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	
Lead	0.01			<0.001		<0.001	
Magnesium			7	17	19	19	17
Manganese	0.05			<0.01		<0.01	
Mercury	0.001	0.0002		<0.0001		<0.0001	
Molybdenum		0.04(i)					
Nickel							
N-NO3 (Nitrate)	10		10.8	10.2	11.2	9.31	9.91
N-NO2 (Nitrite)	1			<0.10		<0.10	
Organic Nitrogen	0.15						
pH (pH units)	6.5-8.5		7.72	7.89	7.9	7.77	7.83
Phenols				<0.001		<0.001	
Phosphate (as P)							
Phosphorus (total)				0.353		0.89	
Potassium				2		2	
Silicon							
Silver		0.0001					
Sodium	200		4	8	8	7	6
Strontium							
Sulphate	500		17	17	18	19	16
Sulphur							
Total Sus. Solids			351		219		289
TDS	500		358	333	364	341	301
Temperature (^{o}C)	15						
Thallium		0.0003(i)					
Tin							
Titanium							
TKN				0.364		0.331	
Vanadium		(0.006(i)					
Zinc	5	0.03 - 0.02(i)		<0.01		<0.01	
Ion Balance							
Field Parameters							
Temperature (^{o}C)			10.9	9	8.6	9.6	10.4
pH			7.7	7.5	7.3	7.6	7.3
Conductivity (µS/cm)			550	590	660	590	810

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 13B (shallow)					
			Oct-02	Oct-03	Oct-04	Nov-05	Sep-06	Aug-07
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		211	61	74	113	68	66
Aluminum	0.1	0.075 (i)	0.86	0.01	0.012	0.007	0.008	
N-NH3 (Ammonia)			0.04	0.18	<0.03	<0.05	0.23	0.07
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.07	<0.010	0.007	0.012	0.007	
Beryllium		0.011	<0.001	<0.001	<0.001	<0.001	<0.001	
BOD								
Boron	5	0.2(i)	<0.050	<0.010	<0.005	0.016	<0.010	<0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Calcium			70	17	21.9	39	13	20
Chloride	250		14	2	1	6	2	1
Chromium	0.05	0.009	0.005	<0.0010	<0.0050	<0.0050	<0.0050	
Cobalt		0.0009(i)	0.0063	<0.0002	<0.0001	<0.0005	<0.0005	
COD			<5	<5	10	14	7	<5
Conductivity (µS/cm)			520	120	170	220	65	146
Copper	1	0.005	0.011	0.009	<0.0005	0.002	<0.0010	0.002
DOC	5		0.8	<0.5	1.1	0.8	0.7	
Fluoride	1.5							
Hardness (as CaCO3)	500		239	59	70	130	46	66
Iron	0.3	0.3	2.26	0.01	<0.03	<0.05		<0.03
Lead	0.01		0.004	<0.0010	0.0009	<0.0005	<0.0005	
Magnesium			16	4	3.77	8.2	3.3	4
Manganese	0.05		0.138	<0.005	<0.005	<0.002	0.002	<0.01
Mercury	0.001	0.0002						
Molybdenum		0.04(i)	<0.005	<0.005	<0.001	<0.001	<0.001	
Nickel			<0.005	<0.005	<0.001	<0.001	<0.001	
N-NO3 (Nitrate)	10		6.73	<0.10	<0.20	1.9	<0.10	<0.10
N-NO2 (Nitrite)	1		<0.10	<0.10	<0.20	<0.01	<0.01	<0.10
Organic Nitrogen	0.15							0.11
pH (pH units)	6.5-8.5		7.5	7.7	7.4	7.1	7.7	
Phenols			<0.001	<0.001	<0.001		<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)								
Potassium			2	1	0.7		0.9	1
Silicon			7.1	9.5	9	8.5	9.7	
Silver		0.0001	<0.00010	<0.00010	<0.00010	<0.00050	<0.00010	
Sodium	200		18	4	3.9	7	4.9	4
Strontium			0.244	0.059	0.057	0.1	0.059	0.068
Sulphate	500		35	15	8.2	13	9	7
Sulphur								
Total Sus. Solids								
TDS	500		352	93	112	287	102	95
Temperature (^{o}C)	15		9	7.4	13	8.3	8.9	
Thallium		0.0003(i)	<0.00100	<0.00100	<0.00005	<0.00005	<0.00005	
Tin			<0.010	<0.010	<0.001	<0.001	<0.001	
Titanium			0.02	<0.010	<0.005	<0.005	<0.005	
TKN								0.18
Vanadium		(0.006(i)	0.005	<0.0010	0.0005	<0.0010	<0.0010	
Zinc	5	0.03 - 0.02(i)	<0.005	<0.010	<0.005	<0.005	0.014	
Ion Balance								
Field Parameters								
Temperature (^{o}C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 13B (shallow)					
			Oct-07	Oct-08	May-09	Oct-09	May-10	Oct-10
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		83	76	50	59	45	71
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.02	0.04	<0.02	0.03	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)			<0.001	<0.001	<0.001	<0.001
Barium	1				<0.01	<0.01	<0.01	<0.01
Beryllium		0.011						
BOD					1	<1		
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002			<0.0001	<0.0001	<0.0001	<0.0001
Calcium			25	20	12	12	12	22
Chloride	250		3	2	2	2	<1	3
Chromium	0.05	0.009			<0.001	0.001	0.002	0.001
Cobalt		0.0009(i)						
COD			<5	<5	15	<5	10	25
Conductivity (µS/cm)			171	166	115	132	106	166
Copper	1	0.005	0.001	<0.001	<0.001	<0.001	<0.001	0.002
DOC	5				0.9	1	1.2	1.2
Fluoride	1.5							
Hardness (as CaCO3)	500		83	70	42	42	42	75
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01				<0.001	<0.001	<0.001	<0.001
Magnesium			5	5	3	3	3	5
Manganese	0.05		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	0.001	0.0002			<0.0001	<0.0001	<0.0001	<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		<0.10	0.38	0.27	<0.10	<0.10	1.02
N-NO2 (Nitrite)	1		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15		≤ 0.19	0.06	<0.10	0.19	<0.10	≤ 0.23
pH (pH units)	6.5-8.5				7.54	7.8	7.52	7.74
Phenols			<0.001	<0.001	<0.001	<0.001		<0.001
Phosphate (as P)								
Phosphorus (total)					3.93	3.53	5.05	2.75
Potassium			<1	<1	<1	<1	<1	<1
Silicon								
Silver		0.0001						
Sodium	200		4	<2	<2	<2	3	3
Strontium			0.081	0.071	0.055	0.068		
Sulphate	500		8	7	7	7	8	8
Sulphur								
Total Sus. Solids					2730	3650		
TDS	500		111	108	75	86	69	108
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.19	0.1	<0.10	0.22	<0.10	0.23
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)			<0.01	<0.01	<0.01	<0.01
Ion Balance				N/A - LC				
Field Parameters								
Temperature (°C)				8.7	8.5	8.6	10.6	8.7
pH				Not Measure	7.6	8.96	9.28	8.61
Conductivity (µS/cm)				150	104	157	970	167.5

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

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			BH 13B (shallow)					
			Jun-11	Nov-11	May-12	Oct-12	Apr-13	Oct-13
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		59	182	63	240	106	244
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.02	<0.02	<0.02	0.03	<0.02	0.03
Arsenic	0.01	0.1 - 0.005(i)	<0.001		<0.001		<0.001	
Barium	1		0.01	0.02	0.01	0.04	0.01	0.03
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.01	0.02	<0.01	0.03	0.01	0.03
Bromide								
Cadmium	0.005	0.0002	<0.0001		<0.0001		<0.0001	
Calcium			11	64	18	97	35	91
Chloride	250		1	10	2	14	4	15
Chromium	0.05	0.009	0.005		0.002		<0.001	
Cobalt		0.0009(i)						
COD			30	15	<5	<5	<5	<5
Conductivity (µS/cm)			127	444	153	606	252	612
Copper	1	0.005	0.002		0.001		0.001	
DOC	5		1.4	1.2	0.9	1.5	0.9	1.4
Fluoride	1.5							
Hardness (as CaCO3)	500		40	225	61	327	120	312
Iron	0.3	0.3	0.42	0.15	0.22	0.17	0.20	0.11
Lead	0.01		<0.001		<0.001		<0.001	
Magnesium			3	16	4	21	8	21
Manganese	0.05		<0.01		0.03		0.02	
Mercury	0.001	0.0002	<0.0001		<0.0001		<0.0001	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		<0.10	5.7	0.85	10.6	2.52	10.9
N-NO2 (Nitrite)	1		<0.10		<0.10		<0.10	
Organic Nitrogen	0.15		<0.15					
pH (pH units)	6.5-8.5		7.79	7.92	7.2	7.97	7.90	7.77
Phenols			<0.001		<0.001		<0.001	
Phosphate (as P)								
Phosphorus (total)			26.7		5.09		4.24	
Potassium			<1		<1		<1	
Silicon								
Silver		0.0001						
Sodium	200		2	7	4	6	3	6
Strontium								
Sulphate	500		7	22	9	24	10	24
Sulphur								
Total Sus. Solids								
TDS	500		83	289	99	394	164	398
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.10		<0.10		<0.10	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01		<0.01		<0.01	
Ion Balance								
Field Parameters								
Temperature (^{o}C)			7.8	8.8	8.2	9.0	8.2	9.2
pH			8.0	7.7	7.3	7.2	7.7	7.7
Conductivity (µS/cm)			77	449	143	575	241	559

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 13B (shallow)					
			Jul-14	Oct-14	Apr-15	Sep-15	Apr-16	Sep-16
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		51	188	54	159	52	121
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.001	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)	<0.0001		< 0.0001		< 0.0001	
Barium	1		0.009	0.025	0.01	0.02	0.006	0.012
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.005	0.022	< 0.005	0.012	< 0.005	< 0.005
Bromide								
Cadmium	0.005	0.0002	<0.00002		< 0.00002		< 0.00002	
Calcium			13.9	73.1	14.3	58	14	32.8
Chloride	250		0.8	9.9	1	7.8	1.4	4.6
Chromium	0.05	0.009	<0.002		< 0.002		0.006	
Cobalt		0.0009(i)						
COD			149	< 5	74	45	30	57
Conductivity (µS/cm)			115	484	115	382	113	270
Copper	1	0.005	0.0014		< 0.002		0.0002	
DOC	5		1.1	2	1.3	1	1.9	0.8
Fluoride	1.5							
Hardness (as CaCO3)	500		49	256	50	203		
Iron	0.3	0.3	0.165	0.091	0.23	< 0.005	< 0.005	< 0.005
Lead	0.01		0.00022		0.00019		< 0.00002	
Magnesium			3.47	18.2	3.52	14.5	3.54	9.22
Manganese	0.05		0.015		0.014		< 0.001	
Mercury	0.001	0.0002	<0.00002		< 0.00002		< 0.00002	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		0.1	8.4	0.2	5.5	0.4	2.9
N-NO2 (Nitrite)	1		0.1		< 0.1		< 0.1	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.7	8.07	7.46	7.76	7.61	7.61
Phenols			<0.001		< 0.001		< 0.001	
Phosphate (as P)								
Phosphorus (total)			7.15		4.03		3.53	
Potassium			0.7		0.7		0.5	
Silicon								
Silver		0.0001						
Sodium	200		2.9	5.5	3.4	5	3.3	3.9
Strontium								
Sulphate	500		6	20	5	16	6	10
Sulphur								
Total Sus. Solids								
TDS	500		59	278	61.5	252	61.1	146
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.2		0.45		0.14	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.005		< 0.005		< 0.005	
Ion Balance			1.03	0.933	1.04			
Field Parameters								
Temperature (^{o}C)			8.4	9.2	8.3	8.5	8.2	8.4
pH			8.4	7.6	7.7	7.9	7.4	7.6
Conductivity (µS/cm)			96	453	111	355	105	300

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 13B (shallow)					
			May-17	Aug-17	Apr-18	Sep-18	Jun-19	Oct-19
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		46	45	49	111	45	175
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			< 0.01	0.41	0.17	< 0.01	0.07	0.02
Arsenic	0.01	0.1 - 0.005(i)	< 0.0001		< 0.0001		< 0.1	
Barium	1		0.005	0.005	0.005	0.014	0.001	0.023
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.006	0.007	0.005	0.014	< 0.005	0.043
Bromide								
Cadmium	0.005	0.0002	< 0.000014		< 0.000014		< 0.015	
Calcium			11.8	11.4	12.1	42.2	8.38	65.1
Chloride	250		3	0.8	0.7	9.6	0.9	13.9
Chromium	0.05	0.009	< 0.002		< 0.002		0.0009	
Cobalt		0.0009(i)						
COD			70	< 5	6	< 5	63	44
Conductivity (µS/cm)			104	101	105	302	88	443
Copper	1	0.005	0.0005		0.0002		< 0.0001	
DOC	5		0.9	0.9	1	1.1	0.8	2
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	0.011	< 0.005	< 0.005	< 0.005	0.017
Lead	0.01		< 0.00002		< 0.00002		< 0.02	
Magnesium			3.1	3.11	3.36	12.7	2.54	18
Manganese	0.05		< 0.001		< 0.001		< 0.001	< 0.001
Mercury	0.001	0.0002	< 0.02		< 0.00002		< 0.00002	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		< 0.05	< 0.05	< 0.05	2.2	0.05	5.38
N-NO2 (Nitrite)	1		< 0.05		< 0.05		< 0.05	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.49	7.52	7.41	7.92	7.63	8.16
Phenols			0.003		< 0.001		< 0.002	
Phosphate (as P)								
Phosphorus (total)			4.11		3.14		17.7	
Potassium			0.4		0.5		0.5	
Silicon								
Silver		0.0001						
Sodium	200		3.1	2.9	3.9	4.5	3	8.5
Strontium								
Sulphate	500		6	4	4	12	4	15
Sulphur								
Total Sus. Solids								
TDS	500		55.1	50	54	149	47	227
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			< 1		0.3		0.5	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005		< 0.005		< 0.005	
Ion Balance							1.32	0.893
Field Parameters								
Temperature (^{o}C)			7.9	8.5	7.8	8.7	8	8.6
pH			8.0	7.1	7.9	7.9	8	7.7
Conductivity (µS/cm)			94	89	90	227	96	475

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 13B (shallow)					
			May-20	Sep-20	Apr-21	Sep-21	May-22	Aug-22
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		45	205	59	246	80	276
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.01	0.01	<0.010	<0.010	0.018	<0.020
Arsenic	0.01	0.1 - 0.005(i)	< 0.0001		<0.001		<0.001	
Barium	1		0.006	0.027	<0.01	0.03	0.01	0.03
Beryllium		0.011						
BOD						2		<1
Boron	5	0.2(i)	< 0.005	0.067	0.01	0.06	0.01	0.07
Bromide								
Cadmium	0.005	0.0002	< 0.000015		<0.0001		<0.0001	
Calcium			13.1	78.8	16	86	24	79
Chloride	250		1.9	20.8	3	22	8	22
Chromium	0.05	0.009	0.001		0.001		<0.001	
Cobalt		0.0009(i)						
COD			7	42	5	57	<5	28
Conductivity (µS/cm)			109	566	139	582	164	648
Copper	1	0.005	0.0004		0.015		<0.001	
DOC	5		0.3	3.3	0.9	1.9	1.6	--
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	0.05	0.2	<0.03	<0.03
Lead	0.01		0.00002		<0.001		<0.001	
Magnesium			3.54	21.7	4	23	6	20
Manganese	0.05		< 0.001		<0.01		<0.01	
Mercury	0.001	0.0002	< 0.00002		<0.0001		<0.0001	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		0.3	7.86	0.43	6.55	1.67	8.77
N-NO2 (Nitrite)	1		< 0.05		<0.10		<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.48	8.01	7.69	7.73	7.35	7.64
Phenols			< 0.002		<0.010		<0.001	
Phosphate (as P)								
Phosphorus (total)			3.17		3		3.44	
Potassium			0.7		<1		<1	
Silicon								
Silver		0.0001						
Sodium	200		2.9	11	3	10	4	9
Strontium								
Sulphate	500		5	23	5	22	7	26
Sulphur								
Total Sus. Solids						154		3660
TDS	500		54	279	90	378	107	421
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium			0.4					
TKN					<0.100		0.133	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005		<0.01		<0.01	
Ion Balance								
Field Parameters								
Temperature (^{o}C)			7.1	8.2	7.3	8.6	8	9.2
pH			7.9	7	7.7	7.1	7	7.8
Conductivity (µS/cm)			104	576	125	597	218	620

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 13B (shallow)					
			Jun-23	Oct-23	Jun-24	Oct-24		
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		60	207	56	204		
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.020	0.028	0.098	<0.020		
Arsenic	0.01	0.1 - 0.005(i)	<0.001		<0.001			
Barium	1		0.02	0.03	<0.01	0.03		
Beryllium		0.011						
BOD				1		<1		
Boron	5	0.2(i)	0.01	0.06	<0.01	0.05		
Bromide								
Cadmium	0.005	0.0002	<0.0001		<0.0001			
Calcium			14	67	18	76		
Chloride	250		1	14	3	14		
Chromium	0.05	0.009	<0.001		<0.001			
Cobalt		0.0009(i)						
COD			<5	20	<5	<5		
Conductivity (µS/cm)			111	496	115	502		
Copper	1	0.005	0.002		0.001			
DOC	5		1.9	5.9	1.0	1.4		
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	<0.03	<0.03			
Lead	0.01		<0.001		<0.001			
Magnesium			4	17	5	18		
Manganese	0.05		<0.01		<0.01			
Mercury	0.001	0.0002	<0.0001		<0.0001			
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		0.24	7.03	0.92	8.49		
N-NO2 (Nitrite)	1		<0.10		<0.10			
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.54	7.77	7.21	7.79		
Phenols			<0.001		<0.001			
Phosphate (as P)								
Phosphorus (total)			4.4		5.9			
Potassium			<1		<1			
Silicon								
Silver		0.0001						
Sodium	200		3	9	4	8		
Strontium								
Sulphate	500		4	17	5	16		
Sulphur								
Total Sus. Solids				7820		795		
TDS	500		72	322	75	326		
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.216		0.204			
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01		<0.01			
Ion Balance								
Field Parameters								
Temperature (^{o}C)			8.1	8.6	9.3	11.8		
pH			8.2	7.4	7.9	6.9		
Conductivity (µS/cm)			140	540	150	1030		

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 14A (deep)					
			Oct-02	Oct-03	Oct-04	Nov-05	Sep-06	Aug-07
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		138	132	126	138	142	132
Aluminum	0.1	0.075 (i)	<0.010					
N-NH3 (Ammonia)			0.03	0.03				0.07
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.03	0.03	0.028	0.03	0.03	
Beryllium		0.011	<0.001					
BOD								
Boron	5	0.2(i)	<0.050	<0.050	<0.010	<0.020	<0.020	<0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001					
Calcium			48	50	48.8	52.7		51
Chloride	250		6	2				6
Chromium	0.05	0.009	0.002					
Cobalt		0.0009(i)	<0.0002					
COD			<5	<5				<5
Conductivity (µS/cm)			260	290	340	290	220	359
Copper	1	0.005	<0.0010					0.002
DOC	5		0.5	<0.5	0.5	0.7	0.6	
Fluoride	1.5							
Hardness (as CaCO3)	500		156	169	167	179		172
Iron	0.3	0.3	<0.01					<0.03
Lead	0.01		<0.0010					
Magnesium			9	11	11.1	11.7		11
Manganese	0.05		0.014	<0.010	<0.005	<0.010		<0.01
Mercury	0.001	0.0002						
Molybdenum		0.04(i)	<0.005					
Nickel			<0.005					
N-NO3 (Nitrate)	10		5.61	3.26	5.4	6	5.8	6.24
N-NO2 (Nitrite)	1		<0.10	<0.10				<0.10
Organic Nitrogen	0.15							0.18
pH (pH units)	6.5-8.5		7.5	7.6	7.2	7.6	8.1	
Phenols			<0.001	<0.001				<0.001
Phosphate (as P)								
Phosphorus (total)								
Potassium			2	2	<1.0	1	2	1
Silicon			4.4					
Silver		0.0001	<0.00010					
Sodium	200		6					3
Strontium			0.094	0.097	0.092	0.1	0.11	0.112
Sulphate	500		21	19	19.3	19	22	19
Sulphur								
Total Sus. Solids								
TDS	500		228	215	208	246	253	233
Temperature (^{o}C)	15		8	7	10	9.4	9.1	
Thallium		0.0003(i)	<0.00100					
Tin			<0.010					
Titanium			<0.010					
TKN								0.25
Vanadium		(0.006(i)	0.001					
Zinc	5	0.03 - 0.02(i)	<0.005					
Ion Balance								
Field Parameters								
Temperature (^{o}C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 14A (deep)					
			Oct-07	May-08	May-08	May-09	Oct-09	May-10
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		138	134	140	137	141	134
Aluminum	0.1	0.075 (i)						<0.02
N-NH3 (Ammonia)			0.05	0.08	0.07	<0.02	<0.02	
Arsenic	0.01	0.1 - 0.005(i)				<0.001	<0.001	<0.001
Barium	1					0.03	0.03	0.03
Beryllium		0.011						
BOD						2	<1	
Boron	5	0.2(i)	<0.01	<0.01	0.01	0.02	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002				<0.0001	<0.0001	<0.0001
Calcium			53	56	57	54	56	51
Chloride	250		8	7	7	7	7	7
Chromium	0.05	0.009				<0.001	0.001	0.002
Cobalt		0.0009(i)						
COD			<5	<5	<5	10	<5	<5
Conductivity (µS/cm)			361	359	375	372	384	371
Copper	1	0.005	0.004	0.001	0.001	<0.001	<0.001	<0.001
DOC	5					0.8	1.1	1
Fluoride	1.5							
Hardness (as CaCO3)	500		181	188	191	183	192	172
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01					<0.001	<0.001	<0.001
Magnesium			12	12	12	12	13	11
Manganese	0.05		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	0.001	0.0002				<0.0001	<0.0001	<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		6.4	6.21	7.37	6.87	7	6.73
N-NO2 (Nitrite)	1		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15		0.22	0.14	0.23	<0.10	<0.10	≤ 0.26
pH (pH units)	6.5-8.5					8.02	8.15	8.08
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)						0.08	0.33	0.43
Potassium			1	2	2	1	1	1
Silicon								
Silver		0.0001						
Sodium	200		4	5	3	2	3	3
Strontium			0.105	0.108	0.104	0.108	0.113	
Sulphate	500		17	19	19	20	19	22
Sulphur								
Total Sus. Solids						73	380	
TDS	500		235	233	244	242	250	241
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.27	0.22	0.3	<0.10	<0.10	0.26
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)				<0.01	<0.01	<0.01
Ion Balance								
Field Parameters								
Temperature (^{o}C)				8.8	7.5	10.4	8.9	10.3
pH				8.89	lot Measure	6.9	8.54	9.7
Conductivity (µS/cm)				373	382	465	393	379

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inoganic
Groundwater Quality

			BH 14A (deep)					
			Oct-10	Jun-11	Nov-11	May-12	Oct-12	Apr-13
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		138	132	141	136	136	134
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001		<0.001		<0.001
Barium	1		0.03	0.03	0.03	0.03	0.03	0.03
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001		<0.0001		<0.0001
Calcium			56	50	56	52	57	52
Chloride	250		7	8	8	8	7	7
Chromium	0.05	0.009	0.001	0.006		<0.001		<0.001
Cobalt		0.0009(i)						
COD			10	5	10	<5	<5	<5
Conductivity (µS/cm)			377	367	372	372	371	368
Copper	1	0.005	<0.001	<0.001		<0.001		<0.001
DOC	5		1.1	1.2	1.6	2.6	0.8	0.8
Fluoride	1.5							
Hardness (as CaCO3)	500		188	173	192	174	191	178
Iron	0.3	0.3	<0.03	0.09	0.09	0.06	0.03	0.12
Lead	0.01		<0.001	<0.001		<0.001		<0.001
Magnesium			12	12	13	11	12	12
Manganese	0.05		<0.01	<0.01		0.02		0.02
Mercury	0.001	0.0002	<0.0001	<0.0001		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.16	6.71	5.86	6.19	6.71	6.60
N-NO2 (Nitrite)	1		<0.10	<0.10		<0.10		<0.10
Organic Nitrogen	0.15		<0.10	<0.15				
pH (pH units)	6.5-8.5		8.13	8.05	8.05	8.13	8.02	8.03
Phenols			<0.001	<0.001		<0.001		<0.001
Phosphate (as P)								
Phosphorus (total)			0.39	0.72		0.25		0.48
Potassium			1	1		1		1
Silicon								
Silver		0.0001						
Sodium	200		3	3	4	5	4	3
Strontium								
Sulphate	500		20	22	22	22	20	22
Sulphur								
Total Sus. Solids								
TDS	500		245	239	242	242	241	239
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.10	<0.10		<0.10		<0.10
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01		<0.01		<0.01
Ion Balance								
Field Parameters								
Temperature (^{o}C)			8.7	8.2	9.0	10.0	9.1	9.0
pH			7.88	8.10	8.0	8.0	7.4	7.8
Conductivity (µS/cm)			386	266	372	366	359	369

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 14A (deep)					
			Oct-13	Jul-14	Oct-14	Apr-15	Sep-15	Apr-16
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		131	121	124	129	130	136
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.02	<0.01	<0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)		0.0002		0.0002		< 0.0001
Barium	1		0.03	0.03	0.029	0.028	0.03	0.033
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.005	0.008	0.007	< 0.005	< 0.005
Bromide								
Cadmium	0.005	0.0002		<0.00002		< 0.00002		< 0.00002
Calcium			52	52.8	54.5	51.4	55.1	57.5
Chloride	250		8	6.8	6.3	6	5.8	6.3
Chromium	0.05	0.009		<0.002		< 0.002		< 0.002
Cobalt		0.0009(i)						
COD			<5	<5	< 5	9	< 5	7
Conductivity (µS/cm)			365	367	352	351	355	370
Copper	1	0.005		0.0006		< 0.0001		0.0007
DOC	5		0.7	1.3	1.5	1.3	1	0.6
Fluoride	1.5							
Hardness (as CaCO3)	500		178	182	185	177	188	
Iron	0.3	0.3	<0.03	0.014	0.031	0.008	< 0.005	< 0.005
Lead	0.01			0.00032		< 0.00002		< 0.00002
Magnesium			12	12.3	12.1	12	12.6	13.4
Manganese	0.05			0.01		0.006		< 0.001
Mercury	0.001	0.0002		<0.00002		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.31	7.1	7.2	6.7	7.4	7.1
N-NO2 (Nitrite)	1			<0.1		< 0.1		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.78	8.08	8.07	8.06	7.88	8.08
Phenols				<0.001		< 0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				0.38		0.26		0.09
Potassium				1.5		1.3		1.4
Silicon								
Silver		0.0001						
Sodium	200		4	4.3	4.2	4.1	4.2	4.6
Strontium								
Sulphate	500		21	23	22	22	22	22
Sulphur								
Total Sus. Solids								
TDS	500		237	204	207	204	234	218
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				<0.05		0.06		0.13
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.005		< 0.005		0.006
Ion Balance				0.926	0.921	0.977		
Field Parameters								
Temperature (^{o}C)			9.2	9.8	9.6	9.7	9.6	9
pH			7.8	8.3	7.9	8.0	7.7	7.9
Conductivity (µS/cm)			344	319	343	397	333	356

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 14A (deep)					
			Aug-16	May-17	Aug-17	Apr-18	Sep-18	Jun-19
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		134	150	141	131	134	127
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.03
Arsenic	0.01	0.1 - 0.005(i)		0.0002		0.0002		< 0.1
Barium	1		0.033	0.028	0.031	0.034	0.032	0.017
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.007	0.011	0.014	0.008	< 0.005	< 0.005
Bromide								
Cadmium	0.005	0.0002		< 0.000014		< 0.000014		< 0.015
Calcium			56.4	52.5	52.4	56.3	57.6	43.1
Chloride	250		6	6.7	5.5	5.8	7.2	7.9
Chromium	0.05	0.009		< 0.002		0.006		0.0004
Cobalt		0.0009(i)						
COD			< 5	< 5	< 5	< 5	< 5	< 5
Conductivity (µS/cm)			359	381	368	381	378	314
Copper	1	0.005		0.0006		0.0003		0.0002
DOC	5		0.6	0.5	0.7	1.3	0.9	1.1
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	0.01	< 0.005	< 0.005	0.013	< 0.005
Lead	0.01			< 0.00002		< 0.00002		< 0.02
Magnesium			13.2	12.2	12.6	13.2	13.9	11.5
Manganese	0.05			< 0.001		< 0.001		< 0.001
Mercury	0.001	0.0002		< 0.02		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.5	8.42	6.62	8.62	8.33	8.59
N-NO2 (Nitrite)	1			< 0.05		< 0.05		< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.97	8.04	8.11	8.14	8.01	8.08
Phenols				< 0.001		< 0.001		< 0.002
Phosphate (as P)								
Phosphorus (total)				0.29		0.21		0.07
Potassium				1.2		1.7		1.4
Silicon								
Silver		0.0001						
Sodium	200		4.7	4	4.4	3.9	4	3.8
Strontium								
Sulphate	500		20	19	12	17	19	22
Sulphur								
Total Sus. Solids								
TDS	500		215	185	173	177	184	166
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				< 0.1		0.2		0.1
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		< 0.005		< 0.005
Ion Balance								1.16
Field Parameters								
Temperature (^{o}C)			9.6	9.6	9.5	10	9.7	9.9
pH			7.8	7.9	7.9	7.7	8	7.8
Conductivity (µS/cm)			392	370	361	331	300	407

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 14A (deep)					
			Oct-19	May-20	Sep-20	Apr-21	Sep-21	May-22
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		135	135	127	136	145	140
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.01	< 0.01	< 0.01	<0.010	<0.010	0.014
Arsenic	0.01	0.1 - 0.005(i)		0.0001		<0.001		<0.001
Barium	1		0.035	0.036	0.031	0.03	0.03	0.04
Beryllium		0.011						
BOD							3	
Boron	5	0.2(i)	0.008	0.007	0.008	0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002		< 0.000015		<0.0001		<0.0001
Calcium			57.1	59.5	54.1	52	58	55
Chloride	250		6.6	7.4	6.4	8	8	7
Chromium	0.05	0.009		< 0.001		<0.001		<0.001
Cobalt		0.0009(i)						
COD			< 5	< 5	8	<5	<5	<5
Conductivity (µS/cm)			358	382	378	379	378	294
Copper	1	0.005		0.0012		0.005		<0.001
DOC	5		1.1	1.5	2.3	1.1	1.1	1.7
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	0.012	<0.03	<0.03	<0.03
Lead	0.01			0.00003		<0.001		<0.001
Magnesium			13.8	13.9	12.5	11	13	12
Manganese	0.05		< 0.001	< 0.001		<0.01		<0.01
Mercury	0.001	0.0002		< 0.00002		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.44	7.96	8.17	7.24	7.73	9.31
N-NO2 (Nitrite)	1			< 0.05		<0.10		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.14	8.09	8.11	8.09	7.95	7.82
Phenols				< 0.002		<0.010		<0.001
Phosphate (as P)								
Phosphorus (total)				0.15		0.364		0.335
Potassium				1.6		1		1
Silicon								
Silver		0.0001						
Sodium	200		4.3	3.9	3.5	4	4	4
Strontium								
Sulphate	500		17	18	19	22	20	22
Sulphur								
Total Sus. Solids							1770	
TDS	500		181	185	173	246	246	191
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium				0.2				
TKN						<0.100		0.166
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		<0.01		<0.01
Ion Balance			0.894					
Field Parameters								
Temperature (^{o}C)			9.3	8.6	8.9	9.3	9.2	9.6
pH			8.1	7.8	7.3	7.4	7.2	7.2
Conductivity (µS/cm)			390	376	396	397	389	420

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 14A (deep)					
			Aug-22	Jun-23	Oct-23	Jun-24	Oct-24	
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		149	160	149	136	135	
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.020	<0.020	<0.020	0.335	<0.020	
Arsenic	0.01	0.1 - 0.005(i)		<0.001		<0.001		
Barium	1		0.03	0.05	0.03	0.03	0.03	
Beryllium		0.011						
BOD			<1		2		<1	
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.01	
Bromide								
Cadmium	0.005	0.0002		<0.0001		<0.0001		
Calcium			55	54	52	57	57	
Chloride	250		6	7	6	7	8	
Chromium	0.05	0.009		<0.001		<0.001		
Cobalt		0.0009(i)						
COD			<5	<5	11	5	<5	
Conductivity (µS/cm)			293	300	289	292	289	
Copper	1	0.005		0.002		0.001		
DOC	5		--	2.0	4.7	1.1	1.1	
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	0.03	<0.03	<0.03	<0.03	
Lead	0.01			<0.001		<0.001		
Magnesium			12	12	12	13	13	
Manganese	0.05			<0.01		<0.01		
Mercury	0.001	0.0002		<0.0001		<0.0001		
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.84	7.51	6.32	7.04	8.00	
N-NO2 (Nitrite)	1			<0.10		<0.10		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.92	8.04	7.87	7.8	7.89	
Phenols				<0.001		<0.001		
Phosphate (as P)								
Phosphorus (total)				0.771		2.95		
Potassium				<1		1		
Silicon								
Silver		0.0001						
Sodium	200		4	4	4	4	4	
Strontium								
Sulphate	500		22	22	20	25	22	
Sulphur								
Total Sus. Solids			696		624		298	
TDS	500		190	195	188	190	188	
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.239		0.186		
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.01		
Ion Balance								
Field Parameters								
Temperature (^{o}C)			9.6	9	8.9	9.7	10	
pH			7.6	5.8	7.6	7.7	7.9	
Conductivity (µS/cm)			390	450	460	420	390	

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 14B (shallow)					
			Oct-02	Oct-03	Oct-04	Nov-05	Sep-06	Aug-07
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		143	135	126	142	145	134
Aluminum	0.1	0.075 (i)	<0.010					
N-NH3 (Ammonia)			0.05	0.04				0.06
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.02	0.03	0.026	0.03	0.03	
Beryllium		0.011	<0.001					
BOD								
Boron	5	0.2(i)	<0.050	<0.050	<0.010	<0.020	<0.020	0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001					
Calcium			45	51	49	51.3		52
Chloride	250		7	2				6
Chromium	0.05	0.009	0.002					
Cobalt		0.0009(i)	<0.0002					
COD			<5	<5				<5
Conductivity (µS/cm)			300	290	355	290	220	359
Copper	1	0.005	<0.0010					0.002
DOC	5		0.7	<0.5	1.2	1.2	1.7	
Fluoride	1.5							
Hardness (as CaCO3)	500		149	172	167	174		174
Iron	0.3	0.3	<0.01					<0.03
Lead	0.01		<0.0010					
Magnesium			9	11	11	11.3		11
Manganese	0.05		<0.005	<0.010	<0.005	<0.010		<0.01
Mercury	0.001	0.0002						
Molybdenum		0.04(i)	<0.005					
Nickel			<0.005					
N-NO3 (Nitrate)	10		5.83	3.82	5.1	5.5	6	5.4
N-NO2 (Nitrite)	1		<0.10	<0.10				<0.10
Organic Nitrogen	0.15							0.09
pH (pH units)	6.5-8.5		7.3	7.6	7.1	7.4	8.2	
Phenols			<0.001	<0.001				<0.001
Phosphate (as P)								
Phosphorus (total)								
Potassium			2	1	<1.0	1	1	1
Silicon			4.4					
Silver		0.0001	<0.00010					
Sodium	200		17					4
Strontium			0.114	0.112	0.097	0.11	0.11	0.113
Sulphate	500		23	17	20.4	20	23	19
Sulphur								
Total Sus. Solids								
TDS	500		241	218	212	270	235	233
Temperature (^{o}C)	15		10	7.2	9	9.5	9.4	
Thallium		0.0003(i)	<0.00100					
Tin			<0.010					
Titanium			<0.010					
TKN								0.15
Vanadium		(0.006(i)	0.001					
Zinc	5	0.03 - 0.02(i)	<0.005					
Ion Balance								
Field Parameters								
Temperature (^{o}C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 14B (shallow)					
			Oct-07	May-08	Oct-08	May-09	Oct-09	May-10
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		138	137	141	140	143	133
Aluminum	0.1	0.075 (i)					<1	
N-NH3 (Ammonia)			0.04	0.09	0.04	<0.02	0.05	<0.02
Arsenic	0.01	0.1 - 0.005(i)				<0.001	<0.001	<0.001
Barium	1					0.03	0.03	0.03
Beryllium		0.011						
BOD						<1		
Boron	5	0.2(i)	<0.01	<0.01	0.001	0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002				<0.0001	<0.0001	<0.0001
Calcium			51	55	57	52	52	49
Chloride	250		6	6	7	6	7	7
Chromium	0.05	0.009				<0.001	0.001	0.002
Cobalt		0.0009(i)						
COD			<5	<5	<5	15	<5	<5
Conductivity (µS/cm)			356	358	369	365	384	368
Copper	1	0.005	0.003	0.001	0.001	<0.001	<0.001	<0.001
DOC	5					0.9	0.9	1.4
Fluoride	1.5							
Hardness (as CaCO3)	500		176	186	191	174	178	167
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01					<0.001	<0.001	<0.001
Magnesium			12	12	12	11	12	11
Manganese	0.05		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Mercury	0.001	0.0002				<0.0001	<0.0001	<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		5.98	6.18	6.25	6.13	6.86	6.89
N-NO2 (Nitrite)	1		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen	0.15		<0.10	0.08	0.16	<0.10	0.31	≤ 0.17
pH (pH units)	6.5-8.5					8.03	8.17	8.04
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphate (as P)								
Phosphorus (total)						0.25	0.26	0.59
Potassium			1	2	2	1	1	1
Silicon								
Silver		0.0001						
Sodium	200		4	5	4	3	4	3
Strontium			0.107	0.108	0.104	0.106	0.115	
Sulphate	500		17	18	18	18	19	20
Sulphur								
Total Sus. Solids						672	805	
TDS	500		231	233	240	237	250	239
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.10	0.17	0.2	<0.10	0.36	0.17
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)				<0.01	<0.01	<0.01
Ion Balance				1.08	1.06			
Field Parameters								
Temperature (^{o}C)				7.9	8.3	8.3	9	8.1
pH				9.24	Not Measure	7.1	9	9.07
Conductivity (µS/cm)				371	369	370	384	376

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inoganic
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			BH 14B (shallow)					
			Oct-10	Jun-11	Jun-11 BH-16 Dup	Nov-11	May-12	Oct-12
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		140	135	135	138	134	141
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.01	0.1 - 0.005(i)	<0.001	<0.001	<0.001		<0.001	
Barium	1		0.03	0.03	0.03	0.03	0.06	0.03
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001	<0.0001		<0.0001	
Calcium			59	48	49	52	50	58
Chloride	250		7	6	8	7	7	7
Chromium	0.05	0.009	0.001	0.062	0.006		0.001	
Cobalt		0.0009(i)						
COD			25	20	15	5	<5	<5
Conductivity (µS/cm)			378	354	363	364	362	375
Copper	1	0.005	<0.001	<0.001	<0.001		0.006	
DOC	5		1.1	1.4	1.1	0.9	2	0.8
Fluoride	1.5							
Hardness (as CaCO3)	500		196	164	167	178	165	193
Iron	0.3	0.3	<0.03	0.06	0.1	0.05	1.58	0.13
Lead	0.01		<0.001	<0.001	<0.001		0.003	
Magnesium			12	11	11	12	10	12
Manganese	0.05		<0.01	<0.01	<0.01		0.12	
Mercury	0.001	0.0002	<0.0001	<0.0001	<0.0001		<0.0001	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.03	6.15	6.39	5.9	6.07	6.7
N-NO2 (Nitrite)	1		<0.10	<0.10	<0.10		<0.10	
Organic Nitrogen	0.15		<0.10		<0.15			
pH (pH units)	6.5-8.5		8.14	7.98	8.11	8.04	8.12	8.03
Phenols			<0.001	<0.001	<0.001		<0.001	
Phosphate (as P)								
Phosphorus (total)			0.47	2.45	1.77		1.51	
Potassium			1	1	1		1	
Silicon								
Silver		0.0001						
Sodium	200		3	<2	3	4	4	4
Strontium								
Sulphate	500		20	19	22	21	21	19
Sulphur								
Total Sus. Solids								
TDS	500		246	230	236	237	235	244
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.10	0.1	<0.10		0.14	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01	<0.01		<0.01	
Ion Balance								
Field Parameters								
Temperature (^{o}C)			9.0	9.1		8.9	9.3	8.8
pH			7.79	8.1		7.9	7.9	7.5
Conductivity (µS/cm)			391	274		366	359	367

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 14B (shallow)					
			Apr-13	Oct-13	Jul-14	Oct-14	Apr-15	Sep-15
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		132	128	122	125	124	132
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.02	0.02	<0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)	<0.001		0.0002		0.0001	
Barium	1		0.03	0.03	0.03	0.031	0.027	0.029
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.01	<0.005	0.008	0.007	< 0.005
Bromide								
Cadmium	0.005	0.0002	<0.0001		<0.00002		< 0.00002	
Calcium			51	51	52.2	54.2	47.7	51.9
Chloride	250		7	7	6.2	5.9	4.9	4.6
Chromium	0.05	0.009	<0.001		<0.002		< 0.002	
Cobalt		0.0009(i)						
COD			<5	<5	65	< 5	48	< 5
Conductivity (µS/cm)			357	355	358	347	323	332
Copper	1	0.005	<0.001		0.0007		0.0004	
DOC	5		0.8	0.8	1.6	1.5	< 0.2	1.3
Fluoride	1.5							
Hardness (as CaCO3)	500		176	176	179	183	164	176
Iron	0.3	0.3	0.26	0.11	0.062	0.11	0.035	< 0.005
Lead	0.01		<0.001		0.00011		< 0.00002	
Magnesium			12	12	12	11.9	11	11.6
Manganese	0.05		0.02		0.012		0.002	
Mercury	0.001	0.0002	<0.0001		<0.00002		< 0.00002	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7	6.85	6.7	6.8	5.5	6
N-NO2 (Nitrite)	1		<0.10		<0.1		< 0.1	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.01	7.79	8.08	8.07	8.06	7.85
Phenols			<0.001		<0.001		< 0.001	
Phosphate (as P)								
Phosphorus (total)			2.41		1.98		1.94	
Potassium			1		1.4		1.2	
Silicon								
Silver		0.0001						
Sodium	200		3	4	4.1	3.9	3.9	3.9
Strontium								
Sulphate	500		20	18	20	21	18	17
Sulphur								
Total Sus. Solids								
TDS	500		232	231	199	203	185	219
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.10		0.12		0.2	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01		<0.005		< 0.005	
Ion Balance					0.924	0.919	0.967	
Field Parameters								
Temperature (^{o}C)			8.5	8.6	8.7	8.9	8.5	9.0
pH			7.8	7.8	8.3	8	8.0	7.8
Conductivity (µS/cm)			356	335	314	342	372	308

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 14B (shallow)					
			Apr-16	Aug-16	May-17	Aug-17	Apr-18	Sep-18
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		131	132	127	124	140	137
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			< 0.01	< 0.01	< 0.01	0.62	0.04	0.02
Arsenic	0.01	0.1 - 0.005(i)	< 0.0001		0.0002		0.0001	
Barium	1		0.032	0.034	0.028	0.031	0.034	0.032
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	< 0.005	0.009	0.012	0.009	0.009	< 0.005
Bromide								
Cadmium	0.005	0.0002	< 0.00002		< 0.000014		< 0.000014	
Calcium			55.1	57.1	47.3	51.9	56.3	57
Chloride	250		6.1	5.9	5.3	5.8	5.6	7.1
Chromium	0.05	0.009	< 0.002		< 0.002		< 0.002	
Cobalt		0.0009(i)						
COD			13	37	< 5	78	47	32
Conductivity (µS/cm)			354	360	366	363	375	383
Copper	1	0.005	0.0006		0.0008		0.0007	
DOC	5		0.6	0.6	0.6	1.2	1.4	0.9
Fluoride	1.5							
Hardness (as CaCO3)	500				167			
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01		< 0.00002		< 0.00002		< 0.00002	
Magnesium			12.6	13	11.7	12.1	13.1	13.5
Manganese	0.05		< 0.001		< 0.001		< 0.001	
Mercury	0.001	0.0002	< 0.00002		< 0.02		< 0.00002	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		6.8	8.1	9.35	8.38	7.22	7.88
N-NO2 (Nitrite)	1		< 0.1		< 0.05		< 0.05	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.05	7.97	8.03	8.08	8.15	8.01
Phenols			< 0.001		< 0.001		< 0.001	
Phosphate (as P)								
Phosphorus (total)			1.07		1.12		1.56	
Potassium			1.3		1.3		1.5	
Silicon								
Silver		0.0001						
Sodium	200		4.3	4.3	4.2	3.6	4.3	4.4
Strontium								
Sulphate	500		20	19	13	15	14	18
Sulphur								
Total Sus. Solids								
TDS	500		208	215	159	164	178	184
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.22		0.3		0.3	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	0.007		< 0.005		< 0.005	
Ion Balance								
Field Parameters								
Temperature (^{o}C)			8	8.6	8.4	8.6	8.2	9.1
pH			8	7.9	8.0	7.8	7.8	8
Conductivity (µS/cm)			342	400	354	359	330	302

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 14B (shallow)					
			Jun-19	Oct-19	May-20	Sep-20	Apr-21	Sep-21
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		131	132	128	128	138	153
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.07	0.02	0.01	0.01	<0.010	<0.010
Arsenic	0.01	0.1 - 0.005(i)	< 0.1		0.0001		<0.001	
Barium	1		0.017	0.042	0.037	0.033	0.03	0.03
Beryllium		0.011						
BOD								2
Boron	5	0.2(i)	< 0.005	0.012	0.008	0.012	0.01	<0.01
Bromide								
Cadmium	0.005	0.0002	< 0.015		< 0.000015		<0.0001	
Calcium			44.1	57.5	58.6	57.4	53	60
Chloride	250		5.8	7.6	7.6	6.6	7	8
Chromium	0.05	0.009	0.0004		< 0.001		<0.001	
Cobalt		0.0009(i)						
COD			27	44	6	36	<5	<5
Conductivity (µS/cm)			305	361	383	385	377	388
Copper	1	0.005	0.0003		0.0015		0.005	
DOC	5		1.2	2.3	1.1	2.7	0.9	1.3
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	0.01	<0.03	0.09
Lead	0.01		< 0.02		0.00003		<0.001	
Magnesium			11.6	13.9	13.1	13	12	14
Manganese	0.05		< 0.001	< 0.001	< 0.001		<0.01	
Mercury	0.001	0.0002	< 0.00002		< 0.00002		<0.0001	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		11.6	8.06	9.93	8.35	7.55	7.77
N-NO2 (Nitrite)	1		< 0.05		< 0.05		<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.09	8.1	8.06	8.12	8.09	7.94
Phenols			< 0.002		< 0.002		<0.010	
Phosphate (as P)								
Phosphorus (total)			3.16		0.88		0.747	
Potassium			1.2		1.5		1	
Silicon								
Silver		0.0001						
Sodium	200		3.7	3.8	3.6	3	4	4
Strontium								
Sulphate	500		15	20	14	19	18	18
Sulphur								
Total Sus. Solids								692
TDS	500		159	183	176	177	245	252
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium					0.3			
TKN			0.4				0.312	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005		< 0.005		<0.01	
Ion Balance			1.17	0.909				
Field Parameters								
Temperature (^{o}C)			8.1	9.1	7.6	7.9	8.3	8.5
pH			8	8	7.8	7.5	7.3	7.3
Conductivity (µS/cm)			416	400	386	406	393	400

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 14B (shallow)					
			May-22	Aug-22	Jun-23	Oct-23	Jun-24	Oct-24
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		138	152	144	167	127	126
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.010	<0.020	<0.020	<0.020	0.03	<0.020
Arsenic	0.01	0.1 - 0.005(i)	<0.001		<0.001		<0.001	
Barium	1		0.04	0.04	0.05	0.03	0.03	0.03
Beryllium		0.011						
BOD				<1		<1		1
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001		<0.0001		<0.0001	
Calcium			54	55	52	54	50	50
Chloride	250		6	6	5	5	5	5
Chromium	0.05	0.009	<0.001		<0.001		<0.001	
Cobalt		0.0009(i)						
COD			<5	14	<5	22	6	<5
Conductivity (µS/cm)			290	296	288	291	258	256
Copper	1	0.005	0.002		0.002		0.002	
DOC	5		1.7	--	2.6	5.4	1.5	1.2
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01		<0.001		<0.001		<0.001	
Magnesium			12	13	12	13	11	11
Manganese	0.05		<0.01		<0.01		<0.01	
Mercury	0.001	0.0002	<0.0001		<0.0001		<0.0001	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		10.2	9.47	8.26	6.34	5.07	5.91
N-NO2 (Nitrite)	1				<0.10		<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.84	7.92	8.02	7.91	7.83	7.89
Phenols			<0.001		<0.001		<0.001	
Phosphate (as P)								
Phosphorus (total)			1.22		0.557		0.644	
Potassium			1		1		1	
Silicon								
Silver		0.0001						
Sodium	200		4	4	4	4	3	3
Strontium								
Sulphate	500		19	18	17	19	18	15
Sulphur								
Total Sus. Solids				883		1220		656
TDS	500		188	192	187	189	168	166
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.1		0.234		0.261	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01		<0.01		<0.01	
Ion Balance								
Field Parameters								
Temperature (^{o}C)			8.5	8.8	8.5	8.8	9.7	10.2
pH			7.9	8.2	7.5	7.8	7.7	7.9
Conductivity (µS/cm)			390	400	430	460	380	370

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 15A (Deep)					
			Oct-13	Oct-13	Jul-14	Sep-14	Apr-15	Sep-15
PARAMETER	ODWSOG	PWQO		QA/QC				
Alkalinity (as CaCO3)	30-500		163	155	138	140	144	145
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.04	0.03	<0.01	<0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)			0.0004		0.0003	
Barium	1		0.05	0.05	0.032	0.04	0.028	0.026
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.01	<0.005	0.01	0.009	< 0.005
Bromide								
Cadmium	0.005	0.0002			<0.00002		< 0.00002	
Calcium			56	57	54.4	59.7	61.2	55.7
Chloride	250		8	8	6.2	5.7	6.3	5.5
Chromium	0.05	0.009			<0.002		< 0.002	
Cobalt		0.0009(i)						
COD			<5	<5	379	92	< 5	< 5
Conductivity (µS/cm)			411	409	378	362	377	369
Copper	1	0.005			0.0011		< 0.002	
DOC	5		1.1	1.2	1.4	1.3	2	0.8
Fluoride	1.5							
Hardness (as CaCO3)	500		196	203	195	211	217	198
Iron	0.3	0.3	0.68	0.57	0.185	0.693	0.066	0.066
Lead	0.01				0.00013		0.00002	
Magnesium			14	15	14.7	15.3	15.8	14.6
Manganese	0.05				0.035		0.012	
Mercury	0.001	0.0002			<0.00002		< 0.00002	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		3.63	3.51	2.0	2.4	2.5	2.4
N-NO2 (Nitrite)	1				<0.1		< 0.1	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.75	7.75	8.13	7.95	7.99	7.86
Phenols					<0.001		< 0.001	
Phosphate (as P)								
Phosphorus (total)					3.77		0.22	
Potassium					2.5		2.6	
Silicon								
Silver		0.0001						
Sodium	200		4	4	4.7	4.8	4.6	4.5
Strontium								
Sulphate	500		29	30	38	36	37	37
Sulphur								
Total Sus. Solids								
TDS	500		267	266	213	220	225	244
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN					0.3		0.05	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)			<0.005		< 0.005	
Ion Balance					0.921	0.854	0.867	
Field Parameters								
Temperature (^{o}C)			8.1		8.5	8.6	8.3	8.5
pH			7.7		8.3	7.9	8.1	7.9
Conductivity (µS/cm)			378		335	354	408	339

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inoganic
Groundwater Quality

			BH 15A (Deep)					
			Apr-16	Aug-16	May-17	Aug-17	Apr-18	Sep-18
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		151	144	158	155	186	187
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			< 0.01	< 0.01	< 0.01	< 0.01	0.05	< 0.01
Arsenic	0.01	0.1 - 0.005(i)	0.0002		0.0003		0.0003	
Barium	1		0.024	0.026	0.022	0.028	0.032	0.033
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	< 0.005	0.008	< 0.005	0.011	0.011	0.01
Bromide								
Cadmium	0.005	0.0002	< 0.00002		0.00002		< 0.000014	
Calcium			54.5	56.6	51.5	61.3	72.8	73
Chloride	250		6.2	6	9.2	8.5	13.9	20.2
Chromium	0.05	0.009	< 0.002		0.083		< 0.002	
Cobalt		0.0009(i)						
COD			< 5	72	< 5	< 5	< 5	< 5
Conductivity (µS/cm)			367	370	439	424	501	555
Copper	1	0.005	0.0007		0.0002		0.0003	
DOC	5		1.7	0.6	0.6	0.8	2	1.6
Fluoride	1.5							
Hardness (as CaCO3)	500		194	203				
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	0.006	< 0.005	< 0.005
Lead	0.01		0.00002		< 0.00002		< 0.00002	
Magnesium			14.4	15.2	15	16.9	20	22.2
Manganese	0.05		0.007		0.004		0.004	
Mercury	0.001	0.0002	< 0.00002		< 0.02		< 0.00002	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		2.6	2.6	4.09	4.32	5.11	4.55
N-NO2 (Nitrite)	1		< 0.1		< 0.05		< 0.05	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.15	8.02	8.09	8.08	8.11	8.08
Phenols			< 0.001		0.001		< 0.001	
Phosphate (as P)								
Phosphorus (total)			1.29		1.98		0.31	
Potassium			2.2		2		2.8	
Silicon								
Silver		0.0001						
Sodium	200		4.6	4.8	4.3	4.6	5.6	6.3
Strontium								
Sulphate	500		37	37	31	30	35	40
Sulphur								
Total Sus. Solids								
TDS	500		221	219	208	217	261	277
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.19		< 1		0.2	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	0.007		< 0.005		< 0.005	
Ion Balance								
Field Parameters								
Temperature (^{o}C)			7.9	8.8	8.4	8.6	7.6	8.3
pH			8.0	7.9	8.0	8.0	7.7	7.7
Conductivity (µS/cm)			358	406	429	417	442	410

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inoganic
Groundwater Quality

			BH 15A (Deep)					
			Jun-19	Oct-19		May-20	Sep-20	Apr-21
PARAMETER	ODWSOG	PWQO			QA/QC			
Alkalinity (as CaCO3)	30-500		194	175	177	201	181	203
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.09	0.02	0.02	< 0.01	0.02	<0.010
Arsenic	0.01	0.1 - 0.005(i)	0.2			0.0002		<0.001
Barium	1		0.024	0.045	0.037	0.046	0.037	0.04
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.008	0.014	0.014	0.018	0.017	0.03
Bromide								
Cadmium	0.005	0.0002	< 0.015			< 0.000015		<0.0001
Calcium			67.1	75.3	72.1	88.7	77.1	71
Chloride	250		20.5	17.8	17.9	19.9	18.4	19
Chromium	0.05	0.009	< 0.0002			< 0.001		<0.001
Cobalt		0.0009(i)						
COD			5	6	6	< 5	69	<5
Conductivity (µS/cm)			510	518	510	565	546	549
Copper	1	0.005	0.0005			0.0016		0.006
DOC	5		1.7	1.8	2	1.2	2.4	0.8
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	0.007	< 0.005	< 0.005	0.005	<0.03
Lead	0.01		< 0.02			0.00003		<0.001
Magnesium			20.2	21.4	21	24.1	21	19
Manganese	0.05		< 0.001	0.006	0.005	0.005		<0.01
Mercury	0.001	0.0002	< 0.00002			< 0.00002		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		5.89	3.26	3.3	4.89	4.52	4.21
N-NO2 (Nitrite)	1		< 0.05			< 0.05		<0.10
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.05	8.08	8.09	8.08	8.08	8.09
Phenols			< 0.002			< 0.002		<0.010
Phosphate (as P)								
Phosphorus (total)			0.43			0.21		0.305
Potassium			3			3.5		3
Silicon								
Silver		0.0001						
Sodium	200		6.4	6.2	6.1	6.6	5.6	6
Strontium								
Sulphate	500		41	42	42	41	45	45
Sulphur								
Total Sus. Solids								
TDS	500		275	271	269	304	279	357
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium						0.2		
TKN			0.2					0.137
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005			< 0.005		<0.01
Ion Balance			1.07	0.87	0.91			
Field Parameters								
Temperature (^{o}C)			8.9	8.4		8	8.3	7.9
pH			7.7	7.8		7.6	7.5	6.8
Conductivity (µS/cm)			589	522		561	574	574

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 15A (Deep)					
			Aug-21	May-22	May-22	Aug-22	Jun-23	Oct-23
PARAMETER	ODWSOG	PWQO			Dup #2			
Alkalinity (as CaCO3)	30-500		208	183	184	476	190	190
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.010	0.019	<0.010	<0.020	<0.020	0.025
Arsenic	0.01	0.1 - 0.005(i)		<0.001	<0.001		<0.001	
Barium	1		0.03	0.04	0.04	0.03	0.04	0.04
Beryllium		0.011						
BOD			2			17		2
Boron	5	0.2(i)	0.02	0.01	0.01	0.01	<0.01	0.01
Bromide								
Cadmium	0.005	0.0002		<0.0001	<0.0001		<0.0001	
Calcium			78	68	66	12	60	59
Chloride	250		17	14	14	2	11	10
Chromium	0.05	0.009		<0.001	<0.001		<0.001	
Cobalt		0.0009(i)						
COD			<5	<5	<5	16	<5	17
Conductivity (µS/cm)			518	478	478	1140	441	323
Copper	1	0.005		<0.001	0.001		0.002	
DOC	5		1.4	1.9	1.4	--	2.0	6.2
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.07	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01			<0.001	<0.001		<0.001	
Magnesium			21	18	18	4	17	16
Manganese	0.05			0.02	0.02		0.06	
Mercury	0.001	0.0002		<0.0001	<0.0001		<0.0001	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		4.02	1.9	1.94	0.18	0.78	1.07
N-NO2 (Nitrite)	1						<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.83	7.79	7.87	7.48	8.03	7.97
Phenols				<0.001	<0.001		<0.001	
Phosphate (as P)								
Phosphorus (total)				0.538	0.43		0.897	
Potassium				3	3		2	
Silicon								
Silver		0.0001						
Sodium	200		6	6	6	1	5	6
Strontium								
Sulphate	500		45	48	48	5	47	46
Sulphur								
Total Sus. Solids			586			260		502
TDS	500		337	311	311	741	287	210
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.123	<0.100		0.222	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01	<0.01		<0.01	
Ion Balance								
Field Parameters								
Temperature (^{o}C)			8.9	8.5	8.5	9.4	8.4	8.5
pH			7.1	10.3	10.3	8.3	7.5	7.1
Conductivity (µS/cm)			537	497	497	480	530	520

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 15A (Deep)					
			Oct-23	Jun-24	Oct-24			MEDIAN
PARAMETER	ODWSOG	PWQO	QA/QC					
Alkalinity (as CaCO3)	30-500		177	162	159			190
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.022	0.035	<0.020			
Arsenic	0.01	0.1 - 0.005(i)		<0.001				
Barium	1		0.03	0.03	0.03			0.04
Beryllium		0.011						
BOD			4		1			
Boron	5	0.2(i)	0.04	0.01	0.01			0.01
Bromide								
Cadmium	0.005	0.0002		<0.0001				
Calcium			57	62	61			65
Chloride	250		11	11	10			13
Chromium	0.05	0.009		<0.001				
Cobalt		0.0009(i)						
COD			38	5	<5			
Conductivity (µS/cm)			324	323	313			
Copper	1	0.005		0.001				
DOC	5		5.2	1.3	1.0			1.6
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.06	<0.03	<0.03			0.03
Lead	0.01			<0.001				
Magnesium			16	16	16			
Manganese	0.05			0.02				0.01
Mercury	0.001	0.0002		<0.0001				
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		1.25	1.16	0.72			
N-NO2 (Nitrite)	1			<0.10				
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.92	7.83	7.94			
Phenols				<0.001				
Phosphate (as P)								
Phosphorus (total)				0.545				
Potassium				3				
Silicon								
Silver		0.0001						
Sodium	200		5	5	5			6
Strontium								
Sulphate	500		48	49	47			46
Sulphur								
Total Sus. Solids			1120		698			
TDS	500		211	210	203			296
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.265				
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01				
Ion Balance								
Field Parameters								
Temperature (^{o}C)				10.6	9.7			
pH				7.8	7.8			
Conductivity (µS/cm)				470	460			

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 15B (Shallow)					
			Oct-13	Jul-14	Sep-14	Apr-15	Sep-15	Apr-16
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		216	188	181	202	195	207
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.03	<0.01	<0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)		0.0002		0.0001		< 0.0001
Barium	1		0.06	0.051	0.059	0.057	0.05	0.049
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.02	0.01	0.02	0.022	0.014	0.013
Bromide								
Cadmium	0.005	0.0002		<0.00002		< 0.00002		< 0.00002
Calcium			77	75.4	79.9	84.9	76.8	78.3
Chloride	250		10	9.3	9.6	9.6	10.2	9.6
Chromium	0.05	0.009		<0.002		< 0.002		< 0.002
Cobalt		0.0009(i)						
COD			<5	218	76	67	< 5	< 5
Conductivity (µS/cm)			534	510	473	496	494	505
Copper	1	0.005		<0.0010		< 0.002		0.0009
DOC	5		1.7	2	2.1	3	1.1	1.9
Fluoride	1.5							
Hardness (as CaCO3)	500		265	261	273	290	267	266
Iron	0.3	0.3	0.23	0.045	0.135	0.035	< 0.005	< 0.005
Lead	0.01			0.00008		0.00004		< 0.00002
Magnesium			18	17.9	18.3	19.3	18.6	17.5
Manganese	0.05			0.025		0.007		< 0.001
Mercury	0.001	0.0002		<0.00002		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		8.53	10	10	9.4	10.6	9.6
N-NO2 (Nitrite)	1			<0.1		< 0.1		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.65	8.03	7.87	7.97	7.87	8.11
Phenols				<0.001		< 0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				1.99		0.76		0.6
Potassium				1.7		1.8		1.4
Silicon								
Silver		0.0001						
Sodium	200		5	5	5.2	5.3	5.3	5.1
Strontium								
Sulphate	500		17	19	18	19	19	19
Sulphur								
Total Sus. Solids								
TDS	500		347	285	286	303	332	297
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.43		0.25		0.28
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.005		< 0.005		0.008
Ion Balance				0.933	0.862	0.881		
Field Parameters								
Temperature (^{o}C)			8.4	8.2	8.7	7.9	8.7	7.7
pH			7.6	8.1	7.7	7.9	7.8	7.8
Conductivity (µS/cm)			478	445	461	555	455	487

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inoganic
Groundwater Quality

			BH 15B (Shallow)					
			Aug-16	May-17	Aug-17	Apr-18	Sep-18	Jun-19
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		193	246	220	222	357	299
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			< 0.01	< 0.01	< 0.01	0.03	< 0.01	0.03
Arsenic	0.01	0.1 - 0.005(i)		< 0.0001		< 0.0001		< 0.1
Barium	1		0.059	0.054	0.071	0.079	0.137	0.077
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.018	0.005	0.026	0.028	0.143	0.091
Bromide								
Cadmium	0.005	0.0002		< 0.000014		< 0.000014		< 0.015
Calcium			78.3	73.4	88.7	95.2	139	94.7
Chloride	250		9.6	14.3	15.3	30.5	40.9	30.5
Chromium	0.05	0.009		0.002		< 0.002		< 0.0002
Cobalt		0.0009(i)						
COD			< 5	< 5	< 5	< 5	9	< 5
Conductivity (µS/cm)			493	612	600	664	997	703
Copper	1	0.005		0.001		0.0008		0.0014
DOC	5		0.8	0.9	1.1	2.3	3.8	2.8
Fluoride	1.5							
Hardness (as CaCO3)	500		273					
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01			< 0.00002		< 0.00002		< 0.02
Magnesium			19.1	19.9	23.1	25.2	37.5	27.9
Manganese	0.05			< 0.001		< 0.001		< 0.001
Mercury	0.001	0.0002		< 0.02		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		11	12.2	12.2	13.1	14.9	17.6
N-NO2 (Nitrite)	1			< 0.05		< 0.05		< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.99	8.02	7.95	7.97	7.78	8
Phenols				0.003		< 0.001		< 0.002
Phosphate (as P)								
Phosphorus (total)				0.42		0.22		0.23
Potassium				1.5		2.8		3
Silicon								
Silver		0.0001						
Sodium	200		5.6	5.1	6.6	8	28	20.7
Strontium								
Sulphate	500		18	20	19	24	35	33
Sulphur								
Total Sus. Solids								
TDS	500		297	282	287	319	498	389
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.2		0.2		0.4
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		< 0.005		< 0.005
Ion Balance								1.1
Field Parameters								
Temperature (^{o}C)			9.3	8.6	8.6	7.5	8.3	8.1
pH			7.7	7.6	7.6	7.6	7.5	7.3
Conductivity (µS/cm)			546	596	594	589	660	887

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inoganic
Groundwater Quality

			BH 15B (Shallow)					
			Oct-19	May-20	Sep-20	Apr-21	Aug-21	May-22
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		250	238	287	295	302	277
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.01	< 0.01	0.01	0.057	<0.010	0.028
Arsenic	0.01	0.1 - 0.005(i)		< 0.0001		<0.001		<0.001
Barium	1		0.107	0.09	0.109	0.1	0.09	0.1
Beryllium		0.011						
BOD							3	
Boron	5	0.2(i)	0.107	0.072	0.087	0.1	0.1	0.07
Bromide								
Cadmium	0.005	0.0002		< 0.000015		<0.0001		<0.0001
Calcium			102	100	120	104	112	100
Chloride	250		19.8	22.8	32.1	25	26	21
Chromium	0.05	0.009		< 0.001		<0.001		<0.001
Cobalt		0.0009(i)						
COD			< 5	< 5	41	9	<5	<5
Conductivity (µS/cm)			652	670	821	775	754	685
Copper	1	0.005		0.0014		0.007		0.002
DOC	5		2.9	4.3	4.3	1.6	2.1	2.2
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.005	0.006	0.005	<0.03	0.11	<0.03
Lead	0.01			< 0.00002		<0.001		<0.001
Magnesium			26.3	24.7	29.3	24	27	23
Manganese	0.05		0.001	< 0.001		<0.01		<0.01
Mercury	0.001	0.0002		< 0.00002		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		15	13.1	14.7	<0.10	12.9	15.6
N-NO2 (Nitrite)	1			< 0.05		<0.10		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.91	8.03	7.88	7.91	7.43	7.68
Phenols				< 0.002		<0.010		<0.001
Phosphate (as P)								
Phosphorus (total)				0.25		0.209		0.167
Potassium				2.7		2		2
Silicon								
Silver		0.0001						
Sodium	200		17.6	11.8	12.6	14	14	12
Strontium								
Sulphate	500		28	24	35	31	30	29
Sulphur								
Total Sus. Solids							402	
TDS	500		347	329	404	504	490	445
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium				0.3				
TKN						0.488		0.269
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		<0.01		<0.01
Ion Balance			0.89					
Field Parameters								
Temperature (^{o}C)			8.5	7.4	8.6	7.5	8.8	8.4
pH			7.5	7.5	7.1	6.6	6.8	6.9
Conductivity (µS/cm)			727	667	868	815	751	709

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
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Groundwater Quality

			BH 15B (Shallow)					
			Aug-22	Jun-23	Oct-23	Jun-24	Oct-24	MEDIAN
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		244	225	211	215	211	241
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.020	<0.020	0.028	<0.02	<0.020	
Arsenic	0.01	0.1 - 0.005(i)		<0.001		<0.001		
Barium	1		0.08	0.08	0.07	0.07	0.02	0.09
Beryllium		0.011						
BOD			<1		2		<1	
Boron	5	0.2(i)	0.07	0.04	0.03	0.03	0.02	0.07
Bromide								
Cadmium	0.005	0.0002		<0.0001				
Calcium			82	73	71	83	81	
Chloride	250		15	11	11	13	14	18
Chromium	0.05	0.009		<0.001		<0.001		
Cobalt		0.0009(i)						
COD			<5	<5	11	5	<5	
Conductivity (µS/cm)			569	527	508	534	520	
Copper	1	0.005		0.002		0.002		
DOC	5		--	2.1	5.6	1.4	1.2	2.2
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	0.03
Lead	0.01			<0.001		<0.001		
Magnesium			20	18	18	19	19	
Manganese	0.05			<0.01		<0.01		0.01
Mercury	0.001	0.0002		<0.0001		<0.0001		
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		11.7	11.7	10.6	10.8	11.1	
N-NO2 (Nitrite)	1			<0.10		<0.10		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.75	7.88	7.81	7.72	7.79	
Phenols				<0.001		<0.001		
Phosphate (as P)								
Phosphorus (total)				0.588		0.401		
Potassium				1		2		
Silicon								
Silver		0.0001						
Sodium	200		10	7	7	7	6	11
Strontium								
Sulphate	500		20	16	17	19	17	22
Sulphur								
Total Sus. Solids			290		494		404	
TDS	500		370	343	330	347	338	359
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.252		0.238		
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.01		
Ion Balance								
Field Parameters								
Temperature (^{o}C)			9.5		8.7	10.5	11.2	7.5
pH			7.2		7	7.8	7.5	7.7
Conductivity (µS/cm)			590		600	610	590	630

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inoganic
Groundwater Quality

			BH 16A (Deep)					
			Oct-13	Jul-14	Sep-14	Apr-15	Sep-15	Apr-16
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		394	378	390	430	438	453
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.06	<0.001	<0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)		0.0002		0.0003		0.0002
Barium	1		0.12	0.119	0.129	0.133	0.129	0.124
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.09	0.091	0.111	0.13	0.129	0.14
Bromide								
Cadmium	0.005	0.0002		0.00003		0.00003		0.00003
Calcium			139	153	162	171	159	159
Chloride	250		53	56.9	59.8	62.3	66.3	68.5
Chromium	0.05	0.009		<0.002		< 0.002		< 0.002
Cobalt		0.0009(i)						
COD			<5	78	<5	< 5	< 5	< 5
Conductivity (µS/cm)			976	1030	996	1040	1030	1050
Copper	1	0.005		0.0028		0.003		0.0032
DOC	5		2.1	4.3	4.7	5.2	2.1	3.8
Fluoride	1.5							
Hardness (as CaCO3)	500		476	531	554	587	549	550
Iron	0.3	0.3	0.27	0.042	0.114	< 0.005	< 0.005	< 0.005
Lead	0.01			0.00016		0.00002		0.00005
Magnesium			32	36.8	37.1	39.5	37.5	37.9
Manganese	0.05			0.017		0.015		0.008
Mercury	0.001	0.0002		<0.00002		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		6.73	7.0	6.9	5.6	5.3	5.5
N-NO2 (Nitrite)	1			<0.10		< 0.1		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.60	7.85	7.67	7.83	7.76	7.92
Phenols				<0.001		< 0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				0.85		0.04		0.42
Potassium				3.8		4.2		3.8
Silicon								
Silver		0.0001						
Sodium	200		20	21.2	22.5	24	24	25.8
Strontium								
Sulphate	500		36	42	42	42	42	42
Sulphur								
Total Sus. Solids								
TDS	500		634	571	593	626	700	633
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.34		0.28		0.34
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.005		< 0.005		< 0.005
Ion Balance				0.901	0.886	0.899		
Field Parameters								
Temperature (°C)			9.7	9.3	9.0	9.1	9.3	9.2
pH			7.4	7.6	7.4	7.4	7.4	7.3
Conductivity (µS/cm)			912	870	962	1150	923	1013

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 16A (Deep)					
			Sep-16	May-17	Aug-17	Apr-18	Sep-18	Jun-19
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		470	461	508	488	479	408
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			< 0.01	< 0.01	< 0.01	0.02	< 0.01	0.03
Arsenic	0.01	0.1 - 0.005(i)		0.0002		0.0001		0.1
Barium	1		0.128	0.121	0.178	0.173	0.185	0.109
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.169	0.222	0.386	0.549	0.579	0.391
Bromide								
Cadmium	0.005	0.0002		0.00004		0.00006		< 0.015
Calcium			135	133	169	161	169	123
Chloride	250		73.6	63.4	73.3	78.8	90.9	71.4
Chromium	0.05	0.009		0.113		< 0.002		< 0.0002
Cobalt		0.0009(i)						
COD			< 5	11	8	14	15	5
Conductivity (µS/cm)			1060	1120	1200	1190	1250	993
Copper	1	0.005		0.0049		0.0064		0.0048
DOC	5		2.9	3.7	5.1	9.1	6.7	5.5
Fluoride	1.5							
Hardness (as CaCO3)	500		478					
Iron	0.3	0.3	0.012	<0.005	0.012	<0.005	<0.005	<0.005
Lead	0.01			< 0.00002		0.00008		< 0.02
Magnesium			34.9	35	42.3	40.9	45.2	34
Manganese	0.05			0.015		0.036		0.02
Mercury	0.001	0.0002		< 0.02		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		4.9	1.96	1.03	0.27	0.88	6.94
N-NO2 (Nitrite)	1			< 0.05		< 0.05		< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.65	7.73	7.59	7.64	7.52	7.65
Phenols				0.004		< 0.001		< 0.002
Phosphate (as P)								
Phosphorus (total)				0.15		0.09		0.08
Potassium				3.8		6.3		4.9
Silicon								
Silver		0.0001						
Sodium	200		30.2	31.7	43.4	52.5	58.2	46.8
Strontium								
Sulphate	500		39	34	29	29	32	33
Sulphur								
Total Sus. Solids								
TDS	500		621	577	668	661	689	558
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.4		0.5		0.5
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		0.007		< 0.005
Ion Balance								1.02
Field Parameters								
Temperature (°C)			9.3	9.3	9.2	8.4	9.5	9.5
pH			6.8	6.9	7.0	6.8	7.5	6.8
Conductivity (µS/cm)			1164	1110	1160	1034	768	1124

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

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			BH 16A (Deep)					
			Oct-19	May-20	Sep-20	Apr-21	Aug-21	May-22
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		436	464	436	489	511	480
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.05	0.03	0.04	0.024	0.023	0.052
Arsenic	0.01	0.1 - 0.005(i)		0.0001		<0.001		<0.001
Barium	1		0.185	0.172	0.165	0.16	0.15	0.18
Beryllium		0.011						
BOD							3	
Boron	5	0.2(i)	0.466	0.488	0.434	0.44	0.41	0.35
Bromide								
Cadmium	0.005	0.0002		0.00005		<0.0001		<0.0001
Calcium			152	163	153	141	160	147
Chloride	250		67.5	69.4	75.6	72	70	71
Chromium	0.05	0.009		< 0.001		<0.001		<0.001
Cobalt		0.0009(i)						
COD			13	9	29	10	<5	<5
Conductivity (µS/cm)			1088	1130	1130	1140	1120	1080
Copper	1	0.005		0.0074		0.011		0.005
DOC	5		7.2	5.8	6.5	5	5.5	5.1
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.005	<0.005	0.031	<0.03	<0.03	0.04
Lead	0.01			0.00005		<0.001		<0.001
Magnesium			39.1	42.1	37.6	34	40	37
Manganese	0.05		0.044	0.06		0.08		0.09
Mercury	0.001	0.0002		< 0.00002		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		2.2	1.72	2.62	0.94	2.09	1.79
N-NO2 (Nitrite)	1			0.07		<0.50		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.75	7.87	7.64	7.71	7.32	7.27
Phenols				< 0.002		<0.010		<0.001
Phosphate (as P)								
Phosphorus (total)				0.13		0.043		0.223
Potassium				5.6		5		4
Silicon								
Silver		0.0001						
Sodium	200		47.3	45.2	41	41	43	38
Strontium								
Sulphate	500		27	29	32	32	32	36
Sulphur								
Total Sus. Solids							88	
TDS	500		602	633	607	741	728	702
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium				0.5				
TKN						0.403		0.521
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		<0.01		<0.01
Ion Balance			0.87					
Field Parameters								
Temperature (^{o}C)			9.0	8.9	8.8	8.3	9.4	9.7
pH			7.1	7	6.7	6.9	6.7	8.5
Conductivity (µS/cm)			1101	1102	1171	1163	1106	1076

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Groundwater Quality

			BH 16A (Deep)					
			Aug-22	Jun-23	Oct-23	Jun-24	Jun-24 QA/QC	Oct-24
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		509	524	523	491	492	475
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.029	<0.020	0.154	0.061	0.096	<0.020
Arsenic	0.01	0.1 - 0.005(i)		<0.001		<0.001	<0.001	
Barium	1		0.16	0.17	0.18	0.16	0.16	0.16
Beryllium		0.011						
BOD			<1		3			1
Boron	5	0.2(i)	0.40	0.43	0.47	0.45	0.46	0.42
Bromide								
Cadmium	0.005	0.0002		<0.0001		<0.0001	<0.0001	
Calcium			155	155	155	168	169	166
Chloride	250		70	72	77	85	85	83
Chromium	0.05	0.009		<0.001		<0.001	<0.001	
Cobalt		0.0009(i)						
COD			8	11	17	9	<5	5
Conductivity (µS/cm)			1080	1090	1110	1110	1110	1110
Copper	1	0.005		0.007		0.005	0.005	
DOC	5		2.0	5.6	15.6	5.4	3.3	4.5
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	0.04	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01			<0.001		<0.001	<0.001	
Magnesium			38	38	39	40	41	40
Manganese	0.05			0.09		0.11	0.11	
Mercury	0.001	0.0002		<0.0001		<0.0001	<0.0001	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		2.35	2.86	3.47	2.49	2.52	2.61
N-NO2 (Nitrite)	1			<0.10		<0.10	<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.53	7.49	7.44	7.48	7.44	7.69
Phenols				<0.001	<0.001	<0.001	<0.001	
Phosphate (as P)								
Phosphorus (total)				0.177		0.615	0.619	
Potassium				4		5	5	
Silicon								
Silver		0.0001						
Sodium	200		36	39	39	40	40	37
Strontium								
Sulphate	500		34	30	30	37	37	36
Sulphur								
Total Sus. Solids			340		413			230
TDS	500		702	708	722	722	722	722
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.603		0.469	0.34	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.01	<0.01	
Ion Balance								
Field Parameters								
Temperature (°C)			9.6	9.5	8.5	10.6		9.4
pH			7.5	7.2	6.2	7.3		7
Conductivity (µS/cm)			1120	1260	1360	1160		1230

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 16A (Deep)						
			Oct-24 QA/QC	MEDIAN					
PARAMETER	ODWSOG	PWQO							
Alkalinity (as CaCO3)	30-500		474	490					
Aluminum	0.1	0.075 (i)							
N-NH3 (Ammonia)			<0.020						
Arsenic	0.01	0.1 - 0.005(i)							
Barium	1		0.15	0.16					
Beryllium		0.011							
BOD			<1						
Boron	5	0.2(i)	0.34	0.43					
Bromide									
Cadmium	0.005	0.0002							
Calcium			164	155					
Chloride	250		82	72					
Chromium	0.05	0.009							
Cobalt		0.0009(i)							
COD			<5						
Conductivity (µS/cm)			1090						
Copper	1	0.005							
DOC	5		4.6	5.5					
Fluoride	1.5								
Hardness (as CaCO3)	500								
Iron	0.3	0.3	<0.03	0.03					
Lead	0.01								
Magnesium			40						
Manganese	0.05			0.05					
Mercury	0.001	0.0002							
Molybdenum		0.04(i)							
Nickel									
N-NO3 (Nitrate)	10		2.59						
N-NO2 (Nitrite)	1								
Organic Nitrogen	0.15								
pH (pH units)	6.5-8.5		7.54						
Phenols									
Phosphate (as P)									
Phosphorus (total)									
Potassium									
Silicon									
Silver		0.0001							
Sodium	200		36	40					
Strontium									
Sulphate	500		36	32					
Sulphur									
Total Sus. Solids			206						
TDS	500		708	708					
Temperature (^{o}C)	15								
Thallium		0.0003(i)							
Tin									
Titanium									
TKN									
Vanadium		(0.006(i)							
Zinc	5	0.03 - 0.02(i)							
Ion Balance									
Field Parameters									
Temperature (^{o}C)									
pH									
Conductivity (µS/cm)									

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 16B (Shallow)					
			Oct-13	Jul-14	Sep-14	Apr-15	Sep-15	Apr-16
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		377	361	362	413	408	435
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.04	<0.01	<0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)		0.0003		0.0003		0.0001
Barium	1		0.13	0.129	0.136	0.15	0.137	0.134
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.09	0.089	0.11	0.121	0.14	0.14
Bromide								
Cadmium	0.005	0.0002		0.00003		0.00002		0.00003
Calcium			136	141	145	167	144	148
Chloride	250		40	47.9	45	59.2	54.7	62.2
Chromium	0.05	0.009		<0.002		< 0.002		< 0.002
Cobalt		0.0009(i)						
COD			22	371	84	60	67	< 5
Conductivity (µS/cm)			926	961	891	1030	960	1010
Copper	1	0.005		0.005		0.004		0.003
DOC	5		2.6	3.8	4.2	4.7	1.8	3.3
Fluoride	1.5							
Hardness (as CaCO3)	500		465	486	496	573	497	512
Iron	0.3	0.3	0.84	0.612	0.695	0.458	< 0.005	< 0.005
Lead	0.01			0.0011		0.00072		0.00004
Magnesium			31	33.2	33.2	38.7	34.1	35.2
Manganese	0.05			0.025		0.029		< 0.001
Mercury	0.001	0.0002		<0.00002		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		9.17	9.2	8.3	8.4	7.6	9.1
N-NO2 (Nitrite)	1			<0.10		< 0.1		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.57	7.95	7.65	7.75	7.7	7.88
Phenols				<0.001		< 0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				9.35		4.79		1.13
Potassium				4.6		5.3		4.5
Silicon								
Silver		0.0001						
Sodium	200		20	20	21.7	22.1	26.1	26.8
Strontium								
Sulphate	500		31	40	34	43	36	42
Sulphur								
Total Sus. Solids								
TDS	500		602	544	539	621	653	620
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				2.38		1.33		0.57
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		0.005		< 0.005		< 0.005
Ion Balance				0.932	0.888	0.904		
Field Parameters								
Temperature (°C)			10.4	9.4	8.9	8.8	9.4	8.9
pH			7.7	7.6	7.3	7.3	7.2	7.4
Conductivity (µS/cm)			861	815	876	1107	866	956

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inoganic
Groundwater Quality

			BH 16B (Shallow)					
			Sep-16	May-17	Aug-17	Apr-18	Sep-18	Jun-19
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		411	408	362	441	401	346
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			< 0.01	< 0.01	< 0.01	0.03	0.02	0.09
Arsenic	0.01	0.1 - 0.005(i)		0.0002		< 0.0001		< 0.1
Barium	1		0.12	0.117	0.121	0.152	0.156	0.094
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.139	0.178	0.286	0.414	0.434	0.225
Bromide								
Cadmium	0.005	0.0002		0.00003		0.00004		0.01600
Calcium			120	115	115	142	144	106
Chloride	250		57.7	48.2	30.1	61	62.7	51.4
Chromium	0.05	0.009		< 0.002		< 0.002		< 0.0002
Cobalt		0.0009(i)						
COD			37	9	8	13	9	5
Conductivity (µS/cm)			933	1000	817	1020	1030	834
Copper	1	0.005		0.004		0.005		0.0029
DOC	5		2.7	2.7	3.4	6.8	5.6	3.8
Fluoride	1.5							
Hardness (as CaCO3)	500		426					
Iron	0.3	0.3	0.031	< 0.005	0.008	< 0.005	< 0.005	< 0.005
Lead	0.01			< 0.00002		0.00007		< 0.02
Magnesium			31.3	30.9	28.5	35.1	38.2	28.9
Manganese	0.05			< 0.001		0.004		< 0.001
Mercury	0.001	0.0002		< 0.02		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		3.3	2.58	1.45	0.56	1.35	8.57
N-NO2 (Nitrite)	1			< 0.05		< 0.05		< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.7	7.82	7.69	7.65	7.65	7.89
Phenols				0.002		< 0.001		< 0.002
Phosphate (as P)								
Phosphorus (total)				0.19		0.13		0.25
Potassium				3.9		5.6		5.2
Silicon								
Silver		0.0001						
Sodium	200		25.7	26.4	29	40.4	47.7	34.1
Strontium								
Sulphate	500		32	28	17	23	25	29
Sulphur								
Total Sus. Solids								
TDS	500		532	497	441	572	565	463
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.5		0.4		0.5
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		0.005		< 0.005
Ion Balance								1.03
Field Parameters								
Temperature (°C)			9.3	9.0	9.0	8.3	9.4	9.3
pH			7.4	7.0	7.0	7.0	7.7	7
Conductivity (µS/cm)			1030	963	776	882	665	949

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 16B (Shallow)					
			Oct-19	May-20	Sep-20	Apr-21	Aug-21	May-22
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		396	399	386	417	421	410
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.11	0.12	0.17	0.155	<0.010	0.025
Arsenic	0.01	0.1 - 0.005(i)		< 0.0001		<0.001		<0.001
Barium	1		0.159	0.165	0.147	0.14	0.13	0.17
Beryllium		0.011						
BOD							4	
Boron	5	0.2(i)	0.403	0.342	0.31	0.33	0.27	0.24
Bromide								
Cadmium	0.005	0.0002		0.00005		<0.0001		<0.0001
Calcium			132	148	138	125	136	137
Chloride	250		47.9	65.2	58.9	67	52	62
Chromium	0.05	0.009		< 0.001		<0.001		<0.001
Cobalt		0.0009(i)						
COD			12	8	18	8	<5	<5
Conductivity (µS/cm)			946	1020	988	1020	959	980
Copper	1	0.005		0.006		0.006		0.005
DOC	5		5.6	4.1	5.6	3.3	4	3.9
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	0.008	<0.03	0.03	<0.03
Lead	0.01			0.00004		<0.001		<0.001
Magnesium			33.4	35.8	32.7	30	33	33
Manganese	0.05		0.027	0.046		0.06		0.06
Mercury	0.001	0.0002		< 0.00002		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		1.22	4.49	3.23	4.59	4.81	8.5
N-NO2 (Nitrite)	1			< 0.05		<0.50		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.83	7.91	7.68	7.72	7.32	7.45
Phenols				< 0.002		<0.010		<0.001
Phosphate (as P)								
Phosphorus (total)				0.11		0.138		0.394
Potassium				5.6		5		5
Silicon								
Silver		0.0001						
Sodium	200		40	35.7	31.6	35	35	30
Strontium								
Sulphate	500		21	29	27	29	28	32
Sulphur								
Total Sus. Solids							537	
TDS	500		518	559	525	663	623	637
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium				0.5				
TKN						0.634		0.529
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		<0.01		<0.01
Ion Balance			0.871					
Field Parameters								
Temperature (^{o}C)			8.8	8.9	8.7	7.9	9.3	9.2
pH			7.3	7.2	6	6.9	6.7	6.9
Conductivity (µS/cm)			939	988	1023	1057	943	978

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 16B (Shallow)					
			Aug-22	Jun-23	Oct-23	Jun-24	Oct-24	MEDIAN
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		417	425	440	426	408	417
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.020	<0.020	0.109	<0.020	<0.020	
Arsenic	0.01	0.1 - 0.005(i)		<0.001		<0.001		
Barium	1		0.15	0.17	0.17	0.17	0.15	0.16
Beryllium		0.011						
BOD			5		3		4	
Boron	5	0.2(i)	0.29	0.28	0.35	0.36	0.38	0.32
Bromide								
Cadmium	0.005	0.0002		<0.0001		<0.0001		
Calcium			130	138	136	160	143	
Chloride	250		55	66	63	87	73	64
Chromium	0.05	0.009		<0.001		<0.001		
Cobalt		0.0009(i)						
COD			30	7	19	10	8	
Conductivity (µS/cm)			926	989	979	1050	1000	
Copper	1	0.005		0.006		0.005		
DOC	5		2.2	4.2	12.2	3.7	3.5	4.0
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	0.05	0.04	<0.03	<0.03	0.03
Lead	0.01			<0.001				
Magnesium			31	33	33	36	33	
Manganese	0.05			0.08		0.06		0.04
Mercury	0.001	0.0002		<0.0001		<0.0001		
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		6.03	7.92	4.71	5.31	7.00	
N-NO2 (Nitrite)	1			<0.10		<0.10		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.52	7.55	7.48	7.56	7.68	
Phenols				<0.001	<0.001	<0.001		
Phosphate (as P)								
Phosphorus (total)				0.42		0.272		
Potassium				5		6		
Silicon								
Silver		0.0001						
Sodium	200		31	33	32	35	39	34
Strontium								
Sulphate	500		29	31	28	39	34	29
Sulphur								
Total Sus. Solids			616		571		358	
TDS	500		602	643	636	682	650	637
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.676		1.16		
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.01		
Ion Balance								
Field Parameters								
Temperature (^{o}C)			10.2	10.2	8.6	11.9	10.1	
pH			7.4	7.2	6	7.3	7	
Conductivity (µS/cm)			950	1150	1220	1130	1220	

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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			BH 17A (Deep)					
			Oct-13	Jul-14	Sep-14	Apr-15	Sep-15	Sep-15 QA/QC
PARAMETER	ODWSOG	PWQO						BH 18
Alkalinity (as CaCO3)	30-500		141	129	131	130	135	142
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.05	<0.01	<0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)		0.0002		0.0002		
Barium	1		0.04	0.035	0.032	0.028	0.031	0.031
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.005	0.007	0.006	< 0.005	< 0.005
Bromide								
Cadmium	0.005	0.0002		<0.00002		< 0.00002		
Calcium			53	53.3	53.9	50.4	54.8	54.8
Chloride	250		7	6.4	6.2	6.3	5.8	5.8
Chromium	0.05	0.009		<0.002		< 0.002		
Cobalt		0.0009(i)						
COD			<5	<5	< 5	< 5	< 5	< 5
Conductivity (µS/cm)			373	370	358	346	354	358
Copper	1	0.005		0.0006		< 0.0001		
DOC	5		1.9	1.4	1.9	1.1	1	1
Fluoride	1.5							
Hardness (as CaCO3)	500		185	186	186	176	189	189
Iron	0.3	0.3	0.39	0.053	0.072	< 0.005	< 0.005	< 0.005
Lead	0.01			0.00005		< 0.00002		
Magnesium			13	13	12.6	12.3	12.9	13
Manganese	0.05			0.005		< 0.001		
Mercury	0.001	0.0002		<0.00002		< 0.00002		
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		6.05	6.1	6	5.7	6	5.9
N-NO2 (Nitrite)	1			<0.1		< 0.1		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.82	8.08	8.06	8.05	7.86	7.86
Phenols				<0.001		< 0.001		
Phosphate (as P)								
Phosphorus (total)				2.16		< 0.01		
Potassium				2.9		2.3		
Silicon								
Silver		0.0001						
Sodium	200		5	4.3	4.1	3.9	4.1	4.1
Strontium								
Sulphate	500		22	23	23	24	24	25
Sulphur								
Total Sus. Solids								
TDS	500		242	207	208	202	234	236
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.07		< 0.05		
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.005		< 0.005		
Ion Balance				0.919	0.933	0.98		
Field Parameters								
Temperature (^{o}C)			8.8	9.8	9.1	9.1	9.6	
pH			8	8.1	8.1	7.9	7.8	
Conductivity (µS/cm)			357	332	346	411	335	

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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			BH 17A (Deep)					
			Apr-16	Aug-16	May-17	Aug-17	Apr-18	Sep-18
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		135	133	126	128	123	129
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.01
Arsenic	0.01	0.1 - 0.005(i)	0.0001		0.0002		< 0.0001	
Barium	1		0.032	0.032	0.026	0.03	0.03	0.028
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	< 0.005	0.008	0.011	0.005	0.007	< 0.005
Bromide								
Cadmium	0.005	0.0002	< 0.00002		< 0.000014		< 0.000014	
Calcium			55.8	55.4	49.6	52.5	52.8	53.3
Chloride	250		6.5	6.2	5.9	5.9	5.8	7.1
Chromium	0.05	0.009	< 0.002		0.028		< 0.002	
Cobalt		0.0009(i)						
COD			< 5	< 5	< 5	< 5	< 5	< 5
Conductivity (µS/cm)			362	361	365	371	364	362
Copper	1	0.005	0.0005		0.0003		0.0003	
DOC	5		0.7	0.6	0.5	0.7	1.2	0.8
Fluoride	1.5							
Hardness (as CaCO3)	500		194	192				
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01		< 0.00002		< 0.00002		< 0.00002	
Magnesium			13.5	13.3	11.9	12.8	12.8	13.5
Manganese	0.05		< 0.001		< 0.001		< 0.001	
Mercury	0.001	0.0002	< 0.00002		< 0.02		< 0.00002	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		6.2	6.3	7.32	7.53	7.71	6.81
N-NO2 (Nitrite)	1		< 0.1		< 0.05		< 0.05	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.12	7.99	8.07	8.09	8.14	8
Phenols			< 0.001		< 0.001		< 0.001	
Phosphate (as P)								
Phosphorus (total)			0.06		0.1		0.02	
Potassium			2.1		1.6		2	
Silicon								
Silver		0.0001						
Sodium	200		4.5	4.4	4.1	4.2	4.4	4.6
Strontium								
Sulphate	500		23	24	20	18	20	22
Sulphur								
Total Sus. Solids								
TDS	500		214	213	169	172	171	180
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			0.13		< 0.1		0.2	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005		< 0.005		< 0.005	
Ion Balance								
Field Parameters								
Temperature (^{o}C)			7.8	9.5	8.8	9.0	8.2	8.5
pH			7.9	7.9	7.9	7.8	7.8	8
Conductivity (µS/cm)			351	396	364	360	322	289

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

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Ross WDS
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Groundwater Quality

			BH 17A (Deep)						
			Jun-19	Oct-19	May-20	Sep-20	Apr-21	Aug-21	May-22
PARAMETER	ODWSOG	PWQO							
Alkalinity (as CaCO3)	30-500		133	134	129	126	134	146	138
Aluminum	0.1	0.075 (i)							
N-NH3 (Ammonia)			0.03	< 0.01	< 0.01	< 0.01	<0.010	<0.010	<0.010
Arsenic	0.01	0.1 - 0.005(i)	0.1		0.0001		<0.001		<0.001
Barium	1		0.015	0.038	0.032	0.03	0.03	0.03	0.04
Beryllium		0.011							
BOD								2	
Boron	5	0.2(i)	< 0.005	0.01	0.009	0.008	<0.01	0.01	<0.01
Bromide									
Cadmium	0.005	0.0002	< 0.015		< 0.000015		<0.0001		<0.0001
Calcium			39.6	54.1	57.7	54.6	53	58	53
Chloride	250		6.5	6.3	6.9	6.9	8	9	7
Chromium	0.05	0.009	0.0005		< 0.001		<0.001		0.001
Cobalt		0.0009(i)							
COD			< 5	< 5	6	19	<5	<5	<5
Conductivity (µS/cm)			304	352	371	384	380	384	294
Copper	1	0.005	0.0002		0.0004		<0.001		0.002
DOC	5		1.1	1.6	3	2.2	1	1.2	1.6
Fluoride	1.5								
Hardness (as CaCO3)	500								
Iron	0.3	0.3	< 0.005	< 0.005	0.009	0.005	<0.03	<0.03	<0.03
Lead	0.01		< 0.02		< 0.00002		<0.001		<0.001
Magnesium			10.9	13.4	13.7	12.8	12	14	12
Manganese	0.05		< 0.001	< 0.001	< 0.001		<0.01		<0.01
Mercury	0.001	0.0002	< 0.00002		< 0.00002		<0.0001		<0.0001
Molybdenum		0.04(i)							
Nickel									
N-NO3 (Nitrate)	10		6.47	5.81	6.97	7.43	6.94	7.13	9.09
N-NO2 (Nitrite)	1		< 0.05		< 0.05		<0.10		
Organic Nitrogen	0.15								
pH (pH units)	6.5-8.5		8.06	8.11	8.09	8.11	8.13	7.98	7.81
Phenols			< 0.002		< 0.002		<0.010		<0.001
Phosphate (as P)									
Phosphorus (total)			0.22		0.12		0.371		0.17
Potassium			1.7		1.9		2		2
Silicon									
Silver		0.0001							
Sodium	200		4.3	4.5	4.3	4.1	4	4	4
Strontium									
Sulphate	500		19	20	20	24	22	23	23
Sulphur									
Total Sus. Solids								40	
TDS	500		162	180	183	180	247	250	191
Temperature (°C)	15								
Thallium		0.0003(i)							
Tin									
Titanium					0.2				
TKN			0.1				0.167		0.174
Vanadium		(0.006(i)							
Zinc	5	0.03 - 0.02(i)	< 0.005		< 0.005		<0.01		<0.01
Ion Balance			1.19	0.907					
Field Parameters									
Temperature (°C)			8.8	9	8.2	8.6	8.3	10	8.8
pH			7.8	7.9	7.8	7.6	7	7.5	7.9
Conductivity (µS/cm)			386	375	368	400	397	391	390

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inoganic
Groundwater Quality

			BH 17A (Deep)					
			Aug-22	Aug-22	Jun-23	Oct-23	Jun-24	Oct-24
PARAMETER	ODWSOG	PWQO		Dup #2				
Alkalinity (as CaCO3)	30-500		146	146	145	146	135	137
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.020	0.035	<0.020	<0.020	<0.020	<0.020
Arsenic	0.01	0.1 - 0.005(i)			<0.001		<0.001	
Barium	1		0.03	0.03	0.04	0.03	0.03	0.03
Beryllium		0.011						
BOD			<1	<1		1		<1
Boron	5	0.2(i)	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002			<0.0001		<0.0001	
Calcium			53	53	52	51	57	56
Chloride	250		7	7	6	6	7	8
Chromium	0.05	0.009			<0.001		<0.001	
Cobalt		0.0009(i)						
COD			<5	<5	<5	10	6	<5
Conductivity (µS/cm)			293	293	290	288	296	289
Copper	1	0.005			0.002		0.001	
DOC	5		--	--	2.6	4.2	1.2	1.1
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01				<0.001		<0.001	
Magnesium			12	12	12	12	13	13
Manganese	0.05				<0.01		<0.01	
Mercury	0.001	0.0002			<0.0001		<0.0001	
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.91	7.92	7.65	6.65	6.58	6.97
N-NO2 (Nitrite)	1				<0.10		<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.95	7.97	8.03		7.84	7.91
Phenols					<0.001	7.93	<0.001	
Phosphate (as P)								
Phosphorus (total)					0.143		3.18	
Potassium					1		2	
Silicon								
Silver		0.0001						
Sodium	200		4	4	4	4	4	4
Strontium								
Sulphate	500		23	22	22	22	26	24
Sulphur								
Total Sus. Solids			212	104		120		41
TDS	500		190	190	188	187	192	188
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN					0.176		0.644	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)			<0.01		<0.01	
Ion Balance								
Field Parameters								
Temperature (^{o}C)			9.6	9.6	9		9.7	10
pH			8	8	7.7		7.7	7.9
Conductivity (µS/cm)			390	390	450		420	390

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inoganic
Groundwater Quality

BH 17A (Deep)
MEDIAN

PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		138					
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)								
Arsenic	0.01	0.1 - 0.005(i)						
Barium	1		0.03					
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.01					
Bromide								
Cadmium	0.005	0.0002						
Calcium								
Chloride	250		7					
Chromium	0.05	0.009						
Cobalt		0.0009(i)						
COD								
Conductivity (µS/cm)								
Copper	1	0.005						
DOC	5		1.6					
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03					
Lead	0.01							
Magnesium								
Manganese	0.05		0.01					
Mercury	0.001	0.0002						
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10							
N-NO2 (Nitrite)	1							
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5							
Phenols								
Phosphate (as P)								
Phosphorus (total)								
Potassium								
Silicon								
Silver		0.0001						
Sodium	200		4					
Strontium								
Sulphate	500		23					
Sulphur								
Total Sus. Solids								
TDS	500		189					
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN								
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)						
Ion Balance								
Field Parameters								
Temperature (^{o}C)								
pH								
Conductivity (µS/cm)								

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inoganic
Groundwater Quality

			BH 17B (Shallow)					
			Oct-13	Jul-14	Sep-14	Apr-15	Sep-15	Apr-16
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		160	132	136	138	136	139
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			0.03	<0.01	<0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.01	0.1 - 0.005(i)		0.0003		0.0002		0.0001
Barium	1		0.04	0.03	0.032	0.025	0.03	0.028
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.005	0.009	0.006	< 0.005	< 0.005
Bromide								
Cadmium	0.005	0.0002		<0.00002		< 0.00002		< 0.00002
Calcium			57	53.5	58.6	50.6	56	56.6
Chloride	250		7	6.5	5.8	6	5.8	6.8
Chromium	0.05	0.009		<0.002		< 0.002		< 0.002
Cobalt		0.0009(i)						
COD			29	<5	< 5	< 5	< 5	< 5
Conductivity (µS/cm)			418	377	358	355	355	364
Copper	1	0.005		0.0006		< 0.0001		0.0004
DOC	5		8	1.8	1.6	1	1	0.7
Fluoride	1.5							
Hardness (as CaCO3)	500		195	185	199	175	191	195
Iron	0.3	0.3	0.17	0.006	0.024	< 0.005	< 0.005	< 0.005
Lead	0.01			0.00007		< 0.00002		< 0.00002
Magnesium			13	12.7	13.1	12.1	12.7	13.3
Manganese	0.05			0.012		0.008		< 0.001
Mercury	0.001	0.0002		<0.00002		0.00003		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		5.91	6.5	6.5	6.4	6.8	6.9
N-NO2 (Nitrite)	1			<0.1		< 0.1		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.62	8.07	7.88	8.06	7.86	8.18
Phenols				<0.001		< 0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				0.14		0.05		0.07
Potassium				1.4		1.1		1
Silicon								
Silver		0.0001						
Sodium	200		7	5.7	5.5	4.8	4.3	4.5
Strontium								
Sulphate	500		22	20	21	19	21	21
Sulphur								
Total Sus. Solids								
TDS	500		272	208	215	205	234	217
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.07		0.08		0.13
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.005		< 0.005		< 0.005
Ion Balance				0.93	0.882	1.01		
Field Parameters								
Temperature (^{o}C)			8.8	9.5	9.2	7.8	9.6	7
pH			7.7	7.9	8.1	8.1	7.9	8.1
Conductivity (µS/cm)			395	346	344	407	335	356

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inoganic
Groundwater Quality

			BH 17B (Shallow)					
			Aug-16	May-17	Aug-17	Apr-18	Sep-18	Jun-19
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		135	129	128	128	130	131
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			< 0.01	< 0.01	< 0.01	0.05	0.02	0.05
Arsenic	0.01	0.1 - 0.005(i)		0.0002		0.0001		0.1
Barium	1		0.03	0.024	0.027	0.028	0.027	0.016
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	0.008	0.014	0.008	0.008	0.005	< 0.005
Bromide								
Cadmium	0.005	0.0002		< 0.000014		< 0.000014		< 0.015
Calcium			56.6	49.4	50.9	53.2	53.9	46.1
Chloride	250		6.2	4.6	5.1	5	6.6	7.2
Chromium	0.05	0.009		< 0.002		< 0.002		0.0005
Cobalt		0.0009(i)						
COD			< 5	< 5	< 5	< 5	< 5	< 5
Conductivity (µS/cm)			364	369	359	360	359	320
Copper	1	0.005		0.0007		0.0005		0.0003
DOC	5		0.7	0.8	0.9	1.4	1.2	1.3
Fluoride	1.5							
Hardness (as CaCO3)	500		194					
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01			< 0.00002		< 0.00002		< 0.02
Magnesium			13.1	11.7	12.2	12.7	13	11.9
Manganese	0.05			< 0.001		< 0.001		< 0.001
Mercury	0.001	0.0002		< 0.02		< 0.00002		< 0.00002
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		7.1	8.81	7.96	8.76	8.54	10.4
N-NO2 (Nitrite)	1			< 0.05		< 0.05		< 0.05
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.98	8.06	8.1	8.14	8.01	8.03
Phenols				0.003		< 0.001		< 0.002
Phosphate (as P)								
Phosphorus (total)				0.07		0.02		0.06
Potassium				0.8		1.3		1
Silicon								
Silver		0.0001						
Sodium	200		4.3	3.8	4	4.4	4.3	4.2
Strontium								
Sulphate	500		22	17	15	17	17	18
Sulphur								
Total Sus. Solids								
TDS	500		215	164	165	170	174	167
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.2		0.2		0.2
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		< 0.005		< 0.005
Ion Balance								1.13
Field Parameters								
Temperature (^{o}C)			9	7.6	9.0	6.5	8.9	8
pH			7.8	8.1	7.7	7.8	8.1	7.6
Conductivity (µS/cm)			400	364	352	326	292	425

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inoganic
Groundwater Quality

			BH 17B (Shallow)					
			Oct-19	May-20	Sep-20	Apr-21	Aug-21	May-22
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		136	137	129	143	151	142
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			< 0.01	< 0.01	< 0.01	<0.010	<0.010	<0.010
Arsenic	0.01	0.1 - 0.005(i)		< 0.0001		<0.001		<0.001
Barium	1		0.024	0.032	0.029	0.03	0.03	0.03
Beryllium		0.011						
BOD							2	
Boron	5	0.2(i)	0.008	0.01	0.01	0.02	0.01	0.01
Bromide								
Cadmium	0.005	0.0002		< 0.000015		<0.0001		<0.0001
Calcium			44.8	61.9	55.6	55	61	55
Chloride	250		0.9	6.4	6.5	8	9	7
Chromium	0.05	0.009		< 0.001		<0.001		<0.001
Cobalt		0.0009(i)						
COD			5	< 5	11	<5	<5	<5
Conductivity (µS/cm)			286	389	391	397	390	299
Copper	1	0.005		0.0004		0.002		0.001
DOC	5		1.5	2.8	2.2	0.6	1.4	1.9
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	< 0.005	< 0.005	0.006	0.05	<0.03	<0.03
Lead	0.01			< 0.00002		<0.001		<0.001
Magnesium			10.5	13.8	13	12	14	12
Manganese	0.05		0.001	< 0.001		<0.01		<0.01
Mercury	0.001	0.0002		< 0.00002		<0.0001		<0.0001
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		0.69	9.3	9.19	8.35	8.17	10.2
N-NO2 (Nitrite)	1			< 0.05		<0.10		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		8.1	8.07	8.06	8.08	7.92	7.77
Phenols				< 0.002		<0.010		<0.001
Phosphate (as P)								
Phosphorus (total)				0.04		0.034		0.041
Potassium				1.3		1		<1
Silicon								
Silver		0.0001						
Sodium	200		3.5	4.1	3.9	4	4	4
Strontium								
Sulphate	500		2	14	17	18	20	19
Sulphur								
Total Sus. Solids							34	
TDS	500		144	184	175	258	254	194
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium				0.2				
TKN						0.108		<0.100
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		< 0.005		<0.01		<0.01
Ion Balance			0.858					
Field Parameters								
Temperature (^{o}C)			8.8	6.9	8.4	7.9	8.9	8.3
pH			7.8	7.9	7	6.9	7.4	7.71
Conductivity (µS/cm)			387	388	409	413	397	400

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inoganic
Groundwater Quality

			BH 17B (Shallow)					
			Aug-22	Jun-23	Oct-23	Jun-24	Oct-24	MEDIAN
PARAMETER	ODWSOG	PWQO						
Alkalinity (as CaCO3)	30-500		152	152	152	144	144	144
Aluminum	0.1	0.075 (i)						
N-NH3 (Ammonia)			<0.020	<0.020	<0.020	<0.020	<0.020	
Arsenic	0.01	0.1 - 0.005(i)		<0.001		<0.001		
Barium	1		0.03	0.04	0.03	0.03	0.03	0.03
Beryllium		0.011						
BOD			<1		<1		<1	
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Bromide								
Cadmium	0.005	0.0002		<0.0001		<0.0001		
Calcium			55	54	53	59	59	
Chloride	250		6	6	6	7	7	7
Chromium	0.05	0.009		<0.001				
Cobalt		0.0009(i)						
COD			7	<5	<5	<5	<5	
Conductivity (µS/cm)			297	295	293	297	293	
Copper	1	0.005		0.002		0.001		
DOC	5		--	1.9	5.0	1.1	1.2	1.5
Fluoride	1.5							
Hardness (as CaCO3)	500							
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	0.03
Lead	0.01			<0.001		<0.001		
Magnesium			12	12	12	13	13	
Manganese	0.05			<0.01		<0.01		0.01
Mercury	0.001	0.0002		<0.0001		<0.0001		
Molybdenum		0.04(i)						
Nickel								
N-NO3 (Nitrate)	10		8.21	8.57	6.97	7.43	7.76	
N-NO2 (Nitrite)	1			<0.10		<0.10		
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		7.93	8.05	7.93	7.82	7.93	
Phenols				<0.001		<0.001		
Phosphate (as P)								
Phosphorus (total)				0.089		0.11		
Potassium				<1		1		
Silicon								
Silver		0.0001						
Sodium	200		4	4	4	4	4	4
Strontium								
Sulphate	500		20	16	18	20	18	18
Sulphur								
Total Sus. Solids			49		38		45	
TDS	500		193	192	190	193	190	193
Temperature (^{o}C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				0.179		<0.100		
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		<0.01		<0.01		
Ion Balance								
Field Parameters								
Temperature (^{o}C)			9.3	8.4	9	10.4	10.3	
pH			8.3	7.6	7.7	7.7	7.9	
Conductivity (µS/cm)			400	460	460	430	440	

Exceeds ODWS
Exceeds PWQO

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Groundwater VOC’s

Ross WDS
Report of Organic Analysis

BH 1

Parameter	Column 1	ODWS/OG	Dec-00	May-09	May-10	Jun-11	Apr-13	Jul-14
Acetone								
1,1,1,2- tetrachloroethane			<0.6	<0.5				
1,1,1- trichloroethane			<0.4	<0.4				
1,1,2,2- tetrachloroethane			<0.6	<0.5				
1,1,2- trichloroethane			<0.4	<0.4				
1,1- dichloroethane			<0.4	<0.4				
1,1- dichloroethylene	MAC	14	<0.5	<0.5				
1,2- dibromoethane			<1.0	<1.0				
1,2- dichlorobenzene	MAC	200	<0.4	<0.4				
1,2- dichloroethane	IMAC	5	<0.7	<0.5				
1,2- dichloropropane			<0.7	<0.5				
1,3,5- trimethylbenzene			<0.3	<0.3				
1,3- dichlorobenzene			<0.4	<0.4				
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.8	<0.4	<0.2
Benzene	MAC	1	<0.5	<0.5	<0.5	<1	<0.5	<0.5
Bromodichloromethane			<0.3	<0.3				
Bromoform			<0.4	<0.4				
Bromomethane			<0.5	<0.5				
c-1,2- Dichloroethylene			<0.4	<0.4				
c-1,3- Dichloropropylene			<0.2	<0.2				
Carbon Tetrachloride	MAC	2	<0.9	<0.5				
Chloroethane			<1.0	<1.0				
Chloroform			<0.5	<0.5				
Chloromethane			<1.0	<1.0				
Dibromochloromethane			<0.3	<0.3				
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<8.0	<4.0	<0.3
Ethylbenzene	AO	140	<0.5	<0.5				
m/p- xylene	AO	300	<1.0	<1.0				
Monochlorobenzene	MAC	80	<0.2	<0.2				
o-xylene			<0.5	<0.5				
Xylene, m,p,o-	AO	300						
Styrene			<0.5	<0.5				
t-1,2- Dichloroethylene			<0.4	<0.4				
t-1,3- Dichloropropylene			<0.2	<0.2				
Tetrachloroethylene	MAC	10	<0.3	<0.3				
Toluene	AO	60	<0.5	<0.5	<0.50	3	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3	<0.3				
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5	<0.5				
Vinyl Chloride	MAC	1	<0.5	<0.2	<0.2	<0.4	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				117	108	112	102	100
4- bromofluorobenzene %				59	109	120	100	91
Toluene- d8 %				117	107	100	94	94.5

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

			BH 1					
			Dup			Dup		
			Jul-14	Apr-15	Apr-16	Apr-16	May-17	Apr-18
Parameter	**Column 1**	ODWS/OG						
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzene	MAC	1	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	<0.3	< 0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			104.0	98.3	110	108	103	105
4- bromofluorobenzene %			90.8	105	98.9	108	105	97
Toluene- d8 %			96.4	110	103	102	104	102

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 1

			Jun-19	Decomissioned				
Parameter	**Column 1**	ODWS/OG						
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.2					
Benzene	MAC	1	< 0.5					
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 0.3					
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5					
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2					
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %								
4- bromofluorobenzene %								
Toluene- d8 %								

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 2B Shallow

Parameter	Column 1	ODWS/OG	May-09	May-10	Jun-11	May-12	Apr-13	Jul-14
Acetone								
1,1,1,2- tetrachloroethane			<0.5					
1,1,1- trichloroethane			<0.4					
1,1,2,2- tetrachloroethane			<0.5					
1,1,2- trichloroethane			<0.4					
1,1- dichloroethane			<0.4					
1,1- dichloroethylene	MAC	14	<0.5					
1,2- dibromoethane			<1.0					
1,2- dichlorobenzene	MAC	200	<0.4					
1,2- dichloroethane	IMAC	5	<0.5					
1,2- dichloropropane			<0.5					
1,3,5- trimethylbenzene			<0.3					
1,3- dichlorobenzene			<0.4					
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	0.4	<0.4	<0.2
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.3					
Bromoform			<0.4					
Bromomethane			<0.5					
c-1,2- Dichloroethylene			<0.4					
c-1,3- Dichloropropylene			<0.2					
Carbon Tetrachloride	MAC	2	<0.5					
Chloroethane			<1.0					
Chloroform			<0.5					
Chloromethane			<1.0					
Dibromochloromethane			<0.3					
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<4.0	<0.3
Ethylbenzene	AO	140	<0.5					
m/p- xylene	AO	300	<1.0					
Monochlorobenzene	MAC	80	<0.2					
o-xylene			<0.5					
Xylene, m,p,o-	AO	300						
Styrene			<0.5					
t-1,2- Dichloroethylene			<0.4					
t-1,3- Dichloropropylene			<0.2					
Tetrachloroethylene	MAC	10	<0.3					
Toluene	AO	60	<0.5	<0.50	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3					
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5					
Vinyl Chloride	MAC	1	<0.2	<0.2	0.4	5.6	2.2	0.5
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			114	114	113	106	119	96.9
4- bromofluorobenzene %			82	111	119	110	103	94.7
Toluene- d8 %			124	112	101	100	96	93.6

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 2B Shallow

Parameter	Column 1	ODWS/OG	Jul-14	Apr-15	Apr-16	May-17	Apr-18	Jun-19
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	0.8	0.8	< 0.2	< 0.2	< 0.2	< 0.2
Benzene	MAC	1	0.6	0.6	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	2.1	2.1	< 0.2	< 0.2	1.5	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			100	100	112	103	103	
4- bromofluorobenzene %			107	107	98.2	104	98	
Toluene- d8 %			111	111	102	103	102	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 2B Shallow

Parameter	Column 1	ODWS/OG	May-20	Apr-21	May-22	Jun-23	Jun-24 Dry	
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.5	<0.4	<0.4	<0.4		
Benzene	MAC	1	< 0.5	<0.5	<0.5	<0.5		
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 5	<4.0	<4.0	<4.0		
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	<0.5	<0.4	<0.4		
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	1.0	<0.2	<0.2	<0.2		
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				114	112	120		
4- bromofluorobenzene %				101	70	89		
Toluene- d8 %				108	102	101		

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 2A Deep

Parameter	Column 1	ODWS/OG	May-09	May-10	Jun-11	May-12	Apr-13	Jul-14
Acetone								
1,1,1,2- tetrachloroethane			<0.5					
1,1,1- trichloroethane			<0.4					
1,1,2,2- tetrachloroethane			<0.5					
1,1,2- trichloroethane			<0.4					
1,1- dichloroethane			<0.4					
1,1- dichloroethylene	MAC	14	<0.5					
1,2- dibromoethane			<1.0					
1,2- dichlorobenzene	MAC	200	<0.4					
1,2- dichloroethane	IMAC	5	<0.5					
1,2- dichloropropane			<0.5					
1,3,5- trimethylbenzene			<0.3					
1,3- dichlorobenzene			<0.4					
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	0.4	<0.4	<0.2
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.3					
Bromoform			<0.4					
Bromomethane			<0.5					
c-1,2- Dichloroethylene			<0.4					
c-1,3- Dichloropropylene			<0.2					
Carbon Tetrachloride	MAC	2	<0.5					
Chloroethane			<1.0					
Chloroform			<0.5					
Chloromethane			<1.0					
Dibromochloromethane			<0.3					
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<4.0	<0.3
Ethylbenzene	AO	140	<0.5					
m/p- xylene	AO	300	<1.0					
Monochlorobenzene	MAC	80	<0.2					
o-xylene			<0.5					
Xylene, m,p,o-	AO	300						
Styrene			<0.5					
t-1,2- Dichloroethylene			<0.4					
t-1,3- Dichloropropylene			<0.2					
Tetrachloroethylene	MAC	10	<0.3					
Toluene	AO	60	<0.5	<0.50	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3					
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5					
Vinyl Chloride	MAC	1	<0.2	<0.2	0.4	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			130	112	111	104	115	96.1
4- bromofluorobenzene %			71	109	120	113	99	92.7
Toluene- d8 %			129	110	99	103	96	96

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 2A Deep

Parameter	Column 1	ODWS/OG	Jul-14	Apr-15	Apr-16	May-17	Apr-18	Jun-19
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzene	MAC	1	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	< 0.2	< 0.2	0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			101	101	111	102	109	
4- bromofluorobenzene %			109	109	98.4	104	98	
Toluene- d8 %			113	113	102	104	102	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 2A Deep

Parameter	Column 1	ODWS/OG	May-20	Apr-21	May-22	Jun-23	Jun-24 Dry	
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.5	<0.4	<0.4	<0.4		
Benzene	MAC	1	< 0.5	<0.5	<0.5	<0.5		
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 5	<4.0	<4.0	<4.0		
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	<0.5	<0.4	<0.4		
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	<0.2	<0.2	<0.2		
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				122	130	119		
4- bromofluorobenzene %				92	93	90		
Toluene- d8 %				106	88	99		

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 4 Deep

Parameter	Column 1	ODWS/OG	Dec-00	May-09	May-10	Jun-11	May-12	Apr-13
Acetone								
1,1,1,2- tetrachloroethane			<0.6	<0.5				
1,1,1- trichloroethane			<0.4	<0.4				
1,1,2,2- tetrachloroethane			<0.6	<0.5				
1,1,2- trichloroethane			<0.4	<0.4				
1,1- dichloroethane			<0.4	<0.4				
1,1- dichloroethylene	MAC	14	<0.5	<0.5				
1,2- dibromoethane			<1.0	<1.0				
1,2- dichlorobenzene	MAC	200	<0.4	<0.4				
1,2- dichloroethane	IMAC	5	<0.7	<0.5				
1,2- dichloropropane			<0.7	<0.5				
1,3,5- trimethylbenzene			<0.3	<0.3				
1,3- dichlorobenzene			<0.4	<0.4				
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.3	<0.3				
Bromoform			<0.4	<0.4				
Bromomethane			<0.5	<0.5				
c-1,2- Dichloroethylene			<0.4	<0.4				
c-1,3- Dichloropropylene			<0.2	<0.2				
Carbon Tetrachloride	MAC	2	<0.9	<0.5				
Chloroethane			<1.0	<1.0				
Chloroform			2.6	<0.5				
Chloromethane			<1.0	<1.0				
Dibromochloromethane			<0.3	<0.3				
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Ethylbenzene	AO	140	<0.5	<0.5				
m/p- xylene	AO	300	<1.0	<1.0				
Monochlorobenzene	MAC	80	<0.2	<0.2				
o-xylene			<0.5	<0.5				
Xylene, m,p,o-	AO	300						
Styrene			<0.5	<0.5				
t-1,2- Dichloroethylene			<0.4	<0.4				
t-1,3- Dichloropropylene			<0.2	<0.2				
Tetrachloroethylene	MAC	10	<0.3	<0.3				
Toluene	AO	60	<0.5	<0.5	<0.50	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	0.4	<0.3				
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5	<0.5				
Vinyl Chloride	MAC	1	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				119	113	114	106	105
4- bromofluorobenzene %				83	112	119	113	100
Toluene- d8 %				130	109	99	103	95

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 4 Deep

Parameter	Column 1	ODWS/OG	Jul-14	Apr-15	Apr-16	May-17	Apr-18	Jun-19
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzene	MAC	1	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	<0.3	< 0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	< 0.2	0.4	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			102	101	109	103	108	
4- bromofluorobenzene %			94.6	105	99.7	104	97	
Toluene- d8 %			95.3	112	104	104	102	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 4 Deep

Parameter	Column 1	ODWS/OG	May-20	Apr-21	May-22	Jun-23	Jun-24	
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.5	<0.4	<0.4	<0.4	<0.4	
Benzene	MAC	1	< 0.5	<0.5	<0.5	<0.5	<0.5	
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 5	<4.0	<4.0	<4.0	<4.0	
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	<0.5	<0.4	<0.4	<0.4	
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1		<0.2	<0.2	<0.2	<0.2	
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				117	128	118	100	
4- bromofluorobenzene %				101	101	90	74	
Toluene- d8 %				109.0	93.0	101.0	121.0	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 4A Shallow

Parameter	Column 1	ODWS/OG	Dec-00	May-09	May-10	Jun-11	May-12	Apr-13
Acetone								
1,1,1,2- tetrachloroethane			<0.6	<0.5				
1,1,1- trichloroethane			<0.4	<0.4				
1,1,2,2- tetrachloroethane			<0.6	<0.5				
1,1,2- trichloroethane			<0.4	<0.4				
1,1- dichloroethane			<0.4	<0.4				
1,1- dichloroethylene	MAC	14	<0.5	<0.5				
1,2- dibromoethane			<1.0	<1.0				
1,2- dichlorobenzene	MAC	200	<0.4	<0.4				
1,2- dichloroethane	IMAC	5	<0.7	<0.5				
1,2- dichloropropane			<0.7	<0.5				
1,3,5- trimethylbenzene			<0.3	<0.3				
1,3- dichlorobenzene			<0.4	<0.4				
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.3	<0.3				
Bromoform			<0.4	<0.4				
Bromomethane			<0.5	<0.5				
c-1,2- Dichloroethylene			<0.4	<0.4				
c-1,3- Dichloropropylene			<0.2	<0.2				
Carbon Tetrachloride	MAC	2	<0.9	<0.5				
Chloroethane			<1.0	<1.0				
Chloroform			1.2	<0.5				
Chloromethane			<1.0	<1.0				
Dibromochloromethane			<0.3	<0.3				
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Ethylbenzene	AO	140	<0.5	<0.5				
m/p- xylene	AO	300	<1.0	<1.0				
Monochlorobenzene	MAC	80	<0.2	<0.2				
o-xylene			<0.5	<0.5				
Xylene, m,p,o-	AO	300						
Styrene			<0.5	<0.5				
t-1,2- Dichloroethylene			<0.4	<0.4				
t-1,3- Dichloropropylene			<0.2	<0.2				
Tetrachloroethylene	MAC	10	<0.3	<0.3				
Toluene	AO	60	<0.5	<0.5	<0.50	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3	<0.3				
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5	<0.5				
Vinyl Chloride	MAC	1	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				106	115	101	103	107
4- bromofluorobenzene %				83	112	90	110	102
Toluene- d8 %				129	105	82	103	98

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 4A Shallow

Parameter	Column 1	ODWS/OG	Jul-14	Apr-15	Apr-16	May-17	Apr-18	Jun-19
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzene	MAC	1	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	<0.3	< 0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			98.3	99.6	112	102	106	
4- bromofluorobenzene %			94.3	107	99.3	104	97	
Toluene- d8 %			95	112	103	104	102	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 4A Shallow

Parameter	Column 1	ODWS/OG	May-20	Apr-21	May-22	Jun-23	Jun-24	
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.5	<0.4	<0.4	<0.4	<0.4	
Benzene	MAC	1	< 0.5	<0.5	<0.5	<0.5	<0.5	
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 5	<4.0	<4.0	<4.0	<4.0	
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	<0.5	<0.4	<0.4	<0.4	
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	<0.2	<0.2	<0.2	<0.2	
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				117	130	119	110	
4- bromofluorobenzene %				100	100	90	75	
Toluene- d8 %				107	94	100	116	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 5

Parameter	Column 1	ODWS/OG	Dec-00	Nov-01	Oct-02	Oct-03	Oct-04	Nov-05
Acetone								
1,1,1,2- tetrachloroethane			<0.6	<0.6	<0.6	<0.6	<0.1	<0.1
1,1,1- trichloroethane			<0.4	<0.4	<0.4	<0.4	<0.1	<0.1
1,1,2,2- tetrachloroethane			<0.6	<0.6	<0.6	<0.6	<0.2	<0.1
1,1,2- trichloroethane			<0.4	<0.4	<0.4	<0.4	<0.2	<0.2
1,1- dichloroethane			<0.4	0.4	0.5	0.9	<0.1	<0.1
1,1- dichloroethylene	MAC	14	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1
1,2- dibromoethane			<1.0	<1.0	<1.0	<1.0	<0.20	
1,2- dichlorobenzene	MAC	200	<0.4	<0.4	<0.4	<0.4	<0.1	<0.2
1,2- dichloroethane	IMAC	5	<0.7	<0.7	<0.7	<0.6	<0.1	<0.1
1,2- dichloropropane			<0.7	<0.7	<0.7	<0.7	<0.1	<0.1
1,3,5- trimethylbenzene			<0.3	<0.3	<0.3	<0.3		
1,3- dichlorobenzene			<0.4	<0.4	<0.4	<0.4	<0.1	<0.2
1,4- dichlorobenzene	MAC	5	1	0.6	<0.4	1	0.9	0.36
Benzene	MAC	1	<0.5	<0.5	<0.5	0.6	0.5	0.6
Bromodichloromethane			<0.3	<0.3	<0.3	<0.3	<0.1	<0.1
Bromoform			<0.4	<0.4	<0.4	<0.4	<0.2	<0.2
Bromomethane			<0.5	<0.5	<0.5	<0.5	<0.5	<1.0
c-1,2- Dichloroethylene			<0.4	<0.4	<0.4	6.5	13.3	0.0131
c-1,3- Dichloropropylene			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carbon Tetrachloride	MAC	2	<0.9	<0.9	<0.9	<0.5	<0.1	<0.1
Chloroethane			<1.0	<1.0	<1.0	<1.0	0.8	
Chloroform			<0.5	<0.5	<0.5	<0.5	<0.1	<0.1
Chloromethane			<1.0	<1.0	<1.0	<1.0	<0.5	
Dibromochloromethane			<0.3	<0.3	<0.3	<0.3	<0.2	<0.2
Dichloromethane	MAC	50	<4.0	<4.0	28.9	<4.0	<0.5	<1.0
Ethylbenzene	AO	140	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1
m/p- xylene	AO	300	<1.0	<1.0	<1.0	<1.0		<0.1
Monochlorobenzene	MAC	80	<0.2	<0.2	<0.2	<0.2	<0.1	<0.1
o-xylene			<0.5	<0.5	<0.5	<0.5	<0.1	<0.1
Xylene, m,p,o-	AO	300						
Styrene			<0.5	<0.5	<0.5	<0.5	<0.1	<0.1
t-1,2- Dichloroethylene			<0.4	<0.4	<0.4	<0.4	0.4	0.4
t-1,3- Dichloropropylene			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Tetrachloroethylene	MAC	10	<0.3	<0.3	<0.3	6.2	0.2	0.1
Toluene	AO	60	<0.5	<0.5	<0.5	<0.5	<0.2	<0.2
Trichloroethylene	MAC	5	<0.3	<0.3	6.2	0.2	0.1	0.1
Dichlorodifluoromethane								
Trichlorofluoromethane					<0.5	<0.5	1.3	<0.5
Vinyl Chloride	MAC	1	1.5	<0.5	<0.5	0.5	0.3	0.6
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %								
4- bromofluorobenzene %								
Toluene- d8 %								

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
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BH 5

Parameter	Column 1	ODWS/OG	Sep-06	May-09	May-10	Jun-11	QA/QC Jun-11	May-12
Acetone								
1,1,1,2- tetrachloroethane			<0.1	<0.5				
1,1,1- trichloroethane			<0.1	<0.4				
1,1,2,2- tetrachloroethane			<0.1	<0.5				
1,1,2- trichloroethane			<0.2	<0.4				
1,1- dichloroethane			<0.1	2.6				
1,1- dichloroethylene	MAC	14	<0.1	<0.5				
1,2- dibromoethane				<1.0				
1,2- dichlorobenzene	MAC	200	<0.2	<0.4				
1,2- dichloroethane	IMAC	5	<0.1	1.3				
1,2- dichloropropane			<0.1	<0.5				
1,3,5- trimethylbenzene				<0.3				
1,3- dichlorobenzene			<0.2	<0.4				
1,4- dichlorobenzene	MAC	5	7.9	<0.4	1.9	5.8	6	3.1
Benzene	MAC	1	0.8	1.7	0.9	1.2	1.2	<0.5
Bromodichloromethane			<0.1	<0.3				
Bromoform			<0.2	<0.4				
Bromomethane			<0.5	<0.5				
c-1,2- Dichloroethylene			3.1	14.8				
c-1,3- Dichloropropylene			<0.2	<0.2				
Carbon Tetrachloride	MAC	2	<0.1	<0.5				
Chloroethane				<1.0				
Chloroform			<0.1	<0.5				
Chloromethane				<1.0				
Dibromochloromethane			<0.2	<0.3				
Dichloromethane	MAC	50	<0.5	<4.0	<4.0	<4.0	<4.0	<4.0
Ethylbenzene	AO	140		<0.5				
m/p- xylene	AO	300	<0.1	<1.0				
Monochlorobenzene	MAC	80	0.7	<0.2				
o-xylene			<0.1	<0.5				
Xylene, m,p,o-	AO	300						
Styrene			<0.1	<0.5				
t-1,2- Dichloroethylene			<0.1	<0.4				
t-1,3- Dichloropropylene			<0.2	<0.2				
Tetrachloroethylene	MAC	10	<0.1	2.1				
Toluene	AO	60	<0.2	<0.5	<0.50	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.1	1				
Dichlorodifluoromethane								
Trichlorofluoromethane			0.4	0.6				
Vinyl Chloride	MAC	1	0.8	1	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				119	103	110	111	107
4- bromofluorobenzene %				90	106	117	116	106
Toluene- d8 %				125	109	100	98	103

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

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BH 5

Parameter	Column 1	ODWS/OG	Apr-13	Jul-14	Apr-15	Apr-16	May-17	Apr-18
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	3.6	6.0	7.4	5.1	0.7	2.9
Benzene	MAC	1	1.0	<0.5	1.3	< 0.5	< 0.5	1.6
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<4.0	<0.3	0.4	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.5	<0.5	< 0.5	< 0.5	0.6
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	0.6	< 0.2	1.4	2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			107	101	105	116	100	103
4- bromofluorobenzene %			100	94.9	103	95.9	102	97
Toluene- d8 %			97	95.7	115	103	104	102

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 5

Parameter	Column 1	ODWS/OG	Jun-19	May-20	Apr-21	May-22	Jun-23	Jun-24
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	3.3	2.2	<4	2.6	3	3.5
Benzene	MAC	1	2.6	1.4	<5	1.6	3	2.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 0.3	< 5	<40	<4.0	<20	<4.0
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	< 0.5	<5	<0.4	<2	<0.4
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	< 0.2	<2	<0.2	<1	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %					114	127	121	84
4- bromofluorobenzene %					101	93	89	74
Toluene- d8 %					106	91	100	89

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 6A Deep

Parameter	Column 1	ODWS/OG	May-09	May-10	Jun-11	Apr-13	Jul-14	Jul-14
Acetone								
1,1,1,2- tetrachloroethane			<0.5					
1,1,1- trichloroethane			<0.4					
1,1,2,2- tetrachloroethane			<0.5					
1,1,2- trichloroethane			<0.4					
1,1- dichloroethane			<0.4					
1,1- dichloroethylene	MAC	14	<0.5					
1,2- dibromoethane			<1.0					
1,2- dichlorobenzene	MAC	200	<0.4					
1,2- dichloroethane	IMAC	5	<0.5					
1,2- dichloropropane			<0.5					
1,3,5- trimethylbenzene			<0.3					
1,3- dichlorobenzene			<0.4					
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.2	<0.2
Benzene	MAC	1	0.7	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.3					
Bromoform			<0.4					
Bromomethane			<0.5					
c-1,2- Dichloroethylene			<0.4					
c-1,3- Dichloropropylene			<0.2					
Carbon Tetrachloride	MAC	2	<0.5					
Chloroethane			<1.0					
Chloroform			<0.5					
Chloromethane			<1.0					
Dibromochloromethane			<0.3					
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<0.3	<0.3
Ethylbenzene	AO	140	<0.5					
m/p- xylene	AO	300	<1.0					
Monochlorobenzene	MAC	80	<0.2					
o-xylene			<0.5					
Xylene, m,p,o-	AO	300						
Styrene			<0.5					
t-1,2- Dichloroethylene			<0.4					
t-1,3- Dichloropropylene			<0.2					
Tetrachloroethylene	MAC	10	<0.3					
Toluene	AO	60	<0.5	<0.50	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3					
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5					
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			123	111	92	106	100	105
4- bromofluorobenzene %			75	113	84	102	89.7	108
Toluene- d8 %			126	108	112	96	96	117

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

Parameter	Column 1	ODWS/OG	BH 6A Deep					
			BH18		BH18			BH18
			QA/QC		QA/QC			QA/QC
			Jul-14	Apr-15	Apr-15	Apr-16	May-17	May-17
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzene	MAC	1	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			108	105	108	86	100	99
4- bromofluorobenzene %			109	108	109	114	105	104
Toluene- d8 %			116	117	116	95	103	103

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 6A Deep

Parameter	Column 1	ODWS/OG	Jun-19	May-20	Apr-21	Apr-21 QAQC	May-22	Jun-23
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.2	< 0.5	<0.4	<0.4	<0.4	<0.4
Benzene	MAC	1	< 0.5	< 0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 0.3	< 5	<4.0	<4.0	<4.0	<4.0
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	< 0.5	<0.5	<0.5	<0.4	<0.4
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	< 0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %					116	117	125	119
4- bromofluorobenzene %					93	94	94	89
Toluene- d8 %					105	108	92	101

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 6A Deep

			Jun-24					
Parameter	**Column 1**	ODWS/OG						
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.4					
Benzene	MAC	1	<0.5					
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<4.0					
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.4					
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2					
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			101					
4- bromofluorobenzene %			73					
Toluene- d8 %			120					

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 6B Shallow

Parameter	Column 1	ODWS/OG	May-09	May-10	Jun-11	Apr-13	Jul-14	Jul-14
Acetone								
1,1,1,2- tetrachloroethane			<0.5					
1,1,1- trichloroethane			<0.4					
1,1,2,2- tetrachloroethane			<0.5					
1,1,2- trichloroethane			<0.4					
1,1- dichloroethane			0.7					
1,1- dichloroethylene	MAC	14	<0.5					
1,2- dibromoethane			<1.0					
1,2- dichlorobenzene	MAC	200	<0.4					
1,2- dichloroethane	IMAC	5	<0.5					
1,2- dichloropropane			<0.5					
1,3,5- trimethylbenzene			<0.3					
1,3- dichlorobenzene			<0.4					
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.8	0.6	<0.2	0.8
Benzene	MAC	1	<0.5	<0.5	<1	<0.5	<0.5	0.5
Bromodichloromethane			<0.3					
Bromoform			<0.4					
Bromomethane			<0.5					
c-1,2- Dichloroethylene			2.1					
c-1,3- Dichloropropylene			<0.2					
Carbon Tetrachloride	MAC	2	<0.5					
Chloroethane			<1.0					
Chloroform			<0.5					
Chloromethane			<1.0					
Dibromochloromethane			<0.3					
Dichloromethane	MAC	50	<4.0	<4.0	<8.0	<0.40	<0.3	<0.3
Ethylbenzene	AO	140	<0.5					
m/p- xylene	AO	300	<1.0					
Monochlorobenzene	MAC	80	<0.2					
o-xylene			<0.5					
Xylene, m,p,o-	AO	300						
Styrene			<0.5					
t-1,2- Dichloroethylene			<0.4					
t-1,3- Dichloropropylene			<0.2					
Tetrachloroethylene	MAC	10	0.4					
Toluene	AO	60	<0.5	<0.50	<1	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3					
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5					
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.4	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			90	113	113	103	97.1	106
4- bromofluorobenzene %			87	118	119	97	90.8	107
Toluene- d8 %			128	108	100	94	95.5	114

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

			BH 6B Shallow				BH19 QA/QC
			Apr-15	Apr-16	May-17	Apr-18	Apr-18
Parameter	**Column 1**	ODWS/OG					
Acetone							
1,1,1,2- tetrachloroethane							
1,1,1- trichloroethane							
1,1,2,2- tetrachloroethane							
1,1,2- trichloroethane							
1,1- dichloroethane							
1,1- dichloroethylene	MAC	14					
1,2- dibromoethane							
1,2- dichlorobenzene	MAC	200					
1,2- dichloroethane	IMAC	5					
1,2- dichloropropane							
1,3,5- trimethylbenzene							
1,3- dichlorobenzene							
1,4- dichlorobenzene	MAC	5	0.8	< 0.2	< 0.2	0.6	0.6
Benzene	MAC	1	0.5	< 0.5	< 0.5	0.7	0.7
Bromodichloromethane							
Bromoform							
Bromomethane							
c-1,2- Dichloroethylene							
c-1,3- Dichloropropylene							
Carbon Tetrachloride	MAC	2					
Chloroethane							
Chloroform							
Chloromethane							
Dibromochloromethane							
Dichloromethane	MAC	50	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140					
m/p- xylene	AO	300					
Monochlorobenzene	MAC	80					
o-xylene							
Xylene, m,p,o-	AO	300					
Styrene							
t-1,2- Dichloroethylene							
t-1,3- Dichloropropylene							
Tetrachloroethylene	MAC	10					
Toluene	AO	60	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5					
Dichlorodifluoromethane							
Trichlorofluoromethane							
Vinyl Chloride	MAC	1	< 0.2	0.2	0.2	0.4	0.4
Xylene; total	AO	90					
Dichloropropene 1,3- cis+trans							
Hexane							
Methyl Ethyl Ketone							
Methyl Isobutyl Ketone							
Methyl-t-butyl Ether							
VOC SURROGATES							
1,2- dichloroethane- d4 %			105	86	99	108	104
4- bromofluorobenzene %			107	114	101	98	98
Toluene- d8 %			114	95	103	102	102

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 6B Shallow

Parameter	Column 1	ODWS/OG	Jun-19	May-20	Apr-21	May-22	Jun-23	Jun-24
Acetone							no sample	
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	0.7	0.9	<0.4	0.8		1.4
Benzene	MAC	1	1.1	1.1	<0.5	0.7		0.7
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 5	< 5	<4.0	<4.0		<4.0
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	< 0.5	<0.5	<0.4		<0.4
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	< 0.2	<0.2	<0.2		<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %					115	105		96
4- bromofluorobenzene %					92	120		75
Toluene- d8 %					105	109		113

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 7A Deep

Parameter	Column 1	ODWS/OG	May-09	May-10	Jun-11	Apr-13	Jul-14	Jul-14
Acetone								
1,1,1,2- tetrachloroethane			<0.5					
1,1,1- trichloroethane			<0.4					
1,1,2,2- tetrachloroethane			<0.5					
1,1,2- trichloroethane			<0.4					
1,1- dichloroethane			<0.4					
1,1- dichloroethylene	MAC	14	<0.5					
1,2- dibromoethane			<1.0					
1,2- dichlorobenzene	MAC	200	<0.4					
1,2- dichloroethane	IMAC	5	<0.5					
1,2- dichloropropane			<0.5					
1,3,5- trimethylbenzene			<0.3					
1,3- dichlorobenzene			<0.4					
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.2	<0.2
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.3					
Bromoform			<0.4					
Bromomethane			<0.5					
c-1,2- Dichloroethylene			<0.4					
c-1,3- Dichloropropylene			<0.2					
Carbon Tetrachloride	MAC	2	<0.5					
Chloroethane			<1.0					
Chloroform			<0.5					
Chloromethane			<1.0					
Dibromochloromethane			<0.3					
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<0.3	<0.3
Ethylbenzene	AO	140	<0.5					
m/p- xylene	AO	300	<1.0					
Monochlorobenzene	MAC	80	<0.2					
o-xylene			<0.5					
Xylene, m,p,o-	AO	300						
Styrene			<0.5					
t-1,2- Dichloroethylene			<0.4					
t-1,3- Dichloropropylene			<0.2					
Tetrachloroethylene	MAC	10	<0.3					
Toluene	AO	60	<0.5	<0.50	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3					
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5					
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			112	114	113	103	98.5	105
4- bromofluorobenzene %			84	113	80	103	90.2	107
Toluene- d8 %			127	109	113	95	97.1	115

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 7A Deep

Parameter	Column 1	ODWS/OG	Apr-15	Apr-16	May-17	Apr-18	Jun-19	May-20
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5
Benzene	MAC	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 5
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			105	86	100	100		
4- bromofluorobenzene %			107	115	104	98		
Toluene- d8 %			115	95	103	102		

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 7A Deep

Parameter	Column 1	ODWS/OG	Apr-21	May-22	Jun-23	Jun-24		
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4		
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5		
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0		
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.4	<0.4	<0.4		
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2		
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			120	98	121	104		
4- bromofluorobenzene %			91	125	89	73		
Toluene- d8 %			107	109	102	118		

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 7B Shallow

Parameter	Column 1	ODWS/OG	Dec-00	Oct-02	May-09	May-10	Jun-11	Apr-13
Acetone								
1,1,1,2- tetrachloroethane			<0.6	<0.6	<0.5			
1,1,1- trichloroethane			<0.4	<0.4	<0.4			
1,1,2,2- tetrachloroethane			<0.6	<0.6	<0.5			
1,1,2- trichloroethane			<0.4	<0.4	<0.4			
1,1- dichloroethane			<0.4	<0.4	<0.4			
1,1- dichloroethylene	MAC	14	<0.5	<0.5	<0.5			
1,2- dibromoethane			<1.0	<1.0	<1.0			
1,2- dichlorobenzene	MAC	200	<0.4	<0.4	<0.4			
1,2- dichloroethane	IMAC	5	<0.7	<0.7	<0.5			
1,2- dichloropropane			<0.7	<0.7	<0.5			
1,3,5- trimethylbenzene			<0.3	<0.3	<0.3			
1,3- dichlorobenzene			<0.4	<0.4	<0.4			
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.3	<0.3	<0.3			
Bromoform			<0.4	<0.4	<0.4			
Bromomethane			<0.5	<0.5	<0.5			
c-1,2- Dichloroethylene			<0.4	<0.4	<0.4			
c-1,3- Dichloropropylene			<0.2	<0.2	<0.2			
Carbon Tetrachloride	MAC	2	<0.9	<0.9	<0.5			
Chloroethane			<1.0	<1.0	<1.0			
Chloroform			<0.5	<0.5	<0.5			
Chloromethane			<1.0	<1.0	<1.0			
Dibromochloromethane			<0.3	<0.3	<0.3			
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Ethylbenzene	AO	140	<0.5	<0.5	<0.5			
m/p- xylene	AO	300	<1.0	<1.0	<1.0			
Monochlorobenzene	MAC	80	<0.2	<0.2	<0.2			
o-xylene			<0.5	<0.5	<0.5			
Xylene, m,p,o-	AO	300						
Styrene			<0.5	<0.5	<0.5			
t-1,2- Dichloroethylene			<0.4	<0.4	<0.4			
t-1,3- Dichloropropylene			<0.2	<0.2	<0.2			
Tetrachloroethylene	MAC	10	<0.3	<0.3	<0.3			
Toluene	AO	60	<0.5	<0.5	<0.5	<0.50	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3	<0.3	<0.3			
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5	<0.5	<0.5			
Vinyl Chloride	MAC	1	<0.5	<0.5	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %					120	105	90	104
4- bromofluorobenzene %					80	110	118	101
Toluene- d8 %					128	101	99	96

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 7B Shallow

Parameter	Column 1	ODWS/OG	Jul-14	Apr-15	Apr-16	May-17	Apr-18	Jun-19
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	0.5	< 0.2	< 0.2	< 0.2	< 0.2
Benzene	MAC	1	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	<0.3	< 0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			97.7	107	86	101	101	
4- bromofluorobenzene %			91.0	108	115	104	98	
Toluene- d8 %			94.5	118	95	103	103	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 7B Shallow

Parameter	Column 1	ODWS/OG	May-20	Apr-21	May-22	Jun-23	Jun-24	
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.5	<0.4	<0.4	<0.4	<0.4	
Benzene	MAC	1	< 0.5	<0.5	<0.5	<0.5	<0.5	
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 5	<4.0	<4.0	<4.0	<4.0	
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	<0.5	<0.4	<0.4	<0.4	
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	<0.2	<0.2	<0.2	<0.2	
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				114	103	118	101	
4- bromofluorobenzene %				97	122	89	74	
Toluene- d8 %				109	110	101	117	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 8

Parameter	Column 1	ODWS/OG	May-09	May-10	Jun-11	Apr-13	Jul-14	Apr-15
Acetone								
1,1,1,2- tetrachloroethane			<0.5					
1,1,1- trichloroethane			<0.4					
1,1,2,2- tetrachloroethane			<0.5					
1,1,2- trichloroethane			<0.4					
1,1- dichloroethane			<0.4					
1,1- dichloroethylene	MAC	14	<0.5					
1,2- dibromoethane			<1.0					
1,2- dichlorobenzene	MAC	200	<0.4					
1,2- dichloroethane	IMAC	5	<0.5					
1,2- dichloropropane			<0.5					
1,3,5- trimethylbenzene			<0.3					
1,3- dichlorobenzene			<0.4					
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.2	<0.2
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.3					
Bromoform			<0.4					
Bromomethane			<0.5					
c-1,2- Dichloroethylene			<0.4					
c-1,3- Dichloropropylene			<0.2					
Carbon Tetrachloride	MAC	2	<0.5					
Chloroethane			<1.0					
Chloroform			<0.5					
Chloromethane			<1.0					
Dibromochloromethane			<0.3					
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<0.3	<0.3
Ethylbenzene	AO	140	<0.5					
m/p- xylene	AO	300	<1.0					
Monochlorobenzene	MAC	80	<0.2					
o-xylene			<0.5					
Xylene, m,p,o-	AO	300						
Styrene			<0.5					
t-1,2- Dichloroethylene			<0.4					
t-1,3- Dichloropropylene			<0.2					
Tetrachloroethylene	MAC	10	<0.3					
Toluene	AO	60	<0.5	<0.50	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3					
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5					
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			114	103	105	119	101	109
4- bromofluorobenzene %			77	110	82	102	99.1	99
Toluene- d8 %			128	112	119	95	94.4	96

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

			BH 8			BH18 QA/QC		
			Apr-16	May-17	Apr-18	Apr-18	Jun-19	May-20
Parameter	**Column 1**	ODWS/OG						
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5
Benzene	MAC	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 5
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			85	98	101	104		
4- bromofluorobenzene %			113	103	98	98		
Toluene- d8 %			96	103	102	102		

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

			BH 8					
			QA/QC May-20	Apr-21	QA/QC Apr-21	May-22	Jun-23	Jun-24
Parameter	**Column 1**	ODWS/OG						
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.5	<0.4	<0.4	<0.4	<0.4	<0.4
Benzene	MAC	1	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 5	<4.0	<4.0	<4.0	<4.0	<4.0
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	<0.5	<0.5	<0.4	<0.4	<0.4
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				118	123	104	115	99
4- bromofluorobenzene %				105	107	74	86	75
Toluene- d8 %				108	106	102	89	117

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 9B Shallow

Parameter	Column 1	ODWS/OG	Dec-00	May-09	May-10	Jun-11	May-12	Apr-13
Acetone								
1,1,1,2- tetrachloroethane			<0.6	<0.5				
1,1,1- trichloroethane			<0.4	<0.4				
1,1,2,2- tetrachloroethane			<0.6	<0.5				
1,1,2- trichloroethane			<0.4	<0.4				
1,1- dichloroethane			<0.4	<0.4				
1,1- dichloroethylene	MAC	14	<0.5	<0.5				
1,2- dibromoethane			<1.0	<1.0				
1,2- dichlorobenzene	MAC	200	<0.4	<0.4				
1,2- dichloroethane	IMAC	5	<0.7	<0.5				
1,2- dichloropropane			<0.7	<0.5				
1,3,5- trimethylbenzene			<0.3	<0.3				
1,3- dichlorobenzene			<0.4	<0.4				
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.8	0.6	<0.4
Benzene	MAC	1	<0.5	<0.5	<0.5	<1	<0.5	<0.5
Bromodichloromethane			<0.3	<0.3				
Bromoform			<0.4	<0.4				
Bromomethane			<0.5	<0.5				
c-1,2- Dichloroethylene			<0.4	<0.4				
c-1,3- Dichloropropylene			<0.2	<0.2				
Carbon Tetrachloride	MAC	2	<0.9	<0.5				
Chloroethane			<1.0	<1.0				
Chloroform			<0.5	<0.5				
Chloromethane			<1.0	<1.0				
Dibromochloromethane			<0.3	<0.3				
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<8.0	<4.0	<4.0
Ethylbenzene	AO	140	<0.5	<0.5				
m/p- xylene	AO	300	<1.0	<1.0				
Monochlorobenzene	MAC	80	<0.2	<0.2				
o-xylene			<0.5	<0.5				
Xylene, m,p,o-	AO	300						
Styrene			<0.5	<0.5				
t-1,2- Dichloroethylene			<0.4	<0.4				
t-1,3- Dichloropropylene			<0.2	<0.2				
Tetrachloroethylene	MAC	10	<0.3	<0.3				
Toluene	AO	60	<0.5	<0.5	<0.50	<1	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3	<0.3				
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5	<0.5				
Vinyl Chloride	MAC	1	<0.5	<0.2	<0.2	<0.4	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				128	112	112	100	104
4- bromofluorobenzene %				75	116	107	111	104
Toluene- d8 %				123	110	98	101	94

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 9B Shallow

Parameter	Column 1	ODWS/OG	Jul-14	Apr-15	Apr-16	May-17	Apr-18	Jun-19
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	0.8	< 0.2	< 0.2	0.4	< 0.2
Benzene	MAC	1	<0.5	0.8	< 0.5	< 0.5	0.6	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	<0.3	< 0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	0.3	< 0.2	0.9	0.8	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			106	102	109	101	106	
4- bromofluorobenzene %			92.9	105	105	103	97	
Toluene- d8 %			70.4	113	104	103	102	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 9B Shallow

Parameter	Column 1	ODWS/OG	May-20	Apr-21	May-22	Jun-23	Jun-24	
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.5	<0.4	<0.4	<0.4	<0.4	
Benzene	MAC	1	< 0.5	<0.5	<0.5	<0.5	<0.5	
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 5	<4.0	<4.0	<4.0	<4.0	
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	<0.5	<0.4	<0.4	<0.4	
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	1.1	<0.2	5.5	3.1	<0.2	
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				119	130	120	104	
4- bromofluorobenzene %				102	97	89	71	
Toluene- d8 %				106.0	89.0	101.0	115.0	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 9A Deep

Parameter	Column 1	ODWS/OG	Dec-00	May-09	May-10	Jun-11	May-12	Apr-13
Acetone								
1,1,1,2- tetrachloroethane			<0.6	<0.5				
1,1,1- trichloroethane			<0.4	<0.4				
1,1,2,2- tetrachloroethane			<0.6	<0.5				
1,1,2- trichloroethane			<0.4	<0.4				
1,1- dichloroethane			<0.4	<0.4				
1,1- dichloroethylene	MAC	14	<0.5	<0.5				
1,2- dibromoethane			<1.0	<1.0				
1,2- dichlorobenzene	MAC	200	<0.4	<0.4				
1,2- dichloroethane	IMAC	5	<0.7	<0.5				
1,2- dichloropropane			<0.7	<0.5				
1,3,5- trimethylbenzene			<0.3	<0.3				
1,3- dichlorobenzene			<0.4	<0.4				
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.3	<0.3				
Bromoform			<0.4	<0.4				
Bromomethane			<0.5	<0.5				
c-1,2- Dichloroethylene			2.6	<0.4				
c-1,3- Dichloropropylene			<0.2	<0.2				
Carbon Tetrachloride	MAC	2	<0.9	<0.5				
Chloroethane			<1.0	<1.0				
Chloroform			<0.5	<0.5				
Chloromethane			<1.0	<1.0				
Dibromochloromethane			<0.3	<0.3				
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Ethylbenzene	AO	140	<0.5	<0.5				
m/p- xylene	AO	300	<1.0	<1.0				
Monochlorobenzene	MAC	80	<0.2	<0.2				
o-xylene			<0.5	<0.5				
Xylene, m,p,o-	AO	300						
Styrene			<0.5	<0.5				
t-1,2- Dichloroethylene			<0.4	<0.4				
t-1,3- Dichloropropylene			<0.2	<0.2				
Tetrachloroethylene	MAC	10	<0.3	<0.3				
Toluene	AO	60	<0.5	<0.5	<0.50	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3	<0.3				
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5	<0.5				
Vinyl Chloride	MAC	1	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				115	110	116	105	109
4- bromofluorobenzene %				79	110	116	109	103
Toluene- d8 %				129	109	99	101	98

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

			BH 9A Deep				BH20 QA/QC	
			Jul-14	Apr-15	Apr-16	May-17	May-17	Apr-18
Parameter	**Column 1**	ODWS/OG						
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzene	MAC	1	<0.5	0.7	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	<0.3	< 0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	< 0.2	0.5	0.6	0.3
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			98.7	101	108	102	100	106
4- bromofluorobenzene %			94.8	104	101	102	101	97
Toluene- d8 %			96.7	113	103	104	103	13

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 9A Deep

Parameter	Column 1	ODWS/OG	Jun-19	May-20	Apr-21	May-22	Jun-23	Jun-24
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.2	< 0.5	<0.4	<0.4	<0.4	<0.4
Benzene	MAC	1	< 0.5	< 0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 0.3	< 5	<4.0	<4.0	<4.0	<4.0
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	< 0.5	<0.5	<0.4	<0.4	<0.4
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	< 0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %					119	124	121	99
4- bromofluorobenzene %					102	92	89	75
Toluene- d8 %					105	95	100	116

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 10A Deep

Parameter	Column 1	ODWS/OG	May-09	May-10	Jun-11	May-12	Apr-13	Jul-14
Acetone								
1,1,1,2- tetrachloroethane			<0.5					
1,1,1- trichloroethane			<0.4					
1,1,2,2- tetrachloroethane			<0.5					
1,1,2- trichloroethane			<0.4					
1,1- dichloroethane			<0.4					
1,1- dichloroethylene	MAC	14	<0.5					
1,2- dibromoethane			<1.0					
1,2- dichlorobenzene	MAC	200	<0.4					
1,2- dichloroethane	IMAC	5	<0.5					
1,2- dichloropropane			<0.5					
1,3,5- trimethylbenzene			<0.3					
1,3- dichlorobenzene			<0.4					
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.2
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.3					
Bromoform			<0.4					
Bromomethane			<0.5					
c-1,2- Dichloroethylene			<0.4					
c-1,3- Dichloropropylene			<0.2					
Carbon Tetrachloride	MAC	2	<0.5					
Chloroethane			<1.0					
Chloroform			<0.5					
Chloromethane			<1.0					
Dibromochloromethane			0.4					
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<4.0	<0.3
Ethylbenzene	AO	140	<0.5					
m/p- xylene	AO	300	<1.0					
Monochlorobenzene	MAC	80	<0.2					
o-xylene			<0.5					
Xylene, m,p,o-	AO	300						
Styrene			<0.5					
t-1,2- Dichloroethylene			<0.4					
t-1,3- Dichloropropylene			<0.2					
Tetrachloroethylene	MAC	10	<0.3					
Toluene	AO	60	<0.5	<0.50	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3					
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5					
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			110	101	102	104	118	96.7
4- bromofluorobenzene %			79	115	115	111	105	92.7
Toluene- d8 %			128	117	82	100	93	93.3

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 10A Deep

Parameter	Column 1	ODWS/OG	Apr-15	Apr-16	May-17	Apr-18	Jun-19	May-20
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5
Benzene	MAC	1	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 5
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			101	112	102	105		
4- bromofluorobenzene %			99	102	104	98		
Toluene- d8 %			97	106	103	102		

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 10A Deep

Parameter	Column 1	ODWS/OG	Apr-21	May-22	Jun-23	Jun-24		
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4		
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5		
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0		
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.4	<0.4	<0.4		
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2		
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			126	129	120	108		
4- bromofluorobenzene %			97	104	87	71		
Toluene- d8 %			103	91	101	112		

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 10B Mid

Parameter	Column 1	ODWS/OG	May-09	May-10	Jun-11	May-12	Apr-13	Jul-14
Acetone								
1,1,1,2- tetrachloroethane			<0.5					
1,1,1- trichloroethane			<0.4					
1,1,2,2- tetrachloroethane			<0.5					
1,1,2- trichloroethane			<0.4					
1,1- dichloroethane			<0.4					
1,1- dichloroethylene	MAC	14	<0.5					
1,2- dibromoethane			<1.0					
1,2- dichlorobenzene	MAC	200	<0.4					
1,2- dichloroethane	IMAC	5	<0.5					
1,2- dichloropropane			<0.5					
1,3,5- trimethylbenzene			<0.3					
1,3- dichlorobenzene			<0.4					
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.2
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.3					
Bromoform			<0.4					
Bromomethane			<0.5					
c-1,2- Dichloroethylene			<0.4					
c-1,3- Dichloropropylene			<0.2					
Carbon Tetrachloride	MAC	2	<0.5					
Chloroethane			<1.0					
Chloroform			<0.5					
Chloromethane			<1.0					
Dibromochloromethane			<0.3					
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<4.0	<0.3
Ethylbenzene	AO	140	<0.5					
m/p- xylene	AO	300	<1.0					
Monochlorobenzene	MAC	80	<0.2					
o-xylene			<0.5					
Xylene, m,p,o-	AO	300						
Styrene			<0.5					
t-1,2- Dichloroethylene			<0.4					
t-1,3- Dichloropropylene			<0.2					
Tetrachloroethylene	MAC	10	<0.3					
Toluene	AO	60	<0.5	0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3					
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5					
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			101	95	110	102	116	98.4
4- bromofluorobenzene %			82	117	102	111	103	95.3
Toluene- d8 %			126	114	82	101	90	94.1

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 10B Mid

Parameter	Column 1	ODWS/OG	Apr-15	Apr-16	May-17	Apr-18	Jun-19	May-20
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5
Benzene	MAC	1	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 5
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			101	107	105	100		
4- bromofluorobenzene %			97	96.8	105	98		
Toluene- d8 %			96	98.4	104	101		

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 10B Mid

Parameter	Column 1	ODWS/OG	Apr-21	May-22	Jun-23	Jun-24		
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4		
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5		
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0		
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.4	<0.4	<0.4		
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2		
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			115	125	120	100		
4- bromofluorobenzene %			94	99	89	73		
Toluene- d8 %			105	92	101	120		

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

			BH 10C Shallow				BH 15 Dup of 10S	
Parameter	**Column 1**	ODWS/OG	Dec-00	May-09	May-10	Jun-11	May-12	May-12
Acetone								
1,1,1,2- tetrachloroethane			<0.6	<0.5				
1,1,1- trichloroethane			<0.4	<0.4				
1,1,2,2- tetrachloroethane			<0.6	<0.5				
1,1,2- trichloroethane			<0.4	<0.4				
1,1- dichloroethane			<0.4	<0.4				
1,1- dichloroethylene	MAC	14	<0.5	<0.5				
1,2- dibromoethane			<1.0	<1.0				
1,2- dichlorobenzene	MAC	200	<0.4	<0.4				
1,2- dichloroethane	IMAC	5	<0.7	<0.5				
1,2- dichloropropane			<0.7	<0.5				
1,3,5- trimethylbenzene			<0.3	<0.3				
1,3- dichlorobenzene			<0.4	<0.4				
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.3	<0.3				
Bromoform			<0.4	<0.4				
Bromomethane			<0.5	<0.5				
c-1,2- Dichloroethylene			<0.4	<0.4				
c-1,3- Dichloropropylene			<0.2	<0.2				
Carbon Tetrachloride	MAC	2	<0.9	<0.5				
Chloroethane			<1.0	<1.0				
Chloroform			<0.5	<0.5				
Chloromethane			<1.0	<1.0				
Dibromochloromethane			<0.3	<0.3				
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Ethylbenzene	AO	140	<0.5	<0.5				
m/p- xylene	AO	300	<1.0	<1.0				
Monochlorobenzene	MAC	80	<0.2	<0.2				
o-xylene			<0.5	<0.5				
Xylene, m,p,o-	AO	300						
Styrene			<0.5	<0.5				
t-1,2- Dichloroethylene			<0.4	<0.4				
t-1,3- Dichloropropylene			<0.2	<0.2				
Tetrachloroethylene	MAC	10	<0.3	<0.3				
Toluene	AO	60	<0.5	<0.5	0.5	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3	<0.3				
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5	<0.5				
Vinyl Chloride	MAC	1	<0.5	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				98	94	114	105	106
4- bromofluorobenzene %				91	119	119	109	110
Toluene- d8 %				109	119	99	102	104

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 10C Shallow

Parameter	Column 1	ODWS/OG	Apr-13	Jul-14	Apr-15	Apr-16	May-17	Apr-18
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.4	<0.2	<0.2	< 0.2	< 0.2	< 0.2
Benzene	MAC	1	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<4.0	<0.3	<0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	< 0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			120	99.2	100	108	103	104
4- bromofluorobenzene %			104	93.6	98	101	102	98
Toluene- d8 %			93.0	95.0	97	104	103	102

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 10C Shallow

Parameter	Column 1	ODWS/OG	Jun-19	May-20	Apr-21	May-22	Jun-23	Jun-24
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.2	< 0.5	<0.4	<0.4	<0.4	<0.4
Benzene	MAC	1	< 0.5	< 0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 0.3	< 5	<4.0	<4.0	<4.0	<4.0
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	< 0.5	<0.5	<0.4	<0.4	<0.4
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	< 0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %					117	125	120	104
4- bromofluorobenzene %					101	98	88	75
Toluene- d8 %					105	89	100	122

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 11A Deep

Parameter	Column 1	ODWS/OG	May-09	May-10	Jun-11	May-12	Apr-13	Jul-14
Acetone								
1,1,1,2- tetrachloroethane			<0.5					
1,1,1- trichloroethane			<0.4					
1,1,2,2- tetrachloroethane			<0.5					
1,1,2- trichloroethane			<0.4					
1,1- dichloroethane			<0.4					
1,1- dichloroethylene	MAC	14	<0.5					
1,2- dibromoethane			<1.0					
1,2- dichlorobenzene	MAC	200	<0.4					
1,2- dichloroethane	IMAC	5	<0.5					
1,2- dichloropropane			<0.5					
1,3,5- trimethylbenzene			<0.3					
1,3- dichlorobenzene			<0.4					
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.2
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.3					
Bromoform			<0.4					
Bromomethane			<0.5					
c-1,2- Dichloroethylene			<0.4					
c-1,3- Dichloropropylene			<0.2					
Carbon Tetrachloride	MAC	2	<0.5					
Chloroethane			<1.0					
Chloroform			<0.5					
Chloromethane			<1.0					
Dibromochloromethane			<0.3					
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<4.0	<0.3
Ethylbenzene	AO	140	<0.5					
m/p- xylene	AO	300	<1.0					
Monochlorobenzene	MAC	80	<0.2					
o-xylene			<0.5					
Xylene, m,p,o-	AO	300						
Styrene			<0.5					
t-1,2- Dichloroethylene			<0.4					
t-1,3- Dichloropropylene			<0.2					
Tetrachloroethylene	MAC	10	<0.3					
Toluene	AO	60	<0.5	<0.50	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3					
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5					
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			118	117	118	104	117	102
4- bromofluorobenzene %			81	113	105	111	105	94.2
Toluene- d8 %			129	109	86	102	96	94

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 11A Deep

Parameter	Column 1	ODWS/OG	Apr-15	Apr-16	May-17	Apr-18	Jun-19	May-20
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5
Benzene	MAC	1	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 5
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			101	110	102	102		
4- bromofluorobenzene %			98	102	102	98		
Toluene- d8 %			100	101	104	102		

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 11A Deep

Parameter	Column 1	ODWS/OG	Apr-21	May-22	Jun-23	Jun-24		
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4		
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5		
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0		
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.4	<0.4	<0.4		
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2		
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			115	111	117	119		
4- bromofluorobenzene %			96	79	83	77		
Toluene- d8 %			106	106	89	98		

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 11B Shallow

Parameter	Column 1	ODWS/OG	May-09	May-10	Jun-11	May-12	Apr-13	Jul-14
Acetone								
1,1,1,2- tetrachloroethane			<0.5					
1,1,1- trichloroethane			<0.4					
1,1,2,2- tetrachloroethane			<0.5					
1,1,2- trichloroethane			<0.4					
1,1- dichloroethane			<0.4					
1,1- dichloroethylene	MAC	14	<0.5					
1,2- dibromoethane			<1.0					
1,2- dichlorobenzene	MAC	200	<0.4					
1,2- dichloroethane	IMAC	5	<0.5					
1,2- dichloropropane			<0.5					
1,3,5- trimethylbenzene			<0.3					
1,3- dichlorobenzene			<0.4					
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.2
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.3					
Bromoform			<0.4					
Bromomethane			<0.5					
c-1,2- Dichloroethylene			<0.4					
c-1,3- Dichloropropylene			<0.2					
Carbon Tetrachloride	MAC	2	<0.5					
Chloroethane			<1.0					
Chloroform			<0.5					
Chloromethane			<1.0					
Dibromochloromethane			<0.3					
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<4.0	<0.3
Ethylbenzene	AO	140	<0.5					
m/p- xylene	AO	300	<1.0					
Monochlorobenzene	MAC	80	<0.2					
o-xylene			<0.5					
Xylene, m,p,o-	AO	300						
Styrene			<0.5					
t-1,2- Dichloroethylene			<0.4					
t-1,3- Dichloropropylene			<0.2					
Tetrachloroethylene	MAC	10	<0.3					
Toluene	AO	60	<0.5	<0.50	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3					
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5					
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			126	106	122	108	111	103
4- bromofluorobenzene %			73	120	82	108	102	96
Toluene- d8 %			125	116	106	101	98	94.5

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

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BH 11B Shallow

Parameter	Column 1	ODWS/OG	Apr-15	Apr-16	May-17	Apr-18	Jun-19	May-20
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5
Benzene	MAC	1	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 5
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			104	110	103	103		
4- bromofluorobenzene %			99	102	101	98		
Toluene- d8 %			100	105	104	103		

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

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BH 11B Shallow

Parameter	Column 1	ODWS/OG	Apr-21	May-22	Jun-23	Jun-24		
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4		
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5		
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0		
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.4	<0.4	<0.4		
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2		
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			114	111	113	116		
4- bromofluorobenzene %			101	71	90	79		
Toluene- d8 %			105	105	101	96		

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
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BH 12

Parameter	Column 1	ODWS/OG	Dec-00	Nov-01	Oct-02	Oct-03	Oct-04	Nov-05
Acetone								
1,1,1,2- tetrachloroethane			<0.6	<0.6	<0.6	<0.6	<0.1	<0.1
1,1,1- trichloroethane			<0.4	<0.4	<0.4	<0.4	<0.1	<0.1
1,1,2,2- tetrachloroethane			<0.6	<0.6	<0.6	<0.6	<0.2	<0.1
1,1,2- trichloroethane			<0.4	<0.4	<0.4	<0.4	<0.2	<0.2
1,1- dichloroethane			<0.4	<0.4	<0.4	<0.4	<0.1	0.2
1,1- dichloroethylene	MAC	14	<0.5	<0.5	<0.5	<0.5	<0.1	<0.1
1,2- dibromoethane			<1.0	<1.0	<1.0	<1.0	<0.2	
1,2- dichlorobenzene	MAC	200	<0.4	<0.4	<0.4	<0.4	<0.1	<0.2
1,2- dichloroethane	IMAC	5	<0.7	<0.7	<0.7	<0.5	<0.1	<0.1
1,2- dichloropropane			<0.7	<0.7	<0.7	<0.7	<0.1	<0.1
1,3,5- trimethylbenzene			<0.3	<0.5	0.6	<0.3		
1,3- dichlorobenzene			<0.4	<0.4	<0.4	<0.4	<0.1	<0.2
1,4- dichlorobenzene	MAC	5	<0.4	<1.0	0.6	<1.0	0.6	<0.5
Benzene	MAC	1	<0.5	0.7	<0.5	0.6	0.3	0.3
Bromodichloromethane			<0.3	<0.3	<0.3	<0.3	<0.1	<0.1
Bromoform			<0.4	<0.4	<0.4	<0.4	<0.2	<0.2
Bromomethane			<0.5	<0.5	<0.5	<0.5	<0.5	<1.0
c-1,2- Dichloroethylene			<0.4	1.2	0.9	0.5	0.7	0.7
c-1,3- Dichloropropylene			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Carbon Tetrachloride	MAC	2	<0.9	<0.9	<0.9	<0.5	<0.1	<0.1
Chloroethane			<1.0	3	<1	3.3	2.2	
Chloroform			<0.5	<0.5	<0.5	<0.5	<0.1	<0.1
Chloromethane			<1.0	<1.0	<1.0	<1.0	<0.5	
Dibromochloromethane			<0.3	<0.3	<0.3	<0.3	<0.2	<0.2
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<0.5	<1.0
Ethylbenzene	AO	140	<0.5	<0.5	<0.5	<0.5	<0.5	<0.1
m/p- xylene	AO	300	<1.0	2	<1	<1		<0.1
Monochlorobenzene	MAC	80	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene			<0.5	0.7	1	<0.5	<0.1	<0.1
Xylene, m,p,o-	AO	300						
Styrene			<0.5	<0.5	<0.5	<0.5	<0.1	<0.1
t-1,2- Dichloroethylene			<0.4	<0.4	<0.4	<0.4	<0.1	<0.1
t-1,3- Dichloropropylene			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Tetrachloroethylene	MAC	10	<0.3	<0.3	<0.3	<0.3	<0.1	<0.1
Toluene	AO	60	<0.5	<0.5	<0.5	<0.5	<0.2	
Trichloroethylene	MAC	5	<0.3	<0.3	<0.3	<0.3	<0.1	<0.1
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5	<0.5	<0.5	<0.5	<0.2	
Vinyl Chloride	MAC	1	<0.5	0.8	<0.5	3.2	0.7	0.3
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %								
4- bromofluorobenzene %								
Toluene- d8 %								

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

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Parameter	Column 1	ODWS/OG	Dec-05	Sep-06	May-09	May-10	Jun-11	May-12
Acetone								
1,1,1,2- tetrachloroethane				<0.1	<0.5			
1,1,1- trichloroethane				<0.1	<0.4			
1,1,2,2- tetrachloroethane				<0.1	<0.5			
1,1,2- trichloroethane				<0.2	<0.4			
1,1- dichloroethane				0.2	<0.4			
1,1- dichloroethylene	MAC	14		<0.1	<0.5			
1,2- dibromoethane					<1.0			
1,2- dichlorobenzene	MAC	200		<0.2	<0.4			
1,2- dichloroethane	IMAC	5		<0.1	<0.5			
1,2- dichloropropane				<0.1	<0.5			
1,3,5- trimethylbenzene					<0.3			
1,3- dichlorobenzene				<0.2	<0.4			
1,4- dichlorobenzene	MAC	5		<0.5	<0.4	<0.4	<0.4	0.6
Benzene	MAC	1		0.4	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane				<0.1	<0.3			
Bromoform				<0.2	<0.4			
Bromomethane				<0.5	<0.5			
c-1,2- Dichloroethylene				0.6	<0.4			
c-1,3- Dichloropropylene				<0.2	<0.2			
Carbon Tetrachloride	MAC	2		<0.1	<0.5			
Chloroethane					<1.0			
Chloroform				<0.1	<0.5			
Chloromethane					<1.0			
Dibromochloromethane				<0.2	<0.3			
Dichloromethane	MAC	50		<0.5	<4.0	<4.0	<4.0	<4.0
Ethylbenzene	AO	140			<0.5			
m/p- xylene	AO	300		<0.1	<1.0			
Monochlorobenzene	MAC	80		<0.2	<0.2			
o-xylene				<0.1	<0.5			
Xylene, m,p,o-	AO	300						
Styrene				<0.1	<0.5			
t-1,2- Dichloroethylene				<0.1	<0.4			
t-1,3- Dichloropropylene				<0.2	<0.2			
Tetrachloroethylene	MAC	10		<0.1	<0.3			
Toluene	AO	60			<0.5	<0.50	<0.5	<0.5
Trichloroethylene	MAC	5		<0.1	<0.3			
Dichlorodifluoromethane								
Trichlorofluoromethane					<0.5			
Vinyl Chloride	MAC	1		0.8	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %					121	102	119	94
4- bromofluorobenzene %					100	110	108	110
Toluene- d8 %					129	109	80	101

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
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			BH 12			BH 19 QA/QC		
			Apr-13	Jul-14	Apr-15	Apr-15	Apr-16	May-17
Parameter	**Column 1**	ODWS/OG						
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	0.5	<0.2	1	1	0.8	< 0.2
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<4.0	<0.3	<0.3	<0.3	< 0.3	0.6
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.5	<0.5	<0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2	< 0.2	0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			114	97.9	98.2	97.7	113	103
4- bromofluorobenzene %			98	94.4	105	107	101	104
Toluene- d8 %			97	92.6	111	111	105	104

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
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			BH 12	BH 20 QA/QC				
			Apr-18	Apr-18	Jun-19	May-20	Apr-21	May-22
Parameter	**Column 1**	ODWS/OG						
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.2	< 0.2	< 0.2	< 0.5	<0.4	1.0
Benzene	MAC	1	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 0.3	< 0.3	< 0.3	< 5	<4.0	<4.0
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	< 0.5	< 0.5	< 0.5	<0.5	<0.4
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	< 0.2	< 0.2	< 0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			109	106			121	129
4- bromofluorobenzene %			97	97			101	105
Toluene- d8 %			102	103			104	94

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

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			BH 12 QA/QC May-22	Jun-23	Jun-24		
Parameter	**Column 1**	ODWS/OG					
Acetone							
1,1,1,2- tetrachloroethane							
1,1,1- trichloroethane							
1,1,2,2- tetrachloroethane							
1,1,2- trichloroethane							
1,1- dichloroethane							
1,1- dichloroethylene	MAC	14					
1,2- dibromoethane							
1,2- dichlorobenzene	MAC	200					
1,2- dichloroethane	IMAC	5					
1,2- dichloropropane							
1,3,5- trimethylbenzene							
1,3- dichlorobenzene							
1,4- dichlorobenzene	MAC	5	0.8	0.6	<0.4		
Benzene	MAC	1	<0.5	<0.5	<0.5		
Bromodichloromethane							
Bromoform							
Bromomethane							
c-1,2- Dichloroethylene							
c-1,3- Dichloropropylene							
Carbon Tetrachloride	MAC	2					
Chloroethane							
Chloroform							
Chloromethane							
Dibromochloromethane							
Dichloromethane	MAC	50	<4.0	<4.0	<4.0		
Ethylbenzene	AO	140					
m/p- xylene	AO	300					
Monochlorobenzene	MAC	80					
o-xylene							
Xylene, m,p,o-	AO	300					
Styrene							
t-1,2- Dichloroethylene							
t-1,3- Dichloropropylene							
Tetrachloroethylene	MAC	10					
Toluene	AO	60	<0.4	<0.4	<0.4		
Trichloroethylene	MAC	5					
Dichlorodifluoromethane							
Trichlorofluoromethane							
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2		
Xylene; total	AO	90					
Dichloropropene 1,3- cis+trans							
Hexane							
Methyl Ethyl Ketone							
Methyl Isobutyl Ketone							
Methyl-t-butyl Ether							
VOC SURROGATES							
1,2- dichloroethane- d4 %			121	120	102		
4- bromofluorobenzene %			90	88	77		
Toluene- d8 %			92	100	121		

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 13B Shallow

Parameter	Column 1	ODWS/OG	May-09	May-10	Jun-11	Apr-13	Jul-14	Apr-15
Acetone								
1,1,1,2- tetrachloroethane			<0.5					
1,1,1- trichloroethane			<0.4					
1,1,2,2- tetrachloroethane			<0.5					
1,1,2- trichloroethane			<0.4					
1,1- dichloroethane			<0.4					
1,1- dichloroethylene	MAC	14	<0.5					
1,2- dibromoethane			<1.0					
1,2- dichlorobenzene	MAC	200	<0.4					
1,2- dichloroethane	IMAC	5	<0.5					
1,2- dichloropropane			<0.5					
1,3,5- trimethylbenzene			<0.3					
1,3- dichlorobenzene			<0.4					
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.2	<0.2
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.3					
Bromoform			<0.4					
Bromomethane			<0.5					
c-1,2- Dichloroethylene			<0.4					
c-1,3- Dichloropropylene			<0.2					
Carbon Tetrachloride	MAC	2	<0.5					
Chloroethane			<1.0					
Chloroform			<0.5					
Chloromethane			<1.0					
Dibromochloromethane			<0.3					
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<0.3	<0.3
Ethylbenzene	AO	140	<0.5					
m/p- xylene	AO	300	<1.0					
Monochlorobenzene	MAC	80	<0.2					
o-xylene			<0.5					
Xylene, m,p,o-	AO	300						
Styrene			<0.5					
t-1,2- Dichloroethylene			<0.4					
t-1,3- Dichloropropylene			<0.2					
Tetrachloroethylene	MAC	10	<0.3					
Toluene	AO	60	<0.5	<0.50	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3					
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5					
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			119	98	119	107	100	105
4- bromofluorobenzene %			76	110	81	103	99.1	105
Toluene- d8 %			127	109	85	96	94.4	114

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

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Report of Organic Analysis

BH 13B Shallow

Parameter	Column 1	ODWS/OG	Apr-16	May-17	Apr-18	Jun-19	May-20	Apr-21
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	<0.4
Benzene	MAC	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 0.3	< 0.3	< 0.3	< 0.3	< 5	<4.0
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			86	99	109			115
4- bromofluorobenzene %			114	103	98			98
Toluene- d8 %			95	103	103			102

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 13B Shallow

Parameter	Column 1	ODWS/OG	May-22	Jun-23	Jun-24			
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4			
Benzene	MAC	1	<0.5	<0.5	<0.5			
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<4.0	<4.0	<4.0			
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.4	<0.4	<0.4			
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2			
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			100	117	100			
4- bromofluorobenzene %			116	89	75			
Toluene- d8 %			110	101	116			

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 13A Deep

Parameter	Column 1	ODWS/OG	May-09	May-10	Jun-11	Apr-13	Jul-14	Apr-15
Acetone								
1,1,1,2- tetrachloroethane			<0.5					
1,1,1- trichloroethane			<0.4					
1,1,2,2- tetrachloroethane			<0.5					
1,1,2- trichloroethane			<0.4					
1,1- dichloroethane			<0.4					
1,1- dichloroethylene	MAC	14	<0.5					
1,2- dibromoethane			<1.0					
1,2- dichlorobenzene	MAC	200	<0.4					
1,2- dichloroethane	IMAC	5	<0.5					
1,2- dichloropropane			<0.5					
1,3,5- trimethylbenzene			<0.3					
1,3- dichlorobenzene			<0.4					
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.2	<0.2
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.3					
Bromoform			<0.4					
Bromomethane			<0.5					
c-1,2- Dichloroethylene			<0.4					
c-1,3- Dichloropropylene			<0.2					
Carbon Tetrachloride	MAC	2	<0.5					
Chloroethane			<1.0					
Chloroform			<0.5					
Chloromethane			<1.0					
Dibromochloromethane			<0.3					
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<0.3	<0.3
Ethylbenzene	AO	140	<0.5					
m/p- xylene	AO	300	<1.0					
Monochlorobenzene	MAC	80	<0.2					
o-xylene			<0.5					
Xylene, m,p,o-	AO	300						
Styrene			<0.5					
t-1,2- Dichloroethylene			<0.4					
t-1,3- Dichloropropylene			<0.2					
Tetrachloroethylene	MAC	10	<0.3					
Toluene	AO	60	<0.5	<0.50	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3					
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5					
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			124	106	99	105	98.7	105
4- bromofluorobenzene %			74	111	83	103	95.4	108
Toluene- d8 %			129	108	119	93	95.0	114

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 13A Deep

Parameter	Column 1	ODWS/OG	Apr-16	May-17	Apr-18	Jun-19	May-20	Apr-21
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	<0.4
Benzene	MAC	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 0.3	< 0.3	< 0.3	< 0.3	< 5	<4.0
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			86	100	106			120
4- bromofluorobenzene %			114	104	97			96
Toluene- d8 %			95	103	102			107

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 13A Deep

Parameter	Column 1	ODWS/OG	May-22	Jun-23	Jun-24			
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4			
Benzene	MAC	1	<0.5	<0.5	<0.5			
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<4.0	<4.0	<4.0			
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.4	<0.4	<0.4			
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2			
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			103	118	87			
4- bromofluorobenzene %			119	88	78			
Toluene- d8 %			108	102	108			

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 14B Shallow

Parameter	Column 1	ODWS/OG	May-09	May-10	Jun-11	May-12	Apr-13	Jul-14
Acetone								
1,1,1,2- tetrachloroethane			<0.5					
1,1,1- trichloroethane			<0.4					
1,1,2,2- tetrachloroethane			<0.5					
1,1,2- trichloroethane			<0.4					
1,1- dichloroethane			<0.4					
1,1- dichloroethylene	MAC	14	<0.5					
1,2- dibromoethane			<1.0					
1,2- dichlorobenzene	MAC	200	<0.4					
1,2- dichloroethane	IMAC	5	<0.5					
1,2- dichloropropane			<0.5					
1,3,5- trimethylbenzene			<0.3					
1,3- dichlorobenzene			<0.4					
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.2
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane			<0.3					
Bromoform			<0.4					
Bromomethane			<0.5					
c-1,2- Dichloroethylene			<0.4					
c-1,3- Dichloropropylene			<0.2					
Carbon Tetrachloride	MAC	2	<0.5					
Chloroethane			<1.0					
Chloroform			<0.5					
Chloromethane			<1.0					
Dibromochloromethane			<0.3					
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<4.0	<0.3
Ethylbenzene	AO	140	<0.5					
m/p- xylene	AO	300	<1.0					
Monochlorobenzene	MAC	80	<0.2					
o-xylene			<0.5					
Xylene, m,p,o-	AO	300						
Styrene			<0.5					
t-1,2- Dichloroethylene			<0.4					
t-1,3- Dichloropropylene			<0.2					
Tetrachloroethylene	MAC	10	<0.3					
Toluene	AO	60	<0.5	<0.50	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3					
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5					
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			110	101	106	104	108	105
4- bromofluorobenzene %			85	111	109	110	102	108
Toluene- d8 %			126	115	96	99	97	95

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 14B Shallow

Parameter	Column 1	ODWS/OG	Apr-15	Apr-16	May-17	Apr-18	Jun-19	May-20
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5
Benzene	MAC	1	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	< 0.3	< 0.3	< 0.3	< 0.3	< 5
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			103	107	101	105		
4- bromofluorobenzene %			99	105	104	98		
Toluene- d8 %			100	104	104	103		

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 14B Shallow

Parameter	Column 1	ODWS/OG	Apr-21	May-22	Jun-23	Jun-24		
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4		
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5		
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0		
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.4	<0.4	<0.4		
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2		
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			118	114	116	86		
4- bromofluorobenzene %			102	78	85	81		
Toluene- d8 %			108	104	90	110		

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 14A Deep

Parameter	Column 1	ODWS/OG	May-09	May-09	Jun-11	QA/QC Jun-11	May-12	Apr-13
Acetone								
1,1,1,2- tetrachloroethane			<0.5	<0.5				
1,1,1- trichloroethane			<0.4	<0.4				
1,1,2,2- tetrachloroethane			<0.5	<0.5				
1,1,2- trichloroethane			<0.4	<0.4				
1,1- dichloroethane			<0.4	<0.4				
1,1- dichloroethylene	MAC	14	<0.5	<0.5				
1,2- dibromoethane			<1.0	<1.0				
1,2- dichlorobenzene	MAC	200	<0.4	<0.4				
1,2- dichloroethane	IMAC	5	<0.5	<0.5				
1,2- dichloropropane			<0.5	<0.5				
1,3,5- trimethylbenzene			<0.3	<0.3				
1,3- dichlorobenzene			<0.4	<0.4				
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Benzene	MAC	1		<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane				<0.3				
Bromoform				<0.4				
Bromomethane				<0.5				
c-1,2- Dichloroethylene			<0.4	<0.4				
c-1,3- Dichloropropylene			<0.2	<0.2				
Carbon Tetrachloride	MAC	2	<0.5	<0.5				
Chloroethane			<1.0	<1.0				
Chloroform			<0.5	<0.5				
Chloromethane			<1.0	<1.0				
Dibromochloromethane			<0.3	<0.3				
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<4.0	<4.0
Ethylbenzene	AO	140	<0.5	<0.5				
m/p- xylene	AO	300	<1.0	<1.0				
Monochlorobenzene	MAC	80	<0.2	<0.2				
o-xylene			<0.5	<0.5				
Xylene, m,p,o-	AO	300						
Styrene			<0.5	<0.5				
t-1,2- Dichloroethylene			<0.4	<0.4				
t-1,3- Dichloropropylene			<0.2	<0.2				
Tetrachloroethylene	MAC	10	<0.3	<0.3				
Toluene	AO	60	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	MAC	5	<0.3	<0.3				
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5	<0.5				
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			115	119	110	116	104	115
4- bromofluorobenzene %			81	76	113	117	111	102
Toluene- d8 %			124	127	99	80	100	98

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 14A Deep

Parameter	Column 1	ODWS/OG	Jul-14	Apr-15	Apr-16	May-17	Apr-18	Jun-19
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzene	MAC	1	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	<0.3	< 0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			102	105	108	101	103	
4- bromofluorobenzene %			95.1	98	105	102	98	
Toluene- d8 %			95.5	100	102	104	103	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 14A Deep

Parameter	Column 1	ODWS/OG	May-20	Apr-21	May-22	Jun-23	Jun-24	
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.5	<0.4	<0.4	<0.4	<0.4	
Benzene	MAC	1	< 0.5	<0.5	<0.5	<0.5	<0.5	
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 5	<4.0	<4.0	<4.0	<4.0	
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	<0.5	<0.4	<0.4	<0.4	
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	<0.2	<0.2	<0.2	<0.2	
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				119	108	112	89	
4- bromofluorobenzene %				105	72	85	78	
Toluene- d8 %				108.0	103.0	91.0	111.0	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 15B Shallow

Parameter	Column 1	ODWS/OG	Jul-14	Apr-15	Apr-16	May-17	Apr-18	Jun-19
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzene	MAC	1	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	<0.3	< 0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			101	103	85	99	107	
4- bromofluorobenzene %			99.8	108	113	103	98	
Toluene- d8 %			94.0	115	95	102	102	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 15B Shallow

Parameter	Column 1	ODWS/OG	May-20	Apr-21	May-22	Jun-23	Jun-24	
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.5	<0.4	<0.4	<0.4	<0.4	
Benzene	MAC	1	< 0.5	<0.5	<0.5	<0.5	<0.5	
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 5	<4.0	<4.0	<4.0	<4.0	
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	<0.5	<0.4	<0.4	<0.4	
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	<0.2	<0.2	<0.2	<0.2	
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				120	99	118	102	
4- bromofluorobenzene %				100	78	88	74	
Toluene- d8 %				104	96	86	118	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 15A Deep

Parameter	Column 1	ODWS/OG	Jul-14	Apr-15	Apr-16	Apr-18	Jun-19	May-20
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	<0.2	< 0.2	< 0.2		< 0.2
Benzene	MAC	1	<0.5	<0.5	< 0.5	< 0.5		< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	<0.3	< 0.3	< 0.3		< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.5	< 0.5	< 0.5		< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	< 0.2	< 0.2		< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			101	108	85	100		
4- bromofluorobenzene %			94.3	108	114	99		
Toluene- d8 %			94.2	117	96	102		

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

			BH 15A Deep					
					Dup #2 QA/QC			
			Apr-21	May-22	May-22	Jun-23	Jun-24	
Parameter	**Column 1**	ODWS/OG						
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.4	
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<4.0	
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.4	<0.4	<0.4	<0.4	
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2	<0.2	
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			121	101	117	115	89	
4- bromofluorobenzene %			97	76	72	90	76	
Toluene- d8 %			105	99	100	101	112	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 16B Shallow

Parameter	Column 1	ODWS/OG	Jul-14	Apr-15	Apr-16	May-17	Apr-18	Jun-19
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzene	MAC	1	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	<0.3	< 0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			99.9	107	84	100	107	
4- bromofluorobenzene %			95.0	108	115	104	98	
Toluene- d8 %			95.0	116	97	102	102	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 16B Shallow

Parameter	Column 1	ODWS/OG	May-20	Apr-21	May-22	Jun-23	Jun-24	
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.5	<0.4	<0.4	<0.4	<0.4	
Benzene	MAC	1	< 0.5	<0.5	<0.5	<0.5	<0.5	
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 5	<4.0	<4.0	<4.0	<4.0	
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	<0.5	<0.4	<0.4	<0.4	
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	<0.2	<0.2	<0.2	<0.2	
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				130	106	119	95	
4- bromofluorobenzene %				108	80	90	78	
Toluene- d8 %				107.0	98.0	100.0	114.0	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 16A Deep

Parameter	Column 1	ODWS/OG	Jul-14	Apr-15	Apr-16	May-17	Apr-18	Jun-19
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzene	MAC	1	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	<0.3	< 0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	< 0.2	< 0.2	0.3	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			98.0	105	87	100	109	
4- bromofluorobenzene %			92.5	105	115	101	98	
Toluene- d8 %			94.1	115	95	103	103	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 16A Deep

Parameter	Column 1	ODWS/OG	May-20	Apr-21	May-22	Jun-23	Jun-24	Jun-24 QA/QC
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.5	<0.4	<0.4	<0.4	<0.4	<0.4
Benzene	MAC	1	< 0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 5	<4.0	<4.0	<4.0	6.7	<4.0
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	<0.5	<0.4	<0.4	<0.4	<0.4
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				114	105	117	98	90
4- bromofluorobenzene %				101	77	89	72	74
Toluene- d8 %				109	100	101	95	127

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 17B Shallow

Parameter	Column 1	ODWS/OG	Jul-14	Apr-15	Apr-16	May-17	Apr-18	Jun-19
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzene	MAC	1	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	<0.3	< 0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			102	109	113	103	101	
4- bromofluorobenzene %			105	96	103	105	98	
Toluene- d8 %			95.4	97	107	103	102	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 17B Shallow

Parameter	Column 1	ODWS/OG	May-20	Apr-21	May-22	Jun-23	Jun-24	
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.5	<0.4	<0.4	<0.4	<0.4	
Benzene	MAC	1	< 0.5	<0.5	<0.5	<0.5	<0.5	
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 5	<4.0	<4.0	<4.0	<4.0	
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	<0.5	<0.4	<0.4	<0.4	
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	<0.2	<0.2	<0.2	<0.2	
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				117	112	115	90	
4- bromofluorobenzene %				102	70	84	78	
Toluene- d8 %				106.0	102.0	88.0	119.0	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 17A Deep

Parameter	Column 1	ODWS/OG	Jul-14	Apr-15	Apr-16	May-17	Apr-18	Jun-19
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Benzene	MAC	1	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	<0.3	<0.3	< 0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	<0.5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	<0.2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			101	103	114	102	101	
4- bromofluorobenzene %			97.8	99	104	104	98	
Toluene- d8 %			92.7	98	105	104	102	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

BH 17A Deep

Parameter	Column 1	ODWS/OG	May-20	Apr-21	May-22	Jun-23	Jun-24	
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.5	<0.4	<0.4	<0.4	<0.4	
Benzene	MAC	1	< 0.5	<0.5	<0.5	<0.5	<0.5	
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 5	<4.0	<4.0	<4.0	<4.0	
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	<0.5	<0.4	<0.4	<0.4	
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	<0.2	<0.2	<0.2	<0.2	
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %				114	111	121	93	
4- bromofluorobenzene %				102	71	106	73	
Toluene- d8 %				108.0	105.0	98.0	118.0	

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

			Trip Blank					
					QA/QC			
			Jun-11	May-12	Oct-12	Apr-13	Jul-14	Apr-15
Parameter	**Column 1**	ODWS/OG						
Acetone								
1,1,1,2- tetrachloroethane						<0.5		< 0.1
1,1,1- trichloroethane						<0.4		< 0.1
1,1,2,2- tetrachloroethane						<0.5		< 0.4
1,1,2- trichloroethane						<0.4		< 0.1
1,1- dichloroethane						<0.4		< 0.1
1,1- dichloroethylene	MAC	14				<0.5		< 0.1
1,2- dibromoethane						<1.0		< 0.1
1,2- dichlorobenzene	MAC	200				<0.4		< 0.1
1,2- dichloroethane	IMAC	5				<0.5		< 0.1
1,2- dichloropropane						<0.5		< 0.1
1,3,5- trimethylbenzene						<0.3		
1,3- dichlorobenzene						<0.4		< 0.1
1,4- dichlorobenzene	MAC	5	<0.4	0.5	<0.4	<0.4	<0.2	< 0.2
Benzene	MAC	1	<0.5	<0.5	<0.5	<0.5	<0.5	< 0.5
Bromodichloromethane						<0.3		< 0.1
Bromoform						<0.4		< 0.1
Bromomethane						<0.5		< 0.3
c-1,2- Dichloroethylene						<0.4		< 0.1
c-1,3- Dichloropropylene						<0.2		< 0.1
Carbon Tetrachloride	MAC	2				<0.5		< 0.2
Chloroethane						<1.0		
Chloroform						1.1		< 0.3
Chloromethane						<1.0		
Dibromochloromethane						<0.3		< 0.1
Dichloromethane	MAC	50	<4.0	<4.0	<4.0	<4.0	<0.3	< 0.3
Ethylbenzene	AO	140				<0.5		< 0.5
m/p- xylene	AO	300				<1.0		< 0.4
Monochlorobenzene	MAC	80				<0.2		< 0.2
o-xylene						<0.5		< 0.1
Xylene, m,p,o-	AO	300						
Styrene						<0.5		< 0.5
t-1,2- Dichloroethylene						<0.4		< 0.1
t-1,3- Dichloropropylene						<0.2		< 0.1
Tetrachloroethylene	MAC	10				<0.3		< 0.2
Toluene	AO	60	<0.5	<0.5	<0.5	<0.5	<0.5	< 0.5
Trichloroethylene	MAC	5				<0.3		< 0.1
Dichlorodifluoromethane								
Trichlorofluoromethane						<0.5		< 0.1
Vinyl Chloride	MAC	1	<0.2	<0.2	<0.2	<0.2	<0.2	< 0.2
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			110	107	116	105	97.9	99.9
4- bromofluorobenzene %			120	109	113	101	96.0	106
Toluene- d8 %			97	100	99	98	94.2	112

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

Trip Blank

Parameter	Column 1	ODWS/OG	Apr-16	May-17	Apr-17	Apr-18	May-20	Apr-21
Acetone				< 2	< 2		< 30	
1,1,1,2- tetrachloroethane			< 0.1	< 0.1	< 0.1		< 0.1	<0.5
1,1,1- trichloroethane			< 0.1	< 0.1	< 0.1		< 0.1	<0.4
1,1,2,2- tetrachloroethane			< 0.4	< 0.4	< 0.4		< 0.4	<0.5
1,1,2- trichloroethane			< 0.1	< 0.1	< 0.1		< 0.1	<0.4
1,1- dichloroethane			< 0.1	< 0.1	< 0.1		< 0.1	<0.4
1,1- dichloroethylene	MAC	14	< 0.1	< 0.1	< 0.1		< 0.1	<0.5
1,2- dibromoethane			< 0.1	< 0.1	< 0.1		< 0.1	<0.2
1,2- dichlorobenzene	MAC	200	< 0.1	< 0.1	< 0.1		< 0.1	<0.4
1,2- dichloroethane	IMAC	5	< 0.1	< 0.1	< 0.1		< 0.1	<0.2
1,2- dichloropropane			< 0.1	< 0.1	< 0.1		< 0.1	<0.5
1,3,5- trimethylbenzene								<0.3
1,3- dichlorobenzene			< 0.1	< 0.1	< 0.1		< 0.1	<0.4
1,4- dichlorobenzene	MAC	5	< 0.2	< 0.2	< 0.2	< 0.2	< 0.5	<0.4
Benzene	MAC	1	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5
Bromodichloromethane			< 0.1	< 0.1	< 0.1		< 0.1	<0.3
Bromoform			< 0.1	< 0.1	< 0.1		< 0.1	<0.4
Bromomethane			< 0.3	< 0.3	< 0.3		< 0.3	<0.5
c-1,2- Dichloroethylene			< 0.1	< 0.1	< 0.1		< 0.1	<0.4
c-1,3- Dichloropropylene			< 0.1	< 0.1	< 0.1		< 0.1	<0.2
Carbon Tetrachloride	MAC	2	< 0.2	< 0.2	< 0.2		< 0.2	<0.2
Chloroethane								<0.2
Chloroform			< 0.3	< 0.3	< 0.3		< 0.3	<0.5
Chloromethane								<0.2
Dibromochloromethane			< 0.1	< 0.1	< 0.1			<0.3
Dichloromethane	MAC	50	< 0.3	< 0.3	< 0.3	< 0.3	< 5	<4.0
Ethylbenzene	AO	140	< 0.5	< 0.5	< 0.5		< 0.5	<0.5
m/p- xylene	AO	300	< 0.4	< 0.4	< 0.4		< 0.4	<0.4
Monochlorobenzene	MAC	80	< 0.2	< 0.2	< 0.2		< 0.2	<0.5
o-xylene			< 0.1	< 0.1	< 0.1		< 0.1	<0.4
Xylene, m,p,o-	AO	300		< 0.4				
Styrene			< 0.5	< 0.5	< 0.5		< 0.5	<0.5
t-1,2- Dichloroethylene			< 0.1	< 0.1	< 0.1		< 0.1	<0.4
t-1,3- Dichloropropylene			< 0.1	< 0.1	< 0.1		< 0.1	<0.2
Tetrachloroethylene	MAC	10	< 0.2	< 0.2	< 0.2		< 0.2	<0.3
Toluene	AO	60	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	<0.5
Trichloroethylene	MAC	5	< 0.1	< 0.1	< 0.1		< 0.1	<0.3
Dichlorodifluoromethane				< 1	< 1		< 1	
Trichlorofluoromethane			< 0.1	< 0.1	< 0.1		< 0.1	<0.5
Vinyl Chloride	MAC	1	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	<0.2
Xylene; total	AO	90			< 0.4		< 0.4	
Dichloropropene 1,3- cis+trans				< 0.1	< 0.1		< 0.1	
Hexane				< 1	< 1		< 1	
Methyl Ethyl Ketone				< 1	< 1		< 1	
Methyl Isobutyl Ketone				< 1	< 1		< 1	
Methyl-t-butyl Ether				< 1	< 1		< 1	
VOC SURROGATES								
1,2- dichloroethane- d4 %			115	102	104	106		120
4- bromofluorobenzene %			98	102	98	97		97
Toluene- d8 %			103	104	102	102		108

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

Trip Blank

Parameter	Column 1	ODWS/OG	May-22	Jun-24				
Acetone								
1,1,1,2- tetrachloroethane			<0.5	<0.5				
1,1,1- trichloroethane			<0.4	<0.4				
1,1,2,2- tetrachloroethane			<0.5	<0.5				
1,1,2- trichloroethane			<0.4	<0.4				
1,1- dichloroethane			<0.4	<0.4				
1,1- dichloroethylene	MAC	14	<0.5	<0.5				
1,2- dibromoethane			<0.2	<0.2				
1,2- dichlorobenzene	MAC	200	<0.4	<0.4				
1,2- dichloroethane	IMAC	5	<0.2	<0.2				
1,2- dichloropropane			<0.5	<0.5				
1,3,5- trimethylbenzene			<0.3	<0.3				
1,3- dichlorobenzene			<0.4	<0.4				
1,4- dichlorobenzene	MAC	5	<0.4	<0.4				
Benzene	MAC	1	<0.5	<0.5				
Bromodichloromethane			<0.3	<0.3				
Bromoform			<0.4	<0.4				
Bromomethane			<0.5	<0.5				
c-1,2- Dichloroethylene			<0.4	<0.4				
c-1,3- Dichloropropylene			<0.2	<0.2				
Carbon Tetrachloride	MAC	2	<0.2	<0.2				
Chloroethane			<0.2	<0.2				
Chloroform			<0.5	<0.5				
Chloromethane			<0.2	<0.2				
Dibromochloromethane			<0.3	<0.3				
Dichloromethane	MAC	50	<4.0	<4.0				
Ethylbenzene	AO	140	<0.5	<0.5				
m/p- xylene	AO	300	<0.4	<0.4				
Monochlorobenzene	MAC	80	<0.5	<0.5				
o-xylene			<0.4	<0.4				
Xylene, m,p,o-	AO	300						
Styrene			<0.5	<0.5				
t-1,2- Dichloroethylene			<0.4	<0.4				
t-1,3- Dichloropropylene			<0.2	<0.2				
Tetrachloroethylene	MAC	10	<0.3	<0.3				
Toluene	AO	60	<0.4	<0.4				
Trichloroethylene	MAC	5	<0.3	<0.3				
Dichlorodifluoromethane								
Trichlorofluoromethane			<0.5	<0.5				
Vinyl Chloride	MAC	1	<0.2	<0.2				
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			123	93				
4- bromofluorobenzene %			110	72				
Toluene- d8 %			99	118				

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis

			Field Blank					
			BH 19	BH 10S				
			May-17	Jun-23				
Parameter	**Column 1**	ODWS/OG						
Acetone								
1,1,1,2- tetrachloroethane								
1,1,1- trichloroethane								
1,1,2,2- tetrachloroethane								
1,1,2- trichloroethane								
1,1- dichloroethane								
1,1- dichloroethylene	MAC	14						
1,2- dibromoethane								
1,2- dichlorobenzene	MAC	200						
1,2- dichloroethane	IMAC	5						
1,2- dichloropropane								
1,3,5- trimethylbenzene								
1,3- dichlorobenzene								
1,4- dichlorobenzene	MAC	5	< 0.2	<0.4				
Benzene	MAC	1	< 0.5	<0.5				
Bromodichloromethane								
Bromoform								
Bromomethane								
c-1,2- Dichloroethylene								
c-1,3- Dichloropropylene								
Carbon Tetrachloride	MAC	2						
Chloroethane								
Chloroform								
Chloromethane								
Dibromochloromethane								
Dichloromethane	MAC	50	< 0.3	<4.0				
Ethylbenzene	AO	140						
m/p- xylene	AO	300						
Monochlorobenzene	MAC	80						
o-xylene								
Xylene, m,p,o-	AO	300						
Styrene								
t-1,2- Dichloroethylene								
t-1,3- Dichloropropylene								
Tetrachloroethylene	MAC	10						
Toluene	AO	60	< 0.5	<0.4				
Trichloroethylene	MAC	5						
Dichlorodifluoromethane								
Trichlorofluoromethane								
Vinyl Chloride	MAC	1	< 0.2	<0.2				
Xylene; total	AO	90						
Dichloropropene 1,3- cis+trans								
Hexane								
Methyl Ethyl Ketone								
Methyl Isobutyl Ketone								
Methyl-t-butyl Ether								
VOC SURROGATES								
1,2- dichloroethane- d4 %			103	120				
4- bromofluorobenzene %			104	88				
Toluene- d8 %			104	101				

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Surface Water

Ross WDS
Report of Inorganic
Surface Water Quality

					SW-2 (Mine View Culvert)- Upgradient					
					Mar-12	Jun-12 Storm Event	Oct-12	Apr-13	Sep-13 Storm Event	Oct-13
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity (as CaCO3)	IPWQO	a			115	No water to Sample	No water to Sample	93	No water to Sample	No water to Sample
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					<0.02			0.02		
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		<0.02			0.00005		
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.001			<0.001		
Barium				2.3	0.02			0.02		
Beryllium	PWQO	b		0.0053						
BOD					1			<1		
Boron	IPWQO	0.2	1.5	3.55	<0.01			<0.01		
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	<0.0001			<0.0001		
Calcium								40		
Chloride			120	180	37			69		
Chromium	PWQO	0.009		0.064	<0.001			<0.001		
Cobalt	IPWQO	0.0009		0.0052						
COD					11			13		
Conductivity (µS/cm)					358			416		
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	<0.001			<0.001		
DOC										
Fluoride										
Hardness (as CaCO3)								141		
Iron	PWQO	0.3	0.3		0.04			0.08		
Lead	PWQO IPWQO	e	0.001	0.002	<0.001			<0.001		
Magnesium										
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	<0.0001			<0.0001		
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		<0.10			<0.10		
N-NO2 (Nitrite)			0.06		<0.10			<0.10		
Organic Nitrogen					≤ 0.47			0.23		
pH (pH units)					7.52			7.28		
Phenols	IPWQO	0.005	0.004	0.961	<0.001			<0.001		
Phosphorus (total)	IPWQO	0.03			0.02			0.03		
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					11			7		
Sulphur										
TDS					233			270		
Total Sus. Solids					<2			<2		
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.47			0.25		
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	<0.01			0.05		
Ion Balance										
Field Parameters										
Temperature (^{o}C)					10.5			4.8		
pH					7.4			7.2		
Conductivity (µS/cm)					335			1128		
DO (mg/L)					4.87			3.12		
Flow (L/s)								0.01		

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
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					SW-2 (Mine View Culvert)- Upgradient					
PARAMETER	Limit	PWQO	CWQG	APV	Apr-14 Storm Event	Jun-14 Storm Event	Jul-14	Sep-14	Apr-15	Aug-15 Storm Event
Alkalinity (as CaCO3)	IPWQO	a			79	106	118	No water	128	37
Aluminum	IPWQO	0.075	<0.1 pH>6.5					to Sample		
N-NH3 (Ammonia)					0.02	0.05	0.19		< 0.01	0.03
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		<0.02	<0.02	<0.02		< 0.0001	0.0002
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0001	0.0003	0.0004		0.0002	0.0001
Barium				2.3	0.027	0.024	0.031		0.019	0.018
Beryllium	PWQO	b		0.0053						
BOD					<3	<3	<3		< 3	3
Boron	IPWQO	0.2	1.5	3.55	<0.005	<0.005	<0.005		< 0.005	0.009
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	<0.00002	0.00003	0.00002		< 0.00002	0.00002
Calcium					37.8					
Chloride			120	180	20.9	27.7	30.6		29.6	3.9
Chromium	PWQO	0.009		0.064	<0.0002	<0.002	<0.002		< 0.002	< 0.002
Cobalt	IPWQO	0.0009		0.0052						
COD					16	34	30		21	39
Conductivity (µS/cm)					263	305	335		334	93
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.0005	0.001	0.0011		0.0014	0.0012
DOC										
Fluoride										
Hardness (as CaCO3)					126	140	165		127	39
Iron	PWQO	0.3	0.3		0.067	0.238	0.605		0.086	0.63
Lead	PWQO IPWQO	e	0.001	0.002	0.00002	0.00009	0.00008		< 0.00002	0.00021
Magnesium					10.3					
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	<0.00002	<0.00002	<0.00002		< 0.00002	< 0.00002
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		<0.1	0.1	<0.1		0.1	< 0.1
N-NO2 (Nitrite)			0.06		<0.1	<0.1	<0.1		< 0.1	< 0.1
Organic Nitrogen					0.42	1.15	0.82			
pH (pH units)					7.76	7.8	7.73		7.76	7.15
Phenols	IPWQO	0.005	0.004	0.961	<0.001	<0.001	<0.001		< 0.001	< 0.001
Phosphorus (total)	IPWQO	0.03			0.03	0.06	0.09		0.06	0.09
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					7	5	5		7	1
Sulphur										
TDS					156	163	181		170	56
Total Sus. Solids					<3	<3	11		< 3	11
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.44	1.2	1.01		0.72	0.9
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	0.102	0.019	0.046		0.006	0.015
Ion Balance										
Field Parameters										
Temperature (^{o}C)					9.1	19.6	20.0		9.3	21.5
pH					7.7	7.8	7.4		7.3	7
Conductivity (µS/cm)					230	351	317		677	88
DO (mg/L)					6.42		2.44		6.85	6.29
Flow (L/s)					0.16	4.2	0.69		0.84	49

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
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Surface Water Quality

					SW-2 (Mine View Culvert)- Upgradient					
					Sep-15	Nov-15 Storm Event	Apr-16	Aug-16 Storm Event	Aug-16	Apr-17 Storm Event
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity (as CaCO3)	IPWQO	a			No Water	119	113	100	No water	71
Aluminum	IPWQO	0.075	<0.1 pH>6.5		to Sample				to Sample	
N-NH3 (Ammonia)						< 0.01	0.01	< 0.01		< 0.01
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019			< 0.00006	0.0001	<0.00016		0.000055
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15		0.0001	0.0001	0.0002		0.0001
Barium				2.3		0.02	0.016	0.017		0.015
Beryllium	PWQO	b		0.0053						
BOD						< 3	< 3	< 3		< 3
Boron	IPWQO	0.2	1.5	3.55		< 0.005	< 0.005	0.008		< 0.005
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021		< 0.00002	< 0.00002	< 0.00002		< 0.000020
Calcium										
Chloride			120	180		29.5	25.5	23.3		23.5
Chromium	PWQO	0.009		0.064		< 0.002	< 0.002	< 0.002		< 0.001
Cobalt	IPWQO	0.0009		0.0052						
COD						< 5	28	34		22
Conductivity (µS/cm)						335	303	276		223
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069		0.0004	0.0005	0.0011		0.0003
DOC										
Fluoride										
Hardness (as CaCO3)						163	154	107		81
Iron	PWQO	0.3	0.3			0.035	0.028	0.056		0.034
Lead	PWQO IPWQO	e	0.001	0.002		< 0.00002	< 0.00002	0.00002		< 0.00002
Magnesium										
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077		< 0.00002	< 0.00002	< 0.00002		< 0.02
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3			< 0.1	< 0.1	< 0.1		< 0.1
N-NO2 (Nitrite)			0.06			< 0.1	< 0.1	< 0.1		< 0.1
Organic Nitrogen										
pH (pH units)						7.57	7.89	7.66		7.73
Phenols	IPWQO	0.005	0.004	0.961		< 0.001	< 0.001	< 0.001		< 0.001
Phosphorus (total)	IPWQO	0.03				0.01	< 0.01	0.05		0.02
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate						14	9	8		5
Sulphur										
TDS						183	172	147		113
Total Sus. Solids						< 3	< 3	4		4
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN						0.28	0.45	0.89		0.47
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089		0.007	< 0.005	0.008		< 0.005
Ion Balance										
Field Parameters										
Temperature (^{o}C)						8.8	6.9	18.7		15.1
pH						7.5	7.7	7		7.3
Conductivity (µS/cm)						322	297	298		224
DO (mg/L)						7.08	12.06	5.47		7.91
Flow (L/s)						0.57	3.2			5

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

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Ross WDS
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Surface Water Quality

					SW-2 (Mine View Culvert)- Upgradient					
					May-17	Aug-17	Oct-17 Storm Event	Apr-18	Aug-18 Storm Event	Sep-18
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity (as CaCO3)	IPWQO	a			149	230	66	118	33	Dry
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					0.37	0.03	< 0.01	< 0.01	0.05	
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.003027	0.00004	0.000157	0.000042	0.001905	
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0002	0.0004	0.0002	0.0002	0.0003	
Barium				2.3	0.021	0.033	0.01	0.024	0.006	
Beryllium	PWQO	b		0.0053						
BOD					< 3	< 3	< 3	< 3	< 3	
Boron	IPWQO	0.2	1.5	3.55	0.006	0.007	< 0.005	< 0.005	0.011	
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	< 0.000014	< 0.000014	< 0.000014	< 0.000014	0.00002	
Calcium										
Chloride			120	180	19.6	16.7	10.5	13.3	2.7	
Chromium	PWQO	0.009		0.064	< 0.001	< 0.001	< 0.001	< 0.002	< 0.002	
Cobalt	IPWQO	0.0009		0.0052						
COD					22	13	< 5	15	46	
Conductivity (µS/cm)					366	508	173	298	122	
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.0002	0.0003	0.0004	0.0004	0.0011	
DOC										
Fluoride										
Hardness (as CaCO3)					174	237	62	138	53	
Iron	PWQO	0.3	0.3		0.06	5.65	0.138	0.121	0.184	
Lead	PWQO IPWQO	e	0.001	0.002	< 0.00002	< 0.00002	0.00002	< 0.00002	< 0.00002	
Magnesium										
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	< 0.02	< 0.00002	< 0.00002	< 0.00002	< 0.00002	
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
N-NO2 (Nitrite)			0.06		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	
Organic Nitrogen										
pH (pH units)					7.94	7.58	7.87	7.93	7.38	
Phenols	IPWQO	0.005	0.004	0.961	0.002	< 0.001	< 0.001	< 0.001	< 0.002	
Phosphorus (total)	IPWQO	0.03			0.03	0.1	0.04	0.03	0.18	
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					6	6	2	5	17	
Sulphur										
TDS					191	262	87	148	63	
Total Sus. Solids					10	16	11	< 3	6	
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.7	0.7	0.4	0.4	1.2	
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	0.009	0.036	0.012	0.018	0.011	
Ion Balance										
Field Parameters										
Temperature (^{o}C)					14.4	17.6	8.1	0.3	20	
pH					7.5	6.6	8.0	7.7	8	
Conductivity (µS/cm)					360	487	152	289	98	
DO (mg/L)					--	1.52	6.61	5.69	7.8	
Flow (L/s)					3.56	0.05	9.0	5.12	7.9	

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
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Surface Water Quality

					SW-2 (Mine View Culvert)- Upgradient					
					Oct-18 Storm	Apr-19	Jun-19 Storm	Oct-19 Storm	Oct-19	May-20
PARAMETER	Limit	PWQO	CWQG	APV	Event		Event	Event		
Alkalinity (as CaCO3)	IPWQO	a			Dry	50	115	46	DRY	119
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)						0.02	0.06	0.04		0.01
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019							0.000072
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15		< 0.0001	0.0002	0.0002		0.0001
Barium				2.3		0.009	0.016	0.009		0.03
Beryllium	PWQO	b		0.0053						
BOD						< 3	< 3	< 3		< 3
Boron	IPWQO	0.2	1.5	3.55		< 0.005	< 0.005	0.005		< 0.005
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021		< 0.000015	< 0.000015	0.000016		< 0.000015
Calcium								18.1		
Chloride			120	180		21.6	25.6	9.6		45.1
Chromium	PWQO	0.009		0.064		< 0.001	< 0.001	< 0.001		< 0.001
Cobalt	IPWQO	0.0009		0.0052						
COD						11	34	29		7
Conductivity (µS/cm)						183	319	186		405
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069		0.0007	0.0006	0.0015		0.0003
DOC										
Fluoride										
Hardness (as CaCO3)						64	148	71		198
Iron	PWQO	0.3	0.3			0.047	0.242	0.148		0.156
Lead	PWQO IPWQO	e	0.001	0.002		< 0.00002	0.00004	0.00003		< 0.00002
Magnesium								6.27		
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077		< 0.00002	< 0.00002	< 0.00002		< 0.00002
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3			< 0.05	< 0.05	< 0.05		0.05
N-NO2 (Nitrite)			0.06			< 0.05	< 0.05	< 0.05		< 0.05
Organic Nitrogen										
pH (pH units)						7.67	7.74	7.47		7.9
Phenols	IPWQO	0.005	0.004	0.961		< 0.002	< 0.002	< 0.002		< 0.002
Phosphorus (total)	IPWQO	0.03				0.02	0.04	0.07		0.01
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate						3	3	22		12
Sulphur										
TDS						89	161	93		213
Total Sus. Solids						< 3	12	< 3		< 3
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN						0.4	0.9	0.8		0.3
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089		0.009	0.008	0.009		0.01
Ion Balance										
Field Parameters										
Temperature (^{o}C)							23.6	--		6.8
pH							7.4	--		7.7
Conductivity (µS/cm)							320	--		422
DO (mg/L)							7.7	--		7.3
Flow (L/s)							6.0	--		0.5

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

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					SW-2 (Mine View Culvert)- Upgradient					
PARAMETER	Limit	PWQO	CWQG	APV	May-20 Storm Event	Aug-20 Storm Event	Sep-20	Apr-21	Aug-21	Sep-21 Storm Event
Alkalinity (as CaCO3)	IPWQO	a			127	Dry	126	159	Dry	80
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					0.11		0.04	<0.02		<0.02
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.00079		0.000117	0.000011		0.000043
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0002		0.0003	<0.001		<0.001
Barium				2.3	0.03		0.021	0.02		0.01
Beryllium	PWQO	b		0.0053						
BOD					< 3		< 3	<1		1
Boron	IPWQO	0.2	1.5	3.55	0.08		0.007	<0.01		0.01
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	< 0.000015		0.000025	<0.0001		<0.0001
Calcium								49		23
Chloride			120	180	36.9		8.1	20		7
Chromium	PWQO	0.009		0.064	< 0.001		< 0.001	<0.001		<0.001
Cobalt	IPWQO	0.0009		0.0052						
COD					32		27	11		35
Conductivity (µS/cm)					402		287	369		170
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.0007		0.0012	<0.001		0.002
DOC										
Fluoride										
Hardness (as CaCO3)					187		139	188		90
Iron	PWQO	0.3	0.3		0.211		1.07	0.22		0.18
Lead	PWQO IPWQO	e	0.001	0.002	0.00003		0.00011	<0.001		<0.001
Magnesium								16		8
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	< 0.00002		< 0.00002	<0.0001		<0.0001
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		0.18		< 0.05			<0.10
N-NO2 (Nitrite)			0.06		0.06		< 0.05	<0.10		<0.10
Organic Nitrogen										
pH (pH units)					7.43		7.47	7.63		7.24
Phenols	IPWQO	0.005	0.004	0.961	< 0.002		< 0.002	<0.001		0.004
Phosphorus (total)	IPWQO	0.03			0.05		0.06	0.026		0.088
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					20		8	3		11
Sulphur										
TDS					212		151	240		110
Total Sus. Solids					< 3		9	<2		<2
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					1.1		0.8	0.77		1.32
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	0.014		0.047	<0.01		<0.01
Ion Balance										
Field Parameters										
Temperature (^{o}C)					15.7		15.4	9.2		14.8
pH					7.4		6.7	6.5		6.9
Conductivity (µS/cm)					370		303	377		198
DO (mg/L)					3.4		4.5	5.6		5
Flow (L/s)					0.005		0.01	0.01		3

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

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Surface Water Quality

					SW-2 (Mine View Culvert)- Upgradient					
					Nov-21 Storm	Apr-22 Storm	May-22	Aug-22	Sep-22 Storm	May-23 Storm
PARAMETER	Limit	PWQO	CWQG	APV	Event	Event			Event	Event
Alkalinity (as CaCO3)	IPWQO	a			Dry	75	Dry	Dry	Dry	82
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)						0.09				<0.020
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019			0.000295				0.000162
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15		<0.001				<0.001
Barium				2.3		0.01				0.01
Beryllium	PWQO	b		0.0053						
BOD						<1				<1
Boron	IPWQO	0.2	1.5	3.55		<0.01				<0.01
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021		<0.0001				<0.0001
Calcium						23				22
Chloride			120	180		27				31
Chromium	PWQO	0.009		0.064		<0.001				<0.001
Cobalt	IPWQO	0.0009		0.0052						
COD						5				23
Conductivity (µS/cm)						201				221
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069		<0.001				<0.001
DOC										
Fluoride										
Hardness (as CaCO3)						86				84
Iron	PWQO	0.3	0.3			0.2				0.06
Lead	PWQO IPWQO	e	0.001	0.002		<0.001				<0.001
Magnesium						7				7
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077		<0.0001				<0.0001
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3			<0.10				<0.10
N-NO2 (Nitrite)			0.06			<0.10				<0.10
Organic Nitrogen										
pH (pH units)						7.37				7.72
Phenols	IPWQO	0.005	0.004	0.961		<0.001				<0.001
Phosphorus (total)	IPWQO	0.03				0.036				0.014
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate						3				3
Sulphur										
TDS						131				144
Total Sus. Solids						<2				<2
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN						0.571				0.463
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089		0.02				<0.01
Ion Balance										
Field Parameters										
Temperature (^{o}C)						8.5				8.3
pH						7.5				7.7
Conductivity (µS/cm)						250				300
DO (mg/L)						11.9				9.1
Flow (L/s)						9				Nm

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
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Surface Water Quality

					SW-2 (Mine View Culvert)- Upgradient					
					Jun-23	Aug-23	Sep-23 Storm Event	Oct-23	May-24 Storm Event	Jun-24
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity (as CaCO3)	IPWQO	a			Dry	Dry	Dry	Dry	Dry	Dry
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)										
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019							
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
Barium				2.3						
Beryllium	PWQO	b		0.0053						
BOD										
Boron	IPWQO	0.2	1.5	3.55						
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021						
Calcium										
Chloride			120	180						
Chromium	PWQO	0.009		0.064						
Cobalt	IPWQO	0.0009		0.0052						
COD										
Conductivity (µS/cm)										
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069						
DOC										
Fluoride										
Hardness (as CaCO3)										
Iron	PWQO	0.3	0.3							
Lead	PWQO IPWQO	e	0.001	0.002						
Magnesium										
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077						
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3							
N-NO2 (Nitrite)			0.06							
Organic Nitrogen										
pH (pH units)										
Phenols	IPWQO	0.005	0.004	0.961						
Phosphorus (total)	IPWQO	0.03								
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate										
Sulphur										
TDS										
Total Sus. Solids										
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN										
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089						
Ion Balance										
Field Parameters										
Temperature (^{o}C)										
pH										
Conductivity (µS/cm)										
DO (mg/L)										
Flow (L/s)										

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

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Ross WDS
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					SW-2 (Mine View Culvert)- Upgradient					
					Oct-24	Nov-24 Storm Event				
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity (as CaCO3)	IPWQO	a			Dry	Dry				
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)										
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019							
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
Barium				2.3						
Beryllium	PWQO	b		0.0053						
BOD										
Boron	IPWQO	0.2	1.5	3.55						
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021						
Calcium										
Chloride			120	180						
Chromium	PWQO	0.009		0.064						
Cobalt	IPWQO	0.0009		0.0052						
COD										
Conductivity (µS/cm)										
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069						
DOC										
Fluoride										
Hardness (as CaCO3)										
Iron	PWQO	0.3	0.3							
Lead	PWQO IPWQO	e	0.001	0.002						
Magnesium										
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077						
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3							
N-NO2 (Nitrite)			0.06							
Organic Nitrogen										
pH (pH units)										
Phenols	IPWQO	0.005	0.004	0.961						
Phosphorus (total)	IPWQO	0.03								
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate										
Sulphur										
TDS										
Total Sus. Solids										
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN										
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089						
Ion Balance										
Field Parameters										
Temperature (^{o}C)										
pH										
Conductivity (µS/cm)										
DO (mg/L)										
Flow (L/s)										

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inorganic
Surface Water Quality

					SW 1: Historical					
					Dec-00	Nov-01	Oct-02	Oct-03	Oct-04	Aug-07
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity (as CaCO3)	IPWQO	a			Dry	Dry	Dry	Dry	Dry	273
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)										
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019							
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
Barium				2.3						
Beryllium	PWQO	b		0.0053						
BOD										
Boron	IPWQO	0.2	1.5	3.55						0.02
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021						
Calcium										86
Chloride			120	180						25
Chromium	PWQO	0.009		0.064						
Cobalt	IPWQO	0.0009		0.0052						
COD										53
Conductivity (µS/cm)										608
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069						0.003
DOC										
Fluoride										
Hardness (as CaCO3)										
Iron	PWQO	0.3	0.3							1.38
Lead	PWQO IPWQO	e	0.001	0.002						
Magnesium										18
Manganese										0.8
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077						
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3							0.36
N-NO2 (Nitrite)			0.06							0.13
Organic Nitrogen										
pH (pH units)										
Phenols	IPWQO	0.005	0.004	0.961						<0.001
Phosphorus (total)	IPWQO	0.03								
Potassium										7
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										11
Strontium										0.29
Sulphate										8
Sulphur										
TDS										395
Total Sus. Solids										
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN										2.04
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089						
Ion Balance										
Field Parameters										
Temperature (^{o}C)										
pH										
Conductivity (µS/cm)										
DO (mg/L)										
Flow (L/s)										

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

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					SW 1: Historical					
					Nov-07	May-08	Oct-08	May-09	Oct-09	May-10
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity (as CaCO3)	IPWQO	a			325	119	368	224	318	368
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)								0.23	0.28	0.2
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019					0.00075	0.00199	0.00503
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15				<0.001	<0.05	<0.001
Barium				2.3				0.05	0.15	0.18
Beryllium	PWQO	b		0.0053						
BOD								2	11	
Boron	IPWQO	0.2	1.5	3.55	0.01	0.01	0.04	0.03	<0.1	0.09
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021				<0.0001	<0.01	<0.0001
Calcium					90	36	110	66	88	123
Chloride			120	180	30	14	44	29	34	41
Chromium	PWQO	0.009		0.064						0.005
Cobalt	IPWQO	0.0009		0.0052						
COD					117	23	60	38	76	30
Conductivity (µS/cm)					670	308	804	542	702	923
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.011	0.001	<0.001	0.002	<0.01	0.002
DOC										9.2
Fluoride										
Hardness (as CaCO3)										
Iron	PWQO	0.3	0.3		21.8	8.76	11.7	3.04	12.6	0.96
Lead	PWQO IPWQO	e	0.001	0.002				<0.001	<0.01	<0.001
Magnesium					23	11	25	15	18	27
Manganese					5.32	1.51	4.90	1.41	5.35	8.27
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077				<0.0001	<0.0001	<0.0001
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		<0.10	<0.10	<0.10	<0.10	<0.10	0.39
N-NO2 (Nitrite)			0.06		<0.10	<0.10	<0.10	<0.10	<0.10	0.12
Organic Nitrogen								0.51	1.49	1.09
pH (pH units)								7.6	7.94	7.83
Phenols	IPWQO	0.005	0.004	0.961	0.017	<0.001	0.007	0.003	0.013	<0.001
Phosphorus (total)	IPWQO	0.03						0.13	0.71	0.18
Potassium					11	4	7	3	7	8
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium					12	10	19	13	15	14
Strontium					0.281	0.148	0.281	0.198	0.23	
Sulphate					2	14	9	17	8	66
Sulphur										
TDS					435	200	523	352	456	600
Total Sus. Solids								91	294	
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					2.88	1.72	0.89	0.74	1.77	1.29
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089				<0.01	<0.05	<0.01
Ion Balance						1.07	0.98			
Field Parameters										
Temperature (^{o}C)						12.4	Not Recorded			19.5
pH						Not Recorded	"			9.56
Conductivity (µS/cm)						357	"			Not Taken
DO (mg/L)						0%	"			Not Taken
Flow (L/s)										Not Taken

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

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Ross WDS
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Surface Water Quality

PARAMETER	Limit	PWQO	CWQG	APV	SW 1: Historical May-11	Jul-11	Nov-11	Mar-12	Jun-12 Storm Event	SW 1A Oct-12 New location
Alkalinity (as CaCO3)	IPWQO	a			335	366	Not	221	No water	185
Aluminum	IPWQO	0.075	<0.1 pH>6.5				Sampled		to Sample	
N-NH3 (Ammonia)					0.03	0.07		<0.02		<0.02
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.00072	0.00483		<0.02		<0.02
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.001	<0.05		<0.001		<0.001
Barium				2.3	0.13	0.1		0.06		0.04
Beryllium	PWQO	b		0.0053						
BOD					<1	4		<1		<1
Boron	IPWQO	0.2	1.5	3.55	0.08	<0.1		0.03		0.01
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	<0.0001	<0.01		<0.0001		<0.0001
Calcium										
Chloride			120	180	37	25		13		9
Chromium	PWQO	0.009		0.064	<0.005	<0.05		0.006		0.003
Cobalt	IPWQO	0.0009		0.0052						
COD					15	70		6		12
Conductivity (µS/cm)					874	751		498		445
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.001	<0.01		<0.001		<0.001
DOC										
Fluoride										
Hardness (as CaCO3)										
Iron	PWQO	0.3	0.3		<0.03	0.9		0.11		<0.03
Lead	PWQO IPWQO	e	0.001	0.002	<0.001	<0.01		<0.001		<0.001
Magnesium										
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	<0.0001	<0.0001		<0.0001		<0.0001
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		6.89	0.36		3.49		5.18
N-NO2 (Nitrite)			0.06		<0.10	<0.10		<0.10		<0.10
Organic Nitrogen					0.22	1.93		≤ 0.48		≤ 0.11
pH (pH units)					7.94	8.26		7.88		8.08
Phenols	IPWQO	0.005	0.004	0.961	<0.001	<0.001		<0.001		<0.005
Phosphorus (total)	IPWQO	0.03			0.02	0.22		0.04		0.01
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium						27				
Sulphate					64			19		18
Sulphur										
TDS					568	488		324		289
Total Sus. Solids					3	48		2		<2
Temperature (°C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.25	2.03		0.48		0.11
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	<0.01	<0.05		<0.01		<0.01
Ion Balance										
Field Parameters										
Temperature (°C)					15.4	20.4		5.3		8.5
pH					7.4	8.2		7.6		7.2
Conductivity (µS/cm)					555	560		385		432
DO (mg/L)					4.77	4.36		6.71		7.44
Flow (L/s)					0.5	0.5		0.2		1.0

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

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PARAMETER	Limit	PWQO	CWQG	APV	SW 1A Apr-13	Apr-13 SW 3 QA/QC	Sep-13 Storm Event	Sep-13 SW 2 QA/QC	Oct-13	Apr-14
Alkalinity (as CaCO3)	IPWQO	a			165	165	178	180	168	137
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					<0.02	0.02	0.03	0.03	0.03	<0.01
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		<0.02	0.00012	0.00031	0.00014	0.00041	<0.02
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.001	<0.001	<0.001	<0.001	<0.001	0.0002
Barium				2.3	0.03	0.03	0.04	0.04	0.04	0.033
Beryllium	PWQO	b		0.0053						
BOD					<1	<1	<1	<1	<1	<3
Boron	IPWQO	0.2	1.5	3.55	0.01	0.01	0.01	0.01	<0.01	0.018
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00002
Calcium					62	62	68	68	60	56.4
Chloride			120	180	8	8	8	8	8	5.5
Chromium	PWQO	0.009		0.064	0.001	0.001	0.003	0.002	<0.001	<0.0002
Cobalt	IPWQO	0.0009		0.0052						
COD					<5	<5	9	9	<5	125
Conductivity (µS/cm)					395	398	424	426	409	339
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0001
DOC										
Fluoride										
Hardness (as CaCO3)					212	212	232	232	203	176
Iron	PWQO	0.3	0.3		<0.03	<0.03	0.08	0.04	<0.03	0.007
Lead	PWQO IPWQO	e	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.00003
Magnesium					14	14	15	15	13	12.5
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00002
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		4.29	4.24	4.30	4.58	5.02	3.2
N-NO2 (Nitrite)			0.06		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen					≤ 0.27	0.32	0.21	0.43	0.28	≤ 0.21
pH (pH units)					7.83	7.88	7.73	7.75	7.89	7.88
Phenols	IPWQO	0.005	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus (total)	IPWQO	0.03			0.02	0.02	0.03	0.05	0.02	0.04
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					19	19	19	18	18	19
Sulphur										
TDS					257	259	276	277	266	196
Total Sus. Solids					2	<2	4	<2	<2	<3
Temperature (°C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.27	0.34	0.24	0.46	0.31	0.21
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005
Ion Balance										
Field Parameters										
Temperature (°C)					4.6		10.8		9.5	4.1
pH					7.2		7.7		7.8	7.8
Conductivity (µS/cm)					406		404		384	322
DO (mg/L)					4.81		6.18		7.27	6.74
Flow (L/s)					1.00		0.90		1.64	1.0

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inorganic
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PARAMETER	Limit	PWQO	CWQG	APV	SW 1A Jun-14 Storm Event	Jul-14	Sep-14	Apr-15	Apr-15 SW 2 QA/QC	Aug-15 Storm Event
Alkalinity (as CaCO3)	IPWQO	a			153	154	153	152	151	85
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					<0.01	<0.01	<0.01	< 0.01	< 0.01	0.02
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		<0.02	<0.02	<0.02	< 0.00016	< 0.00009	0.00021
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0003	0.0003	0.0003	0.0002	0.0002	0.0005
Barium				2.3	0.04	0.041	0.041	0.029	0.032	0.048
Beryllium	PWQO	b		0.0053						
BOD					<3	<3	< 3	< 3	< 3	< 3
Boron	IPWQO	0.2	1.5	3.55	0.019	0.01	0.015	0.012	0.013	0.03
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	<0.00002	<0.00002	<0.00002	< 0.00002	< 0.00002	0.00008
Calcium										
Chloride			120	180	6.3	6.2	6.4	6.4	6.4	2.7
Chromium	PWQO	0.009		0.064	<0.002	<0.002	<0.002	< 0.002	< 0.002	< 0.002
Cobalt	IPWQO	0.0009		0.0052						
COD					18	9	<5	18	17	117
Conductivity (µS/cm)					374	381	383	378	378	192
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.0004	0.0003	0.0014	< 0.0001	< 0.0001	0.0022
DOC										
Fluoride										
Hardness (as CaCO3)					206	210	220	162	178	118
Iron	PWQO	0.3	0.3		0.054	0.04	0.01	0.06	0.079	0.382
Lead	PWQO IPWQO	e	0.001	0.002	0.00022	0.00014	0.00002	0.00019	0.00025	0.00093
Magnesium										
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	<0.00002	<0.00002	<0.00002	< 0.00002	< 0.00002	< 0.00002
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		3.7	4.5	5.6	5	5.1	0.3
N-NO2 (Nitrite)			0.06		<0.1	<0.1	<0.10	< 0.1	< 0.1	< 0.1
Organic Nitrogen					≤ 0.70	≤ 0.59	≤ 0.33			
pH (pH units)					7.97	8.00	7.86	8.04	8.07	7.45
Phenols	IPWQO	0.005	0.004	0.961	<0.001	<0.001	<0.001	< 0.001	< 0.001	< 0.001
Phosphorus (total)	IPWQO	0.03			0.17	0.07	0.02	0.03	0.03	0.07
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					19	18	18	18	17	7
Sulphur										
TDS					214	218	226	200	206	115
Total Sus. Solids					4	10	< 3	5	11	43
Temperature (°C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.70	0.59	0.33	0.53	0.53	0.72
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	0.008	<0.005	<0.005	< 0.005	< 0.005	0.09
Ion Balance										
Field Parameters										
Temperature (°C)					11.7	12.3	9.9	7		19.4
pH					7.8	7.3	7.7	7.6		7.2
Conductivity (µS/cm)					342	350	382	429		180
DO (mg/L)					6.13	4.05	6.95	9.05		6.3
Flow (L/s)					1.73	1.4	1			11.93

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
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PARAMETER	Limit	PWQO	CWQG	APV	SW 1A Sep-15	Nov-15 Storm Event	Apr-16	Aug-16 Storm Event	Aug-16	Apr-17 Storm Event
Alkalinity (as CaCO3)	IPWQO	a			163	158	159	191	204	162
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					< 0.01	< 0.01	0.01	< 0.01	< 0.01	0.02
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		< 0.00012	< 0.00013	0.00009	< 0.00019	< 0.00018	0.000048
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15		0.0001	0.0002	0.0003		0.0002
Barium				2.3		0.04	0.043	0.047		0.043
Beryllium	PWQO	b		0.0053						
BOD					< 3	< 3	< 3	< 3	8	< 3
Boron	IPWQO	0.2	1.5	3.55		0.009	0.017	0.022		0.024
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021		< 0.00002	< 0.00002	0.00002		0.00002
Calcium										
Chloride			120	180	6.7	7.5	7.8	8.4	9.5	12.9
Chromium	PWQO	0.009		0.064		< 0.002	< 0.002	< 0.002		< 0.001
Cobalt	IPWQO	0.0009		0.0052						
COD					< 5	< 5	32	27	10	28
Conductivity (µS/cm)					383	378	371	417	462	416
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069		0.0002	0.0005	0.0002		0.0004
DOC										
Fluoride										
Hardness (as CaCO3)					207	214	223	229	246	202
Iron	PWQO	0.3	0.3		0.019	0.007	0.054	0.07	0.071	0.114
Lead	PWQO IPWQO	e	0.001	0.002		< 0.00002	0.00011	0.0002		0.00035
Magnesium										
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077		< 0.00002	< 0.00002	< 0.00002		< 0.02
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		5.8	5.9	3.8	4	5	4.8
N-NO2 (Nitrite)			0.06		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Organic Nitrogen										
pH (pH units)					7.79	7.9	7.89	7.92	7.93	7.93
Phenols	IPWQO	0.005	0.004	0.961	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Phosphorus (total)	IPWQO	0.03			0.02	0.01	0.03	0.17	0.13	0.05
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					17	18	19	14	15	19
Sulphur										
TDS					257	229	227	245	265	231
Total Sus. Solids					< 3	< 3	4	7	< 3	15
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.22	0.21	0.46	0.64	0.43	0.65
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089		0.007	< 0.005	< 0.005		0.005
Ion Balance										
Field Parameters										
Temperature (^{o}C)					10.6	8.5	3.7	12.8	12.1	4.5
pH					7.9	7.5	7.9	7.2	7.6	7.3
Conductivity (µS/cm)					366	369	377	471	502	436
DO (mg/L)					7.48	8.59	8.63	6.1	4.33	8.43
Flow (L/s)					0.50	0.4	3.69		2.46	5.00

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inorganic
Surface Water Quality

					SW 1A					
					May-17	Aug-17	Oct-17	Apr-18	Aug-18 Storm Event	Sep-18
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity (as CaCO3)	IPWQO	a			225	242	105	206	149	193
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					< 0.01	< 0.01	< 0.01	0.04	0.34	< 0.01
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.000068	0.000054	0.000149	0.000142	0.007884	0.000172
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0001	0.0003	0.0003	0.0003	0.0005	0.0002
Barium				2.3	0.084	0.079	0.042	0.071	0.058	0.061
Beryllium	PWQO	b		0.0053						
BOD					< 3	< 3	< 3	< 3	< 3	< 3
Boron	IPWQO	0.2	1.5	3.55	0.055	0.054	0.024	0.046	0.039	0.044
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	< 0.000014	< 0.000014	0.000069	0.000014	0.000154	0.000054
Calcium										75.6
Chloride			120	180	19.8	28.9	13.4	23.9	20.3	24.6
Chromium	PWQO	0.009		0.064	< 0.001	< 0.001	< 0.001	< 0.002	< 0.002	< 0.001
Cobalt	IPWQO	0.0009		0.0052						
COD					13	17	9	10	93	11
Conductivity (µS/cm)					589	667	291	622	407	562
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.0006	0.0007	0.0032	0.0008	0.0049	0.0046
DOC										
Fluoride										
Hardness (as CaCO3)					331	309	139	283	198	259
Iron	PWQO	0.3	0.3		0.1	0.134	0.378	0.08	0.528	0.085
Lead	PWQO IPWQO	e	0.001	0.002	0.0001	0.00016	0.00092	0.00028	0.0013	0.00054
Magnesium										17.1
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	< 0.02	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		7.14	8.46	2.4	11.1	2.2	7.72
N-NO2 (Nitrite)			0.06		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	0.05
Organic Nitrogen										7.67
pH (pH units)					8.01	8.06	7.96	8.11	7.95	8.29
Phenols	IPWQO	0.005	0.004	0.961	0.002	< 0.001	< 0.001	< 0.001	0.002	0.002
Phosphorus (total)	IPWQO	0.03			0.02	0.07	0.1	0.04	0.26	0.06
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					21	22	8	22	12	18
Sulphur										
TDS					310	324	145	291	209	269
Total Sus. Solids					5	5	59	6	54	10
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.5	0.6	0.9	0.6	1.7	0.5
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	0.063	0.038	0.017	0.017	0.016	0.008
Ion Balance										
Field Parameters										
Temperature (^{o}C)					9	11.9	7.4	3.8	16.2	12.2
pH					7.6	7.4	8.0	7.5	7.9	7.9
Conductivity (µS/cm)					592	647	258	555	318	404
DO (mg/L)					--	3.88	6.06	6.46	7.9	11.3
Flow (L/s)					6.80	8.85	18.40	5.40	10.50	1.80

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

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PARAMETER	Limit	PWQO	CWQG	APV	SW 1A Oct-18 Storm Event	Apr-19	Jun-19 Storm Event	Oct-19 Storm Event	Oct-19	May-20
Alkalinity (as CaCO3)	IPWQO	a			189	94	202	185	189	208
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					0.11	0.05	0.04	0.06	0.01	0.01
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.0007					0.00065
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001
Barium				2.3	0.06	0.026	0.063	0.051	0.049	0.077
Beryllium	PWQO	b		0.0053						
BOD					< 3	< 3	< 3	< 3	< 3	< 3
Boron	IPWQO	0.2	1.5	3.55	0.023	0.02	0.045	0.027	0.022	0.04
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	0.000035	< 0.000015	0.000015	< 0.000015	< 0.000015	< 0.000015
Calcium					76.6			68.7	71.8	
Chloride			120	180	29	17	22.9	19.5	18.4	24.7
Chromium	PWQO	0.009		0.064	< 0.001	0.001	< 0.001	< 0.001	< 0.001	< 0.001
Cobalt	IPWQO	0.0009		0.0052						
COD					29	11	15	6	< 5	5
Conductivity (µS/cm)					538	290	562	517	534	581
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.0055	0.0013	0.0011	0.0003	0.0004	0.0004
DOC										
Fluoride										
Hardness (as CaCO3)					267	119	274	239	250	313
Iron	PWQO	0.3	0.3		0.159	0.092	0.067	0.062	0.027	0.033
Lead	PWQO IPWQO	e	0.001	0.002	0.00031	0.00018	0.00022	0.00003	0.00005	0.00004
Magnesium					18.3			16.3	17.1	
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		4.32	2.47	7.11	6.33	6.95	7.16
N-NO2 (Nitrite)			0.06		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Organic Nitrogen					≤ 4.32					
pH (pH units)					8.08	7.84	8.02	8.1	8.11	8.23
Phenols	IPWQO	0.005	0.004	0.961	0.004	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Phosphorus (total)	IPWQO	0.03			0.1	0.05	0.04	0.04	0.02	0.02
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					17	10	22	17	18	25
Sulphur										
TDS					274	138	281	248	254	305
Total Sus. Solids					7	6	12	< 3	< 3	< 3
Temperature (°C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.7	0.6	0.7	0.5	0.3	0.3
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	0.021	0.009	< 0.005	0.009	< 0.005	< 0.005
Ion Balance										
Field Parameters										
Temperature (°C)					5.3		13.3	7.9		5.5
pH					7.7		7.7	7.4		7.7
Conductivity (µS/cm)					570		575	542		590
DO (mg/L)					7.8		11.1	7.8		9.3
Flow (L/s)					8.00		6.90	4.00		2.50

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inorganic
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					SW 1A					
PARAMETER	Limit	PWQO	CWQG	APV	QA/QC	May-20 Storm Event	QA/QC	Aug-20 Storm Event	QA/QC	Sep-20
Alkalinity (as CaCO3)	IPWQO	a			167	216	167	191	157	200
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					< 0.01	0.09	0.01	< 0.01	0.01	0.01
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.00065	0.000385	0.000385	0.000068	0.000068	0.000048
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0001	0.0002	0.0001	0.0002	0.0002	0.0001
Barium				2.3	0.057	0.072	0.053	0.059	0.062	0.055
Beryllium	PWQO	b		0.0053						
BOD					< 3	< 3	< 3	< 3	< 3	< 3
Boron	IPWQO	0.2	1.5	3.55	0.022	0.122	0.108	0.028	0.108	0.026
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	< 0.000015	0.000045	< 0.000015	< 0.000015	0.000016	< 0.000015
Calcium										
Chloride			120	180	16.4	23.4	14.8	18.5	12	18.2
Chromium	PWQO	0.009		0.064	< 0.001	0.09	< 0.001	< 0.001	0.001	< 0.001
Cobalt	IPWQO	0.0009		0.0052						
COD					< 5	14	13	8	17	9
Conductivity (µS/cm)					475	569	442	524	442	526
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.0004	0.0024	0.0005	0.0004	0.001	0.0004
DOC										
Fluoride										
Hardness (as CaCO3)					257	285	237	264	252	268
Iron	PWQO	0.3	0.3		0.055	0.079	0.099	0.028	0.505	0.023
Lead	PWQO IPWQO	e	0.001	0.002	0.00002	0.0006	0.00004	0.0001	0.00027	0.00003
Magnesium										
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		6.08	6.28	4.95	6.94	6.26	7.59
N-NO2 (Nitrite)			0.06		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Organic Nitrogen										
pH (pH units)					8.25	8.02	8.14	8.12	8.25	7.99
Phenols	IPWQO	0.005	0.004	0.961	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Phosphorus (total)	IPWQO	0.03			< 0.01	0.04	0.02	0.06	0.06	0.05
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					24	23	23	18	25	19
Sulphur										
TDS					246	295	234	260	232	267
Total Sus. Solids					< 3	< 3	< 3	3	21	3
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.3	0.7	0.8	0.4	0.7	0.3
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	0.007	0.009	0.014	< 0.005	0.018	0.054
Ion Balance										
Field Parameters										
Temperature (^{o}C)					5.5	11.9	11.9	12	12	10.3
pH					7.7	7.3	7.3	7.5	7.5	7.4
Conductivity (µS/cm)					590	518	518	529	529	553
DO (mg/L)					9.3	11.1	11.1	16.6	16.6	9.3
Flow (L/s)					2.50	4.20	4.20	1.50	1.50	2.30

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inorganic
Surface Water Quality

					SW 1A					
						Apr-21	Aug-21	Aug-21	Sep-21 Storm	Nov-21 Storm
PARAMETER	Limit	PWQO	CWQG	APV	QA/QC			QA/QC	Event	Event
Alkalinity (as CaCO3)	IPWQO	a			150	204	214	215	213	206
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					0.01	<0.02	<0.02	<0.02	<0.02	<0.02
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.000048	0.000008	0.00008	0.00008	0.00006	0.00007
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0002	<0.001	<0.001	<0.001	<0.001	<0.001
Barium				2.3	0.039	0.06	0.05	0.05	0.06	0.05
Beryllium	PWQO	b		0.0053						
BOD					< 3	<1	4	3	<1	<1
Boron	IPWQO	0.2	1.5	3.55	0.017	0.04	0.03	0.03	0.04	0.03
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	< 0.000015	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium						83	72	72	73	71
Chloride			120	180	11.8	19	16	16	17	13
Chromium	PWQO	0.009		0.064	< 0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	IPWQO	0.0009		0.0052						
COD					16	<5	<5	<5	14	11
Conductivity (µS/cm)					419	527	507	511	513	506
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.0006	<0.001	<0.001	<0.001	<0.001	<0.001
DOC										
Fluoride										
Hardness (as CaCO3)					218	281	246	246	252	239
Iron	PWQO	0.3	0.3		0.159	<0.03	<0.03	<0.03	0.03	<0.03
Lead	PWQO IPWQO	e	0.001	0.002	0.00007	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium						18	16	16	17	15
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	< 0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		5.5	6.24	7.94	7.76	6.22	8.56
N-NO2 (Nitrite)			0.06		< 0.05	<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen										
pH (pH units)					8.05	8.04	8.05	8.03	7.8	8.06
Phenols	IPWQO	0.005	0.004	0.961	< 0.002	<0.010	<0.001	<0.001	0.001	<0.001
Phosphorus (total)	IPWQO	0.03			0.07	0.02	0.014	0.014	0.047	0.008
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					28	20	18	18	21	18
Sulphur										
TDS					217	343	330	332	333	329
Total Sus. Solids					6	<2	23	5	4	<2
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.5	0.366	0.258	0.182	0.339	0.353
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	0.013	<0.01	<0.01	<0.01	<0.01	<0.01
Ion Balance										
Field Parameters										
Temperature (^{o}C)					10.3	8	11.2	11.2	10.9	6.8
pH					7.4	6.4	7.3	7.3	7.2	7.4
Conductivity (µS/cm)					553	548	513	513	493	503
DO (mg/L)					9.3	12.5	7.7	7.7	6.7	8.7
Flow (L/s)					2.30	0.07	1.60	1.60	2.10	3.00

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

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PARAMETER	Limit	PWQO	CWQG	APV	SW 1A Apr-22 Storm Event	May-22	Aug-22	Sep-22 Storm Event	May-23 Storm Event	Jun-23
Alkalinity (as CaCO3)	IPWQO	a			157	185	193	185	152	198
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					0.106	0.021	<0.020	<0.020	<0.020	0.023
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.00036	0.00452	0.00030	0.00026	0.00012	0.0000562
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium				2.3	0.04	0.05	0.05	0.05	0.03	0.05
Beryllium	PWQO	b		0.0053						
BOD					2	<1	8	<1	<1	<1
Boron	IPWQO	0.2	1.5	3.55	0.03	0.02	0.02	0.02	0.03	0.03
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium					57	64	64	65	50	71
Chloride			120	180	10	15	12	11	9	12
Chromium	PWQO	0.009		0.064	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	IPWQO	0.0009		0.0052						
COD					8	<5	30	<5	21	21
Conductivity (µS/cm)					300	451	451	455	286	333
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
DOC										
Fluoride										
Hardness (as CaCO3)					192	217	217	220	174	243
Iron	PWQO	0.3	0.3		<0.03	<0.03	0.08	<0.03	0.04	0.08
Lead	PWQO IPWQO	e	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium					12	14	14	14	12	16
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		4.44	8.59	7.05	7.75	3.97	5.52
N-NO2 (Nitrite)			0.06		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen										
pH (pH units)					7.85	7.7	8.15	8.05	7.87	7.93
Phenols	IPWQO	0.005	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus (total)	IPWQO	0.03			0.052	0.008	0.027	0.027	0.029	0.058
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					17	18	16	18	19	18
Sulphur										
TDS					195	293	293	296	186	216
Total Sus. Solids					<2	465	18	<2	<2	<2
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.826	0.259	0.613	0.207	0.626	0.846
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ion Balance										
Field Parameters										
Temperature (^{o}C)					5.9	9.1	11.9	11.3	7.4	10.6
pH					7.4	9.2	7.85	7.8	7.6	7.1
Conductivity (µS/cm)					400	474	460	350	400	520
DO (mg/L)					12.00	11.90	7.70	8.40	12.50	5.60
Flow (L/s)					1.80	2.00	0.60	1.57	4.60	1.50

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

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					SW 1A					
					Aug-23	Sep-23 Storm Event	Oct-23	May-24 Storm Event	Jun-24	Oct-24
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity (as CaCO3)	IPWQO	a			200	185	184	179	175	176
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.00005	0.00024	0.00024	0.00080	0.00080	0.00020
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium				2.3	0.04	0.05	0.04	0.03	0.05	0.05
Beryllium	PWQO	b		0.0053						
BOD					<1	<1	1	2	<1	<1
Boron	IPWQO	0.2	1.5	3.55	0.01	0.01	0.02		0.01	<0.01
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium					62	60	63	68	68	67
Chloride			120	180	9	9	9	8	7	8
Chromium	PWQO	0.009		0.064	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Cobalt	IPWQO	0.0009		0.0052						
COD					10	<5	9	<5	38	14
Conductivity (µS/cm)					330	326	325	438	433	322
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
DOC										
Fluoride										
Hardness (as CaCO3)					212	207	215	232	232	229
Iron	PWQO	0.3	0.3		<0.03	<0.03	<0.03	<0.03	0.13	0.14
Lead	PWQO IPWQO	e	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium					14	14	14	15	15	15
Manganese								<0.01	0.06	0.08
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		7.21	7.5	6.38	6.91	7.9	7.35
N-NO2 (Nitrite)			0.06		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen										
pH (pH units)					7.97	7.98	7.95	7.89	7.91	7.89
Phenols	IPWQO	0.005	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus (total)	IPWQO	0.03			0.018	0.011	0.01	0.01	0.024	0.019
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium								5	5	4
Strontium								0.112	0.152	0.134
Sulphate					17	16	16	17	16	16
Sulphur										
TDS					214	212	211	285	281	209
Total Sus. Solids					4	<2	<2	<2	14	47
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.415	0.191	0.214	0.327	2.28	0.741
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ion Balance										
Field Parameters										
Temperature (^{o}C)					10.6	10.7	7.6	10.8	10.6	10.6
pH					7.1	7.8	7.9	7.8	8.3	7.8
Conductivity (µS/cm)					520	490	520	530	480	490
DO (mg/L)					5.60	7.50	7.50	7.80	4.70	4.70
Flow (L/s)					0.60	0.50	0.50	0.02	0.02	NM

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

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PARAMETER	Limit	PWQO	CWQG	APV	SW 1A Nov-24 Storm Event	Nov-24 QA/QC				
Alkalinity (as CaCO3)	IPWQO	a			186	187				
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					0.026	<0.02				
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.00025					
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.001	<0.001				
Barium				2.3	0.05	0.05				
Beryllium	PWQO	b		0.0053						
BOD					<1	7				
Boron	IPWQO	0.2	1.5	3.55	<0.01	<0.01				
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	<0.0001	<0.0001				
Calcium					68	68				
Chloride			120	180	8	9				
Chromium	PWQO	0.009		0.064	0.001	<0.001				
Cobalt	IPWQO	0.0009		0.0052						
COD					41	41				
Conductivity (µS/cm)					326	326				
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	<0.001	<0.001				
DOC										
Fluoride										
Hardness (as CaCO3)					232	232				
Iron	PWQO	0.3	0.3		0.09	0.08				
Lead	PWQO IPWQO	e	0.001	0.002	<0.001	<0.001				
Magnesium					15	15				
Manganese					0.03	0.03				
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	<0.0001	<0.0001				
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		5.62	5.55				
N-NO2 (Nitrite)			0.06		<0.10	<0.10				
Organic Nitrogen										
pH (pH units)					8.08	8.09				
Phenols	IPWQO	0.005	0.004	0.961	<0.001	<0.001				
Phosphorus (total)	IPWQO	0.03			0.029	0.032				
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium					5	5				
Strontium					0.148	0.148				
Sulphate					15	15				
Sulphur										
TDS					212	212				
Total Sus. Solids					6	8				
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.618	1.37				
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	<0.01	<0.01				
Ion Balance										
Field Parameters										
Temperature (^{o}C)					7.8					
pH					7.8					
Conductivity (µS/cm)					500					
DO (mg/L)					4.5					
Flow (L/s)					0.02					

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

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					SW-3 (Blind Line Culvert) Down Gradient					
					Jun-12	Oct-12	Apr-13	Apr-13	Sep-13	Oct-13
					Storm			SW 2	Storm	
PARAMETER	Limit	PWQO	CWQG	APV	Event			QA/QC	Event	
Alkalinity (as CaCO3)	IPWQO	a			No water	No water	73	72	No water	No water
Aluminum	IPWQO	0.075	<0.1 pH>6.5		to Sample	to Sample			to Sample	to Sample
N-NH3 (Ammonia)							<0.02	<0.02		
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019				<0.02	<0.02		
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15			<0.001	<0.001		
Barium				2.3			0.02	0.02		
Beryllium	PWQO	b		0.0053						
BOD							<1	<1		
Boron	IPWQO	0.2	1.5	3.55			0.01	<0.01		
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021			<0.0001	<0.0001		
Calcium							42	42		
Chloride			120	180			6	6		
Chromium	PWQO	0.009		0.064			<0.001	<0.001		
Cobalt	IPWQO	0.0009		0.0052						
COD							14	17		
Conductivity (µS/cm)							285	284		
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069			<0.001	<0.001		
DOC										
Fluoride										
Hardness (as CaCO3)							146	146		
Iron	PWQO	0.3	0.3				0.06	0.005		
Lead	PWQO IPWQO	e	0.001	0.002			<0.001	<0.001		
Magnesium							10			
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077			<0.0001	<0.0001		
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3				0.55	0.57		
N-NO2 (Nitrite)			0.06				<0.10	<0.10		
Organic Nitrogen							≤ 0.37	≤ 0.48		
pH (pH units)							7.12	7.13		
Phenols	IPWQO	0.005	0.004	0.961			<0.001	<0.001		
Phosphorus (total)	IPWQO	0.03					0.02	0.01		
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate							57	57		
Sulphur										
TDS							185	185		
Total Sus. Solids							3	<2		
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN							0.37	0.48		
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089			<0.01	<0.01		
Ion Balance										
Field Parameters										
Temperature (^{o}C)							2.0			
pH							7.3			
Conductivity (µS/cm)							303			
DO (mg/L)							7.04			
Flow (L/s)							0.05			

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

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					SW-3 (Blind Line Culvert) Down Gradient					
PARAMETER	Limit	PWQO	CWQG	APV	Apr-14 Storm Event	Apr-14 Dup	Jun-14 Storm Event	Jun-14 Dup	Jul-14	Jul-14 SW 3 QA/QC
Alkalinity (as CaCO3)	IPWQO	a			97	97	141	140	170	171
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					<0.01	<0.01	<0.01	<0.01	<0.001	<0.001
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		<0.02		<0.02		<0.02	
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0001	<0.0001	0.0004	0.0004	0.0006	0.0006
Barium				2.3	0.028	0.026	0.027	0.027	0.033	0.033
Beryllium	PWQO	b		0.0053						
BOD					< 3	< 3	<3	<3	<3	<3
Boron	IPWQO	0.2	1.5	3.55	0.013	0.012	0.014	0.013	0.005	0.005
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	<0.00002	<0.00002	0.00003	<0.00002	<0.00002	<0.00002
Calcium					45.4	41.8				
Chloride			120	180	5.6	5.6	3.3	3.3	5.3	5.3
Chromium	PWQO	0.009		0.064	<0.0002	<0.0002	<0.002	<0.002	<0.002	<0.002
Cobalt	IPWQO	0.0009		0.0052						
COD					30	27	42	40	33	26
Conductivity (µS/cm)					293	297	324	324	357	358
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.0003	0.0003	0.0006	0.0006	0.0003	0.0003
DOC										
Fluoride										
Hardness (as CaCO3)					146	132	171	173	212	211
Iron	PWQO	0.3	0.3		0.053	0.046	1.57	0.175	0.203	0.198
Lead	PWQO IPWQO	e	0.001	0.002	<0.00002	<0.00002	0.00037	0.00008	0.00003	0.00007
Magnesium					10.2	9.45				
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		0.8	0.8	0.2	0.2	0.1	0.1
N-NO2 (Nitrite)			0.06		0.1	0.1	<0.1	<0.1	<0.1	<0.1
Organic Nitrogen					≤ 0.56	≤ 0.51	≤ 1.2	≤ 1.0	≤ 0.67	≤ 0.64
pH (pH units)					7.62	7.63	7.79	7.87	8	7.96
Phenols	IPWQO	0.005	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus (total)	IPWQO	0.03			0.04	0.04	0.09	0.06	0.04	0.04
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					39	39	26	26	13	13
Sulphur										
TDS					170	165	182	181	202	202
Total Sus. Solids					<3	<3	<3	3	<3	<3
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.56	0.51	1.2	1	0.67	0.64
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	<0.005	<0.005	0.007	0.007	<0.005	<0.005
Ion Balance										
Field Parameters										
Temperature (^{o}C)					5.6		17.2		18.5	
pH					7.9		7.6		7.3	
Conductivity (µS/cm)					276		296		325	
DO (mg/L)					5.47		5.95		225	
Flow (L/s)					3.96		4.0		1.4	

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inorganic
Surface Water Quality

					SW-3 (Blind Line Culvert) Down Gradient					
					Sep-14	Apr-15	Aug-15 Storm Event	Aug-15 SW 3 QA/QC	Sep-15	Nov-15 Storm Event
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity (as CaCO3)	IPWQO	a			133	131	47	48	No Water	141
Aluminum	IPWQO	0.075	<0.1 pH>6.5						To Sample	
N-NH3 (Ammonia)					<0.01	< 0.01	0.07	0.03		< 0.01
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		<0.02	< 0.00011	0.00035	0.00004		< 0.00014
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0004	0.0001	0.0006	0.0001		0.0001
Barium				2.3	0.043	0.02	0.313	0.041		0.028
Beryllium	PWQO	b		0.0053						
BOD					<3	< 3	6	4		< 3
Boron	IPWQO	0.2	1.5	3.55	0.028	0.008	0.027	0.012		0.008
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	<0.00002	< 0.00002	0.00019	0.00008		< 0.00002
Calcium										
Chloride			120	180	4.7	6.1	2.7	1.3		7.5
Chromium	PWQO	0.009		0.064	<0.002	< 0.002	0.053	0.003		< 0.002
Cobalt	IPWQO	0.0009		0.0052						
COD					29	36	220	157		< 5
Conductivity (µS/cm)					380	328	136	117		358
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.0019	< 0.0001	0.0224	0.0034		0.0006
DOC										
Fluoride										
Hardness (as CaCO3)					242	142	128	52		189
Iron	PWQO	0.3	0.3		0.213	0.043	34.4	1.84		0.152
Lead	PWQO IPWQO	e	0.001	0.002	0.00011	< 0.00002	0.00535	0.00074		0.00003
Magnesium										
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	<0.00002	< 0.00002	< 0.00002	< 0.00002		< 0.00002
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		<0.10	0.9	0.2	0.1		3
N-NO2 (Nitrite)			0.06		<0.10	< 0.1	< 0.1	< 0.1		< 0.1
Organic Nitrogen					≤ 0.83	≤ 0.9				
pH (pH units)					7.43	7.91	7.04	7.16		7.91
Phenols	IPWQO	0.005	0.004	0.961	<0.001	< 0.001	< 0.001	< 0.001		< 0.001
Phosphorus (total)	IPWQO	0.03			0.04	0.02	1.03	0.11		< 0.01
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					63	27	12	2		34
Sulphur										
TDS					242	172	82	70		213
Total Sus. Solids					10	< 3	1430	710		< 3
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.83	0.45	2.39	0.88		0.3
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	<0.005	< 0.005	0.132	0.074		0.006
Ion Balance										0.3
Field Parameters										
Temperature (^{o}C)					13.3	6.3	21.9			8.9
pH					7.3	7.1	7.3			7.5
Conductivity (µS/cm)					373	3.74	92			354
DO (mg/L)					3.25	8.85	8.19			13.44
Flow (L/s)					0.6	4.75	258.0			2.9

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inorganic
Surface Water Quality

					SW-3 (Blind Line Culvert) Down Gradient					
					Nov-15	Apr-16		Aug-16	Aug-16	Aug-16
					SW 3		SW 2	Storm		
PARAMETER	Limit	PWQO	CWQG	APV	QA/QC		QA/QC	Event	QA/QC	
Alkalinity (as CaCO3)	IPWQO	a			141	119	121	134	118	172
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					0.01	0.01	0.01	0.01	0.01	< 0.01
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		< 0.00007	< 0.00001	< 0.00008	< 0.00022	< 0.000058	< 0.0003
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0002	0.0002	0.0002	0.0003	0.0003	
Barium				2.3	0.027	0.036	0.038	0.031	0.031	
Beryllium	PWQO	b		0.0053						
BOD					< 3	< 3	< 3	< 3	< 3	5
Boron	IPWQO	0.2	1.5	3.55	0.007	0.006	< 0.005	0.019	0.019	
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	< 0.00002	< 0.00002	< 0.00002	0.00002	0.00002	
Calcium										
Chloride			120	180	7.5	5.4	5.7	6.2	6.3	7.8
Chromium	PWQO	0.009		0.064	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	
Cobalt	IPWQO	0.0009		0.0052						
COD					< 5	35	36	40	40	9
Conductivity (µS/cm)					357	298	298	320	317	402
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.0006	0.0012	0.0013	0.0015	0.0015	
DOC										
Fluoride										
Hardness (as CaCO3)					194	174	181	166	169	224
Iron	PWQO	0.3	0.3		0.137	0.512	0.495	0.338	0.273	0.081
Lead	PWQO IPWQO	e	0.001	0.002	0.00004	0.00027	0.00028	0.00016	0.00015	
Magnesium										
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		2.9	2.3	2.3	1.6	1.6	5.2
N-NO2 (Nitrite)			0.06		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.3
Organic Nitrogen										
pH (pH units)					7.92	7.96	7.99	7.92	7.85	8.09
Phenols	IPWQO	0.005	0.004	0.961	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Phosphorus (total)	IPWQO	0.03			< 0.01	0.06	0.08	0.05	0.05	0.05
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					35	23	23	36	37	20
Sulphur										
TDS					216	179	184	196	189	241
Total Sus. Solids					4	60	60	15	16	< 3
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.37	0.65	0.62	0.65	0.77	0.31
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	0.006	< 0.005	< 0.005	< 0.005	< 0.005	
Ion Balance										
Field Parameters										
Temperature (^{o}C)						3.5		14.8		13.9
pH						8.2		7.1		8.5
Conductivity (µS/cm)						305		347		437
DO (mg/L)						12.82		8.02		10.87
Flow (L/s)						7.26				2.78

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inorganic
Surface Water Quality

					SW-3 (Blind Line Culvert) Down Gradient					
					Apr-17	Apr-17	May-17	May-17	Aug-17	Oct-17
PARAMETER	Limit	PWQO	CWQG	APV	Storm Event	QA/QC		QA/QC		
Alkalinity (as CaCO3)	IPWQO	a			112	111	189	189	211	96
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					< 0.01	< 0.01	< 0.01	0.03	< 0.01	< 0.01
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.000046	0.000046	0.000385	0.000385	0.000186	0.000154
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0002	0.0002	0.0001	0.0001	0.0003	0.0003
Barium				2.3	0.026	0.027	0.05	0.051	0.07	0.051
Beryllium	PWQO	b		0.0053						
BOD					< 3	< 3	< 3	< 3	< 3	< 3
Boron	IPWQO	0.2	1.5	3.55	0.01	0.013	0.038	0.037	0.044	0.017
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	< 0.000020	< 0.000020	< 0.000014	< 0.000014	0.000059	0.000078
Calcium										
Chloride			120	180	7.4	7.4	15.2	15.1	22.2	8.8
Chromium	PWQO	0.009		0.064	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.002
Cobalt	IPWQO	0.0009		0.0052						
COD					23	25	5	10	21	24
Conductivity (µS/cm)					303	303	500	487	581	257
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.0006	0.0011	0.0005	0.0005	0.0042	0.0047
DOC										
Fluoride										
Hardness (as CaCO3)					145	149	250	251	286	132
Iron	PWQO	0.3	0.3		0.365	0.409	0.042	0.036	0.477	1.91
Lead	PWQO IPWQO	e	0.001	0.002	0.00007	0.00009	0.00004	< 0.00002	0.00064	0.00105
Magnesium										
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	< 0.02	< 0.02	< 0.02	< 0.02	< 0.00002	< 0.00002
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		2.7	2.8	5.72	5.68	7.63	0.78
N-NO2 (Nitrite)			0.06		< 0.1	< 0.1	< 0.05	< 0.05	< 0.05	< 0.05
Organic Nitrogen										
pH (pH units)					7.92	7.99	8.2	8.19	8.24	7.95
Phenols	IPWQO	0.005	0.004	0.961	< 0.001	< 0.001	0.002	< 0.001	< 0.001	< 0.001
Phosphorus (total)	IPWQO	0.03			0.03	0.03	0.02	0.02	0.09	0.13
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					21	21	20	20	20	10
Sulphur										
TDS					165	167	249	249	287	135
Total Sus. Solids					13	14	< 3	< 3	37	139
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.46	0.66	0.6	0.5	0.8	1
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	0.007	< 0.005	< 0.005	< 0.005	0.035	0.028
Ion Balance										
Field Parameters										
Temperature (^{o}C)					9.8		11		13.2	7.8
pH					7.4		8.3		7.9	8.0
Conductivity (µS/cm)					314		491		547	230
DO (mg/L)					10.34		--		6.3	6.56
Flow (L/s)					32		21.65		7.33	29

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inorganic
Surface Water Quality

					SW-3 (Blind Line Culvert) Down Gradient					
					Oct-17	Apr-18	Apr-18 SW 2	Aug-18 Storm	Aug-18 SW 2	Sep-18
PARAMETER	Limit	PWQO	CWQG	APV	QA/QC		QA/QC	Event	QA/QC	
Alkalinity (as CaCO3)	IPWQO	a			93	162	163	69	73	161
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					< 0.01	0.02	0.02	0.06	0.06	0.01
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.000154	0.000048	0.000048	0.002272	0.002272	0.000203
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0003	0.0005	0.0004	0.001	0.0009	0.0002
Barium				2.3	0.05	0.051	0.048	0.102	0.097	0.051
Beryllium	PWQO	b		0.0053						
BOD					< 3	< 3	< 3	< 3	< 3	< 3
Boron	IPWQO	0.2	1.5	3.55	0.018	0.025	0.025	0.034	0.033	0.293
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	0.000059	< 0.000014	< 0.000014	0.000326	0.00024	0.000036
Calcium										68.2
Chloride			120	180	8.8	15	15.2	12.5	12.5	14.8
Chromium	PWQO	0.009		0.064	0.002	< 0.002	< 0.002	0.009	0.007	< 0.001
Cobalt	IPWQO	0.0009		0.0052						
COD					24	11	11	226	210	6
Conductivity (µS/cm)					252	464	465	262	264	457
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.0049	0.0008	0.0008	0.0135	0.0106	0.0051
DOC										
Fluoride										
Hardness (as CaCO3)					132	223	221	156	155	235
Iron	PWQO	0.3	0.3		1.84	0.319	0.284	4.7	3.63	0.125
Lead	PWQO IPWQO	e	0.001	0.002	0.00097	0.00013	0.00011	0.00426	0.00407	0.00045
Magnesium										15.8
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		0.77	6.78	6.84	0.86	0.86	6.55
N-NO2 (Nitrite)			0.06		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Organic Nitrogen										
pH (pH units)					7.91	8.04	8.14	7.76	7.73	8.42
Phenols	IPWQO	0.005	0.004	0.961	< 0.001	< 0.001	< 0.001	0.006	0.004	0.002
Phosphorus (total)	IPWQO	0.03			0.13	0.04	0.04	0.51	0.47	0.02
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					10	19	19	31	31	21
Sulphur										
TDS					133	225	225	156	157	228
Total Sus. Solids					100	12	11	316	312	10
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					1.1	0.5	0.5	4.4	4.2	0.3
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	0.025	0.017	0.012	0.042	0.039	0.012
Ion Balance										
Field Parameters										
Temperature (^{o}C)						1.9		16.8		14.4
pH						7.4		8.1		7.9
Conductivity (µS/cm)						429		211		344
DO (mg/L)						6.93		9.68		9.6
Flow (L/s)						9.6		47.5		1.8

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

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Ross WDS
Report of Inorganic
Surface Water Quality

					SW-3 (Blind Line Culvert) Down Gradient					
PARAMETER	Limit	PWQO	CWQG	APV	Sep-18 SW 2 QA/QC	Oct-18 Storm Event	Oct-18 SW 2 QA/QC	Apr-19	SW 2 QA/QC	Jun-19 Storm Event
Alkalinity (as CaCO3)	IPWQO	a			159	115	114	79	98	157
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					< 0.01	0.16	0.11	0.05	0.04	0.05
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.000203	0.0013	0.000893			
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0002	0.0003	0.0003	0.0002	0.0002	0.0002
Barium				2.3	0.053	0.062	0.058	0.021	0.022	0.045
Beryllium	PWQO	b		0.0053						
BOD					< 3	< 3	< 3	< 3	< 3	< 3
Boron	IPWQO	0.2	1.5	3.55	0.101	0.013	0.011	0.015	0.016	0.027
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	0.000025	0.000051	0.000069	< 0.000015	0.00002	0.000024
Calcium					69.1	56.3	56.4			
Chloride			120	180	14.8	17.4	17.4	9	9	14.9
Chromium	PWQO	0.009		0.064	0.002	0.002	0.002	0.002	0.001	< 0.001
Cobalt	IPWQO	0.0009		0.0052						
COD					6	48	51	24	26	25
Conductivity (µS/cm)					458	365	366	231	232	433
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.0007	0.0053	0.0068	0.0016	0.0016	0.0015
DOC										
Fluoride										
Hardness (as CaCO3)					239	198	197	102	106	226
Iron	PWQO	0.3	0.3		0.164	1.58	1.53	0.383	0.391	0.335
Lead	PWQO IPWQO	e	0.001	0.002	0.00011	0.00088	0.00088	0.00023	0.00022	0.00028
Magnesium					16	13.9	13.7			
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		6.55	1.9	1.89	1.57	1.59	4.8
N-NO2 (Nitrite)			0.06		0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Organic Nitrogen										
pH (pH units)					8.41	8.05	8.06	7.9	7.86	8.21
Phenols	IPWQO	0.005	0.004	0.961	0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Phosphorus (total)	IPWQO	0.03			0.03	0.12	0.13	0.05	0.05	0.05
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					21	29	29	12	12	20
Sulphur										
TDS					228	199	198	113	126	222
Total Sus. Solids					4	75	80	42	10	44
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.4	1.2	1.2	0.7	0.6	0.8
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	0.017	0.039	0.025	0.006	0.009	0.006
Ion Balance										
Field Parameters										
Temperature (^{o}C)						5.5				16.2
pH						7.8				8.1
Conductivity (µS/cm)						386				444
DO (mg/L)						9.7				9.6
Flow (L/s)						23				10.8

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
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					SW-3 (Blind Line Culvert) Down Gradient					
PARAMETER	Limit	PWQO	CWQG	APV	SW 2 QA/QC	Oct-19 Storm Event	SW 2 QA/QC	Oct-19 Storm Event	SW 2 QA/QC	May-20
Alkalinity (as CaCO3)	IPWQO	a			160	111	112	151	175	164
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					0.05	0.03	0.08	0.14	0.01	0.01
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019							0.000079
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0002	0.0002	0.0002	0.0001	0.0001	0.0001
Barium				2.3	0.045	0.036	0.036	0.037	0.036	0.057
Beryllium	PWQO	b		0.0053						
BOD					< 3	< 3	< 3	< 3	< 3	< 3
Boron	IPWQO	0.2	1.5	3.55	0.027	0.016	0.015	0.015	0.014	0.022
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	0.000023	< 0.000015	< 0.000015	< 0.000015	< 0.000015	< 0.000015
Calcium						52.8	53.3	60.3	59.3	
Chloride			120	180	14.6	13	13.1	12.5	12.6	16.2
Chromium	PWQO	0.009		0.064	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Cobalt	IPWQO	0.0009		0.0052						
COD					27	27	19	9	6	8
Conductivity (µS/cm)					431	395	400	452	451	472
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.0014	0.0008	0.0008	0.0005	0.0004	0.0004
DOC										
Fluoride										
Hardness (as CaCO3)					225	184	184	211	207	262
Iron	PWQO	0.3	0.3		0.299	0.146	0.145	0.059	0.065	0.051
Lead	PWQO IPWQO	e	0.001	0.002	0.00025	0.00039	0.00005	< 0.00002	0.00002	< 0.00002
Magnesium						12.6	12.4	14.7	14.4	
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		4.75	3	2.94	5.78	5.79	6.12
N-NO2 (Nitrite)			0.06		< 0.05	< 0.05	< 0.05	< 0.05	< 0.05	< 0.05
Organic Nitrogen										
pH (pH units)					8.14	7.94	8	8.09	8.14	8.39
Phenols	IPWQO	0.005	0.004	0.961	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Phosphorus (total)	IPWQO	0.03			0.05	0.02	0.02	< 0.01	< 0.01	< 0.01
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					20	50	49	29	29	24
Sulphur										
TDS					223	205	204	218	230	246
Total Sus. Solids					32	5	< 3	< 3	3	< 3
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.8	0.5	0.6	0.5	0.4	0.4
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	0.007	0.013	0.012	< 0.005	< 0.005	0.007
Ion Balance										
Field Parameters										
Temperature (^{o}C)					16.2	5.8	5.8			5.1
pH					8.1	7.4	7.4			7.8
Conductivity (µS/cm)					444	466	466			478
DO (mg/L)					9.6	11.4	11.4			17.3
Flow (L/s)					10.8	10	10			3.2

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
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Surface Water Quality

					SW-3 (Blind Line Culvert) Down Gradient					
PARAMETER	Limit	PWQO	CWQG	APV	May-20 Storm Event	Aug-20 Storm Event	Sep-20	Apr-21	Aug-21	Sep-21 Storm Event
Alkalinity (as CaCO3)	IPWQO	a			168	156	150	157	Dry	112
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					0.06	0.02	0.02	<0.02		<0.02
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.000277	0.000727	0.000095	0.00001	0.00003	0.000003
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0002	0.0002	0.0002	<0.001		<0.001
Barium				2.3	0.046	0.059	0.039	0.04		0.04
Beryllium	PWQO	b		0.0053						
BOD					< 3	< 3	< 3	<1		1
Boron	IPWQO	0.2	1.5	3.55	0.072	0.104	0.017	0.02		0.02
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	< 0.000015	0.000017	< 0.000015	<0.0001		<0.0001
Calcium								68		60
Chloride			120	180	15.6	12	12	13		13
Chromium	PWQO	0.009		0.064	< 0.001	0.001	< 0.001	<0.001		<0.001
Cobalt	IPWQO	0.0009		0.0052						
COD					15	14	14	<5		16
Conductivity (µS/cm)					447	440	426	421		322
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.0005	0.0009	0.0006	<0.001		0.001
DOC										
Fluoride										
Hardness (as CaCO3)					215	239	220	232		207
Iron	PWQO	0.3	0.3		0.073	0.467	0.161	0.06		0.09
Lead	PWQO IPWQO	e	0.001	0.002	0.00004	0.00029	0.00008	<0.001		<0.001
Magnesium								15		14
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	< 0.00002	< 0.00002	< 0.00002	<0.0001		<0.0001
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		4.89	6.03	5.52	4.84		2.39
N-NO2 (Nitrite)			0.06		< 0.05	< 0.05	< 0.05	<0.10		<0.10
Organic Nitrogen										
pH (pH units)					8.12	8.28	8.1	8.06		7.72
Phenols	IPWQO	0.005	0.004	0.961	< 0.002	< 0.002	< 0.002	<0.010		0.002
Phosphorus (total)	IPWQO	0.03			0.02	0.06	0.04	0.009		0.024
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					22	25	28	27		79
Sulphur										
TDS					226	227	218	274		209
Total Sus. Solids					5	22	5	<2		<2
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.6	0.7	0.6	0.441		0.568
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	0.007	0.018	0.017	<0.01		<0.01
Ion Balance										
Field Parameters										
Temperature (^{o}C)					12.9	13.2	10.3	9.3		13.5
pH					7.3	8.2	7.4	6.4		6.9
Conductivity (µS/cm)					405	446	553	437		391
DO (mg/L)					11.6	11.4	9.3	11.6		10.9
Flow (L/s)					6.6	5.8	2.3	0.13		5.3

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

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					SW-3 (Blind Line Culvert) Down Gradient						
					Sep-21 Dup#1 QA/QC	Nov-21 Storm Event	Nov-21 Dup#1 QA/QC	Apr-22 Storm Event	Apr-22 Dup#1 QA/QC	May-22	May-22 Dup#1 QA/QC
PARAMETER	Limit	PWQO	CWQG	APV							
Alkalinity (as CaCO3)	IPWQO	a			111	156	155	90	89	153	154
Aluminum	IPWQO	0.075	<0.1 pH>6.5								
N-NH3 (Ammonia)					<0.02	<0.02	<0.02	0.12	0.084	0.036	0.021
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.000003	0.00029	0.00029	0.00001	0.00001	0.00012	0.00012
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium				2.3	0.04	0.03	0.03	0.02	0.02	0.03	0.03
Beryllium	PWQO	b		0.0053							
BOD					<1	<1	1	7	2	1	<1
Boron	IPWQO	0.2	1.5	3.55	0.02	0.02	0.02	<0.01	<0.01	0.01	0.01
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium					60	61	61	36	36	58	58
Chloride			120	180	13	10	10	6	6	13	13
Chromium	PWQO	0.009		0.064	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	IPWQO	0.0009		0.0052							
COD					20	14	10	24	17	<5	<5
Conductivity (µS/cm)					320	323	322	207	208	310	309
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001
DOC											
Fluoride											
Hardness (as CaCO3)					207	206	206	123	123	198	198
Iron	PWQO	0.3	0.3		0.09	0.05	<0.03	0.14	0.12	0.05	0.05
Lead	PWQO IPWQO	e	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium					14	13	13	8	8	13	13
Manganese											
Molybdenum	IPWQO	0.04	0.073	0.73							
Mercury	PWQO	0.0002		0.00077	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	PWQO	0.025	0.025	0.039							
N-NO3 (Nitrate)			3		2.36	5.82	5.76	0.94	0.98	6.51	6.58
N-NO2 (Nitrite)			0.06		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen											
pH (pH units)					7.69	8.06	8.03	7.39	7.3	7.74	7.81
Phenols	IPWQO	0.005	0.004	0.961	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus (total)	IPWQO	0.03			0.026	0.007	0.004	0.032	0.034	0.003	0.004
Potassium											
Silicon											
Silver	PWQO	0.0001		0.00012							
Sodium											
Strontium											
Sulphate					79	33	32	26	27	31	30
Sulphur											
TDS					208	210	209	135	135	202	201
Total Sus. Solids					2	<2	8	<2	3	80	46
Temperature (^{o}C)											
Thallium	IPWQO	0.0003	0.0008	0.04							
Titanium											
TKN					0.622	0.405	0.372	0.613	0.724	0.362	0.511
Vanadium	IPWQO	0.006		0.02							
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ion Balance											
Field Parameters											
Temperature (^{o}C)					13.5	3.8	3.8	6	6	9	9
pH					6.9	7.9	7.9	5.7	5.7	7.3	7.3
Conductivity (µS/cm)					391	434	434	280	280	427	427
DO (mg/L)					10.9	11.9	11.9	13.1	13.1	12.6	12.6
Flow (L/s)					5.3	3.3	3.3	21	21	3	3

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

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					SW-3 (Blind Line Culvert) Down Gradient						
					Aug-22	Aug-22 Dup#1 QA/QC	Sep-22 Storm Event	Sep-22 Dup#1 QA/QC	May-23 Storm Event	May-23 QA/QC	Jun-23
PARAMETER	Limit	PWQO	CWQG	APV							
Alkalinity (as CaCO3)	IPWQO	a			168	152	149	149	107	105	179
Aluminum	IPWQO	0.075	<0.1 pH>6.5								
N-NH3 (Ammonia)					<0.020	<0.020	<0.020	<0.020	<0.020	<0.020	<0.020
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.00044	0.00044	0.00031	0.00031	0.00010	0.00010	0.01917
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium				2.3	0.04	0.04	0.04	0.04	0.02	0.02	0.03
Beryllium	PWQO	b		0.0053							
BOD					1	4	<1	2	1	<1	2
Boron	IPWQO	0.2	1.5	3.55	0.01	0.01	0.02	0.01	0.02	0.01	0.02
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium					58	47	60	60	40	38	64
Chloride			120	180	10	10	12	9	6	6	10
Chromium	PWQO	0.009		0.064	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	IPWQO	0.0009		0.0052							
COD					8	29	9	7	27	26	<5
Conductivity (µS/cm)					306	294	314	314	238	232	312
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
DOC											
Fluoride											
Hardness (as CaCO3)					198	163	207	207	137	132	222
Iron	PWQO	0.3	0.3		<0.03	<0.03	0.03	0.03	0.13	0.12	0.05
Lead	PWQO IPWQO	e	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium					13	11	14	14	9	9	15
Manganese											
Molybdenum	IPWQO	0.04	0.073	0.73							
Mercury	PWQO	0.0002		0.00077	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Nickel	PWQO	0.025	0.025	0.039							
N-NO3 (Nitrate)			3		5.6	6.21	5.66	5.81	1.74	1.64	5.02
N-NO2 (Nitrite)			0.06		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Organic Nitrogen											
pH (pH units)					8.03	7.99	7.98	7.98	7.86	7.8	8.13
Phenols	IPWQO	0.005	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Phosphorus (total)	IPWQO	0.03			0.009	0.009	0.011	0.011	0.017	0.018	0.019
Potassium											
Silicon											
Silver	PWQO	0.0001		0.00012							
Sodium											
Strontium											
Sulphate					26	27	41	40	30	28	26
Sulphur											
TDS					199	191	204	204	155	151	203
Total Sus. Solids					<2	2	<2	<2	<2	3	2
Temperature (^{o}C)											
Thallium	IPWQO	0.0003	0.0008	0.04							
Titanium											
TKN					0.328	0.258	0.346	0.45	0.682	1.25	0.741
Vanadium	IPWQO	0.006		0.02							
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Ion Balance											
Field Parameters											
Temperature (^{o}C)					13.7	13.7	13.9	13.9	7.5		11.2
pH					7.96	7.96	7.8	7.8	7.8		6.9
Conductivity (µS/cm)					420	420	340	340	320		480
DO (mg/L)					8.1	8.1	8.1	8.1	14.6		
Flow (L/s)					1.4	1.4	10.5	10.5	0.126		3.16

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
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					SW-3 (Blind Line Culvert) Down Gradient						
					Aug-23	Aug-23 Dup#1 QA/QC	Sep-23 Storm Event	Oct-23	May-24 Storm Event	Jun-24	Oct-24
PARAMETER	Limit	PWQO	CWQG	APV							
Alkalinity (as CaCO3)	IPWQO	a			171	169	Dry	149	157	Dry	Dry
Aluminum	IPWQO	0.075	<0.1 pH>6.5								
N-NH3 (Ammonia)					<0.020	0.039		<0.020	<0.020		
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.02000	0.03899		0.00001	0.00040		
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.001	<0.001		<0.001	<0.011		
Barium				2.3	0.03	0.03		0.04	0.02		
Beryllium	PWQO	b		0.0053							
BOD					1	<1		1	<1		
Boron	IPWQO	0.2	1.5	3.55	0.01	<0.01		0.01	<0.01		
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	<0.0001	<0.0001		<0.0001	<0.0001		
Calcium					58	58		61	62		
Chloride			120	180	9	9		12	8		
Chromium	PWQO	0.009		0.064	<0.001	<0.001		<0.001	<0.001		
Cobalt	IPWQO	0.0009		0.0052							
COD					20	14		23	<5		
Conductivity (µS/cm)					313	313		318	310		
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	<0.001	<0.001		<0.001	<0.001		
DOC											
Fluoride											
Hardness (as CaCO3)					198	198		210	212		
Iron	PWQO	0.3	0.3		0.1	0.13		0.1	0.03		
Lead	PWQO IPWQO	e	0.001	0.002	<0.001	<0.001		<0.001	<0.001		
Magnesium					13	13		14	14		
Manganese									0.01		
Molybdenum	IPWQO	0.04	0.073	0.73							
Mercury	PWQO	0.0002		0.00077	<0.0001	<0.0001		<0.0001	<0.0001		
Nickel	PWQO	0.025	0.025	0.039							
N-NO3 (Nitrate)			3		5.75	5.83		4.09	4.33		
N-NO2 (Nitrite)			0.06		<0.10	<0.10		<0.10	<0.10		
Organic Nitrogen											
pH (pH units)					7.97	7.9		7.79	7.85		
Phenols	IPWQO	0.005	0.004	0.961	<0.001	<0.001		<0.001	<0.001		
Phosphorus (total)	IPWQO	0.03			0.026	0.027		0.018	0.006		
Potassium											
Silicon											
Silver	PWQO	0.0001		0.00012							
Sodium									5		
Strontium									0.107		
Sulphate					24	25		48	30		
Sulphur											
TDS					203	203		207	202		
Total Sus. Solids					4	8		8	<2		
Temperature (^{o}C)											
Thallium	IPWQO	0.0003	0.0008	0.04							
Titanium											
TKN					0.546	0.589		0.771	0.44		
Vanadium	IPWQO	0.006		0.02							
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	<0.01	<0.01		<0.01	<0.01		
Ion Balance											
Field Parameters											
Temperature (^{o}C)					13.6			6.6	15.7		
pH					7.5			7.9	7.8		
Conductivity (µS/cm)					490			510	450		
DO (mg/L)					5.3			8.4	8.8		
Flow (L/s)					0.16			0.16	0.585		

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inorganic
Surface Water Quality

PARAMETER	Limit	PWQO	CWQG	APV	SW-3 (Blind Line Culvert) Down Gradient Nov-24 Storm Event
Alkalinity (as CaCO3)	IPWQO	a			149
Aluminum	IPWQO	0.075	<0.1 pH>6.5		
N-NH3 (Ammonia)					0.023
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.00012
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.001
Barium				2.3	0.04
Beryllium	PWQO	b		0.0053	
BOD					4
Boron	IPWQO	0.2	1.5	3.55	<0.01
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	<0.0001
Calcium					60
Chloride			120	180	14
Chromium	PWQO	0.009		0.064	0.005
Cobalt	IPWQO	0.0009		0.0052	
COD					21
Conductivity (µS/cm)					312
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	<0.001
DOC					
Fluoride					
Hardness (as CaCO3)					203
Iron	PWQO	0.3	0.3		0.12
Lead	PWQO IPWQO	e	0.001	0.002	<0.001
Magnesium					13
Manganese					0.02
Molybdenum	IPWQO	0.04	0.073	0.73	
Mercury	PWQO	0.0002		0.00077	<0.0001
Nickel	PWQO	0.025	0.025	0.039	
N-NO3 (Nitrate)			3		2.55
N-NO2 (Nitrite)			0.06		<0.10
Organic Nitrogen					
pH (pH units)					8.07
Phenols	IPWQO	0.005	0.004	0.961	<0.001
Phosphorus (total)	IPWQO	0.03			
Potassium					
Silicon					
Silver	PWQO	0.0001		0.00012	
Sodium					6
Strontium					0.14
Sulphate					35
Sulphur					
TDS					203
Total Sus. Solids					<2
Temperature (^{o}C)					
Thallium	IPWQO	0.0003	0.0008	0.04	
Titanium					
TKN					0.446
Vanadium	IPWQO	0.006		0.02	
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	<0.01
Ion Balance					
Field Parameters					
Temperature (^{o}C)					8.1
pH					7.5
Conductivity (µS/cm)					400
DO (mg/L)					5.7
Flow (L/s)					0.585

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inorganic
Surface Water Quality

PARAMETER	Limit	PWQO	CWQG	APV	Surface Water Statistics Summary MVC Median (History)	MVC 75th Percentile	MVC MIN	MVC MAX		
Alkalinity (as CaCO3)	IPWQO	a			110	119	33	230		
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					0.02	0.05	0.01	0.37		
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.00016	0.00163	0.00001	0.02		
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0002	0.0004	0.0001	0.001		
Barium				2.3	0.020	0.023	0.006	0.033		
Beryllium	PWQO	b		0.0053						
BOD					3	3	1	3		
Boron	IPWQO	0.2	1.5	3.55	0.005	0.009	0.005	0.080		
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	0.00002	0.00002875	0.000014	0.0001		
Calcium					23	38.9	18.1	49		
Chloride			120	180	23.4	29.6	2.7	69		
Chromium	PWQO	0.009		0.064	0.001	0.002	0.0002	0.002		
Cobalt	IPWQO	0.0009		0.0052						
COD					22	31.5	5	46		
Conductivity (µS/cm)					301	352	93	508		
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.001	0.0011	0.0002	0.002		
DOC										
Fluoride										
Hardness (as CaCO3)					138	163	39	237		
Iron	PWQO	0.3	0.3		0.143	0.218	0.028	5.65		
Lead	PWQO IPWQO	e	0.001	0.002	0.000025	0.000185	0.00002	0.001		
Magnesium					7.5	9.7	6.3	16		
Manganese										
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	0.00002	0.0001	0.00002	0.02		
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		0.1	0.1	0.05	0.18		
N-NO2 (Nitrite)			0.06		0.1	0.1	0.05	0.1		
Organic Nitrogen					0.47	0.82	0.23	1.15		
pH (pH units)					7.67	7.76	7.15	7.94		
Phenols	IPWQO	0.005	0.004	0.961	0.001	0.002	0.001	0.004		
Phosphorus (total)	IPWQO	0.03			0.038	0.06	0.01	0.18		
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium										
Strontium										
Sulphate					6.5	10.5	1	22		
Sulphur										
TDS					158.5	189	56	270		
Total Sus. Solids					3	9	2	16		
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.7	0.90	0.25	1.32		
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	0.01	0.019	0.005	0.102		
Ion Balance										
Field Parameters										
Temperature (^{o}C)										
pH										
Conductivity (µS/cm)										
DO (mg/L)										
Flow (L/s)										

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inorganic
Surface Water Quality

					Surface Water Statistics Summary					
					SW1A Median	**SW1A** 75th	**SW1A** MIN	**SW1A** MAX		
PARAMETER	Limit	PWQO	CWQG	APV	(History)	Percentile				
Alkalinity (as CaCO3)	IPWQO	a			185	200	85	242		
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					0.02	0.02	0.01	0.34		
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.00019	0.00066	0.00001	0.02		
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0004	0.001	0.0001	0.001		
Barium				2.3	0.050	0.057	0.026	0.084		
Beryllium	PWQO	b		0.0053						
BOD					3	3	1	8		
Boron	IPWQO	0.2	1.5	3.55	0.023	0.030	0.009	0.122		
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	0.0000745	0.0001	0.000014	0.000154		
Calcium					68	71	50	83		
Chloride			120	180	10.5	18.4	2.7	29		
Chromium	PWQO	0.009		0.064	0.001	0.002	0.0002	0.090		
Cobalt	IPWQO	0.0009		0.0052						
COD					11	20	5	125		
Conductivity (µS/cm)					421	519	192	667		
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.001	0.001	0.0001	0.0055		
DOC										
Fluoride										
Hardness (as CaCO3)					229	251	118	331		
Iron	PWQO	0.3	0.3		0.062	0.09	0.007	0.528		
Lead	PWQO IPWQO	e	0.001	0.002	0.00031	0.001	0.00002	0.0013		
Magnesium					15	16	12	18		
Manganese					0.06	0.07	0.03	0.08		
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	0.00006	0.0001	0.00002	0.02		
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		6.06	7.17	0.3	11.1		
N-NO2 (Nitrite)			0.06		0.1	0.1	0.05	0.1		
Organic Nitrogen					0.31	0.67	0.11	7.67		
pH (pH units)					7.97	8.05	7.45	8.29		
Phenols	IPWQO	0.005	0.004	0.961	0.001	0.002	0.001	0.01		
Phosphorus (total)	IPWQO	0.03			0.03	0.054	0.008	0.26		
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium					5	5	4	5		
Strontium					0.141	0.149	0.112	0.152		
Sulphate					18	19	7	25		
Sulphur										
TDS					257	290	115	343		
Total Sus. Solids					4	7.75	2	465		
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.48	0.64	0.11	2.28		
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	0.01	0.01	0.005	0.09		
Ion Balance										
Field Parameters										
Temperature (^{o}C)										
pH										
Conductivity (µS/cm)										
DO (mg/L)										
Flow (L/s)										

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inorganic
Surface Water Quality

					Surface Water Statistics Summary					
					BLC	**BLC**	**BLC**	**BLC**		
					Median	75th	MIN	MAX		
PARAMETER	Limit	PWQO	CWQG	APV	(History)	Percentile				
Alkalinity (as CaCO3)	IPWQO	a			149	161	47	211		
Aluminum	IPWQO	0.075	<0.1 pH>6.5							
N-NH3 (Ammonia)					0.02	0.02	0.001	0.16		
N-NH3 Ammonia (Unionized) Field	PWQO	0.02	0.019		0.00022	0.00073	0.000003	0.02		
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.0004	0.001	0.0001	0.001		
Barium				2.3	0.039	0.051	0.020	0.313		
Beryllium	PWQO	b		0.0053						
BOD					3	3	1	7		
Boron	IPWQO	0.2	1.5	3.55	0.017	0.027	0.005	0.293		
Cadmium	PWQO IPWQO	0.0002 c	0.00004 to 0.00037	0.00021	0.000036	0.0001	0.000014	0.000326		
Calcium					60	60.3	36	68.2		
Chloride			120	180	10	13	2.7	22.2		
Chromium	PWQO	0.009		0.064	0.001	0.002	0.0002	0.053		
Cobalt	IPWQO	0.0009		0.0052						
COD					21	30	5	226		
Conductivity (µS/cm)					323	431	136	581		
Copper	PWQO IPWQO	0.005 d	0.002 to 0.004	0.069	0.001	0.0015	0.0001	0.0224		
DOC										
Fluoride										
Hardness (as CaCO3)					205	224	102	286		
Iron	PWQO	0.3	0.3		0.128	0.379	0.030	34.4		
Lead	PWQO IPWQO	e	0.001	0.002	0.00045	0.001	0.00002	0.00535		
Magnesium					13	14	8	16		
Manganese					0.015	0.018	0.01	0.02		
Molybdenum	IPWQO	0.04	0.073	0.73						
Mercury	PWQO	0.0002		0.00077	0.00002	0.0001	0.00002	0.02		
Nickel	PWQO	0.025	0.025	0.039						
N-NO3 (Nitrate)			3		3.55	5.71	0.1	7.63		
N-NO2 (Nitrite)			0.06		0.1	0.1	0.05	0.3		
Organic Nitrogen					0.75	0.88	0.37	1.2		
pH (pH units)					7.965	8.09	7.04	8.42		
Phenols	IPWQO	0.005	0.004	0.961	0.001	0.002	0.001	0.01		
Phosphorus (total)	IPWQO	0.03			0.026	0.050	0.003	1.03		
Potassium										
Silicon										
Silver	PWQO	0.0001		0.00012						
Sodium					5.5		5	6		
Strontium					0.124		0.107	0.14		
Sulphate					26.5	32.5	10	79		
Sulphur										
TDS					203	226	82	287		
Total Sus. Solids					3.5	33.25	2	1430		
Temperature (^{o}C)										
Thallium	IPWQO	0.0003	0.0008	0.04						
Titanium										
TKN					0.58	0.7	0.3	4.4		
Vanadium	IPWQO	0.006		0.02						
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.089	0.01	0.013	0.005	0.132		
Ion Balance										
Field Parameters										
Temperature (^{o}C)										
pH										
Conductivity (µS/cm)										
DO (mg/L)										
Flow (L/s)										

Shaded values exceed PWQO and/or CWQG

All parameters in mg/L unless otherwise noted

Columns 3 and 4 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Surface Water VOC’s

Ross WDS
Report of Organic Analysis **SW 1A**
Surface Water

Parameter	ODWS/OG	Oct-12	Apr-13	Jul-14	Apr-16	May-17	Apr-18
1,1,1,2- tetrachloroethane			<0.5	<0.1	< 0.1	< 0.1	< 0.1
1,1,1- trichloroethane			<0.4	<0.1	< 0.1	< 0.1	< 0.1
1,1,2,2- tetrachloroethane			<0.5	<0.4	< 0.4	< 0.4	< 0.4
1,1,2- trichloroethane			<0.4	<0.1	< 0.1	< 0.1	< 0.1
1,1- dichloroethane			<0.4	<0.1	< 0.1	< 0.1	< 0.1
1,1- dichloroethylene	14		<0.5		< 0.1	< 0.1	< 0.1
1,2- dibromoethane			<0.2	<0.1	< 0.1	< 0.1	< 0.1
1,2- dichlorobenzene	200		<0.4	<0.1	< 0.1	< 0.1	< 0.1
1,2- dichloroethane	5		<0.2	<0.1	< 0.1	< 0.1	< 0.1
1,2- dichloropropane			<0.5	<0.1	< 0.1	< 0.1	< 0.1
1,3,5- trimethylbenzene			<0.3				
1,3- dichlorobenzene			<0.4	<0.1	< 0.1	< 0.1	< 0.1
1,4- dichlorobenzene	5	<0.4	<0.4	<0.2	< 0.2	< 0.2	< 0.2
Benzene	1	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane			<0.3	<0.1	< 0.1	< 0.1	< 0.1
Bromoform			<0.4	<0.1	< 0.1	< 0.1	< 0.1
Bromomethane			<0.5	<0.3	< 0.3	< 0.3	< 0.3
c-1,2- Dichloroethylene			<0.4	<0.1	< 0.1	< 0.1	< 0.1
c-1,3- Dichloropropylene			<0.2	<0.1	< 0.1	< 0.1	< 0.1
Carbon Tetrachloride	2		<0.2	<0.2	< 0.2	< 0.2	< 0.2
Chloroethane			<0.2				
Chloroform			<0.5	<0.3	< 0.3	< 0.3	< 0.3
Chloromethane			<0.2				
Dibromochloromethane			<0.3	<0.1	< 0.1	< 0.1	< 0.1
Dichlorodifluoromethane			<0.5	<1	< 1	< 1	< 1
Dichloromethane	50	<4.0	<4.0	<0.3	< 0.3	< 0.3	< 0.3
Ethylbenzene	140		<0.5	<0.5	< 0.5	< 0.5	< 0.5
m/p- xylene			<0.5	<0.4	< 0.4	< 0.4	< 0.4
Monochlorobenzene	80		<0.2	<0.2	< 0.2	< 0.2	< 0.2
o-xylene			<0.5	<0.1	< 0.1	< 0.1	< 0.1
Styrene			<0.5	<0.5	< 0.5	< 0.5	< 0.5
t-1,2- Dichloroethylene			<0.4	<0.1	< 0.1	< 0.1	< 0.1
t-1,3- Dichloropropylene			<0.2	<0.1	< 0.1	< 0.1	< 0.1
Tetrachloroethylene	10		<0.3	<0.2	< 0.2	< 0.2	< 0.2
Toluene	60	<0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	5		<0.3	<0.1	< 0.1	< 0.1	< 0.1
Trichlorofluoromethane			<0.5	<0.1	< 0.1	< 0.1	< 0.1
Vinyl Chloride	1	<0.2	<0.2	<0.2	< 0.2	< 0.2	< 0.2
Xylene; total	90		<1.0	<0.4	< 0.4	< 0.4	< 0.4
Dichloropropene 1,3- cis+trans					< 0.1	< 0.1	< 0.1
Acetone					< 2	< 2	< 2
Hexane					< 1	< 1	< 1
Methyl Ethyl Ketone					< 1	< 1	< 1
Methyl Isobutyl Ketone					< 1	< 1	< 1
Methyl-t-butyl Ether					< 1	< 1	< 1
VOC SURROGATES							
1,2- dichloroethane- d4 %		115	102	99.3	85	101	102
4- bromofluorobenzene %		112	102	92.1	113	104	98
Toluene- d8 %		101	96	95.9	96	103	102

Concentrations greater than MDL

Concentrations greater than ODWS/OG

Column 1 taken from Schedule 5 of the MOE "Landfill Standards 1998"

Ross WDS

Report of Organic Analysis **SW 1A**

Surface Water

Parameter	ODWS/OG	Apr-19	May-20	Apr-21	Jun-23	Jun-24	
1,1,1,2- tetrachloroethane		< 0.1	< 0.1	<0.5	<0.5	<0.5	
1,1,1- trichloroethane		< 0.1	< 0.1	<0.4	<0.4	<0.4	
1,1,2,2- tetrachloroethane		< 0.4	< 0.4	<0.5	<0.5	<0.5	
1,1,2- trichloroethane		< 0.1	< 0.1	<0.4	<0.4	<0.4	
1,1- dichloroethane		< 0.1	< 0.1	<0.4	<0.4	<0.4	
1,1- dichloroethylene	14	< 0.1	< 0.1	<0.5	<0.5	<0.5	
1,2- dibromoethane		< 0.1	< 0.1	<0.2	<0.2	<0.2	
1,2- dichlorobenzene	200	< 0.1	< 0.1	<0.4	<0.4	<0.4	
1,2- dichloroethane	5	< 0.1	< 0.1	<0.2	<0.2	<0.2	
1,2- dichloropropane		< 0.1	< 0.1	<0.5	<0.5	<0.5	
1,3,5- trimethylbenzene				<0.3	<0.3	<0.3	
1,3- dichlorobenzene		< 0.1	< 0.1	<0.4	<0.4	<0.4	
1,4- dichlorobenzene	5	< 0.2	< 0.2	<0.4	<0.4	<0.4	
Benzene	1	< 0.5	< 0.5	<0.5	<0.5	<0.5	
Bromodichloromethane		< 0.1	< 0.1	<0.3	<0.3	<0.3	
Bromoform		< 0.1	< 0.1	<0.4	<0.4	<0.4	
Bromomethane		< 0.3	< 0.3	<0.5	<0.5	<0.5	
c-1,2- Dichloroethylene		< 0.1	< 0.1	<0.4	<0.4	<0.4	
c-1,3- Dichloropropylene		< 0.1	< 0.1	<0.2	<0.2	<0.2	
Carbon Tetrachloride	2	< 0.2	< 0.2	<0.2	<0.2	<0.2	
Chloroethane				<0.2	<0.2	<0.2	
Chloroform		< 0.3	< 0.3	<0.5	<0.5	<0.5	
Chloromethane				<0.2	<0.2	<0.2	
Dibromochloromethane		< 0.1	< 0.1	<0.3	<0.3	<0.3	
Dichlorodifluoromethane		< 1	< 1	<0.5	<0.5	<0.5	
Dichloromethane	50	< 0.3	< 0.3	<4.0	<4.1	<4.1	
Ethylbenzene	140	< 0.5	< 0.5	<0.5	<0.5	<0.5	
m/p- xylene		< 0.4	< 0.4	<0.4	<0.4	<0.4	
Monochlorobenzene	80	< 0.2	< 0.2	<0.5	<0.5	<0.5	
o-xylene		< 0.1	< 0.1	<0.4	<0.4	<0.4	
Styrene		< 0.5	< 0.5	<0.5	<0.5	<0.5	
t-1,2- Dichloroethylene		< 0.1	< 0.1	<0.4	<0.4	<0.4	
t-1,3- Dichloropropylene		< 0.1	< 0.1	<0.2	<0.2	<0.2	
Tetrachloroethylene	10	< 0.2	< 0.2	<0.3	<0.3	<0.3	
Toluene	60	< 0.5	< 0.5	<0.5	<0.5	<0.5	
Trichloroethylene	5	< 0.1	< 0.1	<0.3	<0.3	<0.3	
Trichlorofluoromethane		< 0.1	< 0.1	<0.5	<0.5	<0.5	
Vinyl Chloride	1	< 0.2	< 0.2	<0.2	<0.2	<0.2	
Xylene; total	90	< 0.4	< 0.4	<0.5	<0.5	<0.5	
Dichloropropene 1,3- cis+trans		< 0.1	< 0.1				
Acetone		< 2	< 30				
Hexane		< 1	< 1				
Methyl Ethyl Ketone		< 1	< 1				
Methyl Isobutyl Ketone		< 1	< 1				
Methyl-t-butyl Ether		< 1	< 1				
VOC SURROGATES							
1,2- dichloroethane- d4 %		112		115	91	104	
4- bromofluorobenzene %		92.8		101	115	79	
Toluene- d8 %		98.6		106	100	95	

Concentrations greater than MDL

Concentrations greater than ODWS/O

Column 1 taken from Schedule 5 of th "Landfill Standards 1998"

Ross WDS
Report of Organic Analysis **Trip Blanks**
Surface Water Apr-18 Jun-19 May-20

Parameter	ODWS/OG						
1,1,1,2- tetrachloroethane		< 0.1	< 0.1	< 0.1			
1,1,1- trichloroethane		< 0.1	< 0.1	< 0.1			
1,1,2,2- tetrachloroethane		< 0.4	< 0.4	< 0.4			
1,1,2- trichloroethane		< 0.1	< 0.1	< 0.1			
1,1- dichloroethane		< 0.1	< 0.1	< 0.1			
1,1- dichloroethylene	14	< 0.1	< 0.1	< 0.1			
1,2- dibromoethane		< 0.1	< 0.1	< 0.1			
1,2- dichlorobenzene	200	< 0.1	< 0.1	< 0.1			
1,2- dichloroethane	5	< 0.1	< 0.1	< 0.1			
1,2- dichloropropane		< 0.1	< 0.1	< 0.1			
1,3,5- trimethylbenzene							
1,3- dichlorobenzene		< 0.1	< 0.1	< 0.1			
1,4- dichlorobenzene	5	< 0.2	< 0.2	< 0.2			
Benzene	1	< 0.5	< 0.5	< 0.5			
Bromodichloromethane		< 0.1	< 0.1	< 0.1			
Bromoform		< 0.1	< 0.1	< 0.1			
Bromomethane		< 0.3	< 0.3	< 0.3			
c-1,2- Dichloroethylene		< 0.1	< 0.1	< 0.1			
c-1,3- Dichloropropylene		< 0.1	< 0.1	< 0.1			
Carbon Tetrachloride	2	< 0.2	< 0.2	< 0.2			
Chloroethane							
Chloroform		< 0.3	< 0.3	< 0.3			
Chloromethane							
Dibromochloromethane		< 0.1	< 0.1	< 0.1			
Dichlorodifluoromethane		< 1	< 1	< 1			
Dichloromethane	50	< 0.3	< 0.3	< 0.3			
Ethylbenzene	140	< 0.5	< 0.5	< 0.5			
m/p- xylene		< 0.4	< 0.4	< 0.4			
Monochlorobenzene	80	< 0.2	< 0.2	< 0.2			
o-xylene		< 0.1	< 0.1	< 0.1			
Styrene		< 0.5	< 0.5	< 0.5			
t-1,2- Dichloroethylene		< 0.1	< 0.1	< 0.1			
t-1,3- Dichloropropylene		< 0.1	< 0.1	< 0.1			
Tetrachloroethylene	10	< 0.2	< 0.2	< 0.2			
Toluene	60	< 0.5	< 0.5	< 0.5			
Trichloroethylene	5	< 0.1	< 0.1	< 0.1			
Trichlorofluoromethane		< 0.1	< 0.1	< 0.1			
Vinyl Chloride	1	< 0.2	< 0.2	< 0.2			
Xylene; total	90	< 0.4	< 0.4	< 0.4			
Dichloropropene 1,3- cis+trans		< 0.1	< 0.1	< 0.1			
Acetone		< 2	< 2	< 30			
Hexane		< 1	< 1	< 1			
Methyl Ethyl Ketone		< 1	< 1	< 1			
Methyl Isobutyl Ketone		< 1	< 1	< 1			
Methyl-t-butyl Ether		< 1	< 1	< 1			
VOC SURROGATES							
1,2- dichloroethane- d4 %		104	109				
4- bromofluorobenzene %		98	90				
Toluene- d8 %		102	102				

Concentrations greater than MDL

Concentrations greater than ODWS/O

Column 1 taken from Schedule 5 of th "Landfill Standards 1998"

Field Blanks

Ross WDS
Report of Inorganic
Quality Assurance and
Quality Control

			Field Blanks					
			May-12 BH 16	May-12 BH 17	Oct-12 BH 16	Oct-10 BH 10	Apr-13 BH 15	Oct-13 BH 19
PARAMETER	ODWQS	PWQO	at BH 12	at BH 1	at AF	at BH 1	at BH 5	at BH 8
Alkalinity (as CaCO3)	30-500		<5	<5	<5	<5	<5	<5
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Arsenic	0.025	0.1 - 0.005(i)	<0.001	<0.001			<0.001	
Barium	1		<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Beryllium		0.011						
BOD								
Boron	5	0.2(i)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Bromide								
Cadmium	0.005	0.0002	<0.0001	<0.0001			<0.0001	
Calcium			8	<1	<1	<1	<1	<1
Chloride	250		<1	2	<1	<1	<1	<1
Chromium	0.05	0.009	<0.001	<0.001			<0.001	
Cobalt		0.0009(i)						
COD			<5	<5	<5	<5	<5	<5
Conductivity (µS/cm)			<5	<5	<5	<5	<5	<5
Copper	1	0.005	<0.001	<0.001			<0.001	
DOC	5		2.4	<0.5	<0.5	<0.5	<0.5	<0.5
Fluoride	1.5							
Hardness (as CaCO3)	80-100							
Iron	0.3	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	0.01		<0.001	<0.001			<0.001	
Magnesium			<1	<1	<1	<1	<1	<1
Manganese	0.05		<0.01	<0.01			<0.01	
Mercury		0.0002	<0.0001	<0.0001			<0.0001	
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		<0.10	0.11	<0.10	<0.10	<0.10	<0.10
Nitrite (as N)	1		<0.10	<0.10			<0.10	
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		5.46	5.74	5.58	5.61	5.93	5.87
Phenols			<0.001	<0.001			<0.001	
Phosphate (as P)								
Phosphorus (total)			<0.01	<0.01			<0.01	
Potassium			<1	<1			<1	
Silicon								
Silver		0.0001						
Sodium	200		<2	<2	<2	<2	<2	<2
Strontium								
Sulphate	500		<1	10	<3	<3	<3	<3
Sulphur								
Total Sus. Solids								
TDS	500		<1	<1	<1	<1	<1	<1
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.10	<0.10			<0.10	
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.01	<0.01			<0.01	
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (uS/cm)								

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inorganic
Quality Assurance and
Quality Control

			Field Blanks					
			Apr-14	Jun-14	Jul-14	Oct-14	Apr-15	Aug-15
			SW 2	SW 3	SW 2	BH 19	SW 3	SW 2
PARAMETER	ODWQS	PWQO	at BLC	at BLC	at BLC	at BH 8	at SW1	at BLC
Alkalinity (as CaCO3)	30-500		<5	<5	<5	< 5	< 5	< 5
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			<0.01	<0.01	<0.01	<0.01	< 0.01	< 0.01
Arsenic	0.025	0.1 - 0.005(i)	< 0.0001	<0.0001	<0.0001		< 0.0001	< 0.0001
Barium	1		< 0.001	<0.001	<0.001	<0.001	< 0.001	< 0.001
Beryllium		0.011						
BOD			<3	<3	<3		< 3	< 3
Boron	5	0.2(i)	< 0.005	<0.005	<0.005	< 0.005	< 0.005	< 0.005
Bromide								
Cadmium	0.005	0.0002	<0.00002	<0.00002	<0.00002		< 0.00002	< 0.00002
Calcium			< 0.02			< 0.02		
Chloride	250		< 0.5	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Chromium	0.05	0.009	<0.0002	<0.002	<0.002		< 0.002	< 0.002
Cobalt		0.0009(i)						
COD			<5	15	<5	< 5	< 5	5
Conductivity (µS/cm)			2	2	2	2	1	1
Copper	1	0.005	0.0003	<0.0001	<0.0001		< 0.0001	< 0.0001
DOC	5					< 0.2		
Fluoride	1.5							
Hardness (as CaCO3)	80-100		< 1	<1	<1		< 1	< 1
Iron	0.3	0.3	<0.005	0.026	<0.005	< 0.005	< 0.005	< 0.005
Lead	0.01		<0.00002	<0.00002	<0.00003		< 0.00002	< 0.00002
Magnesium			< 0.01			< 0.01		
Manganese	0.05							
Mercury		0.0002	<0.00002	<0.00002	<0.00002		< 0.00002	< 0.00002
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		< 0.1	<0.1	<0.1	< 0.1	< 0.1	< 0.1
Nitrite (as N)	1		< 0.1	<0.1	<0.1		< 0.1	< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		5.81	5.82	5.85	6.02	5.78	5.45
Phenols			<0.001	<0.001	<0.001		< 0.001	< 0.001
Phosphate (as P)								
Phosphorus (total)			<0.01	<0.01	<0.01		< 0.01	< 0.01
Potassium								
Silicon								
Silver		0.0001						
Sodium	200					< 0.2		
Strontium								
Sulphate	500		< 1	<1	<1	< 1	< 1	< 1
Sulphur								
Total Sus. Solids			< 3	<3	<3		< 3	< 3
TDS	500		0.4	<1	<1	2	< 1	< 1
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			<0.05	<0.1	<0.05		< 0.05	< 0.05
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	<0.005	<0.005	<0.005		< 0.005	< 0.005
Ion Balance						L/C		
Field Parameters								
Temperature (°C)								
pH								
Conductivity (uS/cm)								

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inorganic
Quality Assurance and
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			Field Blanks					
			Sep-15	Nov-15	Apr-16	Aug-16	Sep-16	Apr-17
			BH 21	SW 2	SW 3	SW 2	BH 21	SW 3
PARAMETER	ODWQS	PWQO	at BH 9	at BLC	at BLC	at BLC	at BH5	at MVC
Alkalinity (as CaCO3)	30-500		< 5	< 5	< 5	< 5	< 5	< 5
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic	0.025	0.1 - 0.005(i)		< 0.0001	< 0.0001	< 0.0001		< 0.0001
Barium	1		< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Beryllium		0.011						
BOD				< 3	< 3	< 3		3
Boron	5	0.2(i)	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	0.008
Bromide								
Cadmium	0.005	0.0002		< 0.00002	< 0.00002	< 0.00002		< 0.000020
Calcium			< 0.02				< 0.02	
Chloride	250		< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chromium	0.05	0.009		< 0.002	< 0.002	< 0.002		< 0.001
Cobalt		0.0009(i)						
COD			< 5	< 5	< 5	< 5	< 5	< 5
Conductivity (µS/cm)			1	1	1	2	1	1
Copper	1	0.005		< 0.0001	< 0.0001	< 0.0001		< 0.0001
DOC	5		< 0.2				< 0.2	
Fluoride	1.5							
Hardness (as CaCO3)	80-100			< 1	< 1	< 1		< 1
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Lead	0.01			< 0.00002	< 0.00002	< 0.00002		< 0.00002
Magnesium			< 0.01				< 0.01	
Manganese	0.05							
Mercury		0.0002		< 0.00002	< 0.00002	< 0.00002		< 0.02
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1
Nitrite (as N)	1			< 0.1	< 0.1	< 0.1		< 0.1
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		5.55	5.17	6	6.14	6.45	5.79
Phenols				< 0.001	< 0.001	< 0.001		< 0.001
Phosphate (as P)								
Phosphorus (total)				< 0.01	< 0.01	< 0.01		< 0.01
Potassium								
Silicon								
Silver		0.0001						
Sodium	200		< 0.2				< 0.2	
Strontium								
Sulphate	500		< 1	< 1	< 1	< 1	< 1	< 1
Sulphur								
Total Sus. Solids				< 3	< 3	< 3		< 3
TDS	500		< 1	< 1	< 1	1	1	0.287
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN				< 0.05	< 0.05	< 0.05		0.16
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)		0.008	< 0.005	< 0.005		< 0.005
Ion Balance			6.27					
Field Parameters								
Temperature (°C)								
pH								
Conductivity (uS/cm)								

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Ross WDS
Report of Inorganic
Quality Assurance and
Quality Control

			Field Blanks					
			May-17	Aug-17	Oct-17			
			BH 19	BH 19	SW 3			
PARAMETER	ODWQS	PWQO	at BH 1	at BH 7D	at BLC			
Alkalinity (as CaCO3)	30-500		< 5	< 5	< 5			
Aluminum	0.1	0.075 (i)						
Ammonia (as N)			< 0.01	< 0.01	< 0.01			
Arsenic	0.025	0.1 - 0.005(i)	< 0.0001		< 0.0001			
Barium	1		< 0.001	< 0.001	< 0.001			
Beryllium		0.011						
BOD					< 3			
Boron	5	0.2(i)	< 0.005	< 0.005	0.005			
Bromide								
Cadmium	0.005	0.0002	< 0.000014		< 0.000014			
Calcium			< 0.02	0.02				
Chloride	250		< 0.5	< 0.5	< 0.5			
Chromium	0.05	0.009	< 0.002		< 0.001			
Cobalt		0.0009(i)						
COD			< 5	< 5	< 5			
Conductivity (µS/cm)			2	1	3			
Copper	1	0.005	0.0001		< 0.0001			
DOC	5		< 0.2	< 0.2				
Fluoride	1.5							
Hardness (as CaCO3)	80-100				< 1			
Iron	0.3	0.3	< 0.005	< 0.005	< 0.005			
Lead	0.01		< 0.00002		< 0.00002			
Magnesium			< 0.01	< 0.01				
Manganese	0.05		< 0.001					
Mercury		0.0002	< 0.02		< 0.00002			
Molybdenum		0.04(i)						
Nickel								
Nitrate (as N)	10		< 0.05	< 0.05	< 0.05			
Nitrite (as N)	1		0.05		< 0.05			
Organic Nitrogen	0.15							
pH (pH units)	6.5-8.5		5.67	6.31	6.13			
Phenols			< 0.001		< 0.001			
Phosphate (as P)								
Phosphorus (total)			< 0.01		< 0.01			
Potassium			< 0.1					
Silicon								
Silver		0.0001						
Sodium	200		< 0.2	< 0.2				
Strontium								
Sulphate	500		< 1	< 1	< 1			
Sulphur								
Total Sus. Solids					< 3			
TDS	500		0.905	< 1	< 1			
Temperature (°C)	15							
Thallium		0.0003(i)						
Tin								
Titanium								
TKN			< 0.1		< 0.1			
Vanadium		(0.006(i)						
Zinc	5	0.03 - 0.02(i)	< 0.005		< 0.005			
Ion Balance								
Field Parameters								
Temperature (°C)								
pH								
Conductivity (uS/cm)								

All parameters in mg/L unless otherwise noted

Columns 1 and 2 are taken from Schedule 5 of the MOE "Landfill Standards, 1998"

Groundwater
Relative Percent Difference Calculations

Ross WDS

Groundwater QA/QC
RPD Calculations

		BH-1	BH-1 DUP BH-18		BH-8	BH-8 DUP BH-18		BH 6-D	BH 6-D DUP BH-19		BH 9-D	BH 9-D DUP BH-20		BH 6-D	BH 6-D DUP BH-18	
Parameter	**ODWS/OG**	**Apr-16**	**Apr-16**	**RPD**	**Aug-16**	**Aug-16**	**RPD**	**Sep-16**	**Sep-16**	**RPD**	**Sep-16**	**Sep-16**	**RPD**	**May-17**	**May-17**	**RPD**
Alkalinity (as CaCO3)	30-500	230	230	0.00%	136	137	0.73%	111	109	1.82%	559	599	6.91%	126	104	19.13%
Aluminum	0.1															
N-NH3 (Ammonia)		0.01	0.01	NC	0.01	0.01	NC	0.01	0.01	NC	0.33	0.34	2.99%	0.01	0.01	NC
Arsenic	0.01	0.0001	0.0001	NC										0.0008	0.0008	0.00%
Barium	1	0.06	0.059	1.68%	0.035	0.035	0.00%	0.015	0.015	0.00%	0.14	0.139	0.72%	0.017	0.014	19.35%
Beryllium																
BOD																
Boron	5	0.005	0.005	NC	0.009	0.008	11.76%	0.005	0.005	NC	0.286	0.284	0.70%	0.011	0.005	NC
Bromide																
Cadmium	0.005	0.00002	0.00002	NC			NC			NC			NC	0.000014	0.000014	NC
Calcium		109	109	0.00%	58.1	58.7	1.03%	30.2	30.5	0.99%	156	155	0.64%	34	28.8	16.56%
Chloride	250	100	100	0.00%	18.1	17.9	1.11%	8.6	8.7	1.16%	103	103	0.00%	8.5	8.6	1.17%
Chromium	0.05	0.002	0.002	NC										0.002	0.002	NC
Cobalt																
COD		10	12	18.18%	5	5	NC	5	5	NC	21	22	4.65%	5	5	NC
Conductivity (µS/cm)		866	871	0.58%	380	382	0.52%	280	276	1.44%	1280	1300	1.55%	283	280	1.07%
Copper	1	0.0014	0.0009	43.48%										0.0001	0.0001	NC
DOC	5	1.1	1.1	0.00%	0.7	0.7	0.00%	0.9	0.8	11.76%	5	5	0.00%	0.7	0.6	15.38%
Fluoride	1.5															
Hardness (as CaCO3)	80-100															
Iron	0.3	0.005	0.005	NC	0.005	0.005	NC	0.023	0.025	8.33%	0.005	0.005	NC	0.03	0.025	18.18%
Lead	0.01	0.00002	0.00002	NC										0.00002	0.00002	NC
Magnesium		29.9	30.2	1.00%	13.5	13.6	0.74%	9.27	9.34	0.75%	38.8	38.5	0.78%	9.6	8.9	7.57%
Manganese	0.05	0.012	0.01	18.18%										0.009	0.009	0.00%
Mercury	0.001	0.00002	0.00002	NC										0.02	0.02	NC
Molybdenum																
Nickel																
N-NO3 (Nitrate)	10	15.9	15.9	0.00%	5.9	5.9	0.00%	0.1	0.1	NC	0.8	0.8	0.00%	0.05	0.05	NC
N-NO2 (Nitrite)	1	0.1	0.1	NC									NC	0.05	0.05	NC
Organic Nitrogen	0.15															
pH (pH units)	6.5-8.5	8.07	8.09	0.25%	7.91	7.93	0.25%	7.89	7.92	0.38%	7.6	7.6	0.00%	7.96	8.02	0.75%
Phenols		0.001	0.001	NC			NC			NC			NC	0.006	0.002	100.00%
Phosphate (as P)																
Phosphorus (total)		0.23	0.33	35.71%										0.02	0.02	0.00%
Potassium		2.2	2.3	4.44%										1.6	1.4	13.33%
Silicon																
Silver																
Sodium	200	31.2	31.6	1.27%	4.9	4.9	0.00%	8.9	9.1	2.22%	44.3	43.9	0.91%	9	7.9	13.02%
Strontium																
Sulphate	500	23	23	0.00%	14	14	0.00%	25	25	0.00%	52	52	0.00%	21	21	0.00%
Sulphur																
Total Sus. Solids																
TDS	500	503	505	0.40%	218	219	0.46%	150	150	0.00%	738	760	2.94%	159	139	13.42%
Temperature (°C)	15															
Thallium																
Tin																
Titanium																
TKN																
Vanadium																
Zinc	5	0.005	0.005	NC			NC			NC			NC	0.005	0.005	NC
Average RPD				**7.36%**			**1.28%**			**2.40%**			**1.52%**			**14.06%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS

Groundwater QA/QC
RPD Calculations

		BH 9-D	BH 9-D DUP BH-20		BH-8	BH-8 DUP BH-18		BH 6-D	BH 6-D DUP BH-18		BH-8	BH-8 DUP BH-18		BH 6-S	BH 6-S DUP BH-19	
Parameter	**ODWS/OG**	**May-17**	**May-17**	**RPD**	**Aug-17**	**Aug-17**	**RPD**	**Aug-17**	**Aug-17**	**RPD**	**Apr-18**	**Apr-18**	**RPD**	**Apr-18**	**Apr-18**	**RPD**
Alkalinity (as CaCO3)	30-500	488	580	17.23%	144	145	0.69%	103	106	2.87%	145	145	0.00%	624	603	3.42%
Aluminum	0.1															
N-NH3 (Ammonia)		0.79	0.83	4.94%	0.01	0.01	NC	0.01	0.01	NC	0.01	0.01	NC	0.24	0.23	4.26%
Arsenic	0.01	0.0006	0.0006	0.00%							0.0001	0.0002	66.67%	0.0004	0.0005	22.22%
Barium	1	0.171	0.17	0.59%	0.033	0.033	0.00%	0.019	0.018	5.41%	0.034	0.034	0.00%	0.212	0.205	3.36%
Beryllium																
BOD																
Boron	5	0.382	0.381	0.26%	0.009	0.008	11.76%	0.01	0.011	9.52%	0.011	0.011	0.00%	1.33	1.26	5.41%
Bromide																
Cadmium	0.005	0.000075	0.000075	0.00%			NC			NC	0.000014	0.000014	NC	0.00007	0.000065	7.41%
Calcium		184	184	0.00%	54.2	54.4	0.37%	36.5	35.3	3.34%	54.8	54.3	0.92%	168	162	3.64%
Chloride	250	74.6	74.8	0.27%	6.8	6.8	0.00%	8.5	8.7	2.33%	5.6	5.5	1.80%	189	184	2.68%
Chromium	0.05	0.002	0.002	NC							0.002	0.002	NC	0.002	0.002	NC
Cobalt				NC												
COD		22	18	20.00%	5	5	NC	5	5	NC	5	5	NC	75	80	6.45%
Conductivity (µS/cm)		1390	1380	0.72%	387	386	0.26%	292	289	1.03%	379	375	1.06%	1800	1760	2.25%
Copper	1	0.0112	0.0117	4.37%						NC	0.0004	0.0016	120.00%	0.0145	0.0145	0.00%
DOC	5	8.8	9	2.25%	0.9	0.8	11.76%	0.7	0.7	0.00%	1.3	1.5	14.29%	17.5	17.8	1.70%
Fluoride	1.5															
Hardness (as CaCO3)	80-100															
Iron	0.3	0.005	0.005	NC	0.296	0.154	63.11%	0.031	0.029	6.67%	0.005	0.005	NC	0.091	0.088	3.35%
Lead	0.01	0.00002	0.00002	NC							0.00002	0.00004	NC	0.00006	0.00007	15.38%
Magnesium		43.3	43.2	0.23%	13	13	0.00%	10.5	10.5	0.00%	12.9	13	0.77%	63	60.9	3.39%
Manganese	0.05	0.472	0.469	0.64%							0.001	0.001	NC	0.962	0.931	3.28%
Mercury	0.001	0.02	0.02	NC							0.00002	0.00002	NC	0.00002	0.00002	NC
Molybdenum																
Nickel																
N-NO3 (Nitrate)	10	0.52	0.57	9.17%	7.55	7.57	0.26%	0.05	0.05	NC	6.59	6.61	NC	0.05	0.05	NC
N-NO2 (Nitrite)	1	0.05	0.05	NC							0.05	0.05	NC	0.05	0.05	NC
Organic Nitrogen	0.15															
pH (pH units)	6.5-8.5	7.62	7.72	1.30%	8.08	8.1	0.25%	8.04	8.05	0.12%	8.14	8.16	0.25%	7.58	7.57	0.13%
Phenols		0.004	0.007	54.55%			NC			NC	0.001	0.001	NC	0.001	0.001	NC
Phosphate (as P)																
Phosphorus (total)		0.02	0.02	0.00%							0.41	0.4	2.47%	0.05	0.04	22.22%
Potassium		5.8	5.8	0.00%							1.4	1.5	6.90%	6.6	6.5	1.53%
Silicon																
Silver																
Sodium	200	57.1	56.8	0.53%	5.5	5.2	5.61%	8.8	8.9	1.13%	4.3	4.4	2.30%	159	152	4.50%
Strontium																
Sulphate	500	60	60	0.00%	12	12	0.00%	20	20	0.00%	11	11	0.00%	31	31	0.00%
Sulphur																
Total Sus. Solids																
TDS	500	718	773	7.38%	180	180	0.00%	148	149	0.67%	177	177	0.00%	993	960	3.38%
Temperature (°C)	15															
Thallium																
Tin																
Titanium																
TKN											0.2	0.1	66.67%	1.9	1.8	5.41%
Vanadium																
Zinc	5	0.005	0.005	NC			NC			NC	0.005	0.005	NC	0.005	0.005	NC
Average RPD				**5.66%**			**6.72%**			**2.55%**			**16.71%**			**5.45%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS

Groundwater QA/QC
RPD Calculations

		BH-12	BH-12 DUP BH-20		BH-12	BH-12 DUP BH-20		BH-9	BH-9 DUP BH-20		BH 6-D	BH19 QA/QC		BH 8	BH18 QA/QC	
Parameter	**ODWS/OG**	**Apr-18**	**Apr-18**	**RPD**	**Sep-18**	**Sep-18**	**RPD**	**Sep-18**	**Sep-18**	**RPD**	**Jun-19**	**Jun-19**	**RPD**	**Jun-19**	**Jun-19**	**RPD**
Alkalinity (as CaCO3)	30-500	394	370	6.28%	354	352	0.57%	384	405	5.32%	122	123	0.82%	140	141	0.71%
Aluminum	0.1															
N-NH3 (Ammonia)		5.92	5.86	1.02%	0.98	0.99	1.02%	1.3	1.29	0.77%	0.05	0.04	22.22%	0.04	0.04	NC
Arsenic	0.01	0.0001	0.0001	NC							0.4	0.3	28.57%	0.1	0.1	NC
Barium	1	0.276	0.279	1.08%	0.226	0.215	4.99%	0.146	0.144	1.38%	0.013	0.013	NC	0.019	0.019	NC
Beryllium																
BOD																
Boron	5	0.187	0.188	0.53%	0.171	0.162	5.41%	0.204	0.201	1.48%	0.014	0.014	NC	0.005	0.005	NC
Bromide																
Cadmium	0.005	0.000055	0.000057	3.57%							0.015	0.015	NC	0.015	0.015	NC
Calcium		137	140	2.17%	152	145	4.71%	139	136	2.18%	34.1	33.9	0.59%	44	44.1	0.23%
Chloride	250	61.8	61.9	0.16%	50.4	50.5	0.20%	69.6	69.6	NC	22.6	22.8	0.88%	7.7	7.6	1.31%
Chromium	0.05	0.002	0.002	NC							0.0002	0.0002	NC	0.0005	0.0004	22.22%
Cobalt																
COD		16	12	28.57%	12	9	28.57%	11	5		9	13	36.36%	5	5	NC
Conductivity (µS/cm)		1160	1170	0.86%	1100	1110	0.90%	1030	1040	0.97%	342	343	0.29%	317	318	0.31%
Copper	1	0.0038	0.0034	11.11%							0.0001	0.0001	NC	0.0002	0.0002	NC
DOC	5	5.4	5.7	5.41%	4.8	4.7	2.11%	4.2	4.1	2.41%	2.5	2.2	12.77%	1.3	1.2	8.00%
Fluoride	1.5															
Hardness (as CaCO3)	80-100															
Iron	0.3	0.005	0.005	NC	0.005	0.005	NC	0.005	0.005	NC	0.005	0.005	NC	0.005	0.005	NC
Lead	0.01	0.00002	0.00002	NC							0.02	0.02	NC	0.02	0.02	NC
Magnesium		41.1	41.3	0.49%	41.6	39.7	4.67%	34.7	34.3	1.16%	11.3	11.3	NC	11.5	11.6	0.87%
Manganese	0.05	0.687	0.693	0.87%							0.007	0.006	15.38%	0.001	0.001	NC
Mercury	0.001	0.00002	0.00002	NC							0.00002	0.00002	NC	0.00002	0.00002	NC
Molybdenum																
Nickel																
N-NO3 (Nitrate)	10	23.1	23.2	0.43%	21.6	21.6	NC	7.47	7.46	0.13%	0.05	0.05	NC	8.23	8.1	1.59%
N-NO2 (Nitrite)	1	0.05	0.05	NC							0.05	0.05	NC	0.05	0.05	NC
Organic Nitrogen	0.15															
pH (pH units)	6.5-8.5	7.83	7.81	0.26%	7.68	7.72	0.52%	7.71	7.78	0.90%	8.05	8.09	0.50%	8.01	8.07	0.75%
Phenols		0.001	0.001	NC							0.002	0.002	NC	0.002	0.002	NC
Phosphate (as P)																
Phosphorus (total)		0.62	0.62	0.00%							0.9	0.85	5.71%	2.29	3.14	31.31%
Potassium		24.8	24.6	0.81%							2.3	2.3	NC	1.2	1.3	8.00%
Silicon																
Silver																
Sodium	200	33.4	33.4	0.00%	26.4	25	5.45%	37.6	37.2	1.07%	11.6	11.7	0.86%	4	4.1	2.47%
Strontium																
Sulphate	500	47	47	0.00%	48	48	NC	30	30	NC	26	26	NC	14	14	NC
Sulphur																
Total Sus. Solids																
TDS	500	590	579	1.88%	544	532	2.23%	553	561	1.44%	181	182	0.55%	166	167	0.60%
Temperature (°C)	15															
Thallium																
Tin																
Titanium																
TKN		6	6.1	1.65%							0.3	0.2	40.00%	0.2	0.2	NC
Vanadium																
Zinc	5	0.005	0.005	NC							0.005	0.005	NC	0.005	0.005	NC
Average RPD				**3.20%**			**4.72%**			**1.60%**			**11.82%**			**6.03%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS

Groundwater QA/QC
RPD Calculations

		BH 12	BH19 QA/QC		BH 15-D	BH18 QA/QC		BH-8	DUP		BH 12	DUP		BH 8	DUP	
Parameter	**ODWS/OG**	**Oct-19**	**Oct-19**	**RPD**	**Oct-19**	**Oct-19**	**RPD**	**May-20**	**May-20**	**RPD**	**May-20**	**May-20**	**RPD**	**Sep-20**	**Sep-20**	**RPD**
Alkalinity (as CaCO3)	30-500	425	430	1.17%	175	177	1.14%	141	141	NC	385	383	0.52%	137	137	NC
Aluminum	0.1															
N-NH3 (Ammonia)		0.39	3.8	162.77%	0.02	0.02	NC	0.01	0.01	NC	5.82	5.76	1.04%	0.01	0.01	NC
Arsenic	0.01							0.0002	0.0001	66.67%	0.0001	0.0001	NC			
Barium	1	0.239	0.261	8.80%	0.045	0.037	19.51%	0.047	0.04	16.09%	0.313	0.313	NC	0.034	0.034	NC
Beryllium																
BOD																
Boron	5	0.357	0.37	3.58%	0.014	0.014	NC	0.008	0.007	13.33%	0.313	0.314	0.32%	0.008	0.013	47.62%
Bromide																
Cadmium	0.005							0.000015	0.000015	NC	0.00006	0.000071	16.79%			
Calcium		109	115	5.36%	75.3	72.1	4.34%	60.2	60.6	0.66%	149	150	0.67%	57.5	57.4	0.17%
Chloride	250	58.4	58.4	NC	17.8	17.9	0.56%	6.9	7.2	4.26%	76.5	76.5	NC	10.2	10.2	NC
Chromium	0.05							0.001	0.001	0.00%	0.001	0.001	NC			
Cobalt																
COD		13	19	37.50%	6	6	NC	7	9	25.00%	18	14	25.00%	10	14	33.33%
Conductivity (µS/cm)		994	1033	3.85%	518	510	1.56%	381	380	0.26%	1140	1150	0.87%	401	398	0.75%
Copper	1							0.0049	0.0015	106.25%	0.0067	0.0057	16.13%			
DOC	5	6.7	6	11.02%	1.8	2	10.53%	1.1	1.1	NC	4.3	5.2	18.95%	1.8	2.9	46.81%
Fluoride	1.5															
Hardness (as CaCO3)	80-100															
Iron	0.3	0.005	0.005	NC	0.007	0.005	33.33%	0.369	0.4	8.06%	0.005	0.009	57.14%	0.005	0.02	120.00%
Lead	0.01							0.00035	0.00026	29.51%	0.00006	0.00004	40.00%			
Magnesium		35.8	36.8	2.75%	21.4	21	1.89%	13.7	14.1	2.88%	36.7	36.1	1.65%	13.5	13.5	NC
Manganese	0.05	0.09	0.123	30.99%	0.006	0.005	18.18%	0.012	0.013	8.00%	0.856	0.862	0.70%			
Mercury	0.001							0.00002	0.00002	NC	0.00002	0.00002	NC			
Molybdenum																
Nickel																
N-NO3 (Nitrate)	10	11.9	11.9	NC	3.26	3.3	1.22%	7.47	7.49	0.27%	14.4	14.4	NC	8.03	8	0.37%
N-NO2 (Nitrite)	1							0.05	0.05	0.00%	0.07	0.07	NC			
Organic Nitrogen	0.15															
pH (pH units)	6.5-8.5	7.96	7.95	0.13%	8.08	8.09	0.12%	8.11	8.08	0.37%	7.79	7.76	0.39%	8.14	7.92	2.74%
Phenols								0.002	0.002	NC	0.002	0.002	NC			
Phosphate (as P)																
Phosphorus (total)								0.47	0.6	24.30%	0.09	0.17	61.54%			
Potassium								1.5	1.5	NC	27.5	26.9	2.21%			
Silicon																
Silver																
Sodium	200	37	38.6	4.23%	6.2	6.1	1.63%	3.8	3.8	NC	35.8	35.1	1.97%	3.6	3.6	NC
Strontium																
Sulphate	500	64	64	NC	42	42	NC	12	12	NC	32	33	3.08%	15	15	NC
Sulphur																
Total Sus. Solids																
TDS	500	584	601	2.87%	271	269	0.74%	183	184	0.54%	597	595	0.34%	183	183	NC
Temperature (°C)	15															
Thallium																
Tin																
Titanium								0.2	0.2	NC	6.2	6.2	NC			
TKN																
Vanadium																
Zinc	5							0.005	0.005	NC	0.005	0.005	NC			
Average RPD				**21.15%**			**7.29%**			**17.03%**			**13.12%**			**31.47%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS

Groundwater QA/QC
RPD Calculations

		BH 6A (deep)	DUP		BH8	DUP		BH6A (Deep)	DUP		BH8	DUP		BH12	DUP	
Parameter	**ODWS/OG**	**Sep-20**	**Sep-20**	**RPD**	**Apr-21**	**Apr-21**	**RPD**	**Apr-21**	**Apr-21**	**RPD**	**Aug-21**	**Aug-21**	**RPD**	**Sep-21**	**Sep-21**	**RPD**
Alkalinity (as CaCO3)	30-500	169	167	1.19%	143	145	1.39%	159	161	1.25%	157	159	1.27%	491	494	0.61%
Aluminum	0.1															
N-NH3 (Ammonia)		0.03	0.01	100.00%	0.01	0.01	0.00%	0.01	0.065	146.67%	0.01	0.01	0.00%	5.82	5.87	0.86%
Arsenic	0.01				0.01	0.01	0.00%	0.001	0.001	0.00%						
Barium	1	0.03	0.027	10.53%	0.1	0.1	0.00%	0.02	0.02	0.00%	0.03	0.03	0.00%	0.26	0.27	3.77%
Beryllium																
BOD											3	2	40.00%	3	4	28.57%
Boron	5	0.115	0.085	30.00%	0.1	0.1	0.00%	0.09	0.08	11.76%	0.01	0.01	0.00%	0.27	0.31	13.79%
Bromide																
Cadmium	0.005				0.001	0.001	0.00%	0.0001	0.0001	0.00%						
Calcium		49.4	44.7	9.99%	53	53	0.00%	44	43	2.30%	60	60	0.00%	156	160	2.53%
Chloride	250	23.6	23.7	0.42%	8	8	0.00%	18	18	0.00%	8	8	0.00%		96	NC
Chromium	0.05				0.01	0.01	0.00%	0.001	0.001	0.00%						
Cobalt																
COD		5	16	104.76%	5	5	0.00%	9	5	57.14%	5	5	0.00%	5	7	33.33%
Conductivity (µS/cm)		455	449	1.33%	372	373	0.27%	394	398	1.01%	385	385	0.00%	1310	1320	0.76%
Copper	1				0.01	0.01	0.00%	0.002	0.001	66.67%						
DOC	5	2.6	2.3	12.24%	0.6	0.9	40.00%	1.4	1.7	19.35%	1.5	1.3	14.29%	5.3	5.6	5.50%
Fluoride	1.5															
Hardness (as CaCO3)	80-100															
Iron	0.3	0.099	0.107	7.77%	0.4	0.3	28.57%	0.11	0.12	8.70%	0.03	0.03	0.00%	0.03	0.03	0.00%
Lead	0.01				0.01	0.01	0.00%	0.001	0.001	0.00%						
Magnesium		14.1	13	8.12%	0.1	0.1	0.00%	0.02	0.02	0.00%	14	14	0.00%	34	35	2.90%
Manganese	0.05				11	11	0.00%	12	12	0.00%						
Mercury	0.001				0.001	0.0001	163.64%	0.0001	0.0001	0.00%						
Molybdenum																
Nickel																
N-NO3 (Nitrate)	10	0.05	0.05		6.87	6.96	1.30%	0.1	0.1	0.00%	7.42	7.58	2.13%			
N-NO2 (Nitrite)	1				0.1	0.1	0.00%	0.1	0.1	0.00%						
Organic Nitrogen	0.15															
pH (pH units)	6.5-8.5	8.04	8.01	0.37%	8.08	8.1	0.25%	8.09	8.08	0.12%	7.85	7.97	1.52%	7.4	7.45	0.67%
Phenols					0.01	0.01	0.00%	0.01	0.01	0.00%						
Phosphate (as P)																
Phosphorus (total)					0.99	1.87	61.54%	2.29	2.77	18.97%						
Potassium					1	1	0.00%	2	2	0.00%						
Silicon																
Silver																
Sodium	200	19.6	17.8	9.63%	4	4	0.00%	16	16	0.00%	4	4	0.00%	69	70	1.44%
Strontium																
Sulphate	500	22	22	NC	13	13	0.00%	21	21	0.00%	14	14	0.00%	45	45	0.00%
Sulphur																
Total Sus. Solids											1580	524	100.38%	131	163	21.77%
TDS	500	233	224	3.94%	242	242	0.00%	256	259	1.17%	250	250	0.00%			
Temperature (°C)	15															
Thallium																
Tin																
Titanium																
TKN					0.104	0.1	3.92%	0.1	0.16	46.15%						
Vanadium																
Zinc	5				0.1	0.1	0.00%	0.01	0.01	0.00%						
Average RPD				**21.45%**			**10.37%**			**13.15%**			**8.87%**			**7.77%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS

Groundwater QA/QC
RPD Calculations

		BH12	DUP		BH-15A	DUP		BH8	DUP		BH-17D	DUP		BH-10S	DUP	
Parameter	**ODWS/OG**	**May-22**	**May-22**	**RPD**	**May-22**	**May-22**	**RPD**	**Aug-22**	**Aug-22**	**RPD**	**Aug-22**	**Aug-22**	**RPD**	**Jun-23**	**Jun-23**	**RPD**
Alkalinity (as CaCO3)	30-500	403	401	0.50%	183	184	0.54%	182	184	1.09%	146	146	0.00%	174	180	3.39%
Aluminum	0.1															
N-NH3 (Ammonia)		2.59	2.57	0.78%	0.019	0.01	62.07%	0.02	0.054	91.89%	0.02	0.035	54.55%	0.02	0.091	127.93%
Arsenic	0.01	0.001	0.001	0.00%	0.001	0.001	0.00%							<0.001	<0.001	0.00%
Barium	1	0.24	0.24	0.00%	0.04	0.04	0.00%	0.04	0.04	0.00%	0.03	0.03	0.00%	0.05	0.04	22.22%
Beryllium																
BOD								1	1	0.00%	1	1	0.00%			
Boron	5	0.12	0.13	8.00%	0.01	0.01	0.00%	0.01	0.02	66.67%	0.01	0.01	0.00%	<0.01	0.01	0.00%
Bromide																
Cadmium	0.005	0.00010	0.00010	0.00%	0.00010	0.00010	0.00%							<0.0001	<0.0001	0.00%
Calcium		139	139	0.00%	68	66	2.99%	61	60	1.65%	53	53	0.00%	58	64	9.84%
Chloride	250	56	57	1.77%	14	14	0.00%	6	7	15.38%	7	7	0.00%	12	10	18.18%
Chromium	0.05	0.001	0.001	0.00%	0.001	0.001	0.00%							<0.001	<0.001	0.00%
Cobalt																
COD		5	5	0.00%	5	5	0.00%	5	5	0.00%	5	5	0.00%	<5	<5	0.00%
Conductivity (µS/cm)		979	991	1.22%	478	478	0.00%	422	421	0.24%	293	293	0.00%	311	445	35.45%
Copper	1	0.003	0.003		0.001	0.001	0.00%							0.002	0.001	66.67%
DOC	5	3.9	4.2	7.41%	1.9	1.4	30.30%	27.4	26	5.24%	21.8	21.4	1.85%	1.9	2	5.13%
Fluoride	1.5															
Hardness (as CaCO3)	80-100															
Iron	0.3	0.03	0.03	0.00%	0.03	0.03	0.00%	0.03	0.05	50.00%	0.03	0.03	0.00%	<0.03	<0.03	0.00%
Lead	0.01	0.001	0.001	0.00%	0.001	0.001	0.00%							<0.001	<0.001	0.00%
Magnesium		29	29	0.00%	18	18	0.00%	14	14	0.00%	12	12	0.00%	13	14	7.41%
Manganese	0.05	1.36	1.35	0.74%	0.02	0.02	0.00%							<0.01	<0.01	0.00%
Mercury	0.001	0.0001	0.0001	0.00%	0.0001	0.0001	0.00%							<0.0001	<0.0001	0.00%
Molybdenum																
Nickel																
N-NO3 (Nitrate)	10	18.1	18.0	0.55%	1.9	1.94	2.08%	7.81	7.79	0.26%	7.91	7.92	0.13%	8.04	11.6	36.25%
N-NO2 (Nitrite)	1	0.10	0.10	0.00%										<0.10	<0.10	0.00%
Organic Nitrogen	0.15															
pH (pH units)	6.5-8.5	7.16	7.09	0.98%	7.79	7.87	1.02%	7.86	7.91	0.63%	7.95	7.97	0.25%	7.99	7.94	0.63%
Phenols		0.001	0.001	0.00%	0.001	0.001	0.00%							<0.001	<0.001	0.00%
Phosphate (as P)																
Phosphorus (total)		0.243	0.502	69.53%	0.538	0.43	22.31%							0.594	0.588	1.02%
Potassium		14	14	0.00%	3	3	0.00%							<1	<1	0.00%
Silicon																
Silver																
Sodium	200	23	22	4.44%	6	6	0.00%	3	3	0.00%	4	4	0.00%	6	4	40.00%
Strontium																
Sulphate	500	30	30	0.00%	48	48	0.00%	13	14	7.41%	23	22	4.44%	10	15	40.00%
Sulphur																
Total Sus. Solids								498	496	0.40%	212	104	68.35%			
TDS	500	636	644	1.25%	311	311	0.00%	274	274	0.00%	190	190	0.00%	202	289	35.44%
Temperature (°C)	15															
Thallium																
Tin																
Titanium																
TKN		3.32	3.38	1.79%	0.123	0.1	20.63%							0.195	0.304	43.69%
Vanadium																
Zinc	5	0.01	0.01	0.00%	0.01	0.01	0.00%							<0.01	<0.01	0.00%
Average RPD				**3.53%**			**5.07%**			**13.38%**			**7.20%**			**17.01%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS

Groundwater QA/QC
RPD Calculations

		BH-15D	DUP		BH-16D	DUP		BH-16D	DUP	
Parameter	**ODWS/OG**	**Oct-23**	**Oct-23**	**RPD**	**Jun-24**	**Jun-24**	**RPD**	**Oct-24**	**Oct-24**	**RPD**
Alkalinity (as CaCO3)	30-500	190	177	7.08%	491	492	0.20%	475	474	0.21%
Aluminum	0.1									
N-NH3 (Ammonia)		0.025	0.022	12.77%	0.061	0.096	44.59%	<0.020	<0.020	NC
Arsenic	0.01				<0.001	<0.001	NC			
Barium	1	0.04	0.03	28.57%	0.16	0.16	0.00%	0.16	0.15	6.45%
Beryllium										
BOD		2	4	66.67%				1	<1	NC
Boron	5	0.01	0.04	120.00%	0.45	0.46	2.20%	0.42	0.34	21.05%
Bromide										
Cadmium	0.005				<0.0001	<0.0001	NC			
Calcium		59	57	3.45%	168	169	0.59%	166	164	1.21%
Chloride	250	10	11	9.52%	85	85	0.00%	83	82	1.21%
Chromium	0.05				<0.001	<0.001	NC			
Cobalt										
COD		17	38	76.36%	9	<5	NC	5	<5	NC
Conductivity (µS/cm)		323	324	0.31%	1110	1110	0.00%	1110	1090	1.82%
Copper	1				0.005	0.005				
DOC	5	6.2	5.2	17.54%	5.4	3.3	48.28%	4.5	4.6	2.20%
Fluoride	1.5									
Hardness (as CaCO3)	80-100									
Iron	0.3	0.03	0.06	66.67%	<0.001	<0.03	NC	<0.03	<0.03	NC
Lead	0.01				<0.001	<0.001	NC			
Magnesium		16	16	0.00%	40	41	2.47%	40	40	0.00%
Manganese	0.05				0.11	0.11				
Mercury	0.001				<0.0001	<0.0001				
Molybdenum										
Nickel										
N-NO3 (Nitrate)	10	1.07	1.25	15.52%	2.49	2.52	1.20%	2.61	2.59	0.77%
N-NO2 (Nitrite)	1				<0.10	<0.10	NC			
Organic Nitrogen	0.15									
pH (pH units)	6.5-8.5	7.97	7.92	0.63%	7.48	7.44	0.54%	7.69	7.54	1.97%
Phenols					<0.001	<0.001	NC			
Phosphate (as P)										
Phosphorus (total)					0.615	0.619	0.65%			
Potassium					5	5	0.00%			
Silicon										
Silver										
Sodium	200	6	5	18.18%	40	40	0.00%	37	36	2.74%
Strontium										
Sulphate	500	46	48	4.26%	37	37	0.00%	36	36	0.00%
Sulphur										
Total Sus. Solids		502	1120	76.20%				230	206	11.01%
TDS	500	210	211	0.48%	722	722	0.00%	722	708	1.96%
Temperature (°C)	15									
Thallium										
Tin										
Titanium										
TKN					0.469	0.34	31.89%	0.469	0.34	31.89%
Vanadium										
Zinc	5				<0.01	<0.01	NC	<0.01	<0.01	NC
Average RPD				**29.12%**			**7.80%**			**5.63%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Surface Water
Relative Percent Difference Calculations

Ross WDS
Surface Water QA/QC
RPD Calculations

		BLC	BLC DUP SW 2		BLC	BLC DUP SW 2	
Parameter	**PWQO**	**Apr-16**	**Apr-16**	**RPD**	**Aug-16**	**Aug-16**	**RPD**
Alkalinity (as CaCO3)	a	119	121	1.67%	134	118	12.70%
Aluminum	0.075						
N-NH3 (Ammonia)		0.01	0.01	NC	0.01	0.01	NC
N-NH3 Ammonia Unionized	0.02						
Arsenic	0.1, .005	0.0002	0.0002	0.00%	0.0003	0.0003	0.00%
Barium		0.036	0.038	5.41%	0.031	0.031	0.00%
Beryllium	b						
BOD		3	3	NC	3	3	NC
Boron	0.2	0.006	0.005	NC	0.019	0.019	0.00%
Cadmium	0.0002 c	0.00002	0.00002	NC	0.00002	0.00002	0.00%
Calcium							
Chloride		5.4	5.7	5.41%	6.2	6.3	1.60%
Chromium	0.009	0.002	0.002	NC	0.002	0.002	NC
Cobalt	0.0009						
COD		35	36	2.82%	40	40	0.00%
Conductivity (µS/cm)		298	298	0.00%	320	317	0.94%
Copper	0.005 d	0.0012	0.0013	8.00%	0.0015	0.0015	0.00%
DOC							
Fluoride							
Hardness (as CaCO3)		174	181	3.94%	166	169	1.79%
Iron	0.3	0.512	0.495	3.38%	0.338	0.273	21.28%
Lead	e	0.00027	0.00028	3.64%	0.00016	0.00015	6.45%
Magnesium							
Manganese							
Molybdenum	0.04						
Mercury	0.0002	0.00002	0.00002	NC	0.00002	0.00002	NC
Nickel	0.025						
N-NO3 (Nitrate)		2.3	2.3	0.00%	1.6	1.6	0.00%
N-NO2 (Nitrite)		0.1	0.1	NC	0.1	0.1	NC
Organic Nitrogen							
pH (pH units)		7.96	7.99	0.38%	7.92	7.85	0.89%
Phenols	0.005	0.001	0.001	NC	0.001	0.001	NC
Phosphorus (total)	0.03	0.06	0.08	28.57%	0.05	0.05	0.00%
Potassium							
Silicon							
Silver	0.0001						
Sodium							
Strontium							
Sulphate		23	23	0.00%	36	37	2.74%
Sulphur							
TDS		179	184	2.75%	196	189	3.64%
Total Sus. Solids		60	60	0.00%	15	16	6.45%
Temperature (°C)							
Thallium	0.0003						
Titanium							
TKN		0.65	0.62	4.72%	0.65	0.77	16.90%
Vanadium	0.006						
Zinc	0.03, 0.02	0.005	0.005	NC	0.005	0.005	NC
Average RPD				**4.16%**			**3.97%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS
Surface Water QA/QC
RPD Calculations

		BLC	BLC DUP SW 2		BLC	BLC DUP SW 2	
Parameter	**PWQO**	**Apr-17**	**Apr-17**	**RPD**	**May-17**	**May-17**	**RPD**
Alkalinity (as CaCO3)	a	112	111	0.90%	189	189	0.00%
Aluminum	0.075						
N-NH3 (Ammonia)		0.01	0.01	NC	0.01	0.03	NC
N-NH3 Ammonia Unionized	0.02						
Arsenic	0.1, .005	0.0002	0.0002	0.00%	0.0001	0.0001	0.00%
Barium		0.026	0.027	3.77%	0.05	0.051	1.98%
Beryllium	b						
BOD		3	3	NC	3	3	NC
Boron	0.2	0.01	0.013	26.09%	0.038	0.037	2.67%
Cadmium	0.0002 c	0.00002	0.00002	NC	0.000014	0.000014	NC
Calcium							
Chloride		7.4	7.4	0.00%	15.2	15.1	0.66%
Chromium	0.009	0.001	0.001	NC	0.001	0.001	NC
Cobalt	0.0009						
COD		23	25	8.33%	5	10	66.67%
Conductivity (µS/cm)		303	303	0.00%	500	487	2.63%
Copper	0.005 d	0.0006	0.0011	58.82%	0.0005	0.0005	0.00%
DOC							
Fluoride							
Hardness (as CaCO3)		145	149	2.72%	250	251	0.40%
Iron	0.3	0.365	0.409	11.37%	0.042	0.036	15.38%
Lead	e	0.00007	0.00009	25.00%	0.00004	0.00002	NC
Magnesium							
Manganese							
Molybdenum	0.04						
Mercury	0.0002	0.02	0.02	NC	0.02	0.02	NC
Nickel	0.025						
N-NO3 (Nitrate)		2.7	2.8	3.64%	5.72	5.68	0.70%
N-NO2 (Nitrite)		0.1	0.1	NC	0.05	0.05	NC
Organic Nitrogen							
pH (pH units)		7.92	7.99	0.88%	8.2	8.19	0.12%
Phenols	0.005	0.001	0.001	NC	0.002	0.001	NC
Phosphorus (total)	0.03	0.03	0.03	0.00%	0.02	0.02	0.00%
Potassium							
Silicon							
Silver	0.0001						
Sodium							
Strontium							
Sulphate		21	21	0.00%	20	20	0.00%
Sulphur							
TDS		165	167	1.20%	249	249	0.00%
Total Sus. Solids		13	14	7.41%	3	3	NC
Temperature (^{o}C)							
Thallium	0.0003						
Titanium							
TKN		0.46	0.66	35.71%	0.6	0.5	18.18%
Vanadium	0.006						
Zinc	0.03, 0.02	0.007	0.005	NC	0.005	0.005	NC
Average RPD				**10.32%**			**6.84%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS
Surface Water QA/QC
RPD Calculations

		BLC	BLC DUP SW 3		BLC	BLC DUP SW 2	
Parameter	**PWQO**	**Oct-17**	**Oct-17**	**RPD**	**Apr-18**	**Apr-18**	**RPD**
Alkalinity (as CaCO3)	a	96	93	3.17%	162	163	0.62%
Aluminum	0.075						
N-NH3 (Ammonia)		0.01	0.01	NC	0.02	0.02	NC
N-NH3 Ammonia Unionized	0.02						
Arsenic	0.1, .005	0.0003	0.0003	NC	0.0005	0.0004	22.22%
Barium		0.051	0.05	1.98%	0.051	0.048	6.06%
Beryllium	b						
BOD		3	3	NC	3	3	NC
Boron	0.2	0.017	0.018	5.71%	0.025	0.025	0.00%
Cadmium	0.0002 c	0.000078	0.000059	27.74%	0.000014	0.000014	NC
Calcium							
Chloride		8.8	8.8	0.00%	15	15.2	1.32%
Chromium	0.009	0.002	0.002	0.00%	0.002	0.002	NC
Cobalt	0.0009						
COD		24	24	0.00%	11	11	0.00%
Conductivity (µS/cm)		257	252	1.96%	464	465	0.22%
Copper	0.005 d	0.0047	0.0049	4.17%	0.0008	0.0008	0.00%
DOC							
Fluoride							
Hardness (as CaCO3)		132	132	0.00%	223	221	0.90%
Iron	0.3	1.91	1.84	3.73%	0.319	0.284	11.61%
Lead	e	0.00105	0.00097	7.92%	0.00013	0.00011	16.67%
Magnesium							
Manganese							
Molybdenum	0.04						
Mercury	0.0002	0.00002	0.00002	NC	0.00002	0.00002	NC
Nickel	0.025						
N-NO3 (Nitrate)		0.78	0.77	1.29%	6.78	6.84	0.88%
N-NO2 (Nitrite)		0.05	0.05	NC	0.05	0.05	NC
Organic Nitrogen							
pH (pH units)		7.95	7.91	0.50%	8.04	8.14	1.24%
Phenols	0.005	0.001	0.001	NC	0.001	0.001	NC
Phosphorus (total)	0.03	0.13	0.13	0.00%	0.04	0.04	0.00%
Potassium							
Silicon							
Silver	0.0001						
Sodium							
Strontium							
Sulphate		10	10	0.00%	19	19	0.00%
Sulphur							
TDS		135	133	1.49%	225	225	0.00%
Total Sus. Solids		139	100	32.64%	12	11	8.70%
Temperature (°C)							
Thallium	0.0003						
Titanium							
TKN		1	1.1	9.52%	0.5	0.5	0.00%
Vanadium	0.006						
Zinc	0.03, 0.02	0.028	0.025	11.32%	0.017	0.012	34.48%
Average RPD				**5.66%**			**5.52%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS
Surface Water QA/QC
RPD Calculations

		BLC	BLC DUP SW 2		BLC	BLC DUP SW 2	
Parameter	**PWQO**	**Aug-18**	**Aug-18**	**RPD**	**Sep-18**	**Sep-18**	**RPD**
Alkalinity (as CaCO3)	a	69	73	5.63%	161	159	1.25%
Aluminum	0.075						
N-NH3 (Ammonia)		0.06	0.06	NC	0.01	0.01	
N-NH3 Ammonia Unionized	0.02						
Arsenic	0.1, .005	0.001	0.0009	10.53%	0.0002	0.0002	NC
Barium		0.102	0.097	5.03%	0.051	0.053	3.85%
Beryllium	b						
BOD		3	3	NC	3	3	NC
Boron	0.2	0.034	0.033	2.99%	0.293	0.101	97.46%
Cadmium	0.0002 c	0.000326	0.00024	30.39%	0.000036	0.000025	36.07%
Calcium					68.2	69.1	1.31%
Chloride		12.5	12.5	NC	14.8	14.8	NC
Chromium	0.009	0.009	0.007	25.00%	0.001	0.002	
Cobalt	0.0009						
COD		226	210	7.34%	6	6	NC
Conductivity (µS/cm)		262	264	0.76%	457	458	0.22%
Copper	0.005 d	0.0135	0.0106	24.07%	0.0051	0.0007	151.72%
DOC							
Fluoride							
Hardness (as CaCO3)		156	155	0.64%	235	239	1.69%
Iron	0.3	4.7	3.63	25.69%	0.125	0.164	26.99%
Lead	e	0.00426	0.00407	4.56%	0.00045	0.00011	121.43%
Magnesium					15.8	16	1.26%
Manganese							
Molybdenum	0.04						
Mercury	0.0002	0.00002	0.00002	NC	0.00002	0.00002	NC
Nickel	0.025						
N-NO3 (Nitrate)		0.86	0.86	NC	6.55	6.55	NC
N-NO2 (Nitrite)		0.05	0.05	NC	0.05	0.05	NC
Organic Nitrogen							
pH (pH units)		7.76	7.73	0.39%	8.42	8.41	0.12%
Phenols	0.005	0.006	0.004	40.00%	0.002	0.002	NC
Phosphorus (total)	0.03	0.51	0.47	8.16%	0.02	0.03	40.00%
Potassium							
Silicon							
Silver	0.0001						
Sodium							
Strontium							
Sulphate		31	31	NC	21	21	NC
Sulphur							
TDS		156	157	0.64%	228	228	NC
Total Sus. Solids		316	312	1.27%	10	4	85.71%
Temperature (°C)							
Thallium	0.0003						
Titanium							
TKN		4.4	4.2	4.65%	0.3	0.4	28.57%
Vanadium	0.006						
Zinc	0.03, 0.02	0.042	0.039	7.41%	0.012	0.017	34.48%
Average RPD				**10.80%**			**39.51%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS
Surface Water QA/QC
RPD Calculations

		BLC	BLC DUP SW 2		BLC	BLC DUP SW 2	
Parameter	**PWQO**	**Oct-18**	**Oct-18**	**RPD**	**Apr-19**	**Apr-19**	**RPD**
Alkalinity (as CaCO3)	a	115	114	0.87%	79	98	21%
Aluminum	0.075						
N-NH3 (Ammonia)		0.16	0.11	37.04%	0.05	0.04	22%
N-NH3 Ammonia Unionized	0.02						
Arsenic	0.1, .005	0.0003	0.0003	NC	0.0002	0.0002	NC
Barium		0.062	0.058	6.67%	0.021	0.022	5%
Beryllium	b						
BOD		3	3	NC	3	3	NC
Boron	0.2	0.013	0.011	16.67%	0.015	0.016	6%
Cadmium	0.0002 c	0.000051	0.000069	30.00%	0.000015	0.00002	29%
Calcium		56.3	56.4	0.18%			
Chloride		17.4	17.4	NC	9	9	NC
Chromium	0.009	0.002	0.002	NC	0.002	0.001	67%
Cobalt	0.0009						
COD		48	51	6.06%	24	26	8%
Conductivity (µS/cm)		365	366	0.27%	231	232	0%
Copper	0.005 d	0.0053	0.0068	24.79%	0.0016	0.0016	NC
DOC							
Fluoride							
Hardness (as CaCO3)		198	197	0.51%	102	106	4%
Iron	0.3	1.58	1.53	3.22%	0.383	0.391	2%
Lead	e	0.00088	0.00088	NC	0.00023	0.00022	4%
Magnesium		13.9	13.7	1.45%			
Manganese							
Molybdenum	0.04						
Mercury	0.0002	0.00002	0.00002	NC	0.00002	0.00002	NC
Nickel	0.025						
N-NO3 (Nitrate)		1.9	1.89	0.53%	1.57	1.59	1%
N-NO2 (Nitrite)		0.05	0.05	NC	0.05	0.05	NC
Organic Nitrogen							
pH (pH units)		8.05	8.06	0.12%	7.9	7.86	1%
Phenols	0.005	0.002	0.002	NC	0.002	0.002	NC
Phosphorus (total)	0.03	0.12	0.13	8.00%	0.05	0.05	NC
Potassium							
Silicon							
Silver	0.0001						
Sodium							
Strontium							
Sulphate		29	29	NC	12	12	NC
Sulphur							
TDS		199	198	0.50%	113	126	11%
Total Sus. Solids		75	80	6.45%	42	10	123%
Temperature (°C)							
Thallium	0.0003						
Titanium							
TKN		1.2	1.2	NC	0.7	0.6	15%
Vanadium	0.006						
Zinc	0.03, 0.02	0.039	0.025	43.75%	0.006	0.009	40%
Average RPD				**10.39%**			**21%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS
Surface Water QA/QC
RPD Calculations

		BLC	BLC DUP SW 2		BLC	BLC DUP SW 2	
Parameter	**PWQO**	**Jun-19**	**Jun-19**	**RPD**	**Oct-19**	**Oct-19**	**RPD**
Alkalinity (as CaCO3)	a	157	160	2%	111	112	1%
Aluminum	0.075						
N-NH3 (Ammonia)		0.05	0.05	NC	0.03	0.08	91%
N-NH3 Ammonia Unionized	0.02						
Arsenic	0.1, .005	0.0002	0.0002	NC	0.0002	0.0002	NC
Barium		0.045	0.045	NC	0.036	0.036	NC
Beryllium	b						
BOD		3	3	NC	3	3	NC
Boron	0.2	0.027	0.027	NC	0.016	0.015	6%
Cadmium	0.0002 c	0.000024	0.000023	4%	0.000015	0.000015	NC
Calcium					52.8	53.3	1%
Chloride		14.9	14.6	2%	13	13.1	1%
Chromium	0.009	0.001	0.001	NC	0.001	0.001	NC
Cobalt	0.0009						
COD		25	27	8%	27	19	35%
Conductivity (µS/cm)		433	431	0%	395	400	1%
Copper	0.005 d	0.0015	0.0014	7%	0.0008	0.0008	NC
DOC							
Fluoride							
Hardness (as CaCO3)		226	225	0%	184	184	NC
Iron	0.3	0.335	0.299	11%	0.146	0.145	1%
Lead	e	0.00028	0.00025	11%	0.00039	0.00005	155%
Magnesium					12.6	12.4	2%
Manganese							
Molybdenum	0.04						
Mercury	0.0002	0.00002	0.00002	NC	0.00002	0.00002	NC
Nickel	0.025						
N-NO3 (Nitrate)		4.8	4.75	1%	3	2.94	2%
N-NO2 (Nitrite)		0.05	0.05	NC	0.05	0.05	NC
Organic Nitrogen							
pH (pH units)		8.21	8.14	1%	7.94	8	1%
Phenols	0.005	0.002	0.002	NC	0.002	0.002	NC
Phosphorus (total)	0.03	0.05	0.05	NC	0.02	0.02	NC
Potassium							
Silicon							
Silver	0.0001						
Sodium							
Strontium							
Sulphate		20	20	NC	50	49	2%
Sulphur							
TDS		222	223	0%	205	204	0%
Total Sus. Solids		44	32	32%	5	3	50%
Temperature (°C)							
Thallium	0.0003						
Titanium							
TKN		0.8	0.8	NC	0.5	0.6	18%
Vanadium	0.006						
Zinc	0.03, 0.02	0.006	0.007	15%	0.013	0.012	8%
Average RPD				**7%**			**22%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS
Surface Water QA/QC
RPD Calculations

		BLC	BLC DUP SW 2		SW#1	DUP	
Parameter	**PWQO**	**Oct-19**	**Oct-19**	**RPD**	**May-20**	**May-20**	**RPD**
Alkalinity (as CaCO3)	a	151	175	15%	208	167	22%
Aluminum	0.075						
N-NH3 (Ammonia)		0.14	0.01	173%	0.01	0.01	NC
N-NH3 Ammonia Unionized	0.02						
Arsenic	0.1, .005	0.0001	0.0001	NC	0.0001	0.0001	NC
Barium		0.037	0.036	3%	0.077	0.057	30%
Beryllium	b						
BOD		3	3	NC	3	3	NC
Boron	0.2	0.015	0.014	7%	0.04	0.022	58%
Cadmium	0.0002 c	0.000015	0.000015	NC	0.000015	0.000015	NC
Calcium		60.3	59.3	2%			
Chloride		12.5	12.6	1%	24.7	16.4	40%
Chromium	0.009	0.001	0.001	NC	0.001	0.001	NC
Cobalt	0.0009						
COD		9	6	40%	5	5	NC
Conductivity (µS/cm)		452	451	0%	581	475	20%
Copper	0.005 d	0.0005	0.0004	22%	0.0004	0.0004	NC
DOC							
Fluoride							
Hardness (as CaCO3)		211	207	2%	313	257	20%
Iron	0.3	0.059	0.065	10%	0.033	0.055	50%
Lead	e	0.00002	0.00002	NC	0.00004	0.00002	67%
Magnesium		14.7	14.4	2%			
Manganese							
Molybdenum	0.04						
Mercury	0.0002	0.00002	0.00002	NC	0.00002	0.00002	NC
Nickel	0.025						
N-NO3 (Nitrate)		5.78	5.79	0%	7.16	6.08	16%
N-NO2 (Nitrite)		0.05	0.05	NC	0.05	0.05	NC
Organic Nitrogen							
pH (pH units)		8.09	8.14	1%	8.23	8.25	NC
Phenols	0.005	0.002	0.002	NC	0.002	0.002	NC
Phosphorus (total)	0.03	0.01	0.01	NC	0.02	0.01	67%
Potassium							
Silicon							
Silver	0.0001						
Sodium							
Strontium							
Sulphate		29	29	NC	25	24	4%
Sulphur							
TDS		218	230	5%	305	246	21%
Total Sus. Solids		3	3	NC	3	3	NC
Temperature (°C)							
Thallium	0.0003						
Titanium							
TKN		0.5	0.4	22%	0.3	0.3	NC
Vanadium	0.006						
Zinc	0.03, 0.02	0.005	0.005	NC	0.005	0.007	33%
Average RPD				**19%**			**34%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS
Surface Water QA/QC
RPD Calculations

		SW#1	DUP		SW#1	DUP	
Parameter	**PWQO**	**May-20**	**May-20**	**RPD**	**Aug-20**	**Aug-20**	**RPD**
Alkalinity (as CaCO3)	a	216	167	26%	190	157	19%
Aluminum	0.075						
N-NH3 (Ammonia)		0.09	0.01	160%	0.01	0.01	NC
N-NH3 Ammonia Unionized	0.02						
Arsenic	0.1, .005	0.0002	0.0001	67%	0.0002	0.0002	NC
Barium		0.072	0.053	30%	0.059	0.062	5%
Beryllium	b						
BOD		3	3	NC	3	3	NC
Boron	0.2	0.122	0.108	12%	0.028	0.108	118%
Cadmium	0.0002 c	0.000045	0.000015	100%	0.000015	0.000016	6%
Calcium							
Chloride		23.4	14.8	45%	18	12	40%
Chromium	0.009	0.09	0.001	196%	0.001	0.001	NC
Cobalt	0.0009						
COD		14	13	7%	8	17	72%
Conductivity (µS/cm)		569	442	25%	524	442	17%
Copper	0.005 d	0.0024	0.0005	131%	0.0004	0.001	86%
DOC							
Fluoride							
Hardness (as CaCO3)		285	237	18%	264	252	5%
Iron	0.3	0.079	0.099	22%	0.03	0.5	177%
Lead	e	0.0006	0.00004	175%	0.0001	0.00027	92%
Magnesium							
Manganese							
Molybdenum	0.04						
Mercury	0.0002	0.00002	0.00002	NC	0.00002	0.00002	NC
Nickel	0.025						
N-NO3 (Nitrate)		6.28	4.95	24%	6.9	6.3	9%
N-NO2 (Nitrite)		0.05	0.05	NC	0.05	0.05	NC
Organic Nitrogen							
pH (pH units)		8.02	8.14	1%	8.13	8.25	1%
Phenols	0.005	0.002	0.002	NC	0.002	0.002	NC
Phosphorus (total)	0.03	0.04	0.02	67%	0.06	0.06	NC
Potassium							
Silicon							
Silver	0.0001						
Sodium							
Strontium							
Sulphate		23	23	NC	18	25	33%
Sulphur							
TDS		295	234	23%	260	232	11%
Total Sus. Solids		3	3	NC	3	21	150%
Temperature (°C)							
Thallium	0.0003						
Titanium							
TKN		0.7	0.8	13%	0.4	0.7	55%
Vanadium	0.006						
Zinc	0.03, 0.02	0.009	0.014	43%	0.005	0.018	113%
Average RPD				**59%**			**56%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS
Surface Water QA/QC
RPD Calculations

		SW#1	DUP		No Dup Collected		
Parameter	**PWQO**	**Sep-20**	**Sep-20**	**RPD**	**Apr-21**	**Apr-21**	**RPD**
Alkalinity (as CaCO3)	a	200	150	29%			
Aluminum	0.075						
N-NH3 (Ammonia)		0.01	0.01	NC			
N-NH3 Ammonia Unionized	0.02						
Arsenic	0.1, .005	0.0001	0.0002	67%			
Barium		0.055	0.039	34%			
Beryllium	b						
BOD		3	3	NC			
Boron	0.2	0.026	0.017	42%			
Cadmium	0.0002 c	0.000015	0.000015	NC			
Calcium							
Chloride		18.2	11.8	43%			
Chromium	0.009	0.001	0.001	NC			
Cobalt	0.0009						
COD		9	16	56%			
Conductivity (µS/cm)		526	419	23%			
Copper	0.005 d	0.0004	0.0006	40%			
DOC							
Fluoride							
Hardness (as CaCO3)		268	218	21%			
Iron	0.3	0.023	0.159	149%			
Lead	e	0.00003	0.00007	80%			
Magnesium							
Manganese							
Molybdenum	0.04						
Mercury	0.0002	0.00002	0.00002	NC			
Nickel	0.025						
N-NO3 (Nitrate)		7.59	5.5	32%			
N-NO2 (Nitrite)		0.05	0.05	NC			
Organic Nitrogen							
pH (pH units)		7.99	8.05	1%			
Phenols	0.005	0.002	0.002	NC			
Phosphorus (total)	0.03	0.05	0.07	33%			
Potassium							
Silicon							
Silver	0.0001						
Sodium							
Strontium							
Sulphate		19	28	38%			
Sulphur							
TDS		267	217	21%			
Total Sus. Solids		3	6	67%			
Temperature (^{o}C)							
Thallium	0.0003						
Titanium							
TKN		0.3	0.5	50%			
Vanadium	0.006						
Zinc	0.03, 0.02	0.054	0.013	122%			
Average RPD				**50%**			

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS
Surface Water QA/QC
RPD Calculations

		SW#1	DUP	RDP	BLC	DUP	RDP
Parameter	**PWQO**	**Aug-21**	**Aug-21**	**RPD**	**Sep-21**	**Sep-21**	**RPD**
Alkalinity (as CaCO3)	a	214	215	0%	112	111	1%
Aluminum	0.075						
N-NH3 (Ammonia)		0.02	0.02	0%	0.02	0.02	0%
N-NH3 Ammonia Unionized	0.02						
Arsenic	0.1, .005	0.001	0.001	0%	0.001	0.001	0%
Barium		0.05	0.05	0%	0.04	0.04	0%
Beryllium	b						
BOD		4	3	29%	1	1	0%
Boron	0.2	0.03	0.03	0%	0.02	0.02	0%
Cadmium	0.0002 c	0.0001	0.0001	0%	0.0001	0.0001	0%
Calcium		72	72	0%	60	60	0%
Chloride		16	16	0%	13	13	0%
Chromium	0.009	0.001	0.001	0%	0.001	0.001	0%
Cobalt	0.0009						
COD		5	5	0%	16	20	22%
Conductivity (µS/cm)		507	511	1%	322	320	1%
Copper	0.005 d	0.001	0.001	0%	0.001	0.001	0%
DOC							
Fluoride							
Hardness (as CaCO3)		246	246	0%	207	207	0%
Iron	0.3	0.03	0.03	0%	0.09	0.09	0%
Lead	e	0.001	0.001	0%	0.001	0.001	0%
Magnesium		16	16	0%	14	14	0%
Manganese							
Molybdenum	0.04						
Mercury	0.0002	0.0001	0.0001	0%	0.0001	0.0001	0%
Nickel	0.025						
N-NO3 (Nitrate)		7.94	7.76	2%	2.39	2.36	1%
N-NO2 (Nitrite)		0.1	0.1	0%	0.1	0.1	0%
Organic Nitrogen							
pH (pH units)		8.05	8.03	0%	7.72	7.69	0%
Phenols	0.005	0.001	0.001	0%	0.002	0.002	0%
Phosphorus (total)	0.03	0.014	0.014	0%	0.024	0.026	8%
Potassium							
Silicon							
Silver	0.0001						
Sodium							
Strontium							
Sulphate		18	18	0%	79	79	0%
Sulphur							
TDS		330	332	1%	209	208	0%
Total Sus. Solids		23	5	129%	2	2	0%
Temperature (°C)							
Thallium	0.0003						
Titanium							
TKN		0.258	0.182	35%	0.568	0.622	9%
Vanadium	0.006						
Zinc	0.03, 0.02	0.01	0.01	0%	0.01	0.01	0%
Average RPD				**7%**			**2%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS
Surface Water QA/QC
RPD Calculations

		BLC	DUP	RDP	BLC	DUP	RDP
Parameter	**PWQO**	**Nov-21**	**Nov-21**	**RPD**	**May-22**	**May-22**	**RPD**
Alkalinity (as CaCO3)	a	156	155	1%	153	154	1%
Aluminum	0.075						
N-NH3 (Ammonia)		0.02	0.02	0%	0.036	0.021	53%
N-NH3 Ammonia Unionized	0.02						
Arsenic	0.1, .005	0.001	0.001	0%	0.001	0.001	0%
Barium		0.03	0.03	0%	0.03	0.03	0%
Beryllium	b						
BOD		1	1	0%	1	1	0%
Boron	0.2	0.02	0.02	0%	0.01	0.01	0%
Cadmium	0.0002 c	0.0001	0.0001	0%	0.0001	0.0001	0%
Calcium		61	61	0%	58	58	0%
Chloride		10	10	0%	13	13	0%
Chromium	0.009	0.001	0.001	0%	0.001	0.001	0%
Cobalt	0.0009						
COD		14	10	33%	5	5	0%
Conductivity (µS/cm)		323	322	0%	310	309	0%
Copper	0.005 d	0.001	0.001	0%	0.001	0.001	0%
DOC							
Fluoride							
Hardness (as CaCO3)		206	206	0%	198	198	0%
Iron	0.3	0.05	0.03	50%	0.05	0.05	0%
Lead	e	0.001	0.001	0%	0.001	0.001	0%
Magnesium		13	13	0%	13	13	0%
Manganese							
Molybdenum	0.04						
Mercury	0.0002	0.0001	0.0001	0%	0.0001	0.0001	0%
Nickel	0.025						
N-NO3 (Nitrate)		5.82	5.76	1%	6.51	6.58	1%
N-NO2 (Nitrite)		0.1	0.1	0%	0.1	0.1	0%
Organic Nitrogen							
pH (pH units)		8.06	8.03	0%	7.74	7.81	1%
Phenols	0.005	0.001	0.001	0%	0.001	0.001	0%
Phosphorus (total)	0.03	0.007	0.004	55%	0.003	0.004	29%
Potassium							
Silicon							
Silver	0.0001						
Sodium							
Strontium							
Sulphate		33	32	3%	31	30	3%
Sulphur							
TDS		210	209	0%	202	201	0%
Total Sus. Solids		2	8	120%	80	46	54%
Temperature (°C)							
Thallium	0.0003						
Titanium							
TKN		0.405	0.372	8%	0.362	0.511	34%
Vanadium	0.006						
Zinc	0.03, 0.02	0.01	0.01	0%	0.01	0.01	0%
Average RPD				**10%**			**6%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS
Surface Water QA/QC
RPD Calculations

		BLC	DUP	RDP	BLC	DUP	RDP
Parameter	**PWQO**	**Aug-22**	**Aug-22**	**RPD**	**Sep-22**	**Sep-22**	**RPD**
Alkalinity (as CaCO3)	a	168	152	10%	149	149	0%
Aluminum	0.075						
N-NH3 (Ammonia)		0.02	0.02	0%	0.02	0.02	0%
N-NH3 Ammonia Unionized	0.02						
Arsenic	0.1, .005	0.001	0.001	0%	0.001	0.001	0%
Barium		0.04	0.04	0%	0.04	0.04	0%
Beryllium	b						
BOD		1	4	120%	1	2	67%
Boron	0.2	0.01	0.01	0%	0.02	0.01	67%
Cadmium	0.0002 c	0.0001	0.0001	0%	0.0001	0.0001	0%
Calcium		58	47	21%	60	60	0%
Chloride		10	10	0%	12	9	29%
Chromium	0.009	0.001	0.001	0%	0.001	0.001	0%
Cobalt	0.0009						
COD		8	29	114%	9	7	25%
Conductivity (µS/cm)		306	294	4%	314	314	0%
Copper	0.005 d	0.001	0.001	0%	0.001	0.001	0%
DOC							
Fluoride							
Hardness (as CaCO3)		198	163	19%	207	207	0%
Iron	0.3	0.03	0.03	0%	0.03	0.03	0%
Lead	e	0.001	0.001	0%	0.001	0.001	0%
Magnesium		13	11	17%	14	14	0%
Manganese							
Molybdenum	0.04						
Mercury	0.0002	0.0001	0.0001	0%	0.0001	0.0001	0%
Nickel	0.025						
N-NO3 (Nitrate)		5.6	6.21	10%	5.66	5.81	3%
N-NO2 (Nitrite)		0.1	0.1	0%	0.1	0.1	0%
Organic Nitrogen							
pH (pH units)		8.03	7.99	0%	7.98	7.98	0%
Phenols	0.005	0.001	0.001	0%	0.001	0.001	0%
Phosphorus (total)	0.03	0.009	0.009	0%	0.011	0.011	0%
Potassium							
Silicon							
Silver	0.0001						
Sodium							
Strontium							
Sulphate		26	27	4%	41	40	2%
Sulphur							
TDS		199	191	4%	204	204	0%
Total Sus. Solids		2	2	0%	2	2	0%
Temperature (°C)							
Thallium	0.0003						
Titanium							
TKN		0.328	0.258	24%	0.346	0.45	26%
Vanadium	0.006						
Zinc	0.03, 0.02	0.01	0.01	0%	0.01	0.01	0%
Average RPD				**12%**			**8%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS
Surface Water QA/QC
RPD Calculations

		BLC	DUP	RDP	BLC	DUP	RDP
Parameter	**PWQO**	**May-23**	**May-23**	**RPD**	**Aug-23**	**Aug-23**	**RPD**
Alkalinity (as CaCO3)	a	107	105	2%	171	169	1%
Aluminum	0.075						
N-NH3 (Ammonia)		<0.020	<0.020	0%	0.02	0.039	64%
N-NH3 Ammonia Unionized	0.02	<0.02	<0.02	0%	<0.02	<0.02	0%
Arsenic	0.1, .005	<0.001	<0.001	0%	<0.001	<0.001	0%
Barium		0.02	0.02	0%	0.03	0.03	0%
Beryllium	b						
BOD		1	<1	0%	1	<1	0%
Boron	0.2	0.02	0.01	67%	0.01	<0.01	0%
Cadmium	0.0002 c	<0.0001	<0.0001	0%	<0.0001	<0.0001	0%
Calcium		40	38	5%	58	58	0%
Chloride		6	6	0%	9	9	0%
Chromium	0.009	<0.001	<0.001	0%	<0.001	<0.001	0%
Cobalt	0.0009						
COD		27	26	4%	20	14	35%
Conductivity (µS/cm)		238	232	3%	313	313	0%
Copper	0.005 d	<0.001	<0.001	0%	<0.001	<0.001	0%
DOC							
Fluoride							
Hardness (as CaCO3)		137	132	4%	198	198	0%
Iron	0.3	0.13	0.12	8%	0.1	0.13	26%
Lead	e	<0.001	<0.001	0%	<0.001	<0.001	0%
Magnesium		9	9	0%	13	13	0%
Manganese							
Molybdenum	0.04						
Mercury	0.0002	<0.0001	<0.0001	0%	<0.0001	<0.0001	0%
Nickel	0.025						
N-NO3 (Nitrate)		1.74	1.64	6%	5.75	5.83	1%
N-NO2 (Nitrite)		<0.10	<0.10	0%	<0.10	<0.10	0%
Organic Nitrogen							
pH (pH units)		7.86	7.8	1%	7.97	7.9	1%
Phenols	0.005	<0.001	<0.001	0%	<0.001	<0.001	0%
Phosphorus (total)	0.03	0.017	0.018	6%	0.026	0.027	4%
Potassium							
Silicon							
Silver	0.0001						
Sodium							
Strontium							
Sulphate		30	28	7%	24	25	4%
Sulphur							
TDS		155	151	3%	203	203	0%
Total Sus. Solids		2	3	40%	4	8	67%
Temperature (^{o}C)							
Thallium	0.0003						
Titanium							
TKN		0.682	1.25	59%	0.546	0.589	8%
Vanadium	0.006						
Zinc	0.03, 0.02	<0.01	<0.01	0%	<0.01	<0.01	0%
Average RPD				**7%**			**7%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Ross WDS
Surface Water QA/QC
RPD Calculations

		SW1A	DUP	RDP
Parameter	**PWQO**	**Nov-24**	**Nov-24**	**RPD**
Alkalinity (as CaCO3)	a	186	187	1%
Aluminum	0.075			
N-NH3 (Ammonia)		0.026	<0.02	NC
N-NH3 Ammonia Unionized	0.02	0.00025		
Arsenic	0.1, .005	<0.001	<0.001	NC
Barium		0.05	0.05	0%
Beryllium	b			
BOD		<1	7	NC
Boron	0.2	<0.01	<0.01	NC
Cadmium	0.0002 c	<0.0001	<0.0001	NC
Calcium		68	68	0%
Chloride		8	9	12%
Chromium	0.009	0.001	<0.001	NC
Cobalt	0.0009			
COD		41	41	0%
Conductivity (µS/cm)		326	326	0%
Copper	0.005 d	<0.001	<0.001	NC
DOC				
Fluoride				
Hardness (as CaCO3)		232	232	0%
Iron	0.3	0.09	0.08	12%
Lead	e	<0.001	<0.001	NC
Magnesium		15	15	0%
Manganese		0.03	0.03	0%
Molybdenum	0.04			
Mercury	0.0002	<0.0001	<0.0001	NC
Nickel	0.025			
N-NO3 (Nitrate)		5.62	5.55	1%
N-NO2 (Nitrite)		<0.10	<0.10	NC
Organic Nitrogen				
pH (pH units)		8.08	8.09	0%
Phenols	0.005	<0.001	<0.001	NC
Phosphorus (total)	0.03	0.029	0.032	10%
Potassium				
Silicon				
Silver	0.0001			
Sodium		5	5	0%
Strontium		0.148	0.148	0%
Sulphate		15	15	0%
Sulphur				
TDS		212	212	0%
Total Sus. Solids		6	8	29%
Temperature (^{o}C)				
Thallium	0.0003			
Titanium				
TKN		0.618	1.37	76%
Vanadium	0.006			
Zinc	0.03, 0.02	<0.01	<0.01	NC
Average RPD				**7%**

NC = Not calculated
RDP greater than 25%
RDP greater than 50%

Laboratory Certificate of Analysis

Certificate of Analysis

Client: Jp2g Consultants Inc.
12 International Dr.
Pembroke, ON
K8A 6W5
Attention: Mr. Nick Weston
PO#:
Invoice to: Jp2g Consultants Inc. (Pembroke)

Report Number: 3007837
Date Submitted: 2024-05-29
Date Reported: 2024-06-05
Project: Ross Storm Event 17-6047H
COC #: 226034

Dear Nick Weston:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL: _____
Emma-Dawn Ferguson, Chemist

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

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Certificate of Analysis

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12 International Dr.
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Report Number: 3007837
Date Submitted: 2024-05-29
Date Reported: 2024-06-05
Project: Ross Storm Event 17-6047H
COC #: 226034

Group	Analyte	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.		
					1729248 SURF W 2024-05-28 BLC	1729249 SURF W 2024-05-28 SW1A
Anions	Cl	1	mg/L		8	8
	N-NO2	0.10	mg/L		<0.10	<0.10
	N-NO3	0.10	mg/L		4.33	6.91
	SO4	1	mg/L		30	17
General Chemistry	Alkalinity as CaCO3	5	mg/L		157	179
	BOD5	1	mg/L		<1	2
	COD	5	mg/L		<5	<5
	Conductivity	5	uS/cm		310	438
	pH	1.00		6.5-8.5	7.85	7.89
	Phenols	0.001	mg/L	PWQO 0.001	<0.001	<0.001
	TDS (COND - CALC)	1	mg/L		202	285
	Total Suspended Solids	2	mg/L		<2	<2
Hardness	Hardness as CaCO3	1	mg/L		212	232
Metals	As	0.001	mg/L	PWQO 0.100	<0.001	<0.001
	B	0.01	mg/L	IPWQO 0.200	<0.01	0.01
	Ba	0.01	mg/L		0.02	0.03
	Ca	1	mg/L		62	68
	Cd	0.0001	mg/L	PWQO 0.0002	<0.0001	<0.0001
	Cr	0.001	mg/L		<0.001	<0.001
	Cu	0.001	mg/L	PWQO 0.005	<0.001	<0.001
	Fe	0.03	mg/L	PWQO 0.30	0.03	<0.03
	Hg	0.0001	mg/L		<0.0001	<0.0001
	Mg	1	mg/L		14	15
	Mn	0.01	mg/L		0.01	<0.01
	Na	1	mg/L		5	5

Guideline = PWQO - Ontario *** = Guideline Exceedence**

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Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

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Report Number: 3007837
Date Submitted: 2024-05-29
Date Reported: 2024-06-05
Project: Ross Storm Event 17-6047H
COC #: 226034

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1729248 SURF W 2024-05-28 BLC	1729249 SURF W 2024-05-28 SW1A
Metals	P	0.002	mg/L	IPWQO 0.01		0.006	0.011*
	Pb	0.001	mg/L	PWQO 0.005		<0.001	<0.001
	Sr	0.001	mg/L			0.107	0.112
	Zn	0.01	mg/L	PWQO 0.030		<0.01	<0.01
Nutrients	N-NH3	0.020	mg/L			<0.020	<0.020
	N-NH3 (unionized)	0.02	mg/L	PWQO 0.02		<0.02	<0.02
	Total Kjeldahl Nitrogen	0.100	mg/L			0.440	0.327

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 460701 **Analysis/Extraction Date** 2024-05-30 **Analyst** AaN **Method** EPA 200.8			
Arsenic	<0.001 mg/L	92	80-120
Boron (total)	<0.01 mg/L	97	80-120
Barium	<0.01 mg/L	92	80-120
Cadmium	<0.0001 mg/L	96	80-120
Chromium Total	<0.001 mg/L	102	80-120
Copper	<0.001 mg/L	104	80-120
Iron	<0.03 mg/L	95	80-120
Mercury	<0.0001 mg/L	97	80-120
Manganese	<0.01 mg/L	102	80-120
P	<0.002 mg/L	101	80-120
Lead	<0.001 mg/L	99	80-120
Strontium	<0.001 mg/L	95	80-120
Zinc	<0.01 mg/L	104	80-120
Run No 460735 **Analysis/Extraction Date** 2024-05-30 **Analyst** IP **Method** SM5530D/EPA420.2			
Phenols	<0.001 mg/L	114	50-120

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COC #: 226034

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 460757 **Analysis/Extraction Date** 2024-06-04 **Analyst** AnK **Method** SM 5210B			
BOD5	<1 mg/L	107	75-125
Run No 460758 **Analysis/Extraction Date** 2024-05-31 **Analyst** IP **Method** SM 4110			
Chloride	<1 mg/L	100	90-110
N-NO2	<0.10 mg/L	94	90-110
N-NO3	<0.10 mg/L	103	90-110
SO4	<1 mg/L	95	90-110
Run No 460799 **Analysis/Extraction Date** 2024-05-31 **Analyst** AnK **Method** C SM5220D			
COD	<5 mg/L	87	80-120
Run No 460824 **Analysis/Extraction Date** 2024-06-02 **Analyst** SKH **Method** EPA 350.1			
N-NH3	<0.020 mg/L	94	80-120
Run No 460826 **Analysis/Extraction Date** 2024-05-31 **Analyst** AsA **Method** SM2320,2510,4500H/F			
Alkalinity (CaCO3)	<5 mg/L	95	90-110
Conductivity	<5 uS/cm	100	90-110

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Report Number: 3007837
Date Submitted: 2024-05-29
Date Reported: 2024-06-05
Project: Ross Storm Event 17-6047H
COC #: 226034

QC Summary

Analyte	Blank	QC % Rec	QC Limits
pH		100	90-110
Run No 460828 **Analysis/Extraction Date** 2024-06-03 **Analyst** AET **Method** C SM4500-NH3D			
N-NH3 (unionized)			
Run No 460829 **Analysis/Extraction Date** 2024-06-03 **Analyst** IP **Method** SM 4110			
N-NO3	<0.10 mg/L	100	90-110
Run No 460880 **Analysis/Extraction Date** 2024-06-03 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	102	70-130
Run No 460917 **Analysis/Extraction Date** 2024-06-05 **Analyst** MiV **Method** C SM2540			
Total Suspended Solids	<2 mg/L	97	90-110
Run No 460929 **Analysis/Extraction Date** 2024-06-04 **Analyst** Z S **Method** M SM3120B-3500C			
Calcium	<1 mg/L	101	90-110
Magnesium	<1 mg/L	98	76-124
Sodium	<1 mg/L	99	82-118

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Client: Jp2g Consultants Inc.
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Report Number: 3007837
Date Submitted: 2024-05-29
Date Reported: 2024-06-05
Project: Ross Storm Event 17-6047H
COC #: 226034

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 460951 **Analysis/Extraction Date** 2024-06-04 **Analyst** AET **Method** C SM2340B			
Hardness as CaCO3			
TDS (COND - CALC)			

Guideline = PWQO - Ontario *** = Guideline Exceedence**

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Certificate of Analysis

Client: Jp2g Consultants Inc.
12 International Dr.
Pembroke, ON
K8A 6W5
Attention: Mr. Nick Weston
PO#:
Invoice to: Jp2g Consultants Inc. (Pembroke)

Report Number: 3008519
Date Submitted: 2024-06-19
Date Reported: 2024-06-27
Project: 17-6047H Ross
COC #: 915275

Dear Nick Weston:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL: _____
Emma-Dawn Ferguson, Chemist

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Certificate of Analysis

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Client: Jp2g Consultants Inc.
12 International Dr.
Pembroke, ON
K8A 6W5
Attention: Mr. Nick Weston
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Invoice to: Jp2g Consultants Inc. (Pembroke)

Report Number: 3008519
Date Submitted: 2024-06-19
Date Reported: 2024-06-27
Project: 17-6047H Ross
COC #: 915275

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1732247 GW 2024-06-17 BH-11S	1732248 GW 2024-06-17 BH-11D	1732249 GW 2024-06-17 BH-14S	1732250 GW 2024-06-17 BH-14D
Anions	Cl	1	mg/L	AO 250		8	7	5	7
	N-NO2	0.10	mg/L	MAC 1.0		<0.10	<0.10	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC 10.0		7.07	6.69	5.07	7.04
	SO4	1	mg/L	AO 500		20	24	18	25
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500		209	140	127	136
	COD	5	mg/L			<5	<5	6	5
	Conductivity	5	uS/cm			493	299	258	292
	DOC	0.5	mg/L	AO 5		1.1	1.2	1.5	1.1
	pH	1.00		6.5-8.5		7.74	8.00	7.83	7.80
	Phenols	0.001	mg/L			<0.001	<0.001	<0.001	<0.001
	TDS (COND - CALC)	1	mg/L	AO 500		320	194	168	190
Metals	As	0.001	mg/L	IMAC 0.01		<0.001	<0.001	<0.001	<0.001
	B	0.01	mg/L	IMAC 5.0		<0.01	<0.01	<0.01	<0.01
	Ba	0.01	mg/L	MAC 1.0		0.05	0.03	0.03	0.03
	Ca	1	mg/L			79	59	50	57
	Cd	0.0001	mg/L	MAC 0.005		<0.0001	<0.0001	<0.0001	<0.0001
	Cr	0.001	mg/L	MAC 0.05		<0.001	<0.001	<0.001	<0.001
	Cu	0.001	mg/L	AO 1		0.001	0.001	0.002	0.001
	Fe	0.03	mg/L	AO 0.3		<0.03	<0.03	<0.03	<0.03
	Hg	0.0001	mg/L	MAC 0.001		<0.0001	<0.0001	<0.0001	<0.0001
	K	1	mg/L			2	1	1	1
	Mg	1	mg/L			18	13	11	13
	Mn	0.01	mg/L	AO 0.05		<0.01	<0.01	<0.01	<0.01
	Na	1	mg/L	AO 200		4	4	3	4
	P	0.002	mg/L					0.644	

Guideline = ODWSOG *** = Guideline Exceedence**

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Report Number: 3008519
Date Submitted: 2024-06-19
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Project: 17-6047H Ross
COC #: 915275

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1732247 GW 2024-06-17 BH-11S	1732248 GW 2024-06-17 BH-11D	1732249 GW 2024-06-17 BH-14S	1732250 GW 2024-06-17 BH-14D
Metals	P	0.008	mg/L				1.78		
		0.01	mg/L			3.22			2.95
	Pb	0.001	mg/L	MAC 0.010		<0.001	<0.001	<0.001	<0.001
	Zn	0.01	mg/L	AO 5		<0.01	<0.01	<0.01	<0.01
Nutrients	N-NH3	0.020	mg/L			<0.020	0.022	0.030	0.335
	Total Kjeldahl Nitrogen	0.100	mg/L			0.315	0.244	0.261	0.186
VOCs Surrogates	1,2-dichloroethane-d4	0	%			116	119	86	89
	4-bromofluorobenzene	0	%			79	77	81	78
	Toluene-d8	0	%			96	98	110	111
Volatiles	1,4-dichlorobenzene	0.4	ug/L	MAC 5		<0.4	<0.4	<0.4	<0.4
	Benzene	0.5	ug/L	MAC 1		<0.5	<0.5	<0.5	<0.5
	Dichloromethane	4.0	ug/L	MAC 50		<4.0	<4.0	<4.0	<4.0
	Toluene	0.4	ug/L	MAC 60		<0.4	<0.4	<0.4	<0.4
	Vinyl Chloride	0.2	ug/L	MAC 1		<0.2	<0.2	<0.2	<0.2

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Client: Jp2g Consultants Inc.
12 International Dr.
Pembroke, ON
K8A 6W5
Attention: Mr. Nick Weston
PO#:
Invoice to: Jp2g Consultants Inc. (Pembroke)

Report Number: 3008519
Date Submitted: 2024-06-19
Date Reported: 2024-06-27
Project: 17-6047H Ross
COC #: 915275

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1732251 GW 2024-06-17 BH-17S	1732252 GW 2024-06-17 BH-17D	1732253 GW 2024-06-17 BH-8	1732254 GW 2024-06-17 BH-15S
Anions	Cl	1	mg/L	AO 250		7	7	7	13
	N-NO2	0.10	mg/L	MAC 1.0		<0.10	<0.10	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC 10.0		7.43	6.58	7.01	10.8*
	SO4	1	mg/L	AO 500		20	26	16	19
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500		144	135	191	215
	COD	5	mg/L			<5	6	<5	5
	Conductivity	5	uS/cm			297	296	340	534
	DOC	0.5	mg/L	AO 5		1.1	1.2	1.2	1.4
	pH	1.00		6.5-8.5		7.82	7.84	7.79	7.72
	Phenols	0.001	mg/L			<0.001	<0.001	<0.001	<0.001
	TDS (COND - CALC)	1	mg/L	AO 500		193	192	221	347
Metals	As	0.001	mg/L	IMAC 0.01		<0.001	<0.001	<0.001	<0.001
	B	0.01	mg/L	IMAC 5.0		<0.01	<0.01	<0.01	0.03
	Ba	0.01	mg/L	MAC 1.0		0.03	0.03	0.04	0.07
	Ca	1	mg/L			59	57	72	83
	Cd	0.0001	mg/L	MAC 0.005		<0.0001	<0.0001	<0.0001	<0.0001
	Cr	0.001	mg/L	MAC 0.05		<0.001	<0.001	<0.001	<0.001
	Cu	0.001	mg/L	AO 1		0.001	0.001	0.001	0.002
	Fe	0.03	mg/L	AO 0.3		<0.03	<0.03	<0.03	<0.03
	Hg	0.0001	mg/L	MAC 0.001		<0.0001	<0.0001	<0.0001	<0.0001
	K	1	mg/L			1	2	1	2
	Mg	1	mg/L			13	13	16	19
	Mn	0.01	mg/L	AO 0.05		<0.01	<0.01	<0.01	<0.01
	Na	1	mg/L	AO 200		4	4	4	7
	P	0.002	mg/L			0.110		0.388	0.401

Guideline = ODWSOG *** = Guideline Exceedence**

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Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1732251 GW 2024-06-17 BH-17S	1732252 GW 2024-06-17 BH-17D	1732253 GW 2024-06-17 BH-8	1732254 GW 2024-06-17 BH-15S
Metals	P	0.01	mg/L				3.18		
	Pb	0.001	mg/L	MAC 0.010		<0.001	<0.001	<0.001	<0.001
	Zn	0.01	mg/L	AO 5		<0.01	<0.01	<0.01	<0.01
Nutrients	N-NH3	0.020	mg/L			<0.020	<0.020	<0.020	<0.020
	Total Kjeldahl Nitrogen	0.100	mg/L			<0.100	0.644	0.411	0.238
VOCs Surrogates	1,2-dichloroethane-d4	0	%			90	93	99	102
	4-bromofluorobenzene	0	%			78	73	75	74
	Toluene-d8	0	%			119	118	117	118
Volatiles	1,4-dichlorobenzene	0.4	ug/L	MAC 5		<0.4	<0.4	<0.4	<0.4
	Benzene	0.5	ug/L	MAC 1		<0.5	<0.5	<0.5	<0.5
	Dichloromethane	4.0	ug/L	MAC 50		<4.0	<4.0	<4.0	<4.0
	Toluene	0.4	ug/L	MAC 60		<0.4	<0.4	<0.4	<0.4
	Vinyl Chloride	0.2	ug/L	MAC 1		<0.2	<0.2	<0.2	<0.2

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1732255 GW 2024-06-17 BH-15D	1732256 GW 2024-06-17 BH-16S	1732257 GW 2024-06-17 BH-16D	1732258 GW 2024-06-18 BH-13S
Anions	Cl	1	mg/L	AO 250		11	87	85	3
	N-NO2	0.10	mg/L	MAC 1.0		<0.10	<0.10	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC 10.0		1.16	5.31	2.49	0.92
	SO4	1	mg/L	AO 500		49	39	37	5
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500		162	426	491	56
	COD	5	mg/L			5	10	9	<5

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Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1732255 GW 2024-06-17 BH-15D	1732256 GW 2024-06-17 BH-16S	1732257 GW 2024-06-17 BH-16D	1732258 GW 2024-06-18 BH-13S
General Chemistry	Conductivity	5	uS/cm			323	1050	1110	115
	DOC	0.5	mg/L	AO 5		1.3	3.7	5.4*	1.0
	pH	1.00		6.5-8.5		7.83	7.56	7.48	7.21
	Phenols	0.001	mg/L			<0.001	<0.001	<0.001	<0.001
	TDS (COND - CALC)	1	mg/L	AO 500		210	682*	722*	75
Metals	As	0.001	mg/L	IMAC 0.01		<0.001	<0.001	<0.001	<0.001
	B	0.01	mg/L	IMAC 5.0		0.01	0.36	0.45	<0.01
	Ba	0.01	mg/L	MAC 1.0		0.03	0.17	0.16	<0.01
	Ca	1	mg/L			62	160	168	18
	Cd	0.0001	mg/L	MAC 0.005		<0.0001	<0.0001	<0.0001	<0.0001
	Cr	0.001	mg/L	MAC 0.05		<0.001	<0.001	<0.001	<0.001
	Cu	0.001	mg/L	AO 1		0.001	0.005	0.005	0.001
	Fe	0.03	mg/L	AO 0.3		<0.03	<0.03	<0.03	<0.03
	Hg	0.0001	mg/L	MAC 0.001		<0.0001	<0.0001	<0.0001	<0.0001
	K	1	mg/L			3	6	5	<1
	Mg	1	mg/L			16	36	40	5
	Mn	0.01	mg/L	AO 0.05		0.02	0.06*	0.11*	<0.01
	Na	1	mg/L	AO 200		5	35	40	4
	P	0.002	mg/L			0.545	0.272	0.615	
		0.02	mg/L						5.90
	Pb	0.001	mg/L	MAC 0.010		<0.001	<0.001	<0.001	<0.001
	Zn	0.01	mg/L	AO 5		<0.01	<0.01	<0.01	<0.01
Nutrients	N-NH3	0.020	mg/L			0.035	<0.020	0.061	0.098
	Total Kjeldahl Nitrogen	0.100	mg/L			0.265	1.16	0.469	0.204
VOCs Surrogates	1,2-dichloroethane-d4	0	%			89	95	98	100

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Group	Analyte	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.			
					1732255 GW 2024-06-17 BH-15D	1732256 GW 2024-06-17 BH-16S	1732257 GW 2024-06-17 BH-16D	1732258 GW 2024-06-18 BH-13S
VOCs Surrogates	4-bromofluorobenzene	0	%		76	78	72	75
	Toluene-d8	0	%		112	114	95	116
Volatiles	1,4-dichlorobenzene	0.4	ug/L	MAC 5	<0.4	<0.4	<0.4	<0.4
	Benzene	0.5	ug/L	MAC 1	<0.5	<0.5	<0.5	<0.5
	Dichloromethane	4.0	ug/L	MAC 50	<4.0	<4.0	6.7	<4.0
	Toluene	0.4	ug/L	MAC 60	<0.4	<0.4	<0.4	<0.4
	Vinyl Chloride	0.2	ug/L	MAC 1	<0.2	<0.2	<0.2	<0.2

Group	Analyte	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.			
					1732259 GW 2024-06-18 BH-13D	1732260 GW 2024-06-18 BH-7S	1732261 GW 2024-06-18 BH-7D	1732262 GW 2024-06-18 BH-6S
Anions	Cl	1	mg/L	AO 250	12	37	25	107
	N-NO2	0.10	mg/L	MAC 1.0	<0.10	<0.10	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC 10.0	9.31	13.5*	14.0*	<0.10
	SO4	1	mg/L	AO 500	19	42	33	18
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500	214	381	292	473
	COD	5	mg/L		<5	9	93	59
	Conductivity	5	uS/cm		524	929	758	1220
	DOC	0.5	mg/L	AO 5	1.0	2.1	1.5	19.6*
	pH	1.00		6.5-8.5	7.77	7.36	7.56	7.39
	Phenols	0.001	mg/L		<0.001	<0.001	<0.001	<0.001
	TDS (COND - CALC)	1	mg/L	AO 500	341	604*	493	793*
Metals	As	0.001	mg/L	IMAC 0.01	<0.001	<0.001	<0.001	<0.001

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Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1732259 GW 2024-06-18 BH-13D	1732260 GW 2024-06-18 BH-7S	1732261 GW 2024-06-18 BH-7D	1732262 GW 2024-06-18 BH-6S
Metals	B	0.01	mg/L	IMAC 5.0		0.03	0.13	0.11	
		0.02	mg/L	IMAC 5.0					1.89
	Ba	0.01	mg/L	MAC 1.0		0.07	0.15	0.12	0.45
	Ca	1	mg/L			80	150	115	95
	Cd	0.0001	mg/L	MAC 0.005		<0.0001	<0.0001	<0.0001	<0.0001
	Cr	0.001	mg/L	MAC 0.05		<0.001	<0.001	<0.001	0.001
	Cu	0.001	mg/L	AO 1		0.001	0.003	0.002	0.007
	Fe	0.03	mg/L	AO 0.3		<0.03	<0.03	<0.03	5.18*
	Hg	0.0001	mg/L	MAC 0.001		<0.0001	<0.0001	<0.0001	<0.0001
	K	1	mg/L			2	9	6	17
	Mg	1	mg/L			19	30	26	36
	Mn	0.01	mg/L	AO 0.05		<0.01	0.97*	0.45*	0.62*
	Na	1	mg/L	AO 200		7	18	15	104
	P	0.002	mg/L			0.890	0.172	0.421	0.410
	Pb	0.001	mg/L	MAC 0.010		<0.001	<0.001	<0.001	<0.001
	Zn	0.01	mg/L	AO 5		<0.01	<0.01	<0.01	<0.01
Nutrients	N-NH3	0.020	mg/L			0.021	1.49	0.386	17.2
	Total Kjeldahl Nitrogen	0.100	mg/L			0.331	2.00	0.415	22.4
VOCs Surrogates	1,2-dichloroethane-d4	0	%			87	101	104	96
	4-bromofluorobenzene	0	%			78	74	73	75
	Toluene-d8	0	%			108	117	118	113
Volatiles	1,4-dichlorobenzene	0.4	ug/L	MAC 5		<0.4	<0.4	<0.4	1.4
	Benzene	0.5	ug/L	MAC 1		<0.5	<0.5	<0.5	0.7
	Dichloromethane	4.0	ug/L	MAC 50		<4.0	<4.0	<4.0	<4.0
	Toluene	0.4	ug/L	MAC 60		<0.4	<0.4	<0.4	<0.4

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					1732259 GW 2024-06-18 BH-13D	1732260 GW 2024-06-18 BH-7S	1732261 GW 2024-06-18 BH-7D	1732262 GW 2024-06-18 BH-6S
Volatiles	Vinyl Chloride	0.2	ug/L	MAC 1	<0.2	<0.2	<0.2	<0.2

Group	Analyte	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.			
					1732263 GW 2024-06-18 BH-6D	1732264 GW 2024-06-18 BH-10S	1732265 GW 2024-06-18 BH-10M	1732266 GW 2024-06-18 BH-10D
Anions	Cl	1	mg/L	AO 250	16	8	9	9
	N-NO2	0.10	mg/L	MAC 1.0	<0.10	<0.10	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC 10.0	<0.10	7.36	10.0	11.9*
	SO4	1	mg/L	AO 500	23	11	16	17
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500	141	153	172	169
	COD	5	mg/L		<5	<5	<5	<5
	Conductivity	5	uS/cm		274	301	337	341
	DOC	0.5	mg/L	AO 5	1.1	0.8	0.8	0.9
	pH	1.00		6.5-8.5	7.69	7.75	7.76	7.78
	Phenols	0.001	mg/L		<0.001	<0.001	<0.001	<0.001
	TDS (COND - CALC)	1	mg/L	AO 500	178	196	219	222
Metals	As	0.001	mg/L	IMAC 0.01	<0.001	<0.001	<0.001	<0.001
	B	0.01	mg/L	IMAC 5.0	0.10	<0.01	<0.01	<0.01
	Ba	0.01	mg/L	MAC 1.0	0.03	0.03	0.04	0.04
	Ca	1	mg/L		44	60	69	70
	Cd	0.0001	mg/L	MAC 0.005	<0.0001	<0.0001	<0.0001	<0.0001
	Cr	0.001	mg/L	MAC 0.05	<0.001	<0.001	<0.001	<0.001
	Cu	0.001	mg/L	AO 1	<0.001	0.002	0.001	0.001

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Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1732263 GW 2024-06-18 BH-6D	1732264 GW 2024-06-18 BH-10S	1732265 GW 2024-06-18 BH-10M	1732266 GW 2024-06-18 BH-10D
Metals	Fe	0.03	mg/L	AO 0.3		0.08	<0.03	<0.03	<0.03
	Hg	0.0001	mg/L	MAC 0.001		<0.0001	<0.0001	<0.0001	<0.0001
	K	1	mg/L			2	1	1	1
	Mg	1	mg/L			12	12	15	15
	Mn	0.01	mg/L	AO 0.05		0.02	<0.01	<0.01	<0.01
	Na	1	mg/L	AO 200		13	5	4	4
	P	0.002	mg/L			0.558	0.366	0.161	0.261
	Pb	0.001	mg/L	MAC 0.010		<0.001	<0.001	<0.001	<0.001
	Zn	0.01	mg/L	AO 5		<0.01	<0.01	<0.01	<0.01
Nutrients	N-NH3	0.020	mg/L			0.024	0.045	<0.020	<0.020
	Total Kjeldahl Nitrogen	0.100	mg/L			0.207	0.258	0.173	0.379
VOCs Surrogates	1,2-dichloroethane-d4	0	%			101	104	100	108
	4-bromofluorobenzene	0	%			73	75	73	71
	Toluene-d8	0	%			120	122	120	112
Volatiles	1,4-dichlorobenzene	0.4	ug/L	MAC 5		<0.4	<0.4	<0.4	<0.4
	Benzene	0.5	ug/L	MAC 1		<0.5	<0.5	<0.5	<0.5
	Dichloromethane	4.0	ug/L	MAC 50		<4.0	<4.0	<4.0	<4.0
	Toluene	0.4	ug/L	MAC 60		<0.4	<0.4	<0.4	<0.4
	Vinyl Chloride	0.2	ug/L	MAC 1		<0.2	<0.2	<0.2	<0.2

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Group	Analyte	MRL	Units	Guideline	Lab I.D. / Sample Matrix / Sample Type / Sampling Date / Sample I.D.			
					1732267 GW 2024-06-18 BH-12	1732268 GW 2024-06-18 BH-4S	1732269 GW 2024-06-18 BH-4D	1732270 GW 2024-06-18 BH-9S
Anions	Cl	1	mg/L	AO 250	42	23	47	100
	N-NO2	0.10	mg/L	MAC 1.0	<0.10	<0.10	<0.10	<0.10
	N-NO3	0.10	mg/L	MAC 10.0	13.7*	15.3*	12.9*	0.18
	SO4	1	mg/L	AO 500	29	26	36	32
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500	368	273	366	456
	COD	5	mg/L		6	<5	9	10
	Conductivity	5	uS/cm		900	714	916	1110
	DOC	0.5	mg/L	AO 5	1.9	1.4	1.9	3.2
	pH	1.00		6.5-8.5	7.40	7.59	7.52	7.27
	Phenols	0.001	mg/L		<0.001	<0.001	<0.001	<0.001
	TDS (COND - CALC)	1	mg/L	AO 500	585*	464	595*	722*
Metals	As	0.001	mg/L	IMAC 0.01	<0.001	<0.001	<0.001	<0.001
	B	0.01	mg/L	IMAC 5.0	0.09	0.05	0.25	0.41
	Ba	0.01	mg/L	MAC 1.0	0.16	0.09	0.13	0.23
	Ca	1	mg/L		142	113	141	159
	Cd	0.0001	mg/L	MAC 0.005	<0.0001	<0.0001	<0.0001	<0.0001
	Cr	0.001	mg/L	MAC 0.05	<0.001	<0.001	<0.001	<0.001
	Cu	0.001	mg/L	AO 1	0.003	0.002	0.003	0.005
	Fe	0.03	mg/L	AO 0.3	<0.03	<0.03	<0.03	0.73*
	Hg	0.0001	mg/L	MAC 0.001	<0.0001	<0.0001	<0.0001	<0.0001
	K	1	mg/L		8	3	4	9
	Mg	1	mg/L		27	25	32	32
	Mn	0.01	mg/L	AO 0.05	1.29*	<0.01	0.09*	4.00*
	Na	1	mg/L	AO 200	21	10	26	47
	P	0.002	mg/L		0.729	0.046		

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Certificate of Analysis

eurofins | Environment Testing

Client: Jp2g Consultants Inc.
12 International Dr.
Pembroke, ON
K8A 6W5
Attention: Mr. Nick Weston
PO#:
Invoice to: Jp2g Consultants Inc. (Pembroke)

Report Number: 3008519
Date Submitted: 2024-06-19
Date Reported: 2024-06-27
Project: 17-6047H Ross
COC #: 915275

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1732267 GW 2024-06-18 BH-12	1732268 GW 2024-06-18 BH-4S	1732269 GW 2024-06-18 BH-4D	1732270 GW 2024-06-18 BH-9S
Metals	P	0.004	mg/L					1.06	
		0.04	mg/L						7.01
	Pb	0.001	mg/L	MAC 0.010		<0.001	<0.001	<0.001	<0.001
	Zn	0.01	mg/L	AO 5		<0.01	<0.01	<0.01	<0.01
Nutrients	N-NH3	0.020	mg/L			1.00	<0.020	0.023	2.10
	Total Kjeldahl Nitrogen	0.100	mg/L			1.18	<0.100	0.472	2.47
VOCs Surrogates	1,2-dichloroethane-d4	0	%			102	110	100	104
	4-bromofluorobenzene	0	%			77	75	74	71
	Toluene-d8	0	%			121	116	121	115
Volatiles	1,4-dichlorobenzene	0.4	ug/L	MAC 5		<0.4	<0.4	<0.4	<0.4
	Benzene	0.5	ug/L	MAC 1		<0.5	<0.5	<0.5	<0.5
	Dichloromethane	4.0	ug/L	MAC 50		<4.0	<4.0	<4.0	<4.0
	Toluene	0.4	ug/L	MAC 60		<0.4	<0.4	<0.4	<0.4
	Vinyl Chloride	0.2	ug/L	MAC 1		<0.2	<0.2	<0.2	<0.2

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Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1732271 GW 2024-06-18 BH-9D	1732272 GW 2024-06-18 BH-5	1732273 GW 2024-06-18 Dup#1	1732274 GW 2024-06-18 Trip Blank
Anions	Cl	1	mg/L	AO 250		100	411*	85	
	N-NO2	0.10	mg/L	MAC 1.0		<0.10	<0.10	<0.10	
	N-NO3	0.10	mg/L	MAC 10.0		2.63	0.13	2.52	
	SO4	1	mg/L	AO 500		33	9	37	
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500		459	1740*	492	
	COD	5	mg/L			5	334	<5	
	Conductivity	5	uS/cm			1150	4040	1110	
	DOC	0.5	mg/L	AO 5		3.2	66.1*	3.3	
	pH	1.00		6.5-8.5		7.43	7.22	7.44	
	Phenols	0.001	mg/L			<0.001	0.005	<0.001	
	TDS (COND - CALC)	1	mg/L	AO 500		748*	2630*	722*	
Metals	As	0.001	mg/L	IMAC 0.01		<0.001		<0.001	
		0.005	mg/L	IMAC 0.01			<0.005		
	B	0.01	mg/L	IMAC 5.0		0.40		0.46	
		0.1	mg/L	IMAC 5.0			5.9*		
	Ba	0.01	mg/L	MAC 1.0		0.18		0.16	
		0.05	mg/L	MAC 1.0			1.76*		
	Ca	1	mg/L			164	253	169	
	Cd	0.0001	mg/L	MAC 0.005		<0.0001		<0.0001	
		0.0005	mg/L	MAC 0.005			<0.0005		
	Cr	0.001	mg/L	MAC 0.05		<0.001		<0.001	
		0.005	mg/L	MAC 0.05			<0.005		
	Cu	0.001	mg/L	AO 1		0.005		0.005	
		0.005	mg/L	AO 1			<0.005		
	Fe	0.03	mg/L	AO 0.3		<0.03		<0.03	

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Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1732271 GW 2024-06-18 BH-9D	1732272 GW 2024-06-18 BH-5	1732273 GW 2024-06-18 Dup#1	1732274 GW 2024-06-18 Trip Blank
Metals	Fe	0.3	mg/L	AO 0.3			56.0*		
	Hg	0.0001	mg/L	MAC 0.001		<0.0001		<0.0001	
		0.0005	mg/L	MAC 0.001			<0.0005		
	K	1	mg/L			8	109	5	
	Mg	1	mg/L			33	104	41	
	Mn	0.01	mg/L	AO 0.05		2.30*		0.11*	
		0.05	mg/L	AO 0.05			0.19*		
	Na	1	mg/L	AO 200		47	435*	40	
	P	0.002	mg/L					0.619	
		0.004	mg/L			1.21			
		0.01	mg/L				0.608		
	Pb	0.001	mg/L	MAC 0.010		<0.001		<0.001	
		0.005	mg/L	MAC 0.010			<0.005		
	Zn	0.01	mg/L	AO 5		<0.01		<0.01	
		0.05	mg/L	AO 5			<0.05		
Nutrients	N-NH3	0.020	mg/L			2.71	116	0.096	
	Total Kjeldahl Nitrogen	0.100	mg/L			3.03	116	0.340	
VOCs Surrogates	1,2-dichloroethane-d4	0	%			99	84	90	93
	4-bromofluorobenzene	0	%			75	74	74	72
	Toluene-d8	0	%			116	89	127	118
Volatiles	1,1,1,2-tetrachloroethane	0.5	ug/L						<0.5
	1,1,1-trichloroethane	0.4	ug/L						<0.4
	1,1,2,2-tetrachloroethane	0.5	ug/L						<0.5
	1,1,2-trichloroethane	0.4	ug/L						<0.4
	1,1-dichloroethane	0.4	ug/L						<0.4

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Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1732271 GW 2024-06-18 BH-9D	1732272 GW 2024-06-18 BH-5	1732273 GW 2024-06-18 Dup#1	1732274 GW 2024-06-18 Trip Blank
Volatiles	1,1-dichloroethylene	0.5	ug/L	MAC 14					<0.5
	1,2-dibromoethane	0.5	ug/L						<0.5
	1,2-dichlorobenzene	0.4	ug/L	MAC 200					<0.4
	1,2-dichloroethane	0.5	ug/L	IMAC 5					<0.5
	1,2-dichloropropane	0.5	ug/L						<0.5
	1,3,5-trimethylbenzene	0.3	ug/L						<0.3
	1,3-dichlorobenzene	0.4	ug/L						<0.4
	1,4-dichlorobenzene	0.4	ug/L	MAC 5		<0.4	3.5	<0.4	<0.4
	Benzene	0.5	ug/L	MAC 1		<0.5	2.5*	<0.5	<0.5
	Bromodichloromethane	0.3	ug/L						<0.3
	Bromoform	0.4	ug/L						<0.4
	Bromomethane	0.5	ug/L						<0.5
	c-1,2-Dichloroethylene	0.4	ug/L						<0.4
	c-1,3-Dichloropropylene	0.5	ug/L						<0.5
	Carbon Tetrachloride	0.2	ug/L	MAC 2					<0.2
	Chloroethane	0.5	ug/L						<0.5
	Chloroform	0.5	ug/L						<0.5
	Chloromethane	0.2	ug/L						<0.2
	Dibromochloromethane	0.3	ug/L						<0.3
	Dichloromethane	4.0	ug/L	MAC 50		<4.0	<4.0	<4.0	<4.0
	Ethylbenzene	0.5	ug/L	MAC 140					<0.5
	m/p-xylene	0.4	ug/L						<0.4
	Monochlorobenzene	0.5	ug/L	MAC 80					<0.5
	o-xylene	0.4	ug/L						<0.4
	Styrene	0.5	ug/L						<0.5

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Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1732271 GW 2024-06-18 BH-9D	1732272 GW 2024-06-18 BH-5	1732273 GW 2024-06-18 Dup#1	1732274 GW 2024-06-18 Trip Blank
Volatiles	t-1,2-Dichloroethylene	0.4	ug/L						<0.4
	t-1,3-Dichloropropylene	0.5	ug/L						<0.5
	Tetrachloroethylene	0.3	ug/L	MAC 10					<0.3
	Toluene	0.4	ug/L	MAC 60		<0.4	<0.4	<0.4	<0.4
	Trichloroethylene	0.3	ug/L	MAC 5					<0.3
	Trichlorofluoromethane	0.5	ug/L						<0.5
	Vinyl Chloride	0.2	ug/L	MAC 1		<0.2	<0.2	<0.2	<0.2

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 461710 **Analysis/Extraction Date** 2024-06-20 **Analyst** AnK **Method** C SM5220D			
COD	<5 mg/L	107	80-120
Run No 461711 **Analysis/Extraction Date** 2024-06-20 **Analyst** AnK **Method** C SM5220D			
COD	<5 mg/L	99	80-120
Run No 461781 **Analysis/Extraction Date** 2024-06-20 **Analyst** SKH **Method** EPA 350.1			
N-NH3	<0.020 mg/L	101	80-120
Run No 461832 **Analysis/Extraction Date** 2024-06-21 **Analyst** AnK **Method** C SM5220D			
COD	<5 mg/L	100	80-120
Run No 461854 **Analysis/Extraction Date** 2024-06-21 **Analyst** AsA **Method** SM2320,2510,4500H/F			
Alkalinity (CaCO3)	<5 mg/L	100	90-110
Conductivity	<5 uS/cm	100	90-110
pH		100	90-110
Run No 461855 **Analysis/Extraction Date** 2024-06-21 **Analyst** AsA **Method** SM 5310B			

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
DOC	<0.5 mg/L	104	80-120
Run No 461872 **Analysis/Extraction Date** 2024-06-24 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	106	70-130
Run No 461926 **Analysis/Extraction Date** 2024-06-24 **Analyst** AsA **Method** SM2320,2510,4500H/F			
Alkalinity (CaCO3)	<5 mg/L	100	90-110
Conductivity	<5 uS/cm	100	90-110
pH		100	90-110
Run No 461927 **Analysis/Extraction Date** 2024-06-25 **Analyst** IP **Method** SM 4110			
Chloride	<1 mg/L	100	90-110
N-NO2	<0.10 mg/L	104	90-110
N-NO3	<0.10 mg/L	108	90-110
SO4	<1 mg/L	100	90-110
Run No 461941 **Analysis/Extraction Date** 2024-06-24 **Analyst** AsA **Method** SM 5310B			
DOC	<0.5 mg/L	104	80-120

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 461975 **Analysis/Extraction Date** 2024-06-25 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	97	70-130
Run No 461988 **Analysis/Extraction Date** 2024-06-25 **Analyst** IP **Method** SM5530D/EPA420.2			
Phenols	<0.001 mg/L	106	50-120
Run No 462000 **Analysis/Extraction Date** 2024-06-25 **Analyst** AET **Method** C SM2540			
TDS (COND - CALC)			
Run No 462030 **Analysis/Extraction Date** 2024-06-26 **Analyst** IP **Method** SM 4110			
Chloride	<1 mg/L	100	90-110
N-NO2	<0.10 mg/L	95	90-110
N-NO3	<0.10 mg/L	99	90-110
SO4	<1 mg/L	90	90-110
Run No 462053 **Analysis/Extraction Date** 2024-06-26 **Analyst** Z S **Method** M SM3120B-3500C			
Calcium	<1 mg/L	102	90-110
Potassium	<1 mg/L	102	87-113

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Magnesium	<1 mg/L	99	76-124
Sodium	<1 mg/L	101	82-118
Run No 462055 **Analysis/Extraction Date** 2024-06-26 **Analyst** MiV **Method** EPA 350.1			
N-NH3	<0.020 mg/L	101	80-120
Run No 462056 **Analysis/Extraction Date** 2024-06-26 **Analyst** AaN **Method** EPA 200.8			
Arsenic	<0.001 mg/L	100	80-120
Boron (total)	<0.01 mg/L	107	80-120
Barium	<0.01 mg/L	96	80-120
Cadmium	<0.0001 mg/L	103	80-120
Chromium Total	<0.001 mg/L	104	80-120
Copper	<0.001 mg/L	107	80-120
Iron	<0.03 mg/L	88	80-120
Mercury	<0.0001 mg/L	107	80-120
Manganese	<0.01 mg/L	104	80-120
P	<0.01 mg/L	106	80-120
Lead	<0.001 mg/L	103	80-120

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Zinc	<0.01 mg/L	109	80-120
Run No 462057 **Analysis/Extraction Date** 2024-06-26 **Analyst** AET **Method** C SM2540			
TDS (COND - CALC)			
Run No 462066 **Analysis/Extraction Date** 2024-06-26 **Analyst** AsA **Method** SM 5310B			
DOC	<0.5 mg/L	89	80-120
Run No 462144 **Analysis/Extraction Date** 2024-06-27 **Analyst** ZhL **Method** EPA 8260			
Tetrachloroethane, 1,1,1,2-	<0.5 ug/L	91	60-130
Trichloroethane, 1,1,1-	<0.4 ug/L	101	60-130
Tetrachloroethane, 1,1,2,2-	<0.5 ug/L	92	60-130
Trichloroethane, 1,1,2-	<0.4 ug/L	94	60-130
Dichloroethane, 1,1-	<0.4 ug/L	99	60-130
Dichloroethylene, 1,1-	<0.5 ug/L	100	60-130
1,2-dibromoethane			60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	95	60-130
Dichloroethane, 1,2-	<0.5 ug/L	105	60-130
Dichloropropane, 1,2-	<0.5 ug/L	91	60-130

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
1,3,5-trimethylbenzene	<0.3 ug/L	92	60-130
Dichlorobenzene, 1,3-	<0.4 ug/L	93	60-130
Dichlorobenzene, 1,4-	<0.4 ug/L	93	60-130
Benzene	<0.5 ug/L	96	60-130
Bromodichloromethane	<0.3 ug/L	94	60-130
Bromoform	<0.4 ug/L	86	60-130
Bromomethane	<0.5 ug/L	107	60-130
Dichloroethylene, 1,2-cis-	<0.4 ug/L	92	60-130
Dichloropropene,1,3-cis-	<0.5 ug/L	92	60-130
Carbon Tetrachloride	<0.2 ug/L	100	60-130
Chloroethane	<0.5 ug/L	104	60-130
Chloroform	<0.5 ug/L	102	60-130
Chloromethane	<0.2 ug/L	105	60-130
Dibromochloromethane	<0.3 ug/L	93	60-130
Methylene Chloride	<4.0 ug/L	106	60-130
Ethylbenzene	<0.5 ug/L	92	60-130
m/p-xylene	<0.4 ug/L	98	60-130
Chlorobenzene	<0.5 ug/L	94	60-130

Guideline = ODWSOG *** = Guideline Exceedence**

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

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Methods references and/or additional QA/QC information available on request.

Client: Jp2g Consultants Inc.
12 International Dr.
Pembroke, ON
K8A 6W5
Attention: Mr. Nick Weston
PO#:
Invoice to: Jp2g Consultants Inc. (Pembroke)

Report Number: 3008519
Date Submitted: 2024-06-19
Date Reported: 2024-06-27
Project: 17-6047H Ross
COC #: 915275

QC Summary

Analyte	Blank	QC % Rec	QC Limits
o-xylene	<0.4 ug/L	92	60-130
Styrene	<0.5 ug/L	95	60-130
Dichloroethylene, 1,2-trans-	<0.4 ug/L	95	60-130
Dichloropropene,1,3-trans-	<0.5 ug/L	93	60-130
Tetrachloroethylene	<0.3 ug/L	97	60-130
Toluene	<0.4 ug/L	94	60-130
Trichloroethylene	<0.3 ug/L	91	60-130
Trichlorofluoromethane	<0.5 ug/L	92	60-130
Vinyl Chloride	<0.2 ug/L	97	60-130

Guideline = ODWSOG *** = Guideline Exceedence**

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Certificate of Analysis

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Date Submitted: 2024-06-19
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Project: 17-6047H Ross
COC #: 915275

Sample Comment Summary

Sample ID: 1732248	BH-11D	Sediment not included in TKN analysis.
Sample ID: 1732250	BH-14D	Sediment not included in TKN analysis.
Sample ID: 1732257	BH-16D	Sediment not included in TKN analysis.
Sample ID: 1732258	BH-13S	Sediment not included in TKN analysis.
Sample ID: 1732261	BH-7D	Sediment not included in TKN analysis.
Sample ID: 1732270	BH-9S	Sediment not included in TKN analysis.
Sample ID: 1732271	BH-9D	Sediment not included in TKN analysis.
Sample ID: 1732272	BH-5	Sediment not included in TKN analysis.Metals MRL raised due to matrix interference.
Sample ID: 1732273	Dup#1	Sediment not included in TKN analysis.

Guideline = ODWSOG *** = Guideline Exceedence**

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Report Number: 3008514
Date Submitted: 2024-06-19
Date Reported: 2024-06-27
Project: 17-6047H Ross
COC #: 915274

Dear Nick Weston:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL: _____
Emma-Dawn Ferguson, Chemist

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: https://directory.cala.ca/.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

Certificate of Analysis

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Report Number: 3008514
Date Submitted: 2024-06-19
Date Reported: 2024-06-27
Project: 17-6047H Ross
COC #: 915274

Group	Analyte	MRL	Units	Guideline	Lab I.D. 1732240 Sample Matrix SURF W Sample Type Sampling Date 2024-06-17 Sample I.D. SW1A
Anions	Cl	1	mg/L		7
	N-NO2	0.10	mg/L		<0.10
	N-NO3	0.10	mg/L		7.90
	SO4	1	mg/L		16
General Chemistry	Alkalinity as CaCO3	5	mg/L		175
	BOD5	1	mg/L		<1
	COD	5	mg/L		38
	Conductivity	5	uS/cm		433
	pH	1.00		6.5-8.5	7.91
	Phenols	0.001	mg/L	PWQO 0.001	<0.001
	TDS (COND - CALC)	1	mg/L		281
	Total Suspended Solids	2	mg/L		14
Hardness	Hardness as CaCO3	1	mg/L		232
Metals	As	0.001	mg/L	PWQO 0.100	<0.001
	B	0.01	mg/L	IPWQO 0.200	0.01
	Ba	0.01	mg/L		0.05
	Ca	1	mg/L		68
	Cd	0.0001	mg/L	PWQO 0.0002	<0.0001
	Cr	0.001	mg/L		<0.001
	Cu	0.001	mg/L	PWQO 0.005	<0.001
	Fe	0.03	mg/L	PWQO 0.30	0.13
	Hg	0.0001	mg/L		<0.0001
	Mg	1	mg/L		15
	Mn	0.01	mg/L		0.06
	Na	1	mg/L		5

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Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. 1732240 SURF W 2024-06-17 SW1A
Metals	P	0.002	mg/L	IPWQO 0.01	0.024*
	Pb	0.001	mg/L	PWQO 0.005	<0.001
	Sr	0.001	mg/L		0.152
	Zn	0.01	mg/L	PWQO 0.030	<0.01
Nutrients	N-NH3	0.020	mg/L		<0.020
	N-NH3 (unionized)	0.02	mg/L	PWQO 0.02	<0.02
	Total Kjeldahl Nitrogen	0.100	mg/L		2.28
VOCs Surrogates	1,2-dichloroethane-d4	0	%		104
	4-bromofluorobenzene	0	%		79
	Toluene-d8	0	%		95
Volatiles	1,1,1,2-tetrachloroethane	0.5	ug/L	IPWQO 20	<0.5
	1,1,1-trichloroethane	0.4	ug/L	IPWQO 10	<0.4
	1,1,2,2-tetrachloroethane	0.5	ug/L	IPWQO 70	<0.5
	1,1,2-trichloroethane	0.4	ug/L	IPWQO 800	<0.4
	1,1-dichloroethane	0.4	ug/L	IPWQO 200	<0.4
	1,1-dichloroethylene	0.5	ug/L	IPWQO 40	<0.5
	1,2-dibromoethane	0.5	ug/L		<0.5
	1,2-dichlorobenzene	0.4	ug/L	PWQO 2.5	<0.4
	1,2-dichloroethane	0.5	ug/L	IPWQO 100	<0.5
	1,2-dichloropropane	0.5	ug/L	IPWQO 0.7	<0.5
	1,3,5-trimethylbenzene	0.3	ug/L		<0.3
	1,3-dichlorobenzene	0.4	ug/L	PWQO 2.5	<0.4
	1,4-dichlorobenzene	0.4	ug/L	PWQO 4.0	<0.4
	Benzene	0.5	ug/L	IPWQO 100	<0.5
	Bromodichloromethane	0.3	ug/L	IPWQO 200	<0.3

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12 International Dr.
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Report Number: 3008514
Date Submitted: 2024-06-19
Date Reported: 2024-06-27
Project: 17-6047H Ross
COC #: 915274

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. 1732240 SURF W 2024-06-17 SW1A
Volatiles	Bromoform	0.4	ug/L	IPWQO 60	<0.4
	Bromomethane	0.5	ug/L	IPWQO 0.9	<0.5
	c-1,2-Dichloroethylene	0.4	ug/L	IPWQO 200	<0.4
	c-1,3-Dichloropropylene	0.5	ug/L		<0.5
	Carbon Tetrachloride	0.2	ug/L		<0.2
	Chloroethane	0.5	ug/L		<0.5
	Chloroform	0.5	ug/L		<0.5
	Chloromethane	0.2	ug/L	IPWQO 700	<0.2
	Dibromochloromethane	0.3	ug/L	IPWQO 40	<0.3
	Dichlorodifluoromethane	0.5	ug/L		<0.5
	Dichloromethane	4.0	ug/L	IPWQO 100	<4.0
	Ethylbenzene	0.5	ug/L	IPWQO 8	<0.5
	m/p-xylene	0.4	ug/L	IPWQO 2	<0.4
	Monochlorobenzene	0.5	ug/L	IPWQO 15	<0.5
	o-xylene	0.4	ug/L	IPWQO 40	<0.4
	Styrene	0.5	ug/L	IPWQO 4	<0.5
	t-1,2-Dichloroethylene	0.4	ug/L	IPWQO 200	<0.4
	t-1,3-Dichloropropylene	0.5	ug/L	IPWQO 7	<0.5
	Tetrachloroethylene	0.3	ug/L	IPWQO 50	<0.3
	Toluene	0.4	ug/L	IPWQO 0.8	<0.4
	Trichloroethylene	0.3	ug/L	IPWQO 20	<0.3
	Trichlorofluoromethane	0.5	ug/L		<0.5
	Vinyl Chloride	0.2	ug/L	IPWQO 600	<0.2
	Xylene; total	0.5	ug/L		<0.5

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12 International Dr.
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K8A 6W5
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Invoice to: Jp2g Consultants Inc. (Pembroke)

Report Number: 3008514
Date Submitted: 2024-06-19
Date Reported: 2024-06-27
Project: 17-6047H Ross
COC #: 915274

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 461710 **Analysis/Extraction Date** 2024-06-20 **Analyst** AnK **Method** C SM5220D			
COD	<5 mg/L	107	80-120
Run No 461781 **Analysis/Extraction Date** 2024-06-20 **Analyst** SKH **Method** EPA 350.1			
N-NH3	<0.020 mg/L	101	80-120
Run No 461851 **Analysis/Extraction Date** 2024-06-24 **Analyst** MiV **Method** C SM2540			
Total Suspended Solids	<2 mg/L	90	90-110
Run No 461854 **Analysis/Extraction Date** 2024-06-21 **Analyst** AsA **Method** SM2320,2510,4500H/F			
Alkalinity (CaCO3)	<5 mg/L	100	90-110
Conductivity	<5 uS/cm	100	90-110
pH		100	90-110
Run No 461858 **Analysis/Extraction Date** 2024-06-24 **Analyst** IP **Method** SM 4110			
Chloride	<1 mg/L	100	90-110
N-NO2	<0.10 mg/L	96	90-110
SO4	<1 mg/L	90	90-110

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 461872 **Analysis/Extraction Date** 2024-06-24 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	106	70-130
Run No 461899 **Analysis/Extraction Date** 2024-06-24 **Analyst** AaN **Method** EPA 200.8			
Arsenic	<0.001 mg/L	96	80-120
Boron (total)	<0.01 mg/L	116	80-120
Barium	<0.01 mg/L	104	80-120
Cadmium	<0.0001 mg/L	109	80-120
Chromium Total	<0.001 mg/L	107	80-120
Copper	<0.001 mg/L	112	80-120
Iron	<0.03 mg/L	96	80-120
Manganese	<0.01 mg/L	113	80-120
P	<0.002 mg/L	109	80-120
Lead	<0.001 mg/L	114	80-120
Strontium	<0.001 mg/L	106	80-120
Zinc	<0.01 mg/L	115	80-120
Run No 461908 **Analysis/Extraction Date** 2024-06-24 **Analyst** AET **Method** C SM4500-NH3D			

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
N-NH3 (unionized)			
Run No 461927 **Analysis/Extraction Date** 2024-06-25 **Analyst** IP **Method** SM 4110			
N-NO3	<0.10 mg/L	108	90-110
Run No 461958 **Analysis/Extraction Date** 2024-06-25 **Analyst** AnK **Method** SM 5210B			
BOD5	<1 mg/L	100	75-125
Run No 461983 **Analysis/Extraction Date** 2024-06-25 **Analyst** AaN **Method** EPA 200.8			
Mercury	<0.0001 mg/L	100	80-120
Run No 461988 **Analysis/Extraction Date** 2024-06-25 **Analyst** IP **Method** SM5530D/EPA420.2			
Phenols	<0.001 mg/L	106	50-120
Run No 462053 **Analysis/Extraction Date** 2024-06-26 **Analyst** Z S **Method** M SM3120B-3500C			
Calcium	<1 mg/L	102	90-110
Magnesium	<1 mg/L	99	76-124
Sodium	<1 mg/L	101	82-118

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COC #: 915274

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 462057 **Analysis/Extraction Date** 2024-06-26 **Analyst** AET **Method** C SM2340B			
Hardness as CaCO3			
TDS (COND - CALC)			
Run No 462144 **Analysis/Extraction Date** 2024-06-27 **Analyst** ZhL **Method** EPA 8260			
Tetrachloroethane, 1,1,1,2-	<0.5 ug/L	91	60-130
Trichloroethane, 1,1,1-	<0.4 ug/L	101	60-130
Tetrachloroethane, 1,1,2,2-	<0.5 ug/L	92	60-130
Trichloroethane, 1,1,2-	<0.4 ug/L	94	60-130
Dichloroethane, 1,1-	<0.4 ug/L	99	60-130
Dichloroethylene, 1,1-	<0.5 ug/L	100	60-130
1,2-dibromoethane			60-130
Dichlorobenzene, 1,2-	<0.4 ug/L	95	60-130
Dichloroethane, 1,2-	<0.5 ug/L	105	60-130
Dichloropropane, 1,2-	<0.5 ug/L	91	60-130
1,3,5-trimethylbenzene	<0.3 ug/L	92	60-130
Dichlorobenzene, 1,3-	<0.4 ug/L	93	60-130

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COC #: 915274

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Dichlorobenzene, 1,4-	<0.4 ug/L	93	60-130
Benzene	<0.5 ug/L	96	60-130
Bromodichloromethane	<0.3 ug/L	94	60-130
Bromoform	<0.4 ug/L	86	60-130
Bromomethane	<0.5 ug/L	107	60-130
Dichloroethylene, 1,2-cis-	<0.4 ug/L	92	60-130
Dichloropropene,1,3-cis-	<0.5 ug/L	92	60-130
Carbon Tetrachloride	<0.2 ug/L	100	60-130
Chloroethane	<0.5 ug/L	104	60-130
Chloroform	<0.5 ug/L	102	60-130
Chloromethane	<0.2 ug/L	105	60-130
Dibromochloromethane	<0.3 ug/L	93	60-130
Dichlorodifluoromethane	<0.5 ug/L	91	60-130
Methylene Chloride	<4.0 ug/L	106	60-130
Ethylbenzene	<0.5 ug/L	92	60-130
m/p-xylene	<0.4 ug/L	98	60-130
Chlorobenzene	<0.5 ug/L	94	60-130
o-xylene	<0.4 ug/L	92	60-130

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Styrene	<0.5 ug/L	95	60-130
Dichloroethylene, 1,2-trans-	<0.4 ug/L	95	60-130
Dichloropropene,1,3-trans-	<0.5 ug/L	93	60-130
Tetrachloroethylene	<0.3 ug/L	97	60-130
Toluene	<0.4 ug/L	94	60-130
Trichloroethylene	<0.3 ug/L	91	60-130
Trichlorofluoromethane	<0.5 ug/L	92	60-130
Vinyl Chloride	<0.2 ug/L	97	60-130
Run No 462170 **Analysis/Extraction Date** 2024-06-27 **Analyst** ZhL **Method** EPA 8260			
Xylene Mixture			

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Certificate of Analysis

Client: Jp2g Consultants Inc.
12 International Dr.
Pembroke, ON
K8A 6W5
Attention: Mr. Nick Weston
PO#:
Invoice to: Jp2g Consultants Inc. (Pembroke)

Report Number: 3012770
Date Submitted: 2024-11-22
Date Reported: 2024-11-29
Project: 17-6047H Ross (Storm Event)
COC #: 918039

Dear Nick Weston:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL: _____
Patrick Jacques, Chemist

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12 International Dr.
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Report Number: 3012770
Date Submitted: 2024-11-22
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Project: 17-6047H Ross (Storm Event)
COC #: 918039

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1752199 SURF W 2024-11-21 SW1A	1752200 SURF W 2024-11-21 BLC	1752201 SURF W 2024-11-21 DUP #1
Anions	Cl	1	mg/L			8	14	9
	N-NO2	0.10	mg/L			<0.10	<0.10	<0.10
	N-NO3	0.10	mg/L			5.62	2.55	5.55
	SO4	1	mg/L			15	35	15
General Chemistry	Alkalinity as CaCO3	5	mg/L			186	149	187
	BOD5	1	mg/L			<1	4	7
	COD	5	mg/L			41	21	41
	Conductivity	5	uS/cm			326	312	326
	pH	1.00		6.5-8.5		8.08	8.07	8.09
	Phenols	0.001	mg/L	PWQO 0.001		<0.001	<0.001	<0.001
	TDS (COND - CALC)	1	mg/L			212	203	212
	Total Suspended Solids	2	mg/L			6	<2	8
Hardness	Hardness as CaCO3	1	mg/L			232	203	232
Metals	As	0.001	mg/L	PWQO 0.100		<0.001	<0.001	<0.001
	B	0.01	mg/L	IPWQO 0.200		<0.01	<0.01	<0.01
	Ba	0.01	mg/L			0.05	0.04	0.05
	Ca	1	mg/L			68	60	68
	Cd	0.0001	mg/L	PWQO 0.0002		<0.0001	<0.0001	<0.0001
	Cr	0.001	mg/L			0.001	0.005	<0.001
	Cu	0.001	mg/L	PWQO 0.005		<0.001	<0.001	<0.001
	Fe	0.03	mg/L	PWQO 0.30		0.09	0.12	0.08
	Hg	0.0001	mg/L			<0.0001	<0.0001	<0.0001
	Mg	1	mg/L			15	13	15
	Mn	0.01	mg/L			0.03	0.02	0.03
	Na	1	mg/L			5	6	5

Guideline = PWQO - Ontario *** = Guideline Exceedence**

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Certificate of Analysis

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12 International Dr.
Pembroke, ON
K8A 6W5
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Report Number: 3012770
Date Submitted: 2024-11-22
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Project: 17-6047H Ross (Storm Event)
COC #: 918039

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1752199 SURF W 2024-11-21 SW1A	1752200 SURF W 2024-11-21 BLC	1752201 SURF W 2024-11-21 DUP #1
Metals	P	0.002	mg/L	IPWQO 0.01		0.029*	0.024*	0.032*
	Pb	0.001	mg/L	PWQO 0.005		<0.001	<0.001	<0.001
	Sr	0.001	mg/L			0.148	0.140	0.148
	Zn	0.01	mg/L	PWQO 0.030		<0.01	<0.01	<0.01
Nutrients	N-NH3	0.020	mg/L			0.026	0.023	<0.020
	N-NH3 (unionized)	0.02	mg/L	PWQO 0.02		<0.02	<0.02	<0.02
	Total Kjeldahl Nitrogen	0.100	mg/L			0.618	0.446	1.37

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 469111 **Analysis/Extraction Date** 2024-11-28 **Analyst** AnK **Method** SM 5210B			
BOD5	<1 mg/L	91	75-125
Run No 469114 **Analysis/Extraction Date** 2024-11-23 **Analyst** AnK **Method** C SM5220D			
COD	<5 mg/L	102	80-120
Run No 469204 **Analysis/Extraction Date** 2024-11-27 **Analyst** IP **Method** SM 4110			
Chloride	<1 mg/L	100	90-110
N-NO2	<0.10 mg/L	103	90-110
N-NO3	<0.10 mg/L	104	90-110
SO4	<1 mg/L	95	90-110
Run No 469238 **Analysis/Extraction Date** 2024-11-26 **Analyst** SKH **Method** EPA 350.1			
N-NH3	<0.020 mg/L	112	80-120
Run No 469241 **Analysis/Extraction Date** 2024-11-26 **Analyst** SKH **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	128	70-130

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COC #: 918039

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 469285 **Analysis/Extraction Date** 2024-11-27 **Analyst** AaN **Method** EPA 200.8			
Arsenic	<0.001 mg/L	98	80-120
Boron (total)	<0.01 mg/L	100	80-120
Barium	<0.01 mg/L	93	80-120
Cadmium	<0.0001 mg/L	98	80-120
Chromium Total	<0.001 mg/L	105	80-120
Copper	<0.001 mg/L	103	80-120
Iron	<0.03 mg/L	95	80-120
Mercury	<0.0001 mg/L	91	80-120
Manganese	<0.01 mg/L	99	80-120
P	<0.002 mg/L	104	80-120
Lead	<0.001 mg/L	104	80-120
Strontium	<0.001 mg/L	94	80-120
Zinc	<0.01 mg/L	104	80-120
Run No 469334 **Analysis/Extraction Date** 2024-11-27 **Analyst** AsA **Method** SM2320,2510,4500H/F			
Alkalinity (CaCO3)	<5 mg/L	98	90-110

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Conductivity	<5 uS/cm	99	90-110
pH		100	90-110
Run No 469338 **Analysis/Extraction Date** 2024-11-28 **Analyst** IP **Method** SM 4110			
N-NO3	<0.10 mg/L	107	90-110
Run No 469344 **Analysis/Extraction Date** 2024-11-29 **Analyst** SKH **Method** C SM2540			
Total Suspended Solids	<2 mg/L	95	90-110
Run No 469352 **Analysis/Extraction Date** 2024-11-28 **Analyst** IP **Method** SM5530D/EPA420.2			
Phenols	<0.001 mg/L	107	50-120
Run No 469353 **Analysis/Extraction Date** 2024-11-28 **Analyst** Z S **Method** M SM3120B-3500C			
Calcium	<1 mg/L	99	90-110
Magnesium	<1 mg/L	95	76-124
Sodium	<1 mg/L	103	82-118
Run No 469371 **Analysis/Extraction Date** 2024-11-28 **Analyst** SKH **Method** C SM4500-NH3D			
N-NH3 (unionized)			

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COC #: 918039

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 469372 **Analysis/Extraction Date** 2024-11-28 **Analyst** SKH **Method** C SM2340B			
Hardness as CaCO3			
TDS (COND - CALC)			

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Report Number: 3012770
Date Submitted: 2024-11-22
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Project: 17-6047H Ross (Storm Event)
COC #: 918039

Sample Comment Summary

Sample ID: 1752199 SW1A Sediments not included for metals analysis for all samples on this report.

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12 International Dr.
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K8A 6W5
Attention: Mr. Nick Weston
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Invoice to: Jp2g Consultants Inc. (Pembroke)

Report Number: 3011956
Date Submitted: 2024-10-24
Date Reported: 2024-10-31
Project: 17-6047H Ross
COC #: 917154

Dear Nick Weston:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL: _____
Patrick Jacques, Organics Technician

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Report Number: 3011956
Date Submitted: 2024-10-24
Date Reported: 2024-10-31
Project: 17-6047H Ross
COC #: 917154

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1747979 GW 2024-10-22 BH-11S	1747980 GW 2024-10-22 BH-11D	1747981 GW 2024-10-22 BH-14S	1747982 GW 2024-10-22 BH-14D
Anions	Cl	1	mg/L	AO 250		7	7	5	8
	N-NO3	0.10	mg/L	MAC 10.0		7.37	7.24	5.91	8.00
	SO4	1	mg/L	AO 500		19	22	15	22
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500		192	150	126	135
	BOD5	1	mg/L			1	2	1	<1
	COD	5	mg/L			<5	<5	<5	<5
	Conductivity	5	uS/cm			445	296	256	289
	DOC	0.5	mg/L	AO 5		1.1	1.0	1.2	1.1
	pH	1.00		6.5-8.5		7.89	7.93	7.89	7.89
	TDS (COND - CALC)	1	mg/L	AO 500		289	192	166	188
	Total Suspended Solids	2	mg/L			903	942	656	298
Metals	B	0.01	mg/L	IMAC 5.0		<0.01	<0.01	<0.01	<0.01
	Ba	0.01	mg/L	MAC 1.0		0.05	0.04	0.03	0.03
	Ca	1	mg/L			73	60	50	57
	Fe	0.03	mg/L	AO 0.3		<0.03	0.06	<0.03	<0.03
	Mg	1	mg/L			16	13	11	13
	Na	1	mg/L	AO 200		4	4	3	4
Nutrients	N-NH3	0.020	mg/L			<0.020	<0.020	<0.020	<0.020

Guideline = ODWSOG *** = Guideline Exceedence**

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Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1747983 GW 2024-10-22 BH-17S	1747984 GW 2024-10-22 BH-17D	1747985 GW 2024-10-22 BH-8	1747986 GW 2024-10-22 DUP#1
Anions	Cl	1	mg/L	AO 250		7	8	7	82
	N-NO3	0.10	mg/L	MAC 10.0		7.76	6.97	7.99	2.59
	SO4	1	mg/L	AO 500		18	24	15	36
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500		144	137	182	474
	BOD5	1	mg/L			<1	<1	<1	<1
	COD	5	mg/L			<5	<5	<5	<5
	Conductivity	5	uS/cm			293	289	428	1090
	DOC	0.5	mg/L	AO 5		1.2	1.1	1.1	4.6
	pH	1.00		6.5-8.5		7.93	7.91	7.89	7.54
	TDS (COND - CALC)	1	mg/L	AO 500		190	188	278	708*
	Total Suspended Solids	2	mg/L			45	41	123	206
Metals	B	0.01	mg/L	IMAC 5.0		<0.01	<0.01	<0.01	0.34
	Ba	0.01	mg/L	MAC 1.0		0.03	0.03	0.04	0.15
	Ca	1	mg/L			59	56	69	164
	Fe	0.03	mg/L	AO 0.3		<0.03	<0.03	<0.03	<0.03
	Mg	1	mg/L			13	13	15	40
	Na	1	mg/L	AO 200		4	4	4	36
Nutrients	N-NH3	0.020	mg/L			<0.020	<0.020	<0.020	<0.020

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Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1747987 GW 2024-10-22 BH-15S	1747988 GW 2024-10-22 BH-15D	1747989 GW 2024-10-22 BH-16S	1747990 GW 2024-10-22 BH-16D
Anions	Cl	1	mg/L	AO 250		14	10	73	83
	N-NO3	0.10	mg/L	MAC 10.0		11.1*	0.72	7.00	2.61
	SO4	1	mg/L	AO 500		17	47	34	36
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500		211	159	408	475
	BOD5	1	mg/L			<1	1	4	1
	COD	5	mg/L			<5	<5	8	5
	Conductivity	5	uS/cm			520	313	1000	1110
	DOC	0.5	mg/L	AO 5		1.2	1.0	3.5	4.5
	pH	1.00		6.5-8.5		7.79	7.94	7.68	7.69
	TDS (COND - CALC)	1	mg/L	AO 500		338	203	650*	722*
	Total Suspended Solids	2	mg/L			404	698	358	230
Metals	B	0.01	mg/L	IMAC 5.0		0.02	0.01	0.38	0.42
	Ba	0.01	mg/L	MAC 1.0		0.06	0.03	0.15	0.16
	Ca	1	mg/L			81	61	143	166
	Fe	0.03	mg/L	AO 0.3		<0.03	<0.03	<0.03	<0.03
	Mg	1	mg/L			19	16	33	40
	Na	1	mg/L	AO 200		6	5	39	37
Nutrients	N-NH3	0.020	mg/L			<0.020	<0.020	<0.020	<0.020

Guideline = ODWSOG *** = Guideline Exceedence**

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Report Number: 3011956
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Date Reported: 2024-10-31
Project: 17-6047H Ross
COC #: 917154

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1747991 GW 2024-10-22 BH-13S	1747992 GW 2024-10-22 BH-13D	1747993 GW 2024-10-22 BH-7S	1747994 GW 2024-10-22 BH-7D
Anions	Cl	1	mg/L	AO 250		14	11	32	23
	N-NO3	0.10	mg/L	MAC 10.0		8.49	9.91	15.4*	15.3*
	SO4	1	mg/L	AO 500		16	16	38	25
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500		204	183	378	279
	BOD5	1	mg/L			<1	1	<1	1
	COD	5	mg/L			<5	<5	8	19
	Conductivity	5	uS/cm			502	463	917	714
	DOC	0.5	mg/L	AO 5		1.4	1.2	3.0	1.9
	pH	1.00		6.5-8.5		7.79	7.83	7.60	7.69
	TDS (COND - CALC)	1	mg/L	AO 500		326	301	596*	464
	Total Suspended Solids	2	mg/L			795	289	33	496
Metals	B	0.01	mg/L	IMAC 5.0		0.05	0.03	0.14	0.09
	Ba	0.01	mg/L	MAC 1.0		0.03	0.06	0.15	0.11
	Ca	1	mg/L			76	71	148	109
	Fe	0.03	mg/L	AO 0.3		<0.03	<0.03	<0.03	0.60*
	Mg	1	mg/L			18	17	30	25
	Na	1	mg/L	AO 200		8	6	17	13
Nutrients	N-NH3	0.020	mg/L			<0.020	<0.020	1.18	0.027

Guideline = ODWSOG *** = Guideline Exceedence**

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Certificate of Analysis

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Client: Jp2g Consultants Inc.
12 International Dr.
Pembroke, ON
K8A 6W5
Attention: Mr. Nick Weston
PO#:
Invoice to: Jp2g Consultants Inc. (Pembroke)

Report Number: 3011956
Date Submitted: 2024-10-24
Date Reported: 2024-10-31
Project: 17-6047H Ross
COC #: 917154

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1747995 GW 2024-10-22 BH-6S	1747996 GW 2024-10-22 BH-6D	1747997 GW 2024-10-23 BH-10S	1747998 GW 2024-10-23 BH-10M
Anions	Cl	1	mg/L	AO 250		45	15	12	9
	N-NO3	0.10	mg/L	MAC 10.0		<0.10	<0.10	8.50	10.9*
	SO4	1	mg/L	AO 500		18	22	10	12
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500		232	141	170	167
	BOD5	1	mg/L			2	2	6	1
	COD	5	mg/L			21	5	68	<5
	Conductivity	5	uS/cm			590	268	424	430
	DOC	0.5	mg/L	AO 5		7.6*	1.3	1.3	1.3
	pH	1.00		6.5-8.5		7.73	7.88	7.81	7.93
	TDS (COND - CALC)	1	mg/L	AO 500		384	174	276	280
	Total Suspended Solids	2	mg/L			84	253	253	100
Metals	B	0.01	mg/L	IMAC 5.0		0.65	0.08	0.01	<0.01
	Ba	0.01	mg/L	MAC 1.0		0.10	0.02	0.03	0.04
	Ca	1	mg/L			58	43	66	68
	Fe	0.03	mg/L	AO 0.3		1.05*	0.06	0.13	<0.03
	Mg	1	mg/L			18	12	14	15
	Na	1	mg/L	AO 200		37	12	5	4
Nutrients	N-NH3	0.020	mg/L			4.02	<0.020	<0.020	<0.020

Guideline = ODWSOG *** = Guideline Exceedence**

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Project: 17-6047H Ross
COC #: 917154

Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1747999 GW 2024-10-23 BH-10D	1748000 GW 2024-10-23 BH-12	1748001 GW 2024-10-23 BH-4S	1748002 GW 2024-10-23 BH-4D
Anions	Cl	1	mg/L	AO 250		9	43	23	43
	N-NO3	0.10	mg/L	MAC 10.0		11.2*	15.4*	16.9*	15.0*
	SO4	1	mg/L	AO 500		13	25	21	28
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500		166	382	284	357
	BOD5	1	mg/L			<1	2	2	<1
	COD	5	mg/L			<5	6	<5	11
	Conductivity	5	uS/cm			436	933	727	899
	DOC	0.5	mg/L	AO 5		1.4	2.9	1.8	2.9
	pH	1.00		6.5-8.5		7.92	7.73	7.79	7.71
	TDS (COND - CALC)	1	mg/L	AO 500		283	606*	473	584*
	Total Suspended Solids	2	mg/L			258	231	45	475
Metals	B	0.01	mg/L	IMAC 5.0		<0.01	0.08	0.04	0.22
	Ba	0.01	mg/L	MAC 1.0		0.04	0.16	0.09	0.13
	Ca	1	mg/L			68	146	117	138
	Fe	0.03	mg/L	AO 0.3		<0.03	<0.03	<0.03	<0.03
	Mg	1	mg/L			15	28	26	32
	Na	1	mg/L	AO 200		4	25	9	22
Nutrients	N-NH3	0.020	mg/L			<0.020	0.776	<0.020	<0.020

Guideline = ODWSOG *** = Guideline Exceedence**

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Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D.	1748003 GW 2024-10-23 BH-9S	1748004 GW 2024-10-23 BH-9D	1748005 GW 2024-10-23 BH-5
Anions	Cl	1	mg/L	AO 250		105	107	622*
	N-NO3	0.10	mg/L	MAC 10.0		<0.10	2.18	0.28
	SO4	1	mg/L	AO 500		27	28	5
General Chemistry	Alkalinity as CaCO3	5	mg/L	OG 30-500		472	429	2010*
	BOD5	1	mg/L			5	2	20
	COD	5	mg/L			28	16	480
	Conductivity	5	uS/cm			1160	1110	4770
	DOC	0.5	mg/L	AO 5		4.4	4.3	140*
	pH	1.00		6.5-8.5		7.44	7.58	7.21
	TDS (COND - CALC)	1	mg/L	AO 500		754*	722*	3100*
	Total Suspended Solids	2	mg/L			751	86	231
Metals	B	0.01	mg/L	IMAC 5.0		0.33	0.32	
		0.1	mg/L	IMAC 5.0				9.7*
	Ba	0.01	mg/L	MAC 1.0		0.23	0.17	
		0.1	mg/L	MAC 1.0				2.0*
	Ca	1	mg/L			168	157	195
	Fe	0.03	mg/L	AO 0.3		1.00*	<0.03	
		0.1	mg/L	AO 0.3				4.4*
	Mg	1	mg/L			34	32	93
	Na	1	mg/L	AO 200		43	43	561*
Nutrients	N-NH3	0.020	mg/L			1.99	2.64	0.724

Guideline = ODWSOG *** = Guideline Exceedence**

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COC #: 917154

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 467542 **Analysis/Extraction Date** 2024-10-25 **Analyst** AnK **Method** C SM5220D			
COD	<5 mg/L	86	80-120
Run No 467543 **Analysis/Extraction Date** 2024-10-25 **Analyst** AnK **Method** C SM5220D			
COD	<5 mg/L	86	80-120
Run No 467570 **Analysis/Extraction Date** 2024-10-30 **Analyst** AnK **Method** SM 5210B			
BOD5	<1 mg/L	79	75-125
Run No 467615 **Analysis/Extraction Date** 2024-10-25 **Analyst** AsA **Method** SM 5310B			
DOC	<0.5 mg/L	101	80-120
Run No 467668 **Analysis/Extraction Date** 2024-10-28 **Analyst** MiV **Method** EPA 350.1			
N-NH3	<0.020 mg/L	106	80-120
Run No 467672 **Analysis/Extraction Date** 2024-10-29 **Analyst** IP **Method** SM 4110			
Chloride	<1 mg/L	100	90-110
N-NO3	<0.10 mg/L	104	90-110

Guideline = ODWSOG *** = Guideline Exceedence**

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MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
SO4	<1 mg/L	95	90-110
Run No 467674 **Analysis/Extraction Date** 2024-10-28 **Analyst** AsA **Method** SM 5310B			
DOC	<0.5 mg/L	102	80-120
Run No 467678 **Analysis/Extraction Date** 2024-10-28 **Analyst** AaN **Method** EPA 200.8			
Boron (total)	<0.01 mg/L	101	80-120
Barium	<0.01 mg/L	97	80-120
Iron	<0.03 mg/L	101	80-120
Run No 467689 **Analysis/Extraction Date** 2024-10-29 **Analyst** Z S **Method** M SM3120B-3500C			
Calcium	<1 mg/L	99	90-110
Magnesium	<1 mg/L	96	76-124
Sodium	<1 mg/L	104	82-118
Run No 467706 **Analysis/Extraction Date** 2024-10-29 **Analyst** AaN **Method** EPA 200.8			
Boron (total)	<0.01 mg/L	98	80-120
Barium	<0.01 mg/L	96	80-120
Iron	<0.03 mg/L	98	80-120

Guideline = ODWSOG *** = Guideline Exceedence**

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 467733 **Analysis/Extraction Date** 2024-10-29 **Analyst** AsA **Method** SM2320,2510,4500H/F			
Alkalinity (CaCO3)	<5 mg/L	99	90-110
Conductivity	<5 uS/cm	100	90-110
pH		99	90-110
Run No 467734 **Analysis/Extraction Date** 2024-10-29 **Analyst** AsA **Method** SM 5310B			
DOC	<0.5 mg/L	101	80-120
Run No 467737 **Analysis/Extraction Date** 2024-10-30 **Analyst** IP **Method** SM 4110			
Chloride	<1 mg/L	100	90-110
N-NO3	<0.10 mg/L	101	90-110
SO4	<1 mg/L	100	90-110
Run No 467739 **Analysis/Extraction Date** 2024-10-29 **Analyst** AnK **Method** C SM5220D			
COD	<5 mg/L	95	80-120
Run No 467744 **Analysis/Extraction Date** 2024-10-30 **Analyst** AnK **Method** C SM5220D			
COD	<5 mg/L	100	80-120

Guideline = ODWSOG *** = Guideline Exceedence**

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 467745 **Analysis/Extraction Date** 2024-10-30 **Analyst** AET **Method** C SM2540			
TDS (COND - CALC)			
Run No 467769 **Analysis/Extraction Date** 2024-10-30 **Analyst** AsA **Method** SM2320,2510,4500H/F			
Alkalinity (CaCO3)	<5 mg/L	97	90-110
Conductivity	<5 uS/cm	99	90-110
pH		99	90-110
Run No 467771 **Analysis/Extraction Date** 2024-10-31 **Analyst** MiV **Method** C SM2540			
Total Suspended Solids	<2 mg/L	93	90-110
Run No 467803 **Analysis/Extraction Date** 2024-10-30 **Analyst** AaN **Method** EPA 200.8			
Boron (total)	<0.1 mg/L	96	80-120
Barium	<0.1 mg/L	98	80-120
Run No 467815 **Analysis/Extraction Date** 2024-10-31 **Analyst** IP **Method** SM 4110			
Chloride	<1 mg/L	100	90-110
N-NO3	<0.10 mg/L	104	90-110

Guideline = ODWSOG *** = Guideline Exceedence**

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 467820 **Analysis/Extraction Date** 2024-10-31 **Analyst** AET **Method** C SM2540			
TDS (COND - CALC)			

Guideline = ODWSOG *** = Guideline Exceedence**

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Sample Comment Summary

Sample ID: 1748005 BH-5 Sediments not included for metals analysis. Metals MRL was raised due to matrix interference (a dilution was done).

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Report Number: 3011955
Date Submitted: 2024-10-24
Date Reported: 2024-10-31
Project: 17-6047H Ross
COC #: 917153

Dear Nick Weston:

Please find attached the analytical results for your samples. If you have any questions regarding this report, please do not hesitate to call (613-727-5692).

Report Comments:

APPROVAL: _____
Patrick Jacques, Organics Technician

All analysis is completed at Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) unless otherwise indicated.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by CALA, Canadian Association for Laboratory Accreditation to ISO/IEC 17025 for tests which appear on the scope of accreditation. The scope is available at: https://directory.cala.ca/.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is licensed by the Ontario Ministry of the Environment, Conservation, and Parks (MECP) for specific tests in drinking water (license #2318). A copy of the license is available upon request.

Eurofins Environment Testing Canada Inc. (Ottawa, Ontario) is accredited by the Ontario Ministry of Agriculture, Food, and Rural Affairs for specific tests in agricultural soils.

Please note: Field data, where presented on the report, has been provided by the client and is presented for informational purposes only. Guideline values listed on this report are provided for ease of use (informational purposes) only. Eurofins recommends consulting the official provincial or federal guideline as required. Unless otherwise stated, measurement uncertainty is not taken into account when determining guideline or regulatory exceedances.

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Report Number: 3011955
Date Submitted: 2024-10-24
Date Reported: 2024-10-31
Project: 17-6047H Ross
COC #: 917153

				Lab I.D.	1747978
				Sample Matrix	SURF W
				Sample Type	
				Sampling Date	2024-10-22
				Sample I.D.	SW1A
Group	**Analyte**	**MRL**	**Units**	**Guideline**	
Anions	Cl	1	mg/L		8
	N-NO2	0.10	mg/L		<0.10
	N-NO3	0.10	mg/L		7.35
	SO4	1	mg/L		16
General Chemistry	Alkalinity as CaCO3	5	mg/L		176
	BOD5	1	mg/L		<1
	COD	5	mg/L		14
	Conductivity	5	uS/cm		322
	pH	1.00		6.5-8.5	7.89
	Phenols	0.001	mg/L	PWQO 0.001	<0.001
	TDS (COND - CALC)	1	mg/L		209
	Total Suspended Solids	2	mg/L		47
Hardness	Hardness as CaCO3	1	mg/L		229
Metals	As	0.001	mg/L	PWQO 0.100	<0.001
	B	0.01	mg/L	IPWQO 0.200	<0.01
	Ba	0.01	mg/L		0.05
	Ca	1	mg/L		67
	Cd	0.0001	mg/L	PWQO 0.0002	<0.0001
	Cr	0.001	mg/L		<0.001
	Cu	0.001	mg/L	PWQO 0.005	<0.001
	Fe	0.03	mg/L	PWQO 0.30	0.14
	Hg	0.0001	mg/L		<0.0001
	Mg	1	mg/L		15
	Mn	0.01	mg/L		0.08
	Na	1	mg/L		4

Guideline = PWQO - Ontario *** = Guideline Exceedence**

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Group	Analyte	MRL	Units	Guideline	Lab I.D. Sample Matrix Sample Type Sampling Date Sample I.D. 1747978 SURF W 2024-10-22 SW1A
Metals	P	0.002	mg/L	IPWQO 0.01	0.019*
	Pb	0.001	mg/L	PWQO 0.005	<0.001
	Sr	0.001	mg/L		0.134
	Zn	0.01	mg/L	PWQO 0.030	<0.01
Nutrients	N-NH3	0.020	mg/L		<0.020
	N-NH3 (unionized)	0.02	mg/L	PWQO 0.02	<0.02
	Total Kjeldahl Nitrogen	0.100	mg/L		0.741

Guideline = PWQO - Ontario *** = Guideline Exceedence**

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COC #: 917153

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 467542 **Analysis/Extraction Date** 2024-10-25 **Analyst** AnK **Method** C SM5220D			
COD	<5 mg/L	86	80-120
Run No 467570 **Analysis/Extraction Date** 2024-10-30 **Analyst** AnK **Method** SM 5210B			
BOD5	<1 mg/L	79	75-125
Run No 467668 **Analysis/Extraction Date** 2024-10-28 **Analyst** MiV **Method** EPA 350.1			
N-NH3	<0.020 mg/L	106	80-120
Run No 467669 **Analysis/Extraction Date** 2024-10-28 **Analyst** MiV **Method** EPA 351.2			
Total Kjeldahl Nitrogen	<0.100 mg/L	107	70-130
Run No 467672 **Analysis/Extraction Date** 2024-10-29 **Analyst** IP **Method** SM 4110			
Chloride	<1 mg/L	100	90-110
N-NO2	<0.10 mg/L	102	90-110
SO4	<1 mg/L	95	90-110
Run No 467678 **Analysis/Extraction Date** 2024-10-28 **Analyst** AaN **Method** EPA 200.8			

Guideline = PWQO - Ontario *** = Guideline Exceedence**

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12 International Dr.
Pembroke, ON
K8A 6W5
Attention: Mr. Nick Weston
PO#:
Invoice to: Jp2g Consultants Inc. (Pembroke)

Report Number: 3011955
Date Submitted: 2024-10-24
Date Reported: 2024-10-31
Project: 17-6047H Ross
COC #: 917153

QC Summary

Analyte	Blank	QC % Rec	QC Limits
Arsenic	<0.001 mg/L	96	80-120
Boron (total)	<0.01 mg/L	101	80-120
Barium	<0.01 mg/L	97	80-120
Cadmium	<0.0001 mg/L	99	80-120
Chromium Total	<0.001 mg/L	106	80-120
Copper	<0.001 mg/L	108	80-120
Iron	<0.03 mg/L	101	80-120
Mercury	<0.0001 mg/L	108	80-120
Manganese	<0.01 mg/L	106	80-120
P	<0.002 mg/L	105	80-120
Lead	<0.001 mg/L	107	80-120
Strontium	<0.001 mg/L	97	80-120
Zinc	<0.01 mg/L	109	80-120
Run No 467689 **Analysis/Extraction Date** 2024-10-29 **Analyst** Z S **Method** M SM3120B-3500C			
Calcium	<1 mg/L	99	90-110
Magnesium	<1 mg/L	96	76-124
Sodium	<1 mg/L	104	82-118

Guideline = PWQO - Ontario *** = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 467733 **Analysis/Extraction Date** 2024-10-29 **Analyst** AsA **Method** SM2320,2510,4500H/F			
Alkalinity (CaCO3)	<5 mg/L	99	90-110
Conductivity	<5 uS/cm	100	90-110
pH		99	90-110
Run No 467737 **Analysis/Extraction Date** 2024-10-30 **Analyst** IP **Method** SM 4110			
N-NO3	<0.10 mg/L	101	90-110
Run No 467745 **Analysis/Extraction Date** 2024-10-30 **Analyst** AET **Method** C SM2340B			
Hardness as CaCO3			
TDS (COND - CALC)			
Run No 467771 **Analysis/Extraction Date** 2024-10-31 **Analyst** MiV **Method** C SM2540			
Total Suspended Solids	<2 mg/L	93	90-110
Run No 467830 **Analysis/Extraction Date** 2024-10-31 **Analyst** AET **Method** C SM4500-NH3D			
N-NH3 (unionized)			

Guideline = PWQO - Ontario *** = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Certificate of Analysis

eurofins | Environment Testing

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QC Summary

Analyte	Blank	QC % Rec	QC Limits
Run No 467840 **Analysis/Extraction Date** 2024-10-31 **Analyst** IP **Method** SM5530D/EPA420.2			
Phenols	<0.001 mg/L	111	50-120

Guideline = PWQO - Ontario *** = Guideline Exceedence**

Results relate only to the parameters tested on the samples submitted.
Methods references and/or additional QA/QC information available on request.

MRL = Method Reporting Limit, AO = Aesthetic Objective, OG = Operational Guideline, MAC = Maximum Acceptable Concentration, IMAC = Interim Maximum Acceptable Concentration, STD = Standard, PWQO = Provincial Water Quality Guideline, IPWQO = Interim Provincial Water Quality Objective, TDR = Typical Desired Range

Appendix H
Landfill Gas Monitoring Results

ROSS WASTE DISPOSAL SITE
LANDFILL GAS RESULTS

Test Location	Date of Sampling Event						
	Nov-11	May-12	Oct-12	Apr-13	Oct-13	Jul-14	Sep-14
Site Office	N/G	N/G	N/G	N/G	N/G	N/G	N/G
Attendant's Shelter	N/G	N/G	N/G	N/G	N/G	N/G	N/G
Enclosed Storage	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-1	[CH_3] = 100% LEL [O_2] = 14%	[CH_3] = 100% LEL [O_2] = 13%	[CH_3] = 85% LEL [O_2] = 14.0%	[CH_3] = 100% LEL [O_2] = 14.5%	[CH_3] = > 100% LEL [O_2] = 8.0% [CO] = 15ppm	[CH_3] = 59% LEL [O_2] = 18.2%	[CH_3] = 100% LEL [O_2] = 9.0%
BH-2B (shallow)	N/G	x	N/G	N/G	N/G	N/G	N/G
BH-2A (deep)	N/G	x	N/G	N/G	N/G	N/G	N/G
BH-4A (shallow)	N/G	x	N/G	N/G	N/G	N/G	N/G
BH-4 (deep)	N/G	x	N/G	N/G	N/G	N/G	N/G
BH-5	N/G	x	[CH_3] = 2% LEL	N/G	N/G	N/G	N/G
BH-6B (shallow)	N/G	N/G	x	N/G	N/G	N/G	N/G
BH-6A (deep)	N/G	N/G	x	N/G	N/G	N/G	N/G
BH-7B (shallow)	[CO] = 16ppm [O_2] = < 14% N/G	[O_2] = 18.5% N/G	x	[O_2] = 18.8% N/G	N/G	N/G	N/G
BH-7A (deep)	N/G	N/G	x	N/G	N/G	N/G	N/G
BH-8	N/G	N/G	N/G	N/G	N/G	[CH_3] = 7 LEL [O_2] = 20% Vol N/G	N/G
BH-9B (shallow)	N/G	x	N/G	N/G	N/G	N/G	N/G
BH-9A (deep)	N/G	x	N/G	N/G	N/G	N/G	N/G
BH-10C (shallow)	N/G	x	N/G	N/G	N/G	N/G	N/G
BH-10B (mid)	N/G	x	N/G	N/G	N/G	N/G	N/G
BH-10A (deep)	N/G	x	N/G	N/G	N/G	N/G	N/G
BH-11B (shallow)	N/G	x	x	N/G	N/G	N/G	N/G
BH-11A (deep)	N/G	x	x	N/G	N/G	N/G	N/G
BH-12	N/G	x	[CH_3] = 6% LEL	N/G	N/G	N/G	N/G
BH-13B(shallow)	N/G	N/G	x	N/G	N/G	N/G	N/G
BH-13A (deep)	N/G	N/G	x	N/G	N/G	N/G	N/G
BH-14B (shallow)	N/G	x	x	N/G	N/G	N/G	N/G
BH-14A (deep)	N/G	x	x	N/G	N/G	N/G	N/G
BH-15B (shallow)					N/G	N/G	N/G
BH-15A (deep)					N/G	N/G	N/G
BH-16B (shallow)					N/G	N/G	N/G
BH-16A (deep)					N/G	N/G	N/G
BH-17B (shallow)					N/G	N/G	N/G
BH-17A (deep)					N/G	N/G	N/G

Notes:

- X - No Sample Taken
- N/G – No landfill gas has been detected
- [O_2] – Concentration of oxygen (percent volume)
- [CO] – Concentration of carbon monoxide (parts per million)
- [CH_3] – Concentration of methane (percentage of the lower explosive limit of methane in air)
- Methane was used as an indicator for the presence of landfill gas. When it is said that there was no landfill gas detected, it refers to the methane concentrations being lower than the detectable limit.

ROSS WASTE DISPOSAL SITE
LANDFILL GAS RESULTS

Test Location	Date of Sampling Event							
	Apr-15	Sep-15	Apr-16	Sep-16	May-17	Aug-17	Apr-18	Sep-18
Site Office	N/G	N/G	N/G	N/G	X	X	N/G	N/G
Attendant's Shelter	N/G	N/G	N/G	N/G	X	X	N/G	N/G
Enclosed Storage	N/G	N/G	N/G	N/G	X	X	N/G	N/G
BH-1	$[CH_3]$ = 100% LEL $[O_2]$ =6.0%	$[CH_3]$ = 59% LEL	$[CH_3]$ = 50% LEL $[O_2]$ =19%	$[CH_3]$ = 63% LEL $[0_2]$ =19.3%	$[CH_3]$ = 26% LEL $[0_2]$ =20.2%	$[CH_3]$ = 25% LEL	N/G	$[CH_3]$ = 27% LEL $[O_2]$ = 19.8% Vol
BH-2B (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-2A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-4A (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-4 (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-5	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-6B (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-6A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-7B (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-7A (deep)	N/G	N/G	$[CH_3]$ = 7 LEL $[O_2]$ = 20% Vol N/G	N/G	[CO] = 164 ppm $[O_2]$ = 18.4% Vol	N/G $[O_2]$ = 19.1% Vol	N/G	N/G
BH-8	N/G	N/G	N/G	N/G	[CO] = 44 ppm $[O_2]$ = 18.9% Vol	[CO] = 38 ppm $[O_2]$ = 16.6% Vol	$[O_2]$ = 18% Vol	N/G
BH-9B (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-9A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-10C (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-10B (mid)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-10A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-11B (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-11A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-12	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-13B(shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-13A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-14B (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-14A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-15B (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-15A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-16B (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-16A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-17B (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-17A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G

Notes:

- X - No Sample Taken
- N/G – No landfill gas has been detected
- $[O_2]$ – Concentration of oxygen (percent volume)
- [CO] – Concentration of carbon monoxide (parts per million)
- $[CH_3]$ – Concentration of methane (percentage of the lower explosive limit of methane in air)
- Methane was used as an indicator for the presence of landfill gas. When it is said that there was no landfill gas detected, it refers to the methane concentrations being lower than the detectable limit.

ROSS WASTE DISPOSAL SITE
LANDFILL GAS RESULTS

Test Location	Date of Sampling Event							
	Jun-19	Oct-19	May-20	Sep-20	Apr-21	Aug and Sept-21	May-22	Aug-22
Site Office	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
Attendant's Shelter	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
Enclosed Storage	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-1	Decommissioned							
BH-2B (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-2A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-4A (shallow)	$[O_2]$ = 18% Vol [CO] = 124 ppm	N/G	N/G	$[O_2]$ = 20.3 %/Vol	N/G	[CO] = 7 ppm	$[CH_3]$ = 5%, [CO] = 474ppm, $[O_2]$ = 20%/Vol	N/G
BH-4 (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-5	N/G	$[O_2]$ = 19.5% Vol	N/G	N/G	N/G	N/G	N/G	N/G
BH-6B (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-6A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-7B (shallow)	N/G	N/G	N/G	$[O_2]$ = 20.2 %/Vol	N/G	N/G	N/G	N/G
BH-7A (deep)	N/G	N/G	$[CH_3]$ = 2%, [CO] = 80ppm, $[O_2]$ = 19%/Vol	[O2] = 19.3 %/Vol	N/G	N/G	N/G	N/G
BH-8	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-9B (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-9A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-10C (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-10B (mid)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-10A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-11B (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-11A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-12	N/G	N/G	N/G	N/G	N/G	$[O_2]$ = 19.1 %/Vol	N/G	$[O_2]$ = 19 %/Vol
BH-13B(shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-13A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-14B (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-14A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-15B (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-15A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-16B (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-16A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-17B (shallow)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G
BH-17A (deep)	N/G	N/G	N/G	N/G	N/G	N/G	N/G	N/G

Notes:

- X - No Sample Taken
- N/G – No landfill gas has been detected
- $[O_2]$ – Concentration of oxygen (percent volume)
- [CO] – Concentration of carbon monoxide (parts per million)
- $[CH_3]$ – Concentration of methane (percentage of the lower explosive limit of methane in air)
- Methane was used as an indicator for the presence of landfill gas. When it is said that there was no landfill gas detected, it refers to the methane concentrations being lower than the detectable limit.

ROSS WASTE DISPOSAL SITE
LANDFILL GAS RESULTS

Test Location	Date of Sampling Event		Date of Sampling Event	
	Jun-23	Oct-23	Jun-24	Oct-24
Site Office	N/G	N/G	N/G	N/G
Attendant's Shelter	N/G	N/G	N/G	N/G
Enclosed Storage	N/G	N/G	N/G	N/G
BH-1				
BH-2B (shallow)	N/G	N/G	N/G	N/G
BH-2A (deep)	N/G	N/G	N/G	N/G
BH-4A (shallow)	[CH3] = 0.5 ppm [CO] = Over Limit [O2] = 18.6%/Vol	[O2] = 18.7%/Vol	[CO] = 71ppm [O2] = 19.6%/Vol	N/G
BH-4 (deep)	N/G	N/G	N/G	N/G
BH-5	N/G	N/G	N/G	N/G
BH-6B (shallow)	N/G	N/G	N/G	N/G
BH-6A (deep)	N/G	N/G	N/G	N/G
BH-7B (shallow)	N/G	N/G	N/G	N/G
BH-7A (deep)	N/G	N/G	N/G	N/G
BH-8	N/G	N/G	N/G	N/G
BH-9B (shallow)	N/G	N/G	N/G	N/G
BH-9A (deep)	N/G	N/G	N/G	N/G
BH-10C (shallow)	N/G	N/G	N/G	N/G
BH-10B (mid)	N/G	N/G	N/G	N/G
BH-10A (deep)	N/G	N/G	N/G	N/G
BH-11B (shallow)	N/G	N/G	N/G	N/G
BH-11A (deep)	N/G	N/G	N/G	N/G
BH-12	N/G	$[O_2]$ = 18.8 %/Vol	N/G	N/G
BH-13B(shallow)	N/G	N/G	N/G	N/G
BH-13A (deep)	N/G	N/G	N/G	N/G
BH-14B (shallow)	N/G	N/G	N/G	N/G
BH-14A (deep)	N/G	N/G	N/G	N/G
BH-15B (shallow)	N/G	N/G	N/G	N/G
BH-15A (deep)	N/G	N/G	N/G	N/G
BH-16B (shallow)	N/G	N/G	N/G	N/G
BH-16A (deep)	N/G	N/G	N/G	N/G
BH-17B (shallow)	[O2] = 18.3 %/Vol	$[O_2]$ = 19.5 %/Vol	N/G	N/G
BH-17A (deep)	N/G	N/G	N/G	N/G

Notes:

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- $[O_2]$ – Concentration of oxygen (percent volume)
- [CO] – Concentration of carbon monoxide (parts per million)
- $[CH_3]$ – Concentration of methane (percentage of the lower explosive limit of methane in air)
- Methane was used as an indicator for the presence of landfill gas. When it is said that there was no landfill gas detected, it refers to the methane concentrations being lower than the detectable limit.