PATERSON GROUP

Landfill Impact Assessment

Proposed Residential Development

Spring Valley Trails
3252 Navan Road
Ottawa, Ontario

Prepared for Claridge Homes

Report PG6879-2 dated November 16, 2023

Table of Contents

PAGE

1.0 Introduction 1

2.0 Proposed Development 1

3.0 Background Information 2

4.0 Buffer Study Update 3

4.1 Introduction 3

4.2 Existing Waste Recycling and Disposal Facility 3

4.3 Local Geology 4

4.4 Surface Runoff 4

4.5 Local Groundwater Flow 5

4.6 Leachate Characteristics 5

4.7 Leachate Management and Groundwater Protection System 6

4.8 Leachate Monitoring Program 6

4.9 Landfill Gas Characteristics 7

4.10 Landfill Gas and Odour Management Systems 7

4.11 Landfill Gas Monitoring Program 8

4.12 Odour Monitoring Program 9

4.13 Odour Control Measures and Site Response Practice 10

4.14 Contaminated Soil Treatment 10

4.15 Dust Management Plan 11

4.16 Noise Control Plan 11

4.17 Ground Settlement 12

4.18 Visual Impact 12

5.0 Geotechnical Information and Long-Term Dewatering 13

6.0 Conclusion 14

7.0 Statement of Limitations 15

Appendices

Appendix 1 Government of Ontario Guidelines D-4 Standards
Navan Landfill Expansion
Claridge Homes Spring Valley Trails Development - Phase 3 – Buffer Study in Relation to the BFI Navan Waste Recycling and Disposal Facility - Report Number 07-1121-0232 (2000) – Prepared by Golder Associates – dated December 2013

Appendix 2 2021 Operations and Monitoring Report – Navan Waste Recycling and Disposal Facility – 3354 Navan Road, Ottawa, Ontario – Prepared by Waste Connections of Canada – dated March 2022

Appendix 3 2019 Complaints Summary
2020 Complaints Summary
2021 Complaints Summary

1.0 Introduction

Paterson Group (Paterson) was commissioned by Claridge Homes to conduct a landfill impact assessment for the proposed development at 3252 Navan Road, in the City of Ottawa, Ontario. It should be noted that Paterson's report was solely prepared for landfill impact assessment, as residential development is proposed within 500 m of an existing landfill (Navan Waste Recycling and Disposal Facility).

The following report has been prepared specifically and solely for the aforementioned project which is described herein. It contains our findings and includes environmental concerns for the proposed residential development as they are understood at the time of writing this report.

This study has been conducted according to the Government of Ontario Guidelines D-4 Standards: Land Use On or Near Landfills and Dumps.

2.0 Proposed Development

It is understood that the proposed development will consist of single houses and townhouses. The single houses and townhouses are anticipated to rise 7.5 m above grade. Local roadways, residential driveways and landscaped areas are anticipated for the proposed development. Outdoor living areas consisting of rear yards were identified on the proposed site plan.

3.0 Background Information

It is understood that an operations and monitoring report is prepared every year for the Navan Waste Recycling and Disposal Facility located at 3354 Navan Road, Ottawa, Ontario, by Waste Connections of Canada. The appendix sections of operations and monitoring report incorporate the landfill monitoring report, landfill gas monitoring report, and technical memorandum regarding noise monitoring prepared every year for the Navan Waste Recycling and Disposal Facility by Golder Associates (Golder). Paterson issued a FOI on December 7, 2022, and Paterson has received the annual operations and monitoring reports entitled “2019 Operations and Monitoring Report”, “2020 Operations and Monitoring Report”, and “2021 Operations and Monitoring Report”. These reports were issued in March 2020, March 2021, and March 2022, respectively.

This landfill impact assessment report has been prepared to outline our findings and include the environmental concerns for the proposed residential development located west of the Navan Facility with a buffer zone of 125 metres. Paterson has reviewed and adapted the information provided in the aforementioned documents for the preparation of this report.

4.0 Buffer Study Update

4.1 Introduction

The subject development is located at 3252 Navan Road which is south of Navan Road and west of Navan Waste Recycling and Disposal Facility. The eastern edge of the proposed residential development is separated by approximately 125 m from the western limit of Navan Facility and is therefore within the 500 m radius of an existing landfill. The Navan Facility is currently owned and operated by Waste Connections of Canada (WCC) (previously by BFI Canada Inc. before its merge with Waste Services Inc.).

The initial buffer study for the proposed "Spring Valley Trails" residential development prepared by Golder Associates (Golder) was accepted in 2014 by the City of Ottawa. The accepted buffer study addressed the potential for impact from the waste disposal facility possibly due to contamination by surface water runoff, leachate, landfill gas migration, odour, soil contamination, fugitive dust, noise, ground settlement, and visual impact. No potential issues were identified in the buffer study, and the study was deemed acceptable.

4.2 Existing Waste Recycling and Disposal Facility

The Navan Waste Recycling and Disposal Facility is owned and operated by WCC under the amended Environmental Compliance Approval (ECA) for a waste disposal site and industrial sewage works. Significant activities performing at the Navan Facility include the following:

- Landfilling operations (solid asbestos waste, non-hazardous waste – domestic, industrial, commercial & institutional, contaminated soil, and wood waste, excluding putrescible waste)
- Recycling of waste materials at the facility
- Pre-treatment of collected leachate and disposal to Robert O. Pickard Environmental Centre (ROPEC) for off-site treatment
- Adding clay cover to completed fill areas of landfill
- Treatment of hydrocarbon impacted soils in the material processing area
- Screening of coarse granular soils to separate rock from soil for re-use

Composting of leaf and yard material was previously performed and has not been accepted since 2009.

Under the present ECA, the remaining life of the Navan Facility is estimated to be 5.1 to 5.2 years as of December 31, 2021, based on future projected maximum annual waste receipts for landfilling and a 5-year average waste density. The actual life of the landfill will vary based on annual fill rates, in-place waste densities, waste diversion and recycling initiatives at the Facility, and the rate of air space development.

4.3 Local Geology

Local geology of the subject site is located within the Ottawa Valley clay plain at the western edge of the Prescott and Russell sand plains, and the Navan Facility is situated on the banks of the Ottawa River Channel. The post-glacial Ottawa River Channels are generally 3 to 10 km wide and up to 18 m deep, floored with clay and silt and bordered by sand deltas.

The escarpment that runs east-west through the subject site and the Navan Facility was once covered by much silty sand deposits. However, most sand deposits below the escarpment have been eroded, leaving behind only a thin sand blanket. Above the escarpment, silty sand deposits are found to be 0.6 to 2 m thick. A thick (20 to 35 m) marine silty clay deposit underlies the entire area and has been exposed by the deep erosion channels that have cut through the escarpment. Bedrock in the area consists of shale from the Billings Formation.

4.4 Surface Runoff

Surface runoff from the east side of the Navan Facility site drains to Bear Brook drainage basin, which is part of the South Nation River watershed. Surface runoff from the west side of the Navan Facility drains to Mud Creek drainage basin, which in turn drains into Green's Creek, part of the Rideau River watershed. The Mer Bleue bog, a unique and internationally recognized ecological feature, is located south of Navan Facility.

The existing surface water control features at Navan Facility comprises a network of diversion ditches and culverts to divert upstream flows around the landfill along the perimeters of site buffer zones, and intercept runoff generated on-site and convey it to storm water retention ponds located at the southeast corner and the southwest corner of the landfill. In the meanwhile, landfill operations are carried out such that surface water is directed away from the waste to minimize water infiltration. Furthermore, clay cover has been placed in the landfill once the final waste grades have been reached. Soil stockpiles are also covered with topsoil and/or compost and seeded for surface water and erosion control.

As the Navan Facility is an engineered landfill, potential contamination from the leachate releases would be apparent in groundwater prior to surface water. An on-going monitoring is performed to assess the surface water quality up-gradient and down-gradient from the Navan Facility. The monitoring results from 2019 to 2021 indicate that surface water runoff is not causing adverse effects on surface water quality down-gradient from the Navan Facility. Therefore, surface water at the subject site will not be adversely impacted by the Navan Facility.

4.5 Local Groundwater Flow

The direction of local groundwater flow in the area is from north to south, towards the Mer Bleue bog located south of Navan Facility. The thick clay deposit acts as an aquitard or hydraulic barrier to groundwater movement, such that lateral flow occurs only through the surficial silty sand deposit and the upper weathered desiccated silty clay crust zone, which have a total thickness of a few metres. The results of water levels at up-gradient wells indicate the shallow water table of typically 1 to 2 m below ground surface with only small fluctuations in water levels for recent years. The results of water levels at down-gradient wells indicate the shallow water table close to the original groundwater surface (elevation of 68.8 m to 70.2 m) with seasonal variations of nearly 1 m. There is also the possibility of a perched groundwater condition in water trapped in the silty sand deposit overlying the impervious silty clay deposit.

4.6 Leachate Characteristics

Landfill leachate is water that comes into contact with waste and leaches soluble material from the waste. Its composition is a function of the solid waste characteristics, prevailing meteorology, hydrogeology, and parameters within the landfill such as pH, moisture content, degree of compaction, geometry, etc. Leachate is wastewater that dynamically alters not only with landfill age but also with changes in seasons and waste characteristics. It is noted that the leachate containment is currently provided by a thick (20 to 35 m) marine silty clay deposit which underlies the entire site. The thick silty clay deposit has a hydraulic conductivity (K) of less than 10^{-9} m/s, such that it performs as a natural liner. Therefore, the leachate at Navan Facility is not leachate impacted groundwater, but rather it is predominantly precipitation that has infiltrated through the waste pile. The leachate at Navan Facility could also consist of porewater from the underlying clay as a result of upward gradients and/or consolidation.

4.7 Leachate Management and Groundwater Protection System

The existing leachate management system at Navan Facility includes a perimeter leachate collection system along the west and south perimeter of the waste pile, and an underlain leachate collection system (LCS) below the waste in the northeast, central, east, and southeast areas of the site. The perimeter leachate collection system consists of a granular-filled trench and perforated drainage pipe. The LCS at the northeast and central areas of the site (Phases 4, 5 and 8) consists of a network of perforated collection pipes, French drains, and sand drainage blanket. The LCS at the east and southeast areas of the site (Phases 1 and 6) consists of a network of perforated HDPE pipe, separation and filter geotextiles, a clear drainage stone layer and a sand protective layer. All leachate collected in the existing leachate collection system is designed to gravity drain or be pumped to a wet well and a pre-treatment / pump station where the leachate is pre-treated with air stripping hydrogen sulphide (H_2S) and Volatile Organic Carbons (VOC_s) with the use of activated carbon filters prior to discharge for final treatment at the City's municipal sewage treatment plant.

A vertical manhole, connected to the leachate collection system in the centre of site, provides an alternative point of access to evacuate leachate from this part of leachate collection system in the event that gravity drainage to the wet well and pump station cannot be maintained due to sub-grade settlement.

Low permeability cover soils are currently used to minimize infiltration of precipitation into the waste column. Clay soil cover is placed on the north, west, and south facing slopes, as well as the completed fill areas of the site.

4.8 Leachate Monitoring Program

Prior to the construction of leachate collection system (LCS), leachate was sampled and analyzed in areas where surface breakout was observed. Breakout of leachate usually occurred at the down-gradient toe of the landfill.

The monitoring of leachate quality is mainly focused on the LCS. The leachate sampled is wastewater that has not been treated or subjected to natural attenuation. Water impacted by leachate typically has high concentrations of dissolved constituents with chemical concentrations ten to hundred times higher than those measured at reference monitoring locations. The intrinsic biodegradability of landfill leachate can be measured by a BOD:COD ratio and the concentration of ammonia. The results from leachate quality monitoring from 2019

to 2021 indicate that the leachate generated at Navan Facility continues to be a relatively weak wastewater when compared to municipal landfill leachate.

Complaints received from 2019 to 2021 are presented in Appendix 3. No leachate related complaints were noted.

4.9 Landfill Gas Characteristics

Landfill gas is a by-product of the decomposition of organic material in landfills. Landfill gas generation at the site is limited although it is present in the waste pile area by the decomposition of dying vegetation and/or localized snow melting during winter. Based on the characterization of landfill gas at Navan Facility in 1994, 2002 and 2009, the landfill gas at Navan Facility primarily consists of carbon dioxide (CO_2) (50%) and methane (CH_4) (50%) as well as water vapour, nitrogen, and trace amounts of other non-methane organic compounds (NMOC). It is noted that the entire Navan Facility site is underlain by a thick (20 to 35 m) layer of marine silty clay deposit. Landfill gas migrates through the path of least resistance, as such, the thick silty clay layer does not favour landfill gas migration. Landfill gas would preferentially migrate towards the atmosphere through the waste pile and/or the silty sand deposit.

4.10 Landfill Gas and Odour Management Systems

The non-putrescible waste received at Navan Facility does not generate landfill gas and methane at the same rate as municipal solid waste. However, methane, which is explosive at concentrations greater than 5%, still imposes a health and safety risk on-site and off-site. Therefore, engineering systems have been designed to reduce the health and safety risk imposed by landfill gas and CH_4. There are 4 types of engineering systems: Buffer Area and Natural Barrier System, Constructed Barrier System, Interim Odour Control System (until the installation of LGF Collection System), and Passive Ventilation System.

Buffer area and natural barriers are designed with the consideration that methane gas migration of any significance may extend for a distance ten times of the depth of the landfill between the ground surface and the water table, as specified in the MECP Guideline for Assessing Methane Hazards from Landfill Sites. Based on the depth of less than 2.5 metres between the ground surface and the water table, methane migration could extend for a distance of 25 metres. It is noted that the buffer zone at the west between proposed residential development and landfill footprint is 125 metres. Therefore, the buffer zone would provide adequate natural venting.

A barrier system consisting of low permeability clay cut-off walls, clay berms, and intervening drainage trenches has been constructed at the perimeter of the waste footprint. At the north, northeast, northwest, west, southwest, southeast, and east perimeters of fill area, native sand and other pervious materials have been removed and replaced with less permeable compacted clay that can act as a barrier against the lateral migration of LFG. In addition to the clay buffer wall, an intervening trench or excavated drainage ditch is also constructed at the perimeter of waste footprint to intercept and force any methane to the atmosphere.

The leachate collection system constructed along the west, south, and east perimeters of landfill area also serves as a passive ventilation system that prevents the subsurface migration of LFG_s beyond the landfill property by altering the path of flow without the use of mechanical components.

An interim landfill gas odour control system has been constructed within the existing landfill footprint, connecting to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells. The system consists of lateral and header piping, condensate management facilities, an outdoor skid-mounted abstraction plant, and a candlestick flare. Extensions to the interim system were installed by adding vertical wells and horizontal well. The interim landfill gas odour control system has satisfactorily assisted in controlling potential odorous emissions from the site. The construction of full-scale landfill gas collection and flaring system started in 2021. The interim system would be in operation until the full-scale landfill gas collection and flaring system is installed at the site.

4.11 Landfill Gas Monitoring Program

Gas monitors have been installed in on-site buildings to measure the carbon monoxide (CO), nitrogen dioxide (NO_2) and CH_4 in the main site building, H_2S and CH_4 in the scale house, and H_2S and CH_4 in the pump station building. Up to this date, the monitors have not detected any of these gases in the buildings.

Field measurements have also been carried out on three occasions per year, generally during the spring, summer, and late fall or winter, with portable field instruments at site facilities such as leachate pump station, maintenance garage, weigh scale station and leachate collection system. Manholes within the leachate collection system were included. The instrument used to detect and measure LFG concentrations was LANDTEC GEM-5000 Infrared Gas Analyzer, which is designed for measuring the % of CH_4, CO_2, CO, H_2S and O_2 to analyze LFG composition and measuring relative and atmospheric pressures to calculate flow.

Ontario Regulation 232/98 states that the design of landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of CH_4 gas below the surface of the land at the boundary of site must be less than 2.5% by volume
- The concentration of CH_4 gas must be less than 1.0% by volume in any on-site building or enclosed structure

These requirements were met at the Navan Facility based on the 2019-2021 monitoring results.

4.12 Odour Monitoring Program

Navan Facility is a dry waste facility and wet organic waste is not permitted for processing or disposal. As a result, few odours are emitted from the waste pile at this site. Odours from waste pile, when detected, are in isolated locations occurring generally from fugitive emissions at ground surface in areas of recent landfilling activity. In areas where there is no clay cover, operations are made to assure the prevention of LFG accumulation by ensuring the good ventilation of waste and daily / interim cover materials at the surface. Odours resulting from LFG are occasionally noticeable at some of the manhole openings located along the leachate collection system. These odours dissipate rapidly and are barely noticeable at a short distance from the source.

It is understood that there are no Ontario Government standards for odour, and there are no agreed-upon, empirical measurement protocols or odour thresholds to be used for odour regulation during landfill operations. Many aerobic odours maybe very inoffensive, even at a significant concentration, while even very low levels of the types of odours associated with anaerobic activity may be deeply offensive. Consequently, the best odour monitoring program available is to give responsibility to all staffs working at the site to use their own senses to monitor for any excessive odour on-site. Every morning, site manager looks for anything untoward, and pays special attention to the presence of odours likely to have some off-site impact. Also, whenever there are operations that disturb any materials at site, staff would periodically stand at downwind location and assure that any odours being created are mild, indicative of fully aerobic activity, and are not likely to be carried off the property. In the event staff on-site believes any odours may have some off-site impact, he will drive to a location off-site and downwind of the facility to determine if any off-site impact can be detected. If there is a detectable off-site impact, the operations on site will be stopped immediately and remedial measures will be taken as appropriate.

4.13 Odour Control Measures and Site Response Practice

The best odour control strategy is odour prevention. The preventive measures include eliminating the potential of LFG off-site migration by the installation of perimeter drainage system, eliminating the possibility of odours emanating from on-site treatment and leachate retention ponds, monitoring the concentrations of CH_4 gas at the landfill site, and controlling potential odorous emissions through the installation of LFG odour control system.

Effective odour control strategies include masking the odour and isolating the odour source. The measures for masking the odour consist of using physical, biological and/or chemical methods to mask the odours on the surface of odour source, so that none of the odours contained within are released to the environment. These control strategies can be applied within minutes, and the effects will be largely felt within 10-15 minutes of application. The last strategy is isolating and neutralizing the odour source material which consists of removing the offensive material from the problem area. This strategy will be used at the discretion of site manager.

The site practice, when odour complaints are received at the time of occurrence, is to carry out an investigation of the source of odour regardless of the source of origin, and to follow up with the callers with the corrective measures taken or to notify them the potential source of odour if the source is deemed to be an off-site source. A log is also maintained at site to record the date and time of any odour complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. Complaints received from 2019 to 2021 are presented in Appendix 3. The number of odour related complaints drastically reduced from 2019 (20 complaints) to 2021 (1 complaint). In 2021, the odour related complaint was received on October 14, 2021, from a resident west of the landfill.

4.14 Contaminated Soil Treatment

Contamination of soil at the subject site is not expected to occur as a result of the Navan Facility. Hazardous waste is not accepted at the Navan Facility.

Hydrocarbon contaminated soils are received at the treatment area (soil processing area of the landfill) and re-used as a construction fill material in accordance with ECA conditions for the site.

Complaints received from 2019 to 2021 are presented in Appendix 3. No soil contamination related complaints were noted.

4.15 Dust Management Plan

The landfill has the potential to generate fugitive dust emissions. The practices implemented at site to minimize the potential for off-property impacts include the following:

- Spreading aggregate over unpaved roads to reduce silt loading
- Watering unpaved roads to increase the moisture content of surface material and reduce the potential for fugitive dust generation, and using dust suppressants as required
- Enforcing a speed limit of 15 km/hr while vehicles are travelling on unpaved roads
- Keeping short travel distances to material transfers and drop points
- Constructing the wheel wash station to wash vehicles exiting the landfill and to reduce mud drag-out onto Navan Road (operational during non-freezing months of the year)

Complaints received from 2019 to 2021 are presented in Appendix 3. No fugitive dust related complaints were noted.

4.16 Noise Control Plan

The noise level at the landfill site is dominated by road traffic noise along Navan Road and landfill activities at active fill areas. The noise control plan includes having a sufficient set-back between active fill areas and Navan Road, and placing berms and soil stockpiles as a sound barrier between active fill areas and nearby homes and offices.

Complaints received from 2019 to 2021 are presented in Appendix 3. No noise related complaints were noted.

Detailed stationary noise assessment for the impact of Navan Facility towards proposed residential development is provided in Paterson Report titled “Environmental Noise Control Study - Stationary Noise Component”.

4.17 Ground Settlement

Ground settlement on the subject site is not expected to occur as a result of landfilling activities. Significant drawdown of the water table can cause ground settlement in silty clay deposits. Water table drawdown as a result of the excavations during the landfill construction and the hydraulic trap design of the leachate collection system is limited in lateral extent due to the low permeability of the thick silty clay deposit. Therefore, ground settlement on the subject site will not be caused by operations of the Navan Facility, as confirmed by the on-going monitoring of groundwater levels within 10 m of the Navan Facility.

Complaints received from 2019 to 2021 are presented in Appendix 3. No ground settlement related complaints were noted.

4.18 Visual Impact

Potential visual impact from the Navan Facility was assessed. Existing mitigation measures including landscaped vegetation and planting provide an adequate visual barrier from viewpoints west of the Navan Facility. Continued growth of vegetation will further decrease the landfill visibility with time. Furthermore, the excavating, filling, and landscaping operations at Phase 3 have been completed. Therefore, it is understood that there is a buffer zone of 135 m between the western limit of waste placement and the western limit of active operation area. The landfill visibility from viewpoints west of the Navan Facility is expected to be low.

Complaints received from 2019 to 2021 are presented in Appendix 3. No visual impact related complaints were noted.

5.0 Geotechnical Information and Long-Term Dewatering

Long Term Dewatering

The western limit of active operation area within Navan Facility is separated from the eastern edge of the proposed residential development by approximately 260 m. The invert of the leachate collection system along the northern and western boundary of the Navan Facility ranges from elevation 68.7 m (southern portion) to approximately 70 m (northern portion). A clay cut-off trench along the western limit of the Navan Facility is used as a hydraulic barrier to prevent horizontal migration of any below grade leachate from migrating within the silty sand layer overlying the silty clay deposit.

Due to the proximity of the proposed development to the existing landfill, in combination with the existing residential housing and municipally owned roadway between the proposed development and the landfill, there is minimal impact of any long-term dewatering at the subject site impacting the landfill.

6.0 Conclusion

In conclusion, the Navan Facility will not have any adverse effects on the proposed residential development and will not pose any risks to human health and safety. Furthermore, the completion of the proposed residential development will have no adverse effects to the neighbouring Navan Facility including the leachate collection system, the clay cut-off barrier located along the northern and western limits of the waste facility and the slope stability of the existing landfill side slopes.

7.0 Statement of Limitations

The recommendations made in this report are in accordance with our present understanding of the project. Our recommendations should be reviewed when the project drawings and specifications are complete.

The present report applies only to the project described in this document. Use of this report for purposes other than those described herein or by person(s) other than Claridge Homes or their agent(s) is not authorized without review by this firm for the applicability of our recommendations to the altered use of the report.

Paterson Group Inc.







Yolanda Tang, M.A.Sc. Stephanie A. Boisvenue, P.Eng.

Report Distribution:

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APPENDIX 1

Government of Ontario Guidelines D-4 Standards

Navan Landfill Expansion

Claridge Homes Spring Valley Trails Development - Phase 3
– Buffer Study in Relation to the BFI Navan Waste Recycling and Disposal Facility
– Report Number 07-1121-0232 (2000)
– Prepared by Golder Associates – dated December 2013

D-4 Land Use On or Near Landfills and Dumps

A guide for land use planning authorities on how to decide what types of land uses are appropriate near landfilled waste.

Legislative Authority:
Environmental Protection Act, RSO 1990, Part V, Sections 27and 46
O. Reg. 347, General -- Waste Management
Planning Act, RSO 1990, Sections 2(a)(b)(c)(f)(g)(h), 17(9),22(3), 41(4) and 51(3)
Condominium Act, RSO 1990, Section 50(3)
Environmental Assessment Act, RSO 1990, Section 5(3)

Responsible Director:
Director, Environmental Planning Branch

Last Revision Date:
April, 1994

Synopsis

This guideline specifies restrictions and controls on land use that the Ministry wishes to see implemented in the vicinity of landfills and dumps, in order to protect the health, safety, convenience and welfare of residents near such facilities. It complements existing ministry abatement programs for landfills and dumps, and is a direct application of Guideline D-1: "Land Use Compatibility."

Application of the guideline extends to all proposals for land use on, or near, operating and non-operating landfills, (as defined in O. Reg. 347) and dumps which contain municipal solid waste, industrial solid waste and/or sewage sludges. The guideline applies to all such facilities regardless of ownership. It does not apply to lands certified as organic soil conditioning sites under O. Reg. 347.

Ministry staff shall use the guideline when they are reviewing land use proposals, including official plans and amendments, and plans of subdivision/condominium:

a. at the request of the responsible Ministry or the delegated approving authority, under the Planning Act or the Condominium Act;

b. for land use requests subject to Section 46 of the Environmental Protection Act; and

c. for undertakings subject to the Environmental Assessment Act.

Introduction

This guideline protects the health, safety, convenience and welfare of residents from the potential adverse effects of landfills and dumps, by restricting or controlling land use in their vicinity. It complements the Ministry's existing abatement programs, and Ministry staff shall refer to it when they review land use proposals.

The principles of Guideline D-4 shall also be considered when looking for locations to establish a landfill in Ontario.

Procedure D-1-1: "Land Use Compatibility: Procedure for Implementation" discusses various implementation approaches and tools. Procedure D-1-3: "Land Use Compatibility: Definitions" provides definitions of terms, in addition to those included in Section 2.0 of this guideline.

Definitions

Note: Additional definitions are provided in Procedure D-1-3:"Land Use Compatibility: Definitions".

Fill Area
The area of a waste disposal site set aside for landfilling or dumping (see Conceptual Diagram No. 1. below).

Land Use
Any existing or proposed activity, structure, service, facility, or natural feature, either at, above, or below grade, which conforms to an approved municipal plan.

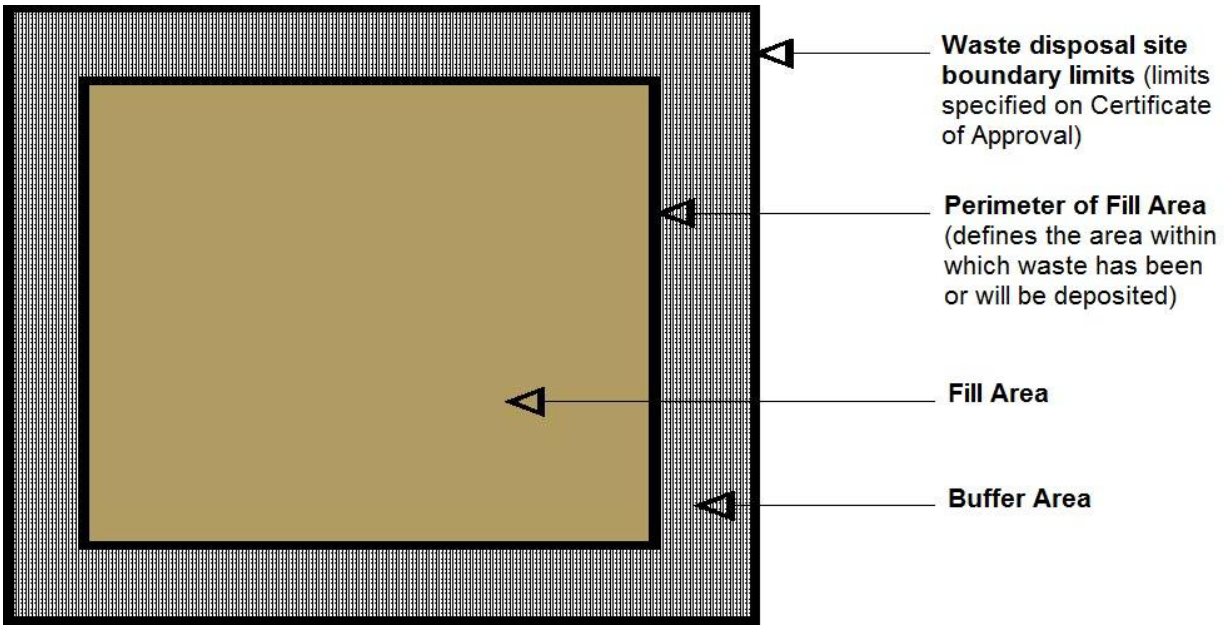
Land Used for Waste Disposal Purposes
The land comprising the fill area, where landfilling or dumping has occurred, and the land which is being used or is to be used for the leachate buffer area and/or

the gas buffer area; the land may be on- or off-site, (see Conceptual Diagram No. 1 below).

Peripheral Area
The area controlled by the site owner/operator between the boundary of the waste disposal site and the fill area; together, the peripheral area and the fill area make up the waste disposal site; the peripheral area will contain the buffer areas required to be on-site (see Conceptual Diagram No. 1 below).

Vectors and Vermin
Disease-carrying organisms, insects, rodents, birds (especially gulls) and other harmful creatures (e.g., bears).

Conceptual diagram no. 1 (plan view)



Application

3.1 General

This guideline applies to all proposals for land use on or near any landfill or dump which contains municipal solid waste, industrial solid waste and/or sewage sludges. It does not apply to lands certified as organic soil conditioning sites under O. Reg. 347.

3.2 Liquid industrial and hazardous waste

For proposals in the vicinity of landfills and dumps that have accepted liquid industrial, toxic or hazardous waste, the Ministry shall expect proponents to undertake further investigations and provide a report to the approving authority.

Where there is evidence of off-site migration of contaminants, the Ministry shall require abatement measures beyond those discussed in this guideline.

Environmental considerations

Environmental considerations shall be considered by all parties involved in the production, review and approval of a study/evaluation report.

4.1 Operating sites

Factors to be considered when land use is proposed near an operating site include: landfill-generated gases, ground and surface water contamination by leachate, odour, litter, contaminant discharges from associated vehicular traffic, visual impact, dust, noise, other air emissions, fires, surface runoff, and vectors and vermin. Particular attention shall be given to the production and migration of methane gas.

4.2 Non-operating sites

Factors to be considered when land use is proposed on or near anon-operating site include: ground and surface water contamination by leachate, surface runoff, ground settlement, visual impact, soil contamination and hazardous waste, and landfill- generated gases. Particular attention shall be given to the production and migration of methane gas.

4.3 Assessment

The adverse effects of the factors listed in Sections 4.1 and 4.2of this guideline may create:

a. a hazard or health/safety risk;

b. a nuisance to man; and/or

c. degradation of the natural environment.

The overall extent, number, degree and frequency of contaminant discharges and visual problems can vary with each site. Consideration must be given to the nature of proposed land use(s).

Reference should be made to Reference (a) (Section 7.0), if particular site conditions warrant obtaining further information with respect to methane gas.

4.4 Buffering techniques

One or a combination of buffers, as defined in GuidelineD-1: "Land Use Compatibility", may be employed in a given situation.

4.5 Hydrogeologic/engineering studies

4.5.1 Responsibility

Where the hydrogeologic and geologic setting of the proponent's property and the inter-relationship with gas and/or leachate from the fill area are unknown, Ministry staff shall recommend to the approving authority that the proponent engage a qualified hydrogeologist and/or engineer to determine the subsurface conditions and, where necessary, propose remedial measures.

4.5.2 Exceptions

The Ministry shall not normally recommend a formal site investigation, as recommended in Section 4.5.1, when its staff is satisfied that the evaluation of existing data indicates the absence of a problem.

4.6 Controls and monitoring for adverse effects

Where appropriate, Ministry staff shall recommend, as a condition of approval, that a proponent include controls to deal with adverse effects or risks to health or safety and that the approving authority monitor contaminant migration and carry out inspections of control facilities.

In the event that the approving authorities lack the expertise or resources to perform such inspections, they shall employ qualified consultants to do so.

4.7 Monitoring on private property

Where the approving authority requires monitoring and inspections on private property, Ministry staff shall recommend that a contract be executed between the proponent and the municipality, in the form of, or as part of an agreement that may be registered on title and run with the land. Documents which are able to be registered on title are identified in References (b) and (c) (see Section 7.0).

Land use considerations

5.1 Sensitive land use

The Ministry will normally recommend against proposals for sensitive land use (see Section 5.1.1. for details) adjacent to operating landfills, and on land used for waste disposal purposes where there are completed or partially completed fill areas.

Where land uses are proposed for approval on non operating landfills and dumps under Section 46 of the Environmental Protection Act, the Ministry normally shall not permit residential or other sensitive land use. Further details are provided in Reference (d) of Section 7.0.

5.1.1 Sensitive land uses for landfills currently in operation

Any existing or committed land use which includes:

a. a permanent structure used in animal husbandry; or

b. agricultural land used for pasturing livestock; or

c. a permanent structure where:

i. a person sleeps, or

ii. a person is present on a full time basis;

but not including food or motor vehicle service facilities adjacent to a highway, utility operations, scrap yards, heavy industrial uses, gravel pits, quarries, mining or forestry activities; or

d. cemeteries

5.1.2 Compatible land uses for landfills currently in operation

Compatible land uses may include:

a. utilities and above grade transportation routes except major highways;

b. fences;

c. wood harvesting and other forestry activities;

d. certain farming activities;

e. industrial uses, including incinerators permitted to operate under O. Reg. 347;

f. gravel pits and quarries, and other mining activities(provided the landfill water table is not affected); or

g. such land uses which would not be threatened by any hazard to public health or safety and would not be impaired by nuisance effects.

5.2 Land use within 30 metres of a fill area

5.2.1 Operating sites

No land use may take place within 30 metres of the perimeter of a fill area. This is a minimum distance.

Each operating landfill shall have an on-site operational/maintenance buffer area identified on the Certificate of Approval. This buffer shall be no less than 30 metres; it is normally 60-100 metres.

5.2.2 Non-operating sites

Where technical controls for leachate, or leachate and gas are required surrounding a fill area, no land use may take place within 30 metres of its perimeter. This distance maybe reduced to 20 metres in cases where only gas controls are necessary.

5.3 Land use within 500 metres of a fill area

The Ministry considers the most significant contaminant discharges and visual problems to be normally within 500 metres of the perimeter of a fill area. Accordingly, the Ministry recommends this distance be used as a study area for land use proposals. Ministry staff shall ensure that the proponent has evaluated the presence and impact of any adverse effects or risks to health and safety and that necessary remedial measures are taken when land use proposals are within this distance. This assessment shall be based on the nature and knowledge of the disposal site, and the nature of land use(s) proposed.

Actual influence areas for the considerations listed in Section4.1 and 4.2 of this guideline will vary with the individual landfill or dump. Where the actual influence area of a site has been determined to be less than the 500 metre study area set out in this section, the study area for land use proposals can be reduced to coincide with the actual influence area.

5.4 Land use beyond 500 metres of a fill area

Where significant impacts are encountered at or beyond 500 metres, the study area within which an assessment for any change in land use is recommended, shall

be extended beyond the 500 metre area set out in Section 5.3. Historical evidence in Ontario has shown that the maximum distance within which adverse effects could be experienced while a landfill is operating is up to 3 kilometres.

In exceptional hydrogeologic situations, such as areas of fractured rock or sand, where it is anticipated that leachate or gas from a non-operating landfill or dump could migrate beyond 500 metres and pose a problem, Ministry staff shall recommend that proponents carry out hydrogeologic and/or engineering studies for land use proposals beyond 500 metres of a fill area (see Section 4.5 for more details).

5.5 Significant impacts

The Ministry shall recommend against land use proposals where proponents have not incorporated feasible remedial measures to prevent or minimize adverse effects (as discussed in Section4.3).

5.6 Sequential development

In considering long-range planning, the Ministry may recommend that proponents delay or phase certain types of land use to coincide with closure of sections of a landfill, or the operation itself, as nuisance effects are reduced or eliminated. This approach shall only be permitted in cases where no risks to health or safety are present.

Responsibilities

6.1 Operators and/or owners of landfills or dumps

The Ministry shall require operators and/or owners of operating landfills and non operating landfills and dumps to comply with the Environmental Protection Act and O. Reg. 347 (Waste Management) requirements for the control of adverse effects caused by these facilities.

6.2 Proponents/consultants

Ministry staff shall recommend to the approving authority that the proponent provide a report on environmental considerations(see Section 4.0) and, where necessary, propose and implement appropriate control measures. These measures shall include design details and specifications for any control device or facility.

6.3 Municipalities

The local municipal authority is responsible for ensuring that proponents implement and monitor proper control measures associated with new, sensitive developments. It also shall ensure that periodic inspections of operating landfills and non-operating landfills and dumps for contaminant migration and potential hazards are carried out.

6.4 Ministry

With respect to its mandate for landfills and dumps, the Ministry shall exercise the following responsibilities:

6.4.1 Near land used or to be used for waste disposal purposes

Ministry staff will expect proponents and municipalities to fulfill their responsibility to protect public health and safety in areas of land use near a landfill or dump, and to prevent significant impacts from difficult-to-control nuisance effects which may extend beyond the lands under the Certificate of Approval for an operating landfill.

6.4.2 On land used for waste disposal purposes

Where a proponent submits a land use proposal for approval under Section 46 of the Environmental Protection Act, the proponent must assure Ministry staff and the municipality that the proposal contains adequate measures for the protection of public health and safety, in order to facilitate the Minister making a decision on approval.

Where an approval under EPA Section 46 is not required from the Minister, Section 6.4.1 of this guideline applies.

Reference documents

a. Procedure D-4-1: "Assessing Methane Hazards from Landfill Sites"

b. Ministry of Consumer and Commercial Relations Bulletin No.91003: "Environmental Warnings/Restrictions"

c. Ministry of Consumer and Commercial Relations Bulletin No.80023: "Registration of Certificates & Provisional Certificates"

d. Guideline D-7: "Requests for Land Use Approval Under EPA, Section 46" (under development)

e. Procedure D-1-1: "Land Use Compatibility: Procedure for Implementation"

f. Procedure D-1-3: "Land Use Compatibility: Definitions"

g. Guideline D-1: "Land Use Compatibility"

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REPORT ON

Claridge Homes Spring Valley Trails Development – Phase 3 Buffer Study in Relation to the BFI Navan Waste Recycling and Disposal Facility

Submitted to:
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REPORT

Report Number: 07-1121-0232 (2000)

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Golder Associates

EXECUTIVE SUMMARY

The Claridge Homes (Claridge) Spring Valley Trails development is located on lands to the south of the intersection of Navan Road and Renaud Road in Ottawa, Ontario. The property is being developed in 3 Phases. Presently, Phases 1 and 2 have been approved. Phase 3 of the Claridge development is located within 500 metres of the BFI Canada Inc. (BFI) Navan Waste Recycling and Disposal Facility (BFI Navan Facility), a solid waste disposal site. According to Section 3.8 of the City of Ottawa (City) Official Plan, land within 500 metres of an operating or non-operating solid waste disposal site is considered to be within the influence area of the solid waste disposal site. This buffer study was performed on behalf of Claridge in consultation with BFI Canada Inc. to satisfy the requirements of Section 3.8.6 as it relates to Phase 3 of the Spring Valley Trails development area, which requires that a study be performed to assess the potential for the solid waste disposal site to have unacceptable or adverse effects on the proposed development or pose risks to human health and safety. Based on this site-specific assessment, a determination is to be made of the required buffer (or separation) between the waste disposal site and the proposed development.

As required under Section 3.8.7 of the City of Ottawa's Official Plan, this buffer study addresses the potential for impact to the Claridge site from the BFI Navan Facility due to contamination by leachate, surface water runoff, ground settlement, visual impact, air (dust), odour, and noise, soil contamination, and landfill gas migration.

The BFI Navan Facility is owned and operated by BFI under Environmental Compliance Approval (ECA) No. A460702. The BFI Navan Facility performs landfilling and/or processing/recycling of solid, non-hazardous industrial, commercial and institutional (IC&I) waste (including construction and demolition (C&D) waste), asbestos waste, dry non-putrescible domestic waste (non-organic) and impacted soil. Composting of leaf and yard materials was previously performed, but material has not been accepted for composting since 2009. The western edge of the BFI Navan Facility property is located approximately 100 metres from the eastern edge of the Claridge Spring Valley Trails development; an additional separation of 100 metres exists between the western toe of the landfill footprint and the BFI Navan Facility western property boundary, such that Phase 3 of the Claridge site is separated from the limit of waste placement by approximately 200 metres. In April 2009, BFI received *Environmental Protection Act* (EPA) Approval for the expansion of the BFI Navan Facility. The approved expansion design provided additional disposal capacity for an estimated 10 years of operation beyond 2012. As per an agreement made during the Environmental Assessment (EA) process, the site will close on reaching the currently approved capacity and there will not be an application made for future expansion.

Local geology in the area of the Claridge site and the BFI Navan Facility consists of a thick clay deposit overlain by sands of varying thickness. An escarpment which runs east-west through the Claridge site and the BFI Navan Facility was once covered by such sand deposits, which have been mostly eroded below the escarpment. Above the escarpment, sands are found to be 0.6 to 2.0 metres thick. A thick (20 to 35 metre) marine clay deposit underlies the entire area. Bedrock in the area is composed of shale of the Billings Formation.

Surface runoff from the east side of the BFI Navan Facility site drains to the Bear Brook drainage basin, which is part of the South Nation River watershed. The west side (and the Claridge site) drain into the Mud Creek drainage basin, which in turn drains into Green's Creek, part of the Rideau River watershed. The Mer Bleue bog, a unique and internationally recognized ecological feature, is located to the south of both sites.

Local groundwater flow in the area is from north to south, from the escarpment toward the edge of the Mer Bleue. The thick clay deposit acts as an aquitard or barrier to groundwater movement, such that lateral flow

occurs only through the surficial sand unit and upper weathered clay zone, which have a total thickness of a few metres. The water table is between 1 and 2 metres below ground surface north of the escarpment and near the ground surface south of the escarpment. Regional groundwater flow in the deep bedrock aquifer is eastward.

Infiltration of rain water into a landfill and decomposing waste creates a liquid called leachate which, if not managed properly, has the potential to impact groundwater in the vicinity of a landfill. In assessing the potential for groundwater contamination by leachate, the local geology and hydrogeology, approved engineered controls, and continued groundwater monitoring program were considered. The natural hydrogeological aquitard imposed by the thick clay deposit that underlies the area impedes the flow of groundwater, which flows from north to south, hydraulically cross-gradient to the Claridge site. Engineered controls include a leachate collection system below the northeast and central area of the waste footprint, and a perimeter collection trench along the west and south edges of the waste footprint. The leachate collection system is designed such that the groundwater elevation within the landfill is maintained at a level lower than the groundwater elevation in the surrounding area, creating a "hydraulic trap", which causes groundwater to flow toward the landfill, rather than away from it. In addition, the 100 metre wide west buffer between the landfill footprint and the BFI Navan Facility property boundary is occupied by a berm of compacted silty clay soil, which adds an additional level of redundancy in mitigating the potential westward migration of leachate. Collected leachate is pumped to the City's sewer system via force main, but can also be pumped to tanker trucks as a contingency measure. A proposed addition to the leachate management system will be constructed during the approved horizontal expansion area of the landfill to the east. Groundwater monitoring is performed semi-annually, such that potentially impacted groundwater would be detected prior to any migration off-site. In summary, there is no mechanism by which landfill leachate can affect groundwater quality beneath the Claridge Phase 3 lands.

Studies performed during the approval process for the expansion of the BFI Navan Facility found that surface water runoff is not having an adverse effect on surface water receivers downstream of the landfill. The existing approved surface water management system at the BFI Navan Facility comprises a network of drainage ditches and roadside swales to intercept runoff generated on-site and direct it to either the east or west stormwater management pond. As the BFI Navan Facility landfill is an engineered landfill, potential contamination from a leachate release would be apparent in groundwater prior to surface water. Additionally, surface water monitoring is performed to assess surface water flow and quality at the BFI Navan Facility. As such, surface water on the Claridge site will not be impacted by the BFI Navan Facility.

Ground settlement on the Claridge lands is not expected to occur as a result of landfilling activities. Significant drawdown of the water table can cause ground settlement in clay soils. Water table drawdown as a result of excavations during landfill construction and the hydraulic trap design of the leachate collection system is limited in lateral extent due to the low permeability of the thick silty clay deposit. As a result, ground settlement on the Claridge site will not be caused by operations at the BFI Navan Facility, as confirmed by ongoing monitoring of groundwater levels within 10 metres of the landfill on the BFI site.

Potential visual impact from the BFI Navan Facility expansion was assessed during the expansion approval process. Though additional mitigation of visual impact was not deemed necessary along the west side of the BFI Navan Facility (which is closest to the Claridge property), existing mitigation measures provide an adequate visual barrier from viewpoints west of the BFI Navan Facility. Continued growth of vegetation will further decrease the landfill visibility with time. Additionally, in the longer term the waste mound will be landscaped with plantings so as to blend into the escarpment, which will occur early on in the lifespan of the landfill due to

phasing of the vertical expansion beginning on the west side of the BFI Navan Facility site and moving eastward away from the Claridge lands.

The predictive modelling of potential off-site impacts related to air quality, dust, odour and noise carried out as part of the approvals processes for the BFI Navan Facility landfill expansion included potential receptor locations within the Claridge Phase 3 lands. The modelling prediction results indicated that the site operations were expected to meet provincial requirements and not cause adverse effects off-site. There are a number of design and operational mitigation measures to control and minimize the potential for off-site atmospheric impacts. Ongoing monitoring programs demonstrate that the BFI Navan Facility is performing acceptably as expected based on predictions. Considering that operations on the landfill are progressively moving eastwards, away from the Claridge Phase 3 lands, it is expected that the Claridge Phase 3 lands will not experience unacceptable atmospheric effects from the BFI Navan Facility site.

Contamination of soil at the Claridge site is not expected to occur as a result of the BFI Navan Facility.

Hazardous waste is not accepted at the BFI Navan Facility.

As discussed in studies performed during the approval process for the BFI Navan Facility expansion, the migration of landfill gas generated by the BFI Navan Facility landfill is impeded by the naturally occurring geology and engineered controls for the landfill site. Landfill gas migrates through the path of least resistance; as such, the thick clay layer which underlies the area does not favor methane migration and gas would preferentially migrate toward the atmosphere through the waste or sand unit. Methane generated by the landfill is expected to be intercepted by the leachate collection perimeter trench or blocked by the perimeter clay berms before it would travel off site. Using a generally accepted approximation that significant methane migration may extend for a distance equal to ten times the depth of landfill between the ground surface and the water table, the maximum distance of significant methane migration would be expected to be 20 metres from the toe of the waste footprint, about one tenth the distance between the western waste limit of the BFI Navan Facility landfill and the eastern property boundary of the Claridge site. A proposed landfill gas collection system was approved as part of the expansion of the BFI Navan Facility and an interim landfill gas management system is currently in place. Furthermore, landfill gas monitoring is performed at a large number of locations on the BFI Navan Facility site, and indicates that off-site lateral migration of landfill gas has not occurred. For all of the reasons described above, the combination of the natural geological setting and engineered features mitigate the potential migration of landfill gas in the subsurface from the BFI Navan Facility.

The City has retained consultants in the past to review studies about potential impacts from the BFI Navan Facility on the surrounding properties. Outstanding concerns raised during previous reviews of the BFI Navan Facility expansion and its potential off-site impacts have been addressed throughout this study.

In conclusion, the BFI Navan Facility will not have unacceptable or adverse effects on the proposed development and will not pose any risks to human health and safety. It is recommended that the zone of influence of the BFI Navan Facility be reduced such that it excludes the Claridge Spring Valley Trails development lands.

Table of Contents

EXECUTIVE SUMMARY i

1.0 INTRODUCTION 1

2.0 SITE DESCRIPTION 2

2.1 Claridge Homes Spring Valley Trails Development 2

2.2 BFI Navan Facility 2

3.0 PHYSICAL SITE SETTING 4

3.1 Geology 4

3.2 Hydrogeology and Hydrology 4

4.0 ASSESSMENT OF POTENTIAL LANDFILL IMPACTS 5

4.1 Groundwater Contamination by Leachate 5

4.1.1 Leachate Generation Rate and Quality 5

4.1.2 Geological and Hydrogeological Barriers 5

4.1.3 Leachate Management System 6

4.1.4 Contingency Plan 7

4.1.5 Groundwater Monitoring 8

4.1.6 Summary 9

4.2 Surface Water Runoff 9

4.2.1 Environmental Assessment Study Report 9

4.2.2 Surface Water Management 9

4.2.3 Surface Water Monitoring 10

4.2.4 Summary 10

4.3 Ground Settlement 10

4.4 Visual Impact 11

4.5 Air, Odour and Noise 11

4.5.1 Environmental Assessment Study Report 11

4.5.2 Improvements to Controls of Atmospheric Emissions from the BFI Navan Facility Expansion 12

4.5.3 Monitoring Program 13

4.5.3.1 Dust Monitoring 13

4.5.3.2 Noise Monitoring 13

4.5.3.3 Odour Monitoring 14
4.5.4 Summary 14
4.6 Soil Contamination 14
4.7 Hazardous Waste 14
4.8 Landfill Gas 14
4.8.1 Geological Barriers 14
4.8.2 Landfill Gas Management System 15
4.8.3 Landfill Gas Monitoring Program 16
4.8.4 Summary 16
4.9 Post-closure Activities and Monitoring 16
5.0 PREVIOUS REVIEWS BY THE CITY OF OTTAWA 17
6.0 CONCLUSIONS 18
7.0 LIMITATIONS AND USE OF REPORT 19
8.0 CLOSURE 20
REFERENCES 21

FIGURES

Figure 1 – Key Plan
Figure 2 – Claridge Homes Spring Valley Trails Site Plan
Figure 3 – BFI Navan Facility Site Plan
Figure 4 – Schematic Cross-Section A-A'
Figure 5 – Schematic Cross Section B-B'
Figure 6 – Groundwater Flow in Surficial Sand and Weathered Clay Zone
Figure 7 – Leachate Collection System
Figure 8 – Surface Water Management Plan
Figure 9 – Air and Odour Modeling Sensitive Receptor Locations
Figure 10 – Noise Receptors and 2012 Monitor Locations
Figure 11 – Approved Landfill Gas Collection System Layout
Figure 12 – Landfill Gas Monitoring Locations

APPENDICES

APPENDIX A
City of Ottawa Peer Review of Environmental Assessment Study Report

1.0 INTRODUCTION

Claridge Homes (Claridge) is constructing a residential development called Spring Valley Trails to the south of the intersection of Navan Road and Renaud Road in the east end of Ottawa, Ontario as shown in the Key Plan (Figure 1). The development has been proposed in 3 Phases; presently, Phases 1 and 2 have been approved. Phase 3 of the Claridge development is located within 500 metres of the BFI Canada Inc. (BFI) Navan Waste Recycling and Disposal Facility (BFI Navan Facility), a solid waste disposal site. According to Section 3.8 of the City of Ottawa (City) Official Plan, land within 500 metres of an operating or non-operating solid waste disposal site is considered to be within the influence area of the solid waste disposal site, as shown on Figure 2. As a result, the City requires that a buffer study be conducted, in consultation with the owner/operator of the waste disposal site, to assess the potential for the solid waste disposal site to have unacceptable or adverse effects on the proposed development or pose risks to human health and safety. Based on this site-specific assessment, a determination is to be made of the required buffer (or separation) between the waste disposal site and the proposed development.

The purpose of this buffer study is to satisfy the requirements of Section 3.8 of the City's Official Plan, as it relates to Phase 3 of the Spring Valley Trails development area. The study also addresses previous concerns expressed by the City with regard to development within 500 metres of the BFI Navan Facility. As required by Section 3.8.7 of the Official Plan, the buffer study addresses the following areas of potential concern: contamination by leachate, surface water runoff, ground settlement, visual impact, air (dust), odour, and noise, soil contamination, and landfill gas (LFG) migration. This study has been completed by Golder Associates Ltd. (Golder) on behalf of Claridge and in consultation with BFI.

2.0 SITE DESCRIPTION

2.1 Claridge Homes Spring Valley Trails Development

The Claridge Homes Spring Valley Trails Development (Claridge Development) is located on lands south of Navan Road and Renaud Road. The property measures approximately 800 metres by 800 metres in plan dimension (though is irregular in shape). It is bound to the south by a former CN Rail line and the Mer Bleue Conservation area (Mer Bleue), to the west by a residential development, to the north by Navan Road and Renaud Road, and to the east by a 100 metre wide commercial property followed by the BFI Navan Facility site further to the east. Figure 1 indicates the site location on a Key Plan. The development has been proposed in three Phases. Phases 1 and 2, located at the western portion of the Claridge Development, have been approved and are constructed or are under construction. The proposed Phase 3 comprises the eastern end of the property, and falls within 500 metres of the BFI Navan Facility landfill property. Phase 3 of the Claridge Development, to which this buffer study applies, will be hereafter referred to as the Claridge site. Figure 2 shows the extent of Phase 3, and its location in relation to the BFI Navan Facility landfill.

2.2 BFI Navan Facility

The BFI Navan Facility (formerly known as the Waste Services (CA) Inc. Navan Landfill) is located at 3354 Navan Road in the east end of Ottawa, Ontario, and is owned and operated by BFI under Environmental Compliance Approval (ECA) (formerly referred to as a Certificate of Approval) No. A460702. The BFI Navan Facility began operating in 1960, and performs landfilling and processing/recycling of wastes mostly generated within the City. The BFI Navan Facility accepts solid, non-hazardous industrial, commercial and institutional (IC&I) waste (including construction and demolition (C&D) waste), asbestos waste, dry non-putrescible domestic waste (non-organic) and impacted soil. Composting of leaf and yard materials was previously performed at the BFI Navan Facility, but material has not been accepted for composting since 2009. The north, west, south and east sides of the landfill footprint are surrounded by buffer zones of 30 to 70 metres, 100 metres, 10 metres and 140 metres, respectively. Note that on the south side of the landfill a 10-metre buffer zone exists between the south limits of the waste mound and the VIA Rail right-of-way (ROW) and an additional buffer strip with a width of 100 metres exists to the south of the VIA Rail ROW. Figure 3 shows the BFI Navan Facility site layout and its location in relation to the neighbouring Claridge Development to the west. Considering the total 100 metre width of buffer on the west side of the BFI Navan Facility and the adjacent 100 metre wide commercial property, the total separation distance between the limit of waste placement and the east limit of the Claridge property is 200 metres.

In April 2009, BFI received *Environmental Protection Act* (EPA) Approval for the expansion of the BFI Navan Facility. This approval was achieved following the approval under the *Environmental Assessment Act* of an Environmental Assessment Study Report (EASR) (Golder 2007b) in August 2007, and through the submission of the following applications:

- Amendment to ECA No. A460702 under Section 27 of the EPA;
- ECA (Air and Noise) under Section 9 of the EPA; and,
- ECA (Sewage Works) under Section 53 of the *Ontario Water Resources Act* (OWRA).

The EASR considered several options for the expansion of the landfill, and identified the preferred option from which the final landfill expansion details were developed. The EASR was accompanied by technical support documents detailing the air and odour assessment, noise assessment and the conceptual design for each of the expansion options. As part of the public consultation process, the EASR was peer reviewed on behalf of the City in full by Conestoga-Rovers & Associates (CRA) in 2007. Following the environmental assessment, the aforementioned ECA applications under Sections 9 and 27 of the EPA and under Section 53 of the OWRA were submitted. A Design and Operations (D&O) Report (Golder 2008b) was submitted providing the required technical support for the three applications. Additional supporting documents included a Hydrogeology, Hydrology and Geotechnical Study (Golder 2008a) and Financial Assurance documents. The application to amend ECA No. A460702 was approved, and ECA (Air and Noise) No. 6733-7BYS9A and ECA (Sewage Works) No. 4816-7C7M6C were issued for the expanded BFI Navan Facility. The approved expansion design provided additional disposal capacity for an estimated 10 years operation beyond 2012; it is currently expected that the landfill capacity will be reached in about 2025.

3.0 PHYSICAL SITE SETTING

Due to the physical proximity of the Claridge site and the BFI Navan Facility, the geology, hydrogeology, and hydrology for the two sites have been described concurrently.

3.1 Geology

The Claridge site and the BFI Navan Facility are situated in the region of the Ottawa Valley clay plain at the western edge of the Prescott and Russell sand plains. The lowland region is composed of unconsolidated glacial till deposits, varved clays and marine beds of clay and sand from the post-glacial Champlain Sea. The Claridge and BFI sites are located on the banks of a former channel of the Ottawa River. The post-glacial Ottawa River Channels (located east of Ottawa) are from 3 kilometres to 10 kilometres wide and up to 18 metres deep, and are floored with clay and silt and bordered by sand deltas. The escarpment which runs east-west through the Claridge site and the BFI Navan Facility was once covered by sand deposits which have been mostly eroded below the escarpment. Above the escarpment, surficial sands are found to be 0.6 to 2.0 metres thick in the landfill area. A thick (20 to 35 metre) marine clay deposit underlies the entire area. Bedrock in the area is composed of shale of the Billings Formation. Figure 4 provides a schematic cross-section through the landfill in the north-south direction, which shows the geology through the escarpment. Figure 5 contains a cross-section in the east-west direction through the eastern portion of the Claridge site and the western portion of the BFI Navan Facility, which shows the consistency in geology across the sites. The landfill geometry and certain features are also shown on the cross sections.

3.2 Hydrogeology and Hydrology

The BFI Navan Facility is located on a watershed divide between two major drainage watersheds - the Rideau River watershed to the west and the South Nation River watershed to the east. Surface runoff drains to both the east and west of the BFI Navan Facility site. The east side of the BFI Navan Facility site drains to the Bear Brook drainage basin, which is part of the South Nation River watershed. The west side, and the Claridge site, drain into the Mud Creek drainage basin, which in turn drains into Green's Creek, part of the Rideau River watershed. The Mer Bleue bog, a unique and internationally recognized ecological feature, is located to the south of both sites.

Studies have shown that the regional groundwater flow in the deep bedrock aquifer is eastward. Local groundwater flow in the area is from north to south as shown on Figure 6, i.e., from the escarpment towards the edge of the Mer Bleue. The thick clay deposit acts as an aquitard or barrier to groundwater movement, such that lateral flow occurs only through the surficial sand unit and upper weathered clay zone, which have a total thickness of a few metres. As indicated in the Hydrogeology, Hydrology and Geotechnical Study Report for the BFI Navan Facility (Golder, 2008a), the water table is between 1 and 2 metres below ground surface north of the escarpment, and very near the ground surface south of the escarpment. Historical groundwater level data from the BFI Navan Facility site indicate that a groundwater recharge zone exists north of the escarpment (where a downward hydraulic gradient exists), and that a discharge zone exists south of the escarpment (where an upward hydraulic gradient exists).

4.0 ASSESSMENT OF POTENTIAL LANDFILL IMPACTS

4.1 Groundwater Contamination by Leachate

Infiltration of rain water into a landfill and decomposing waste creates a liquid called leachate. If not managed properly, leachate has the potential to impact groundwater in the vicinity of a landfill. The following sections describe the generation of leachate at the BFI Navan Facility, the systems in place to manage the leachate (the natural geological and hydrogeological barriers and the leachate management system) and the approach used to detect if leachate has entered and is migrating in the groundwater flow system (the groundwater monitoring program).

4.1.1 Leachate Generation Rate and Quality

As discussed in the Hydrogeology, Hydrology and Geotechnical Study (Golder 2008a), leachate contaminants suggested in Ontario Regulation (O.Reg.) 232/98 (MOE 1998) to represent municipal solid waste are not all applicable to the BFI Navan Facility due to the type of waste accepted at the landfill site, which consists of IC&I waste and non-organic domestic waste. Following consultation with the MOE and the Ministry of Natural Resources (MNR) during the EA process for the landfill expansion, boron, dichloromethane, potassium, magnesium, ammonia and phenols were chosen as appropriate parameters for modelling the potential groundwater impacts due to leachate from the landfill.

4.1.2 Geological and Hydrogeological Barriers

The potential for leachate generated by the BFI Navan Facility landfill to impact the Claridge site has been assessed based on the direction of groundwater flow, the physical separation between the Claridge site and the landfill footprint, the leachate collection system (LCS) and the results of the contaminant transport modelling.

Shallow groundwater flow in the area is from north to south consistent with the relief of the property which changes in elevation by approximately 15 metres to 18 metres between the up-gradient and down-gradient boundaries of the landfill. The groundwater flow is shown in Figure 6, which has been generated using water elevation data from May 2013. Groundwater elevations within the landfill footprint are not available as monitoring wells are not constructed within the waste footprint; groundwater levels within the footprint are locally controlled by the leachate collection system beneath the base of the waste. As shown on Figure 6 the groundwater elevation north of the landfill (on top of the escarpment) is approximately 14 metres higher than the groundwater elevation south of the landfill (below the escarpment), indicating a strong horizontal hydraulic gradient from north to south. The Claridge site is located west and hydraulically cross-gradient of the BFI Navan Facility. The thick clay deposit in the area is of low permeability and acts as an aquitard (or barrier to groundwater movement). Shallow groundwater flow is thus controlled by the surficial sand layer and upper weathered clay zone above the clay aquitard. The slight upward gradient at the down-gradient boundary of the landfill would suggest there is upward vertical flow of shallow groundwater at this location, which would retard the potential for leachate migration into the deeper groundwater system. Groundwater flow in the deep bedrock aquifer is eastward and hydraulically downgradient (away) from the Claridge site, noting that the landfill area does not provide a source of infiltrating water to the deep aquifer due to the natural aquitard provided by the thick clay deposit.

In addition to being hydraulically cross-gradient and upgradient from the BFI Navan Facility, the Claridge site is physically separated from the landfill footprint by a 100 metre buffer zone (within the BFI Navan Facility property limits) and a 100 metre wide commercial property, reducing even further the potential for landfill leachate impacted groundwater from reaching the Claridge site.

Potentially impacted groundwater is cut off from the shallow groundwater flow system by the perimeter LCS located around the south and southwest sides of the landfill. The groundwater elevations in the area around the landfill footprint are higher than the base of the landfill and LCS, therefore creating a "hydraulic trap", i.e., a groundwater flow direction into the landfill as opposed to out of the landfill. Maintaining the LCS in a drained condition, which is the way the LCS is operated, results in a lowering of the water table at the southeast corner of the landfill by more than 3 metres below the original ground at the southeast corner of the landfill, and by about 2 metres at the southwest corner. This water table lowering influences the hydraulic gradients within the waste pile near the landfill's south boundary. A clay cut-off wall on the down-gradient (south) side of the LCS was constructed as a back up to the LCS to further limit the potential migration of leachate out of the landfill towards the south. The hydraulic trap, and presence and operation of a LCS decrease the potential risk of leachate impacting the surrounding groundwater.

Finally, contaminant transport modelling was completed during the landfill expansion approvals process as documented in the Hydrogeology, Hydrology and Geotechnical Study (Golder 2008a). The modelling found that movement of contaminants, both laterally at shallow depth south toward Mer Bleue and downward toward the bedrock aquifer is controlled by diffusion. It was concluded, based on the modelling, that any diffusion of contaminants laterally and downward at the landfill site itself will be negligible. Lateral diffusion of contaminants was modelled for movement southward as this is the direction of groundwater flow, and would thus also be the direction potentially most impacted by the diffusion of contaminants. As such, impacts from the diffusion of contaminants in all other directions (for example, westward in the direction of the Claridge site) would be less than those in the direction of groundwater flow. As such, long term diffusion of contaminants is not expected to impact groundwater beneath the Claridge site.

4.1.3 Leachate Management System

A plan view of the existing and approved eastern expansion of the leachate management system is presented in Figure 7. The existing leachate management system includes an underdrain system in the northwest corner of the waste footprint. This is connected via HDPE pipe to a perimeter leachate collection trench which runs along the west and south sides of the waste mound, and extends approximately 150 metres along the east side of the waste mound, starting at the southeast corner. The perimeter leachate collection trench consists of a granular-filled trench and perforated drainage pipe and access to the perimeter leachate collection trench is provided via a series of manholes. A LCS also exists beneath the northeast and central area of the waste footprint. All leachate collected is drained to a wet well and pump station located at the southeast corner of the pre-expansion waste footprint. Leachate is pretreated and pumped via forcemain to the City sewer system for final treatment at the City's municipal sewage treatment plant. As a contingency, leachate may also be transported by tanker truck to the municipal sewage treatment plant. A vertical manhole connected to the LCS in the northeast quadrant ("the central manhole") provides an alternative point of access to evacuate leachate if positive drainage to the wet well and pump station is not maintained. The need for an artificial constructed liner system is negated by the natural low-permeability clay soils at the base of the landfill, which act as a natural barrier to the transport of contaminants out of the landfill.

The proposed extension of the LCS in the disposal area to the east of the existing waste mound has been designed to meet or exceed the requirements in Schedule 1 of the Landfill Standards (MOE 1998) for a 100-year service life. The proposed LCS in this area includes an underdrain system consisting of perforated leachate collection pipes and a granular drainage blanket composed of clear stone, separated from the clay subgrade by a separator geotextile, and from the waste by a filter geotextile covered above by a sand layer to prevent fines from entering the drainage blanket. The leachate collection pipes will drain to a perforated header pipe which will drain to a sump. Leachate will be pumped from the sump to the existing wet well and leachate pump station. Leachate collection pipes will be sloped toward the header pipe, and the header pipe sloped toward the sump to achieve positive drainage. The sump will be located in the interior of the eastern area where settlement is expected to be highest, such that positive drainage will be maintained as settlement occurs. The subgrade will be prepared in a saw-tooth fashion to provide gradients toward the collection pipes. A perimeter collection trench will be constructed along the south limits of the eastern area as a secondary/contingency containment measure, and will be connected to the wet well/pump station by a gate valve.

BFI has constructed low permeability clay cut-off walls and clay berms at the perimeter of the waste footprint. At the edge of the fill area, native sand and other pervious materials have been removed and replaced with lower permeability compacted clay. These clay barriers are designed to contain leachate. Presently, the constructed clay barriers exist along the north perimeter, and the west and south perimeters of the fill area. As development of the landfill progresses into the eastern area, clay barriers will be constructed along the south and southeast perimeters.

In addition, the 100 metre wide west buffer of the BFI site is occupied by a large berm of compacted silty clay soil between the disposal area and the BFI property boundary (illustrated in Figure 5). This berm, together with the west side perimeter leachate collection pipe, provides protection against potential leachate migration in the westward direction.

4.1.4 Contingency Plan

The existing perimeter LCS and the perimeter LCS to be constructed at the down-gradient side of the expanded footprint area to the east will function as a contingency measure should the collection system beneath the waste fail. If these perimeter systems (and repaired or replacement perimeter systems) do not function as intended, and in the event of premature failure of the LCS such that a leachate mound is formed within the landfill, an additional contingency exists that involves the installation of purge wells through the cover of the landfill and into the granular blanket of the LCS. Details of the purge well installation would be determined based on the level of leachate mound control required. Leachate collected from the purge wells would be sent off-site for treatment. MOE approval to implement the contingency measures, if ever required, will be obtained through an amendment to the D&O Report for the expanded BFI Navan Facility landfill.

In addition, a compacted clay berm/cut-off trench will be built along the southern limits of the expanded footprint area to the east, extending some distance up the east side of the waste footprint. This clay berm would be keyed into the underlying native unweathered clay soils to provide a redundant level of containment in the unlikely event that leachate were to mound at the downgradient end of this eastern area.

In the event that positive drainage is not maintained within the LCS in the northeast quadrant, leachate can be removed through the central manhole.

4.1.5 Groundwater Monitoring

Groundwater monitoring has been performed at the BFI Navan Facility since 1981, and has occurred semi-annually since 1991. Groundwater monitoring is performed and reported as outlined in Condition 109 of ECA No. A460702. Groundwater monitoring is performed in the four stratigraphic units identified as a shallow surface sand layer, an upper weathered clay zone, an intact (unweathered) deposit of clay and a glacial till/upper bedrock zone. Monitoring wells are present in each of these units up-gradient, at the down-gradient edge of the waste pile and further down-gradient of the landfill. Monitoring well locations are shown on Figure 6.

Traditional methods of site compliance assessment involve comparing downgradient concentrations of site specific compliance evaluation parameters (parameters defined as site specific leachate indicator parameters) in groundwater to Reasonable Use Performance Objective (RUPO) concentrations, as defined by MOE Guideline B-7 (MOE 1994). RUPO concentrations for compliance evaluation parameters are calculated using the upper background concentration value at the site. Traditionally, a trigger concentration of a compliance evaluation parameter exceeds the RUPO for that parameter. Trigger concentrations may change over time as background concentrations from future monitoring programs are added to the data base.

Due to the poor natural (background) water quality at the BFI Navan Facility site, traditional methods of site compliance assessment provide very limited understanding of potential leachate impact. A comparison of water quality between the up-gradient station and the south property boundary station on the east side of the property, where there are no potential impacts from landfill activities, shows that there is a difference between the up-gradient and down-gradient water quality in the area of the landfill site. Several naturally occurring parameters, including boron, copper, iron, sodium, alkalinity, arsenic, bicarbonate, lead, TDS, COD and chloride are elevated at the southeast property boundary station. These naturally elevated parameters could potentially mask the presence of leachate impacts associated with the landfill. The RUPO for groundwater at the BFI Navan Facility would consider iron, manganese, and boron. Based on the natural water quality data, boron and iron are not good leachate indicator parameters, which would leave only manganese to evaluate compliance. Therefore, the MOE has agreed that RUPO is not an appropriate method of determining site compliance in the hydrogeologic setting of the BFI Navan Facility.

A site-specific trigger mechanism outlined in the Groundwater and Surface Water Trigger Mechanism report (Golder 2007a) was proposed in 2007, and approved during the expansion approval process. The leachate indicator parameter list for the BFI Navan Facility site includes alkalinity, ammonia, boron, chloride, hardness, magnesium, manganese and potassium. The list was derived based on both typical landfill and site specific leachate indicator parameters, taking into consideration historical concentrations of typical parameters observed in the leachate compared to those observed concentrations in groundwater. Concentrations of parameters that exceed background range are treated as potential exceedances which warrant further consideration. Trigger locations within the sand deposit, weathered clay zone, intact clay deposit, and glacial till/upper bedrock zone are located at the down-gradient (south) limit of the landfill footprint. .

In conclusion, groundwater is monitored on a regular basis and there are systems in place to detect if landfill leachate is beginning to impact the groundwater surrounding the landfill footprint (trigger mechanism). Steps would then be taken to determine how the leachate is reaching the groundwater and the situation would be rectified. This monitoring program and trigger mechanism further reduce the potential for landfill leachate to impact groundwater on the Claridge site.

The results of the groundwater monitoring to date show that leachate has not adversely affected groundwater quality in the surficial sand layer or upper weathered clay zone at a distance 10 metre south of the landfill (directly downgradient in terms of the groundwater flow direction).

4.1.6 Summary

Groundwater quality beneath the Claridge Phase 3 Spring Valley Trails land is protected from potential leachate impacts from the BFI Navan Facility by:

- The natural geologic setting, consisting of an extensive and thick deposit of low permeability silty clay soil;
- A groundwater flow direction from north to south (escarpment towards the edge of the Mer Bleue), not westward towards the Claridge site;
- A physical separation distance of 200 metres between the disposal area and the east property limit of the Phase 3 lands;
- An engineered perimeter leachate collector around the west and south side of the landfill, and a leachate collection system beneath the northeast and central portions of the disposal area and beneath the approved expanded footprint area further to the east; and,
- The design and operation of the leachate collection system, which creates a "hydraulic trap" and induces shallow groundwater flow towards the landfill, not away from it.

Ongoing groundwater monitoring shows that leachate has not affected groundwater quality at a distance of 10 metres beyond the downgradient (south) limit of the disposal area.

In conclusion, there is no apparent mechanism by which landfill leachate can affect groundwater quality beneath the Claridge Phase 3 lands.

4.2 Surface Water Runoff

The following sections describe the study undertaken to assess potential impact to surface water from the BFI Navan Facility landfill, the surface water management system in place and the surface water monitoring program.

4.2.1 Environmental Assessment Study Report

An assessment of the surface water environment was previously performed during the preparation of the EASR (Golder 2007b) for the BFI Navan Facility expansion. Both surface water quantity and surface water quality were assessed based on the conceptual model of surface flows for the BFI Navan Facility. The assessment found that the landfill is not having an adverse effect on downstream surface water receivers or the Mer Bleue.

4.2.2 Surface Water Management

The surface water management system at the BFI Navan Facility comprises a network of drainage ditches and roadside swales to intercept runoff generated at the BFI Navan Facility and direct it to either the east or west stormwater management pond. The east stormwater pond is located in the southeast corner of the BFI Navan Facility property, north of the Via Rail ROW and the discharge follows the same path south of the Via Rail ROW as the original pond servicing the east half of the site. Upstream flows originating to the northeast of the landfill

site are directed and conveyed to the Mer Bleue via the East By-Pass Ditch. The west stormwater pond is located in the northwest part of the BFI Navan Facility property approximately 275 m from the north property limit and discharges to the existing ditch which crosses the west property limit. Upstream flows originating to the north and northwest of the BFI Navan Facility site are diverted around the landfill by ditches that exist along the perimeters of the on-site buffer zone. The surface water management plan is shown in Figure 8.

Additionally, interim clay cover is placed over inactive portions of the existing waste mound to minimize runoff from the waste mound. Finished slopes are covered with clay soil, graded and seeded. Soil stockpiles are also covered with topsoil and/or compost and seeded for surface water and erosion control. To protect the perimeter clay slopes against erosion, clay diversion dikes and drainage swales have been constructed to collect surface run-off above the slope.

4.2.3 Surface Water Monitoring

Surface water monitoring is performed and reported as outlined in Condition 109 of ECA No. A460702. Surface water monitoring is performed three times per year to assess surface water quality and to estimate surface water flow at the BFI Navan Facility. Monitoring locations are shown in Figure 8.

Similar to groundwater, traditional compliance monitoring is not appropriate for the BFI Navan Facility. Surface water data at the BFI Navan Facility is variable over time and the Mer Bleue bog surface water quality is poor. It is difficult to assess surface water site compliance with scattered data. The BFI Navan Facility is an engineered landfill site; therefore, a release of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the purpose of effectively protecting the off-site surface water/bog water regime. The site-specific groundwater based trigger mechanism discussed in Section 4.1.4 of this report is the appropriate approach for the BFI Navan Facility. Surface water quality monitoring continues at the BFI Navan Facility, with the samples analyzed for appropriate parameters of concern and evaluated for potential impacts. This approach was outlined in the approved Groundwater and Surface Water Trigger Mechanism report (Golder 2007a) and the MOE has agreed that this is the appropriate approach for the BFI Navan Facility.

4.2.4 Summary

Therefore, based on the EASR study and the surface water management system in place, the BFI Navan Facility landfill will not impact the surface water on the Claridge site. The site-specific groundwater trigger mechanism will detect landfill leachate impact in the groundwater before the BFI Navan Facility surface water is impacted. Steps would then be taken to prevent impacted groundwater from impacting the surface water at the BFI Navan Facility before it would have the potential to impact surface water outside of the BFI Navan Facility property.

4.3 Ground Settlement

Significant drawdown of the water table can cause ground settlement in clay soils. Drawdown of the water table in an area could be caused by dewatered excavations on adjacent land. The oldest western part of the BFI Navan Facility landfill operations consisted of placing waste essentially above the existing grade without a bottom leachate collection system. As shown on Figure 7, in the newer north central and eastern portions, an excavation has been made to a depth of about 12 metres into the clay escarpment to create the landfill cell and construct a leachate collection system. As mentioned previously, the hydraulic trap design in the north central and eastern portions induces groundwater flow towards/into the landfill, and lowers the water table within the

disposal area relative to the water table in the area beyond the landfill. Because of the low permeability silty clay deposit, the radius (or distance) of influence of the "dewatered" landfill disposal area is quite limited; this is shown by ongoing monitoring of groundwater levels on the BFI site both above and below the escarpment area within 10 of metres of the landfill. Considering that the "dewatered" portion of the BFI Navan landfill is physically separated by a minimum of about 500 metres from the closest east boundary of the Claridge lands, the BFI Navan Facility will not cause ground settlement on the Claridge site.

4.4 Visual Impact

An assessment of the visual impact from the approved BFI Navan Facility landfill expansion was performed as part of the EASR (Golder 2007b). Visual impact was assessed by determining the impact of the landfill from nine view points surrounding the BFI Navan Facility. View point 3, "From Field West of Landfill" is located in the eastern portion of the Claridge site. During the EASR, it was concluded that additional visual impact mitigation measures (berms) were only required for the north portion of the BFI Navan Facility site along Navan Road.

Existing visual impact mitigation measures along the west side of the landfill include a deciduous hedgerow, as well as planting along the existing crest of the landfill prior to the vertical expansion (raising) of the landfill. In the EASR (Golder 2007b), the landfill is noted as being visible between the deciduous trees, particularly during the leafless period of the year. Visibility of the landfill will decrease as growth at the base of the landfill continues. In addition, in the longer term the waste mound will be landscaped with plantings so as to blend into the escarpment. Lastly, the approved phasing of the landfill development involves first raising the west part of the fill area closest to the Claridge lands, so that this area can be completed, final cover and vegetation applied early on, which will shelter future filling activities further to the east from view on the Claridge lands.

4.5 Air, Odour and Noise

The following sections describe the studies undertaken regarding the potential for atmospheric impacts as a result of the expanded BFI Navan Facility, the improved atmospheric controls associated with the approved expansion, and the monitoring programs for air, odour and noise in place at the BFI Navan Facility.

4.5.1 Environmental Assessment Study Report

An air impact assessment for the BFI Navan Facility was produced as a component of the EASR (Golder 2007b) prepared for the then proposed (now approved) BFI Navan Facility expansion. The assessment considered the possible impacts to air, odour and noise from the design alternatives considered for the expansion. Sources of air quality and odour impacts from the landfill included dust from roads and loading/unloading activities, products of combustion from the landfill gas (LFG) flare and on-site vehicles, fugitive LFG emissions, and odour emissions from the active area of the landfill. Sources of noise impacts from the landfill site included operations equipment, the site maintenance facility, LFG flare, and leachate pumping facility.

Potential air quality and odour impacts from the landfill were assessed for compliance with O.Reg. 419/05 (MOE 2005) and for impacts to off-site receptors based on the predicted concentration of indicator compounds determined from dispersion modelling. Indicator compounds selected for the assessment included particulate matter associated with dust (suspended particulate matter (SPM) and particulate matter < 10 micrometres (PM_{10})), combustion gases associated with landfill gas flaring and on-site vehicles (nitrogen dioxide (NO_2) and sulphur dioxide (SO_2), hydrogen sulphide (H_2S), vinyl chloride, and odour. Off-site air quality indicator compounds and odour levels were predicted using the AERMOD dispersion modelling system, a regulatory

model recommended by the MOE. Four different groups of receptors used in the dispersion modelling; most notably, 285 sensitive receptors were placed in existing and future residential areas to establish the maximum exposure that residents near the landfill may experience. Figure 9 shows the location of all sensitive receptors considered in the modelling, and the Claridge site. Many of the sensitive receptor locations used in the modelling were within the Claridge site.

Potential noise impacts from the landfill were assessed at 17 existing or future receptor locations identified as the most sensitive in the vicinity of the BFI Navan Facility. Figure 10 shows the receptor locations, which included 3 future locations (R1, R2, R3) along the east limits of the Claridge site. Source sound level measurements at the BFI Navan Facility were taken using a sound level meter/realtime analyzer. Using the source sound level data, noise impact predictions were made for each receptor using the international standard ISO 9613-2 [AE4] on sound propagation outdoors.

The air quality and odour impact assessment found that all previously proposed landfill expansion alternatives, including the chosen alternative that received *Environmental Protection Act* approval in 2009, comply with O.Reg. 419/05 (MOE 2005). Predicted levels of air quality indicator parameters did not exceed Ontario criteria, while predicted odour levels, though infrequently marginally exceeding Ontario guideline criteria at certain sensitive receptor locations, were found to be within the allowable number of exceedances set out by the odour framework for Ontario at the time of the assessment.

The noise impact assessment found that all previously proposed landfill expansion alternatives, including the chosen alternative that received *Environmental Protection Act* approval in 2009, will generate noise levels that meet the MOE noise level limit for landfill operations and ancillary equipment at all off-site receptor locations, using the installation of the proposed noise barrier systems incorporated into the landfill operations design alternatives. Additionally, annual noise monitoring has previously indicated that noise levels caused by landfill operations do not significantly contribute to noise levels at the BFI Navan Facility property limits (Golder 2013b).

4.5.2 Improvements to Controls of Atmospheric Emissions from the BFI Navan Facility Expansion

The approved landfill expansion incorporated a number of mitigation measures that assist in the management of potential impacts to air quality, odour, and noise. These mitigation measures include:

- The installation of the leachate management system (mitigates potential air quality and odour impacts);
- Conveying of leachate off-site for treatment in a forcemain, therefore eliminating leachate tanker traffic (and associated traffic noise and/or odours off-site);
- Interim landfill gas and odour control system that went into operation in 2012 (mitigates potential odour impacts);
- The discontinuation of composting operations (mitigates potential air quality and odour impacts, reduces noise from on-site equipment);
- The proposed installation of an active LFG collection system, for the whole landfill site, to be installed progressively as filling is completed in an area of the landfill, equipped with an enclosed flare (mitigates potential air quality and odour impacts);

- Enclosing the leachate pump and LFG flare (Golder 2008b) (reduces noise impacts);
- The continuation of the landfill dust management practices including:
  - The application of gravel to unpaved on-site haul routes;
  - Watering and the addition of dust suppressants (calcium chloride) on unpaved roads;
  - Imposing a speed limit of 20 km/h on unpaved roads;
  - Implementation of truck tire-wash facility; and,
  - Cleaning of BFI Navan Facility site entrance.
- The installation of 4 metre high berms along Navan Road and tree planting as defined in the D&O Report (Golder 2008b) (mitigates noise impacts);
- The adoption of noise, odour, and dust monitoring plans as described in the D&O Report (Golder 2008b); and,
- Continuation of a complaints and response procedure as defined in the D&O Report (Golder 2008b).

4.5.3 Monitoring Program

Dust, noise, and odour monitoring programs were developed and approved during the previous expansion approval process, and are defined in the D&O Report (Golder 2008b), and required by the ECA for site operation.

4.5.3.1 Dust Monitoring

The BFI Navan Facility dust monitoring plan was developed in consultation with the MOE, National Capital Commission (NCC) and the City in accordance with EA Conditions 10.7 and 10.8. The plan comprised two parts: monitoring of dust, and monitoring of triggers of fugitive dust.

Dust monitoring was performed and reported as outlined in Condition 111 of ECA No. A460702. The monitoring of dust was performed from 2009 to 2011 using dust fall monitors located within the Mer Bleue Conservation Area and in areas of potential highest off-property impacts, with locations varying based on the movement of landfilling operations across the BFI Navan Facility site over time. Dust fall monitoring was performed for three years, and the program was discontinued following the results of the 2011 monitoring report (Golder 2012), as they did not indicate additional impact beyond existing conditions in the area, and the requirements under EA conditions 10.7 and 10.8 had been met.

The monitoring of triggers of fugitive dust is performed through maintaining records of mitigative dust control measures, any complaints and complaint response, and traffic, and by performing weekly site inspections that includes factors related to the generation of dust.

4.5.3.2 Noise Monitoring

Noise monitoring is performed and reported as outlined in Condition 111 of ECA No. A460702. The BFI Navan Facility noise monitoring program involves the use of noise monitors that log acoustic data every hour for the duration of the monitoring period. Monitoring is performed twice per year during peak landfilling activity.

Monitoring locations may vary depending on the active landfill phase. Current monitoring locations are presented in Figure 10. Noise monitoring to date indicates that the BFI Navan Facility is operating as expected.

4.5.3.3 Odour Monitoring

Odour monitoring is performed and reported as outlined in Condition 111 of ECA No. A460702. The BFI Navan Facility odour monitoring program involves inspecting the preventative measures that make up the Odour Management Plan. During the once weekly site inspection for fugitive dust, an inspection is also conducted of the landfill cap, to ensure there are no cracks and/ or gaps which would potentially allow LFG to escape. This inspection program also records any significant changes to on-site odour and initiates corrective action in cases where it is possible that off-property impacts may occur. Odour monitoring to date indicates that the BFI Navan Facility is operating as expected.

4.5.4 Summary

The predictive modelling of potential off-site impacts related to air quality, dust, odour and noise carried out as part of the approvals process for the BFI Navan Facility landfill expansion included potential receptor locations within the Claridge Phase 3 lands. The modelling prediction results indicated the site operations were expected to meet provincial requirements and not cause adverse effects off-site. There are a number of design and operational mitigation measures to control and minimize the potential for off-site atmospheric impacts. Ongoing monitoring programs demonstrate that the BFI Navan Facility is performing acceptably, as expected based on predictions. Considering that operations on the landfill are progressively moving eastwards, away from the Claridge Phase 3 lands, it is expected that the Claridge Phase 3 lands will not experience unacceptable atmospheric effects from the BFI Navan Site.

4.6 Soil Contamination

Contamination of soil on the Claridge site could only occur as a result of contaminant transport from the BFI Navan Facility landfill to the Claridge site via groundwater or surface water. As previously discussed in Sections 4.1 and 4.2, contaminant transport from the BFI Navan Facility by groundwater or surface water is not expected to occur due to the natural hydrogeology and engineered controls for the landfill site.

4.7 Hazardous Waste

Hazardous waste is not accepted at the BFI Navan Facility.

4.8 Landfill Gas

The following sections describe the potential for LFG migration in the subsurface from the BFI Navan Facility to the Claridge site. The natural geological and engineered barriers to LFG migration are considered, and LFG monitoring is described.

4.8.1 Geological Barriers

The natural potential for the subsurface migration of LFG was considered during the environmental assessment for the proposed landfill expansion in 2007, and in the D&O Report (Golder 2008b) for the landfill. LFG is composed of about 50% methane, which is of concern if it accumulates in potentially explosive concentrations in air within enclosed spaces. It was discussed in the D&O Report (Golder 2008b) that the geological setting in the area does not encourage the lateral migration of methane from LFG through the subsurface. The clay deposit

does not support migration of gas, causing the gas (which is lighter than air) to move preferentially to the atmosphere through the waste, surficial sand unit, or through passive ventilation through the LCS on the west, south and east limits of the waste area, and by stormwater ditches or leachate intervening trenches. Additionally, LFG migrates above the water table. In the *Guideline for Assessing Methane Hazards from Landfill Sites* (MOE 1987) it is stated that significant methane migration may extend for a distance equal to ten times the depth of landfill between the ground surface and the water table. If the depth of the water table in this site area can be conservatively considered to be 2 metres below the ground surface, the maximum distance of significant methane migration would be expected to be 20 metres from the toe of the waste footprint. As stated in the D&O Report (Golder 2008b), the buffer between the toe of the waste mound and the western property boundary of the BFI Navan Facility is 100 metres. An additional 100 metres of privately owned land (not used for residential purposes) separates the BFI Navan Facility property from the Claridge site. It is not anticipated that methane generated by the landfill would migrate off of the BFI Navan Facility site, or the additional 100 metres to the eastern edge of the Claridge site.

LFG migration is also impeded by barriers and passive ventilation on the BFI Navan Facility site. Low permeability clay cut-off walls, clay berms and intervening drainage trenches installed for the purpose of minimizing and containing the flow of leachate also act as a barrier against LFG migration. The low permeability barriers exist along the north, west and south perimeters of the waste footprint. Clay barriers will be installed along the east perimeter of the waste footprint as landfill development progresses (Golder 2013a).

4.8.2 Landfill Gas Management System

As an approved component of the BFI Navan Facility expansion, a LFG management system that complies with existing requirements under O.Reg. 232/98 (MOE 1998) was designed. A complete description of the proposed LFG management system is provided in Section 6.7 of the D&O Report (Golder 2008b). The LFG management system consists of LFG extraction wells, lateral and header piping, an abstraction facility and enclosed flare. The 31 vertical extraction wells will be drilled into the waste and connected to lateral piping which will direct the gas to the main header pipe. Maintenance manholes and the leachate collection sump (as proposed for the landfill expansion) will also be connected to the main header by lateral piping. The main header transmits the gas to the abstraction facility and flare. The blower within the abstraction facility extracts the gas under negative pressure, and the enclosed flare will destroy the LFG by combustion. It is estimated that the system will have 65-70% collection efficiency. The LFG management system is expected to significantly reduce or eliminate outward LFG pressure gradients, and by doing so contribute further to decreasing the potential for lateral migration away from the waste mound. Operation of the LFG management system will include regular monitoring and periodic adjustment to the well field and abstraction facility to maintain and balance the system. Figure 11 shows the proposed LFG management system layout. The LFG management system will be progressively installed as the development of the landfill continues.

An interim LFG odour control system has been installed and operated since April of 2012 with the purpose of reducing odour from LFG prior to the full-scale LFG collection system being completely installed. This system includes connections to the existing LCS cleanouts and to existing vertical LFG extraction wells, as well as lateral and header piping, condensate management facilities, an outdoor abstraction plant and candlestick flare.

4.8.3 Landfill Gas Monitoring Program

LFG monitoring is performed and reported as outlined in Condition 110 of ECA No. A460702. Figure 12 shows the locations on the BFI Navan Facility site where LFG is monitored. LFG monitoring at the locations shown in Figure 12 is performed three times per year. Additionally, routine monitoring for explosive methane gas levels within all buildings or structures at the BFI Navan Facility is performed at the same frequency as the current monitoring program of three times per year. LFG monitoring to date has indicated that there is no lateral migration of landfill gas from the landfill.

4.8.4 Summary

For all of the reasons described above, the combination of the natural geological setting and engineered features mitigate the potential migration of LFG in the subsurface from the BFI Navan Facility.

4.9 Post-closure Activities and Monitoring

Following the BFI Navan Landfill site reaching its approved disposal capacity, the ongoing post-closure activities will consist of: continued operation of the leachate collection system and conveyance for off-site treatment; continued operation of the landfill gas extraction system and flare; the site monitoring programs; and site inspection and maintenance.

5.0 PREVIOUS REVIEWS BY THE CITY OF OTTAWA

The City has retained consultants in the past to review studies about potential impacts from the BFI Navan Facility on the surrounding properties.

During the BFI Navan Facility expansion Environmental Assessment approval process, the EASR and supporting technical documents (Golder 2007b) were peer reviewed in full by Conestoga Rovers and Associates (CRA) on behalf of the City in 2007. The CRA peer review included all agents of the environment relevant to the buffer study. The peer review and resulting comments from the City were submitted to the MOE for consideration with regard to the previously pending expansion approval. The City concluded from the peer review that there were no outstanding technical concerns with the EASR, with the exception of comments regarding the odour and noise review, as stated in the attached letter from the City to the MOE dated April 23, 2007. These comments were addressed by Golder on behalf of BFI (formerly WSI (CA) Inc.), the owner of the BFI Navan Facility. The responses were submitted to the MOE as part of the application for expansion approval. The MOE subsequently granted EA and EPA approval of the expansion. The CRA peer review is included in Appendix A of this report.

In 2008, RWDI Air Inc. (RWDI) performed a peer review of the atmospheric portion of the EASR (Golder 2007b) on behalf of the City with regard to potential atmospheric impacts from the BFI Navan Facility to a proposed development located north of Navan Road. Golder provided responses to comments resulting from the peer review, and provided supplemental information to RWDI. Additionally, a buffer study was completed by Trow Associates Inc. (Trow) with regard to potential impacts to the same proposed development north of Navan Road resulting from the BFI Navan Facility. As a result of the peer review by RWDI and the buffer study by Trow, the City agreed to reduce the zone of influence of the BFI Navan Facility to exclude the proposed development. The City has recently requested that the buffer study by Trow be revisited to address any substantive changes to the environment that have occurred since the aforementioned buffer study, which was completed and accepted in 2008.

Jacques Whitford Ltd. (JWL), on behalf of the City, performed a peer review of work done by John D. Paterson and Associates (Paterson) for the Claridge lands, which included comments on potential impacts to the proposed Claridge site from the BFI Navan Facility. Comments resulting from this peer review were addressed by Golder, acting on behalf of Claridge, in a letter dated February 15, 2008, and in a presentation to the City on July 8, 2008. Outstanding concerns presented by JWL are addressed within this buffer study.

6.0 CONCLUSIONS

This buffer study was completed to satisfy Section 3.8.6 of the City's Official Plan, which requires any development requiring planning approval on land within the (presumed) influence area of 500 metres from an operating or non-operating solid waste disposal site to undertake a study to demonstrate that the solid waste disposal site will not have any unacceptable adverse effects on the proposed development and will not pose any risks to human health and safety.

As required by Section 3.8.7 of the Official Plan, this buffer study addressed the following areas of concern: potential contamination by leachate, surface runoff, ground settlement, visual impact, air (dust), odour, and noise, soil contamination, and LFG migration.

Based on the studies and design work performed during the BFI Navan Facility's expansion, which received EA approval in 2007 and EPA Approval in 2009, as well as historical and on-going monitoring at the BFI Navan Facility site, it can be concluded that the BFI Navan Facility will not have any unacceptable adverse effects on the proposed Claridge Spring Valley Trails Phase 3 development, and will not pose any risks to human health and safety. It is also not expected that the development of the Claridge site will impact the continued operation of the landfill. The proposed continuation of current operational practices and environmental monitoring, as well as the installation of environmental controls proposed as part of the continued expansion of the BFI Navan Facility is expected to result in continued compliance with Section 3.8.6 of the City's Official Plan.

It is recommended that the zone of influence of the BFI Navan Facility be reduced such that it excludes the Claridge Spring Valley Trails development lands.

7.0 LIMITATIONS AND USE OF REPORT

This report was prepared for the exclusive use of Claridge Homes. The report, which specifically includes all figures and attachments, is based on data and information collected by Golder Associates Ltd. and is based solely on the conditions of the properties at the time of the work, supplemented by historical information and data obtained by Golder Associates Ltd. as described in this report.

Golder Associates Ltd. has relied in good faith on all information provided and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in the report as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation.

The assessment of environmental conditions and possible hazards at this site has been made using the results of physical measurements from a number of locations. The site conditions between sampling locations have been inferred based on conditions observed. Conditions may vary from these sampled locations.

The services performed, as described in this report, were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, Golder Associates Ltd. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

8.0 CLOSURE

We trust this report meets your current needs. If you have any questions regarding this report, please contact the undersigned.

GOLDER ASSOCIATES LTD.

Andria Caletti, B.Sc.Eng.
Environmental Consultant

Paul Smolkin, P.Eng.
Principal

REGISTERED PROFESSIONAL ENGINEER
P. A. SMOLKIN
Dec 20/13
PROVINCE OF ONTARIO

ALC/MKF/PAS/sg
n:\active\2007\1121 - geotechnical\07-1121-0232 claridge spring valley ottawa\task 2000 environmental\buffer study\navan landfill buffer study_final 2013dec20.docx

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REFERENCES

Golder Associates Ltd. (2013a). 2012 Landfill Gas Monitoring Report, BFI Canada Inc., Waste Recycling and Disposal Facility, March 2013.

Golder Associates Ltd. (2013b). BFI Navan Facility Noise Monitoring 2012, March 2013.

Golder Associates Ltd. (2013c). 2012 Landfill Monitoring, BFI Canada Inc., Navan Waste Recycling and Disposal Facility Site, March 2013.

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Golder Associates Ltd. (2008b). Design and Operations Report, Navan Landfill Site Expansion Approvals, January 2008.

Golder Associates Ltd. (2007a). Groundwater and Surface Water Trigger Mechanism, Waste Services (CA) Inc., Navan Landfill Site, March 2007.

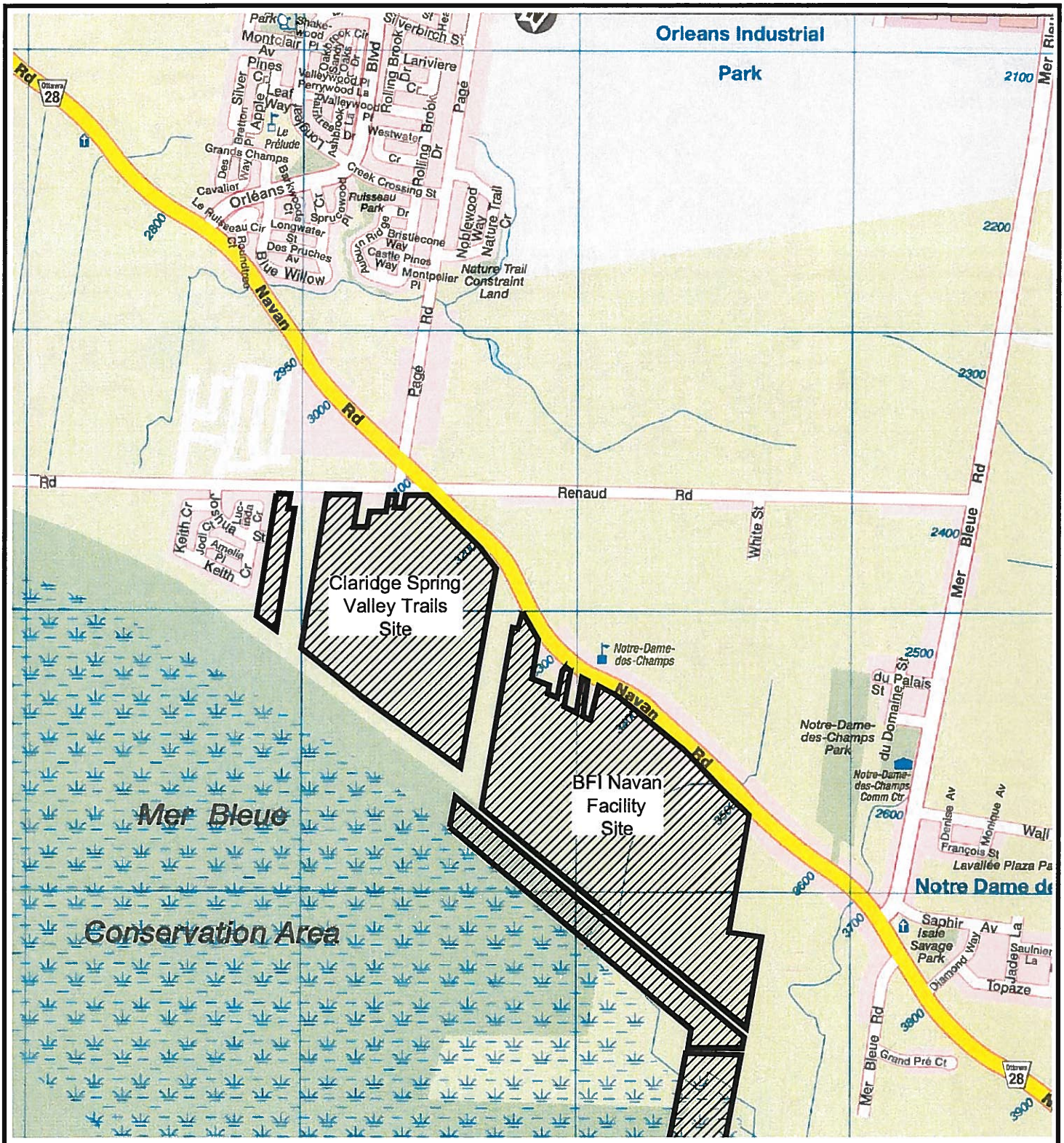
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Ministry of the Environment, (1994). Guideline B-7: Incorporation of the Reasonable Use Concept into MOE Groundwater Management: Ontario Ministry of the Environment and Energy Program Development Branch, Ontario Ministry of the Environment and Energy, April 1994.

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NOTE

THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 07-1121-0232-2000

Golder Associates
Ottawa, Ontario, Canada

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DATE	2013-12-20
DESIGN	
CAD	JM/BR
CHECK	ALC
REVIEW	PAS

TITLE

KEY PLAN

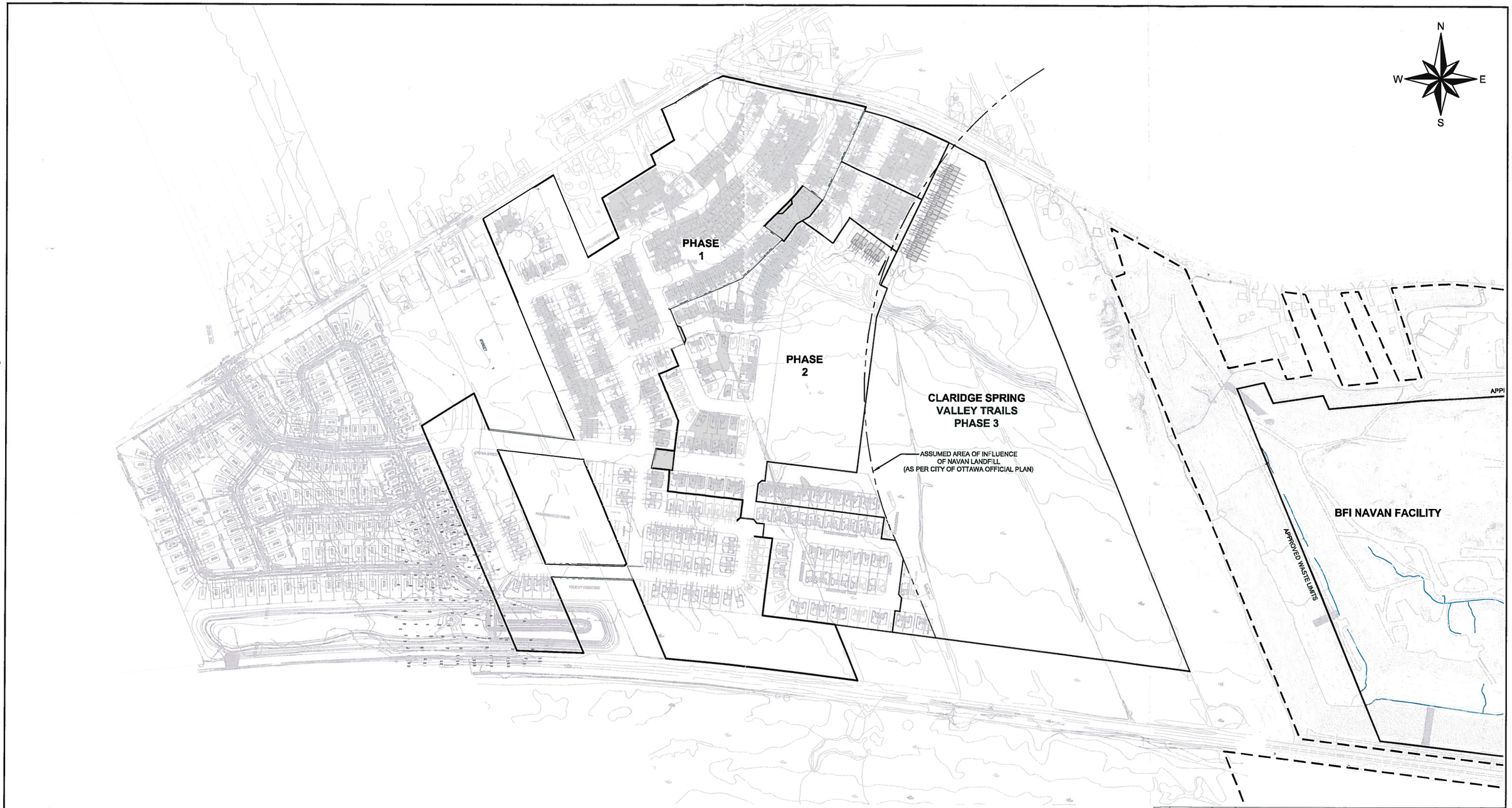
FILE No. 0711210232-2000-01.dwg

PROJECT No. 07-1121-0232 REV.

BUFFER STUDY
PHASE 3 - SPRING VALLEY TRAILS

FIGURE 1

PLOT DATE: December 20, 2013
FILENAME: N:\Active\2007\1121 - Geotechnical\07-1121-0232 Claridge Spring Valley Ottawa\ACAD\Phase 2000\0711210232-2000-01.dwg



LEGEND

- CLARIDGE PROPERTY BOUNDARY
- EXISTING BUILDING
- ROAD
- BFI PROPERTY BOUNDARY
- FENCE LINE
- CLARIDGE SITE CONTOURS (SEP. 2006)
- BFI SITE CONTOURS (JULY 2010)

REFERENCE

1. BASE PLAN SUPPLIED IN ELECTRONIC FORMAT BY IBI GROUP AND THE BASE MAPPING CO. LTD.

NOTE

1. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 07-1121-0232-2000

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SCALE 1:5000 METRES

REV	DATE	DES	REVISION DESCRIPTION	CAD	CHK	RVW

PROJECT

BUFFER STUDY
PHASE 3 - SPRING VALLEY TRAILS
OTTAWA, ONTARIO

TITLE

CLARIDGE HOMES
SPRING VALLEY TRAILS
SITE PLAN

Golder Associates
Ottawa, Ontario, Canada

PROJECT No.	07-1121-0232		FILE No. 0711210232-2000-02.dwg
DESIGN			SCALE 1:5,000 REV.
CAD	JM/BR	2013-12-20	FIGURE No.
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PLOT DATE: December 20, 2013
FILENAME: N:\Active\2007\1121 - Geotechnical\07-1121-0232 Claridge Spring Valley Ottawa\ACAD\Phase 2000\0711210232-2000-02.dwg

PHASE 2

CLARIDGE SPRING VALLEY TRAILS PHASE 3

ASSUMED AREA OF INFLUENCE OF NAVAN LANDFILL (AS PER CITY OF OTTAWA OFFICIAL PLAN)

BFI NAVAN FACILITY

APPROVED WASTE LIMITS

APPROVED WASTE LIMITS

APPROVED WASTE LIMITS

APPROVED WASTE LIMITS

A

A'

B

B'

N

W

E

S

LEGEND

- CLARIDGE PROPERTY BOUNDARY
- EXISTING BUILDING
- ROAD
- BFI PROPERTY BOUNDARY
- FENCE LINE
- CLARIDGE SITE CONTOURS (SEP. 2006)
- BFI SITE CONTOURS (JULY 2010)
- GROUNDWATER MONITORING STATION
- A A' CROSS-SECTION LOCATION. REFER TO FIGURES 4 AND 5 FOR CROSS-SECTIONS

REFERENCE

1. BASE PLAN SUPPLIED IN ELECTRONIC FORMAT BY IBI GROUP AND THE BASE MAPPING CO. LTD.

NOTE

1. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 07-1121-0232-2000

100 0 100 200

SCALE 1:5000 METRES

REV	DATE	DES	REVISION DESCRIPTION	CAD	CHK	RVW

PROJECT

BUFFER STUDY
PHASE 3 - SPRING VALLEY TRAILS
OTTAWA, ONTARIO

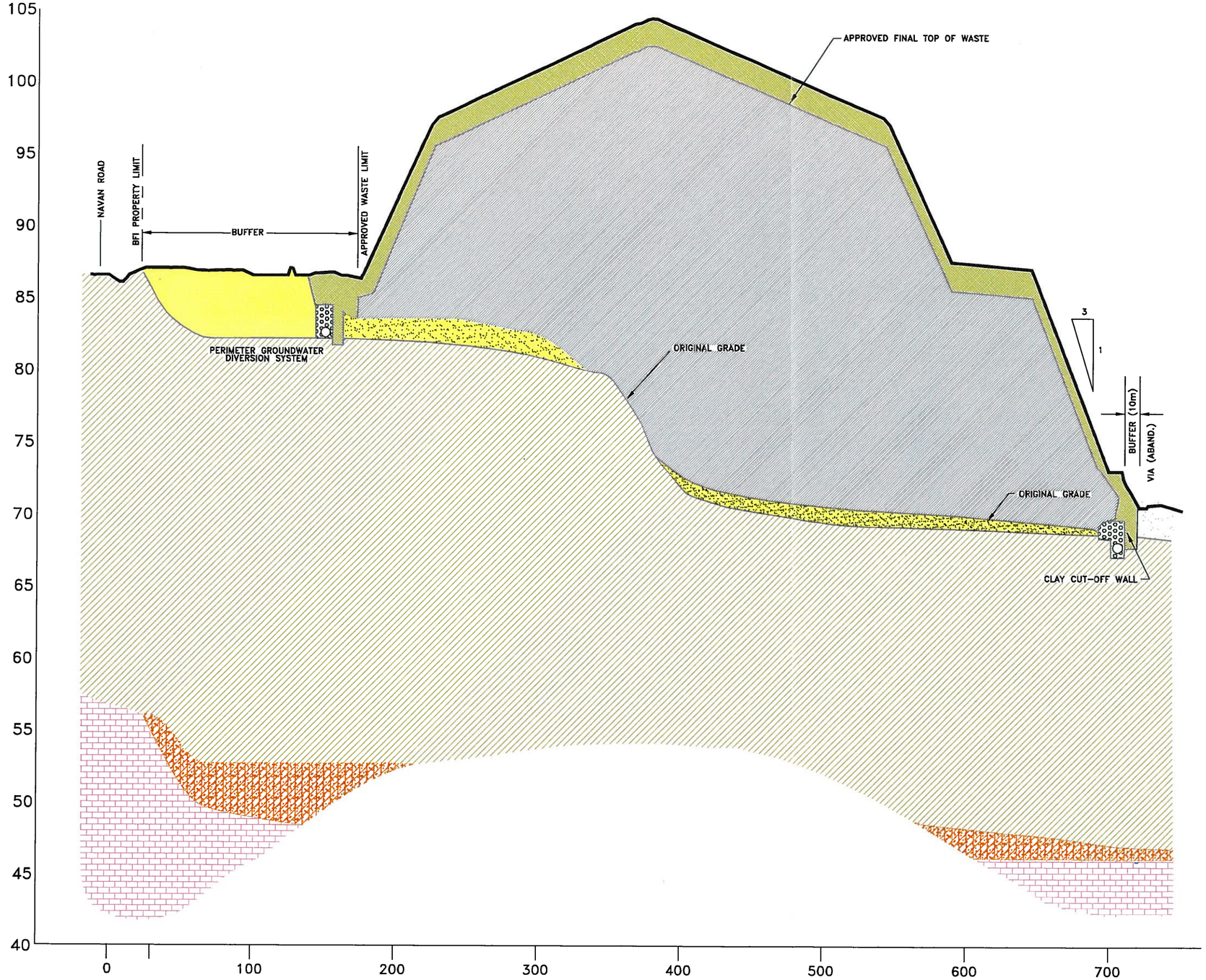
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BFI NAVAN FACILITY SITE PLAN

Golder Associates
Ottawa, Ontario, Canada

PROJECT No.	07-1121-0232		FILE No. 0711210232-2000-03.dwg
DESIGN			SCALE 1:5,000 REV.
CAD	JMBR	2013-12-20	FIGURE No.
CHECK	ALC	2013-12-20	3
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PLOT DATE: December 20, 2013
FILENAME: N:\Active\2007\1121 - Geotechnical\07-1121-0232 Claridge Spring Valley Ottawa\ACAD\Phase 2000\0711210232-2000-03.dwg



HORIZONTAL SCALE: 1:3,000
VERTICAL SCALE: 1:300
HORIZONTAL SCALE EXAGGERATED 10 TIMES THE VERTICAL SCALE FOR ILLUSTRATION PURPOSES

LEGEND

- CLAY FINAL COVER
- REFUSE
- CLEAR CRUSHED STONE
- SAND
- SILTY CLAY
- GLACIAL TILL
- BEDROCK

REFERENCE

1. BASE MAP PROVIDED BY WSI, DRAWING No.: 2005-2.9. DATED: FEBRUARY 2006

NOTE

1. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 07-1121-0232-2000

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PROJECT

BUFFER STUDY
PHASE 3 - SPRING VALLEY TRAILS
OTTAWA, ONTARIO

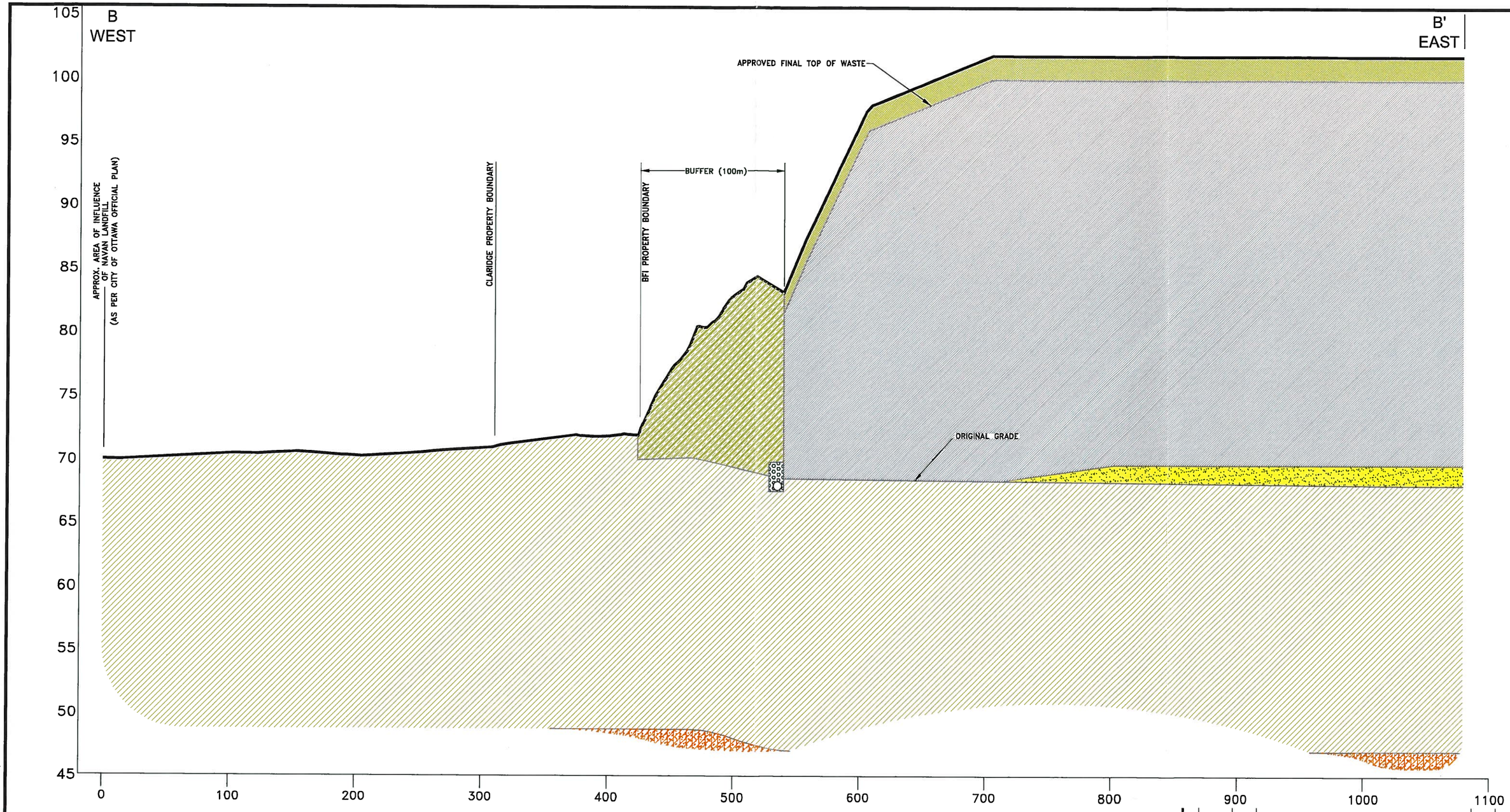
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SCHEMATIC CROSS-SECTION A-A'

Golder Associates
Ottawa, Ontario

PROJECT No. 07-1121-0232			FILE No. 0711210232-2000-03.dwg	
DESIGN			SCALE AS SHOWN	REV. 0
CADD	JM/BR	2013-12-20	FIGURE 4	
CHECK	ALC	2013-12-20		
REVIEW	PAS	2013-12-20		

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HORIZONTAL SCALE: 1:3,000
VERTICAL SCALE: 1:300
HORIZONTAL SCALE EXAGGERATED 10 TIMES THE VERTICAL SCALE FOR ILLUSTRATION PURPOSES

LEGEND

- CLAY FINAL COVER
- REFUSE
- CLAY BERM
- CLEAR CRUSHED STONE
- SILTY CLAY
- SAND
- GLACIAL TILL

REFERENCE

1. BASE MAP PROVIDED BY WSI, DRAWING No.: 2005-2.9. DATED: FEBRUARY 2006

NOTE

1. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 07-1121-0232-2000

REV	DATE	DES	REVISION DESCRIPTION	CADD	CHK	RVW
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PROJECT

BUFFER STUDY
PHASE 3 - SPRING VALLEY TRAILS
OTTAWA, ONTARIO

TITLE

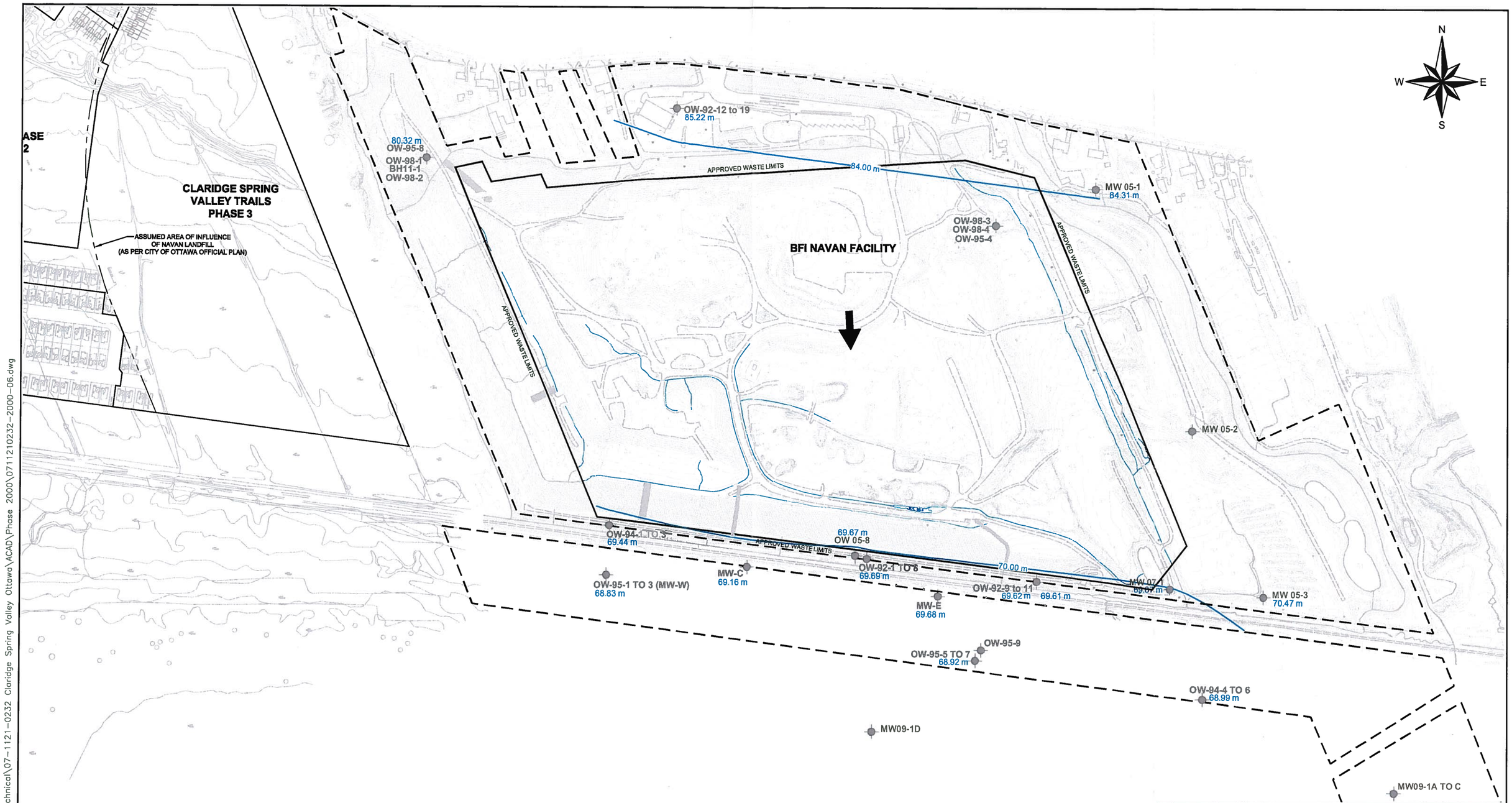
SCHEMATIC CROSS-SECTION B-B'

Golder Associates
Ottawa, Ontario

PROJECT No. 07-1121-0232			FILE No.	0711210232-2000-03.dwg
DESIGN			SCALE	AS SHOWN
CADD	JM/BR	2013-12-20	REV.	D
CHECK	ALC	2013-12-20		
REVIEW	PAS	2013-12-20		

FIGURE 5

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LEGEND

- CLARIDGE PROPERTY BOUNDARY
- EXISTING BUILDING
- ROAD
- BFI PROPERTY BOUNDARY
- FENCE LINE
- CLARIDGE SITE CONTOURS (SEP. 2006)
- BFI SITE CONTOURS (JULY 2010)
- GROUNDWATER MONITORING STATION
- –74.00 m– GROUNDWATER ELEVATION CONTOUR (MAY 21, 2013)
- 85.22 m GROUNDWATER ELEVATION, metres (MAY 21, 2013)
- INTERPRETED GW FLOW DIRECTION

REFERENCE

1. BASE PLAN SUPPLIED IN ELECTRONIC FORMAT BY IBI GROUP AND THE BASE MAPPING CO. LTD.

NOTE

1. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 07-1121-0232-2000

100 0 100 200
SCALE 1:5000 METRES

REV	DATE	DES	REVISION DESCRIPTION	CAD	CHK	RVW
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PROJECT
BUFFER STUDY
PHASE 3 - SPRING VALLEY TRAILS
OTTAWA, ONTARIO

TITLE
GROUNDWATER FLOW IN SURFICIAL SAND AND WEATHERED CLAY ZONE

Golder Associates
Ottawa, Ontario, Canada

PROJECT No.	07-1121-0232		FILE No.	0711210232-2000-06.dwg	
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PLOT DATE: December 20, 2013
FILENAME: N:\Active\2007\1121 – Geotechnical\07–1121–0232 Claridge Spring Valley Ottawa\ACAD\Phase 2000\0711210232–2000–06.dwg

PHASE 2

CLARIDGE SPRING VALLEY TRAILS PHASE 3

ASSUMED AREA OF INFLUENCE OF NAVAN LANDFILL (AS PER CITY OF OTTAWA OFFICIAL PLAN)

APPROVED WASTE LIMITS

(ABANDONED)

MH-12

MH-11

MH-10

MH-9

MH-8

MH-7

MH-6

MH-5

MH-4

MH-3

MH-2

MH-1

MH-0

MH-15

MH

MH

CENTRAL MANHOLE

APPROVED EXPANSION AREA

LEACHATE WET WELL AND PUMP STATION

N

W

E

S

LEGEND

- CLARIDGE PROPERTY BOUNDARY
- EXISTING MAINTENANCE HOLE
- EXISTING BUILDING
- ROAD
- BFI PROPERTY BOUNDARY
- FENCE LINE
- CLARIDGE SITE CONTOURS (SEP. 2060)
- BFI SITE CONTOURS (JULY 2010)
- EXISTING LEACHATE UNDERDRAIN COLLECTOR
- EXISTING PERIMETER LEACHATE COLLECTOR AND UNDERDRAINS
- EXISTING HYDRAULIC CONNECTIONS
- LEACHATE COLLECTOR PIPE (APPROVED, YET TO BE CONSTRUCTED)
- 200 mm DIA. NON-PERFORATED DRAIN PIPE
- FRENCH DRAIN
- CLAY FILL

REFERENCE

1. BASE PLAN SUPPLIED IN ELECTRONIC FORMAT BY IBI GROUP AND THE BASE MAPPING CO. LTD.

NOTE

1. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 07-1121-0232-2000

100 0 100 200

SCALE 1:5000 METRES

REV	DATE	DES	REVISION DESCRIPTION	CAD	CHK	RVW

PROJECT

BUFFER STUDY
PHASE 3 - SPRING VALLEY TRAILS
OTTAWA, ONTARIO

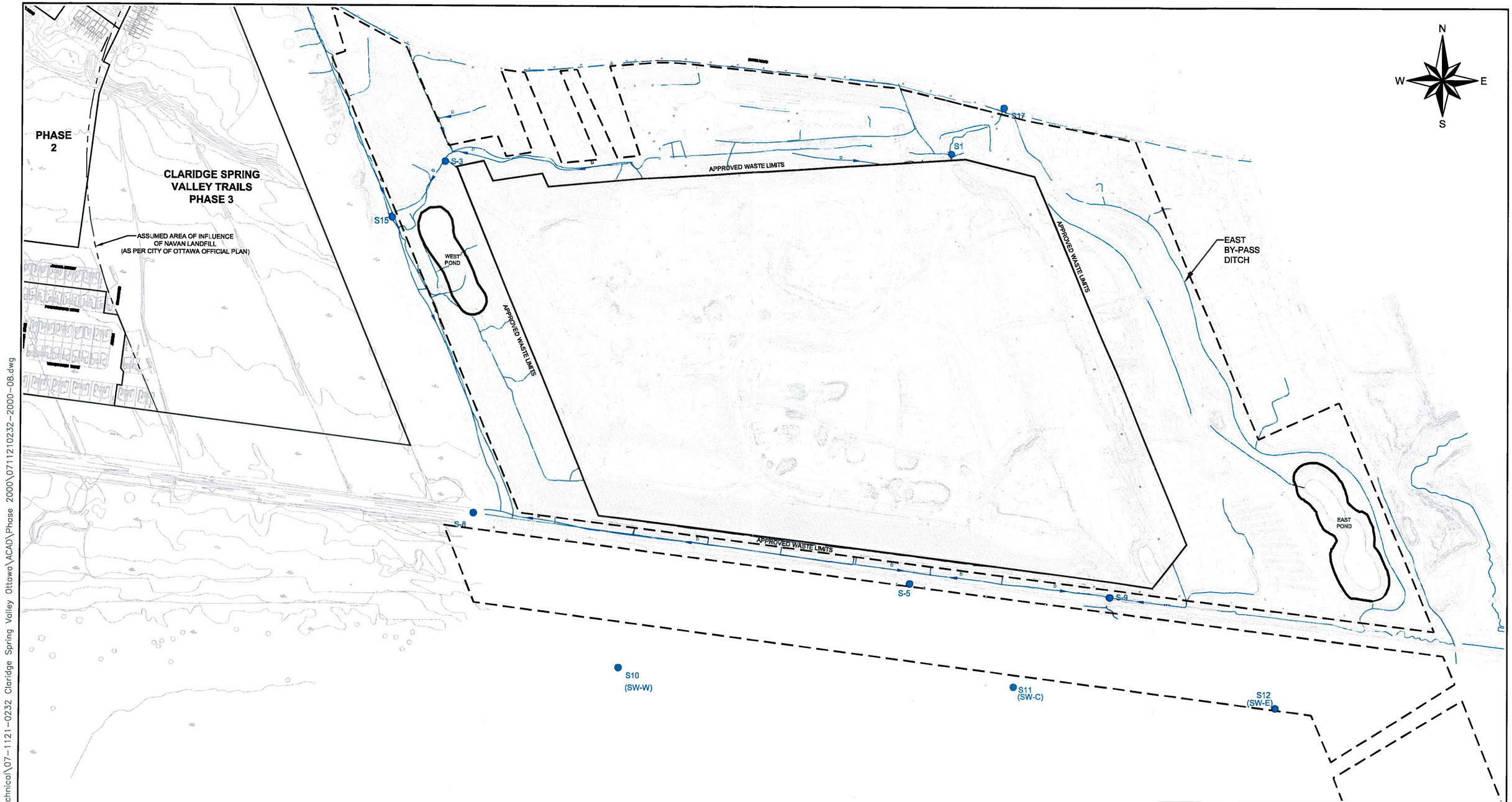
TITLE

LEACHATE COLLECTION SYSTEM

Golder Associates
Ottawa, Ontario, Canada

PROJECT No.	07-1121-0232		FILE No. 0711210232-2000-07.dwg
DESIGN			SCALE 1:5,000 REV.
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PLOT DATE: December 20, 2013
FILENAME: N:\Active\2007\1121 - Geotechnical\07-1121-0232 Claridge Spring Valley Ottawa\ACAD\Phase 2000\0711210232-2000-07.dwg



LEGEND

- CLARIDGE PROPERTY BOUNDARY
- D — DITCH
- DRAINAGE FLOW DIRECTION
- EXISTING BUILDING
- ROAD
- BFI PROPERTY BOUNDARY
- FENCE LINE
- CLARIDGE SITE CONTOURS (SEP. 2006)
- BFI SITE CONTOURS (JULY 2010)
- SURFACE WATER SAMPLING STATION

REFERENCE

1. BASE PLAN SUPPLIED IN ELECTRONIC FORMAT BY IBI GROUP AND THE BASE MAPPING CO. LTD.

NOTE

1. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 07-1121-0232-2000

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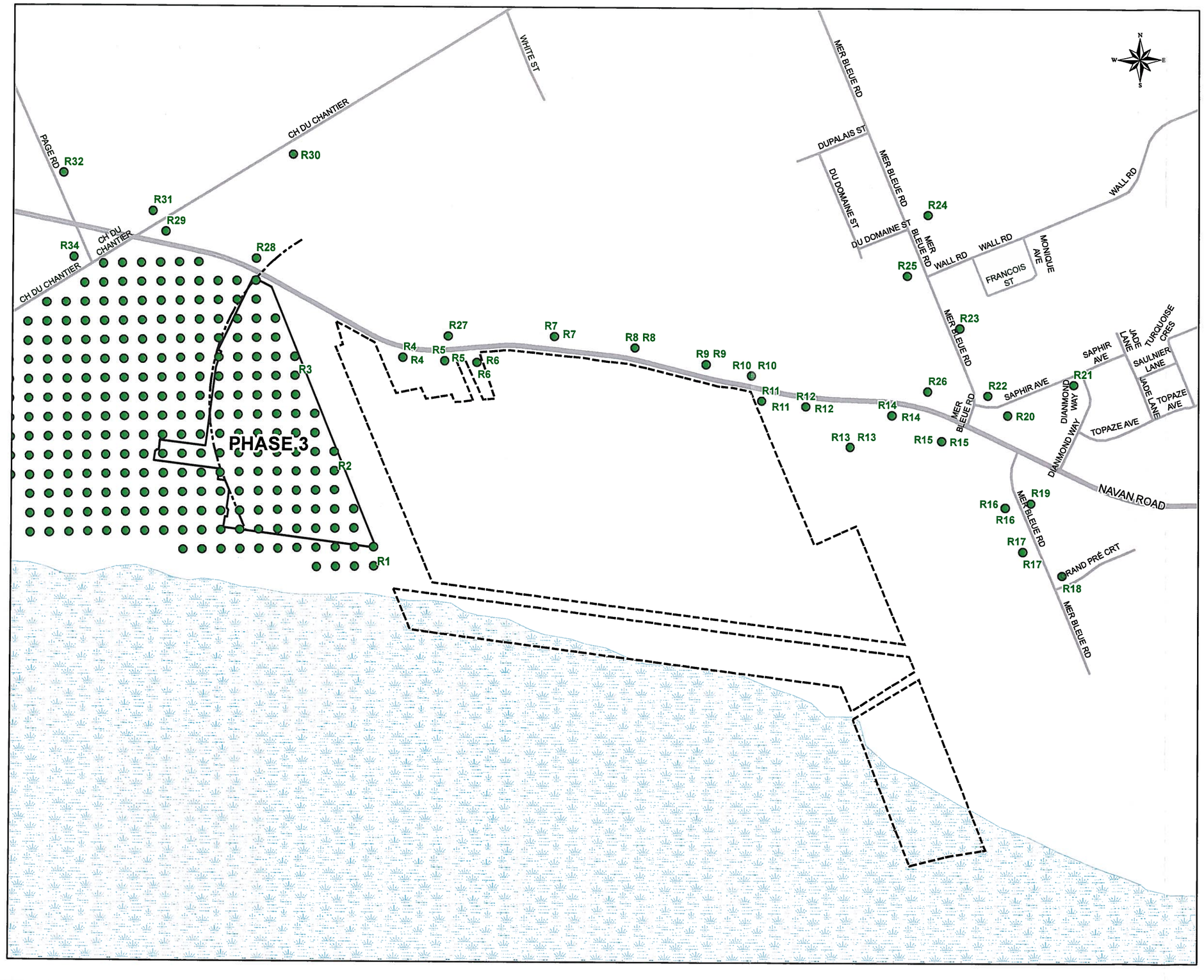
PROJECT
BUFFER STUDY
PHASE 3 - SPRING VALLEY TRAILS
OTTAWA, ONTARIO

TITLE
SURFACE WATER MANAGEMENT PLAN

Golder Associates
Ottawa, Ontario, Canada

PROJECT No.	07-1121-0232		FILE No. 0711210232-2000-08.dwg		
DESIGN			SCALE 1:5,000	REV.	
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PLOT DATE: December 20, 2013
FILENAME: N:\Active\2007\1121 - Geotechnical\07-1121-0232 Claridge Spring Valley Ottawa\ACAD\Phase 2000\0711210232-2000-08.dwg



LEGEND

- SENSITIVE RECEPTOR LOCATION
- ASSUMED AREA OF INFLUENCE OF NAVAN LANDFILL (AS PER CITY OF OTTAWA OFFICIAL PLAN)
- BFI PROPERTY BOUNDARY
- CLARIDGE PHASE 3 BOUNDARY
- ROADWAY
- WETLAND (MER BLEUE)

REFERENCE

DIGITAL BASE MAP DATA SUPPLIED BY DMTI SPATIAL INC. CANMAP, 2006.
PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83
COORDINATE SYSTEM: UTM ZONE 18

200 0 200
SCALE 1:5,000 METRES

PROJECT
BUFFER STUDY, PHASE 3
SPRING VALLEY TRAILS

TITLE
AIR AND ODOUR MODELING
SENSITIVE RECEPTOR LOCATIONS

Golder Associates
Ottawa, Ontario

PROJECT No. 07-1121-232			SCALE AS SHOWN	REV. 0
DESIGN	DDS	2007-02-07		
GIS	PJM	2013-12-20		
CHECK	ALC	2013-12-20		
REVIEW	PAS	2013-12-20		

FIGURE: 9

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LEGEND

- NOISE MONITOR LOCATION
- NOISE RECEPTOR LOCATION
- ASSUMED AREA OF INFLUENCE OF NAVAN LANDFILL (AS PER CITY OF OTTAWA OFFICIAL PLAN)
- BFI PROPERTY BOUNDARY
- CLARIDGE PHASE 3 BOUNDARY
- ROADWAY
- WETLAND (MER BLEUE)

REFERENCE

DIGITAL BASE MAP DATA SUPPLIED BY DMTI SPATIAL INC. CANMAP, 2006.
PROJECTION: TRANSVERSE MERCATOR DATUM: NAD 83
COORDINATE SYSTEM: UTM ZONE 18

200 0 200
SCALE 1:5,000 METRES

PROJECT
BUFFER STUDY, PHASE 3
SPRING VALLEY TRAILS

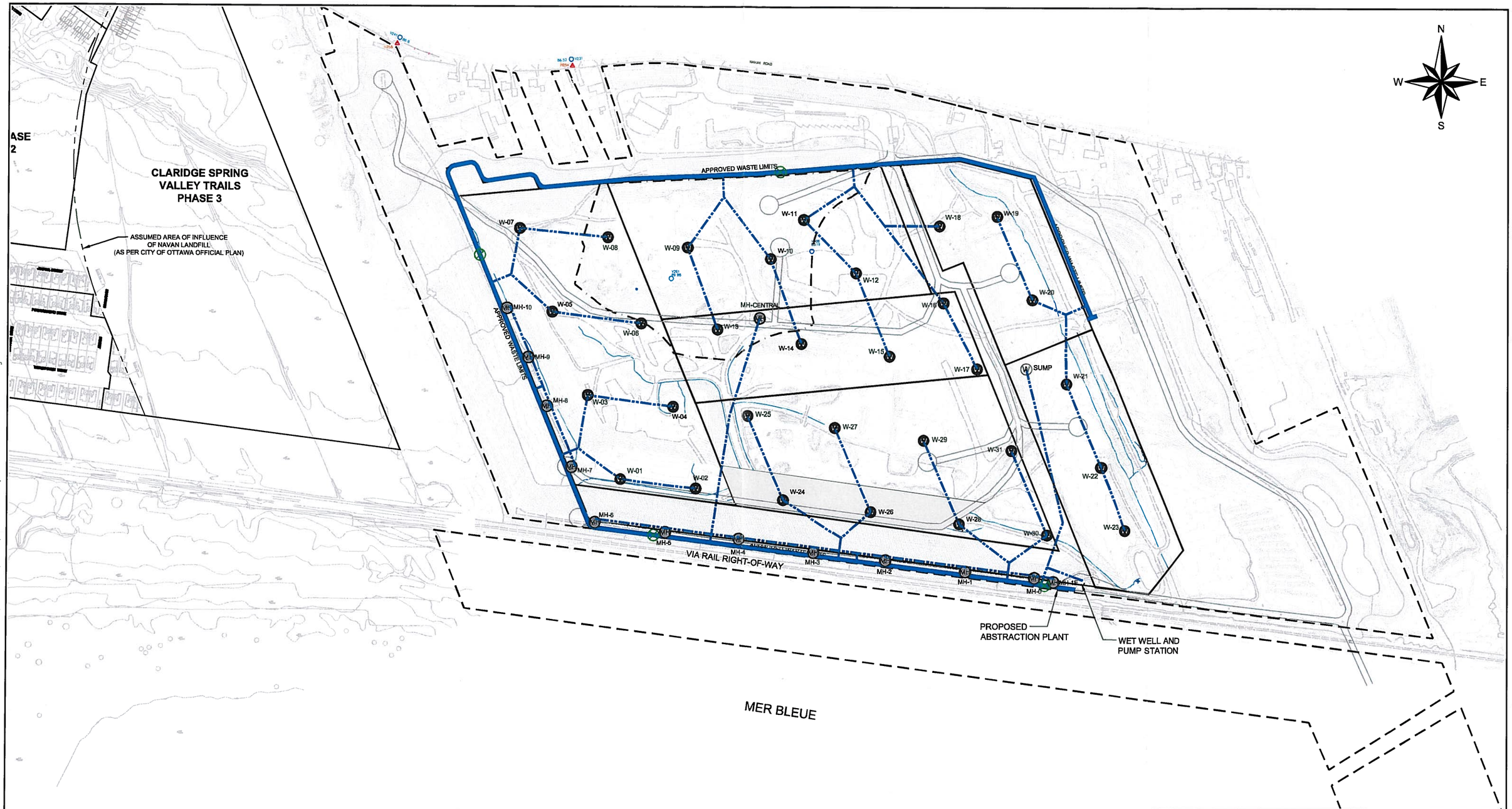
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NOISE RECEPTORS AND 2012 MONITOR LOCATIONS

Golder Associates
Ottawa, Ontario

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CHECK	ALC	2013-12-20		
REVIEW	PAS	2013-12-20		

FIGURE: 10

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LEGEND

- PROPOSED LANDFILL GAS LATERAL PIPE
- PROPOSED LANDFILL GAS HEADER PIPE
- W-01 PROPOSED LANDFILL GAS EXTRACTION WELL
- PROPOSED CONDENSATE TRAP
- SUMP PROPOSED LEACHATE COLLECTION SUMP
- MH-1 EXISTING MAINTENANCE MANHOLE
- EXISTING WET WELL AND LEACHATE PUMP STATION
- VERTICAL / HORIZONTAL CONTROL
- EXISTING BUILDING
- ROAD
- BFI PROPERTY BOUNDARY
- FENCE LINE
- CLARIDGE SITE CONTOURS (SEP. 2006)
- BFI SITE CONTOURS (JULY 2010)

REFERENCE

1. BASE PLAN SUPPLIED IN ELECTRONIC FORMAT BY IBI GROUP AND THE BASE MAPPING CO. LTD.

NOTE

1. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 07-1121-0232-2000

100 0 100 200

SCALE 1:5000 METRES

REV	DATE	DES	REVISION DESCRIPTION	CAD	CHK	RVW

PROJECT

BUFFER STUDY
PHASE 3 - SPRING VALLEY TRAILS
OTTAWA, ONTARIO

TITLE

APPROVED LANDFILL GAS COLLECTION SYSTEM LAYOUT

Golder Associates
Ottawa, Ontario, Canada

PROJECT No.	07-1121-0232		FILE No.	0711210232-2000-11.dwg	
DESIGN			SCALE	1:5,000	REV.
CAD	JM/BR	2013-12-20	FIGURE No.		
CHECK	ALC	2013-12-20		11	
REVIEW	PAS	2013-12-20			

PLOT DATE: December 20, 2013
FILENAME: N:\Active\2007\1121 - Geotechnical\07-1121-0232 Claridge Spring Valley Ottawa\ACAD\Phase 2000\0711210232-2000-11.dwg

CLARIDGE SPRING VALLEY TRAILS PHASE 3

ASSUMED AREA OF INFLUENCE OF NAVAN LANDFILL (AS PER CITY OF OTTAWA OFFICIAL PLAN)

APPROVED WASTE LIMITS

MH-10 MH-9 MH-8 MH-7 MH-6 MH-5 MH-4 MH-3 MH-2 MH-1 MH-0 MH-1E

GW-1 GW-2 GW-3 GW-4

PUMP STATION

N W E S

LEGEND

- G56 AMBIENT AIR COLLECTOR PIPES
- G68 CENTRAL AREA-MISCELLANEOUS
- G45 AIR VENTS
- G5 WEST AND SOUTH FACES
- EXISTING LANDFILL GAS EXTRACTION WELL
- G30 OFFICE/BUILDING AREA
- G50 FORMER COMPOST AREA
- G90 NORTH AND EAST FACES
- G101 AIR VENTS
- MAINTENANCE HOLE LOCATION
- EXISTING BUILDING
- ROAD
- BFI PROPERTY BOUNDARY
- FENCE LINE
- CLARIDGE SITE CONTOURS (SEP. 2006)
- BFI SITE CONTOURS (JULY 2010)

REFERENCE

1. BASE PLAN SUPPLIED IN ELECTRONIC FORMAT BY IBI GROUP AND THE BASE MAPPING CO. LTD.

NOTE

1. THIS FIGURE IS TO BE READ IN CONJUNCTION WITH THE ACCOMPANYING GOLDER ASSOCIATES LTD. REPORT No. 07-1121-0232-2000

100 0 100 200

SCALE 1:5000 METRES

REV	DATE	DES	REVISION DESCRIPTION	CAD	CHK	RVW

PROJECT

BUFFER STUDY
PHASE 3 - SPRING VALLEY TRAILS
OTTAWA, ONTARIO

TITLE

LANDFILL GAS MONITORING LOCATIONS

Golder Associates
Ottawa, Ontario, Canada

PROJECT No.	07-1121-0232		FILE No. 0711210232-2000-12.dwg
DESIGN			SCALE 1:5,000 REV.
CAD	JM/BR	2013-12-20	FIGURE No.
CHECK	ALC	2013-12-20	12
REVIEW	PAS	2013-12-20	

PLOT DATE: December 20, 2013
FILENAME: N:\Active\2007\1121 - Geotechnical\07-1121-0232 Claridge Spring Valley Ottawa\ACAD\Phase 2000\0711210232-2000-12.dwg

APPENDIX A

City of Ottawa Peer Review of Environmental Assessment Study Report

December 2013
Report No. 07-1121-0232 (2000)

Golder Associates

File No. W21-06-07-NAVAN/45838

23 April 2007

VIA FACSIMILE AND E-MAIL

Ms. Solange Desautels
Project Officer
Ministry of the Environment
Environmental Assessment and Approvals Branch
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario M4V 1L5
FAX (416) 314-8452
Email: solange.desautels@ontario.ca

Dear Ms. Desautels:

Re: Environmental Assessment (EA) – Environmental Assessment Study Report (February 2007) – Waste Services (CA) Inc., Ottawa (Navan), Ontario

Introduction

This letter and attachments provides the City's comments on the Environmental Study Report (ESR) prepared on behalf of Waste Services (CA) Inc. (WSI). These comments have been compiled from staff in the City's Public Works and Services Department and by the City's consultant, Conestoga Rovers & Associates (CRA). As you are aware, these staff comments are subject to ratification by the City's Planning and Environment Committee (PEC) and Council. It is expected that these comments will be considered by PEC on May 22, 2007 and forwarded to Council for approval on May 23, 2007.

Focused Peer Review Comments

The City's consultant, CRA, was tasked with doing a high-level, focused peer review of the ESR. The City has adopted CRA's report attached as Document 1 to this letter with the following summary conclusions:

1. Consultation – The consultation conducted satisfies the Province's EA consultation requirements. Consistent with the City's comments on the Terms of Reference (ToR), the City expects that an EA monitoring strategy be required as a condition of EA approval and/or will be incorporated into any *Environmental Protection Act* (EPA) or *Ontario Water Resources Act* (OWRA) approvals. The City requests that WSI describe how it intends to continue to consult with stakeholders pending approval of the expansion;

2. Conceptual Site Design – The proposed expansion design alternatives appear to comply with *O.Reg. 232/98 Landfilling Sites* and no other issues were identified;

3. Geologic/Hydrologic – Based on review of geology and hydrologeology, the site is suitable for use as a landfill site. The modeling assessment was appropriate and applied correctly with regards to the requirements of regulations and industry standards. The predicted results of no future impact are reasonable based on the modeling work conducted;

4. Surface Water – The modeling assessment was appropriate and applied correctly with regards to the requirements of regulations and industry standards. No issues were identified with the proposed drainage/surface water management measures associated with the proposed expansion and WSI has identified that these measures will be in accordance with O.Reg. 232/98 Landfilling Site and subject to OWRA approval;

5. Atmospheric Impact (Odour & Noise) – The odour modeling did not include the odour emissions from fugitive landfill gas emitted from the surface of the landfill that is not collected by the landfill gas collection system. The report assumed that approximately 5% of the landfill gas will be emitted as fugitive emissions from the surface (see Section 5.6.2). A September 27, 2006 Odour Sampling report by Zorix indicates that there is odour in the landfill gas emitted from a passive gas vent. This same landfill gas also has a potential to contribute to off-site odour as it is currently assumed to be emitted from the landfill surface at a rate of 5% of the total gas generated. The City recommends that fugitive landfill gas emissions through the landfill cap be incorporated into the odour modeling evaluation and that appropriate mitigation measures be developed in conjunction with a future EPA section 9 application, as required.

   With respect to noise modeling, several of the residential receptors, including R5, R6, R7, R8, and R11 are predicted to have a noise level of 55 dBA even with the proposed noise barriers. Given the inherent uncertainty in the modeling results, the proposed noise barrier designs should be revised to achieve theoretical noise levels less than 55 dBA at the sensitive receptors. The modeling does show that compliance with noise criteria can be achieved and the City recommends that the noise barrier designs be revisited during the EPA section 9 approvals process;

6. Site Mitigation Measures – The selection of site mitigation measures to address odour, noise, dust, visual impact, property value and end use are appropriate at this time;

7. Preferred Alternative Selective Methodology – The preferred selection methodology is appropriate, however, a quantitative approach might have been more useful in confirming the identification of the preferred alternative.

Thus, in regards to the matters examined, with the exception of odour and noise review assessments noted above, the City has concluded that there are no outstanding technical concerns with the ESR.

Planning Act Comments

The ESR identified planned land use matters in Section 5.13 of the ESR. While the City has no concerns with the factual issues discussed therein, the ESR did not outline the requirement to submit a required rezoning application with the City for the proposed expansion. This requirement has been noted in the City's Official Plan Policy 3.8.4 available at http://www.ottawa.ca/city_hall/ottawa2020/official_plan/vol_1/designtns_lnd_use/solid_waste_sites/index_en.html.

Agreement between the Friends of Mer Bleue Community Association (FOMB) & WSI

Staff have obtained and reviewed a recent agreement signed by FOMB and WSI, attached as Document 2 to this letter. The City is in support of the substantive matters as outlined in the agreement. The City recommends that each substantive matter be incorporated as a condition of EA approval by the Minister of the Environment as follows:

- **Formation and composition of membership of a Public Advisory Committee (PAC);**

  This recommendation is consistent with the City's prior submission on the Navan Landfill Terms of Reference (ToR) and the present membership composition of the City's Trail Landfill Liaison Committee. The role of the PAC would be to review new issues that may arise out of approvals issued under the *EA Act*, *Environmental Protection Act* or *Ontario Water Resources Act*, to incorporate the recommendations of the City's Industrial, Commercial & Institutional (IC&I) Waste Strategy, encourage enhanced waste diversion measures at the Landfill site and be supplied with monitoring data regarding potential environmental impacts or emissions from the Landfill site.

- **Formation of a Dispute Resolution Strategy to be employed by WSI and the PAC;**

  This recommendation is consistent with the City's prior comments on the Terms of Reference that were submitted, and recently withdrawn, by Waste Management of Canada Corporation for their Carp Ottawa Waste Management Facility.

- **Expansion of WSI's Property Value Protection Plan to include the properties on Mer Bleue Road and on Grandpre, directly east of the Navan Landfill;**

- **WSI work with the City of Ottawa, FOMB and the PAC to identify and develop community projects to enhance and improve the local community and public spaces; and**

- **In issuing any future approval under the *Environmental Protection Act*, the City of Toronto would be specifically excluded from the service area for the Navan Landfill site.**

  This recommendation is consistent with the 2001 Settlement Agreement which obliges WSI to reserve 75% capacity of the Site for waste generated within Ottawa and prior City communications to the Ministry of the Environment regarding shipment of waste from the City of Toronto.

Conclusion

As previously noted, the City's Planning and Environment Committee will be considering these comments on May 22, 2007 with the anticipated Council consideration to follow on May 23, 2007. Any changes to staff's comments or Council resolutions related to the proposed Navan Landfill expansion will be forwarded to you for the MOE's consideration as soon as possible after the Council meeting.

In the interim, please do not hesitate to contact the undersigned at (613) 580-2424 ext. 21268, should you have any questions or concerns about the City's comments.

Yours truly,

Original signed by

R.G. Hewitt. P.Eng.
Deputy City Manager
Public Works and Services

Attach. (2)

cc: Kenneth J. Brothers, Director, Utility Services Branch
M. Rick O'Connor, City Solicitor, Legal Services Branch

Brian Forrestal, Vice President, Environmental Mgmt. & Engineering, Waste Services Inc.
Mike Benson, Conestoga Rovers & Associates

Ontario (https://www.ontario.ca/page/government-ontario)

Navan Landfill Expansion

Project information about this environmental assessment.

Introduction

Proponent

Waste Services (CA) Inc.

Location

3354 Navan Road, Ottawa

Type

Waste

Reference Number

06029

Contact

Environmental Approvals Branch, 416-314-8001

Toll free 1-800-461-6290

Current Status

Environmental assessment: approved, August 2, 2007

Project Summary

The purpose of the undertaking is for the expansion of the existing landfill site located in Notre Dames-des-Champs on Navan Road in the eastern end of the City

of Ottawa.

Project History

- Environmental assessment: approved
  - Date submitted: May 25, 2007
  - Expiry of public comment period: April 20, 2007
  - Expiry of public comment period for ministry review: June 29, 2007
  - Decision date: August 2, 2007
- Terms of reference: approved
- Date submitted: June 16, 2006
- Expiry of public comment period: July 21, 2006
- Decision date: October 6, 2006
- Decision date: May 30, 2006
- Designation: voluntary agreement granted

Environmental Assessment

Proposed Undertaking

Waste Services (CA) Inc. proposed an expansion of its existing landfill site located in Notre Dames-des-Champs on Navan Road in the eastern end of the City of Ottawa. The existing 31.9 hectare landfill footprint will be expanded easterly by 8.5 hectares. The total capacity will increase by an estimated 3.6 million cubic metres of additional waste. The annual waste tonnage accepted at the site will continue to be 234,750 tonnes of waste per year which will extend the life of the landfill by approximately 11 years past its currently estimated closure date of 2011. It is proposed that the site will continue to accept solid non-hazardous Industrial, Commercial and Institutional (IC & I) waste including construction and demolition waste. The approved area for the receipt of waste for disposal will continue to be the province of Ontario, excluding IC&I waste from the City of Toronto.

Waste diversion will continue at the site related to the recovery of metal for recycling and wood for chipping.

The EA considered five potential expansion alternatives in accordance with the approved Terms of Reference. Alternative 3 was chosen as the preferred alternative.

The comment period on the EA was from March 2, 2007 to April 20, 2007. A Notice of Completion of Review was published on May 25, 2007. A five week comment period on the Review was provided from May 25, 2007 to June 29, 2007. During this time period any person could provide comments about the proposed undertaking, the EA, and the ministry's Review. The Minister with Cabinet's concurrence approved the Navan landfill expansion subject to conditions of approval. The Minister imposed conditions of approval that will provide assurance of environmental protection for the surrounding watershed, air quality, the Mer Bleue Bog, and the surrounding community. The ministry is satisfied that the proposed conditions of approval will address any issues and concerns that were raised with the ministry. All comments received during the two public comment periods were considered prior to a decision being made to approve the landfill expansion. Approvals are also required under the Environmental Protection Act, the Ontario Water Resources Act and the Planning Act. Those who provided comments on the EA or the ministry's Review will receive notice of the Minister's decision.

Terms of Reference

The Proposal

Waste Services (CA) Inc. (WSI) is proposing to expand their existing landfill site. The current approved footprint for the landfill, processing and composting occupies 31.9 hectares within a total owned property of 90 hectares. The site is licensed to receive solid, non-hazardous industrial and commercial waste (including construction and demolition waste), dry non-putrescible domestic waste, asbestos waste, and impacted soils. A total of 234,750 tonnes of waste is permitted to be received for disposal in the landfill annually. The approved area for receipt of waste for disposal is the Province of Ontario. In addition to accepting waste for disposal, the site undertakes significant diversion activities through recovery of metal for recycling, wood for chipping and composting and leaf and yard waste composting.

The proposed expansion alternatives under consideration would increase the approved capacity of the site by between approximately 3.6 and 5.5 million cubic meters to provide approximately 2.4 to 3.6 million tonnes of additional waste disposal capacity. At the approved annual disposal rate this would provide approximately 10 to 15 years of additional disposal capacity at the landfill, which is expected to reach its currently approved capacity in 2011.

Purpose of the Undertaking

WSI has determined that there is an ongoing demand for its waste disposal services in Ottawa and that it has the opportunity to continue to provide environmentally sound waste management services for disposal of solid, non-hazardous Industrial, Commercial and Institutional as well as Construction and Development wastes. The purpose of the expansion is to address that demand and opportunity.

Approval of the Terms of Reference

As provided for by Section 6(4) of the Environmental Assessment Act, the Terms of Reference submitted for approval to the Ministry of the Environment on June 16, 2006, to govern the preparation of an environmental assessment for the above-noted undertaking, are hereby approved with the following amendments:

Section 4.4 of the ToR be amended by adding the following:

- “Mer Bleue Bog
- The environmental assessment will contain a description of the effects that will be caused or may be reasonably expected to be caused to the Mer Bleue Bog by each alternative method of carrying out the undertaking.
- The environmental assessment will contain a description of the measures that will prevent, change, mitigate or remedy the effects that will be caused or may be reasonably expected to be caused to the Mer Bleue Bog by each alternative method of carrying out the undertaking.”

Section 5.3 of the ToR be amended by adding the following:

- “Aboriginal Consultation" The Aboriginal communities that may be affected by or have an interest in the Navan Landfill Expansion EA, will be provided with sufficient opportunity to participate in the development of the EA.”

Designation (Voluntary Agreement)

Waste Services (CA) Inc. (WSI) is proposing to expand their existing landfill site. The current approved footprint for the landfill, processing and composting occupies 31.9 hectares within a total owned property of 90 hectares. The site is licensed to receive solid, non-hazardous industrial and commercial waste (including construction and demolition waste), dry non-putrescible domestic waste, asbestos waste, and impacted soils. A total of 234,750 tonnes of waste is permitted to be received for disposal in the landfill annually. The approved area for receipt of waste for disposal is the Province of Ontario. In addition to accepting waste for disposal, the site undertakes significant diversion activities through recovery of metal for recycling, wood for chipping and composting, and leaf and yard waste composting.

The proposed expansion alternatives under consideration would increase the approved capacity of the site by between approximately 3.6 and 5.5 million cubic meters to provide approximately 2.4 to 3.6 million tonnes of additional waste disposal capacity. At the approved annual disposal rate this would provide approximately 10 to 15 years of additional disposal capacity at the landfill, which is expected to reach its currently approved capacity in 2011.

Related

Updated: July 08, 2021
Published: March 20, 2014

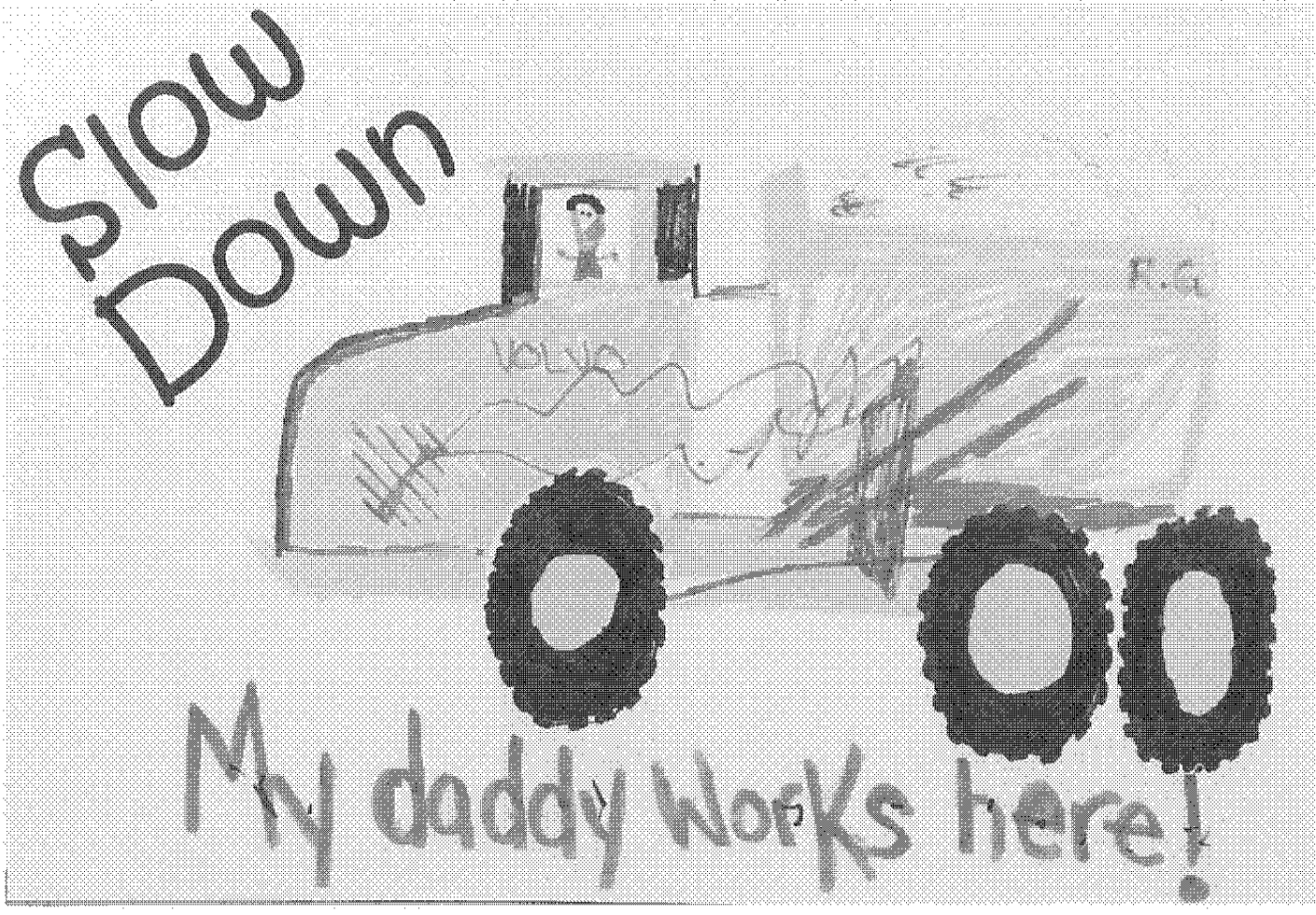
APPENDIX 2

2021 Operations and Monitoring Report –
Navan Waste Recycling and Disposal Facility
– 3354 Navan Road, Ottawa, Ontario
– Prepared by Waste Connections of Canada – dated March 2022

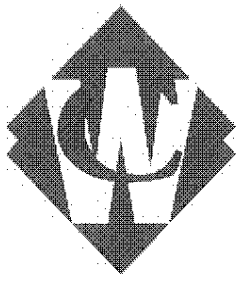
WASTE CONNECTIONS OF CANADA

NAVAN WASTE RECYCLING AND DISPOSAL FACILITY

3354 NAVAN ROAD, OTAWA, ON K4B 1H9



OPERATIONS AND MONITORING REPORT 2021



WASTE CONNECTIONS OF CANADA

3354 NAVAN ROAD, OTAWA, ON K4B 1H9
Tel: 613-824-7289 Fax: 613-824-6730

2021
OPERATIONS AND MONITORING REPORT

Waste Connections of Canada Inc.
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 Navan Road, Ottawa, Ontario

March, 2022

EXECUTIVE SUMMARY

The Navan Waste Recycling and Disposal Facility is a 91.87 ha waste management facility that includes a 40 ha landfill as well as processing (recycling) operations. The Site is located in the east end of the City of Ottawa (formerly in the City of Gloucester) and is owned and operated by Waste Connections of Canada Inc. (WCC).

The site currently operates under amended Environmental Compliance Approval (ECA) for a waste disposal site (ECA # A460702) re-issued April 16th, 2009 with subsequent amendments (Notices 1 through 13) as well as an ECA for Industrial Sewage Works, ECA # 5616-86NKNW amendment dated June 29th, 2010 and ECA Air # 3536-8APNZD amendment dated November 24th, 2010 and ECA # 4024-9WFQE5 dated June 8th, 2015 and ECA # 2427-AETKQ5 dated November 14, 2016. The waste ECA also incorporates and makes reference to the Design and Operations (D&O) Report for the Site prepared by Golder Associates and dated January 2008.

An emergency amendment under Notice No. 13 dated September 29, 2021 was received which stipulated the following: Emergency Notice for Soils was issued permitting up to 1,693 tonnes of waste and cover material per day may be received at the Site for the year 2021 and contaminated/impacted soil to be used as an alternative daily or interim cover may be received at the Site in excess of the maximum annual waste limit provided the amount of such soil received in 2021 is no greater than 190,000 tonnes and the waste to cover ratio is no less than 2.75:1.

The Facility is approved to receive solid non-hazardous and asbestos waste, excluding putrescible waste. Landfilling is restricted to waste generated within the Province of Ontario, excluding the City of Toronto. The site includes a processing facility for the recycling of waste materials and treatment of hydrocarbon impacted soils. The processing site is approved to receive solid non-hazardous waste, excluding putrescible waste, generated within the Outaouais Region of the Province of Quebec and within the Province of Ontario, excluding the City of Toronto. The site is also approved to host household hazardous waste (HHW) day events, whereby, the waste is received by a carrier approved through valid certificates of approval to receive, temporarily store and transport HHW to an approved waste disposal site. Other than during HHW events, no hazardous or liquid industrial wastes, as defined in O. Reg. 347, R.R.O. 1990, are permitted at the site. Most of the waste handled at the Site is generated within the City of Ottawa and neighbouring municipalities.

In 2021, a total of 513,078 tonnes of materials entered the site. Of this total, 190,415 tonnes (37.11%) were received as landfill material; 5,074.24 tonnes (1.0%) were recycled and removed from the site; and an estimated 36 tonnes (0.01%) were waste materials rejected and removed from the site by WCC for alternative disposal at another licensed facility. Other materials received for re-use on site included 40,041 tonnes (7.8%) of rock, brick, shingles, concrete and rubble re-used as aggregate for road construction and staging area pads; 8,120 tonnes (1.58%) of clean fill, topsoil, and asphalt re-used on site for final grading, road/pad construction and engineered fill; 95,846 tonnes (18.68%) of treated soils or soils re-used on site; and 173,546 tonnes (33.82%) of special materials such as storm sewer screenings and impacted non-hazardous soils received at the site for re-use as daily cover material.

002377

Golder Associates Ltd. estimated the air space used by measuring the volumetric changes between topographic mapping generated from aerial photography obtained on May 1st, 2021 and the previous year on April 28th 2020. The net estimated air space used (ASU) between the last two aerial survey dates was reported to be 319,316 m^3. Records indicate that the ASU during that period of time was consumed by approximately 380,715 tonnes of waste, daily cover material and other materials resulting in a density calculation of 1.19 tonnes/m^3 and a five year average density of 1.42 tonnes/m^3. Air space used was also calculated based on assigning assumed waste densities to the various waste streams received and landfilled, cover material and re-used materials placed within the air space from May 1st to December 31st, 2021. Using this approach, it is estimated that approximately 244,244 m^3 of remaining air space was used and excludes materials diverted off site for recycling and some materials re-used outside the air space. Based on this approach, the weighted average of the in-place density for all of the materials used in the air space calculation was estimated to be 1.34 tonnes/m^3. The variance in density calculations could be attributed to factors such as cell excavation and settlement which influence the year over year volume calculations. The air space remaining as of January 1st, 2022 was estimated to be 1,252,969 m^3.

Under the present Environmental Compliance Approval (ECA), the life expectancy remaining for the Navan Waste Recycling and Disposal Facility as of January 1st, 2022 is estimated to be 5.1 – 5.2 yrs (2027) based on future projected maximum annual waste receipts for landfilling including daily cover of 344,750 tonnes and a 5 year average waste density of 1.42 tonnes/m^3. The actual life of the landfill will vary based on annual fill rates, in-place waste densities, waste diversion and recycling initiatives at the Facility, and the rate of air space development.

Diversion through the reuse and recycling of resources is a key activity in the on-going management and preservation of disposal capacity at the Navan Facility. For example, all daily and intermediate cover needs are met by substituting the use of virgin soils with the re-use of significant quantities of impacted soils. Brick, concrete, asphalt and rubble are also recovered for re-use each year in the construction of access roads. Roofing shingles free of paper and other debris are also re-used on site as a sub-base for roads and pads over which a base of aggregate or recycled asphalt is placed. In addition, steel, aluminum, wood, tires and white goods are recovered daily from the active face for recycling. Recycling of E-waste and drywall was continued in 2021 as a service to the local community. Hydrocarbon contaminated soils treated in 2021 were re-used at the site as final cover material and structural fill within the east buffer area.

Materials received by the Navan Waste Recycling and Disposal Facility are those which IC&I generators have generally deemed to be waste and of no further value (i.e., post diversion at the source). Many of the waste generators, serviced by waste collection contractors who bring waste to the Site, also divert materials from landfill at their place of business prior to collection. Recycling within the IC&I sector is regulated by the Ministry of the Environment, Conservation and Parks under Regulations 101, 103 and 104. While the Site receives post-diversion waste materials from the IC&I sector, WCC has procedures in place to screen the incoming waste for recyclable material in what is known as a "last chance harvest" which is a "positive" sort where the recyclable item must be removed from the mixed waste mass. In this case, the majority of the material is not recyclable (i.e. it is waste). This is very different than recycling from "source separated" material, which results in a "negative" sort, where the waste components are removed from what is predominantly recyclable material. WCC also encourages and receives "clean" recyclable materials such as drywall, metal, electronics and glass where such materials can be shipped to market in bulk in efforts to make the recycling of such materials more economically viable.

The Navan Waste Recycling and Disposal Facility diverted over 149,081 tonnes of material from disposal in 2021, and over 440,508 tonnes during the past 5 years. For 2021, this represents a "last chance harvest" diversion rate of 43.9% and excludes the re-use of impacted soils for daily cover material. This is in addition to the diversion rate for IC&I waste considered to occur at the source. WCC will continue to improve waste diversion and recycling initiatives at the Navan Facility and pursue economically viable waste diversion opportunities to help the local community and WCC clients achieve a better IC&I recycling rate.

Significant activities and capital works undertaken between January 1st and December 31st, 2021 included active landfilling in Phase 6 (refer to Figure 2.4); excavation of clay cover material in the N-E quadrant of Phase 8; continued recycling operations at the facility with treatment of hydrocarbon impacted soils; screening of coarse granular soils to separate rock from soil for re-use; pre-treatment and disposal of collected leachate to ROPEC for off-site treatment; retained Dillon Consulting Limited to undertake Airborne Contaminant Discharge Monitoring and Reporting requirements for the landfill site as well as the National Pollutants Release Inventory and Green House Gas reporting; retained Golder Associates to carry out surface water, groundwater, leachate, gas and noise monitoring and reporting programs; added clay cover to completed fill areas of the landfill; constructed a new perimeter access road on the east side of the waste footprint; retained Base Mapping to undertake aerial photos and prepare topographic mapping of the site; retained Les Entreprises Forlam Inc. to construct the perimeter 300 mm diameter landfill gas collection pipe line along the north, west and east limits of the waste footprint; retained Farrell & Sons to construct the concrete pads for the permanent enclosed gas flare and abstraction plant; and, retained Perennial Energy, LLC to manufacture, assemble, package, check, test, and deliver a Landfill Gas Extraction Plant and Enclosed Flaring System.

Leachate generated by the landfill is collected by a drainage system consisting of three separate components that gravity flow to a leachate treatment and pumping station located at the southeast corner of the waste pile and a fourth located in the east cell that is pumped to the on-site treatment station. Presently, the disposal method of choice for the pre-treated leachate is direct discharge to the City of Ottawa sewer system via approximately 2 km of forcemain. In 2021, a total of 88,591 m^3 of pre-treated leachate was discharged to the City of Ottawa wastewater system, a 33.3% reduction over 2020. The decrease is attributed to efforts to reduce the infiltration of surface water runoff into the waste. There were no issues reported with the operation of the leachate treatment and pumping system in 2021.

The WCC Facility is ideally situated on a thick deposit of Champlain Sea Clay (Leda Clay). The clay deposit at this site ranges from 22 metres to greater than 33 metres in depth. A clay ridge that cuts across the site rises approximately 18 m above the floor of an abandoned Ottawa River Channel. This results in surface water and shallow groundwater flowing in a southward direction. The Site is located on the northern fringe of the Mer Bleue Bog, a well-known salt water bog that is an Area of National Scientific Interest (ANSI). These natural features are ideal for the control and monitoring of leachate at the site.

Environmental control systems and operational activities that include the operation and maintenance of an elaborate perimeter leachate collection system (LCS) and surface water diversion works are monitored in accordance with the conditions of the ECA. Monitoring carried out to identify areas of environmental concern includes measuring water quality parameters in surface water and in groundwater at the site's boundary as well as in the leachate generated by the landfill. Monitoring for the presence of landfill gas was also carried out. In addition, sediment quality monitoring at three locations within the Mer Bleue Bog that was started in 2000 at the request of the National Capital Commission (NCC) was continued.

The monitoring program carried out in 2021 was a continuation of the monitoring program already in place for this site.

Based on the groundwater levels obtained during the 2021 monitoring program, no significant change in groundwater flow patterns has been observed.

Groundwater at the Navan Waste Recycling and Disposal Facility is monitored within four stratigraphic units identified as a shallow surface sand layer, an upper weathered clay zone, an intact (unweathered) deposit of clay and a glacial till/upper bedrock zone. Monitoring wells are present in each of these units up-gradient, at the down-gradient edge of the waste pile (used to assess compliance) and further down-gradient of the landfill within the buffer zone.

The objectives of the 2021 Environmental Monitoring Program were to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702; to assess any potential impacts on water quality at the site resulting from landfill operations; to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the Facility; to document the chemical composition of groundwater and surface water in the vicinity of the Facility; to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate; and to document the chemical composition of sediment at three locations in the Mer Bleue Bog.

The hydrogeology of the site indicates a recharge area north of the landfill having a downward groundwater flow component. South of the site, the hydrogeology indicates a typical discharge area having a slight upward groundwater flow component. In general, shallow groundwater quality is variable, but a distinction is noted between groundwater quality up-gradient and down-gradient of the landfill in the weathered clay. Groundwater in the intact clay deposit up-gradient of the landfill is also slightly different from down-gradient groundwater quality. In the glacial till/upper bedrock groundwater zone, only minor differences exist in the groundwater quality across the site.

The Ministry of the Environment, Conservation and Parks (MECP) has stated that the Reasonable Use Guideline is not applicable at this site. A compliance assessment of groundwater quality was completed using the accepted groundwater and surface water trigger mechanism (Golder, 2007b). The Leachate Indicator Parameters at all groundwater monitoring locations immediately down-gradient from the landfill which are used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2020 background range.

Leachate quality monitoring results for 2021 indicate that leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Leachate at the WCC Navan Facility continues to be relatively weak wastewater when compared to municipal landfill leachate.

Trigger concentration exceedances were reported in 2018. As a result, in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. WCC presented a proposed course of action to address these exceedances and implemented it in 2019, in a continuing effort to achieve a drained state in the leachate collection system.

WCC's efforts were successful in limiting the continued increases in concentrations. Concentrations have since stabilized or decreased in the sand and weathered clay units, confirming that these corrective actions should continue to be implemented.

In 2021, there were two confirmed exceedances (continued increase in concentration beyond the background range), manganese concentration in the weathered clay at OW-92-10 in November 2021 and the ammonia concentration in the intact clay at MW-07-1B in November 2021. These two confirmed exceedances were reported by Golder to the MECP in an email dated February 4, 2022. It was proposed that the confirmed exceedances would be assessed in the 2021 Landfill Monitoring report and a contingency plan proposed, if required. It is interpreted that these exceedances are not the result of further landfill leachate migration. Therefore, Golder does not recommend any further contingency action in addition to the voluntary action WCC is currently taking but will continue to assess the exceedances and trends in subsequent monitoring sessions.

The Mer Bleue Bog is located immediately south of the site. Surface water samples are collected in the drainage course to the east, the west and in the perimeter of the Mer Bleue Bog. Surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. The WCC Navan Facility is an engineered landfill site; therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility.

Sediment samples were collected at three locations within the Mer Bleue Bog as per an agreement with the National Capital Commission (NCC). In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

The peat deposit in the Mer Bleue Bog predates any human activity in the area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink.

In 2002/2003, an assessment of the WCC Navan Facility operations was undertaken in support of a WCC-NCC (WSI-NCC) exchange of land parcels located south of the Navan Facility along the northern margin of the Mer Bleue. The assessment concluded that the landfill site had not caused impacts to soil, sediment, groundwater or surface water quality within the Mer Bleue. These findings were accepted by the NCC.

A Monitoring and Screening Checklist prepared and signed by a Competent Environmental Practitioner (CEP) is included with the Golder 2021 Landfill Monitoring report attached as Appendix '1'.

The proposed 2022 Environmental Monitoring Program is the same as was conducted in 2021, with the exception of VOCs which are proposed to be removed from the groundwater monitoring program and sediment monitoring which is proposed to be discontinued. As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to

collect a sample during a dry period (i.e., in the summer or the fall depending on site conditions) as has been done between 2014 and 2021.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during the November 2021 monitoring session and will be monitored again in the spring of 2023.

In 2021, Golder Associates Ltd. (GAL) was retained to carry out the landfill gas monitoring program. The monitoring program undertaken was a continuation of the monitoring program already in place for this site and the results of the monitoring events undertaken are presented in more detail in the GAL report provided in Appendix '2'.

LFG monitoring was undertaken in May, August and December 2021. At most locations monitored, methane gas was detected at concentrations lower than 1.25% by volume. Non-methane organic compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system, with methane concentrations measured in excess of 1.25% by volume at MH-2 (G18-a), MH-3 (G13-a), MH-4 (G-12a) and MH-5 (G11-a) in August 2021, MH-7 (G5-a), MH-9 (G3-a), and MH-10 (G2-a) in December 2021.

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met by the WCC Navan Facility based on the 2021 monitoring results. Although no monitoring locations are available below surface at the property boundary, it is anticipated that the WCC Navan Facility met the property boundary requirements in 2021.

Hydrogen sulfide was not detected at any location during the 2021 monitoring events, with the exception of MH-6 (G6-a), OW-94-2 (G8), OW-92-8 (G15), and Primary Tank #1 (G26d), in May 2021 which reported relatively low detection (1 part per million or 1 ppm).

It is noted that an interim LFG odour control system was installed in 2011 and commissioned in April 2012. Extensions to the LFG odour control system were installed in 2016, in 2017 and in 2019. The additional wells installed in 2017 and 2019 are intended to be part of the future permanent LFG collection system. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells. In 2021, construction of the permanent landfill gas collection system was started consisting of the construction of the 300 mm diameter HDPE landfill gas header pipe along the north, west and south perimeters of the waste footprint and construction of the concrete pads for the enclosed flare and abstraction plant.

out. In 2022, landfilling will continue in the last completed cell identified as Phase 6 and north part of Phase 1. Closure work will be carried out on the north side of Phase 6 and the east sides of Phase 6 and Phase 1 where final waste grades will have been reached.

The development of the remaining landfill capacity in the area of Phase 6 and Phase 1 (east cell expansion) requires the filling and compaction of material along the east waste limit. Soil management practices will include the following:

- Treated soils will be placed and compacted in the east buffer area;
- Excavation of clay from the Phase 8 area will occur in the first three quarters of 2022;
- Sediment control measures will be taken so that inactive areas such as soil stockpile side slopes are seeded; silt fences are installed as required around the perimeter of disturbed areas; and surface runoff from the stockpile areas will be channeled to the internal ditch system which will drain to the site's stormwater retention ponds.

Along with landfilling operations, other site operations expected to be carried out in 2022 will consist of the following:

- Provide additional landscaping to completed final cover areas on the north surfaces of Phase 4.
- Re-align surface runoff away from fill areas and cell construction areas.
- Raise grades at the east waste limit and grade to direct surface runoff away from waste.
- "Last Chance Harvest" of recyclable waste will continue in the active face using specialized heavy equipment as per present practice.
- Increase efforts to sort and divert waste from small vehicles at the small vehicle drop-off area and provide incentives to clients to sort materials at source, prior to arrival at the Site.
- Establish markets for new recyclable materials and increase the types of materials to be recycled at the site.
- Enhance treatment of hydrocarbon impacted soils.
- Construct a working pad in the area of Phase 1 for recycling activities.
- Expand the east end of the existing recycling pad north into Phase 8.
- Continue the screening of rock out of contaminated soils received at the site.
- Add additional wells (horizontal and/or vertical) to the landfill gas flaring system, if required, to enhance and control fugitive gas in fill areas and odours from the landfill.
- Construct the perimeter landfill gas forcemain along the east waste perimeter as designed by Golder Associates and connect to the existing landfill gas collection system.
- Install and commission the permanent enclosed flare and abstraction plant.
- Extend and complete the east access road onto the top of Phase 1.

The 30 m buffer at the northern, eastern and western perimeter of the landfill and the 10m buffer at the southern perimeter will continue to be maintained as required by the ECA. Aesthetic improvements at the site will continue to be an on-going objective.

In August 2007, WCC (WSI) received approval from the Minister of the Environment under the Environmental Assessment Act for expansion of the Navan Landfill in Ottawa, Ontario. Approval under the Ontario Environmental Protection Act (EPA) as well as other legislation were also received which culminated in the issuance of the above noted Certificates of Approval for the Site. Condition 4 of the EAA approval required that WCC (WSI) prepare an annual compliance report describing the extent of compliance with the Environmental Assessment (EA) conditions of approval and the results of WCC's compliance monitoring program (EAAB File # is EA 02 08 02). In accordance with Condition 3 of the EA approval, WCC has previously submitted a separate document proposing an EA Compliance Monitoring Program. In November 2008, the Ministry expressed its general satisfaction with the EACMR and noted outstanding requirements. It also allowed WCC (WSI) to coordinate submission of follow up EACMRs with submission of the Annual Operations and Monitoring Report. Accordingly, this EACMR is submitted as Appendix 5 to this Annual Report and covers the period January 1st to Dec. 31st, 2021. No non-compliance issues were identified during the reporting period.

TABLE OF CONTENTS

1. INTRODUCTION 1-1

1.1 BACKGROUND 1-1

1.2 PURPOSE AND ORGANIZATION OF REPORT 1-3

1.3 WASTE QUANTITIES 1-4

1.4 ECA AMENDMENTS (2021) 1-4

1.5 ENVIRONMENTAL ASSESSMENT COMPLIANCE MONITORING REPORT (EACMR) 1-4

1.6 HISTORY OF THE FACILITY 1-5

2. SITE SETTING 2-1

2.1 Site Location and Legal Description 2-1

2.2 Location, Zoning, and Surrounding Land Uses 2-1

2.3 Existing Site Design and Facilities 2-3
2.3.1 Existing Facilities 2-3
2.3.2 Leachate Management and Groundwater Protection System 2-4
2.3.3 Landfill Gas and Odour Management System 2-5
2.3.4 Surface Water Management System 2-5

2.4 Climatic Setting 2-6

2.5 Geology 2-6

2.6 Hydrogeology 2-7

2.7 Surface Water Flow System 2-8

2.8 Mer Bleue Bog 2-9

3. OPERATIONS - 2021 3-1

3.1 Description of Operations 3-1
3.1.1 Active Landfilling 3-2
3.1.2 Cell Development 3-3
3.1.3 Processing (recycling) 3-3
3.1.4 Contaminated Soil Treatment 3-3

3.1.5 Soil Screening Plant 3-4
3.1.6 Leachate Management 3-4
3.1.7 Stormwater Management 3-4
3.1.8 Landfill Gas Monitoring 3-4
3.1.9 Noise Monitoring 3-5
3.1.10 Surface Water, Groundwater and Leachate Monitoring 3-5
3.1.11 Closure 3-5
3.1.12 Aerial Photography 3-6

3.2 Daily Site Operations 3-6
3.2.1 Access 3-6
3.2.2 Hours of Operation 3-6
3.2.3 Site Staffing 3-7
3.2.4 Equipment 3-7
3.2.5 Equipment Maintenance 3-9
3.2.6 Scale House and Small Vehicle Pad 3-9
3.2.7 Site Office 3-10
3.2.8 House Keeping and Controls 3-10
3.2.9 Waste Acceptance and Placement 3-17

4. WASTE QUANTITIES AND CHARACTERISTICS 4-1

5. SITE CAPACITY AND LIFE EXPECTANCY 5-1

5.1 Estimate of Air Space Used (ASU) - 2021 5-2

5.2 Financial Assurance 5-4

6. ENVIRONMENTAL CONTROLS 6-1

6.1 Overview 6-1

6.2 Surface Water Management 6-2

6.3 Leachate Management 6-3

6.4 Landfill Gas Management 6-5

6.5 Buffer Zone 6-6

7. WATER QUALITY MONITORING 7-1

7.1 Groundwater Quality Assessment 7-2

7.2 Leachate Water Quality Assessment 7-5

7.3 Surface Water Quality Assessment 7-6

7.4 Sediment Quality Assessment 7-7

7.5 Proposed 2022 Monitoring Program 7-8

8. LANDFILL GAS (LFG) 8-1

8.1 LFG Monitoring Results 8-1

8.2 2019 Regulatory Reporting (NPRI, O.Reg. 127/01, O.Reg. 347, O.Reg 452/09 and Federal GHG) 8-3

9. PROCESSING/RECYCLING 9-1

9.1 Diversion of Waste and Other Materials from Disposal 9-1

9.2 Recycling 9-3

10. PROPOSED 2022 OPERATIONS 10-1

10.1 Landfill Development 10-1
10.1.1 Phasing of Remaining Operations 10-1
10.1.2 Development Schedule 10-1
10.1.3 Soil Management 10-3

10.2 Proposed Surface Water Control Improvements 10-3

10.3 Leachate Management 10-4

10.4 Surface Water, Groundwater and Leachate Monitoring 10-5

10.5 Landfill Gas Management 10-5

10.6 Recycling and Small Vehicle Unloading Facility 10-6

10.7 Capital Improvements 10-7

11. REFERENCES 11-1

APPENDICES

APPENDIX '1'	Report on 2021 Landfill Monitoring by Golder Associates Ltd.
APPENDIX '2'	Report on 2021 Landfill Gas Monitoring by Golder Associates Ltd.
APPENDIX '3'	Technical Memorandum regarding WCC Navan Facility Noise Monitoring 2021 by Golder Associates Ltd.
APPENDIX '4'	Schedule "A" –Complaints Summary Schedule "B" – 2021 Material Tonnage Summary Schedule "C" – Brief Site History Schedule "D" – Amendment to Environmental Compliance Approval No. A460702 Notice No. 13
APPENDIX '5'	2021 Environmental Assessment Compliance Monitoring Report (EACMR)

LIST OF FIGURES & DRAWINGS

Figure 1.1	Key Plan
Drawing 1.2	Survey Plan (Derived from Plan 4R-21920)
Drawing 1.3	Survey Plan (Derived from Plan 4R-23883)
Figure 2.1	East Urban Community – Community Design Plan (City of Ottawa)
Figure 2.2	East Urban Community – Phase 2 CDP (City of Ottawa)
Figure 2.3	Current Zoning of Site and Surrounding Area
Drawing 2.4	Site Features Plan
Figure 2.5	Average Monthly Temperature and Precipitation for 2021
Figure 2.6	Average Monthly Rainfall and Snowfall for 2021
Figure 2.7	Surficial Soil Classification
Drawing 2.8	Regional Geology
Drawing 2.9	Local Hydrogeology
Drawing 2.10	Cross-Section Along Grid Line 7
Figure 2.11	Watershed and Sub-basin Delineation
Drawing 3.1	Approved Top of Waste Elevations
Drawing 3.2	Proposed Closure Sequence
Drawing 4.1	Material Stockpiles
Drawing 6.1	Existing Surface Drainage Plan
Drawing 6.2	Leachate Collection System
Figure 6.3	Total Monthly Volume of Leachate Hauled Off Site
Figure 6.4	Cumulative Monthly Volume of Pre-treated Leachate Hauled Off Site
Figure 6.5	Cumulative Monthly Volume of Leachate Pumped From East Cell
Drawing 7.1	Water Monitoring Stations
Figure 8.1	Landfill Gas - Odour Control System Layout
Drawing 10.1-A	Proposed Fill Sequence – 2022
Drawing 10.1-B	Proposed Fill Sequence – 2022 Section A1/A2/A3
Drawing 10.2	Anticipated Projects - 2022

1. INTRODUCTION

The Waste Connections of Canada Inc. (WCC) Navan Waste Recycling and Disposal Facility operates under the Ministry of the Environment, Conservation and Parks (MECP) Environmental Compliance Approval (ECA) for a Waste Disposal Site number A460702 as amended. The site is approved to receive solid non-hazardous and asbestos waste, excluding putrescible waste. Landfilling is restricted to waste generated within the Province of Ontario, excluding the City of Toronto. The processing site is approved to receive solid non-hazardous waste, excluding putrescible waste, generated within the Outaouais Region of the Province of Quebec and within the Province of Ontario, excluding the City of Toronto. The site is also approved to host household hazardous waste (HHW) day events whereby the waste is received by a carrier approved through valid certificates of approval to receive, temporarily store and transport HHW to an approved waste disposal site. Other than during HHW events, no hazardous or liquid industrial wastes, as defined in O.Reg 347, R.R.O. 1990, are permitted at the site. Most of the waste handled at the site is generated within the City of Ottawa and neighbouring municipalities. The site is also approved to treat contaminated soils.

This report presents the annual operating and monitoring conditions for the site to the Ministry of the Environment , Conservation and Parks (MECP) pursuant to Conditions 135 and 136 of the ECA No. A460702. The site is located in the eastern portion of Ottawa, Ontario on Part of West Half of Lot 2, Part of Lots 3 and 4, Concession IV, Ottawa Front (Parts 1, 2 and 3 on Plan 4R-19707, Parts 1 and 2 on Plan 5R-13200, Parts 1, 2, 3, 5 and 6 on Plan 5R-11073, Parts 1 and 2 on Plan 5R-11716 also referred as Parts 1, 2 and 3 on Plan 4R-21920), 3354 Navan Road, Township of Gloucester, now in the City of Ottawa, UTM Easting: 460570, UTM Northing: 5030570 at the front entrance to the site (see Key Plan, Figure 1.1 and Survey Plan, Figures 1.2 and 1.3).

1.1 BACKGROUND

The site was formerly owned and operated by Huneault Waste Management Ltd., and has undergone a series of name changes beginning with Waste Services Inc. (WSI) in 2000. In 2002, Capital Environmental Services Inc. (CERI) acquired WSI and kept the operating name of WSI. Later, in July 2010, WSI merged with BFI Canada Inc. BFI Canada Inc. changed name to Progressive Waste Solutions Canada Inc. and later merged with Waste Connections Inc. now operating in Canada as Waste Connections of Canada Inc. (WCC). The Site started operations in the early 1960s, and has operated under the Environmental Compliance Approval (ECA) No. A460702 first issued in 1971 by the Ministry of the Environment, Conservation and Parks (MECP) and numerous amendments since. The current ECA approval officially revoked and replaced the previous approval dated May 12, 2006 due to the site's expansion in 2009. The following summarizes the notices that have amended the current ECA No. 460702:

- Notice No. 1 dated October 9, 2009: Permitted construction of base liner and leachate collection system for the east cell expansion.
- Notice No. 2 dated August 4, 2010: Widening of Navan Road.
- Notice No. 3 dated November 1, 2010: Landfill Gas Odour Control System.

- Notice No. 4 dated April 29, 2011: Financial assurance update (processing site)
- Notice No. 5 dated June 13, 2012: Financial assurance update (processing site)
- Notice No. 6 dated April 19, 2013: Financial Assurance update (processing site)
- Notice No. 7 dated February 25, 2014: Financial assurance update (landfill)
- Notice No. 8 dated June 8, 2015: Soil Treatment Pad
- Notice No. 9 dated February 1, 2016: Financial assurance update (landfill)
- Notice No. 10 dated March 14, 2017: Landfill and Processing Facility Financial Assurance
- Notice No. 11 dated June 19, 2018: Landfill and Processing Facility Financial Assurance
- Notice No. 12
- Notice No. 13 dated September 29, 2021: Temporary Tonnage Exemption for Contaminated Soil

The site also operates under an ECA for Industrial Sewage Works, ECA # 5616-86NKNW amendment dated June 29th, 2010 and ECA Air # 3536-8APNZD amendment dated November 24th, 2010, ECA # 4024-9WFQE5 dated June 8, 2015 and ECA # 2427-AETKQ5 dated November 14, 2016. The waste ECA also incorporates and makes reference to the Design and Operations (D&O) Report for the site prepared by Golder Associates and dated January 2008.

The site occupies a 91.87 hectare (ha) property (blue and green areas on Fig. 1.2) that includes a 40 ha area currently approved for recycling and disposal (red area on Fig. 1.2). Figure 1.2 depicts the existing approved waste boundaries at the site including the total land area currently owned by WCC. The site receives solid, non-hazardous industrial, commercial and institutional (IC&I) waste including construction and demolition (C&D) waste, asbestos waste, dry non-putrescible (i.e., non-organic) domestic waste and impacted soil. The approved service area for the receipt of waste for disposal is the Province of Ontario excluding the City of Toronto. The approved service area for processing/recycling and transfer includes the Province of Ontario (excluding the City of Toronto) and the Outaouais Region of the Province of Quebec (consisting of Quebec Region 7 including La Vallée-de-la-Gatineau, Pontiac, les Collines-de-l'Outaouais, Papineau and the City of Gatineau). Solid non-hazardous industrial and commercial waste including C&D waste and dry domestic recyclable waste may be received for processing. In 2015 the site was approved for the treatment of contaminated soils (ECA Amendment Notice 8) as part of its processing operations.

The remaining operating life for the landfill disposal site is influenced significantly by a number of factors such as the waste mix, the annual waste receipts, materials recycled and re-used, and the density of the in-place waste to name a few. Consequently, the remaining life can only be estimated to extend to the year 2027 based on current site approvals and projected annual waste receipts (refer to Section 5).

The last expansion of the Navan Waste Recycling and Disposal Facility received approval under the Ontario Environmental Assessment Act (EAA) in 2007 and approval under the Ontario Environmental Protection Act (EPA) as well as other legislation in 2009. Major amendments to the Environmental Compliance Approval for a waste disposal site (ECA # A460702) were issued as listed above. An Environmental Compliance Approval for Industrial Sewage Works, ECA # 4816-7C7M6C issued on April 16th, 2009 was amended by ECA # 5616-86NKNW on June 29th, 2010. An Environmental Compliance Approval Air, ECA # 6733-7BYS9A issued on April 16th, 2009 was amended by ECA # 3536-8APNZD on November 24th,

2010 and by ECA # 4024-9WFQE5 on June 8th, 2015 and by ECA # 2427-AETKQ5 dated November 14, 2016.

The site is situated on a thick deposit of Leda clay and is located immediately north of a large bog (Mer Bleue). The underlying clay deposit serves as a natural liner system. Leachate management activities include the operation of a leachate collection system that consists of a perimeter collector and underdrain systems. A leachate pre-treatment/pumping station and forcemain connection to the City of Ottawa sanitary sewer system was completed in 2007 and commissioned in early 2008. It continues to be used for the management of leachate generated by the facility. Surface water is diverted around the landfill footprint through a series of berms, swales and ditches. Landfill gas generated by the facility continues to be monitored and an interim landfill gas odour control system approved by the Technical Standards and Safety Authority (TSSA) was constructed and commissioned in early 2012. Design details for a permanent landfill gas collection and enclosed flaring system was completed by Golder Associates Ltd. and construction was started in 2021.

1.2 PURPOSE AND ORGANIZATION OF REPORT

This document is referred to as the Operation and Monitoring (O&M) Report. The O&M components specifically described in this document include the following:

- Zoning and surrounding land uses;
- Existing facilities and utilities;
- Geology;
- Hydrogeology;
- Surface water flow system;
- Mer Bleue Bog;
- Description of operations (2021);
- Waste quantities and characteristics;
- Site capacity and life expectancy;
- Surface water management;
- Leachate management;
- Landfill gas management;
- Groundwater quality assessment;
- Leachate water quality assessment;
- Surface water quality assessment;
- Sediment quality assessment;
- Landfill gas monitoring results;
- Diversion of waste and other materials from disposal; and
- Proposed 2022 operations.

All O&M components described in this report have been prepared to address the Conditions of the ECA for the Navan Waste Recycling and Disposal Facility, ECA No. A460702.

1.3 *WASTE QUANTITIES*

The maximum total amount of waste that can be received at the site for disposal is controlled by the site's approved final waste contour plan. Base on the final waste contour plan approved, the estimated total air space for the site was approximately 7.6 million cubic metres. Under the current ECA (#A460702), the maximum annual amount at which the site can receive waste for disposal (excluding daily and interim cover material) is 234,750 tonnes per year. The maximum daily rate, averaged over a year, at which the site can receive waste (including daily and interim cover material), is 1500 tonnes per day. The maximum amount of unprocessed material and residuals from the processing operation that may be stored on site at any one time is 225 tonnes. In 2021, an Emergency Notice for Soils was issued permitting up to 1,693 tonnes of waste and cover material per day may be received at the Site for the year 2021 and contaminated/impacted soil to be used as an alternative daily or interim cover may be received at the Site in excess of the maximum annual waste limit provided the amount of such soil received in 2021 is no greater than 190,000 tonnes and the waste to cover ratio is no less than 2.75:1.

Diversion, through the reuse and recycling of resources is a key activity in the on-going management and preservation of disposal capacity at the Navan Waste Recycling and Disposal Facility. Management is constantly searching for on-site and off-site diversion or re-use opportunities to ensure that approved disposal capacity is preserved and used for the disposal of waste material of least commercial value. Given the provincial policy and regulations concerning waste diversion from landfill, the site will continue to provide critical support to the City and Province in their efforts to meet diversion targets while at the same time ensuring essential disposal capacity is available locally.

1.4 *ECA AMENDMENTS (2021)*

The site currently operates under amended Environmental Compliance Approval (ECA) for a waste disposal site (ECA # A460702) re-issued April 16th, 2009 with subsequent amendments (Notices 1 through 13). An emergency amendment under Notice No. 13 dated September 29, 2021 was received which stipulated the following: Emergency Notice for Soils was issued permitting up to 1,693 tonnes of waste and cover material per day may be received at the Site for the year 2021 and contaminated/impacted soil to be used as an alternative daily or interim cover may be received at the Site in excess of the maximum annual waste limit provided the amount of such soil received in 2021 is no greater than 190,000 tonnes and the waste to cover ratio is no less than 2.75:1. A copy of the MECP amendment Notice No. 13 is provide in Appendix 4, Schedule 'D'.

1.5 *ENVIRONMENTAL ASSESSMENT COMPLIANCE MONITORING REPORT (EACMR)*

In August 2007, WCC (formerly WSI) received approval from the Minister of the Environment under the Environmental Assessment Act for expansion of the Navan Landfill in Ottawa, Ontario. Approval under the Ontario Environmental Protection Act (EPA) as well as other legislation were also received which culminated in the issuance of the above noted Environmental Compliance Approval for the site. Condition 4 of the EAA approval required that WCC (WSI) prepare an annual compliance report describing the

extent of compliance with the Environmental Assessment (EA) conditions of approval and the results of WCC's compliance monitoring program. In accordance with Condition 3 of the EA approval, WCC had previously submitted a separate document proposing an EA Compliance Monitoring Program. In November 2008, the Ministry expressed its general satisfaction with the EACMR and noted outstanding requirements. It also allowed WCC (WSI) to coordinate submission of follow up EACMRs with the submission of the annual Operations and Monitoring Report. Accordingly, this EACMR is submitted as Appendix 5 to this annual report and covers the period January 1st to Dec. 31st, 2021.

No non-compliance issues were identified during the 2021 reporting period.

The Ministry's EAAB File # is EA 02 08 02.

1.6 *HISTORY OF THE FACILITY*

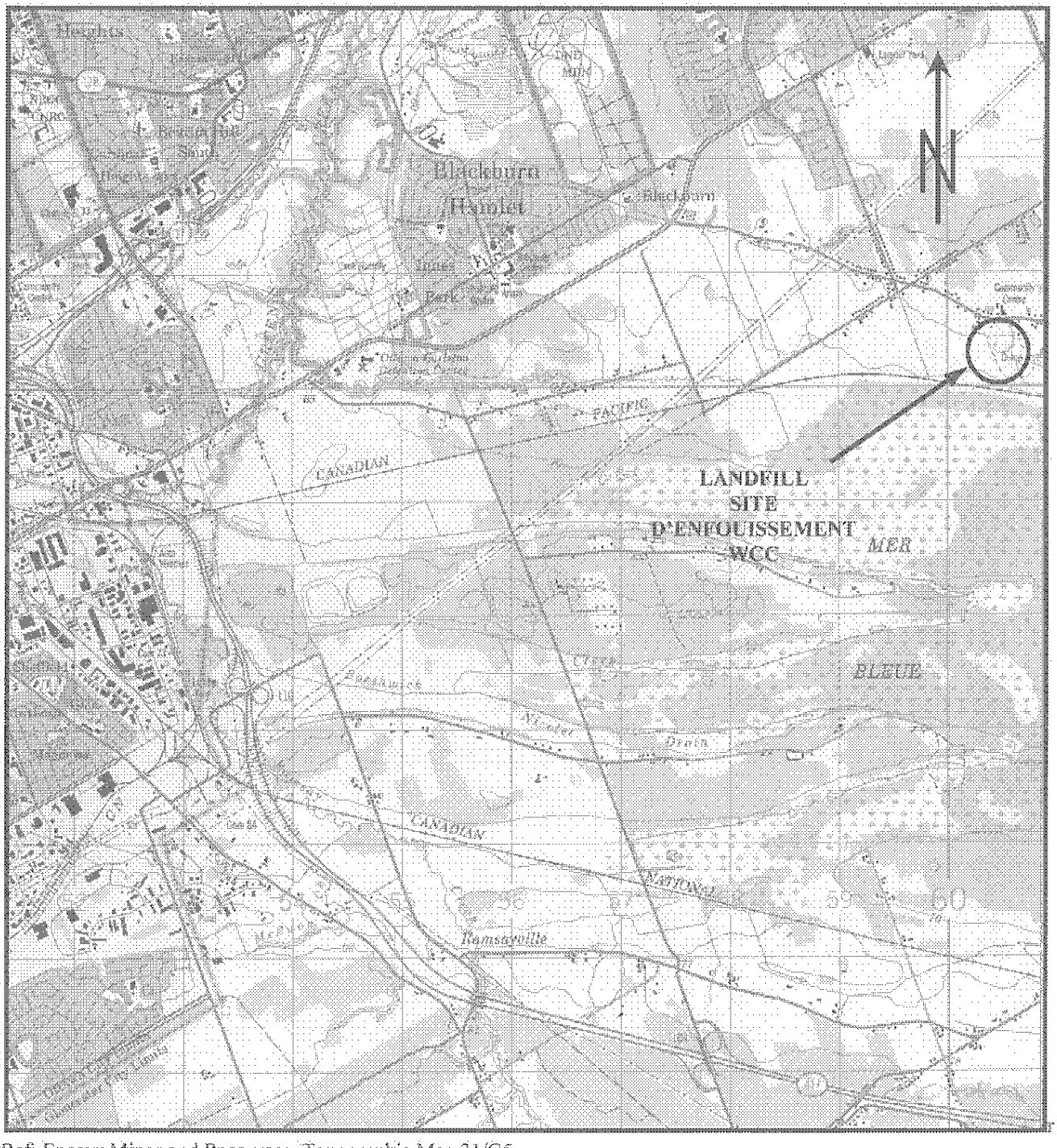
Landfilling at the site started in the early 1960s and served, at the time, as a rural dump operation for local residents. In 1971, the Ministry of the Environment (MOE) issued an Environmental Compliance Approval (CofA No. 460702) to Mr. D. J. Huneault for disposal of industrial waste including construction and demolition waste. Currently the site receives all types of solid, non-hazardous waste for disposal excluding putrescible waste. In 1995, the CofA was amended for the operation of waste processing and composting facilities at the site. Composting operations were later suspended with the issuance of the ECA amendments in April 2009 for the landfill expansion.

Annual monitoring of groundwater and surface water was initiated in 1987 and has evolved into a comprehensive monitoring program that is reported to the MECP on an annual basis. In 1992, a leachate collection system was constructed along the down-gradient toe of the landfill and surface water diversion ditches were constructed up-gradient within the north buffer zone. Leachate was initially collected in retention ponds and re-circulated onto and into the landfill following treatment through a peat filter and constructed wetland system. Transport of leachate by tanker truck to the municipal wastewater treatment plant was initiated in 1997 following odour issues related to leachate storage ponds. Presently, leachate is pre-treated on site and discharged to the City of Ottawa sewer system for treatment at the Robert O. Pickard Environmental Centre (ROPEC). Construction of the existing leachate pre-treatment/pumping station and forcemain connection to the sanitary sewer system was completed in 2007 and commissioned in early 2008.

In 2011, a landfill gas collection and flaring system was constructed as an interim odour control system. This system was commissioned and approved in April of 2012 by the Technical Standards and Safety Authority (TSSA) and has since remained operational. Permanent vertical gas wells were last added in the Phase 4 area of the landfill in 2019. In 2020, one horizontal gas well was added to the landfill gas collection system in the northwest corner of Phase 1. In 2021, construction of the permanent landfill gas forcemain and abstraction plant was started.

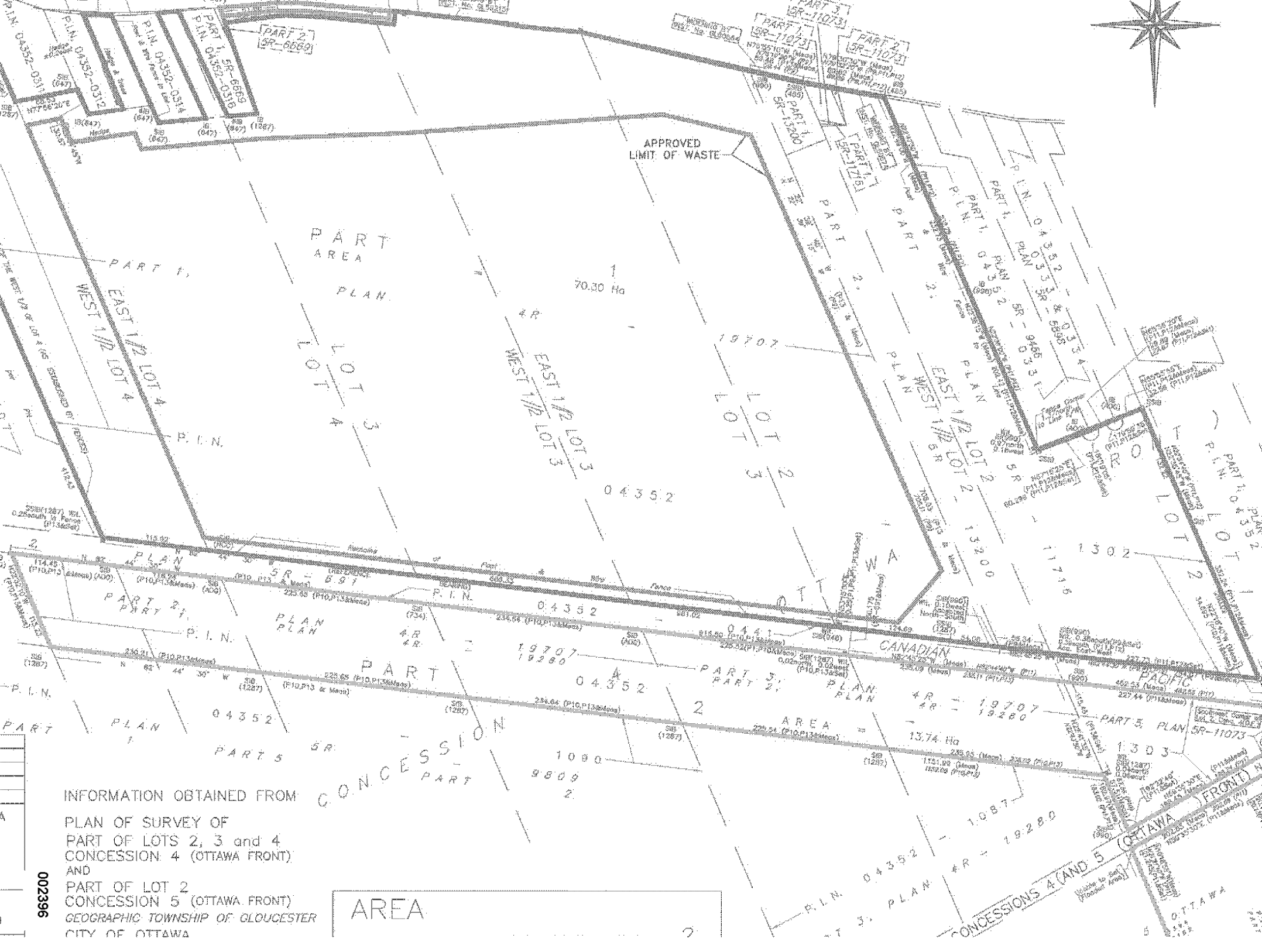
In June of 2015, the site was approved for the treatment of contaminated soils as part of the site's processing operations. Treatment of hydrocarbon impacted soils has since been on-going.

A more detailed record of milestones in the site's history is presented in Appendix 4 – Schedule 'C'.



Ref: Energy Mines and Resources, Topographic Map 31/G5

FIGURE 1.1	**KEY PLAN**	WASTE CONNECTIONS OF CANADA


APPROVED
LIMIT OF WASTE
PART 1, 5R-6669
PART 2, 5R-6669
PART 1, 5R-11073
PART 2, 5R-11073
PART 3, 5R-11073
PART 1, 5R-13200
PART 1, 5R-11716
P.I.N. 04352-0312
P.I.N. 04352-0314
P.I.N. 04352-0318
P.I.N. 04352-0319
P.I.N. 04352-0331
P.I.N. 04352-0333
P.I.N. 04352-0334
P.I.N. 04352-0335
P.I.N. 04352-0336
P.I.N. 04352-0337
P.I.N. 04352-0338
P.I.N. 04352-0339
P.I.N. 04352-0340
P.I.N. 04352-0341
P.I.N. 04352-0342
P.I.N. 04352-0343
P.I.N. 04352-0344
P.I.N. 04352-0345
P.I.N. 04352-0346
P.I.N. 04352-0347
P.I.N. 04352-0348
P.I.N. 04352-0349
P.I.N. 04352-0350
P.I.N. 04352-0351
P.I.N. 04352-0352
P.I.N.

OF

(A FRONT)
GLOUCESTER

SURVEYING LTD.

SCALE = 1:500

0 5 10 20 30 40 50

BEARING NOTE

BEARINGS ARE GRID AND ARE DERIVED FROM THE EASTERLY LIMIT OF PART 2, PLAN 5R-6003, SHOWN ON PLAN 04-21920 AS HAVING A BEARING OF N16°36'15"W.

LEGEND

⊕	SURVEY MONUMENT FOUND
⊡	SURVEY MONUMENT SET
SIB	STANDARD IRON BAR
SSIB	9.5mm STANDARD IRON BAR
IB	IRON BAR
m	(MEASURED)
CU	CROWN LAND UNKNOWN
Acc.	ACCEPTED
WIT	WITNESS
---x---	FENCE
990/00F	J.G. FAYETTE, O.L.S.
1287/FSD /1882	FARLEY, SMITH & DENIS SURVEYING LTD.

NOTE: ALL BEARINGS, DISTANCES AND MONUMENTS ARE PER PLAN 4R-21920, UNLESS NOTED OTHERWISE.

I REQUIRE THIS PLAN TO BE DEPOSITED UNDER THE LAND TITLES ACT.

DATE: AUGUST 18, 2009

RONALD A. DENIS
ONTARIO LAND SURVEYOR

SCHEDULE

Part	Lot	Concession	P.I.N.
1	Part of Lot 3	A (O.F.)	PART of P.I.N. 04352-1302

PLAN 4R-23883

RECEIVED AND DEPOSITED

DATE: August 18, 2009

Asst. Dep. C. Holloway

LAND REGISTRAR FOR THE LAND TITLES DIVISION OF OTTAWA-CARLETON No.4

REGIONAL ROAD No. 22

ROAD

NAVAN

(AS WIDENED BY BY-LAW No. 1750, INST. No. GL73185)

CENTRELINE

P. I. N. 04352

P. I. N. 04343

EXISTING

WIDENING BY INST. No. GL59239

WIDENING BY INST. No. GL59244

ROAD ASSUMPTION BY BY-LAW 16-87 INST. No. N376812

PART 1

AREA = 983.0m²

PART 1, PLAN 4R-21920

P. I. N. 04352-1302

EAST 1/2 LOT 3

WEST 1/2 LOT 3

LOT 3 CONCESSION 4 (OTTAWA FRONT)

Southeast Corner of Lot 3, Conc. 4(O.F.)

Part 3, Plan 5R-6003

ROAD ALLOWANCE BETWEEN CONCESSIONS A AND B (O.F.)

SURVEYOR'S CERTIFICATE

I certify that:
1. This survey and plan are correct and in accordance with the Surveys Act, the Surveyors Act, and the Land Titles Act and the regulations made under them.
2. The survey was completed on the 12th day of August, 2009.

Date: AUGUST 18, 2009

RONALD A. DENIS
Ontario Land Surveyor

FARLEY, SMITH & DENIS SURVEYORS LTD.
ONTARIO LAND SURVEYORS
CANADA LANDS SURVEYORS
150 COLONNADE ROAD, OTTAWA, ONTARIO K2E 7J6
(613) 727-8228 FAX (613) 727-1833

METRIC NOTE:
DISTANCES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

FILE No. : 249-09 | BOOK : 3080

AUGUST 18, 2009 CAD FILE: M:\PENNY\PLANS\2009\P249-09_ORLEANS-NAVAN ROAD_4R-xxxxx.dwg

002397

2. SITE SETTING

2.1 *Site Location and Legal Description*

The Navan Waste Recycling and Disposal Facility is located in the eastern portion of Ottawa, Ontario on Part of West Half of Lot 2, Part of Lots 3 and 4, Concession IV, Ottawa Front at 3354 Navan Road, City of Ottawa (formerly the Township of Gloucester), UTM Easting: 460570, UTM Northing: 5030570 at the front entrance to the site. The location is indicated on the Key Plan, Figure 1.1. The latest legal survey plan for the site was registered on April 13th, 2008 as Plan 4R-21920. Parts 1, 2 and 3 of this Plan are lands owned by WCC (refer to Fig. 1.2). A narrow section of land bordering Navan Road, west of the site entrance and having an area of 963 m^2 referred to as Part 1 on Plan 4R-23883 dated August 18th, 2009 was severed from WCC property as part of a Site Plan Agreement for the development of the new site facilities (refer to Fig. 1.2 and 1.3) and transferred to the City of Ottawa for the future widening of Navan Road.

2.2 *Location, Zoning, and Surrounding Land Uses*

According to the City of Ottawa's Official Plan (City of Ottawa, 2003) (Schedule B), the site is designated as Solid Waste Disposal site and is located within the Developing Community designation of the Urban Area. The East Urban Community is the southeast portion of the Orléans Community bounded by Mer Bleue Road to the east, a former Canadian Pacific Railway line (VIA Rail ROW) bordering the Mer Bleue Bog and WCC Site to the south, the National Capital Commission (NCC) Greenbelt to the west and a hydro corridor to the north. Generally, it is Urban Area (Developing Community) to the north, west and east, and Significant Wetland to the south (refer to Fig. 2.1, 2.2 and 2.3). Designations in the vicinity of the Site include: General Urban Area, including Mixed Use and Employment Areas to the north, Significant Wetland Area to the south, Residential to the immediate west and General Rural Area further to the east.

The Developing Communities designation is used by the City to identify those areas where the detail for the development of the lands requires additional study. The planning process for the Phase 1 lands was completed when City Council approved the Phase 1 Community Development Plan (CDP) document July 2005. The Landfill Site is located within the Phase 2 study area of the East Urban Community as shown on Figures 2.1 and 2.2. The landfill site was clearly identified during the work on each of these studies. The adopted CDP includes policies to protect the landfill site from sensitive land uses being established within 500 metres without a specific study to ensure compatibility. The CDP confirmed the Official Plan policies for road widening along Navan Road and also identified the need for future linkages that would be necessary to create the municipal infrastructure (water, sanitary and storm sewers) to complete the development of the community.

In 2006 a study of a 500 m buffer area around the WCC landfill site was initiated by the city. The purpose of the study was to fulfill the Official Plan requirements and to determine whether any land would be temporarily or permanently undevelopable due to its proximity to the WCC site. The peer reviewed buffer study was completed in the late spring of 2008. It determined that the landfill posed no constraints to

development of any Phase 2 lands. However, the peer review noted that where development occurs within the buffer zone, warning clauses should be placed in the purchase and sale agreements and on title. The clause should state that there is a possibility of occasional dust and odour episodes from the landfill operations.

The City of Ottawa has now adopted a Comprehensive Zoning By-law for the entire Amalgamated City (2001). By-law 250-2008 was adopted by Council in June of 2008 and was subject to numerous appeals, none related to the landfill. In November 2008 the Ontario Municipal Board provided an Order that brought the vast majority of the Zoning By-law into effect. All of the lands in the area of the site are now subject to the provisions of this By-law.

The existing adjacent lands are predominantly residential and rural residential with some scattered non-residential uses. The land is primarily open pasture, wooded areas and the Mer Bleue Bog. Existing land uses adjacent to the site boundaries are as follows:

- **To the North:** Navan Road, formerly known as Regional Road 28, residential and light commercial developments, and a former school now used as a senior's center, medical center and pharmacy.

  The north side of Navan Road is zoned Development Reserve in the Comprehensive Zoning By-law for the City of Ottawa. A Plan of Subdivision Proposal has been approved for approximately 23 hectares of largely undeveloped land, situated north of Navan Road and extending to Renaud Road (refer to Figure 2.2). These lands owned by Ashcroft Homes are presently under development. The eastern limit of the proposed development abuts the properties of the White Street residential enclave and other undeveloped lands. The lands to the west, known as Eastboro, continue to be under development for residential purposes and include two schools.

  The senior's center property directly across from the WCC Site is in a special Development Reserve Zone (DR) that identifies the community center as an additionally permitted use. A medical center and pharmacy also occupies this property presently.

- **To the East:** woodlots, a small scrap yard, and a small recycling business (abandoned and partially remediated). The lands to the east are also in the DR Zone.

  There was a rezoning for 3628 Navan Road to permit a recycling business to be recognized as a Temporary Use so that an Environmental Compliance Approval could be issued for the use of a portable wood chipper. This exception to the By-law is identified as DR [1616] and it is a Temporary Use permission which expired on December 7th, 2011. This property has been identified by the City of Ottawa as the preferred location for a large storm water management pond to service the Phase 2 CDP. The design for this pond has been approved by the City of Ottawa and is presently under construction by Ashcroft Homes.

  The balance of the lands to the east is in the same Development Reserve Zone (DR) which replaces the former Future Growth zone;

- **To the South:** VIA Rail right-of-way (ROW) is currently used as a recreational trail, however, railway traffic may resume in the future. This ROW is used as the zoning boundary in the comprehensive by-law. A 100 m strip of land south of the ROW is owned by WCC.

The lands south of the ROW that are within the Provincially Significant Wetland are identified as Environmental Protection (EP) in the zoning by-law. The remaining lands south of the ROW are zoned Rural in the By-law;

- **To the West:** Immediately west was a former composting and soil blending operation recently shut down which is zoned DR, while beyond that point are lands re-zoned and being developed by Claridge Homes for urban residential (R3VV[1286]), including Open Space (O1) and a portion that remains as a DR Exception [459]-h Zone.

Figure 2.3 summarizes the current zoning that is found in the area as shown in the Comprehensive Zoning By-law for the City of Ottawa.

The lands owned by WCC are within two defined zoning areas. The actual landfill being zoned as Heavy Industrial Exception [2] (IH[2]H(11)) and the buffer area being a separate Exception Zone to recognize its function as a buffer (IH[1483]H(11)). These are the zones found in the Comprehensive Zoning By-law. The WCC lands that lie south of the VIA Rail corridor are zoned as Environmental Protection and Rural as shown on Figure 2.3.

2.3 *Existing Site Design and Facilities*

The existing approved design and operation of the site is described in the Design and Operations report prepared by Golder Associates Ltd. for the site expansion (Golder, January 2008) and the approved Quality Assurance/Quality Control Plan and Specifications for the WSI Landfill Leachate Collection and Management System – Lateral Expansion Area (Golder, June 2009 and MOE reference Number 1851-7SUSJ9). The following sections summarize some of the current facilities and systems described therein.

2.3.1 Existing Facilities

A gated entrance from Navan Road at the north end of the site presently serves as the only access point into the landfill. The gate is locked after operating hours and monitored by security personnel. Access during operating hours is controlled by an attendant at the scales, operating from a scale house. The scale house is in close proximity to the equipment maintenance garage and administrative office building.

Internal roads are constructed and relocated as necessary to provide access to the active landfill areas and other site facilities. The internal roads are generally constructed using recycled asphalt, re-used screened rock, brick or crushed concrete over a sub-base of re-used shingles. The current approximate road network is illustrated in plan view on Figure 2.4.

A waste processing area has been built on interim-covered waste in the south-central part of the waste footprint to facilitate stockpiles of recycled and processed materials (refer to Figure 2.4). A small vehicle pad consisting of reinforced concrete retaining walls was constructed south of the scale house for the unloading and sorting of waste from small vehicles. Concrete block bunkers are available for the separation of larger volumes of recyclable materials such as shingles, aggregates, clean fill, windshield glass, etc.

A minimum buffer width of 30 metres is maintained around the west, north and east sides of the approved waste disposal area. A 10 metre buffer is maintained between the southern limit of the waste footprint and the VIA rail corridor. Additional buffer lands owned by WCC exist to the east and west with a minimum 100 metres wide strip of land extending the full width of the site south of the VIA right-of-way (see Figure 2.4).

2.3.2 Leachate Management and Groundwater Protection System

The existing leachate management system at the Navan Waste Recycling and Disposal Facility includes an underdrain system in the northwest corner of the existing waste footprint north of Grid Line I and between Grid Lines 3 and 6 (refer to drawing 6.2). This area is connected via perforated HDPE pipe to a perimeter leachate collection trench. It consists of a granular-filled trench and perforated drainage pipe which runs along the west edge of the waste mound (Grid Line 1) and the south toe of the waste mound (between Grid Lines Q & R).

An underdrain leachate collection system also exists in the southeast corner of Phase 8 consisting of a combination of perforated collection pipes, French drains and sand drainage blanket. This drainage layer extends from Grid Line N to the south toe of the waste mound and between Grid Lines 14 and 16.

An underdrain leachate collection system also exists in the north central area of the waste footprint in the Phase 4 and 5 area of the site (refer to Fig. 2.4) consisting of a combination of perforated collection pipes, French drains and sand drainage blanket. This large drainage system extends from the north toe of the waste mound to Grid Line L and between Grid Lines 6 and 16.

The leachate drainage system in the east expansion cell (Phase 1) was constructed in 2014/2015 and consists of a network of perforated HDPE pipe, separation and filter geotextiles, a clear drainage stone layer and a sand protective layer. A similar system was constructed in 2018/19 for the cell to the north in Phase 6. A pump station was constructed at the northwest corner of Phase 1 to assist with the drainage of the east cells.

The existing leachate collection systems are illustrated in Figure 6.2 and discussed in greater detail in Section 6.3.

All leachate collected in the existing leachate collection system is designed to gravity drain or be pumped to a wet well and a pre-treatment/pump station located in the south buffer near Grid Lines R-16. Pre-treatment of leachate consists of air stripping hydrogen sulphide (H_2S) and Volatile Organic Carbons (VOCs) with the use of activated carbon filters prior to discharge. During 2021, all leachate was pre-treated and pumped via forcemain to the City of Ottawa sewer system for final treatment at the City's municipal sewage treatment plant. The leachate forcemain was flushed and cleaned twice during 2021. No operational issues with the treatment and pumping station were reported in 2021.

A vertical manhole, connected to the leachate collection system in the centre of the existing waste footprint (referred to as "the central manhole"), provides an alternative point of access to evacuate leachate from this part of the leachate collection system in the event that positive drainage to the wet well and pump station cannot be maintained due to sub-grade settlement. This manhole has been raised to an elevation of 101 metres and will require that it be raised with additional MH sections in 2022.

Access to the leachate collection pipes in the Phase 4 and 5 area (refer to Fig. 2.4) is provided via a series of cleanouts along the north side of the existing waste footprint. Cleanouts are also provided along the east perimeter for leachate collection pipe access in the east cell expansion. Access to the west and south perimeter leachate collection system is provided via a series of manholes. The system was checked for drainage to ensure proper performance of the drainage/collection system. Low permeability cover soils are currently used to minimize infiltration of precipitation into the waste column. At present, clay soil cover is located on the north, west and south facing slopes as well as the surface of completed fill areas in Phase 3, the north part of Phase 4 and parts of Phase 1. Leachate containment is currently provided by a thick deposit of natural low-permeability clay soil which underlies the entire site and a constructed final clay cover.

2.3.3 Landfill Gas and Odour Management System

The Certificate of Approval (Air), ECA # 6733-7BYS9A issued on April 16th, 2009 was amended by ECA (Air) # 3536-8APNZD on November 24th, 2010 to add one (1) candlestick flare, used to combust a maximum of 0.24 actual cubic metres per second (500 scfm) of landfill gas (LFG) collected from three (3) vertical landfill gas wells and gas collected from the Leachate Collection System (refer to Fig. 8.1). Construction of the approved candlestick flare was completed at the end of 2011 and was commissioned and approved by the Technical Standards and Safety Authority (TSSA) in April of 2012. Horizontal and vertical wells were later added in the area of Phase 4, Phase 3 and Phase 1 to enhance the odour control system. Details are provided in Section 8.

A fixed line misting system powered by a portable generator was added at the end of 2017 to be on hand ready to be implemented as an emergency response system to assist in addressing odour issues.

2.3.4 Surface Water Management System

The regional surface water flow system in the area of the landfill is discussed in sub-section 2.7 and existing surface water control features are shown on Figures 2.4 and 6.1. Existing controls can be summarized as follows:

a) Upstream flows originate north and northwest of the site. This flow is diverted around the landfill by ditches that exist along the north perimeter of the site buffer zones.

b) A diversion ditch has been constructed along the northern limits of the landfill that discharges into the east perimeter ditch at the northeast corner of the landfill. The east perimeter ditch conveys flows southward to storm water management ponds located at the south-east corner of the site. These ponds discharge into a perimeter ditch that flows south under the VIA ROW onto and through WCC property and drains to the Mer Bleue drainage basin.

c) Another diversion ditch has been constructed northwest of the site in the north buffer area. This ditch discharges further west into a natural drainage channel termed the west perimeter ditch which is not well defined. Surface water from the completed west parts of the site is controlled and discharges into a storm water pond located at the northwest corner. This pond discharges into a ditch located on WCC property which drains into the west perimeter ditch. The west perimeter

ditch conveys flows southward and then westward north of the VIA ROW to the Mud Creek drainage basin.

d) An east diversion ditch was constructed in accordance with South Nation Conservation Authority requirements for a fish habitat and was commissioned following approval in the fall of 2009.

e) Interim clay cover has been placed over inactive portions of the existing waste mound. Finished slopes are covered with clay soil and topsoil, graded and seeded. Soil stockpiles are also covered with topsoil and/or compost and seeded for surface water and erosion control. To protect the perimeter clay slopes against erosion, clay diversion dikes and drainage swales have been constructed to collect surface run-off above the slope. Storm water collected by the swales is directed down the landfill side slopes via rip-rap lined drainage chutes. Culverts exist at the top of each drainage chute to provide surface runoff across the perimeter access road, with the access road itself serving as a berm.

2.4 *Climatic Setting*

The landfill is located 17 km northeast of the meteorological station located at the Ottawa International Airport (OTAWA INTL. A, climate ID 6106001). Climatic conditions at the site are presented on Figures 2.5 and 2.6 and summarized as follows:

a) The average monthly temperatures in 2021, obtained from Environment Canada Atmospheric Environment Service, varied from an average low of about -8.3°C in February to an average high of 22.3°C in August with an annual average temperature of 7.6°C. The 60 year average ranges from a low of -10.4°C to a high of 20.9°C and an annual average of 6.2°C.

b) The average (1961 to 2021) annual precipitation at the Ottawa International Airport station is 920.1 millimetres. The driest month is generally February at an average of 55.4 mm and the wettest month being July at an average of 91.2 mm. Total precipitation for 2021 was 836.8 mm and ranged from a low of 30.2 mm in January to a high of 139.9 mm in October.

c) The average annual water surplus (i.e. precipitation minus evaporation) for the Ottawa vicinity is in the order of 320mm (12.5 in.). The water surplus provides an estimate of the amount of water available for infiltration into the site and for surface run-off during a 12-month period.

2.5 *Geology*

Regionally, the site is located within the Ottawa Valley clay plain at the western edge of the Prescott and Russell sand plains. The lowland region is composed of unconsolidated glacial deposits of till, varved clays and marine beds of clay and sand from the post-glacial Champlain Sea. The region is bound to the north by Precambrian formations of the Canadian Shield and underlain by interbedded Paleozoic bedrock that outcrops in ridges and scattered exposures due to faulting and downdrop fault blocks. The WCC Facility is situated on the banks of the Ottawa River Channel. The post-glacial Ottawa River Channels, east of Ottawa, are from 3 kilometres to 10 kilometres wide and up to 18 metres deep. They are floored with clay and silt and bordered by sand deltas. Figure 2.7 shows the surficial geology of the area.

Sand deposits cover the escarpment that runs through the site. Sands are found to be 0.6 metres to 2 metres deep in the area of the Facility above the escarpment. For the most part, the sand below the escarpment has been eroded, leaving behind only a thin sand blanket. A thick (20 to 35 m) marine clay deposit underlies the entire area and has been exposed by the deep erosion channels that have cut through the escarpment and wherever the thin sand deposit has been eroded. The bedrock beneath the site is shown to consist of shale of the Billings Formation (Figure 2.8). A review of MECP water well records within the site vicinity study area indicated that the Site is underlain by limestone or shale.

2.6 *Hydrogeology*

The regional groundwater flow direction in the deep bedrock is east (Charron, 1978). In the general area of the site, groundwater flows from a north to south direction, toward the Mer Bleue bog located south of the site. Figure 2.9 indicates the groundwater flow direction and the interpreted groundwater recharge, transitional and discharge areas as described in studies undertaken for this area (A.J. Robinson and Associates Inc., 1987, Gore & Storrie Limited, 1992).

The thick clay deposit which underlies the site and surrounding area acts as an acquitard, such that lateral flow is directed through the surface sand unit and the upper weathered clay (total thickness of a few metres). Shallow groundwater flow is strongly influenced by topography, the depth of the surficial sand layer, the underlying weathered clay, the natural drainage systems and recently constructed drainage systems. Shallow groundwater flow occurs at the site generally in a north to south direction, as shown schematically on Figure 2.10.

The results of water levels measured at the site at up-gradient wells indicate the shallow water table to be typically located approximately 1 to 2 metres below ground surface with only small fluctuations in water levels indicated for recent years. A downward hydraulic gradient has been profiled up-gradient to the site. The only variation in the direction of the hydraulic gradient is indicated in the upper 5.6 metres to 10.4 metres below ground surface, from a downward gradient to an upward gradient in the weathered clay. These results may be attributed to a perched water table at the interface of the weathered clay and the intact clay. The relatively weak downward gradient from the sand to the weathered clay suggests a hydraulic interconnection between these units. The downward gradient is quite pronounced from the weathered clay down to the lower reaches of the intact clay deposit. It is interpreted that the intact clay deposit at depth beneath the landfill site acts as a barrier to groundwater flow.

The results of the water levels measured at the down-gradient wells at the site indicate the shallow groundwater table lies within the sand deposit close to the original ground surface ranging in elevation from about 68.8 metres to 70.2 metres. Seasonal variations of nearly 1 metre have been observed. The high water levels generally occur during the wet spring whereas the lower water levels are recorded during the dry summer months and fall. Unlike the up-gradient groundwater level profiles, the down-gradient profiles generally indicate a slight upward vertical gradient, although a localized weak downward gradient is observed at times between the upper 6.3 metres to 7.6 metres within the weathered clay. The upper sand and fractured clay layers appear to be hydraulically connected with near vertical or hydrostatic water level profiles. A slight upward gradient at the down-gradient boundary of the landfill suggests there is upward vertical flow of shallow groundwater at this location which would retard the potential for leachate migration into the deeper groundwater system.

Water levels obtained further down-gradient of the landfill indicate the shallow groundwater table is close to the ground surface within the upper sand or organic deposit with artesian conditions within the clay. Hydraulic head profiles illustrate an upward gradient through most of the profile with a weak downward gradient from the sand to the weathered clay. Historically, there has been an upward gradient through the entire profile. The presence of an upward gradient suggests upward groundwater flow is occurring south of the landfill. These results may also suggest upward leaching of pore water from the Champlain Sea clay, a brackish water deposit, may be occurring at the southern boundary of the landfill. North of the landfill, downward leaching of the clay pore water is indicated.

The horizontal hydraulic gradient in the shallow sand deposit and weathered clay at this site is consistent with the relief of the property which changes in elevation by approximately 15 metres to 18 metres between the up-gradient and down-gradient boundaries of the landfill. Since the shallow water table appears to be a reflection of the original surface topography, horizontal hydraulic gradients are expected to vary between 0.7% in the plateau above the escarpment and 1.4% in the valley below. Water levels measured south of the landfill indicate shallow groundwater is flowing in a south to southwest direction with a small hydraulic gradient ranging between 0.5% and 2%. The horizontal gradients in the bog area are influenced by seasonal fluctuations in the surface water levels. Hydraulic gradients could also be influenced by the leachate collection system (LCS) located along the south toe of the landfill. Keeping the LCS drained could result in a lowering of the water table by more than 3 metres below the original grade at the southeast corner of the landfill and by 2 metres at the southwest corner. This water table lowering could significantly influence the hydraulic gradients within the waste pile near the landfill's south boundary. A clay cut-off wall on the down-gradient side of the LCS was constructed to alleviate any potential problems related to lowering of the groundwater table south of the landfill.

Water levels measured within the glacial till/upper bedrock up-gradient and down-gradient of the site indicate a difference in water levels of about 6 metres, which represents a hydraulic gradient of approximately 1% across the site within the glacial till/upper bedrock.

Many factors, such as mounding within the waste pile, the installation of the leachate collection system and the construction of waste cells with under drainage will influence the rate of groundwater flow across the site.

Within the study area MECP water well records indicate that former groundwater users obtained their groundwater from the overburden and bedrock interface. This interface is considered the main aquifer in the study area. Down-gradient of the landfill, in the direction of groundwater flow, there are no potential groundwater users and the marine clays present in the Mer Bleue bog area produce saline water.

2.7 Surface Water Flow System

The Navan Landfill is located on a watershed divide between two major drainage watersheds - the Rideau River watershed to the west and the South Nation River watershed to the east (see Figure 2.11). Surface runoff drains to both the east and west of the site. The east side of the site drains to the Bear Brook drainage basin, which is part of the South Nation River watershed. The west side drains into the Mud Creek drainage basin which in turn drains into Green's Creek; part of the Rideau River watershed. The Mer Bleue bog, a

unique and internationally recognized ecological feature, is located to the south of the landfill as seen on Figure 1.1.

2.8 *Mer Bleue Bog*

The Mer Bleue bog, located south of the site, is an important ecological and hydrologic feature in the Ottawa area. This 4,106 ha area was formed approximately 9,500 years ago, following the last ice age, (Frasier et al., 2001) when the Champlain Sea occupied the Ottawa Valley and laid down deep marine clay deposits. As the glaciers began to melt, a spillway channel formed south of the present day Ottawa River. Melt water flowing through the southern channel eroded the floor of the Champlain Sea. As the melt waters receded and isostatic rebound forced sea water eastward to the Atlantic Ocean, the southern channel ceased flowing and a lake formed in the present location of the Mer Bleue bog. Plant growth progressively filled in the lake, forming a raised peat dome Sphagnum bog. The peat thickness is reported to be about 6 to 7 m.

The Mer Bleue is underlain by Ordovician limestone and shale, deposited as marine sediments 445 million years ago (Brunton, 1984). The bedrock layer is deeply buried by organic deposits over the central portion of the Mer Bleue with marginal deposits of marine clay, and sand deposits along two prominent ridges. The marine clay deposits are very thick, ranging from 12 to 45 m in depth (Hobson et al., 1969). There are also sandy shoreline deposits located on the northern and southern margins of the Mer Bleue bog (Brunton, 1984).

The hydrologic features of the bog are very unusual. Being a domed bog, surface water drainage in the bog flows radially outwards from the centre towards the edges of the bog and then flows in the "lagg" along the perimeter of the bog. The elevation at the centre of the bog is approximately 70 m above sea level, sloping gradually down to about 67 m at the perimeter of the bog. Groundwater flow into the bog is very small given the low permeability of the underlying clay soils. Surface water inflow to the bog is also very limited because the contributing drainage watersheds are quite small; consequently the bog receives most of its water and nutrients in the form of atmospheric precipitation (for this reason the Mer Bleue is referred to as an "ombrotrophic bog").

Surface water flowing radially outwards from the centre of the bog enters the lagg around the perimeter of the bog which is basically a channel of standing or very slowly flowing water flowing along the perimeter of the bog. The lagg receives water from the bog and distributes it through the surrounding lands. On the western portion of the bog, drainage channels drain bog waters westward to Greens Creek. On the eastern portion of the bog, drainage from the bog ultimately discharges to Bear Brook Drain to the southwest.

Attempts were made in the late 1800's to drain portions of the bog for agricultural purposes; however, these drainage ditches no longer function because of the many beaver ponds which started up in the late 1950's. Now the water level in the Mer Bleue is at or near the surface of the bog for most of the year. The Savage Drain is an example of an agricultural drain which is quite visible in aerial photographs of the bog as a prominent linear feature on the eastern side of the bog. Flow in the drain in the northern part of the bog (nearest the landfill) is northward and then eastward along the lagg on the perimeter of the bog. There are a number of agricultural drains along the northern and eastern parts of the bog which receive surface water from the bog.

Shoreline erosion is not a concern as the surface water flow rates are nil to minimal. Flooding in the bog is also not a concern as water levels are controlled naturally through beaver dams and the ability of sphagnum to absorb large amounts of water.

In addition to its hydrologic function, the lagg is also a transition zone for plant communities and water quality, where the water regime changes from acid dominated waters in the bog to increasing calcium and basic waters.

Fraser et al., (2001) studied flow patterns and geochemistry in the peat in the Mer Bleue bog. The researchers found that vertical groundwater flow patterns in the bog alternated annually between periods of recharge and discharge in accordance with changes in precipitation, evapotranspiration and the differential head response of the lower peat layer to changes in water table. A sustained moisture deficit during the summer maintained a flow reversal for about a month until a significant rainfall raised the water table. One of the reasons that the researchers selected the Mer Bleue for their study of flow reversals was that the large peatland was isolated from the regional groundwater flow (Fraser, et al., 2001).

The surface vegetation in the Mer Bleue bog has, to some extent, become a shrub-rich bog as a result of the extensive drainage activities and peat mining of the 19th and early 20th centuries. These disturbances reduced the wetland size by 20%, accelerated the maturation of the peatland and accelerated the rate of tree establishment. The re-establishment of beaver populations along the margins of the peatland have helped restore pre-disturbance water levels, however many bog species have already been reduced (Brunton, 1992).

Ponding due to beaver activity has the potential to convert the bog vegetation to marsh communities. There is a concern about the spread of invasive and/or non-native plant species; in particular, purple loosestrife, grey birch, glossy buckthorn and European frog-bit (Wetlands International, 2001).

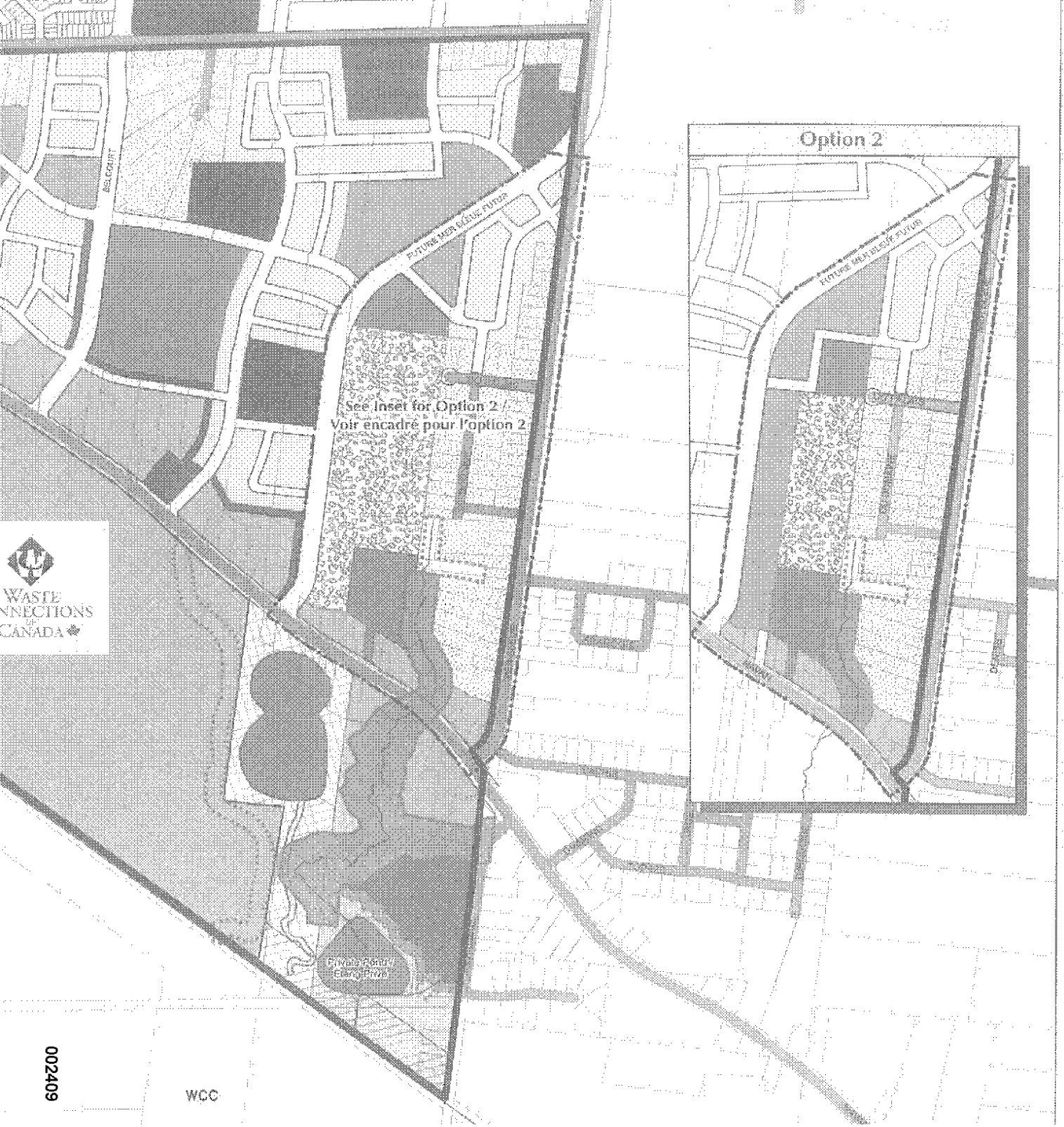


East Urban Community
COMMUNITY DESIGN PLAN

Communauté urbaine de l
PLAN DE CONCEPTION COMMUNAUTAIRE

- Proposed School / Ecole proposé
- Future Institutional Site / Futur emplacement
- 15m Overland Flow Corridor / Couloir d'éco
- Existing and Proposed Parks / Parc existant e
- Wooded Area / Zone boisée
- BFI Waste Disposal Site / Décharge de BFI
- Storm Water Management Pond / Bassin de
- Slope Stability Setback / Marge de reculeme
- Aquatic Habitat Setbacks from top of Bank / Marge de reculement des habitats aquatique à partir du haut de la rive
- Buffer to Mer Bleue Bog / Zone tampon de la tourbière de la Mer Bleu
- Proposed Street / Rue proposé
- Future Mixed Use Area /
- Phase 2 Area /

002408



Communauté urbaine G

PLAN DE CONCEPTION COMMUNAUTAIRE

LAND USE / UTILISATION DU SO

- School / Ecole
- Institutional / Institutionnel
- 15m Overland Flow Corridor / Couloir d'
- Park / Parc
- Wooded Area / Zone boisée
- BFI Waste Disposal Site / Décharge BFI
- Storm Water Management Pond Area / Zone de retention des eaux pluviales
- Slope Stability Setback / Marge de reculem
- Aquatic Habitat Setbacks from top of Ban Marge de reculement des habitats aquatic de la rive
- Existing Residential – Potential for long ter redevelopment to low/medium density re Résidentiel existant – Potentiel, à long ter en résidentiel de densité faible à moyenne
- Future Residential – low/medium density Résidentiel futur – faible/moyenne densité
- Future Residential – medium/high density Résidentiel future – moyenne/haute densi
- Mixed Use – institutional, office, commerc Secteur polyvalent – institutionnel, bureau
- Leisure/ recreational uses - Significant acce servicing constraints limit development po Utilisations de loisir et récréatives - Les co conduites pluviales et domestiques limitén
- Future development potential to low dens and sanitary servicing constraints can be o Potentiel d'aménagement futur en lotissem densité, uniquement si les contraintes de domestiques peuvent être résolues
- Buffer zone from the rail corridor / Zone t
- Proposed Street / Rue proposé

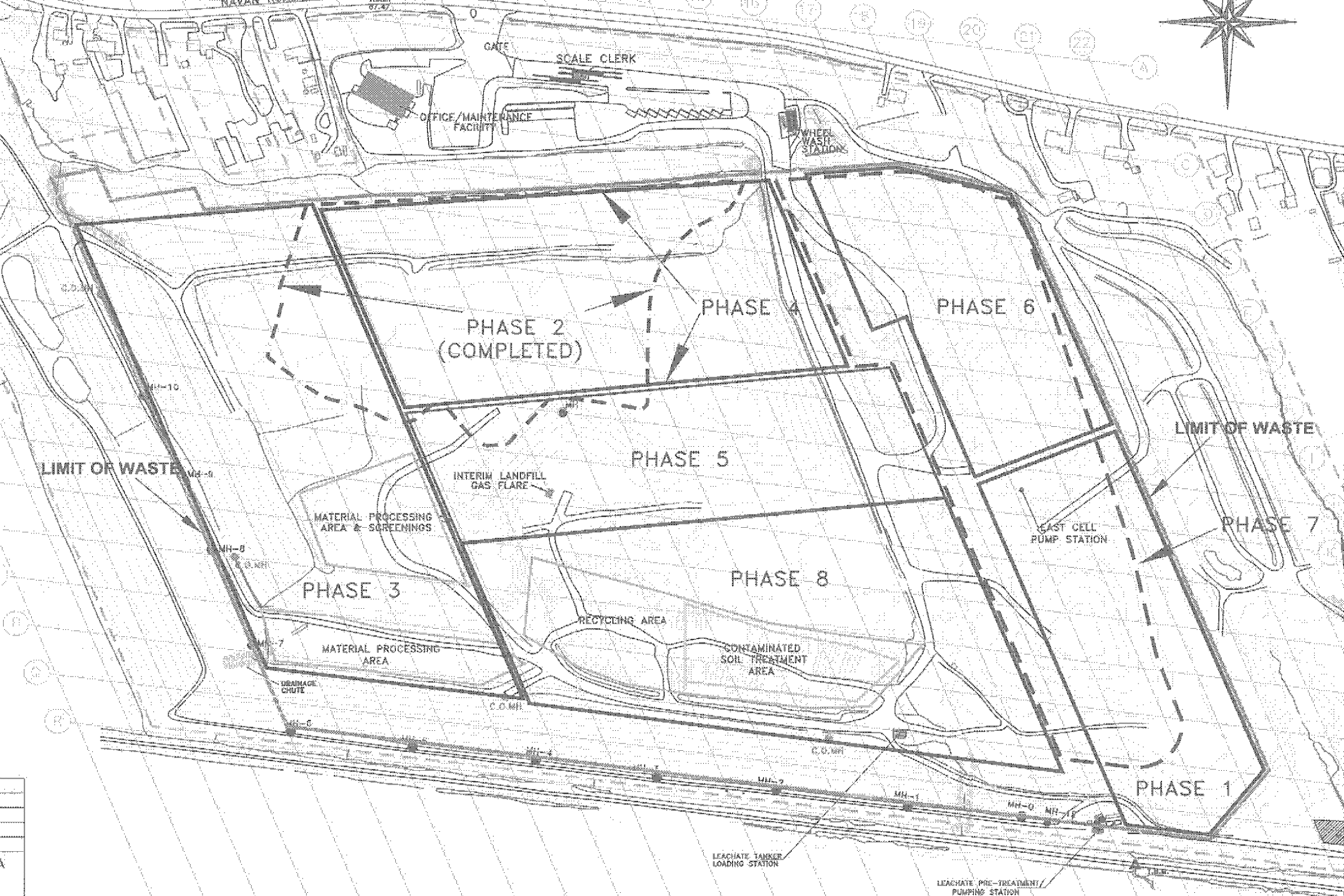
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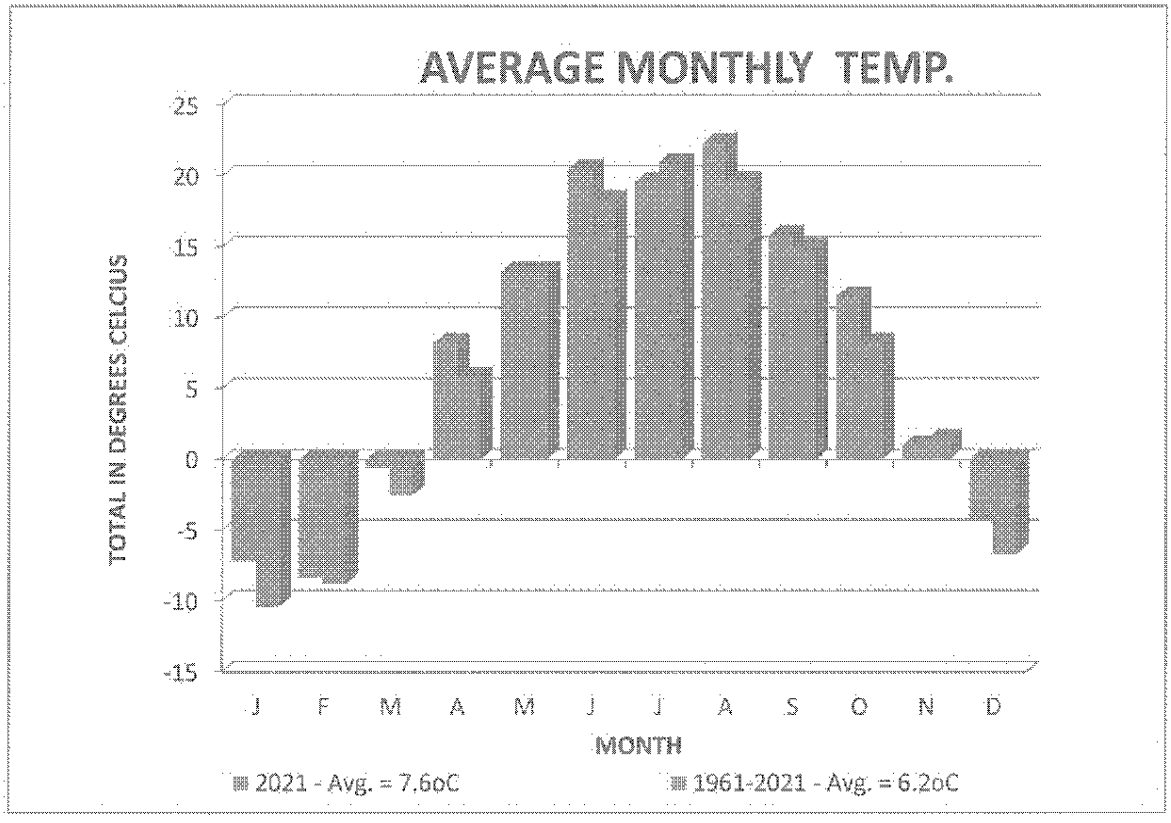
FIGURE 2.3

CURRENT ZONING OF SITE AND SURROUNDING AREA

WASTE CONNECTIONS OF CANADA


GATE
SCALE CLERK
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
PHASE 2 (COMPLETED)
PHASE 4
PHASE 6
PHASE 5
PHASE 7
PHASE 8
PHASE 3
PHASE 1
LIMIT OF WASTE
LIMIT OF WASTE
INTERIM LANDFILL GAS FLARE
MATERIAL PROCESSING AREA & SCREENINGS
EAST CELL PUMP STATION
RECYCLING AREA
MATERIAL PROCESSING AREA
CONTAMINATED SOIL TREATMENT AREA
DRAINAGE CHUTE
LEACHATE TANKER LOADING STATION
LEACHATE PRE-TREATMENT PUMPING STATION
MH-10
MH-9
MH-8
MH-7
MH-6
MH-5
MH-4
MH-3
MH-2
MH-1
MH-0
MH-11
C.O. MH

002411



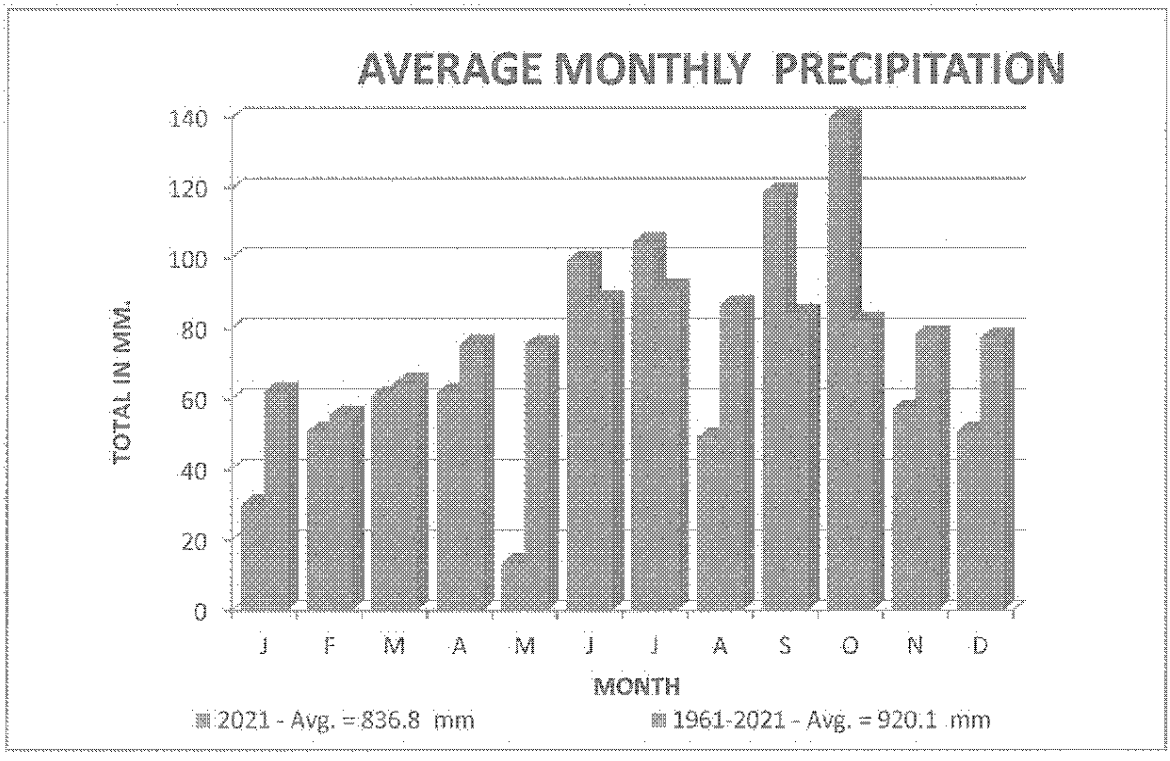
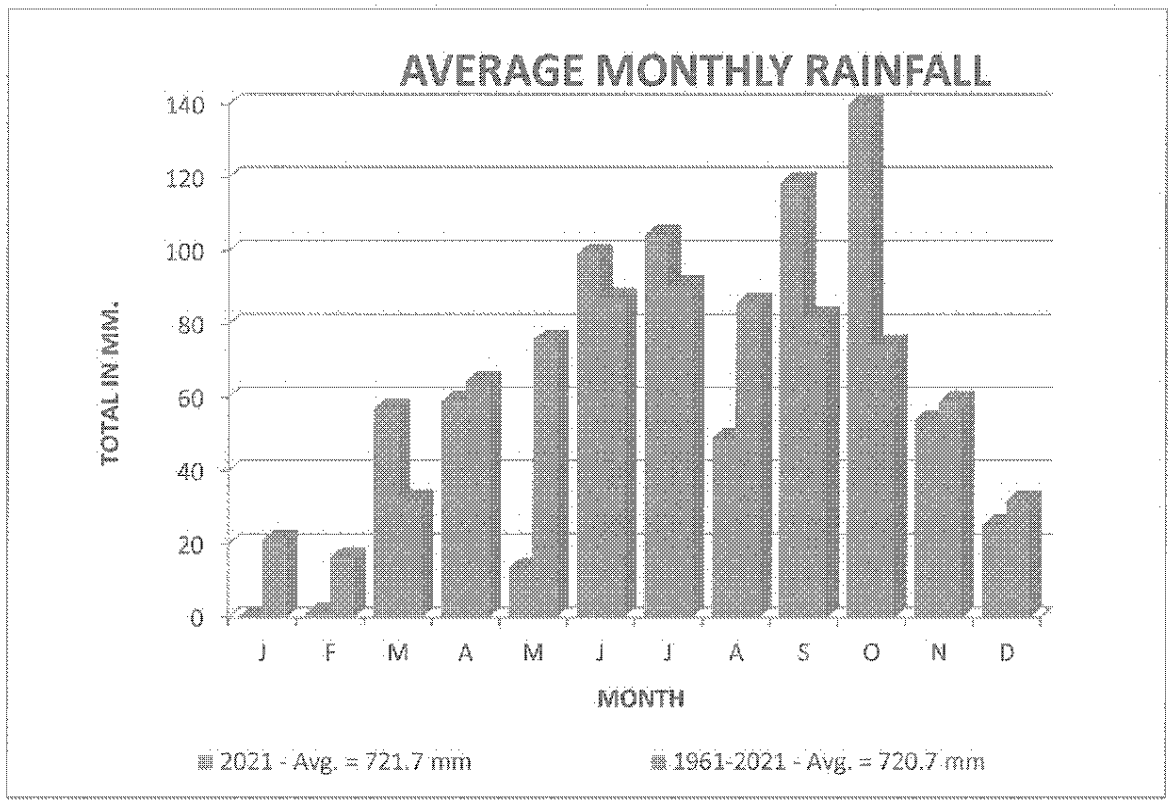


Figure 2.5: Average MonthlyTemperature and Precipitation for 2021



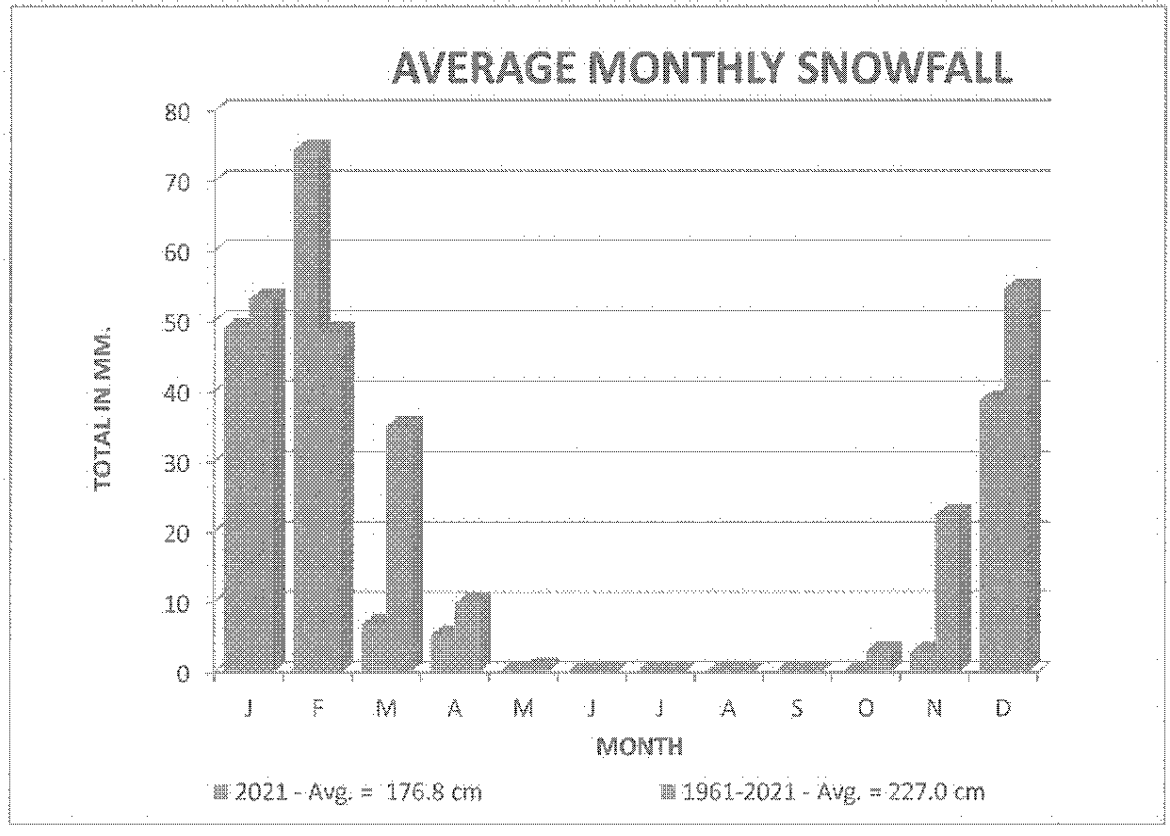
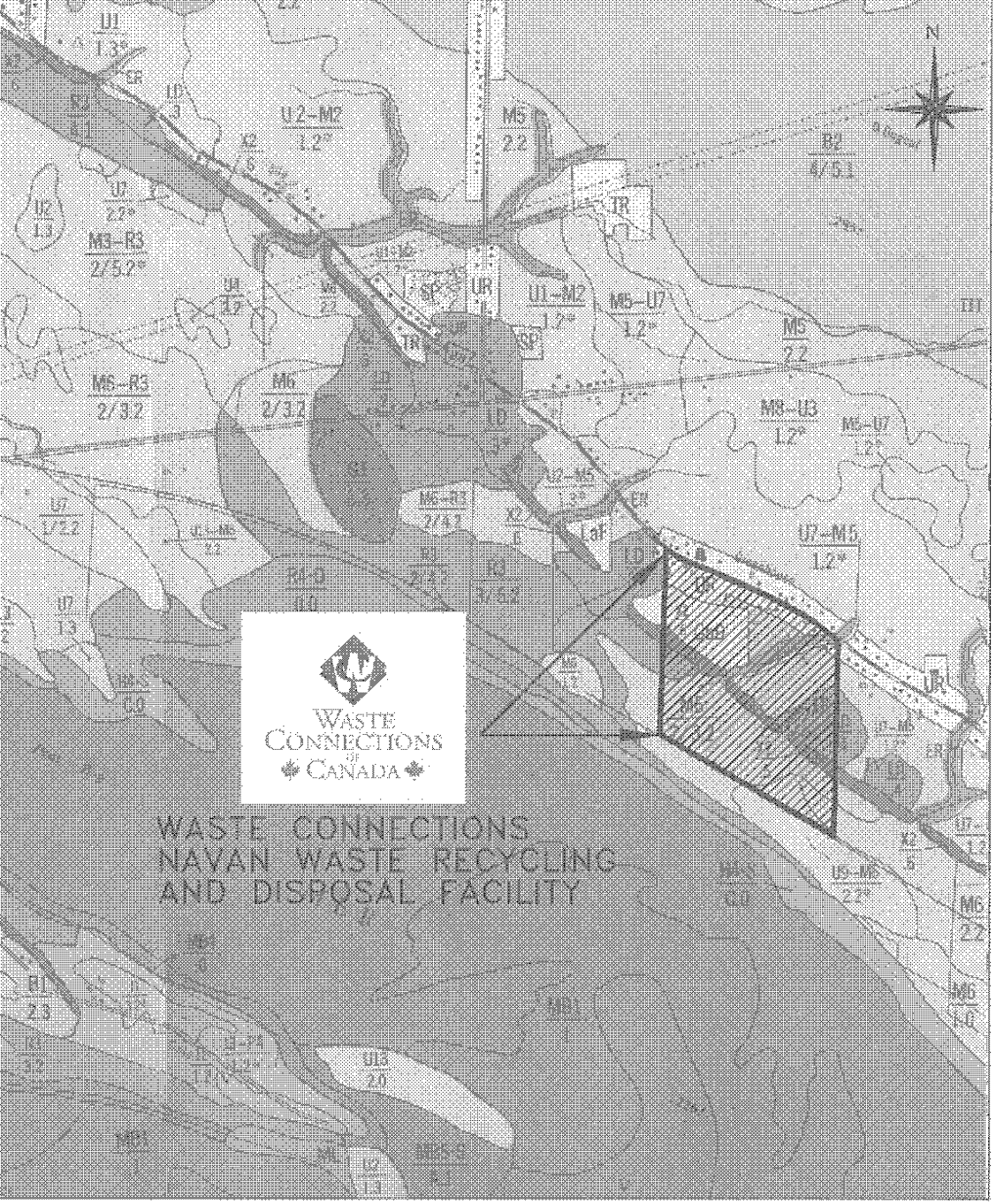
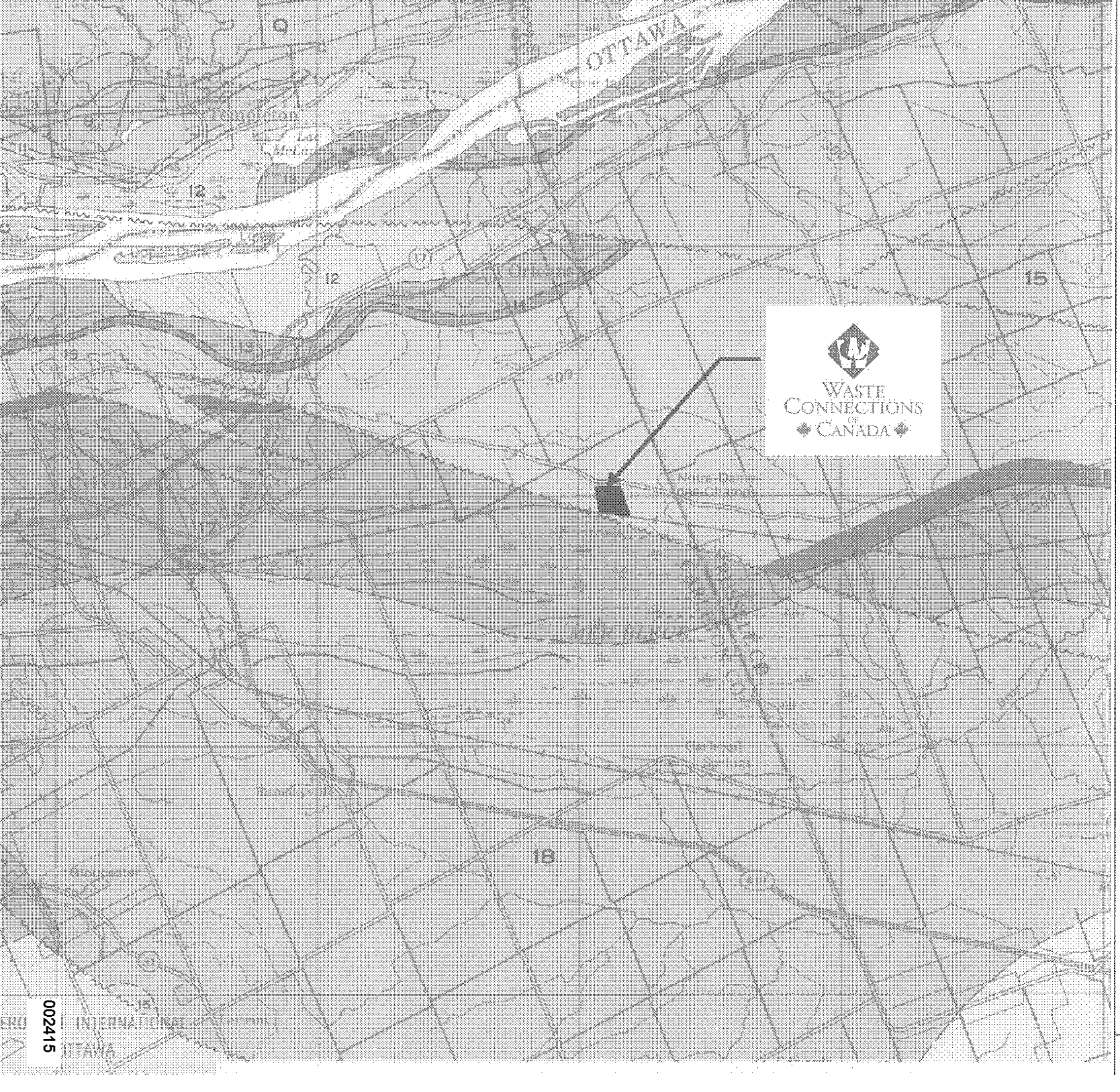


Figure 2.6: Average Monthly Rainfall and Snowfall for 2021


N
U1
1.3*
U2-M2
1.2*
M5
2.2
B2
4/5.1
M3-R3
2/5.2*
M5-U7
1.2*
M6-R3
2/3.2
M6
2/3.2
M8-U3
1.2*
M5-U7
1.2*
U7-M5
1.2*
R4-3
1.0
M6
2.2
U7-M5
2.2*
M6
2.2
U1-M5
2.2*
U3-M5
2.2*
U3-M6
2.2*
U1-M6
2.2*
U1-M2
1.2*
M5-U7
1.2*
U7
1.2.2
U7
1.3
U1
2.3
U2
1.3
U3
2.0
M6
2.2
M6
2.2
M6
2.2



LEGEND

Q — No information is available on t
Newa Dictionary deposits

PALEOZOIC

ORDOVICIAN

10 — QUEENSTON FORMATION:

9 — CARLSBAD FORMATION: gra
layers

8 — BILLINGS FORMATION: blac

7b — PASTVIEW FORMATION: dark

7a — OTTAWA FORMATION: limest
sandstone in basal part

6 — ST. MARTIN FORMATION: sha
dolomite

5 — ROCKCLIFFE FORMATION: sh

4 — OXFORD FORMATION: volcan

3 — MARCH FORMATION: interbed

ORDOVICIAN OR CAMBRIAN

1a — NEPEAN FORMATION: sandst

PRECAMBRIAN

Granite, quartz monzonite, gra
and syenite) and associated mig

Syenite, monzonite, massive and

Pegmatite, white pegmatite and

Diorite, gabbro, diabase, meta

Marble, lime silicate rocks, biotit

Amphibolite, greenstone, quartz
garnetiferous (includes probably

Paragneiss, pelitic and psammop
(includes some layered amphibo

Quartzite, interlayered paragneiss

Undifferentiated Precambrian

Geological boundary (approximate, assumed)

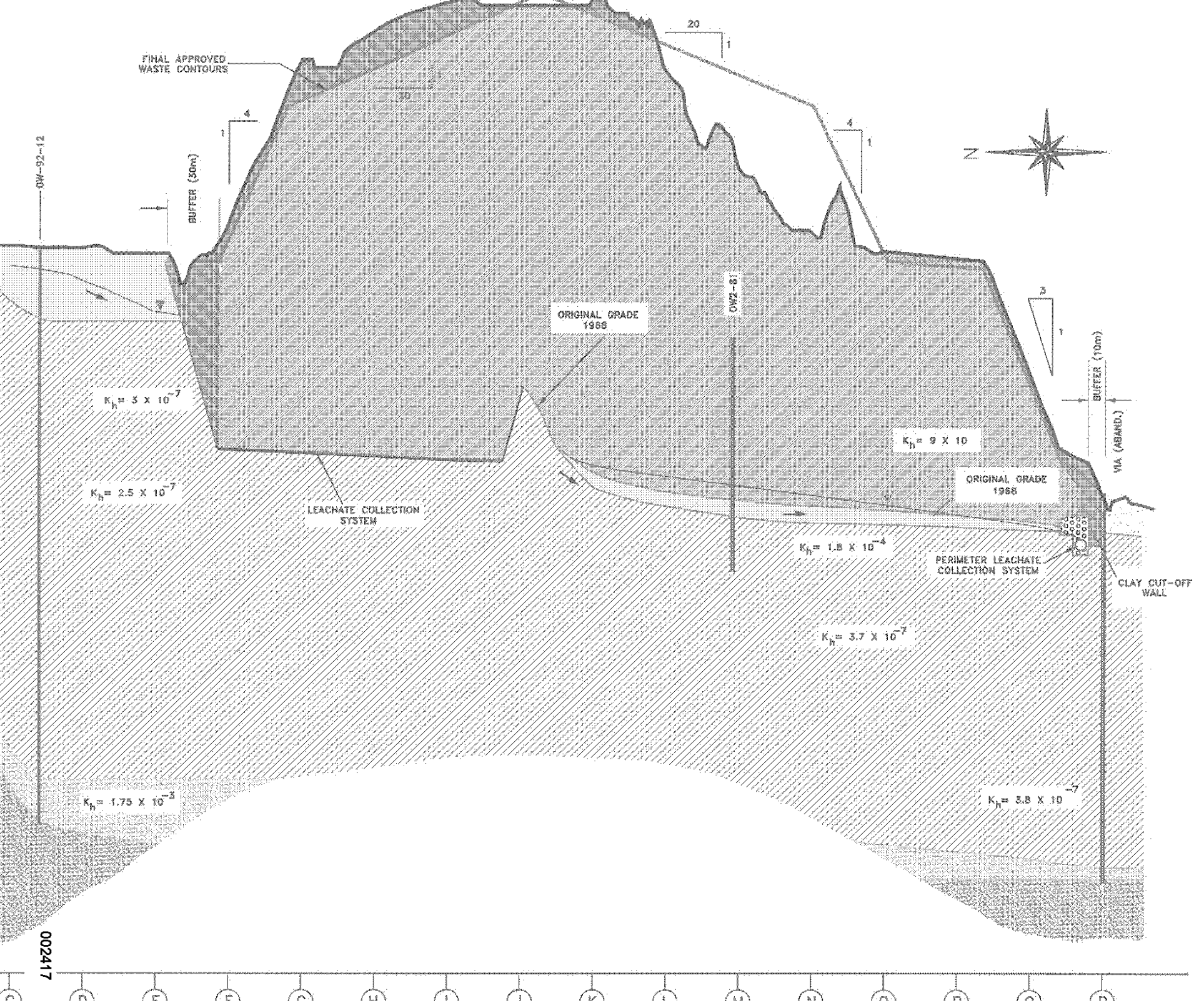
Fault (defined, approximate)

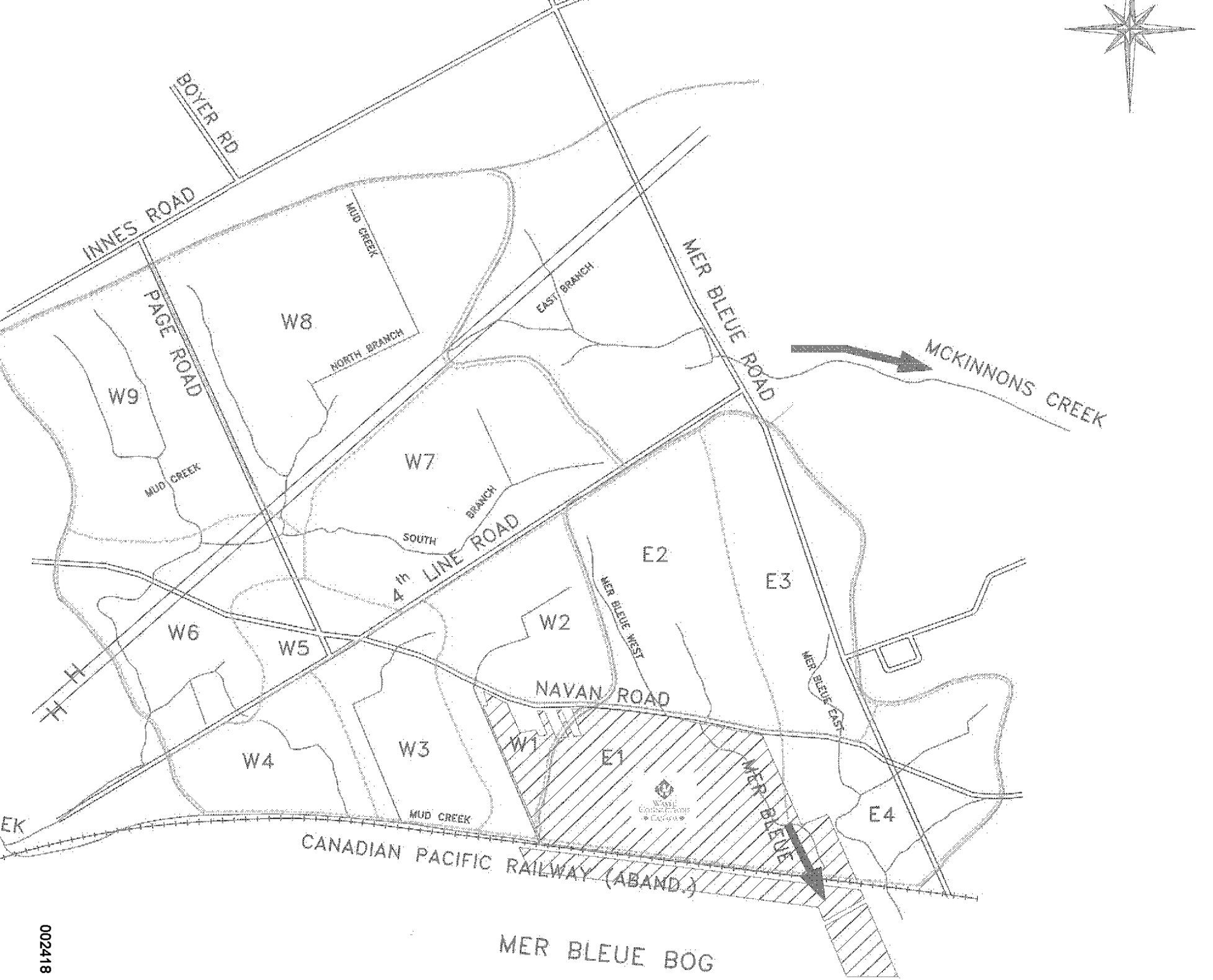
PROGRESSIVE WASTE SOLUTIONS LANDFILL SITE – 33

002415

MCKINNONS CREEK
ONTARIO HYDRO
R.O.W.
MER BLEUE ROAD
NAVAN ROAD
Renaud Road
VIA (Abandoned Railway)
MER BLEUE BOG
BOYER ROAD
PAGE ROAD
INNES ROAD
60
65
70
WATTS
CONSULTING
ENGINEERS
OTTAWA

002416


FINAL APPROVED WASTE CONTOURS
20
1
4
1
BUFFER (30m)
OW-92-12
ORIGINAL GRADE 1958
OW2-81
3
1
BUFFER (10m)
VIA. (ABAND.)
K_h= 3 X 10^{-7}
K_h= 2.5 X 10^{-7}
LEACHATE COLLECTION SYSTEM
K_h= 9 X 10
ORIGINAL GRADE 1958
K_h= 1.8 X 10^{-4}
PERIMETER LEACHATE COLLECTION SYSTEM
CLAY CUT-OFF WALL
K_h= 3.7 X 10^{-7}
K_h= 1.75 X 10^{-3}
K_h= 3.8 X 10^{-7}
002417


BOYER RD
INNES ROAD
PAGE ROAD
MUD CREEK
W8
NORTH BRANCH
EAST BRANCH
MER BLEUE ROAD
MCKINNONS CREEK
W9
MUD CREEK
W7
SOUTH BRANCH
4th LINE ROAD
E2
E3
MER BLEUE WEST
MER BLEUE EAST
W6
W5
W2
NAVAN ROAD
W1
E1
W4
W3
MUD CREEK
MER BLEUE
E4
CANADIAN PACIFIC RAILWAY (ABAND.)
MER BLEUE BOG

002418

3. OPERATIONS - 2021

3.1 *Description of Operations*

The Navan Waste Recycling and Disposal Facility has evolved over the years from being simply a disposal site into an integrated waste management facility with increased focus on re-use and recycling.

Prior to 1981, landfilling was carried out by end-dumping over an existing east-west oriented ridge with minimal base preparation. Following an ownership change in 1981, the site was operated using an area method with waste being placed in the southern half of the landfill (i.e., below the escarpment). As-built survey information collected during the construction of the perimeter leachate collection system indicated the base elevation of the waste varied between 68 and 70 m ASL below the escarpment along the perimeter of the waste footprint. The landfill expansion approvals received in 2009 added 3,600,000 m^3 of air space bringing the total estimated waste capacity for the site to 7.6 million m^3, which included the previously approved capacity of 4 million m^3.

Prior to expansion, cell development in the north central part of the landfill footprint (Phases 4&5 on Drawing 2.4) consisted of stripping topsoil and excavating native sand and clay soils to the required elevations for the construction of a leachate collection system. These base grades varied from 69.5 m ASL at the low point of the system along the east edge of Phase 8 at Grid Point M-16 to approximately 73.2 m ASL at the high point of the system in the N-W corner of Phase 4 at Grid Point F-7. The base grades were sloped downward at 0.5% draining in a south-easterly direction to the S-E corner of the cell (Grid Point M-16). The cell construction maintained gravity flow of leachate to the pump station located southeast of the waste footprint (Grid Q/R-16) entering the pump station at about elevation 67 m. Construction of the east cell expansion (Phase 1) was completed in 2015 with a leachate collection system overlying a clay floor ranging in elevation from 70.1 m to 72.1 m. Construction of the east cell expansion (Phase 6) was completed in 2019. Both cells in Phase 1 and Phase 6 drain to a pump station near Grid J/K-17. The design of the leachate collection system is summarized in Section 6.3.

The landfill will continue to be developed until the upper approved final waste contours are achieved. Figure 3.1 presents the current approved top of waste grades. The final cover, which at a minimum will have a 1.0 m thickness, will be superimposed on top of the final grades. Generally, an interim clay cover is constructed immediately upon reaching the approved fill heights in an effort to reduce water infiltration and the volume of leachate generated at the site. Clay cover has been placed in areas such as the north, west, south and southeast slopes and the top of waste where final waste grades have been reached in the area of Phase 3 and the north half of Phase 4.

Active landfilling continued from January through December of 2021 in the Phase 6 east cell area. Significant activities and capital works undertaken between January 1st and December 31st, 2021 included the following:

1. Active landfilling in the east cell (Phase 6);
2. Excavation of clay cover in the N-E quadrant of Phase 8;
3. On-going recycling operations at the facility;
4. Treatment of hydrocarbon contaminated soils in the material processing area of the site;
5. Screening of coarse granular soils to separate rock from soil for re-use;
6. Continued pre-treatment of collected leachate and disposal to ROPEC for off-site treatment;
7. Retained Dillon Consulting Limited to complete the reporting requirements under the National Pollutants Release Inventory (NPRI) for the 2020 calendar year; to assess the Greenhouse Gas Reduction Reporting as required under Ontario Regulation 347; to determine the reporting requirements under Ontario Regulation 390/18 – Greenhouse Gas Emissions Reporting and the Federal Government Greenhouse Gas Reporting Program;
8. Retained Golder Associates to carry out surface water, groundwater, leachate, gas and noise monitoring and reporting programs;
9. Added clay cover to completed fill areas of the landfill;
10. Constructed a new perimeter access road on the east side of the waste footprint;
11. Retained Base Mapping Ltd. to undertake aerial photography and produce an updated topographic map of the site;
12. Retained Les Entreprises Forlam Inc. to construct the perimeter 300mm diameter landfill gas collection pipe line along the north, west and south limits of the waste footprint;
13. Retained Farrell & Sons to construct the concrete pads for the enclosed landfill gas flare and abstraction plant; and
14. Retained Perennial Energy, LLC to manufacture, assemble, package, check, test, and deliver a Landfill Gas Extraction Plant and Enclosed Flaring System.

A brief description of the major activities and capital works follows.

3.1.1 Active Landfilling

From January through to the end of December of 2021, active landfilling was carried out in the east cell in Phase 6. Operations in this area focused on constructing an access road and a receiving pad for haul trucks and placing lifts over the drainage layer. Construction of the east buffer wall against which waste could be

placed was achieved with the use of treated soils placed along the east waste limit in Phase 6. Access to the active fill area was provided by a north-south access road along the west edge of the cell area running along the east side of grid line 14 then turning east at Grid Line J and into the cell then exiting at the N-W corner of Phase 6 near Grid Point E-15.

3.1.2 Cell Development

On-going cell wall construction of the east cell defined as Phase 6 was carried out concurrently as other landfilling operations progressed. Excavated clay from the N-E quadrant of Phase 8 was used to construct the cell walls along Grid Line D from Grid Lines 16-19 and along Grid Line 19 from Grid Lines D-G. Construction of the leachate collection system on the constructed sloped walls of the cell was completed by WCC personnel.

3.1.3 Processing (recycling)

Recycling operations continued throughout 2021 making use of an excavator equipped with a grappler and magnet for the removal of metals, wood and bulky items from the waste stream received at the active face. Wood and metals recovered were moved to a recycling area located on site within the waste footprint where metals and wood are stored for further processing and/or bulk removal. A resident mobile wood grinder is used on site to reduce the wood into chips suitable for use as bio-fuel at a local mill or re-used at a local organic waste composting facility. A Duratech EJ100 Wood Grinder was used for the grinding of recycled wood into wood chips. On occasion a wood grinding contractor was retained to assist with wood grinding operations. A refrigerant recovery program established at the site continued to assist clients wanting to properly dispose of their appliances containing refrigerants. Materials such as brick, concrete, rubble, clean roofing shingles and asphalt continued to be separated for beneficial re-use in the construction of access roads, turn areas at the active face and storage pads. Other materials recycled and/or re-used at the site consist of cardboard, drywall, glass, tires, electronic waste, batteries and propane cylinders found within the waste. Further details on recycling and material volumes are provided in Section 9.

3.1.4 Contaminated Soil Treatment

The treatment of hydrocarbon contaminated soils was on-going throughout 2021 in the soil processing area of the landfill along Grid Line O between Grid Lines 9 and 13 (refer to Dwg 2.4). A total of 38,593 tonnes of hydrocarbon impacted soils meeting the target parameters were received at the treatment area and re-used as a construction fill material in the east buffer along Grid Line 19 between Grid Lines D and P in accordance with ECA conditions for the site. A total of 30,769 tonnes of impacted soils were re-used as construction material within the waste footprint of the landfill.

3.1.5 Soil Screening Plant

A METSO rock screening plant was used for the screening of rock and rubble greater than 50 mm. This plant separates materials 150 – 600 mm and 50 – 150 mm. The rock was re-used as general fill and as construction materials such as rip-rap for drainage chutes and erosion control. Material finer than 50 mm was landfilled or re-used as cover material. A total of 26,484 tonnes of rock was re-directed from landfill airspace.

3.1.6 Leachate Management

Leachate generated by the landfill continued to be collected through a leachate collection system and directed to an on-site leachate pre-treatment/pumping station. In 2021, a total of 88,591 m^3 of leachate was pre-treated and pumped via force main to the City of Ottawa sewer system for final treatment at the Robert. O. Pickard Environmental Centre (ROPEC), the City of Ottawa wastewater treatment plant. The forcemain conducting leachate to the sewer system was flushed and cleaned twice in 2021. No operational problems with the leachate discharge operations at the landfill were reported for 2021.

3.1.7 Stormwater Management

Stormwater and snow melt water at the site is managed to direct surface runoff to the east and west watersheds using a series of natural and constructed ditches, swales, chutes, culverts and stormwater ponds. In 2019, a 237 m long culvert was constructed at the north and northeast corner of the cell in Phase 6. The culvert consists of a 900 mm diameter corrugated smooth interior HDPE pipe joined with bell and spigot c/w gasket and pre-fabricated concrete headwalls at both ends. A sediment trap was also constructed in front of the inlet structure. Construction of the north and north-east clay walls over the culvert in the Phase 6 cell was completed in 2020 and vertical extension of the clay wall continued in 2021.

3.1.8 Landfill Gas Monitoring

Monitoring of methane gas at the landfill site was performed by Golder Associates Ltd. on three separate occasions in 2021. Results of the monitoring programs and interpretation of the data are presented in Section 8 and Appendix '2' of this report. Construction of the candlestick flaring system for the Interim Odour Control System designed by Golder and approved by the MECP was completed in late 2011. In early 2012 the flaring system was commissioned and approved by the Technical Standards and Safety Authority (TSSA) and has since been in continuous operation.

In 2014, the landfill gas collection system was expanded to collect gas from the central manhole and from horizontal wells constructed at the top of the Phase 3 area in efforts to mitigate fugitive emissions from these areas. In 2016, additions to the gas collection system were required and five horizontal collectors were constructed. In 2017, seven vertical wells and one horizontal well were added. In 2019, four additional vertical wells were constructed in Phase 4. In 2020, one horizontal well was added at the north-west corner

of Phase 1. In 2021, the 300 mm diameter landfill gas collection pipe line for the permanent landfill gas collection and flaring system was constructed along the north, west and south limits of the waste footprint.

Dillon Consulting Limited was retained to complete the previous year (2020) reporting requirements under the National Pollutants Release Inventory (NPRI); to assess the Greenhouse Gas Reduction Reporting as required under Ontario Regulation 347; to determine the reporting requirements under Ontario Regulation 390/18 – Greenhouse Gas Emissions Reporting and the Federal Government Greenhouse Gas Reporting Program.

3.1.9 Noise Monitoring

Monitoring of noise levels at the WCC Navan Facility was performed by Golder Associates Ltd. at two points of reception (POR) for the period of November 1st to November 9th, 2021. Monitoring results are presented in a Technical Memorandum provided in Appendix 3. The noise levels at the two PORs are reported to be dominated by road traffic noise along Navan Road with audible noise from landfill operations of the WCC Navan Facility. The measured average hourly noise levels were equal to 48 dBA and 57 dBA at Monitoring Location 1 and Monitoring Location 2, respectively. The noise level at Monitoring Location 1 was below the applicable MECP Landfill Guidelines for landfilling operations noise limit, whereas at Monitoring Location 2 the average cumulative (i.e. ambient plus landfill) hourly noise level was 2 dB above the noise limit. Monitoring Location 2 is located on landfill property in close proximity to landfill activity. The nearest off site noise POR is some 100 m to the N-E of Monitoring Location 2 on the other side of the busy Navan Road. It is expected that the off-site noise POR would be lower due to increased distance and Navan Road traffic noise sources between the POR and landfill activities. Therefore, the Facility is expected to be able to operate within the compliance with the relevant noise limits based on the results of 2021 noise monitoring. It should be noted that the Facility is not a source of noise complaint from area residents.

3.1.10 Surface Water, Groundwater and Leachate Monitoring

Water quality monitoring programs are carried out twice annually for groundwater, and three times per year for surface water and leachate by Golder Associates Ltd. Surface water quality monitoring events were carried out on May 27th, August 24th, and November 24th of 2021. Leachate was also sampled by Golder at the pump station on May 27th, August 24th, and November 24th 2021. Groundwater quality monitoring was carried out in May and November 2021. Groundwater monitoring wells further in the Mer Bleue Bog were sampled in August of 2021 as frozen well conditions prevent winter sampling. Additional monitoring of surface water, groundwater and sediments requested by the National Capital Commission (NCC) in early 2000 was continued. Results of the monitoring programs and interpretation of the data reported by Golder Associates Ltd. are presented in Appendix '1' of this report and discussed in Section 7.

3.1.11 Closure

Closure consisting of placing clay fill material of at least 1.0m in thickness was continued where final waste grades were reached in the area of Phases 1 and 4. These areas are also used for staging excavated wet clay for drying and re-use purposes. Placing of topsoil and seeding will be carried out in these areas at a later date.

3.1.12 Aerial Photography

Base Mapping Co. Ltd. of Ottawa was again retained to undertake aerial photography of the Navan Waste Recycling and Disposal Facility. Digitized topographic maps of the site with 0.5 metre contour intervals were obtained for May 1st, 2021. The 2021 topography with 2 metre contour intervals is shown on most drawings. To date, a total of 221,100 m^2 of the waste footprint has received clay cover as shown of Figure 3.2.

3.2 *Daily Site Operations*

The site continues to be operated in accordance with the approved Design and Operations report (Golder, 2008) and the amended Certificate of Approval. Daily site operations are described in the following sub-sections.

3.2.1 Access

The site is well serviced by Regional Roads, being located on Regional Road 28, locally known as Navan Road (refer to Figure 1.1). Most of the traffic at the site is generated by commercial vehicles which access the site via Innes Road (Regional Road 30) and Navan Road. The Tenth Line Road (Regional Road 47) and Milton Road (Regional Road 31) also provide access from East Ottawa (Cumberland Township).

Access to the site is provided by one entrance located off Navan Road. The gate is kept locked after hours to restrict access. The access road is paved between Navan Road and a distance past the scale house and wheel wash station (Grid Lines C-15). A well-maintained all-weather road provides access to the designated unloading areas. Other access roads are provided throughout the site allowing access to water management systems, material stockpiles, site facilities and equipment storage areas (refer to the Site Features Plan - Figure 2.4).

3.2.2 Hours of Operation

Approved hours of operation for the receipt of waste are from 7:00 am to 6:00 pm Monday through Saturday, inclusive, however the site generally closes at 5:00 pm on week days and 1:00 pm on Saturdays and statutory holidays. The site does not receive waste prior to 7:00 am or after 6:00 pm on these days. Waste acceptance outside of these hours requires the approval of the MECP District Manager. Operating hours may vary within the approved hours. On occasion and as required, Landfill excavation and equipment/site maintenance may occur outside these hours.

The site is secured after operating hours and includes sporadic security patrols by a security services contractor. No scavenging is permitted at the site.

3.2.3 Site Staffing

WCC routinely reviews and monitors its staffing needs for the site and adjusts the staffing level accordingly. Currently 23 fulltime equivalent employees (FTE) are employed locally at the site including management, sales, administrative, clerical, and operations personnel. University and/or college students are also retained to assist with general landfill task and fulfil the work requirements of their co-op program.

The number of employees at the landfill site is variable from time to time and is based on the workload which can be seasonal and personnel turnover. Throughout the year, part time personnel or contractors are hired to perform general tasks such as grass cutting, general site clean-up, minor site maintenance work, surveying, traffic control, etc. Personnel from other WCC districts are also called upon from time to time to assist with landfill operations. When required, contractors are also hired for task specific work such as maintenance, security and landscaping.

3.2.4 Equipment

The following equipment was in use at the landfill site in 2021:

1) 1- 826G & 1- 826H CATERPILLAR WASTE COMPACTOR
   - levelling; compaction; grading of waste

2) D7R CATERPILLAR BULLDOZER (C/W LANDFILL PKG)
   - levelling; placing; grading of waste

3) D6N LGP CATERPILLAR BULLDOZER
   - Levelling; compaction; grading; earth works

4) D6T XW & D6T LGP CATERPILLAR BULLDOZER
   - Levelling; compaction; grading; earth works

5) Volvo EC340DL EXCAVATOR
   - excavating; levelling; ditching; grading; soil movement; berm construction

6) CAT 330 WH EXCAVATOR C/W GRAPPLER
   - recycling; excavating; levelling; ditching; grading; soil movement; berm construction; processing; box scrape outs

7) Volvo EC220 EL EXCAVATOR C/W GRAPPLER AND MAGNET
   - recycling; excavating; levelling; ditching; grading; soil movement; berm construction; processing; box scrape outs

8) JOHN DEERE 310J BACKHOE (C/W ATTACHMENTS)
   - excavating; recycling; levelling; ditching; grading; snow removal; box scrape outs

9) CAT 420F BACKHOE (C/W ATTACHMENTS)
   - excavating; levelling; ditching; grading; snow removal; box scrape outs; tree planting

10) 1 – 730 CAT ARTICULATED TRUCK
- 6-wheel drive truck / earthworks; daily cover

11) 2 - A25E VOLVO ARTICULATED TRUCK
- 6-wheel drive truck / earthworks; daily cover

12) 1 - CAT 950H LOADER
- material loading; snow removal; processing; road maintenance

13) 1 - CAT 950M LOADER
- material loading; snow removal; processing; road maintenance

14) DURATECH EJ100 WOOD GRINDER
- wood and drywall grinding

15) 2- MACK ROLL-OFF TRUCK
- on-site container management; dust control

16) PICK-UP TRUCKS AND ALL-TERRAIN VEHICLES
- site access; road sweeping; snow removal; magnetic sweeps; salting

17) 1 TON DUMP TRUCK (c/w SNOW PLOUGH)
- For general use and snow removal both on-site and off-site

18) 3-35 HP LEACHATE PUMPS
- available throughout the year for leachate management

19) 2- 100 MM GORMAN RUPP PUMPS AND ADDITIONAL GENERAL PURPOSE PUMPS
- available for the handling of leachate and surface water

20) TANKER 22.7 m^3 (5,000 GAL.)
- On-site water needs (dust control; clean roadways; flush leachate MHs etc.)

21) 100 KW GENERATOR, 40 KW GENERATOR AND 20KW GENERATOR
- Power supply for the candlestick flare
- Power supply for the odour misting system
- Pump Station backup power supply.

22) KUBOTA UTILITY VEHICLE
- Equipped with snow blowing and lawn mowing equipment.

23) ARGO UTILITY VEHICLE C/W TRACKS
- All terrain vehicle.

24) LIGHT TOWERS
- Landfill and recycling area lighting and power supply for equipment.

25) METSO SCREENING PLANT
- Screening of oversize materials from soil and rubble.

Vehicles are equipped with 2-way radio equipment along with hand held portable 2-way radios utilized for on-site communication between equipment operators, supervisors, spotter, weigh scale attendants, maintenance personnel and site office.

The size and type of equipment available on site handles the every day and long-term operation of this engineered facility. Additional equipment is brought on site as required to supplement or replace the WCC heavy equipment during repair programs or for special projects.

3.2.5 Equipment Maintenance

A maintenance building completed in 2009 is used for equipment repairs and storage of parts, tools and supplies. A comprehensive preventative maintenance program is in place and equipment maintenance is fully documented. A maintenance schedule is followed in a strict manner. WCC's own staff mechanics perform all lubrication and oil changes as well as most vehicle repairs. Qualified equipment dealers perform major repairs and warranty work when required. A daily pre-trip and post-trip inspection of all equipment in use is performed by equipment operators.

All machinery is equipped with fire suppressant and first aid equipment. First-aid stations are located at various locations on site.

On-site personnel are able to perform routine maintenance on all machinery and employees are trained to operate and maintain different pieces of equipment. A daily, weekly and monthly equipment inspection is carried out and documented for each piece of equipment. Daily records of fuel, lubrication consumption, and hours of operation are maintained.

3.2.6 Scale House and Small Vehicle Pad

Two full-time employees operate the scale house. Two 100 tonne Rice Lake scales installed in early 2009 are in operation to reduce traffic congestion on Navan Road. All vehicles are weighed upon entering and leaving the landfill. Drivers must exit their vehicle and sign the weigh bill at the scale house. The scale clerk records the name of the client, the origin of the waste (customer), the type of waste, driver identification, truck identification and notes using a grid system where the waste was placed within the landfill. All records from these transactions are maintained at the site office and recorded in WCC's computer records.

The scale clerk has contact with the site office, spotter and equipment operators at all times. The site cannot be opened unless the scale clerk and an operator/spotter are present. Rejected loads of waste are recorded and reported to the MECP and a record is kept on site.

A small vehicle unloading area was built southeast of the weigh scales to service small vehicles and promote recycling. The paved area is maintained and kept clean at all times. Concrete bunkers were added in 2012 west of the small vehicle pad to add capacity for small loads of aggregate, shingles, asphalt, metals, wood

and recyclable windshield glass. These bunkers are also used to accommodate small waste vehicles preventing them from entering the landfill where commercial and heavy equipment activity is occurring.

3.2.7 Site Office

Management and administrative staff work in an office/maintenance building constructed in 2009 located north of the landfill near the Navan Road site entrance. The site office is open Monday to Friday during working hours of the landfill. All records are maintained at the site office. The site office is equipped with several computers to maintain landfill records, employee information and site operation manuals. Areas of active landfilling are recorded daily and referenced to a grid system. The daily operation of the landfill is carried out from this office.

3.2.8 House Keeping and Controls

(a) Site safety

All employees have been instructed in safety procedures and a Joint Occupational Health and Safety Committee meets monthly to discuss health and safety issues at the site. Managers have been tasked as Site Safety Leaders dedicating time to safety related programs, training and safety awareness. On-site employees have completed waste handling safety courses, GHS training (Global Harmonized System of Classification and Labelling of Chemicals), confined space entry, and CPR & basic first aid training courses. On-site first-aid stations are available on the equipment, maintenance facility, scale house, pump station and site office. On-site communication allows for quick response. Emergency spill kits are available at the maintenance garage and site office. All workers have been provided with personal protective equipment (PPE) and must wear hard hats, safety boots, reflective clothing and safety glasses. All vehicles have back-up alarms. A spotter directs all traffic and machinery at the working face of the landfill.

Employees have been instructed in the handling of special materials, in particular impacted soils and asbestos, a designated waste. All employees and haulers follow a documented protocol for the handling of these materials. In brief, the procedure is as follows:

No hauler is allowed to enter the site with these materials without prior approval. All haulers of these materials must give advance warning of their coming to the site. A time slot is then assigned for receipt of the material. A designated spot for the placement of the materials is prepared. Asbestos waste is landfilled and covered without any equipment coming into contact with the waste. Disposable safety coveralls, head covers and respirators are also available on site for the handling of special wastes.

Employees have been instructed as to the types of waste allowed and materials not allowed to be received at the site. All containers must be open and void of any liquid material before they can enter the site. Closed containers are refused. Waste that is inadvertently dumped at the site is either placed back in the hauler vehicle or stored in one of WCC's boxes for later removal. Hauled materials are inspected for any banned waste and the above procedure followed. Materials rejected from the landfill are reported to the MECP district office. Records of rejected waste and materials removed from the site are kept at the landfill site office.

(b) Scavenging control

No scavenging is permitted at the site. The spotter and equipment operators working at the active face strictly enforce this. On-site personnel carry out recycling of wood, metals and white goods in a controlled and manageable manner at the active face using heavy equipment specially equipped with a grappler and magnet. A small vehicle receiving pad is provided where waste from small vehicles can be received safely and materials can be sorted for recycling by the vehicle operator. Concrete bunkers were added to this area to further assist with the recycling of materials such as asphalt, aggregates, shingles, wood, metals and windshield glass. A program for the recovery of refrigerants is available and this service continued throughout 2021.

(c) Litter control

Litter has not been a problem at the Navan Waste Recycling and Disposal Facility because of the use of daily cover. Periodic checks are made of the finished and active areas of the site for litter. Litter fencing is maintained at the active working face and temporary fencing is maintained in areas of the landfill perimeter as a supplementary litter control measure. Fencing is cleaned of litter as required. At least twice each year WCC personnel collect litter accumulated in the ditches along Navan Road for a distance of 1 km to the east and west of the site entrance. No complaints related to litter were received in 2021.

(d) Vector and vermin control

The presence of vermin and vectors is not a problem at the site primarily due to the dry, non-putrescible nature of the waste stream. Periodic checks have proven that no problems with vermin exist at the site due to proper landfilling procedures. If vermin are detected at the site, a registered pest control company is retained to control the problem. Although some seagulls and crows do frequent the site in summer months, this is not considered a health or environmental problem because of the small numbers present. A bird scare permit has been obtained from the Ministry of Natural Resources. When required, pellet whistlers are shot into the air to control birds during business hours. Abell Pest Control was hired in 2018 to set up bait control stations at various locations throughout the landfill to monitor activity on site and continued their work throughout 2021. No complaints were received in 2021.

(e) Dust management plan

The landfill has the potential to generate fugitive dust emissions. Fugitive dust sources have been assessed in accordance with MECP guidelines. In order to minimize the potential for off-property impacts due to fugitive dust, the following practices are implemented at the site:

- Aggregate (e.g., gravel, crushed limestone) is spread over unpaved roads to reduce silt loading. Repeat applications of aggregate are done on an as-needed basis, dependent on the condition of the roads.
- Watering of unpaved roads is carried out to increase the moisture content of the surface material and reduce the potential for fugitive dust generation. Dust suppressants (e.g., calcium chloride,

wood chips) are also used, depending on the ability of watering to appropriately control dust. The frequency of application of water or dust suppressants to roadways is adjusted based on road conditions, weather conditions and traffic loadings. In 2021, watering of access roads for dust suppressant with the use of an on-site water truck was carried out on 142 separate occasions throughout the dry weather months. The company also owns a backhoe equipped with a road brush for sweeping asphalted surfaces. In addition to the use of on-site equipment, mud and dirt was removed from Navan Road and on-site paved roads by a subcontractor retained to vacuum sweep/flush paved surfaces on 9 separate occasions.

- A speed limit of 15 km/h is enforced while vehicles are traveling on unpaved roads. This limit is posted on site and communicated to users of the unpaved roads.
- Where possible, travel distances to material transfers and drop points are kept as short as practical to reduce dust generation.
- A wheel wash station was constructed in 2009 east of the weigh scales and scale house to wash vehicles exiting the landfill and to reduce mud drag-out onto Navan Road. The wheel wash station is operational during the non-freezing months of the year.

The site maintains a log to record the date and time of any fugitive dust complaints and a summary is provided in Appendix '4' – Schedule 'A'. This log also describes activities related to the investigation of the complaint and also records the mitigative measures implemented to address concerns raised. In 2021, WCC received no complaints related to dust or dirty roads.

(f) Noise control

The active face of the landfill operation is sufficiently set back from Navan Road to minimize disturbance resulting from noise. Berms and soil stockpiles are located between active fill areas and nearby homes and offices to act as a sound barrier. Landscaped berms have been constructed along Navan Road east and west of the site access as well as east of the wheel wash station. No complaints related to noise were received in 2021. Noise monitoring was carried out by Golder Associates Ltd. and results are presented in Appendix 3. The results and site observations indicate that elevated background noise levels exist at surrounding receptors due to road traffic noise along Navan Road including landfill activities. Based on these results, the operations of the Navan Landfill are considered to be in compliance with the MECP's Landfill Guideline and NPC-205.

(g) Aesthetic controls

Landscaped berms have been constructed along Navan Road and a tree planting program is in place to improve site aesthetics. Each year efforts are made to further improve site aesthetics. A fish habitat ditch was completed along the east limit of the site complete with vegetation, landscaping and other ditch features. In addition to drainage, the ditch also provides an aesthetic barrier to the landfill.

(h) Fire control

Fire control is maintained by the supervision of all staff including the scale staff, the spotter and equipment operators. A number of non-smoking signs have been erected throughout the site that warns users of the

danger of fire in the landfill. Personnel have been instructed on the procedures of handling a landfill fire. The use of the landfill compactor and soil as cover material does not allow a fire to persist. The excavator, compactor, loader and the dozers are available to isolate a fire. Spare cover material, available at the working face, will be used in conjunction with the landfill compactor to smother a fire. The proximity of the Ottawa Fire Department at Blackburn Hamlet (less than 5 kilometres) will allow any superficial fire to be put out in a timely manner. On-site security and the presence of employees who live adjacent to the site will allow for quick action in the event of fire after hours. All machinery is equipped with proper fire extinguishers.

(i) Odour Control (Odour Management Plan)

To ensure the WCC Navan Facility is operated in a manner that minimizes the impact from odour on the public and the natural environment, the following program is in place at the WCC Navan Facility to deal with odour issues.

(1) Odour Monitoring

WCC has a comprehensive program for monitoring odours and for taking remedial action in the event that odours become at all problematic in the operation of the WCC Navan Facility. Any unusual odour events and any measures taken to deal with odour at the site are recorded and filed on-site.

There are no Ontario Government standards for odour. There are no agreed-upon, empirical measurement protocols or odour thresholds that may be used in the operation of a landfill or processing facility. Consequently, the ultimate test of an effective odour-control strategy for any facility can only be that it produces no odour complaints from the surrounding community over an extended period of operation. The operators of the facility need to take preventative and other control measures to ensure that odours never reach a threshold where they can generate complaints. The best odour monitoring program available is to give responsibility to all staff working at the site to use their own senses to constantly monitor for excessive levels of odour on-site. While some level of on site odour is normal and acceptable, it can become a problem when these same odours register off the property. As well, the character of the odour is significant. Many 'aerobic' odours may be very inoffensive, even at a significant concentration, while even very low levels of the types of odour associated with anaerobic activity may be deeply offensive.

It is normal practice at the site to monitor odours in the following way. Every morning, when staff first arrives on the site, a general inspection is undertaken of the facility. While the site manager is looking for anything untoward, the presence of any odours likely to extend beyond the perimeter of the site will be of special concern. In addition, whenever any material at the site is being disturbed by the equipment used at the facility, staff on site periodically stand downwind of the work that is being done, and assure themselves that any odours being created are mild, indicative of fully aerobic activity, and are not likely to be carried off the property.

In the event staff on-site believes any odours may have some potential for off-site impact, they will drive to a location off-site and downwind from the work at the facility to determine at that moment if any off-site impact can be detected. If there is a detectable off-site impact, work on the site will be stopped immediately and remedial measures will be taken (see below). If no off-site impacts are detectable, work

at the site will proceed with caution, with further periodic inspections off-site. Remedial measures will again be taken as appropriate.

The key to this approach is that all staff is constantly vigilant for even mild odours produced on-site and will take actions to deal with those odours well before they become evident off-site.

A windsock and flag is installed on the site. This provides a strong visual reminder to site staff of existing wind conditions, such that they can make judgments as to the potential for off-site odours, given that day's planned activities.

No odour monitoring program is of much value unless there is a companion program to control those same odours, once they are detected. What follows is a stepped program, capable of dealing effectively with everything from the mildest odours to the most offensive. It should be noted that all of the measures described below can and are just as likely to be applied to only sections of a site, rather than to the entire site. The source of odour problems can commonly be quite localized.

(2) Prevention

The best odour control strategy is odour prevention. If experienced staff early in the process makes the correct, preventative decisions, odour will not be an issue. Although mild odours are experienced on-site from time to time, they are mild in nature and should not be noticeable off-site.

A perimeter drainage system put in place by WCC has been excavated through the sand deposit into the underlying clay and extends below the water table. This drainage system has significantly reduced, if not eliminated, the potential for off-site migration of LFG.

Monitoring of methane gas at the landfill site is performed on three occasions per year generally during the spring, summer and late fall or winter. Results of the monitoring programs and interpretation of the data are presented in Section 8 of this report.

A leachate pumping station has been constructed in the southeast corner of the landfill site and a forcemain connection to the municipal sewage treatment plant commenced in 2007. Presently, the disposal method of choice for leachate generated by the WCC Navan Facility is treatment at the Robert O. Pickard Environmental Centre, a waste water treatment plant. The use of leachate retention ponds has been discontinued. This eliminates the possibility of odours emanating from on-site treatment and leachate retention ponds.

As discussed an interim LFG odour control system was installed in 2011 and commissioned in April 2012. The purpose of the interim LFG odour control system is to control potential odorous emissions from the site until the full-scale LFG collection system is installed at the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells as well as a series of horizontal extraction wells.

(3) Masking the Odour

Principally, these additional measures will consist of using physical, biological and/or chemical methods to mask the odours on the surface of the odour source, so that none of the odours contained within are

released to the environment. A number of proven masking techniques are available and can be used at the discretion of the site manager:

- Physically covering the surface of the odour source with a 15 centimetre layer of bulking material is often enough to block the release of most odours for a period of a day or more while remedial work is done;

- A number of biological inoculants are available commercially. These substances, when applied to the surface in a water solution, are felt to effectively reinforce aggressive aerobic activity on the surface by out competing any anaerobic colonies that may be present in the near surface area. In effect, this creates a bio-filter, and biologically processes anaerobic gases as they are released; and/or

- A number of chemical/nutrient mixtures are also available commercially. These substances, when applied to the odour source in much the same manner used with the biological inoculants, can have a very similar or even stronger effect. Manufacturers of these products claim that their compounds rapidly stimulate the growth of one desirable family of microorganisms or another, again to create a bio-filter effect.

Whatever the actual mechanism, these products have been proven effective in the field. In all cases, odour control strategies used at this level can be applied within minutes of the decision to use them, and the effects will be largely felt within 10-15 minutes of that application, if not sooner.

(4) Isolating an Odour Source

The last strategy will consist of using additional measures to isolate and neutralize the offending odour source material. The offensive material may be removed from the problem area, landfilled and covered immediately. This isolation strategy will be used at the discretion of the site manager.

(j) Contingency for winter operations

The following contingency factors have been implemented in the event that very cold conditions cause operating problems:

- Snow removal equipment

A variety of equipment is available for snow removal. Two CAT 950 loaders are mainly used for this purpose. A John Deere and a CAT backhoe along with a one ton truck equipped with snow ploughing equipment are also used. A Kubota utility vehicle equipped with snow blowing equipment is available to assist with snow removal along walkways and vehicle restricted areas.

- Cover material stockpiles

Impacted soil reserved for re-use as daily cover material has been stockpiled in certain areas of the landfill. In case of frost, an excavator equipped with ripping tooth is available for ripping through the frost line. The excavator and 6-wheel drive articulated dump trucks are used to move and stockpile cover as a contingency.

(k) Complaints Procedure

In the event that an odour complaint is received, either by the City of Ottawa or the MECP, it is expected that those parties will immediately contact WCC site staff and notify them of the problem. WCC staff will take immediate steps to determine the extent of the problem and whether or not it is caused by the facility. If the source of the complaint is deemed to be originating from the WCC Navan Facility, appropriate measures as described above will be taken to mitigate the problem. Again, all such measures taken will be documented and a record kept on-site. If the identity of the complainant is made known to WCC staff, staff will contact the complainant that day, listen to their description of the problem, advise them in detail of the measures taken to rectify the problem, and invite them to visit the facility at some point to see for themselves how the site is operated. WCC will also call them back to determine whether or not they have been aware of any other site related issues.

WCC staff has found in the past that this kind of immediate and personal attention goes a long way to building community support for a facility and builds community confidence in the management of the site.

The site maintains a log to record the date and time of any complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. A summary of complaints received in 2021 is provided as Schedule 'A' in Appendix '4'. In 2021, WCC personnel received 1 odour related complaint. No other complaints were received by site personnel in 2021.

(l) Record Keeping

Record keeping is in accordance with the requirements of the ECA and as described in the D&O (Golder, 2008) as follows:

Site inspection records and daily waste records are retained at the site for a minimum period of two years. The records include the following information:

a. Type and estimated amount of waste received at the site for landfilling and processing;
b. Area of the site in which landfilling operations are taking place;
c. Type, source and amount of daily and intermediate cover used;
d. Waste types and quantities of recyclable wastes received at the site;
e. Source of their generation (e.g. customer);
f. Waste types and quantities of recyclable wastes transferred off the site;
g. Destination of recyclable wastes transferred off the site;
h. White goods tag numbers tagged at the site;
i. Types of wastes and quantity transferred from the processing area into the landfill area;
j. The calculated total quantity (including volume or weight) of waste remaining on-site at the end of each day;
k. Records of any dust suppression activities undertaken at the site;
l. Maintenance and repairs performed on the equipment used at the site;

m. Records of complaints received and actions taken to resolve them;
n. Summary of emergency situations and actions taken to address them; and
o. Any environmental and operational problems and any mitigative actions taken.

3.2.9 Waste Acceptance and Placement

The mechanics of waste placement at the active disposal face are described as follows:

1. Procedures are in place at the site to pre-screen all special waste materials prior to arrival at the site. Generators/haulers are required to provide information related to the type of waste to be delivered at the site and complete and submit a computer generated or hard copy Special Waste Approval Form which is screened prior to approval by WCC staff. Once approved, an Vehicle Code (VC) number is provided and must be presented at the scale prior to entry to the site.

2. The gate clerk registers all vehicles entering the site at the weigh scale. Vehicles are weighed and directed to the active disposal face. Light vehicles are diverted to an unloading area near the entrance to the site and do not enter the working area of the landfill. Appropriate signs are posted to indicate clearly where vehicles are to unload.

3. Vehicles reach the active face via a well-maintained gravel surfaced access road. On arrival, they wait until a ground worker screens the load and directs them to back into the active working face. The working face length is confined to as small an area as possible, but generally is wide enough so that 6 to 8 trucks can operate safely in the working face area at any one time. After dumping, the trucks move a distance of several metres from the active working face where they can be cleaned by the truck operator.

4. Waste is placed and compacted on the active working face using a "push down method" and/or a "push up method" to an average depth of approximately 60 cm.

5. A landfill D7 dozer is used to spread and level the waste as it is received. An 826 CAT compactor works on top of the refuse and compacts and shapes the waste into place. Between 3 and 5 passes with this equipment are made before the required density is obtained. Additional waste is spread evenly by repeated passes of the dozer and compactor to a total average lift depth of 2.5 to 3 metres.

6. Cover material is placed daily and as required. Generally, impacted soil hauled to the active face is used as cover material and spread into a minimum 15 cm thick layer. Areas not visited for an extended period of time are covered with a minimum of 25 cm of interim cover material.

7. All weigh tickets are kept on site along with daily and monthly summaries which are available for review. All rejected waste loads are reported to the Ministry of the Environment, Conservation and Parks (MECP) district office in Ottawa and a record of the report is kept on site.

8. Asbestos waste is landfilled in accordance with Section 17 of Ont. Reg. 347. These procedures consist of the following:

    a. Personnel involved in the disposal of asbestos are trained to recognize the related hazards.

b. Asbestos is accepted only in containers/bags and not in a loose form. Care is taken to ensure that staff and equipment do not come into contact with the asbestos.
c. Asbestos is accepted only with 24 hour pre-notification.
d. Personal protective equipment including disposable coveralls, head covers and respirators are available for the handling of special wastes.
e. Prior to the arrival of asbestos on-site, a trench is excavated to receive the material.
f. Other operations in the immediate vicinity of the trench are temporarily suspended while the containers are emptied in the trench.
g. The trench is immediately covered over with at least 1.25 metres of waste or cover soil.

9. Refrigerant containing appliances are received and handled in accordance with the following procedures:

a. When refrigerant containing appliances are identified in the waste load, the client will be notified and given the opportunity to reclaim the unit(s) and remove it from the site and a rejected waste form shall be completed by scale personnel if the unit is reclaimed for removal;

b. Should the client/driver not reclaim the refrigerant containing unit(s), scale personnel shall be notified immediately and the unit(s) shall be recorded on the weigh ticket and the unit(s) shall be removed by landfill or recycling personnel and taken to a designated area on the recycling pad taking all necessary precautions not to damage the refrigerant containing unit;

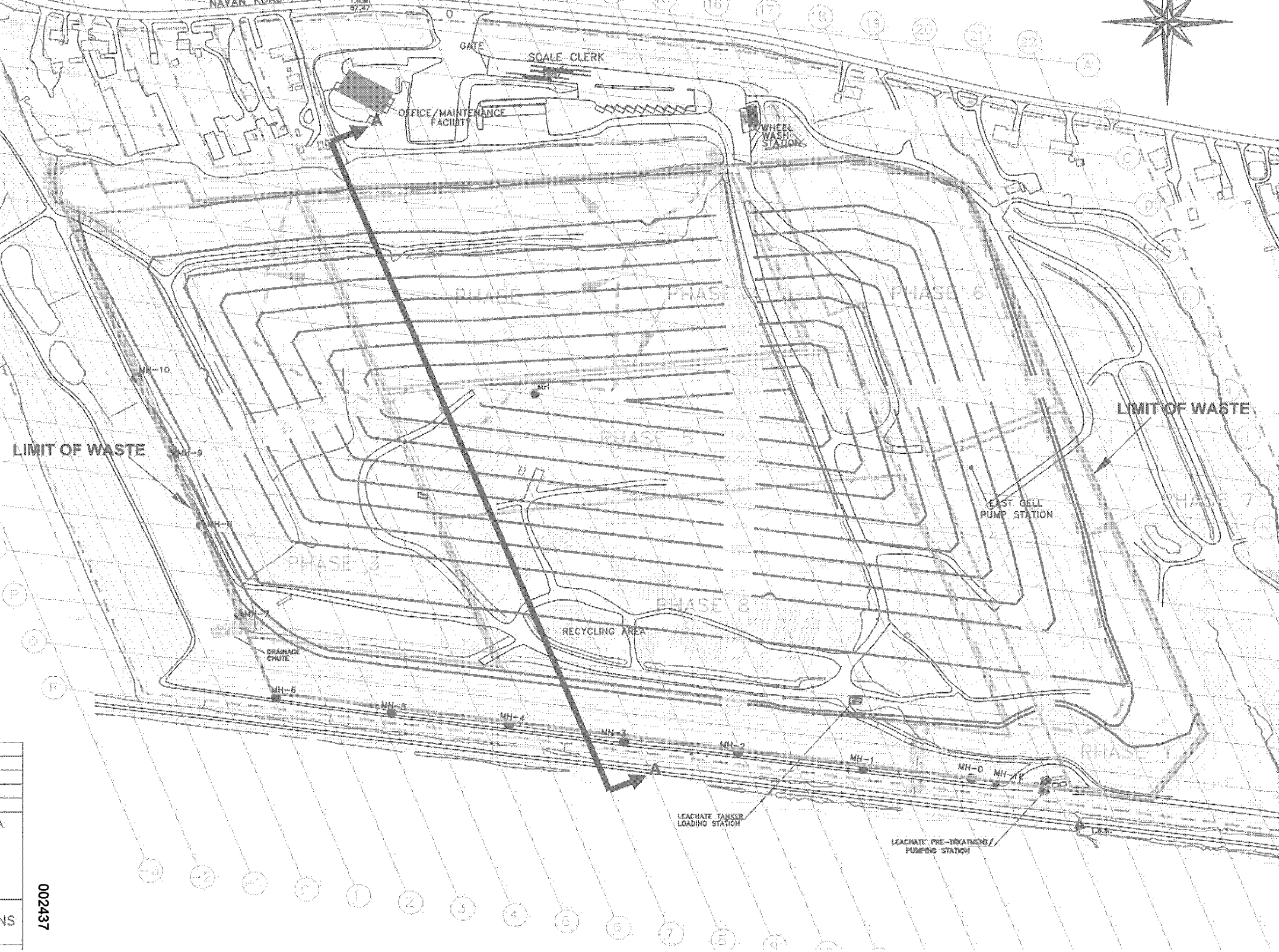
c. Every effort shall be taken by personnel to store the refrigerant containing unit in the designated area on the recycling pad in an orderly manner that is accessible to the refrigerant removal technician and in an up-right position or, if not possible due to damage, in a manner to prevent damage to the refrigerant containing unit.

d. Once a sufficient number of units have been stored for removal of refrigerants, or once quarterly, a certified technician shall be retained to safely remove all refrigerants and certify them as completed and a record of the certification shall be kept on file;

e. Once the unit has been certified it shall be available for removal as scrap metal;

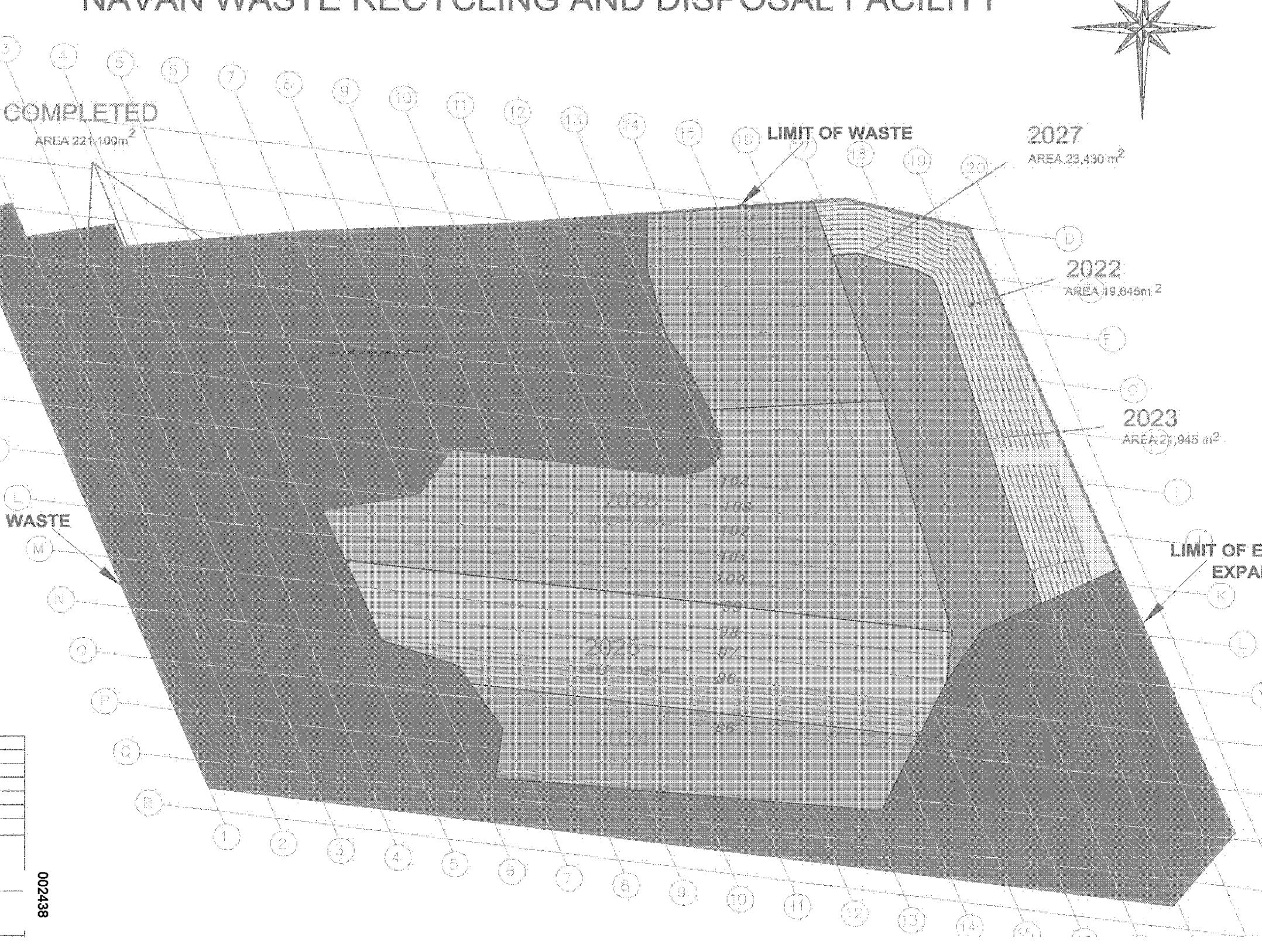
f. The procedures noted above shall apply for all units received at the site that do not contain a refrigerant removal certificate, including those claimed to no longer contain refrigerant materials.

No waste is accepted, deposited or removed from the site unless the site supervisory personnel is present.


GATE
SCALE CLERK
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
LIMIT OF WASTE
LIMIT OF WASTE
MH-10
MH-9
MH-8
MH-7
MH-6
MH-5
MH-4
MH-3
MH-2
MH-1
MH-0
MH
EAST CELL PUMP STATION
RECYCLING AREA
DRAINAGE CHUTE
LEACHATE TANKER LOADING STATION
LEACHATE PRE-TREATMENT PUMPING STATION
PHASE 5
PHASE 6
PHASE 7

002437

NAVAN WASTE RECYCLING AND DISPOSAL FACILITY



002438

4. WASTE QUANTITIES AND CHARACTERISTICS

Major private haulers as well as small haulers serving all segments of the Ottawa community, Eastern Ontario and the Outaouais are served by the Navan Waste Recycling and Disposal Facility. Materials processed at the site in 2021 consisted mainly of contaminated soils, construction and demolition waste, IC&I waste including asbestos waste as well as general dry waste and recyclable materials. Materials received at the site for re-use included brick, rubble and small concrete as aggregate, asphalt, granular materials and clean roofing shingles for road/pad construction material. Impacted non-hazardous soils were also received for re-use as cover material or treated for re-use outside the designated air space in accordance with approvals received for the site. Materials such as metals, wood, glass, drywall, cardboard, white goods, tires and electronics were also recycled and removed from the site.

All materials received at the site are weighed upon arrival on one of two scales located at the entrance to the facility. During 2021 a total of 513,078 tonnes of waste and other materials were received at the site of which 190,415 tonnes were landfilled. The total tonnage and number of loads are summarized in Table 4.1 below.

Table 4.1: WCC Material Tonnage, Jan.1 – Dec. 31, 2021

	Tonnage	No. of Loads
Total:	513,078	67,219
Total Landfilled:	190,415	N/A
Total Reused/recycled:	322,663	N/A
Monthly Average:	42,757	5,602
Daily Average:	1,650	216

The above material tonnage received in 2021 includes waste landfilled, recycled waste materials, treated contaminated soils, rejected waste removed from the site and other materials received for re-use at the site.

The material distribution is as follows:

- Tonnage landfilled totalled 190,415 tonnes (37.11%) and included IC&I waste, C&D waste and other materials that were received and directed to the active working face for landfilling;
- Recyclable materials such as cardboard, tires, glass, drywall, e-waste, wood, metals and white goods taken off-site to market totalled 5,074.24 tonnes (1.0 %);

- Waste materials rejected and removed from the site by WCC for alternative disposal at a licensed facility totalled an estimated 36 tonnes (0.01%).

- Special materials such as storm sewer screenings and impacted non-hazardous soil received at the site for re-use as cover material totalled 173,546 tonnes (33.82%).

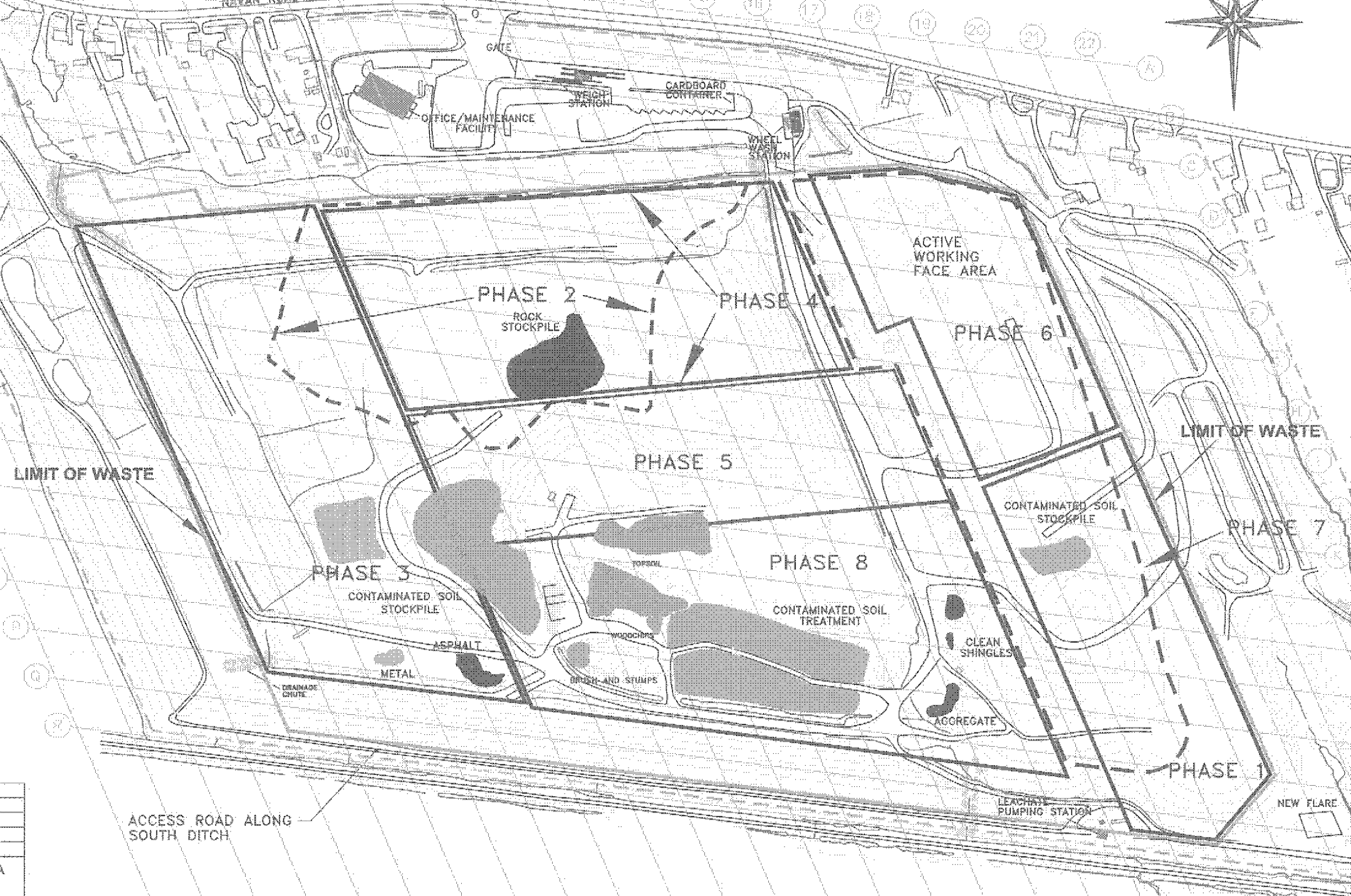
- Impacted soils treated or re-used on site totalled 95,846 tonnes (18.68%).

- Rock, brick, concrete, aggregate, shingles and rubble received and re-used on site as aggregate totalled 40,041 tonnes (7.8%); and

- Clean fill, topsoil and asphalt re-used on site for final grading, road/pad construction and engineered fill totalled 8,120 tonnes (1.58%).

Additional materials were recovered from on-site excavation such as soil, concrete, boulders, stumps and metals and re-used on site or recycled. These materials however, were already on site and were not part of the inbound receipts.

All weigh tickets are kept on site along with daily and monthly summaries, which are available for review. All rejected waste loads are reported to the MECP district office in Ottawa and a record of the report is kept on site. A monthly summary of material tonnage received in 2021 is provided as Schedule 'B' in Appendix '4'. The location of materials stockpiled on site is shown on Figure 4.1.


GATE
WEIGH STATION
CARDBOARD CONTAINER
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
ACTIVE WORKING FACE AREA
PHASE 2
ROCK STOCKPILE
PHASE 4
PHASE 6
LIMIT OF WASTE
PHASE 5
LIMIT OF WASTE
CONTAMINATED SOIL STOCKPILE
PHASE 7
PHASE 3
CONTAMINATED SOIL STOCKPILE
TOPSOIL
PHASE 8
CONTAMINATED SOIL TREATMENT
WOODCHIPS
ASPHALT
CLEAN SHINGLES
METAL
BRUSH AND STUMPS
DRAINAGE CHUTE
AGGREGATE
PHASE 1
ACCESS ROAD ALONG SOUTH DITCH
LEACHATE PUMPING STATION
NEW FLARE

002441

5. SITE CAPACITY AND LIFE EXPECTANCY

The capacity of the site is a measure of the amount of compacted waste that can be incorporated into the site in a series of lifts in accordance with the approved top of waste elevation contours as shown on Figure 3.1. The total site capacity includes the total volume of daily cover material used for lift and cell construction. The estimate of air space remaining does not include the final cover materials that WCC will place once the waste pile has reached the approved fill height.

Some of the factors that continue to influence the estimated life remaining at the Navan Waste Recycling and Disposal facility are as follows:

- Volume of waste permitted by the approved top of waste elevation contours;
- Annual and daily material tonnage received at the facility for landfilling;
- Characteristics (bulk density) of the waste materials being landfilled;
- Compaction energy provided during the placing of the waste;
- Volumetric cover to waste ratio;
- The degree of cell development optimisation;
- Operational factors such as recycled waste removed from the site and the exclusion of bulky, non-compactable materials that cannot be readily incorporated into the working face;
- The re-use of waste materials received as an alternative construction material for roads and unloading pads;
- The treatment of contaminated soils;
- The removal and re-use of rock and concrete from waste;
- The volume of loose non-compactable asbestos waste received at the site and cover material required to properly dispose of asbestos waste;
- Water infiltration and rate of biodegradation of the waste; and
- Settlement/consolidation of the waste pile and underlying soft clay soils.

Factors affecting the remaining life of a site are many and varied and in fact, some will change daily. Therefore, such calculations will only provide a theoretical approximation of the expected life remaining. A factor, which appears to be changing year over year, is the bulk density of waste landfilled. Increased recycling efforts at the source with the diversion of heavy materials such as concrete, rock, brick and rubble along with increased efforts to recycle and divert materials from landfill impact on the bulk density of the waste placed within the air space used. Other factors that affect the in-place density include the volume of impacted soils landfilled; the lift placement and compaction energy used to compact the waste; the volume of daily cover used; the volume of impacted soils treated rather than landfilled as a waste material and the volume of bulky asbestos waste that cannot be effectively compacted following burial of this waste.

Information related to site life expectancy is important for the proper management of landfill operations. Daily records of waste landfilled or stored at the site are therefore necessary.

5.1 *Estimate of Air Space Used (ASU) - 2021*

A simplistic approach to the calculation of air space used (ASU) consists of assigning assumed in-place compacted densities to the various types of waste materials landfilled as described below:

- 2.0 tonnes/m^3 for cover soil material;
- 0.9 tonnes/m^3 for IC&I, C&D, and general waste materials;
- 0.9 tonnes/m^3 for excavated waste materials;
- 1.2 tonnes/m^3 for roofing materials
- 1.5 tonnes/m^3 for Special Waste Materials (Industrial Waste, Screenings, etc.)
- 0.4 tonnes/m^3 for asbestos waste
- 0.4 tonnes/m^3 for wood waste; and
- 2.0 tonnes/m^3 for materials that are re-usable such as soil, concrete, brick and masonry.

Based on the assumed waste density distribution indicated above, the air space used by waste received, cover material and re-used materials placed within the air space during 2021 as presented in Table 5.1 is estimated at approximately 327,100 m^3 and excludes materials diverted off site for recycling and some materials re-used outside the air space. Based on this approach, the weighted average of the in-place density for all of the materials used in the air space calculation for 2021 is estimated to be 1.32 tonnes/m^3.

Table 5.1: ESTIMATED AIR SPACE USED (ASU), Jan.1 – Dec. 31, 2021

Material	Tonnage	Average Assumed Density, (tonnes/m^3)	Estimated Volume (m^3)
Waste Materials Landfilled	161,431	0.9	179,387.5
Special Waste Material	47,837	1.5	31,891.3
Asbestos Waste	2,306	0.4	5,764
Daily Cover Soils	173,546	2.0	86,773
Re-use materials (aggregates, asphalt)	43,021	2.0	21,510.4
Shingles used for sub base on road/turn areas	2,152.8	1.2	1,794
Estimated Air Space Used	430,294	1.32	327,100.2

Golder Associates Ltd. estimated the air space used by measuring the volumetric changes from topographic mapping generated from aerial photography obtained on May 1st, 2021 and the previous year on April 28th 2020. The net estimated air space used (ASU) between the last two aerial survey dates was reported to be 319,316 m^3 resulting in air space remaining of 1,497,213 m^3. Records indicate that the ASU during that period was consumed by approximately 380,715 tonnes of waste, daily cover material and other materials resulting in a density calculation of 1.19 tonnes/m^3 for a 5-year average of 1.42 tonnes/m^3. The variance between the density calculations could be attributed to many factors including optimization of cell excavation, settlement of the underlying soft clay soils and surcharge loading of the waste pile, which influence the year over year volume calculations.

Active landfilling of waste materials and daily cover throughout 2021 was carried out in the east cell or area outlined as Phase 6 (refer to Figure 2.4). Of the 269,391tonnes of impacted soils received in 2021, a total 95,845 tonnes were treated and re-used in the east buffer or re-used on site. 139,150 tonnes of impacted soils were re-used as daily and interim cover and as cover over asbestos waste in accordance with O. Reg. 347 (17). A balance of 34,396 tonnes received in 2021 was added to the soil stockpiled on site for re-use as cover material and located on the south side of Phase 6 as shown on Figure 4.1.

The remaining air space volume of the landfill estimated by Golder Associates Limited is 1,497,213 m^3(as of the latest Aerial Survey dated May 1st, 2021). Golder Associates Limited estimated the remaining life of the landfill to be 5.1 years as of December 31st, 2021. This estimate was based on the remaining air space calculated as of May 1st 2021, a projected 179,909 m^3 of airspace to be consumed between the May 1st, 2021 survey date and December 31st, 2021, a 5 year average density of 1.42 tonnes/m^3 and projected future annual waste receipts and daily cover soils of 344,750 tonnes/yr.

The actual tonnage landfilled and re-used within the air space between May 1st and December 31st, 2021 was 326,890 tonnes as shown in Table 5.2 consuming an estimated volume of 244,244 m^3 based on assumed waste type densities shown yielding an estimated overall density of 1.34 tonnes/m^3 and remaining air space of 1,252,969 m^3 as of December 31st, 2021. Allowing for future waste receipts and cover soils of 344,750

tonnes/year consuming 242,782 m^3/year at a 5 year average density of 1.42 tonnes/m^3, the estimated life remaining would be 5.2 years.

Table 5.2: ESTIMATED AIR SPACE USED (ASU), May 1 – Dec. 31, 2021

Material	Tonnage	Average Assumed Density, (tonnes/m^3)	Estimated Volume (m^3)
Waste Materials Landfilled	114,839	0.9	127,598.9
Special Waste Material	40,350	1.5	26,900
Asbestos Waste	1,637	0.4	4,092.5
Daily Cover Soils	139,812	2.0	69,906
Re-use materials (aggregates, asphalt)	28,391	2.0	14,195.5
Shingles used for sub base on road/turn areas	1,861	1.2	1550.8
Estimated Air Space Used	326,890	1.34	244,243.7

As of January 1st, 2022 the life expectancy remaining for the Navan Waste Recycling and Disposal Facility under the present Environmental Compliance Approval is estimated to be 5.1- 5.2 years (2027) based on future projected annual waste receipts and cover soils of 344,750 tonnes/yr and a 5 year average waste density of 1.42 tonnes/m^3 as discussed above. As indicated, the actual life of the landfill will vary significantly based on in-place waste densities and waste mix, but also on annual waste tonnage receipts, the amount of waste diversion and recycling initiatives at the landfill and settlement of the underlying soft clays.

5.2 *Financial Assurance*

In compliance with Condition 15 of the Environmental Compliance Approval #A460702, Financial Assurance for the site is currently in place with the MECP in the form of a Surety Bond in the amount of $13,566,246.00. Amendment Notice 11 to the ECA A460702 dated June 19th, 2018 requires that Financial Assurance be reviewed at intervals of three (3) years commencing on March 31, 2021 (Condition 15(b)); that commencing on March 31st, 2019 the owner shall prepare and maintain at the Site an updated re-evaluation of the amount of Financial Assurance required to implement the actions required under Condition 15(a) for each of the intervening years in which a re-evaluation is not required to be submitted to the Director under Condition 15(b). A Financial Assurance re-evaluation prepared by Golder Associates dated March 26th, 2021 was submitted to the MECP. Based on this latest Financial Assurance evaluation to be reviewed and approved by the MECP, the Financial Assurance for the site has increased to $13,724,172. The next re-evaluation report to be submitted to the MECP Director will be due on March 31, 2024.

6. ENVIRONMENTAL CONTROLS

6.1 *Overview*

The key components of the environmental controls at the site are as follows:

a) Surface Water Controls:

- Ditches have been constructed to divert external flows around the landfill. These consist of north, west, and east diversion ditches, including a 237 m long large diameter drainage culvert at the northwest corner of the site;
- Drainage water generated within the landfill that does not come into contact with waste is diverted to the perimeter ditches. Surface runoff water is directed from the top of the landfill down drainage chutes lined with erosion protection;
- The east diversion ditch was constructed as a fish habitat and was commissioned in late 2009 following the South Nation Conservation Authority approval;
- A pond exists in the southeast corner of the site which serves as a storm water retention pond. The north and east parts of the site drain to this pond prior to discharge to the east diversion ditch;
- A pond exists in the northwest corner of the site which serves as a storm water retention pond. The northwest and west parts of the site drain to this pond prior to discharge to the north diversion ditch.

b) Leachate Controls:

- The landfill is underlain with native low permeability clay soil (i.e. a natural liner);
- A perimeter leachate collection system has been constructed along the west and south perimeter of the waste pile;
- A leachate underdrain and collection system has been constructed below the waste in the north 1/3 of Phase 3; below the waste in the east part of Phase 8; below the waste in Phase 4; below the waste in the east half of Phase 5; below the waste in Phase 1; and below the waste in Phase 6;
- The landfill will be covered with low permeability final cover material to reduce water infiltration. Final cover has been completed in parts of the landfill as shown on Figure 3.2.

c) Landfill Gas Controls:

- Riser pipes for the leachate collection system along the north, east and west perimeters of the waste pile have been capped and the interim landfill gas odour control system consisting of a landfill gas collection and flaring system was approved by the TSSA and commissioned in April of 2012. This system has since been in operation on a continuous basis;

- The landfill gas collection system was extended to the top of Phase 3 below the final clay cover in late 2014 as well as a connection to the central MH to control odours generated from these areas. Additional horizontal gas collectors were added to this system in 2016 and 2017 and 2020. In 2017, 5 vertical wells were added in the Phase 3 area and 2 vertical wells were added in the south east corner of the Phase 1 area. In 2019, 4 vertical wells were added in the Phase 4 area of the waste footprint.

- The leachate collection system and maintenance holes along the west and south waste boundaries serve as a passive venting system.

- In 2017, a misting system comprising of a 300 m perforated HDPE line and blower powered by a diesel generator was constructed on the west side of the main access road that runs along Grid Line 14 as an added odour control system.

Environmental control systems for surface water, groundwater, leachate control, and erosion control systems are discussed in greater detail in the Design & Operations Report (Golder 2008). For the purpose of this report, a summary of the systems presently in use and/or proposed is provided in the following sub-sections. Surface water, groundwater, leachate and landfill gas monitoring undertaken by Golder Associates Ltd. are discussed in Sections 7 and 8 of this report.

6.2 Surface Water Management

The overall objectives for surface water management at the site are as follows:

- Divert surface run-off and shallow ground water flows originating upstream of the site around the outside perimeter of the waste footprint;

- Maintain the pre-development drainage conditions and water balance to each watershed;

- Minimize the amount of surface water that comes into contact with waste (which must then be managed as leachate); and

- Maximize the removal of suspended sediment from surface water generated on site prior to its release to the downstream drainage systems.

The regional surface water setting of the landfill is discussed in Section 2.7 and existing surface water control features are shown on Figure 6.1. Existing controls can be summarized as follows:

a) Upstream flows originate from the north and northwest of the site. These flows are diverted around the landfill via ditches located along the perimeters of the site buffer zones.

b) A diversion ditch has been constructed in the north buffer of the landfill flowing east from the office/maintenance facility. A large diameter culvert was added in 2019 at the northeast corner of the waste footprint. This northern diversion ditch and culvert discharges into the east perimeter ditch. The east perimeter ditch conveys water southward into a storm water retention pond located at the southeast corner of the site. This pond discharges into an existing ditch along the landfill's south property line. The southern ditch drains under the VIA ROW near Grid Lines R-16 and flows onto WCC property and to the Mer Bleue drainage basin.

c) A diversion ditch has been constructed in the north buffer area flowing west from the office/maintenance facility. This ditch discharges into a natural drainage channel, referred to as the west perimeter ditch, flowing southward along the west perimeter of the property east of Grid Line -2. This ditch discharges at a location near the intersection of Grid Lines R and -2 and conveys flows westward to the Mud Creek drainage basin. Land through which this ditch flows is subject to a proposed residential development.

d) Clay cover has been placed on the north, west and south facing slopes of the waste pile as well as the top of Phase 3, the north edge of Phase 4 and the south half of Phase 1 where final waste grades have been reached as shown on Figure 3.2. Finished slopes are covered with clay soil, a thin layer of topsoil, graded and seeded. Soil stockpiles are also covered with topsoil and/or compost and seeded for surface water and erosion control.

e) Landfill operations are carried out such that surface water is directed away from the waste to minimize water infiltration.

Surface water monitoring is discussed in Section 7.

6.3 *Leachate Management*

Leachate is generated from a combination of infiltration of precipitation into the waste pile as well as surface water and groundwater discharge into the landfill despite efforts to divert water around the waste footprint. Generation of leachate is minimized by grading the waste surface and placing low permeability cover materials over areas of the landfill that have been filled with waste in efforts to reduce infiltration from precipitation and to promote surface runoff.

Leachate generated by the landfill is collected by a collection system consisting of four separate components that all drain to a leachate pumping station in the southeast corner of the site. Figure 6.2 presents the leachate collection system in plan view.

1. A perimeter leachate collection system has been constructed along the southern limit of the waste footprint extending from Grid line 15 to Grid Line 1 and then approximately 330 m north

along the west perimeter of the waste footprint along Grid Line 1 to just north of Grid Line K. The perimeter leachate collection system was designed with a slope varying between 0.4% and 0.6% to provide gravity drainage to a collection point at the southeast corner of the site. The waste in the north 1/3 area of Phase 3 (Northwest Cell) was placed on a drainage blanket that connects to the west perimeter leachate collection system. This system consists of a granular trench with a 250 mm diameter perforated HDPE (Boss 2000) drainage pipe. Along the southern perimeter, the leachate collection system has been constructed with lateral granular filled hydraulic connector trenches into the waste pile. Access to the western and southern leachate collection system is provided by a series of manholes spaced at approximately 100 m intervals for monitoring and maintenance purposes.

2. The north area of the site below Phase 4 was constructed with a grid-type drainage network within a stone drainage layer underlying the waste. The leachate collection system in this excavated cell consists of 200 mm diameter perforated HDPE (Boss 2000) drainage pipe surrounded by 50 mm clear stone and non-woven geotextile laid out in a grid pattern spaced no more than 45 m apart. A network of French drains, consisting of clear stone wrapped in non-woven geotextile, placed between the drainage pipes reduces the drainage path along the floor of the cell to approximately 15 m.

3. An underdrain leachate collection system has been constructed beneath the waste located between Grid Lines 14 and 16 and south of Grid Line N and just north of the pump station consisting of a stone drainage layer and perforated drainage piping similar to the system constructed in the Phase 4 area to the north. A clay berm was constructed along Grid Line N to separate the two leachate collection systems located on each side of Grid Line N.

4. A fourth component to the leachate collection system consists of the east lateral expansion cell (Phases 1 and 6) designed by Golder Associates Ltd. and approved by the MECP as an amendment to the ECA No. A460702 Notice 1 dated October 9th 2009. This system in Phase 1 was completed in 2015 with Phase 6 completed in 2019. QA/QC was carried out by Golder Associates Ltd. and as-built reports were prepared by Golder Associates for each of the completed cells and submitted to the MECP. A leachate sump and pump is located at the northwest corner of Phase 1 to drain leachate from both the Phase 1 and Phase 6 areas.

Presently, the disposal method of choice for leachate generated by the WCC Facility is pre-treatment using air stripping followed by direct discharge to the City sewer system via a WCC forcemain. The leachate pumping station located at the southeast corner of the landfill site and leachate forcemain connection to the municipal sewer system on Renaud Road were completed in 2007 and commissioned in early 2008. Pre-treatment of leachate to reduce the concentration of H_2S and Volatile Organic Carbons (VOCs) using an air stripping system is carried out prior to pumping leachate to the municipal system. In 2008, cleanouts were added along the leachate forcemain to provide easier access for cleaning and maintenance. In 2011, the leachate pre-treatment and pumping station was expanded with the addition of higher capacity treatment chambers and higher capacity pumps to maintain discharge flows at the approved 17L/sec. The forcemain discharging to the City of Ottawa sewer system was pressure washed on two separate occasions in 2021 to clean the line and maintain unobstructed flows.

In 2021, a total of 88,591 m^3 of pre-treated leachate was discharged to the City of Ottawa wastewater system, a 33.3 % reduction over 2020. The decrease is attributed to efforts to decrease surface water

runoff into the waste. The monthly leachate volumes discharged are summarized in Table 6.1. The monthly and cumulative volumes of leachate pumped are shown graphically on Figures 6.3, 6.4 and 6.5. The peak month was March with a volume of 12,585 m^3. The daily average for the period of operation was 242.7 m^3/day.

Table 6.1: Summary of Leachate Volumes Discharged Off-Site in 2021

Month	Leachate Volumes (m^3) Discharged to City Sewer	Cumulative Leachate Volumes (m^3)
January	7,576	7,576
February	4,493	12,069
March	12,585	24,654
April	6,254	30,908
May	3,832	34,740
June	11,937	46,677
July	11,282	57,959
August	7,155	65,114
September	6,681	71,795
October	6,856	78,651
November	8,077	86,728
December	1,863	88,591
Total:	88,591	

Leachate monitoring is discussed in Section 7.

6.4 *Landfill Gas Management*

Landfill gas generation at the site is limited although its presence can be identified in the waste pile area by signs of dying vegetation and/or localized snow melt during the winter. Landfill gas is produced when organic waste decomposes. It consists primarily of methane (50%) and carbon dioxide (50%) as well as water vapour, nitrogen, and trace amounts of other non-methane organic compounds (NMOC). Non-putrescible waste received at the landfill does not generate landfill gas and methane at the same rate as municipal solid waste (MSW). Methane, which is explosive at concentrations greater than 5%, presents a health and safety risk both on-site and off-site. As a result, monitoring of landfill gas is carried out at the property boundary and within facilities located on site. In addition, passive gas ventilation systems and an active gas collection system at the site prevent the off-site migration of landfill gas.

The perimeter leachate collection system extends below the water table and prevents off-site migration of gas. Figure 6.2 provides details of the perimeter leachate collection system along the southern limit of the landfill.

As part of a commitment to control potential odorous emissions from the site, WCC has installed an interim landfill gas odour control system which will operate until the full-scale landfill gas collection system is installed at the site, which is expected in 2022. This interim odour control system, constructed within the existing landfill footprint, includes connections to leachate collection cleanouts, existing vertical landfill gas extraction wells, and to horizontal wells. This system also includes the installation of lateral and header piping, condensate management facilities, an outdoor skid-mounted abstraction plant, and a candlestick flare. During construction, leachate collection system cleanouts were excavated and the perforated pipe replaced with solid pipe and air tight connections. Tees were installed in the header pipe to allow for expansion of the system as required.

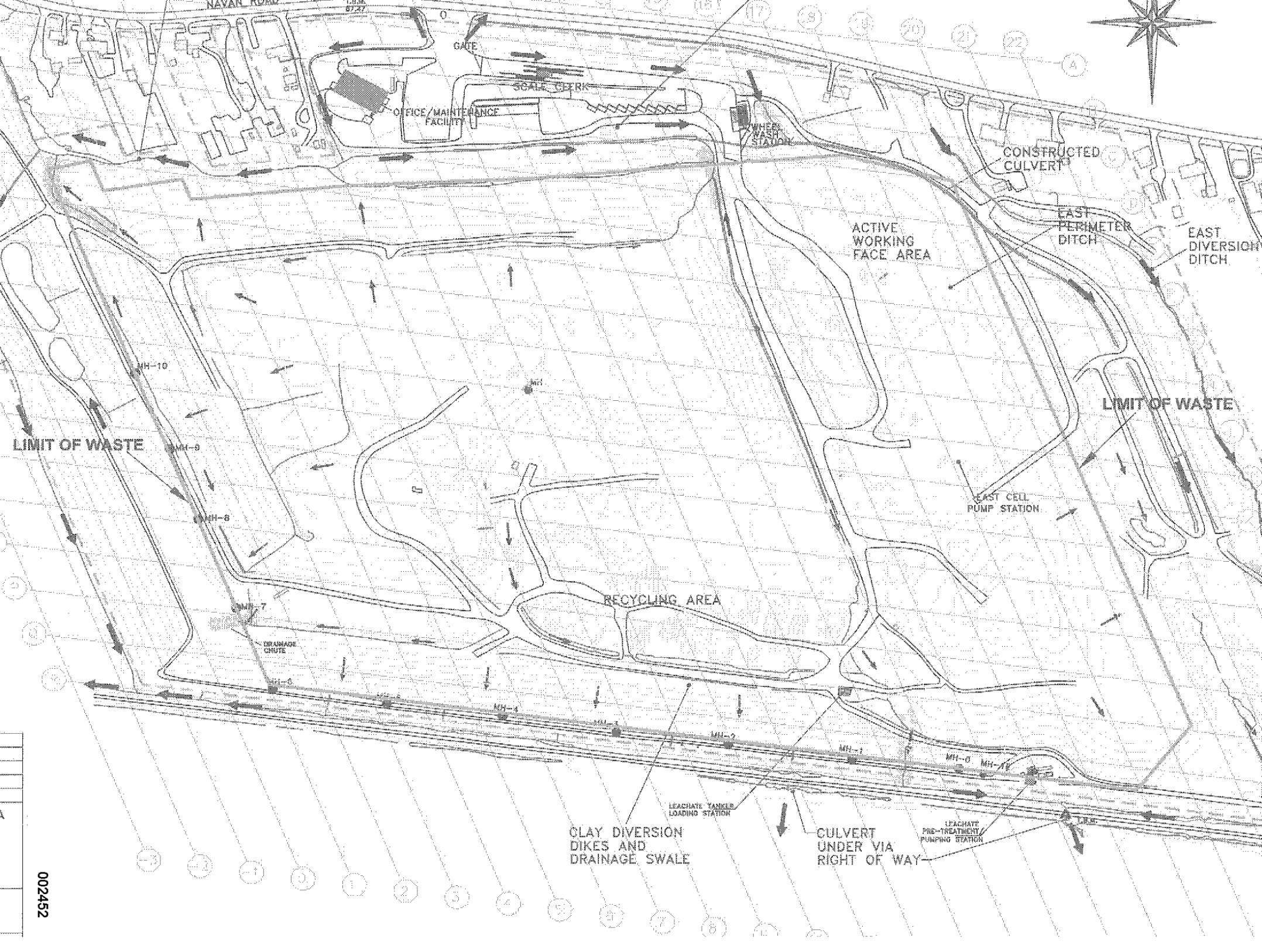
The interim landfill gas odour control system was installed in 2011 and commissioned in April of 2012. Additions to the LFG collection system which included horizontal and vertical wells were constructed in 2016, in 2017, in 2019 and in 2020. In 2021 the interim LFG system operated for 8,252 hrs at an average of 391 scfm with a totalizer reading indicating 5,801,695 m^3 of landfill gas was recovered at a methane (CH4) concentration of approximately 49.5%. A total of 2,871,839 m^3 of methane was flared using the interim landfill gas flaring system in 2021, a 1.81% increase in methane recovery from 2020 to 2021.

A monitoring program associated with the odour control system has also been implemented. Design of the full-scale landfill gas collection and flaring system has been completed by Golder Associates Ltd. and construction started in 2021.

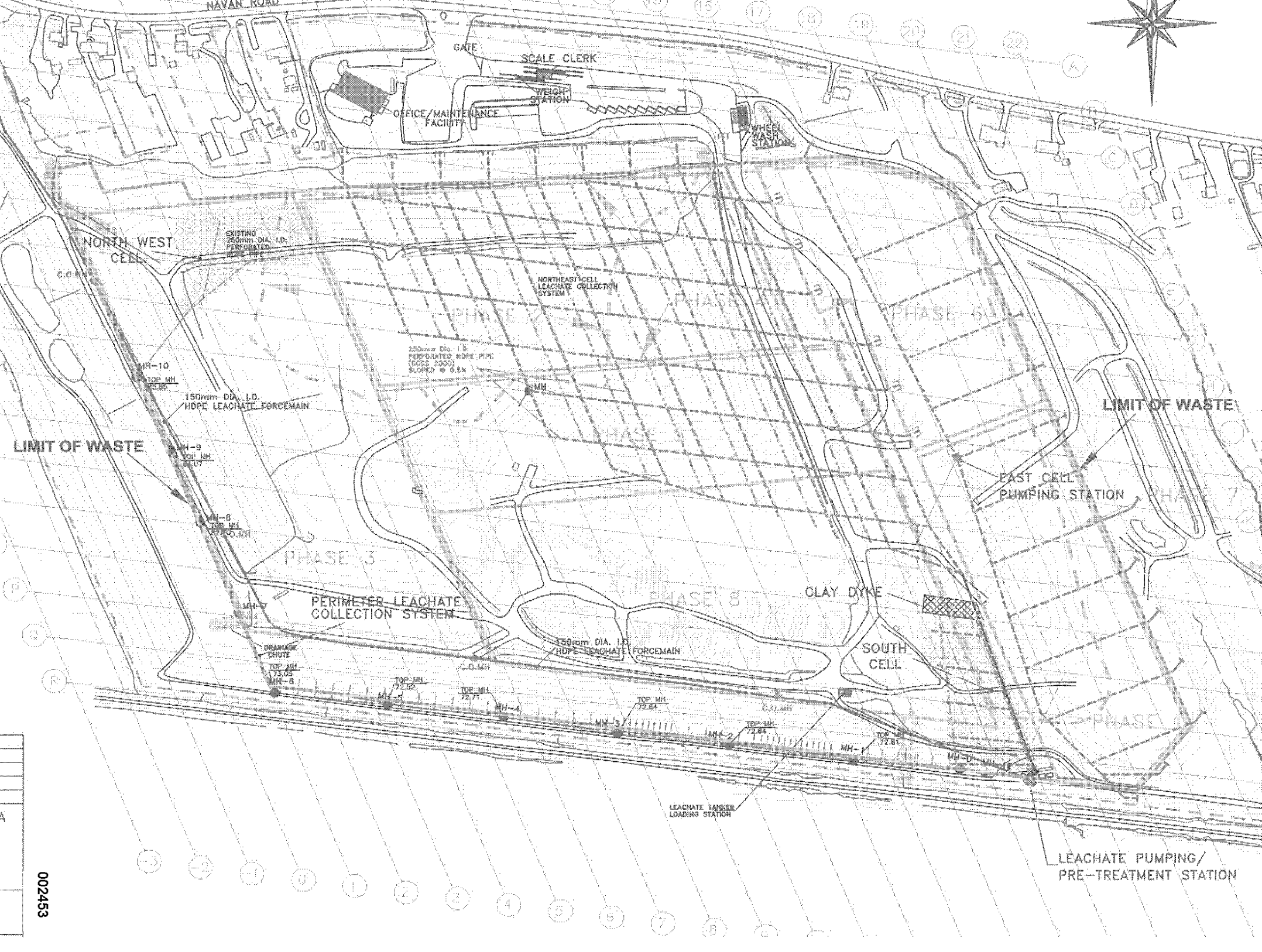
Landfill Gas monitoring is discussed in Section 8.

6.5 *Buffer Zone*

The perimeter of the site is surrounded by a buffer zone which occupies an area of about 6.2 ha. In accordance with the ECA, a minimum buffer width of 30 m is maintained between the northern, eastern and western limits of the landfill area and the property boundary. A minimum buffer width of 10 m is maintained between the southern limit of the landfill area and a VIA Right-of-Way. WCC owns additional lands to the north, west and east of the landfill site as well as a 100m wide track of land south of the VIA ROW providing additional buffer space. No waste is deposited within the designated buffer zone. The limits of waste are illustrated on Figure 2.4.


NAVAL ROAD
GATE
SCALE HOUSE
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
CONSTRUCTED CULVERT
EAST PERIMETER DITCH
EAST DIVERSION DITCH
ACTIVE WORKING FACE AREA
LIMIT OF WASTE
LIMIT OF WASTE
MH-10
MH-9
MH-8
MH-7
MH-6
MH-5
MH-4
MH-3
MH-2
MH-1
MH-0
MH-11
EAST CELL PUMP STATION
RECYCLING AREA
DRAINAGE CHUTE
LEACHATE TANKER LOADING STATION
CLAY DIVERSION DIKES AND DRAINAGE SWALE
CULVERT UNDER VIA RIGHT OF WAY
LEACHATE PRE-TREATMENT PUMPING STATION

002452


NAVAN ROAD
GATE
SCALE CLERK
WEIGH STATION
OFFICE/MAINTENANCE FACILITY
WHEEL WASH STATION
NORTH WEST CELL
EXISTING 250mm DIA. I.D. PERFORATED HDPE PIPE
NORTHEAST CELL LEACHATE COLLECTION SYSTEM
MH-10
TOP MH 75.06
150mm DIA. I.D. HDPE LEACHATE FORCEMAIN
MH
LIMIT OF WASTE
MH-9
TOP MH 74.10
MH-8
TOP MH 73.60 C.O.MH
LIMIT OF WASTE
EAST CELL PUMPING STATION
PERIMETER LEACHATE COLLECTION SYSTEM
CLAY DYKE
MH-7
DRAINAGE CHUTE
TOP MH 73.05
MH-6
TOP MH 72.92
MH-5
TOP MH 72.71
MH-4
150mm DIA. I.D. HDPE LEACHATE FORCEMAIN
C.O.MH
SOUTH CELL
TOP MH 72.84
MH-3
TOP MH 72.84
MH-2
TOP MH 72.81
MH-1
MH-0
MH-12
LEACHATE TANKER LOADING STATION
LEACHATE PUMPING/ PRE-TREATMENT STATION

002453

Figure 6.3: Total Monthly Volume of Pre-treated Leachate Discharged to City of Ottawa Sewer

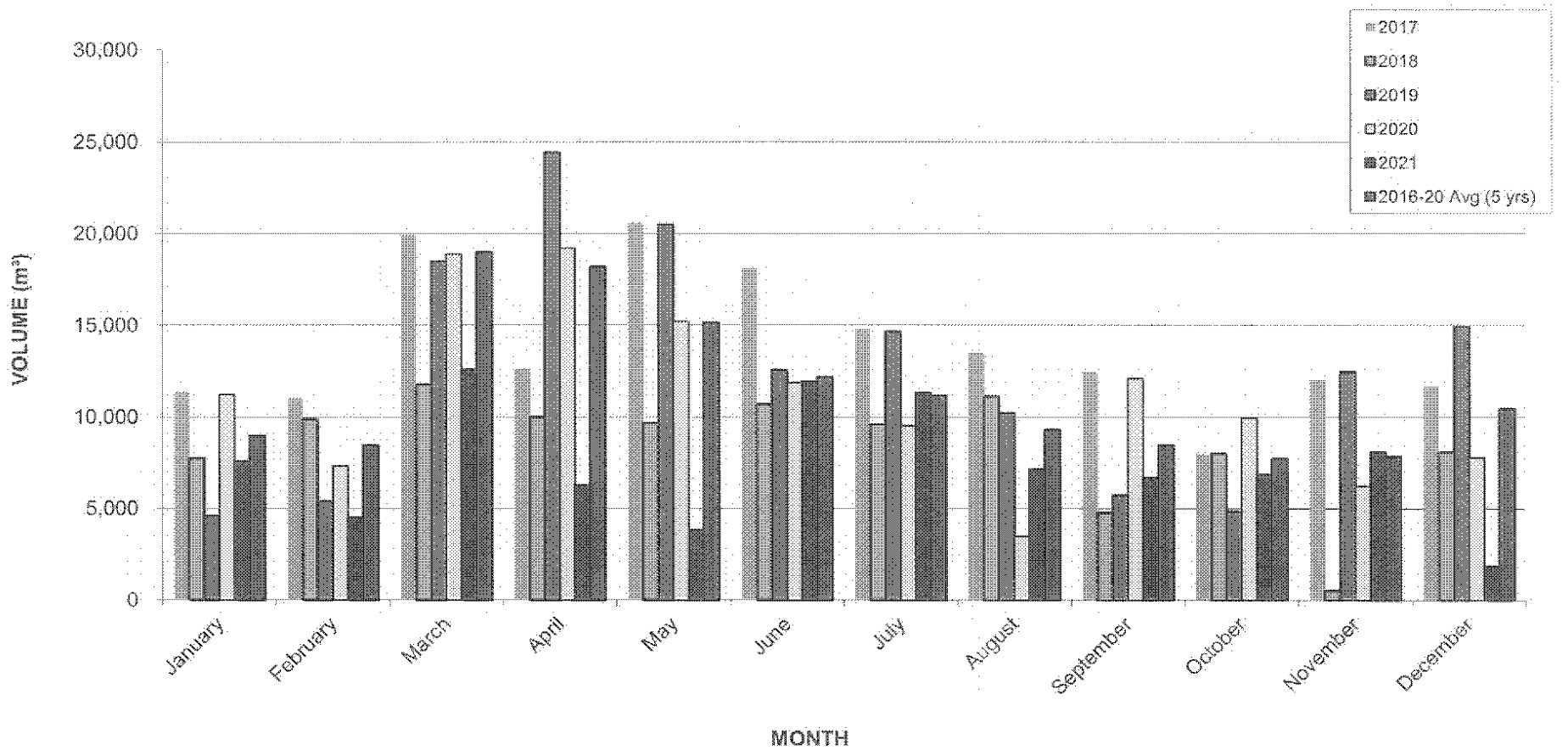


Figure 6.4: Cumulative Monthly Volume of Pre-treated Leachate Discharged to City of Ottawa Sewer

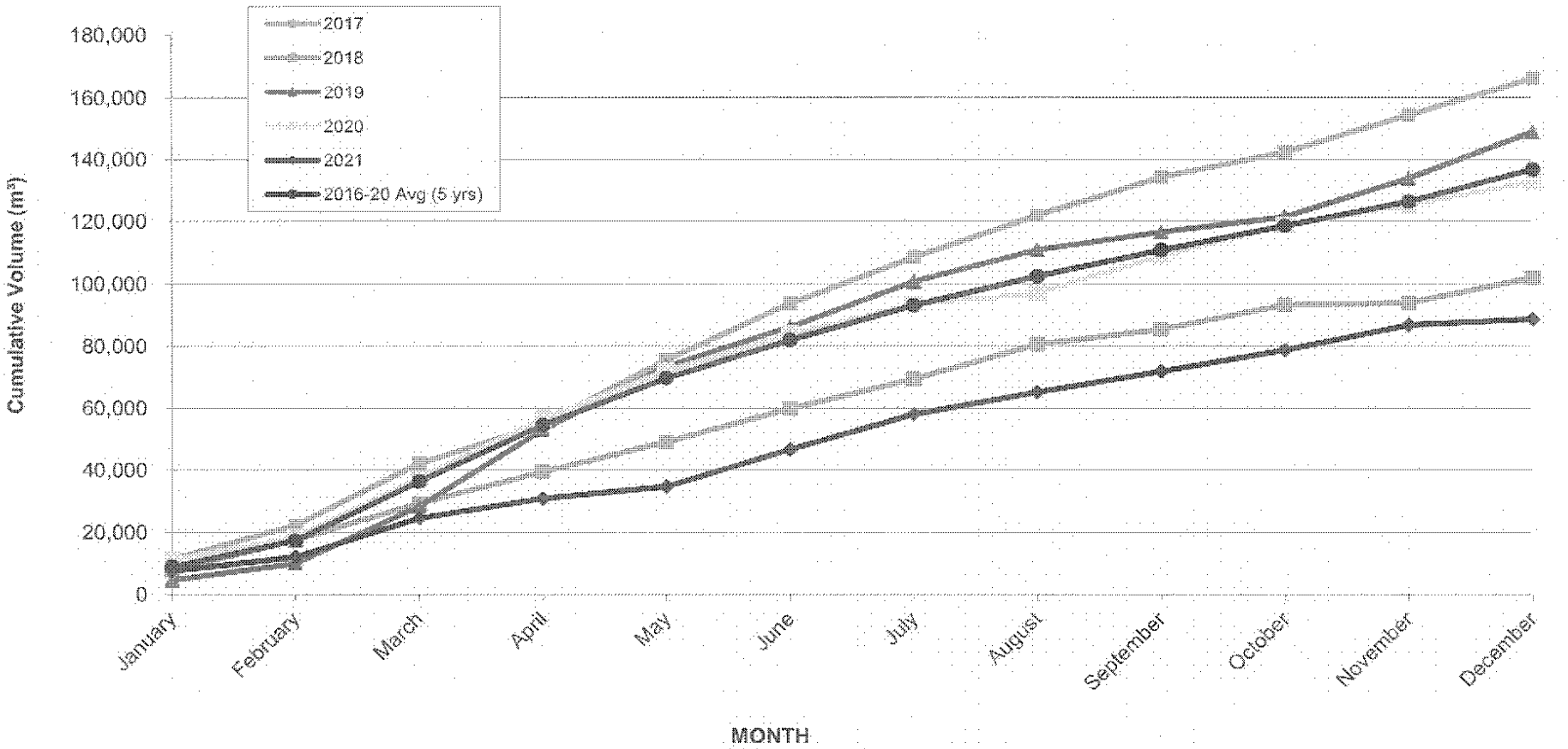
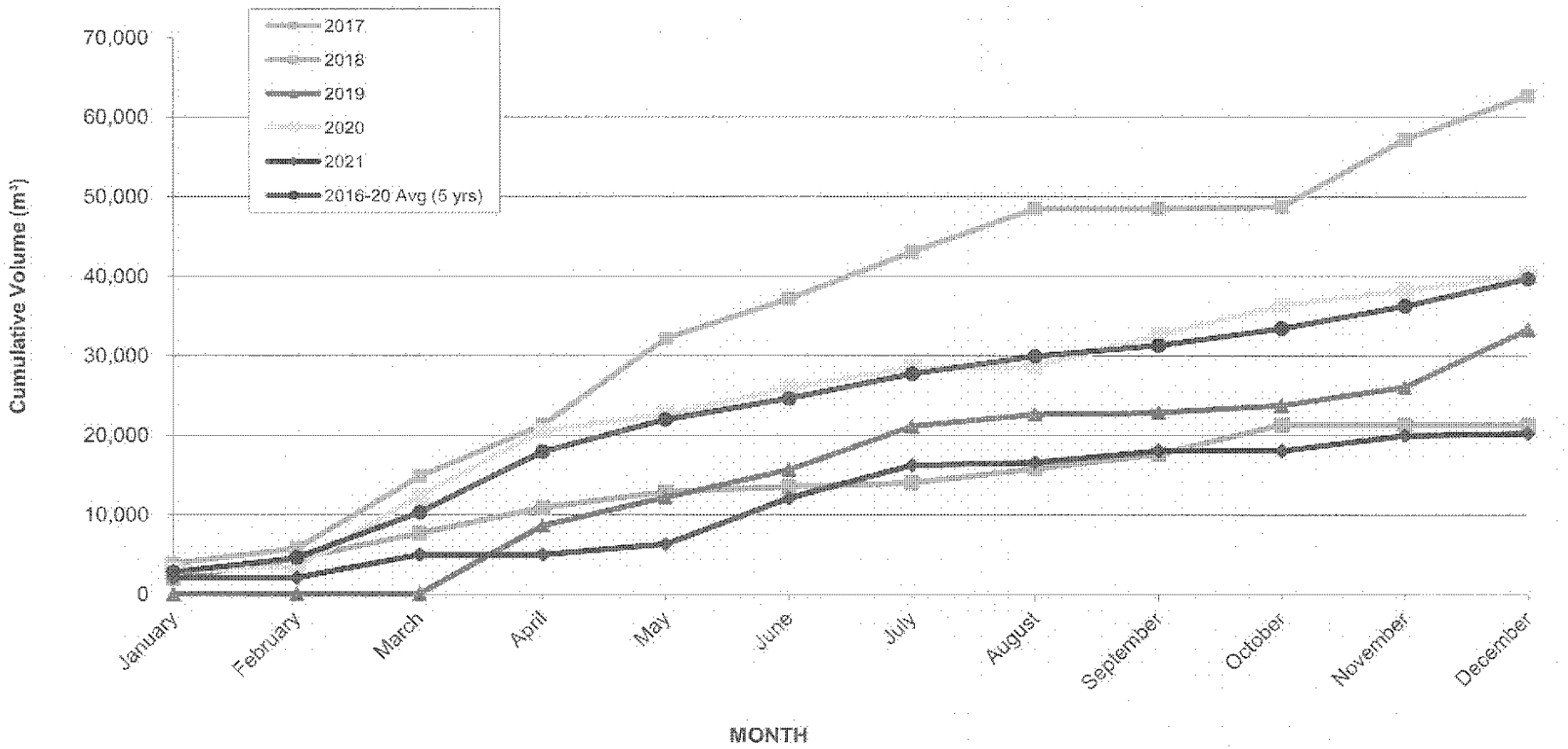


Figure 6.5: Cumulative Monthly Volume of Pre-treated Leachate From East Cell



7. WATER QUALITY MONITORING

Water quality monitoring undertaken to date at the Navan Waste Recycling and Disposal Facility consists of water quality analysis of surface water, groundwater, leachate and sediment. The location of water monitoring stations is shown on Figure 7.1. In 2021, Golder Associates Ltd. (GAL) was retained to carry out the annual water quality monitoring program and reporting requirements for the Navan Waste Recycling and Disposal Facility and prepare a report to fulfill the reporting requirements outlined in Conditions 135 and 136 of the Environmental Compliance Approval (ECA) No. A460702. The 2021 GAL report is attached in Appendix 1 and summarized below.

The following summary highlights key points only; for complete information and findings it is necessary for the reader to examine the GAL report provided in Appendix 1.

The monitoring program undertaken in 2021 was a continuation of the monitoring program carried out in 2020 and followed the program outlined in Conditions 109 and 112 of the ECA and Condition 10.1 of the Conditions of Environmental Assessment Approval. As per Condition 109, the monitoring program includes sampling of the monitoring wells located in BH09-1 in order to assess the groundwater quality in the Mer Bleue Bog. The original monitoring program indicated the wells would be sampled during the winter, when the Mer Bleue Bog is frozen and the wells are accessible. However, the groundwater in the monitoring wells has frequently been frozen during these events. In the 2013 monitoring report (Golder, 2014), it was proposed to sample them during the summer, rather than the winter, and this recommendation has carried forward to the present (monitoring is now completed either in summer or in fall, depending on site conditions). Groundwater samples were successfully collected at monitoring wells MW09-1A, MW09-1B, and MW09-C during the summer monitoring session in August, 2021 (no sample was collected from monitoring well MW09-D due to dry conditions).

Groundwater monitoring sessions in 2021 were carried out by GAL on May 26, August 24 and November 30. Surface water monitoring sessions were carried out by GAL on May 27, August 24 and November 24. Leachate quality analysis was undertaken on samples obtained by GAL from the pump station (L5) on May 27, August 24 and November 24. The following is a summary of the results of the monitoring sessions undertaken in 2021 presented in the GAL report provided in Appendix '1'. Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected in August 2021. The monitoring wells screened in the intact clay deposit and in the glacial till/upper bedrock zone will be sampled again in the spring of 2023.

During the spring monitoring session, the condition of each well within the monitoring well network at the site was assessed. A summary of the findings of the 2021 monitoring well network condition survey (properly cased, capped and locked) are provided in Table 3 of the GAL report attached in Appendix 1. At the time of the condition survey it was observed that all monitoring wells were in good condition.

In addition, sediment quality is also monitored at three locations within the Mer Bleue Bog. The sampling locations are the same as the surface water sampling stations located within the bog, i.e., SED-W was obtained at SW-W, SED-C at SW-C and SED-E at SW-E (refer to Figure 7.1). This program was initiated

in 2000 at the request of the National Capital Commission (NCC). In 2021, sediment samples were obtained by GAL on May 27 and November 24.

A Monitoring and Screening Checklist prepared and signed by a Competent Environmental Practitioner (CEP) is included with the Golder 2021 Landfill Monitoring Report attached as Appendix `1`.

The objectives of the 2021 environmental monitoring program were:

- To comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of Environmental Compliance Approval No. A460702;
- To assess any potential impacts on water quality at the site resulting from landfill operations;
- To continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill;
- To document the chemical composition of groundwater and surface water in the vicinity of the landfill;
- To assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate; and
- To document the chemical composition of sediment at three locations in the Mer Bleue Bog.

7.1 *Groundwater Quality Assessment*

Groundwater has been monitored at observation wells since 1981. However, since 1985, landfilling operations expanded over the original down-gradient observation wells which have since been replaced with the existing wells. Existing observation wells were installed in 1992, 1994, 1995, 1998, 2005, 2007, 2009, 2010 and 2011.

Groundwater at the WCC Navan Facility is monitored within four stratigraphic units identified as follows:

- a shallow surface sand layer at depths ranging from 1.5 to 2.5 m below original grade
- the weathered clay zone of a thick clay deposit at depths ranging from 3.5 to 4.5 m below original grade
- the intact clay deposit at depths ranging from 7 to 8 m below original grade
- glacial till/bedrock contact zone at depths ranging from 22.3 to 37.1 m below original grade

Monitoring wells are present up-gradient, at the down-gradient edge (used to assess compliance) and further down-gradient of the landfill in each of these units. The two upper stratigraphic units, the sand and weathered clay units, were sampled for both the May and November monitoring events. The two lower stratigraphic units, the intact clay and near bedrock units, are sampled every 18 months. Groundwater samples from these units were collected in November 2021 and the next sampling session for the monitoring wells screened in these units will be in the spring of 2023.

Based on the groundwater levels obtained during the 2021 monitoring program, no significant change in groundwater flow patterns was observed.

The hydrogeology of the site indicates a recharge area north of the landfill having a downward groundwater flow component. South of the site, the hydrogeology indicates a typical discharge area having a slight upward groundwater flow component. In general, shallow groundwater quality is variable, but a distinction is noted between groundwater quality up-gradient and down-gradient of the landfill in the weathered clay. Groundwater in the intact clay deposit up-gradient of the landfill is also slightly different from down-gradient groundwater quality. In the glacial till/ upper bedrock groundwater zone, only minor differences exist in the groundwater quality across the site.

Traditional methods of site compliance provide very limited useful and/or reliable parameters for assessment of the WCC Navan Facility; therefore, an alternate method must be used. The difference in hydrogeology across the site coupled with the very saline environment of the clay deposit that underlies the Mer Bleue clay have resulted in the MECP accepting that Guideline B-7 (RUPO) is not applicable at this site. The MECP's position in this regard was documented in a November 2000 memorandum issued by the MECP (MOE, 2000). Therefore, the Leachate Indicator Parameter list and the method to determine if leachate from the site is impacting local groundwater was developed in the Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The Leachate Indicator Parameter list includes alkalinity, ammonia, boron, chloride, hardness, magnesium, manganese and potassium.

After the completion of a monitoring session, the concentration of each Leachate Indicator Parameter for all groundwater locations used to assess compliance should be visually checked. If a parameter concentration appears to be elevated, a comparison to the background concentration range should be completed. The potential for an increase in concentration of a Leachate Indicator Parameter will be investigated by comparing the concentrations for each parameter to the background range for its corresponding stratigraphic unit. The background range will be derived from the maximum and minimum data obtained at the locations used to assess compliance from 1998 to present in each stratigraphic unit. In addition, data from monitoring wells MW05-3A to D located to the east of the site and not impacted by landfill leachate will be used to define the background range. Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each location used to assess compliance are presented in time-concentration graphs in Appendix F of the GAL report (provided in Appendix 1). The background ranges will be updated annually using the most recent data if it is not deemed impacted by landfill leachate. An exceedance of the background range is considered an exceedance of the trigger mechanism and the implementation of the trigger format outlined in the trigger mechanism report should proceed.

Following the confirmed exceedances reported in the 2018 annual monitoring report (Golder, 2019), in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. Trigger results of the spring and fall monitoring sessions were reported by Golder, on behalf of WCC, to the MECP Ottawa District Office via email on August 8, 2019 and December 24, 2019, respectively. In accordance with the proposed course of action presented to the MECP in the 2018 annual monitoring report and communications in 2019, WCC acquired a spare leachate pump to reduce down time when a pump requires servicing and WCC intends to proactively maintain the forcemain in good working condition in a continuing effort to achieve a drained state in the leachate collection system.

Leachate pumping and disposal operating issues reported in the fall 2018 had an impact to groundwater quality in the sand and weathered clay units in monitoring wells located immediately down gradient of the leachate collection system (less than 10 m south of the leachate collection system and close to the south toe collector).

Concentrations of some Leachate Indicator Parameters in the sand unit spiked in November 2018, but the efforts from WCC in 2019 were successful in limiting the continued increases in concentrations. Concentrations have since stabilized or decreased in the sand and weathered clay units, confirming that these corrective actions should continue to be implemented. Since the hydraulic conductivity of the sand is greater than the weathered clay, elevated concentrations have been taking longer to dissipate in the weathered clay unit.

Golder contacted the MECP Ottawa District Office via email on July 9, 2020 to update them on the trigger exceedances and to notify them that no trigger exceedance was reported in the spring of 2020 following two previous exceedances showing an increasing trend and that there was no need to implement a contingency plan at this time.

In 2021, WCC continued to implement the proposed voluntary action plan to control potential increases in concentrations. Manganese concentrations in the weathered clay at OW-92-10 in November 2021 marked a confirmed increase and the ammonia concentration in the intact clay at MW-07-1B also marked a confirmed exceedance. These two confirmed exceedances were reported to the MECP in an email dated February 4, 2022. It was proposed that the confirmed exceedances would be assessed in the attached Golder report (Appendix 1) and a contingency plan proposed, if required. It is interpreted that these exceedances are not the result of further landfill leachate migration. Therefore, Golder does not recommend any further contingency action in addition to the voluntary action WCC is currently taking but will continue to assess the exceedances and trends in subsequent monitoring sessions.

It is WCC's intention to continue implementing in 2022 the proposed voluntary action plan to control potential increases in concentrations.

A Phase II Environmental Site Assessment was conducted at the landfill by Intera (Intera, 2003). This assessment concluded that groundwater within the sand layer, the upper weathered clay and perhaps the deeper intact clay deposit on down-gradient lands has slightly elevated concentrations of parameters previously thought to be indicative of landfill leachate (e.g., boron, ammonia, TKN). However, there is no obvious spatial correlation of these parameters with proximity to the landfill or groundwater migration pathway. The lack of spatial correlation suggests that groundwater on down-gradient lands is representative of naturally elevated background groundwater quality associated with the Mer Bleue environment.

In addition, the groundwater and surface water trigger mechanism report prepared by Golder (Golder, 2007b) demonstrates a clear difference between up-gradient (north) and south property boundary water quality on the east side of the property, where there are not potential impacts from landfill activities. Naturally elevated parameters measured included boron, copper, iron, arsenic, lead, sodium, alkalinity, bicarbonate, TDS, COD and chloride.

7.2 Leachate Water Quality Assessment

Prior to the construction of the leachate collection system (LCS) in 1991-1992, leachate was sampled and analysed in areas where surface breakout was observed. Breakout of leachate, when encountered, usually occurred at the down-gradient toe of the landfill.

The monitoring program for leachate quality has focused on the LCS. For the purpose of the annual monitoring report, leachate generated by the landfill is monitored at the down-gradient end of the south toe collector at L5 at the same time surface water is monitored. A more extensive leachate monitoring program is carried out throughout the year in accordance with a City of Ottawa Leachate Discharge Agreement for the discharge of treated leachate at the Robert O. Pickard Environmental Centre (ROPEC), the municipal wastewater treatment plant.

The leachate sampled is wastewater that has not been treated or subjected to natural attenuation. The landfill is underlain by a thick natural clay deposit which has a hydraulic conductivity, K, of less than 10^{-9} metres per second and as such performs as a natural liner. Therefore, leachate collected at the landfill is not leachate impacted groundwater, but rather it is predominantly precipitation that has infiltrated through the waste pile. It should be noted that leachate at the site could also consist of pore water from the underlying clay as a result of upward gradients and/or consolidation, noting that pore water release to the leachate collection system is slowed by the low hydraulic conductivity of the clay.

Landfill leachate is water that comes into contact with waste and leaches soluble material from the waste. Its composition is a function of the solid waste characteristics, prevailing meteorology, hydrogeology and parameters within the landfill such as pH, moisture content, degree of compaction, geometry, etc. Leachate is wastewater that dynamically alters not only with landfill age but also with changes in seasons and waste characteristics. The intrinsic biodegradability of municipal landfill leachate can be measured by a BOD:COD ratio. During the first several years of production, the BOD:COD ratio generally is in the 0.5 range. As the landfill ages, the ratio decreases to levels less than 0.1 suggesting a more or less biologically recalcitrant organic composition (Andreottola et al., 1989). Also, the concentration of ammonia tends to increase with landfill age since ammonia is a by-product of the stabilization of organic matter (Elefiniotis et al., 1989), although at a dry waste facility such as the WCC Facility, ammonia concentrations can be expected to remain relatively low.

Leachate quality monitoring results for 2021 indicate that the leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Concentrations of field measured dissolved oxygen, ammonia, boron, potassium, and TKN show a generally increasing trend over time although boron concentrations have been relatively stable in recent years. The concentration of chloride was previously indicated to be increasing but has been stable for approximately five years. The concentrations of DIC and manganese, show a general decreasing trend over time although they have stabilized in recent years. Previously reported decreasing trend in hardness appears to be stabilizing. The concentrations of certain parameters remain above the surface water and groundwater quality near the site.

7.3 *Surface Water Quality Assessment*

The WCC Navan Facility is located on a watershed divide resulting in drainage of surface water to both the east and west of the site. The east side of the site drains to the Bear Brook or Mer Bleue drainage basin and the west side into the Mud Creek drainage basin which drains into Green's Creek. The Mer Bleue Bog is located immediately south of the site. Surface water samples are collected in the drainage course to the east, the west and in the perimeter of the Mer Bleue Bog.

For the purpose of surface water quality assessment, the background surface water quality is assumed to be represented by the data available from stations located in close proximity to the landfill and up-gradient of surface water flow. For the 2021 monitoring program, the PWQO is being applied for the purpose of water quality assessment at the surface water sampling stations.

A total of eleven surface water stations continue to be monitored on an on-going basis at this site. The monitoring stations have been located to obtain representative information on water quality up-gradient from the landfill at stations S1, S3, S15, S16 and S17 (background), on water quality at compliance sites down-gradient from the landfill at stations S5, S8 and S9 and on water quality in the Mer Bleue Bog at S10 (SW-W), S11 (SW-C) and S12 (SW-E). Monitoring locations SW-W, SW-C and SW-E are location references used by the NCC.

The up-gradient surface water quality is characterized by concentrations of the following parameters which exceed or are outside the PWQO: cobalt, copper, dissolved oxygen, iron, lead, phenols, total phosphorus. Occasional PWQO exceedances of cadmium, chromium, boron, and zinc have been observed in the past as well.

Surface water quality is generally consistent over time (with seasonal variability). An increasing trend in concentrations of alkalinity, chloride, and conductivity, can be observed at surface water station S1 over time. Previously observed overall increasing trends for concentrations of DIC, sodium, TDS, and hardness at surface water station S1, concentrations of alkalinity, ammonia, DIC and iron at surface water station S3, and concentrations of iron, magnesium, manganese, sodium and TDS at surface water station S15 appear to have stabilized, with seasonal variability remaining. Similarly, the previously observed decreasing trend in dissolved oxygen concentrations at surface water stations S3 appears to have stabilized with seasonal variability remaining. A slight increasing trend in magnesium is observed at S16 and S17. Hardness is also observed to be increasing at S16.

The current or historical increases in concentrations of parameters at these locations is not related to leachate impact as these stations are up gradient of the site.

The down-gradient surface water quality is characterized by dissolved oxygen, iron, and total phosphorus concentrations which exceed or are outside the PWQO. Occasional PWQO exceedances of boron, cadmium, cobalt, copper, chromium, phenols and zinc have been observed.

The concentrations of most of the parameters that exceeded the PWQO in the down-gradient control stations S10 and S11 during the May, August and November 2021 monitoring sessions were generally similar to or slightly elevated compared to the surface water quality at the up-gradient station S16 during

the spring monitoring session. During the fall monitoring session, parameter concentrations tended to be similar or lower than at S16.

Surface water quality at the control down-gradient stations is generally consistent over the years with no specific trends observed with the exception of boron. Boron concentrations at S10, S11, and S12 were previously elevated in the mid to late 1990s, but have since decreased and remained stable, at concentrations slightly higher or similar to up-gradient surface water at most up-gradient stations for approximately 20 years.

Surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. It becomes increasingly difficult to assess surface water site compliance with scattered data. The WCC Navan Facility is an engineered landfill site. Therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater-based trigger mechanism is the appropriate approach for the WCC Navan Facility. Surface water quality monitoring will continue at the site, with the samples analyzed for appropriate parameters of concern and evaluated for potential impacts. This approach was outlined in the approved Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The MECP has agreed that this is the preferred approach for the WCC Navan Facility.

7.4 Sediment Quality Assessment

Sediment samples were collected at three locations within the Mer Bleue Bog as per an agreement with the National Capital Commission (NCC). In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

Analytical results on the sediment samples indicate that no parameters exceed the CCME Guidelines for freshwater sediment except for arsenic at SED-E. This is the highest arsenic concentration reported at SED-E (9.1 ug/g) with the previous highest concentration reported in May 2009 (7 ug/g). The laboratory was requested to re-analyze the sample and similar results were reported. Arsenic, copper, chromium and nickel concentrations exceed the MECP Table 1 sediment criteria. The analytical results observed at the sampling locations are consistent with historical results observed at the respective locations.

Analytical results on the sediment samples indicate that boron exceeds MECP Table 2 and Table 4 soil criteria during the spring monitoring sessions at each sampling location. Boron also exceeded MECP Table 2 and Table 4 during the fall monitoring session at SED-W. Selenium exceeded the CCME soil criteria during the spring monitoring session at SED-E and SED-W. In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

The peat deposit in the Mer Bleue Bog predates any human activity in the area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink.

In 2002/2003, an assessment of the WCC Navan Facility operations was undertaken in support of a WCC-NCC (WSI-NCC) exchange of land parcels located south of the WCC Navan Facility along the

northern margin of the Mer Bleue. The assessment concluded that the landfill site had not caused impacts to soil, sediment, groundwater or surface water quality within the Mer Bleue. These findings were accepted by the NCC.

7.5 *Proposed 2022 Monitoring Program*

The proposed 2022 Environmental Monitoring Program is the same as was conducted in 2021, with the exception of VOCs which are proposed to be removed from the list of parameters of the groundwater monitoring program and sediment monitoring which is proposed to be discontinued (these proposed changes were also listed in the 2020 Annual Monitoring Report).

In groundwater samples, VOCs were detected at times in groundwater monitoring wells located immediately downstream of the waste footprint, with most occurrences of VOC detections happening in 2007 and 2008 in wells MW05-11 and MW05-8 when spikes were also experienced in other leachate indicator parameter concentrations. Even then, the VOC concentrations were well below the ODWQS with no recorded exceedance of ODWQS in down gradient wells with the exception of benzene concentrations at MW05-11 more than 10 years ago (in November 2007, May 2008 and November 2008) and MW05-8 (November 2008, December 2008 and May 2009). Some VOCs (relatively low concentrations of one or more of benzene, toluene or ethylbenzene) are sometimes detected in leachate samples (location L5) with some exceedances slightly above the ODWQS. It is proposed to continue monitoring VOCs in leachate and monitoring for VOCs in down gradient monitoring wells could be resumed if an increase in VOCs in leachate is observed.

As explained in Section 7.3, the MECP agreed that an excursion of landfill leachate would be apparent in the underlying stratigraphic units prior to a surface water impact and a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. Therefore, it is proposed to discontinue sediment monitoring and rely on the groundwater and surface water monitoring programs to assess off-site leachate impacts. With MECP concurrence, sediment monitoring could resume temporarily if leachate impacts and trigger exceedances are reported at the site.

As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer) as it was done since 2014.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during November 2021 monitoring session and will be monitored again in the spring of 2023.


NAVAN RD
S17
S1
S2
MW-05-1
(M.B.C.D)
LIMIT OF WASTE
EAST CELL
PUMP STATION
S8
S5
S9
S10
(SW-W)
MW-05-5
OW-92-1/8
MW-E
OW-92-9/11
MW-05-11
OW-95-9
OW-95-5/7
150 METRES

002465

8. LANDFILL GAS (LFG)

Golder Associates Ltd. (GAL) was retained to carry out the landfill gas monitoring program in 2021. The monitoring program undertaken was a continuation of the monitoring program already in place for this site and the results of the monitoring events undertaken are summarized below and presented in more detail in the GAL report provided in Appendix '2'.

8.1 *LFG Monitoring Results*

The report has been prepared to fulfill the reporting requirements outlined in Condition 110 of Environmental Compliance Approval No. A460702 dated April 16th, 2009.

LFG monitoring was undertaken on May 20th 2021, on August 25th 2021 and on December 16th 2021. At most locations monitored, methane gas was detected at concentrations lower than 1.25% by volume. Non-methane organic compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system that also serves as a passive ventilation system, with methane concentrations measured in excess of 1.25% by volume at the following locations (refer to Fig 2, Appendix "2"):

- MH-2 (G-18-a), MH-3 (G-13a), MH-4 (G12-a), and MH-5 (G-11a) in August 2021
- MH-7 (G5-a), MH-9 (G3-a) and MH-10 (G2a) in December 2021

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met by the Navan Facility based on the 2021 monitoring results.

The Navan Facility is designed with a buffer area and natural barriers. The site has a favourable hydrogeological setting whereby the site is underlain and surrounded by a thick clay deposit of low permeability. The depth below grade to the water table at the perimeter of the site is shallow. The depth of the landfill between the ground surface and the water table is less than 2.5 metres. It is generally considered that methane gas migration of any significance may extend for a distance of ten times the depth of the landfill between the ground surface and the water table. Based on site conditions, this 10:1 general rule would suggest that methane migration could extend for a distance of 25 metres. The north, west,

south and east sides of the landfill footprint are surrounded by buffer zones of 30 to 70 metres, 100 metres, 10 metres and 140 metres, respectively. Note that on the south side of the landfill a 10-metre buffer zone exists between the south limits of the waste mound and the VIA Rail right-of-way (ROW) and an additional buffer strip with a width of 100 metres exists to the south of the VIA Rail ROW. These buffers would therefore, under present groundwater conditions, provide adequate natural venting. The natural barriers and the provision of adequate buffer area present at the Navan Facility are the preferred method of dealing with potential LFG migration. Although no monitoring locations are available below surface at the property boundary, based on the presence of a buffer area and natural barrier system, it is anticipated that the Navan Facility met the property boundary requirements in 2021.

Hydrogen sulfide was not detected at any location during the 2021 monitoring events with the exception of the following locations, which reported relatively low detection (1 part per million or 1 ppm):

MH-6 (G6a), OW-94-2 (G8), OW-92-8 (G15), and Primary Tank #1 (G26d), all in May 2021.

In the past, venting of LFG could be observed at ground surface along the west side of the landfill between MHs. The LFG venting was only noticeable once the ground surface was covered with snow. In 2021, venting of LFG at ground surface was not noticeable.

During the May 2021 monitoring session, faint odours were noted at the site, while no odours were noted during the August and December monitoring sessions by the Golder field technician. Gas monitors installed in three on-site buildings including the scale house have not been triggered to date. The site maintains a log to record the date and time of any odour complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. In 2021, WCC personnel responded to one odour related complaints (received on October 14, 2021 from a resident west of the landfill).

It is noted that an interim LFG odour control system (refer to Section 6.4) was installed in 2011 and commissioned in April 2012. An extension to the LFG odour control system was installed in 2016, in 2017 and in 2019. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells (refer to Fig. 8.1). The additional vertical wells installed in 2017 and 2019 are intended to be part of the permanent LFG collection system. The purpose of this system is to control potential odorous emissions from the site until the full-scale LFG collection system is completed at the site. In 2021, construction of the permanent landfill gas collection system was started consisting of the construction of the 300 mm diameter HDPE landfill gas header pipe along the north, west and south perimeters of the waste footprint and construction of the concrete pads for the enclosed flare and abstraction plant.

In 2021 the interim LFG system operated for 8,252 hrs at an average of 391 scfm with a totalizer reading indicating 5,801,695 m^3 of landfill gas was recovered at a methane (CH4) concentration of approximately 49.5%. In 2021 a total of 2,871,839 m^3 of methane was flared using the interim landfill gas flaring system representing a 1.81% increase in methane recovery from 2020 to 2021.

8.2 *2019 Regulatory Reporting (NPRI, O.Reg. 127/01, O.Reg. 347, O.Reg 452/09 and Federal GHG)*

In 2021, Dillon Consulting Limited (Dillon) was retained by Waste Connections of Canada Inc. (WCC) to complete the following for the WCC Navan Facility:

- An assessment to determine the reporting requirements under the *National Pollutant Release Inventory* (NPRI) for the 2020 calendar year;
- Greenhouse Gas Reduction Reporting as required under *Ontario Regulation 347*;
- An assessment to determine the reporting requirements under *Ontario Regulation 390/18 – Greenhouse Gas Emissions: Quantification, Reporting and Verification (O.Reg. 390/18) and the Federal Government Greenhouse Gas Reporting for the 2020 calendar year;*
- An assessment to determine the reporting requirements under the Federal Government Greenhouse Gas Reporting Program (GHGRP) for the 2020 calendar year; and
- Assist with data input and submission for Environment Canada's online Single Window Information Manager (SWIM) module, if required.

The Navan Landfill has reported in past years to the NPRI program under ID 10967 and the GHGRP program under ID G10975. Site operations are identified by NAICS code number 562210 - Waste Treatment and Disposal.

Dillon conducted an assessment of facility operations and material usage in order to determine which substances must be reported to each of the programs mentioned above for the year 2020.

The reporting of releases to the NPRI is separated into on-site releases to air, land, and water, and off-site transfers for disposal and recycle for Part 1, 2 and 3 substances. Only air releases for Part 4 and 5 substances are reported to NPRI. Based on Dillon's assessment, the Navan Landfill was required to report in 2020 under the NPRI program for the year 2020. The total annual on-site releases and off-site transfers of the reportable NPRI Part 1, Part 2, and Part 3 substances are summarized in Table 8.1. Annual air releases for the NPRI Part 4 and Part 5 substances are also provided in Table 8.1.

The reports were made based on estimates and not measured values. Many of the parameters that are reportable are the result of handling high volumes of materials on site which are above the manufactured, processed or otherwise used reporting threshold, e.g. leachate and asbestos, but do not result in airborne emissions from the facility. The reporting of the emissions of particulate matter (PM10) was triggered by fugitive dust emissions from roads and is generally also reported by all industrial operations in Ontario due to very low thresholds.

It is noted that an interim landfill gas odour control system (refer to Section 6.4) was installed in 2011 and commissioned in April 2012. The purpose of this system is to control potential odorous emissions from the site until the full-scale landfill gas collection system is installed. The interim landfill gas odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical landfill gas extraction wells as shown on Figure 8.1.

Table 8.1: 2020 NPRI Reporting

NPRI Substance	On-site Releases (tonnes)			Off-site Transfers (tonnes)	
	Air	Land	Water	Disposal	Recycle
Part 1 Substances					
Asbestos	-	-	-	258.7 (on-site)	-
Part 2 Substances					
None	-	-	-	-	-
Part 3 Substances					
None	-	-	-	-	-
Part 4 Substances					
CO	72.80				
PM10	3.922	-	-	-	-
PM2.5	1.880	-	-	-	-
Part 5 Substances					
None	-	-	-	-	-

The reporting threshold for the federal Greenhouse Gas Emissions Reporting Program through Environment Canada is 10,000 tonnes of CO2 equivalent units.

Based on the assessment by Dillon, the Navan Landfill meets the GHG reporting requirements for the Federal reporting program and is therefore required to report for the 2020 calendar year. Table 8.2 provides the annual CO_2e release for comparison with the government reporting threshold. Only direct emissions are included in the annual totals shown. CO_2 emissions from biomass decomposition and emissions from indirect electricity consumption are not included in the federal threshold calculation for comparison purposes.

Table 8.2: 2020 GHG Reporting

Reporting Program	Annual CO_2e Release (tonnes)	Reporting Threshold (tonnes)	Required to Report (Y/N)
Environment Canada – Federal Greenhouse Gas Reporting	34,268	10,000	Y

The reporting threshold for O.Reg. 390/18 is 10,000 tonnes of CO_2 equivalent units. Table 8.3 provides the annual CO_2e release for comparison with the provincial government reporting threshold. Only direct emissions from stationary combustion are included in the annual totals shown.

The Navan Landfill is not required to report GHG emissions to the Province of Ontario as annual emissions are below the 10,000 tonnes CO_2e reporting threshold.

Table 8.3: 2020 Provincial GHG Reporting Requirements

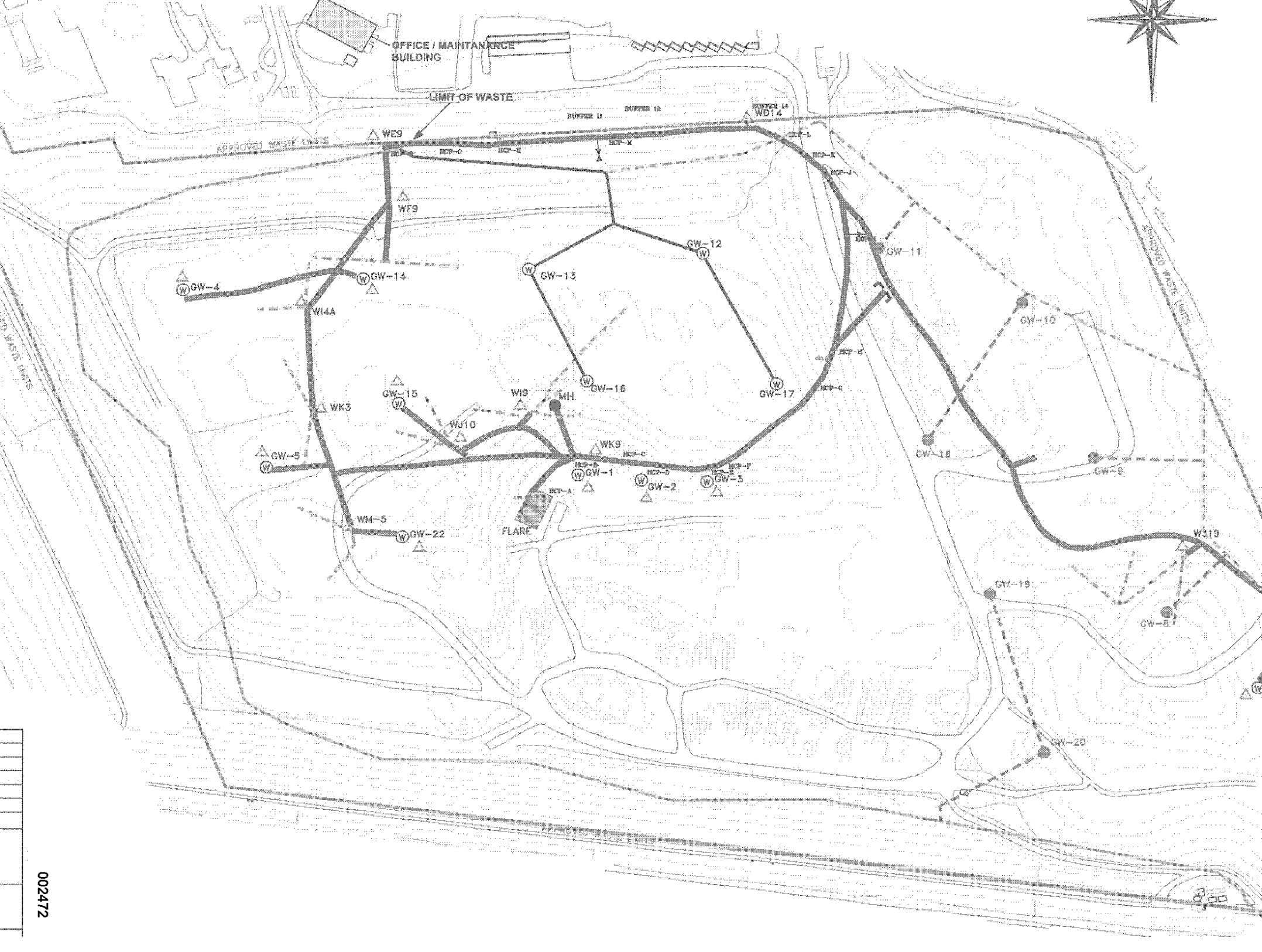
Reporting Program	Annual CO_2e Release (tonnes)	Reporting Threshold (tonnes)	Required to Report (Y/N)
O.Reg. 390/18 (with CO_2 from biomass)	14,604	-	-
O.Reg. 390/18 (without CO_2 from biomass)	1,055	10,000	N

Release Estimate Comparison: 2019 vs. 2020

Table 8.4 provides a comparison between 2019 and 2020 releases for reportable substances. Reasons for changes in release quantities for the two reporting years are provided for those substances/contaminants shown with a ±10% change in release quantity.

Table 8.4 – 2019 vs. 2020 Release Values

Substance	2019 Reported Value	2020 Reported Value	% Change	Reason/ Comments
Asbestos	Air = 0 tonnes Disposal = 369.4 tonnes Recycle = 0 tonnes	Air = 0 tonnes Disposal = 258.7 tonnes Recycle = 0 tonnes	(-) 30%	Decrease in asbestos waste received at the site
CO	Air = 75.54 tonnes	Air = 72.80 tonnes	(-) 4%	No significant change in air releases
PM_{10}	Air = 5,122 tonnes	Air = 3,922 tonnes	(-) 31%	Decrease distance traveled on unpaved roads
$PM_{2.5}$	Air = 2,056 tonnes	Air = 1,880 tonnes	(-) 9%	No significant change in air releases
CO_2e (Federal)	Air = 33,594 tonnes	Air = 34,268 tonnes	(+)2%	No significant change in GHG releases


OFFICE / MAINTANANCE BUILDING
LIMIT OF WASTE
APPROVED WASTE LIMITS
WE9
WD14
WF9
GW-12
GW-11
GW-4
GW-14
GW-13
WI4A
GW-10
GW-16
GW-17
GW-15
WI9
MH
WK3
WJ10
GW-18
GW-5
WK9
GW-9
GW-1
GW-2
GW-3
WM-5
GW-22
FLARE
WJ19
GW-19
GW-8
GW-20

002472

9. PROCESSING/RECYCLING

9.1 *Diversion of Waste and Other Materials from Disposal*

Diversion through the reuse and recycling of resources is a key activity in the on-going management and preservation of disposal capacity at the WCC Navan Waste Recycling and Disposal Facility. For example, all daily and intermediate cover needs are met by substitution of virgin soils with the re-use of significant quantities of impacted soils. Brick, concrete, asphalt and rubble are also recovered for re-use each year in the construction of access roads and container storage pads. Roofing shingles free of paper and other debris are also re-used on site as a sub-base for roads and pads over which is placed a layer of aggregate or recycled asphalt. In addition, steel, aluminum, wood and white goods are recovered daily from the active face of the landfill and recycled. The site also currently assists local landscape and tree removal contractors by receiving wood waste that is put through a grinding process and sent to markets off site for use as bio-mass or bulking agent for organic composting. Other waste materials removed from the site for recycling include cardboard, tires, glass, drywall, E-waste, large boulders and screened rock.

Materials received by the Navan Waste Recycling and Disposal Facility are those which IC&I generators, contractors and local residents have generally deemed to be waste and of no further value (i.e., post diversion at the source). Many of the waste generators serviced by waste collection contractors who bring waste to the site also divert materials from the landfill at their place of business prior to collection. Recycling within the IC&I sector is regulated by the Ministry of the Environment, Conservation and Parks under Regulations 101, 103 and 104. While the site receives post-diversion waste materials from the IC&I sector, WCC has procedures in place to screen the incoming waste for recyclable material in what is known as a "last chance harvest" which is a "positive" sort where the recyclable item must be removed from the mixed waste mass. In this case, the majority of the material is not recyclable (i.e., it is waste). This is very different than recycling from "source separated" material, which results in a "negative" sort, where the waste components are removed from what is predominantly recyclable material. WCC also encourages and receives "clean" recyclable materials such as wood, metals, drywall, glass and E-waste. Such materials are shipped to market in bulk in efforts to make the recycling of these materials more economically viable.

Management at the WCC Navan Waste Recycling and Disposal Facility is constantly searching for on-site and off-site diversion opportunities to ensure that approved disposal capacity is preserved and used for the disposal of waste material of least commercial value. Given the provincial policy and regulations concerning waste diversion from landfill, the WCC Facility will continue to support the City and the Province in their efforts to meet diversion targets while at the same time ensuring essential disposal capacity is available locally.

Approval for the treatment of contaminated soils was received from the MECP in June of 2015. The treatment of hydrocarbon contaminated soils was started soon after in the processing area of the site located within the waste footprint (refer to Figure 2.4). Treated soils are re-used on site as final cover material or as structural fill within the east buffer along the limit of waste. Soils which had not reached the treatment criteria by the end of 2021 remained on the treatment pad until the treatment objectives could be achieved or landfilled as waste.

The amount of waste diversion achieved from "last chance harvest" at the WCC Navan Waste Recycling and Disposal Facility over the past five years is summarized in Table 9.1.

Table 9.1: Diversion at Navan Waste Recycling and Disposal Facility (2017 - 2021)

Material	2017	2018	2019	2020	2021	5-Year Total
Off-Site recycling:						
Materials removed for off-Site recycling	10,249	14,712	11,025	6,017	5,074	47,077
On-Site reuse:						
Aggregate material re-used (rubble; brick; concrete; rock)	8,480	11,935	5,949	25,788	40,041	92,193
Asphalt, clean fill, clean shingles	7,262	5,623	11,151	7,916	8,120	40,072
Treated/re-used soils	31,096	31,726	67,249	35,249	95,846	261,166
Total Diversion (excluding daily cover soils)	**57,087**	**63,996**	**95,374**	**74,970**	**149,081**	**440,508**
Waste to Landfill	171,419	233,994	222,976	224,497	190,415	1,043,301
WCC Recycling and Disposal Facility "last chance harvest" diversion rate (excluding daily cover soils)	**25.0%**	**21.5%**	**29.9%**	**25.0%**	**43.9%**	**29.7%**

NOTE: All quantities are in tonnes

At the Navan Waste Recycling and Disposal Facility, loads of clean rubble, rock, asphalt, clean shingles or concrete that are received for disposal from a construction job site are set aside for re-use in the construction of on-site roads and pads. From 2017 to 2021, approximately 132,265 tonnes of these materials were diverted from disposal, avoiding the use of a more valuable resource such as quarried stone.

Heavy equipment, equipped with a large magnet and grappling attachments, is in use for the recovery of metals from within the waste received for disposal after it has been dumped at the landfill. Five people have been hired full-time to focus on recycling opportunities and are assisted by landfill personnel. All refrigerant containing appliances have the refrigerant removed by a licensed technician prior to recycling. Metals, recovered on site and stockpiled, are removed in bulk by a local contractor using tractor-trailers. Smaller loads of more valued metals such as copper, aluminum and brass, are shipped regularly to local scrap metal recyclers such as American Iron and Metal (AIM). In response to market interests in recycled wood products, wood is recovered from waste received at the site and then processed through a wood grinder to reduce the wood to a chip size that is suitable to an end market and then removed in bulk using tractor-trailers. Wood chips, shipped off-site to local mills, are re-used in the production of wood pellets or used directly as an alternative fuel source. Wood chips are also used as a bulking agent at organic composting sites. Glass is also collected and removed in bulk from the site for recycling. From 2017 to 2021, over 47,077 tonnes of materials have been shipped off site for recycling and diverted from disposal at the site.

As indicated in Table 9.1, the Navan Waste Recycling and Disposal Facility diverted over 149,081 tonnes of material from disposal in 2021, and over 440,508 tonnes during the past 5 years. This represents a "last chance harvest" diversion rate of 29.7% over the past 5 years and excludes the re-use of impacted soils for daily cover material. This is in addition to the diversion rate for IC&I waste that occurs at the source. WCC will continue to improve waste diversion and recycling initiatives at the Navan Facility and pursue economically viable waste diversion opportunities to help the local community and WCC clients achieve a better IC&I recycling rate.

9.2 *Recycling*

For years, an independent contractor has undertaken processing (recycling) of steel and wood at the active face of the landfill. In 2009, the use of heavy equipment and permanent staff were introduced to improve health and safety as well as productivity. Daily records of materials received for processing and materials recycled and/or reused are maintained on site. In 2021, there were no operational problems reported related to the processing (recycling) facility.

A total of 5,074 tonnes of waste materials consisting of aluminium, wood, glass, drywall, e-waste, white goods, tires and ferrous metals were recycled and removed from the site in 2021. At the end of the year some materials remained stockpiled for removal in bulk at a later date such as white goods and metals. Wood waste also remained stockpiled in the material recycling area for further size reduction with the use of a wood grinder prior to shipment to off-site markets.

Brick, aggregate, rock and rubble received at the site and re-used in 2021 as aggregate for road construction totalled 40,041 tonnes. Clean fill, clean shingles and asphalt re-used on site as final grading, road/pad construction and engineered fill totalled 8,120 tonnes.

Drywall material received at the site free of debris was stored in a designated area for recycling and when sufficient volumes were received, drywall was processed through a grinder and re-used in powder form as a soil amendment.

Glass received at the site free of debris was stored in a designated area and when a sufficient volume was received, the glass was shipped in bulk to a recycling facility in Montreal, Quebec or Guelph, Ontario.

Treatment of hydrocarbon contaminated soils was started at the site in 2015 following the receipt of MECP approval. Treated soils were re-used on site as final cover material and as structural fill along the waste limit within the east buffer. Soils which had not reached the treatment criteria by the end of 2021 remained on the treatment pad until the treatment objectives could be achieved or were landfilled as waste. In 2021, 95,846 tonnes of hydrocarbon impacted soils were treated at the recycling facility for re-use in the east buffer or re-used within the landfill footprint as construction materials.

10. PROPOSED 2022 OPERATIONS

10.1 *Landfill Development*

10.1.1 Phasing of Remaining Operations

In 2022, WCC will continue to develop the landfill in a manner consistent with their past operating practices and proceed with capital projects required for the site operations as presented in the revised D&O (Golder, 2008). Over the past number of years, landfilling has progressed in a counter-clockwise pattern starting in the northwest corner of the site (area indicated as north half of Phase 3 on Figure 10.1). To date waste has been placed over the entire permitted waste footprint of the landfill as shown on Figure 10.1 with Phases 2 and 3 having been completed. In areas where significant settlement has occurred, re-grading will be carried out. In 2022, landfilling will continue in the last completed cell identified as Phase 6 with closure work to be carried out over the completed north slope of Phase 6 and the east slope of Phases 1 and 6 as shown on Figure 3.2.

The landfill development strategy for the 2022 operating period is presented on Figures 10.1 A & B and 10.2 and described in more detail in Section 10.1.2.

10.1.2 Development Schedule

The schedule for developing the remaining landfill capacity is driven by the on-going rate of waste receipts for disposal and readily available constructed landfill air space. Under the revised ECA (April 2009), the life expectancy remaining for the WCC Landfill as of January 1st, 2022 is estimated to be 5.1-5.2 years (2027) based on future projected annual waste receipts of 344,750 tonnes/yr and a 5 year average waste density of 1.42 tonnes/m^3 (refer to Chapter 5). The actual life of the landfill will vary based on the actual annual fill rate, waste densities achieved, waste diversion and recycling initiatives at the landfill and the rate of air space development.

Other site operations will evolve together with the on-going landfilling operation as follows:

a) Landscaping

- Continue applying topsoil and providing additional landscaping to completed final cover areas on the north surface of Phase 4 as well as planting additional trees in previously completed areas. This will include removing trees previously planted and re-planting them in other areas of the landfill that have been completed.

b) Final Cover Construction

- Complete filling to final grade in the north area of Phase 6 and east areas of Phases 1 and 6 (refer to Fig. 3.2). Complete final cover construction in completed areas of fill.

c) Surface Water Management

- As waste elevations in Phase 6 increase above the natural grade of the east buffer, re-align surface runoff away from the waste fill areas.
- Raise grades in the east buffer adjacent to the waste footprint and grade to direct surface runoff away from the landfilled waste.
- Place cover clay in areas where final waste elevations have been reached to direct surface runoff water to collection swales and ditches.

d) Recycling Operations

- "Last Chance Harvest" of recyclable waste will continue in the active face using specialized heavy equipment as per present practice.
- Increase efforts to sort and divert waste from small vehicles at the small vehicle drop-off area and provide incentives to clients to sort materials at source prior to arrival at the site.
- Establish markets for new recyclable materials in efforts to increase the types of materials to be recycled at the site.
- Enhance treatment of contaminated soil.
- Continue the screening of rock out of the contaminated soils received for re-use on and off site.
- Expand the working pad in the area of Phase 8 further north for recycling activities.

e) Landfill Gas Flaring System

- Where required, add additional wells (horizontal and/or vertical) to the landfill gas collection system to control fugitive gas in fill areas and enhance the odour control system (e.g. GW-8, GW-9 and GW-10).
- Construct the permanent perimeter landfill gas forcemain along the east perimeter as designed by Golder Associates and connect it to the existing landfill gas system.
- Construct, install and commission the permanent abstraction and flaring plant.
- De-commission the existing temporary landfill gas flaring plant.

f) East Cell Construction (Phase 6)

- Complete landfilling on the north and northeast cell slopes in Phase 6 to above the perimeter grade to allow for improved surface runoff.
- Construct a barrier wall in the east buffer at the limit of waste.

g) Access Road Construction

- Construct an access road extending from the east of Phase 6 onto the top of Phase 1.
- Excavate the existing access road running north to south through the landfill west of Phase 6 and Phase 1.

10.1.3 Soil Management

The development of the remaining landfill capacity in the area of Phase 6 (east cell) requires filling and compacting material including side slopes. Soil management practices will include the following:

- Excavation of clay from the Phase 8 area will occur in the first three quarters of 2022;
- Sediment control measures will be taken so that inactive areas such as soil stockpile side slopes are seeded; silt fences are installed as required around the perimeter of disturbed areas; and surface runoff from the stockpile areas will be channeled to the internal ditch system which will drain to the site's stormwater retention ponds.

10.2 *Proposed Surface Water Control Improvements*

The current surface water management system is described in the "Design and Operations Report - Navan Landfill Site Expansion Approvals" (Golder 2008). The surface water management system operates at the site to maintain the pre-landfill drainage conditions to each watershed; to divert surface water and shallow groundwater flows originating upstream of the site around the landfill; to minimize the amount of surface water that comes into contact with waste; and to maximize the removal of suspended sediment from surface water generated prior to it's release to the downstream watersheds. Water that comes into contact with waste is collected and managed as leachate. For the revision and updating of the D&O plan, the existing surface water system was assessed in regards to the storm flows that can be transmitted and these flows were compared to the requirements of the Landfill Standards. Improvements were proposed where the existing system was deficient relative to the Standards. Further modifications have been proposed in support of the EPA/OWRA application for the landfill expansion. As a result of these assessments, WCC has proceeded with changes to the surface water management system at the site in order to improve the overall system. The proposed changes to the drainage system are described as follows:

- The east diversion ditch has been deemed a fish habitat and its construction included various features to promote and support fish habitat. This work was completed and continues to be maintained. However, base flow volumes to this ditch originating north of Navan Road will cease due to residential development and new storm water management practices on these lands.
- A storm water management pond was constructed in the southeast corner of the site and a ditch discharging surface runoff water to the pond was constructed along the east access road connecting the pond to the north drainage ditch. In 2022, inspection of sediment accumulation should be carried out and if required, dredging could be planned and budgeted for 2023. In 2019, construction of a

HDPE drainage culvert in the existing ditch alignment along the north and north-east edge of the waste cell was completed and the clay cut-off wall above the culvert was constructed in 2020. In 2022, the east cell wall at the waste limit will be completed.

- A stormwater management pond located in the northwest corner of the site was constructed in 2012 to manage runoff water from the west side of the site. Landscaping consisting of the planting of shrubs and trees in this area is on-going. Drainage chutes in the northwest and southwest corners of Phase 3 were constructed in 2015 to control surface runoff water from the completed surface of Phase 3 and Phase 4. As the access roads at the top of Phase 3 and Phase 4 continue to be extended, swales to promote drainage and seeding will also be carried out;

- Efforts will be made on a continuing basis to maximize the diversion of surface runoff from the active working face in order to reduce leachate generation. This will involve the redirection of internal ditching on an as-needed basis to direct runoff water from capped and stabilized areas to the perimeter ditch system.

10.3 *Leachate Management*

All leachate collected in the existing leachate collection system is designed to drain to a collection well and pump station located at the southeast corner of the existing waste footprint near Grids Q-16. A forcemain connection allowing treated leachate to be pumped directly to the municipal sewage system for conveyance to the city waste water treatment plant has been constructed and an agreement is in place with the City of Ottawa to discharge pre-treated leachate to the City sewer system. The forcemain was commissioned in early 2008 and has since been successfully in use. The use of the forcemain to discharge leachate from the site to the City of Ottawa sewer system is anticipated to continue throughout 2022. Connection to a new City sewer line located at the north-west corner of the site is anticipated in late 2022. This will effectively eliminate the need for the forcemain to run along the south shoulder of Navan Road and east shoulder of Renaud Road and reduce the length of the existing leachate forcemain in half.

Approved modifications to the pre-treatment/pumping system were completed in 2011. These improvements were initiated in advance of the east expansion cell construction to improve the treatment efficiency and capacity of the system and to increase the pump station flow rates as well as reduce maintenance. The system improvements were commissioned in early 2012 and will continue operations throughout 2022.

The "Navan Landfill Leachate Collection and Maintenance System Lateral Expansion Area – Quality Assurance/Quality Control Plan and Specifications" prepared by Golder Associates was submitted and approved by the MECP in 2009. Excavation and construction of the east expansion cell, Phase 1, was completed in 2015 with Phase 6 completed in 2019 which included the construction of the drainage layer and leachate drainage features and the east cell pumping system. This system will continue to be in full operation in 2022 discharging collected leachate from the east cells to the leachate treatment system. Completing the east wall within the east buffer should occur in 2022.

A vertical manhole, connected to the leachate collection system in the centre of the existing waste footprint (referred to as "the central manhole"), provides an alternative point of access to evacuate leachate from this

part of the leachate collection system in the event positive drainage to the wet well and pump station cannot be maintained due to sub-grade settlement. This manhole has been raised to an elevation of 101 metres and will require that it be raised with additional MH sections in 2022. Water levels within this manhole should be measured to assess the depth of leachate ponding on top of the leachate collection system in this area and if required, consideration be given to installing a pump at the base of this manhole.

10.4 *Surface Water, Groundwater and Leachate Monitoring*

The proposed 2022 Environmental Monitoring Program is the same as was conducted in 2021. As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer or fall) as it was done since 2014.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during the fall of 2021 monitoring session and will be monitored again in the spring of 2023.

The objectives of the 2022 environmental monitoring program are:

- to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702
- to assess any potential impacts on water quality at the site resulting from landfill operations
- to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill
- to document the chemical composition of groundwater and surface water in the vicinity of the landfill
- to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate
- to document the chemical composition of sediment in the Mer Bleue Bog

10.5 *Landfill Gas Management*

Construction of an approved landfill gas collection and flaring system to serve as an interim odour control system was completed in 2011. Commissioning of this system was carried out in April 2012. In 2022, the permanent landfill gas collection system will be constructed consisting of a closed flare and abstraction plant located at the south-east corner of the landfill. A gas collection forcemain extending along the south, west and north perimeter of the waste footprint was constructed in 2021. Extending and completing this forcemain along the east waste limit will occur in 2022. This forcemain will also be connected to the existing

landfill gas collection system. The exiting interim landfill gas flaring plant will be de-commissioned as soon as the new flaring plant is commissioned and running.

The landfill gas monitoring program undertaken by Golder Associates in 2021 will be continued in 2022. Monitoring of landfill gas is carried out three times per year at the property boundary and within facilities located on the site. Monitoring of the odour control and flaring system will also be part of this program.

Assessment of air emissions will again be undertaken for the landfill site in accordance with MECP Reg.127/01 and NPRI reporting requirements.

10.6 *Recycling and Small Vehicle Unloading Facility*

Recycling will continue at the WCC Landfill site in 2022. Heavy equipment equipped with a large magnet and grappler is used for the removal of metal and wood from waste received at the active face of the landfill. A small vehicle unloading pad consisting of a raised paved surface with concrete retaining walls has been constructed at the front of the site east of the new site entrance to serve as an area for small vehicles to unload and sort materials. Concrete bunkers for the receipt of small loads of recyclable materials such as clean fill, asphalt, aggregates, and roofing shingles were added just south of the scale house with access from the small vehicle pad to the east. This small vehicle unloading area improves safety at the site by eliminating the need for small vehicles to access the active face. The facility is grade separated such that bins for various types of wastes and recyclables are easily accessible (i.e., with the top of the bins at or near the ground surface in the drop off area). A utility road has been included to provide access to collect or drop off roll-off containers. Small vehicles are required to be weighed on the scales when entering and exiting the site.

Another recycling area is located within the waste footprint along the southern edge of the area identified as Phase 8. This area is used for the storage of processed materials for later removal in bulk and shipment to local markets. White goods containing refrigerants are also stored in this area for refrigerant removal by an on-site technician. Recycling activities in this area consist of tires, drywall, glass, clean shingles, metals and wood. In 2022, it is proposed to construct a recycling pad at the south end of Phase 1 and expand the east end of the existing pad north into Phase 8.

E-waste recycling services are also offered for the benefit of the local community.

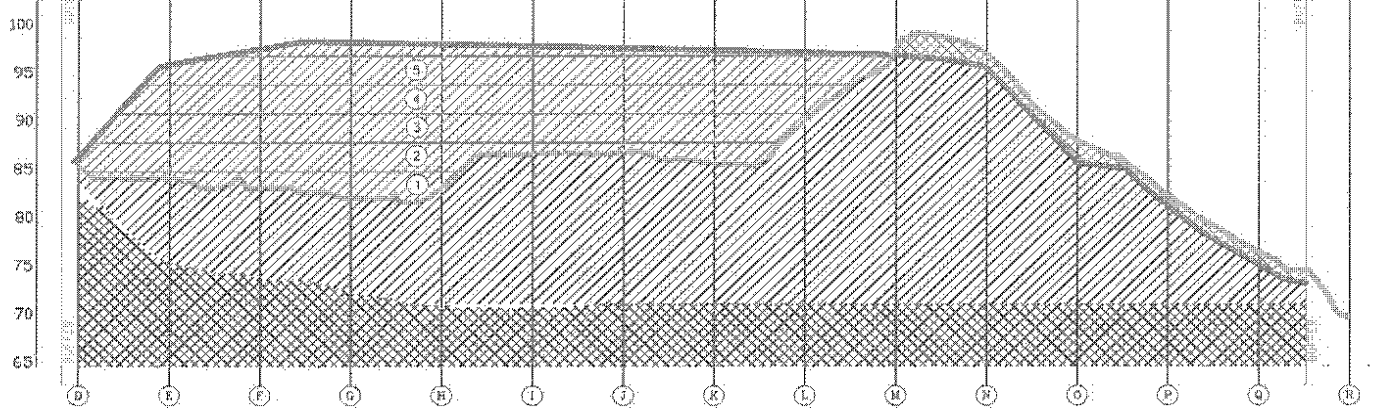
The treatment of contaminated soil as part of the recycling initiatives at the site was approved by the MECP in 2015. Contaminated soils will be treated to a level sufficient for an alternative use on-site and/or off-site. The treatment of impacted soils will continue throughout 2022.

These recycling activities will continue throughout 2022 as will efforts to expand on recycling services and finding new markets for recycled materials.

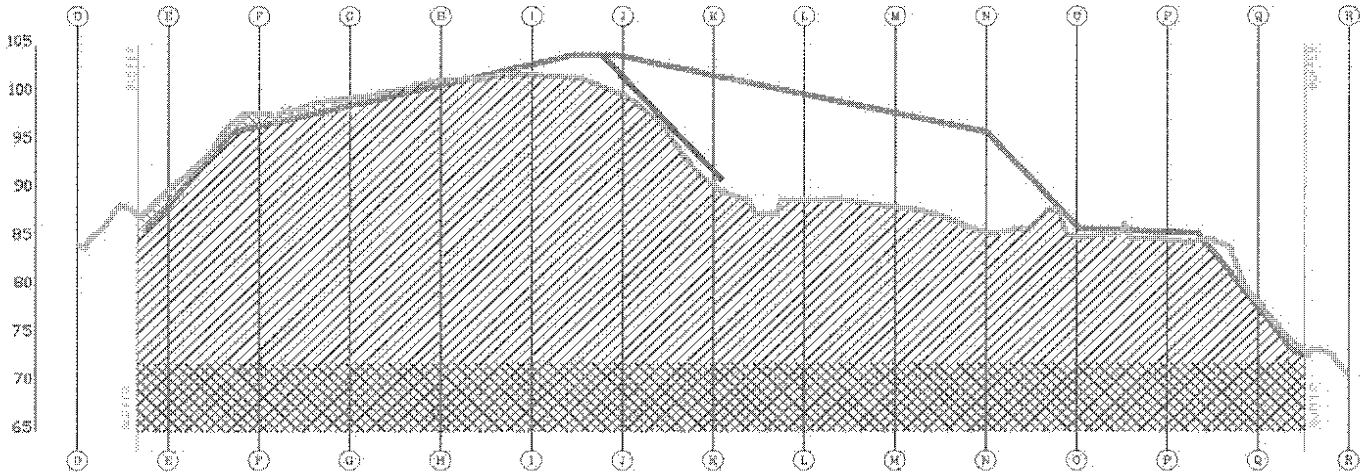
10.7 *Capital Improvements*

A major capital improvement project to take place in 2022 will be the completion of construction of the permanent landfill gas collection and flaring plant. Connecting the existing leachate forcemain to a new sewer line under construction on Navan Road is anticipated for the end of 2022. The acquisition of a new dozer is also being considered for 2022 to assist landfill operations. No other capital site improvement projects other than on-going access road construction, landscaping and minor site improvements are anticipated. The access road running along the north and east perimeter of Phase 6 will be extended onto the top of Phase 1 and connect to existing internal landfill access roads. Landscaping efforts will continue on the north, west, south and southeast facing slopes where cover construction has been completed. Preserving existing vegetation by transplanting trees to the east and north sides of the landfill in addition to adding new trees and shrubs will also continue.

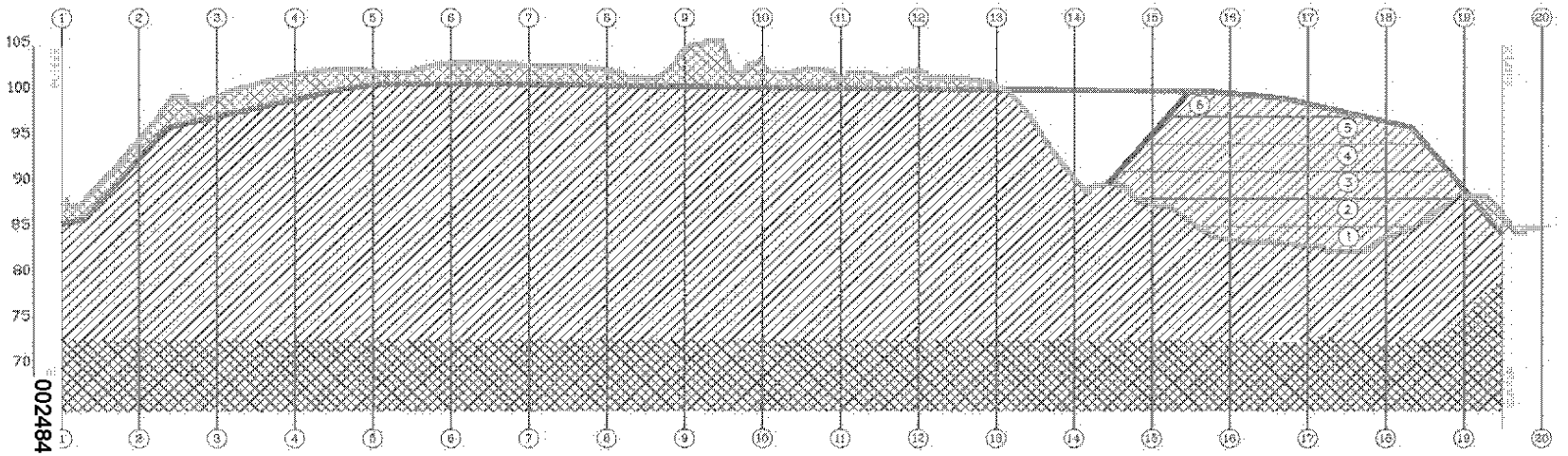
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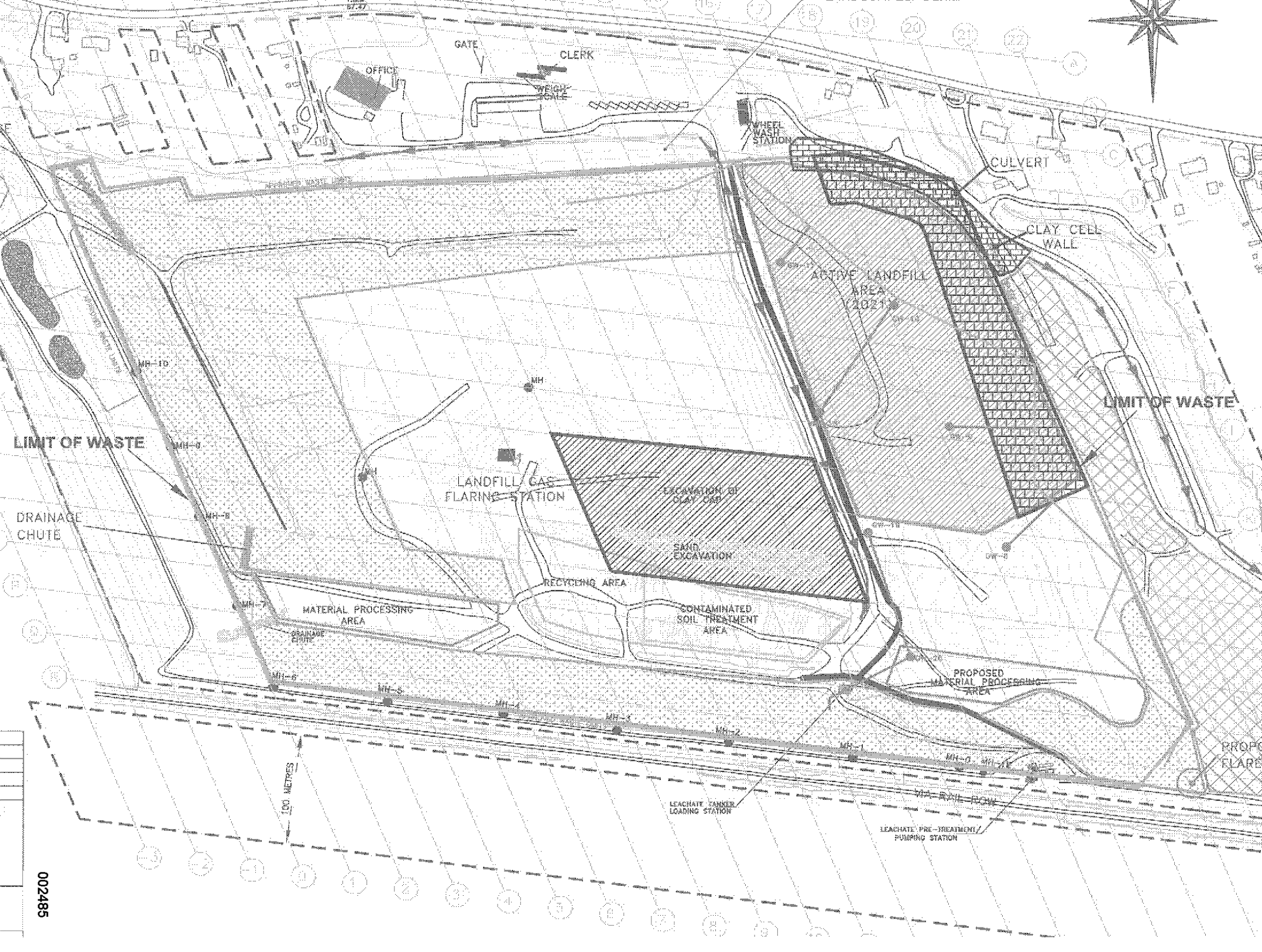
SECTION A2–A2



SECTION A3–A3



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GATE
CLERK
OFFICE
WEIGH SCALE
WHEEL WASH STATION
CULVERT
CLAY CELL WALL
ACTIVE LANDFILL AREA (2021)
LIMIT OF WASTE
LIMIT OF WASTE
MH-10
MH-9
MH
MH-8
LANDFILL GAS FLARING STATION
EXCAVATION OF CLAY CAP
SAND EXCAVATION
DRAINAGE CHUTE
RECYCLING AREA
MH-7
MATERIAL PROCESSING AREA
DRAINAGE CHUTE
CONTAMINATED SOIL TREATMENT AREA
PROPOSED MATERIAL PROCESSING AREA
MH-6
MH-5
MH-4
MH-3
MH-2
MH-1
MH-0
MH-R/W
MH-R/W-ROW
100 METRES
LEACHATE TANKER LOADING STATION
LEACHATE PRE-TREATMENT/ PUMPING STATION
PROPO
FLARE

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Appendix '1'

Golder 2021 Landfill Monitoring Report

WSP GOLDER

REPORT

2021 Landfill Monitoring

Waste Connections of Canada
Navan Waste Recycling and Disposal Facility
Ottawa, ON

Submitted to:

Waste Connections of Canada
Waste Connections of Canada
3354 Navan Road
Ottawa, Ontario
K4B 1H9

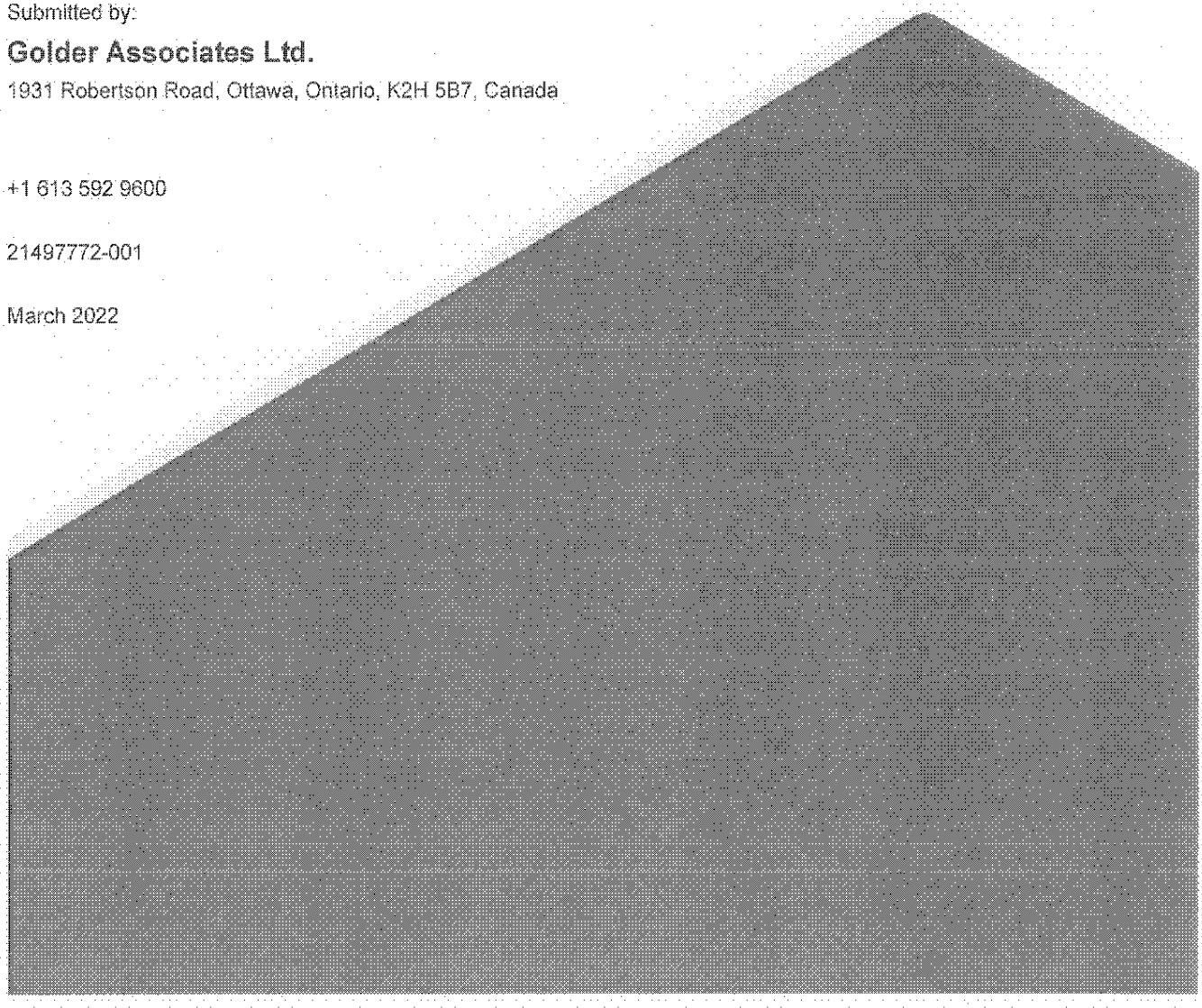
Submitted by:

Golder Associates Ltd.
1931 Robertson Road, Ottawa, Ontario, K2H 5B7, Canada

+1 613 592 9600

21497772-001

March 2022



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) 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 (WDS) Name	Navan Waste Recycling and Disposal Facility
Location (e.g. street address, lot, concession)	3354 Navan Road. Parts of Lots 2, 3 and 4, Concession IV
GPS Location (taken within the property boundary at front gate/ front entry)	460569.6m E 5030570.0m N (Zone 18)
Municipality	City of Ottawa (formerly City of Gloucester)
Client and/or Site Owner	Waste Connections of Canada
Monitoring Period (Year)	2021
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval (ECA) Number (formerly "Certificate of Approval" (C of A)) :	No. A460702
ector's Order No.:	N/A
Provincial Officer's Order No.:	N/A

Other:	N/A		
Report Submission Frequency	(•) **Annual** ( ) **Other**	Due March 31	
The site is: **(Operation Status)**	(•) **Open** ( ) **Inactive** ( ) **Closed**		
Is there an active waste transfer station at the site?	( ) **Yes** (•) **No**		
Does this WDS have a Closure Plan?	(•) **Not yet submitted** ( ) **Submitted and under review** ( ) **Submitted and approved**		
Total Approved Capacity	7,600,000 (excl. final cover)	*Units*	Cubic Metres
Maximum Approved Fill Rate	1,500	*Units*	Tonnes per Day
Total Waste Received within Monitoring Period (Year)	190,415	*Units*	Tonnes
Total Waste Received within Monitoring Period (Year) *Describe the methodology used to determine this quantity*	Weighed		
Estimated Remaining Capacity	1,252,969	*Units*	Cubic Metres
Estimated Remaining Capacity *Describe the methodology used to determine this quantity*	Estimation		
Estimated Remaining Capacity *Date Last Determined*	31-Dec-2021		
Non-Hazardous Approved Waste Types	[x] Domestic [x] Industrial, Commercial & Institutional (IC&I) [ ] Source Separated Organics (Green Bin) [ ] Tires	[x] Contaminated Soil [x] Wood Waste [ ] Blue Box Material [ ] Processed Organics [ ] Leaf and Yard Waste	[ ] Food Processing/Preparation Operations Waste [ ] Hauled Sewage Other: Asbestos waste. Petruscible waste are not accepted for landfilling.
Subject Waste Approved Waste Classes: Hazardous & Liquid Industrial *(separate waste classes by comma)*	None		

Year Site Opened *(enter the Calendar Year only)*	1960	**Current ECA Issue Date**	April 16, 2009, not incl. notices
Is your Site required to submit Financial Assurance?		(•) **Yes** ( ) **No**	
Describe how your WDS 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 ECA, 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:			

Have any measurements been taken since the last reporting period that indicate landfill gas volumes have exceeded the MOE limits for subsurface or adjacent buildings? (i.e. exceeded the LEL for methane)	○ Yes ◉ No

Groundwater WDS Verification:

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

Sampling and Monitoring Program Status:

1) **The monitoring program continues to effectively characterize site conditions and any groundwater discharges from the site. All monitoring wells are confirmed to be in good condition and are secure:**	◉ **Yes** ○ **No**	
2) **All groundwater, leachate and landfill gas sampling and monitoring for the monitoring period being reported on was successfully completed as required by ECA 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**
MW09-1A, 1B, 1C, and 1D	Those groundwater monitoring locations were not sampled during the winter of 2022 due to historical conditions of frozen water in the monitoring wells. Instead, they were monitored in August 2021. MW09-1D was dry at the time and no sample was collected at this location.	24-Aug-2021

3) a) Some or all groundwater, leachate and landfill gas sampling and monitoring requirements have been established or defined outside of a ministry ECA, authorizing, or control document *or Ministry concurrence.*	○ Yes ◉ No ○ Not Applicable	
b) If yes, the sampling and monitoring identified under 3(a) for the monitoring period being reported on was successfully completed in accordance with established protocols, frequencies, locations, and parameters developed as per the Technical Guidance Document:	○ Yes ○ No ◉ Not Applicable	If no, list exceptions below or attach additional information.

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

4) All field work for groundwater investigations was done in accordance with Standard Operating Procedures (SOP) 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	Golder Associates Ltd. standard practices were followed as described in the 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	In 2021, two confirmed (continued increase in concentration beyond the background range) trigger exceedances of the background range were reported in the weathered clay and intact clay stratigraphic units. Manganese exceeded at monitoring well OW-92-10 in the weathered clay and ammonia exceeded at monitoring well 07-1B in the intact clay.
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	Trigger exceedances are not interpreted to be a result of further migration of landfill leachate. Results will be monitored in the future.

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	In 2021, two confirmed (continued increase in concentration beyond the background range) trigger exceedances of the background range were reported in the weathered clay and intact clay stratigraphic units. Manganese exceeded at monitoring well OW-92-10 in the weathered clay and ammonia exceeded at monitoring well 07-1B in the intact clay.	

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.

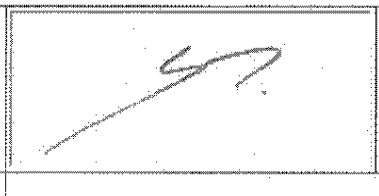
I have examined the applicable Environmental Compliance Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed, *as deemed appropriate for this site in my professional judgement,* the Monitoring and Reporting for Waste Disposal Sites Groundwater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

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

Recommendations:

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

○ **No changes to the monitoring program are recommended**	
◉ **The following change(s) to the monitoring program is/ are recommended:**	Due to on-going inability to collect water samples in monitoring wells MW09-1A through D located in Mer Bleue because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer or fall). It is also proposed to remove VOCs from the list of parameters of the groundwater monitoring program as well as discontinue sediment monitoring (see rationale in Section 9.0).
◉ **No Changes to site design and operation are recommended**	
○ **The following change(s) to the site design and operation is/are recommended:**	
Name:	Yannick Marcerou, M.Eng., P.Eng.
Seal:	

Signature:		**Date:**	16-Mar-2022
CEP Contact Information:			
Company:	Golder Associates Ltd.		
Address:	1931 Robertson Road, Ottawa, Ontario, K2H 5B7		
Telephone No.:	613-592-9600	Fax No. :	613-592-9601
E-mail Address:	Yannick_Marcerou@golder.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)	See Attachment A.

Distance(s)	N/A

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 ECA or relevant authorizing/control document(s) (if applicable):	(•) 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

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

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

All field work for surface water investigations was done in accordance with SOP, 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	Golder Associates Ltd. standard practices were followed as described in the 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 on the following page 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. ECA limit, PWQO, background	e.g. X% above PWQO
6) In my opinion, any exceedances listed in Question 5 are the result of non-WDS related influences (such as background, road salting, sampling site conditions)?	(•) **Yes** ( ) **No**	There are no exceedances as there is no surface water-related compliance criteria (see question 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**	The WCC Navan Facility is an engineered landfill site. Therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility. The MECP has agreed that this is the preferred approach for the WCC Navan Facility.
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	
9) **Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):**	( ) **Yes** ( ) **No** (•) **Not Applicable**	

Surface Water CEP Declaration:

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

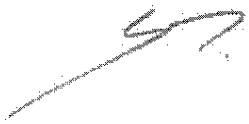
I have examined the applicable Environmental Compliance Approval and any other environmental authorizing or control documents that apply to the site. I have read and followed, *as deemed appropriate for this site in my professional judgement,* the Monitoring and Reporting for Waste Disposal Sites Groundwater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

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

Recommendations:

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

○ **No Changes to the monitoring program are recommended**	
◉ **The following change(s) to the monitoring program is/are recommended:**	it is proposed to discontinue sediment monitoring (see rationale in Section 9.0).
◉ **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	P.Eng. with demonstrated relevant experience.
Date:	16-Mar-2022
CEP Contact Information:	Yannick Marcerou, M.Eng., P.Eng.
Company:	Golder Associates Ltd.
Address:	1931 Robertson Road, Ottawa, ON, K2H 5B7
Telephone No.:	613-592-9600
Fax No. :	613-592-9601
E-mail Address:	Yannick_Marcerou@golder.com

Save As | Print Form

Attachment A

In the event that leachate-impacted water was to reach either stormwater management ponds or ditches on the site, the source of the impact would be determined and then intercepted, as required. If necessary, the affected pond and/or ditches could then be emptied through a temporary pumping operation and the pumped water could be combined with the leachate and directed for off-site treatment. Therefore, there are no surface water bodies potentially receiving waste disposal site effluent.

002506

Distribution List

10 copies	Waste Connections of Canada
1 copy	National Capital Commission
1 e-copy	Golder Associates Ltd.

Executive Summary

This report serves as the annual environmental monitoring portion of the 2021 site operations and monitoring report and presents the results of groundwater, surface water, leachate and sediment monitoring activities carried out during 2021 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility). This report has been prepared to fulfill the reporting requirements outlined in Conditions 135 and 136 of Environmental Compliance Approval (ECA) No. A460702.

The following executive summary highlights key points only; for complete information and findings it is necessary for the reader to examine the complete report.

Based on the groundwater levels obtained during the 2021 monitoring program, no significant change in groundwater flow patterns has been observed.

Groundwater at the WCC Navan Facility is monitored within four stratigraphic units identified as a shallow surface sand layer, an upper weathered clay zone, an intact (un-weathered) deposit of clay and a glacial till/upper bedrock zone. Monitoring wells are present up-gradient, at the down-gradient edge (used to assess compliance) and further down-gradient of the landfill in each of these units.

The hydrogeology of the site indicates a recharge area north of the landfill having a downward groundwater flow component. South of the site, the hydrogeology indicates a typical discharge area having a slight upward groundwater flow component. In general, shallow groundwater quality is variable, but a distinction is noted between groundwater quality up-gradient and down-gradient of the landfill in the weathered clay. Groundwater in the intact clay deposit up-gradient of the landfill is also slightly different from down-gradient groundwater quality. In the glacial till/ upper bedrock groundwater zone, only minor differences exist in the groundwater quality across the site.

The Ministry of the Environment, Conservation and Parks (MECP) has stated that the Reasonable Use Guideline is not applicable at this site. A compliance assessment of groundwater quality was completed using the accepted groundwater and surface water trigger mechanism (Golder, 2007b). The Leachate Indicator Parameters at all groundwater monitoring locations immediately down-gradient from the landfill which are used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2020 background range.

Leachate quality monitoring results for 2021 indicate that leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Leachate at the WCC Navan Facility continues to be relatively weak wastewater when compared to municipal landfill leachate.

Trigger concentration exceedances were reported in 2018. As a result, in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. WCC presented a proposed course of action to address these exceedances and implemented it in 2019, in a continuing effort to achieve a drained state in the leachate collection system.

WCC's efforts were successful in limiting the continued increases in concentrations. Concentrations have since stabilized or decreased in the sand and weathered clay units, confirming that these corrective actions should continue to be implemented.

In 2021, there were two confirmed exceedances (continued increase in concentration beyond the background range), manganese concentration in the weathered clay at OW-92-10 in November 2021 and the ammonia concentration in the intact clay at MW-07-1B in November 2021. These two confirmed exceedances were reported to the MECP in an email dated February 4, 2022. It was proposed that the confirmed exceedances would be assessed in this report and a contingency plan proposed, if required. It is interpreted that these exceedances are not the result of further landfill leachate migration. Therefore, Golder does not recommend any further contingency action in addition to the voluntary action WCC is currently taking but will continue to assess the exceedances and trends in subsequent monitoring sessions. The Mer Bleue Bog is located immediately south of the site. Surface water samples are collected in the drainage course to the east, the west and in the perimeter of the Mer Bleue Bog. Surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. The WCC Navan Facility is an engineered landfill site; therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater based trigger mechanism is the appropriate approach for the WCC Navan Facility.

Sediment samples were collected at three locations within the Mer Bleue Bog as per an agreement with the National Capital Commission (NCC). In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

The peat deposit in the Mer Bleue Bog predates any human activity in the area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink.

The proposed 2022 Environmental Monitoring Program is the same as was conducted in 2021, with the exception of VOCs which are proposed to be removed from the groundwater monitoring program and sediment monitoring which is proposed to be discontinued (see Section 9.0). As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer or the fall depending on site conditions) as has been done between 2014 and 2021.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during the November 2021 monitoring session and will be monitored again in the spring of 2023.

Table of Contents

EXECUTIVE SUMMARY i

1.0 INTRODUCTION 1

2.0 FIELD PROCEDURES 1

2.1 Objectives 1

2.2 Environmental Monitoring Program 2

2.2.1 Groundwater Component 2

2.2.2 Leachate Component 3

2.2.3 Surface Water 4

2.3 Sediments 5

2.4 Status of Monitoring Well Network 5

3.0 WATER LEVEL DATA 6

3.1 Groundwater Levels 6

3.1.1 Up-Gradient Control Wells 6

3.1.2 Immediate Down-Gradient Wells and Wells in Line with Immediate Down-Gradient Wells 6

3.1.3 Mer Bleue/Down-Gradient Control Wells 7

3.1.4 Horizontal Hydraulic Gradients 7

3.2 Surface Water Flow Measurements 8

4.0 GROUNDWATER QUALITY ASSESSMENT 8

4.1 Quality Assurance/Quality Control 9

4.2 Up-Gradient Control Wells 10

4.2.1 Sand Layer 10

4.2.2 Weathered Clay Deposit 10

4.2.3 Intact Clay Deposit 11

4.2.4 Glacial Till/Upper Bedrock Zone 11

4.3 Mer Bleue/Down-Gradient Control Wells 12

4.3.1 Sand Layer 12

4.3.2 Weathered Clay Deposit 12
4.3.3 Intact Clay Deposit 13
4.3.4 Glacial Till/Upper Bedrock Zone 13
4.4 Results 14
5.0 LEACHATE CHARACTERISTICS 15
6.0 GROUNDWATER COMPLIANCE ASSESSMENT 17
6.1 Compliance Mechanism 17
6.2 Immediately Down-Gradient Wells Used to Assess Compliance 18
6.2.1 Sand Layer 18
6.2.2 Weathered Clay Deposit 19
6.2.3 Intact Clay Deposit 19
6.2.4 Glacial Till/Upper Bedrock Zone 20
6.3 Results 20
6.3.1 Confirmed Exceedances and Proposed Course of Action 22
7.0 SURFACE WATER QUALITY ASSESSMENT 23
7.1 Quality Control/Quality Assurance 23
7.2 Surface Water Quality Monitoring 23
7.2.1 Up-Gradient Control Stations 24
7.2.2 Down-Gradient Control Stations 25
7.3 Surface Water Compliance Assessment 26
8.0 SEDIMENTS 26
9.0 PROPOSED 2022 MONITORING PROGRAM 28
10.0 LIMITATIONS AND USE OF REPORT 29

002511

TABLES

Table 1a: Summary of Water Sampling Stations for May 2021

Table 1b: Summary of Water Sampling Stations for August 2021

Table 1c: Summary of Water Sampling Stations for November 2021

Table 2: List of Parameters Analyzed or Calculated in 2021

Table 3: 2021 Monitoring Well Network Condition Survey

Table 4: Summary of Analytical Results – Sediments (May 2021)

Table 5: Summary of Analytical Results – Sediments (November 2021)

FIGURES

Figure 1: Key Plan

Figure 2: Site Plan

Figure 3: Hydraulic Head Profiles

Figure 4: Piper Trilinear Diagram – Sand Deposit (May 2021)

Figure 5: Piper Trilinear Diagram – Sand Deposit (November 2021)

Figure 6: Piper Trilinear Diagram – Weathered Clay Deposit (May 2021)

Figure 7: Piper Trilinear Diagram – Weathered Clay Deposit (November 2021)

Figure 8: Piper Trilinear Diagram – Intact Clay Deposit (May 2021)

Figure 9: Piper Trilinear Diagram – Glacial Till / Upper Bedrock Zone (May 2021)

APPENDICES

APPENDIX A
Record of Borehole Sheets

APPENDIX B
Laboratory Certificates of Analysis

APPENDIX C
Groundwater Level Records

APPENDIX D
Groundwater Results of Field and Laboratory Chemical and Physical Analyses

APPENDIX E
Leachate Results of Field and Laboratory Chemical and Physical Analyses

APPENDIX F
Groundwater Leachate Indicator Parameter Concentrations

APPENDIX G
Surface Water Results of Field and Laboratory Chemical and Physical Analyses

APPENDIX H
MECP Correspondence

002513

1.0 INTRODUCTION

This report serves as the 2021 annual monitoring report and presents the results of monitoring activities carried out during 2021 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility).

The WCC Navan Facility is a 91.87 hectare (ha) waste management facility that includes a 40 ha landfill, as well as processing (recycling). The site is located on parts of Lots 2, 3 and 4, of Concession IV, Ottawa Front in the City of Ottawa (formerly the city of Gloucester), Ontario (see Key Plan, Figure 1). This site has been in operation since 1960 and operates under Environmental Compliance Approval (ECA) No. A460702. In April 2009, WCC received *Environmental Protection Act* approval for the expansion of the WCC Navan Facility.

The monitoring program undertaken in 2021 by Golder Associates Ltd. (Golder) is outlined in Tables 1a through 1c. Monitoring to date at the WCC Navan Facility consists of water quality analysis of surface water, groundwater and leachate. The 2021 monitoring program was a continuation of the monitoring program carried out in 2020 and followed the program outlined in Conditions 109 and 112 of ECA No. A460702 and Condition 10.1 of the Conditions of Environmental Assessment Approval. As per Condition 109 of ECA No. A460702, the monitoring program includes sampling of the monitoring wells located in BH09-1, in order to assess the groundwater quality in the Mer Bleue Bog. The original monitoring program indicated that the wells would be sampled during the winter, when the Mer Bleue Bog is frozen and the wells are accessible. However, the groundwater in the monitoring wells has frequently been frozen during these events. In the 2013 monitoring report (Golder, 2014), it was proposed to sample them during the summer, rather than winter, and this recommendation has carried forward to present (monitoring is now completed either in summer or in the fall, depending on site conditions). Groundwater samples were successfully collected at monitoring well MW09-1A, MW09-1B, and MW09-C, during the summer monitoring session (no sample was collected from monitoring well MW09-1D due to dry conditions).

In addition, sediment quality monitoring which started in 2000 at the request of the National Capital Commission (NCC) at three locations within the Mer Bleue Bog is also documented in this report. Results of landfill gas, noise and odour monitoring undertaken in 2021 are provided under separate covers in Attachments 2 and 3.

2.0 FIELD PROCEDURES

2.1 Objectives

The objectives of the 2021 water quality monitoring program were:

- to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702
- to assess any potential impacts on water quality at the site resulting from landfill operations
- to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill
- to document the chemical composition of groundwater and surface water in the vicinity of the landfill
- to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate
- to document the chemical composition of sediment in the Mer Bleue Bog

2.2 Environmental Monitoring Program

2.2.1 Groundwater Component

The 2021 groundwater monitoring program followed the program outlined in Conditions 109 and 112 of ECA No. A460702 and satisfies objectives listed above. Water quality monitoring at the WCC Navan Facility was initiated in 1981. Since 1991, semi-annual monitoring programs were undertaken. Observation wells were added in 1992, 1994, 1995, 1998, 2000, 2005, 2007, 2009, 2010 and 2011. Groundwater monitoring sessions were carried out on May 26, August 24, and November 30, 2021. The groundwater monitors are outlined in Tables 1a, 1b and 1c and illustrated on the Site Plan (Figure 2). Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected in November 2021. The monitoring wells screened in the intact clay deposit and in the glacial till/upper bedrock zone will be sampled again in the spring of 2023.

The approved groundwater monitoring program was followed, except that as discussed in Section 1.0, groundwater monitoring locations BH09-1A, BH09-1B, BH09-1C and BH09-1D were not sampled during the winter of 2021 due to historical conditions of frozen water in the monitoring wells. Monitoring wells BH09-1A, BH09-1B, and BH09-1C were sampled during the summer session on August 24, 2021 (monitoring well BH09-1D was dry and therefore no sample could be collected at the time).

Detailed logs of the subsurface conditions encountered in each borehole are provided on the Record of Borehole sheets in Appendix A for most of the groundwater monitors included in the 2021 groundwater monitoring program. The top of pipe and ground surface elevations at each groundwater monitor location were surveyed with reference to geodetic datum following completion of the corresponding borehole drilling and groundwater installation program. The top of pipe for each of the monitoring wells included in the groundwater monitoring program were re-surveyed by WCC during November 2011 to account for any movement of the monitors over time.

The groundwater levels in the monitors included in the sampling sessions were measured on May 19, 2021 and November 23, 2021.

All monitors sampled during 2021 were developed through the removal of at least one standing volume of water using dedicated samplers which have been provided in each groundwater monitor. Sampling of groundwater was generally performed one week after monitor development, because the wells recover slowly.

As part of the Quality Assurance/Quality Control (QA/QC) program, a total of five field groundwater samples duplicates were prepared (two in the spring and three in the fall) along with three field blanks (one in the spring, one in the summer, and one in the fall) and three trip blanks (one in the spring, one in the summer, and one in the fall).

The temperature, pH and electrical conductivity of the groundwater samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private certified analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The sample preparation and preservation protocol provided below was followed for the groundwater samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, hardness (calcium and magnesium), potassium, sodium, manganese and zinc	plastic bottle, field filtered to 0.45 microns and preserved to pH<2 with nitric acid
total dissolved solids (TDS), alkalinity, sulphate, nitrate, nitrite, chloride, bicarbonate, and carbonate	plastic bottle, unfiltered and unpreserved
ammonia, total phosphorus, phenols, COD and TKN*	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
benzene, toluene, ethylbenzene, m/p-xylene, o-xylene, 1,1-dichloroethane, methylene chloride and vinyl chloride	amber glass septum vial with no headspace, unfiltered and preserved to pH<2 with hydrochloric acid or sodium bisulphate

Notes: * Organic nitrogen calculated based on laboratory ammonia and TKN concentrations.

Paracel Laboratories Ltd. (Paracel) in Ottawa, Ontario performed all laboratory chemical and physical analyses on the groundwater samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The reportable detection limits (RDLs) for the specific groundwater analyses were generally commensurate with the standards established in the Ontario Drinking Water Quality Standards, Objectives and Guidelines (referred to as ODWQS, MOE, 2006, revised January 1, 2020).

2.2.2 Leachate Component

The leachate monitoring program followed the program outlined in Conditions 109 and 112 of ECA No. A460702. Leachate quality analysis was undertaken on samples obtained from the pump station (L5) during the May 27, August 24 and November 24 monitoring sessions as outlined in Tables 1a through 1c. The location of the leachate monitor is illustrated on the Site Plan (Figure 2).

As part of the QA/QC program, one field blank and one trip blank for the volatile organic compounds (VOCs) were prepared during the August sampling session.

The temperature, pH, electrical conductivity and dissolved oxygen of the collected leachate samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All leachate samples were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2.

The sample preparation and preservation protocol outlined below was followed for the leachate samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, hardness (calcium and magnesium), potassium, sodium and zinc	plastic bottle, field filtered to 0.45 microns and preserved to pH<2 with nitric acid
TDS, alkalinity, sulphate, nitrate, nitrite, chloride, total suspended solids (TSS), and biochemical oxygen demand (BOD)	plastic bottle, unfiltered and unpreserved
ammonia, total phosphorus, phenols, COD and TKN*	amber glass, unfiltered and preserved to pH<2 with sulphuric acid
dissolved inorganic carbon (DIC)**, dissolved organic carbon (DOC)	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
benzene, toluene, ethylbenzene, m/p-xylene, o-xylene, 1,1-dichloroethane, methylene chloride and vinyl chloride	amber glass septum vial with no headspace, unfiltered and preserved to pH<2 with hydrochloric acid or sodium bisulphate

Notes:
* Organic nitrogen calculated based on laboratory ammonia and TKN concentrations.
** Dissolved inorganic carbon (DIC) calculated based on laboratory dissolved organic carbon (DOC) and total dissolved carbon

Paracel performed all laboratory chemical and physical analyses on the leachate samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The RDLs for the specific leachate analyses were commensurate with the standards established in the ODWQS (MOE, 2006, revised January 1, 2020).

2.2.3 Surface Water

The 2021 surface water monitoring program followed the program outlined in Condition 109 of ECA No. A460702. The 2021 surface water monitoring program is outlined in Tables 1a through 1c and monitoring stations are illustrated on Figure 2. Surface water samples were obtained on May 27, August 24, and November 24, 2021.

The only deviations from the approved surface water monitoring program were due to dry or stagnant conditions. Surface water monitoring station S5 was not sampling May 2021, stations S5, S8, S10, S11, and S16 were not sampled in August 2021 and station S5 in November 2021.

The estimation of surface water flow was obtained concurrently with surface water sampling on May 27, August 24 and November 24, 2021.

One field duplicate was prepared during the May, August, and November sampling sessions as part of the QA/QC program.

The temperature, pH, electrical conductivity and dissolved oxygen of the surface water samples were measured in the field at the time of sample collection. All field instruments were calibrated in the field prior to use. All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The same preparation and preservation protocol below was followed for each of the surface water samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, hardness (calcium and magnesium), potassium, sodium, manganese and zinc	plastic bottle, unfiltered and preserved to pH<2 with nitric acid
TDS, alkalinity, sulphate, nitrate, nitrite, chloride, TSS, and BOD	plastic bottle, unfiltered and unpreserved
ammonia*, total phosphorus, dissolved organic carbon (DOC), phenols, COD and TKN	amber glass bottle, unfiltered and preserved to pH<2 with sulphuric acid
dissolved inorganic carbon (DIC)	amber glass bottle, unfiltered and unpreserved

Notes: * Unionized ammonia calculated based on laboratory ammonia concentration, field temperature and pH measurements.

Paracel performed all laboratory chemical and physical analyses on the surface water samples. The Report of Analyses sheets from Paracel are provided in Appendix B. The RDLs for the specific surface water analyses were generally commensurate with the standards established in the Provincial Water Quality Objectives (referred to as PWQO, MOE, 1994, reprinted 1999).

2.3 Sediments

Sediment quality was monitored at three locations within the Mer Bleue Bog. The sampling locations are the same as the surface water sampling stations located within the bog, i.e., SED-W was obtained at SW-W, SED-C at SW-C and SED-E at SW-E (refer to Figure 2). Sediment quality monitoring in the Mer Bleue Bog was added to the monitoring program in 2000 and sediment samples were obtained in 2021 at three locations on May 27 and November 24.

All samples collected were entered on a Chain of Custody Form and placed in coolers with ice packs until they were delivered in person to a private analytical laboratory. Parameters analysed for this reporting period are listed in Table 2. The sample preparation and preservation protocol outlined below was followed for the sediment samples.

Analytical Parameters	Preparation and Preservation Protocols
arsenic, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, mercury, molybdenum, nickel, selenium and zinc	glass jar, with a plastic lid

Paracel performed all laboratory chemical and physical analyses on the sediment samples. The Report of Analyses sheets from Paracel are provided in Appendix B.

2.4 Status of Monitoring Well Network

During the spring monitoring session, the condition of each well within the monitoring well network at the site was assessed. A summary of the findings of the 2021 monitoring well network condition survey (properly cased, capped and locked) are provided in Table 3. At the time of the condition survey it was observed that all monitoring wells were in good condition.

3.0 WATER LEVEL DATA

3.1 Groundwater Levels

Records of monitoring well water elevations obtained in May and November 2021 are provided in Tables C-1 and C-2, Appendix C and are shown graphically on Figures C1 through C10. Water level changes for 2021 are discussed in the following sub-sections. It should be noted that all monitoring wells were resurveyed in 2011 which resulted in an increase in water elevations at some locations. This reflects the more accurate survey data and does not necessarily reflect changes in the groundwater elevations.

3.1.1 Up-Gradient Control Wells

The results of water levels measured at the up-gradient wells are shown graphically on Figure C1 through Figure C4 in Appendix C. There are no significant changes indicated in groundwater levels measured at these locations. The results indicate the shallow water table to be typically located approximately 1 to 2 metres (m) below ground surface at up-gradient wells OW-92-12 to OW-92-19 and MW05-1A to MW05-1D. There are only small fluctuations in water levels indicated for recent years, except for an unusually elevated groundwater level recorded in November 2017 at monitoring location OW-92-15 which returned to levels similar to historical levels during 2018.

Hydraulic head profiles for monitoring wells OW-92-12 to OW-92-19 for May and November 2021 are shown on Figure 3 illustrating a downward hydraulic gradient. The only variation in the direction of the hydraulic gradient is indicated in the upper 5.6 m to 10.4 m below ground surface in the spring and in the upper 6.4 m to 10.4 m in the fall, from a downward gradient to an upward gradient in the intact clay and weathered clay. This result may be attributed to a perched water table at the interface of the weathered clay and the intact clay. The relatively weak downward gradient from the sand to the weathered clay suggests a hydraulic interconnection between these units. The downward gradient is quite pronounced from the weathered clay down to the lower reaches of the intact clay deposit. It is interpreted that the intact clay deposit at depth beneath the landfill site acts as a barrier to groundwater flow.

3.1.2 Immediate Down-Gradient Wells and Wells in Line with Immediate Down-Gradient Wells

The results of the water levels measured at the large down-gradient nest of observation wells (OW-92-1 to OW-92-8 and MW05-8) are shown graphically on Figure C5 provided in Appendix C. These results indicate the shallow groundwater table lies within the sand deposit close to the original ground surface ranging in elevation from about 68.58 m to 71.46 m. Similar results are indicated at observation wells OW-92-9 to OW-92-11 and MW05-11 as well as OW-94-1 to OW-94-3 and MW05-R3 as shown graphically on Figures C6 and C7, respectively. Seasonal variations of nearly 1 m have previously been indicated. The high water levels generally occur during the wet spring whereas the lower water levels are recorded during the dry summer months and fall. Similar trends were observed in 2021 at most wells, with the higher spring elevations being more pronounced in the spring of 2021.

Hydraulic head profiles for the nest of observation wells OW-92-1 to OW-92-8 are presented on Figure 3. Unlike the up-gradient groundwater level profiles, the down-gradient profiles historically have indicated a slight upward vertical gradient and a localized weak downward gradient observed at times between the upper 6.3 m to 7.6 m within the weathered clay. Similar to 2019 and 2020, a slight downward gradient is observed from the sand to the weathered clay in 2021. A slight downward gradient was also observed from the weathered clay to the intact clay in the fall of 2021. The upper four wells historically have appeared to be hydraulically connected with near vertical or

hydrostatic water level profiles. A slight upward gradient from the bedrock to the weathered clay at the down-gradient boundary of the landfill would suggest there is upward vertical flow at this location, which would retard the potential for leachate migration into the deeper groundwater system. In the spring and fall of 2021, there was near vertical or a hydrostatic water level profile between the bedrock and weathered clay.

3.1.3 Mer Bleue/Down-Gradient Control Wells

Water levels obtained at the down-gradient control wells are shown graphically on Figures C8, C9 and C10 in Appendix C. These results indicate artesian conditions at OW-94-4 to OW-94-6, OW-95-5 to OW-95-7 and OW-95-9, while at OW-95-1 to OW-95-3, the shallow groundwater table is close to the ground surface within the upper sand, weathered and intact clay. Monitoring well OW-95-9 and OW-95-5 were frozen during the fall 2021 monitoring session.

Hydraulic head profiles for the nest of observation wells OW-95-5 to 95-7 and OW-95-9, as shown on Figure 3, illustrate an upward gradient through most of the profile with a weak downward gradient from the sand to the weathered clay. Historically, there has been an upward gradient through the entire profile. The presence of an upward gradient suggests upward groundwater flow is occurring south of the landfill. These results may also suggest upward leaching of porewater from the Champlain Sea clay, a brackish water deposit, may be occurring at the southern boundary of the landfill. North of the landfill, downward leaching of the clay porewater is indicated. Hydraulic gradients between 95-9 and 95-5 were unable to be determined the fall monitoring session due to frozen conditions.

3.1.4 Horizontal Hydraulic Gradients

The horizontal hydraulic gradient in the shallow sand deposit and weathered clay at this site is consistent with the relief of the property which changes in elevation by approximately 15 m to 18 m between the up-gradient and down-gradient boundaries of the landfill. Since the shallow water table appears to be a reflection of the original surface topography, horizontal hydraulic gradients are expected to vary between 0.007 in the plateau above the escarpment and 0.014 in the valley below. Water levels measured south of the landfill indicate shallow groundwater is flowing in a south to southwest direction with a small hydraulic gradient ranging between 0.005 and 0.025. The horizontal gradients in the bog area are influenced by seasonal fluctuations in the surface water levels. Hydraulic gradients could also be influenced by the leachate collection system (LCS) located along the south toe of the landfill. Keeping the LCS drained could result in a lowering of the water table at the southeast corner of the landfill by more than 3 m below the original grade at the southeast corner of the landfill and by 2 m at the southwest corner. This water table lowering could significantly influence the hydraulic gradients within the waste pile near the landfill's south boundary. A clay cut-off wall on the down-gradient side of the LCS was constructed to alleviate any potential problems related to lowering of the groundwater table south of the landfill.

Water levels measured in the up-gradient and down-gradient deep wells (OW-92-12 and OW-95-9) indicate a typical difference in water levels of about 6 m, which represents a hydraulic gradient of approximately 0.01 (0.008 in spring 2021) across the site within the glacial till/upper bedrock.

Many factors, such as mounding within the waste pile, the installation of the leachate collection system and the construction of waste cells with under drainage will influence the rate of groundwater flow across the site.

002520

3.2 Surface Water Flow Measurements

Estimates of surface water flow measurements for 2021 are summarised below along with the historical minimum and maximum flow rates estimated at each monitoring station.

Monitoring Station	Minimum Flow L/s	Maximum Flow L/s	Expected Dry Weather Flow L/s	Estimated Flow May 27, 2021 L/s	Estimated Flow Aug. 24, 2021 L/s	Estimated Flow Nov. 24, 2021 L/s
S-1	No flow	73	0.5 – 2	0.2	0.2	21
S-3	No flow	140	<0.5	No flow	0.4	No flow
S-5	No flow	No flow	No flow	Dry	Dry	No flow
S-8	No flow	5 – 10	0.5 – 2	No flow	Dry	No flow
S-9	No flow	94	2 – 5	0.2	1.6	7.0
S-10 (SW-W) [a]	No flow	No flow	No flow	No flow	No flow	No flow
S-11 (SW-C) [a]	No flow	No flow	No flow	No flow	No flow	No flow
S-12 (SW-E) [a]	No flow	No flow	No flow	No flow	No flow	No flow
S-15	No flow	120	0.3 – 2	3	No flow	1.5
S-16	No flow	56	No flow	8.3	Dry	No flow
S-17	No flow	44	0.5 – 2	No flow	No flow	13.0

Notes:
[a] Monitoring stations S-10 (SW-W), S-11 (SW-C) and S-12 (SW-E) are located at the northern edge of the Mer Bleue Bog and consist of stagnant bog water.

Input: ETB
Checked: RPM

4.0 GROUNDWATER QUALITY ASSESSMENT

Groundwater has been monitored at observation wells since 1981. However, since 1985, landfilling operations expanded over the original down-gradient observation wells which have since been replaced with the existing wells. Existing observation wells were installed in 1992, 1994, 1995, 1998, 2005, 2007, 2009, 2010 and 2011.

Groundwater at the WCC Navan Facility is monitored within four stratigraphic units identified as follows:

- a shallow surface sand layer at depths ranging from 1.5 to 2.5 m below original grade
- the weathered clay zone of a thick clay deposit at depths ranging from 3.5 to 4.5 m below original grade
- the intact clay deposit at depths ranging from 7 to 8 m below original grade
- glacial till/bedrock contact zone at depths ranging from 22.3 to 37.1 m below original grade

The two upper stratigraphic units, the sand and weathered clay units, were sampled for both the May and November monitoring events. The two lower stratigraphic units, the intact clay and near bedrock units, are sampled every 18 months. Groundwater samples from these units were collected in November 2021 and the next sampling session for the monitoring wells screened in these units will be in the spring of 2023. The observation wells monitored in 2021 are listed in Tables 1a, 1b and 1c and illustrated on Figure 2.

As previously discussed, Condition 109 of the ECA requires groundwater monitoring locations MW09-1A, MW09-1B, MW09-1C and MW09-1D to be sampled once per year. Due to expected frozen conditions in the winter, MW09-1A, MW09-1B, MW09-1C and MW09-D have been monitored during the summer sessions starting

in 2014. Due to dry conditions, no sample could be collected from monitoring well MW09-1D in August 2021. Data from these wells is being collected to assess the groundwater quality in the area of the Mer Bleue as part of the expansion of the landfill.

Current and historical analytical results for groundwater in all units are presented in Appendix D.

4.1 Quality Assurance/Quality Control

The 2021 QA/QC protocol included the following: (i) preparation of one laboratory trip blank and one field blank for the May and November 2021 monitoring session to be analyzed for VOCs; (ii) the collection and analysis of two blind groundwater sample duplicate for the May 2021 sampling session and (iii) two blind groundwater sample duplicates for the November 2021 sampling session. In addition, the laboratory performs equipment blanks as an internal method of QA/QC.

Analytical results on blind sample duplicates are deemed to be outside of acceptable tolerance limits if the RPD between the original sample and its duplicate is greater than 50% when both analytical results are between 10 and 20 times the RDL or if the RPD is greater than 30% when both analytical results are greater than 20 times the RDL.

All QA/QC results for groundwater were within acceptable tolerance limits during the May 2021 monitoring session, except for the TKN concentration in the sample collected from MW95-8 (identified as 95-8 in the laboratory report) and its duplicate (identified as Dupe-3 in the laboratory report). A data check was requested for the sample collected at MW95-8 in May 2021 and its duplicate; it was determined that there was an error on the original and duplicate TKN concentrations and a revised report was issued. Following the revised report, the TKN concentration does not exceed the acceptable tolerance limits. MW-95-8 and its duplicate had TKN concentrations consistent with historical results.

Three blind groundwater sample duplicates were analyzed during the November 2021 session. All QA/QC results for groundwater were within acceptable tolerance limits during the November 2021 monitoring session except for the copper concentrations, iron concentrations, and phosphorous concentrations in the sample collected from MW95-8 (identified as 95-8 in the laboratory report) and its duplicate (identified as Dupe-2 in the laboratory report) as well as the manganese concentrations in the sample collected from MW92-7 (identified as 92-7 in the laboratory report) and its duplicate (identified as Dupe-3 in the laboratory report). The sample collected at MW95-8 and its duplicate were re-analyzed by the laboratory and the results demonstrated that the QC on the original sample concentrations was acceptable. Copper and iron concentrations are consistent with historical results for both MW95-8 and its duplicate. The phosphorous concentration reported at MW95-8 in the fall was elevated compared to recent historical concentrations, but still within historical concentrations at this location. Manganese concentrations reported at MW92-7 in the primary and duplicate samples were both within the range of historical concentrations for this parameter at this location (which have been typically variable) and the laboratory could not explain the discrepancy.

It is believed that the discrepancies noted should not affect the interpretation of the groundwater results.

The results of the VOCs analyses of the field blanks and trip blank (identified respectively as Field Blank and Trip Blank in the laboratory report from the May and November 2021 monitoring sessions) were within acceptable tolerance limits with all parameters concentrations below their respective RDL.

4.2 Up-Gradient Control Wells

Monitoring of groundwater quality up-gradient from the site was made possible with the use of observation wells installed in 1992 behind the WCC administration office at 3354 Navan Road (OW-92-12 to OW-92-19). In 1995, two additional wells were installed within the shallow sand deposit to the southeast (OW-95-4) and west (OW-95-8) of the administration office. Four additional wells were installed in the fall of 1998 at the up-gradient corners of the waste footprint (OW-98-1 to 98-4). In August 2011, a borehole was drilled and a new observation well was installed to replace OW-98-2 in the intact clay deposit, as it was filled with sand. Monitoring wells OW-95-4, OW-98-4 and OW-98-3 were decommissioned in 2012 and replaced by existing monitoring wells MW05-1A to D as per Item 42 listed in Schedule A of ECA No. A460702. All these wells are referred to as the up-gradient control wells. The up-gradient groundwater quality in each stratigraphic unit was compared to the ODWQS for which aesthetic objectives or maximum or interim maximum acceptable concentrations exist.

4.2.1 Sand Layer

The background groundwater quality within the sand layer was monitored during the 2021 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-19, MW05-1D (replacing OW-95-4), and OW-95-8.

The groundwater quality during 2021 at the sand layer groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2021 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
92-19	TDS and manganese	Chloride, manganese, sodium and TDS
05-1D	Chloride and TDS	Chloride and TDS
95-8	Manganese and TDS	Iron, manganese and TDS

Input: ETB
Checked: RPM

As apparent from the above table and historical data, the groundwater quality within the sand layer is characterized by concentrations of chloride, manganese, iron, sodium and TDS that exceed the ODWQS.

4.2.2 Weathered Clay Deposit

The background groundwater quality within the weathered clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-18, OW-98-1 and MW05-1C (replacing OW-98-4).

The groundwater quality during 2021 at the weathered clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2021 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
92-18	Chloride and TDS	Chloride, manganese and TDS
98-1	Chloride, sodium and TDS	Chloride, iron, manganese, sodium and TDS
05-1C	Manganese	[None]

Input: ETB
Checked: RPM

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As apparent from the above table and historical data, the groundwater quality within the weathered clay deposit is characterized by concentrations of chloride, iron, manganese, sodium and TDS that exceed the ODWQS.

4.2.3 Intact Clay Deposit

The background groundwater quality within the intact clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-16, MW11-1 (replacing OW-98-2) and MW-05-1B (replacing OW-98-3).

The groundwater quality during 2021 at the intact clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
92-16	[None]
05-1B	[None]
11-1	Chloride, sodium, manganese and TDS

Input: ETB
Checked: YJM

As apparent from the above table and historical data, the groundwater quality within the intact clay deposit is characterized by concentrations of chloride, manganese, sodium and TDS that exceed the ODWQS.

4.2.4 Glacial Till/Upper Bedrock Zone

The background groundwater quality within the glacial till/upper bedrock was monitored during the 2021 groundwater monitoring program through the inclusion of up-gradient monitors OW-92-12 and MW-05-1A.

The groundwater quality during 2021 at the glacial till/upper bedrock groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
92-12	Sodium and TDS
05-1A	Sodium and TDS

Input: ETB
Checked: RPM

As apparent from the above table, the groundwater quality within the glacial till/upper bedrock is characterized by concentrations of sodium and TDS which regularly exceed the ODWQS.

002524

4.3 Mer Bleue/Down-Gradient Control Wells

Groundwater further down-gradient from the landfill is monitored with the use of nested observation wells installed in 1994 and 1995 south of the landfill at the northern edge of the Mer Bleue Bog. These observation wells were installed to obtain a better understanding of the hydrogeology of the area and geochemistry of the groundwater south of the landfill. The nested wells are located in line with the eastern limits of the landfill (OW-94-4, OW-94-5 and OW-94-6), east of the landfill centre line (OW-95-5, OW-95-6, OW-95-7 and OW-95-9) and in line with the western limits of the existing landfill (OW-95-1, OW-95-2 and OW-95-3). All these wells are referred to as the down-gradient control wells. The groundwater quality of the down-gradient control wells in each stratigraphic unit was compared to the ODWQS for aesthetic objectives or maximum or interim maximum acceptable concentrations.

4.3.1 Sand Layer

The down-gradient groundwater quality within the sand layer was monitored during the 2021 groundwater monitoring program through the inclusion of down-gradient monitors OW-94-6, OW-95-3, and OW-95-7.

The groundwater quality during 2021 at the sand layer groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2021 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
94-6	Iron, manganese, and TDS	Sodium, manganese, and TDS
95-3	Manganese, sodium and TDS	Manganese, sodium and TDS
95-7	Chloride, iron, manganese, sodium and TDS	Chloride, manganese, sodium and TDS

Input: ETB
Checked: RPM

As apparent from the above table and historical data, the groundwater quality within the sand layer is characterized by concentrations of chloride, iron, manganese, sodium and TDS that exceed the ODWQS. Similar ODWQS exceedances for these parameters were also observed in the up-gradient groundwater at similar concentrations.

4.3.2 Weathered Clay Deposit

The down-gradient groundwater quality within the weathered clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of down-gradient monitors OW-94-5, OW-95-2, and OW-95-6.

The groundwater quality during 2021 at the weathered clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During May 2021 Monitoring Session	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
94-5	Chloride, iron, manganese, sodium, and TDS	Chloride, manganese, sodium, and TDS
95-2	Chloride, manganese, sodium, and TDS	Chloride, sodium, and TDS
95-6	Chloride, manganese, sodium, and TDS	Chloride, manganese, sodium, and TDS

Input: ETB
Checked: RPM

002525

As apparent from the above table and historical data, the groundwater quality within the weathered clay deposit is characterized by concentrations of chloride, iron, manganese, sodium and TDS that exceed the ODWQS, similarly to groundwater quality within the same deposit upgradient of the landfill.

4.3.3 Intact Clay Deposit

The down-gradient groundwater quality within the intact clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of down-gradient monitors OW-94-4, OW-95-1, and OW-95-5.

The groundwater quality during 2021 at the intact clay deposit groundwater monitors met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
94-4	Chloride, manganese, sodium, and TDS
95-1	[monitoring location was frozen]
95-5	Chloride, manganese, sodium, and TDS

Input: ETB
Checked: RPM

As apparent from the above table as well as historical data, the groundwater quality within the intact clay deposit is characterized by concentrations of chloride, iron, manganese, sodium and TDS which exceed the ODWQS. Up-gradient groundwater quality is different than down-gradient water quality, even though similar parameters exceed ODWQS at up-gradient observation well MW11-1. The concentrations observed at the down-gradient locations were generally higher than at the up-gradient locations.

4.3.4 Glacial Till/Upper Bedrock Zone

The down-gradient groundwater quality within the glacial till/upper bedrock zone was monitored during the 2021 groundwater monitoring program through the inclusion of down-gradient monitor OW-95-9.

The groundwater quality during 2021 at the glacial till/upper bedrock zone groundwater monitor met the ODWQS for all parameters analyzed with the exception of the following:

Groundwater Monitor	Parameter(s) Exceeding ODWQS During November 2021 Monitoring Session
95-9	[monitoring location was frozen]

Input: ETB
Checked: RPM

As apparent from historical data, the groundwater quality within the glacial till/upper bedrock zone is characterized by concentrations of chloride, sodium, and TDS that regularly exceed the ODWQS. Historically, concentrations of iron and manganese have occasionally exceeded the ODWQS. The concentrations of chloride and sodium in the down-gradient groundwater quality are typically higher than in the up-gradient groundwater quality.

002526

4.4 Results

Piper trilinear diagrams for groundwater in the sand layer during May and November 2021 are shown on Figures 4 and 5, respectively. The diagrams indicate that shallow groundwater at the immediately down-gradient locations is somewhat variable and has a geochemical fingerprint between the up-gradient groundwater quality and the groundwater in the sand within the Mer Bleue Bog. Similar to past observations, the distribution of up-gradient groundwater quality on the Piper diagrams is reflecting elevated but stable chloride and hardness (calcium and magnesium) concentrations at MW05-1D since 2012.

Figures 6 and 7 indicate that groundwater in the weathered clay at the immediately down-gradient site OW-92-10 has a geochemical fingerprint between the up-gradient groundwater quality and the groundwater in the weathered clay within the Mer Bleue Bog (with a fingerprint very similar to leachate quality). Groundwater at other compliance sites is more like groundwater in the weathered clay within the Mer Bleue Bog. These diagrams also indicate that groundwater in the weathered clay deposit up-gradient of the landfill is different from groundwater in the bog. There are no significant changes from the previous year.

Figure 8 indicates that groundwater in the intact clay downgradient of the site has a geochemical fingerprint similar to groundwater quality in the intact clay in the Mer Bleue Bog. Although historically a similar observation was reported for groundwater quality in the glacial till/upper bedrock zone, this comparison could not be done in 2021 because the only Mer Bleue Bog well in this stratum (OW-95-9) was frozen in November 2021 (see Figure 9).

A Phase II Environmental Site Assessment was conducted at the landfill by Intera (Intera, 2003). This assessment concluded that groundwater within the sand layer, the upper weathered clay and perhaps the deeper intact clay deposit on down-gradient lands has slightly elevated concentrations of parameters previously thought to be indicative of landfill leachate (e.g., boron, ammonia, TKN). However, there is no obvious spatial correlation of these parameters with proximity to the landfill or groundwater migration pathway. The lack of spatial correlation suggests that groundwater on down-gradient lands is representative of naturally elevated background groundwater quality associated with the Mer Bleue environment.

In addition, the groundwater and surface water trigger mechanism report prepared by Golder (Golder, 2007b) demonstrates a clear difference between up-gradient (north) and south property boundary water quality on the east side of the property, where there are not potential impacts from landfill activities. Naturally elevated parameters measured included boron, copper, iron, arsenic, lead, sodium, alkalinity, bicarbonate, TDS, COD and chloride.

5.0 LEACHATE CHARACTERISTICS

Prior to the construction of the leachate collection system (LCS) in 1991-1992, leachate was sampled and analysed in areas where surface breakout was observed. Breakout of leachate, when encountered, usually occurred at the down-gradient toe of the landfill.

The monitoring program for leachate quality has focused on the LCS. For the purpose of the annual monitoring report, leachate generated by the landfill is monitored at the down-gradient end of the south toe collector at L5 at the same time surface water is monitored. A more extensive leachate monitoring program is carried out throughout the year in accordance with a City of Ottawa Leachate Discharge Agreement for the discharge of treated leachate at the Robert O. Pickard Environmental Centre (ROPEC), the municipal wastewater treatment plant.

The leachate sampled is wastewater that has not been treated or subjected to natural attenuation. The landfill is underlain by a thick natural clay deposit which has a hydraulic conductivity, K, of less than 10^{-9} metres per second and as such performs as a natural liner. Therefore, leachate collected at the landfill is not leachate impacted groundwater, but rather it is predominantly precipitation that has infiltrated through the waste pile. It should be noted that leachate at the site could also consist of porewater from the underlying clay as a result of upward gradients and/or consolidation, noting that porewater release to the leachate collection system is slowed by the low hydraulic conductivity of the clay.

Landfill leachate is water that comes into contact with waste and leaches soluble material from the waste. Its composition is a function of the solid waste characteristics, prevailing meteorology, hydrogeology and parameters within the landfill such as pH, moisture content, degree of compaction, geometry, etc. Leachate is wastewater that dynamically alters not only with landfill age but also with changes in seasons and waste characteristics. The intrinsic biodegradability of municipal landfill leachate can be measured by a BOD:COD ratio. During the first several years of production, the BOD:COD ratio generally is in the 0.5 range. As the landfill ages, the ratio decreases to levels less than 0.1 suggesting a more or less biologically recalcitrant organic composition (Andreottola et al., 1989). Also, the concentration of ammonia tends to increase with landfill age since ammonia is a by-product of the stabilisation of organic matter (Elefiniotis et al., 1989), although at a dry waste facility such as the WCC Navan Facility, ammonia concentrations can be expected to remain relatively low.

Typical parameter concentrations in leachate are provided in the tables below. Average concentrations indicate that the WCC Navan Facility leachate is distinctly different from most other landfill sites in Ontario, including the City of Ottawa Trail Waste Facility, with most analytes measured in the WCC Navan Facility leachate having much lower concentrations. The concentration of various parameters listed below suggests a comparatively low strength leachate is generated at the WCC Navan Facility. The concentration of the traditional indicators of environmental quality (conventional pollutants) such as BOD_6, suspended solids, ammonia and metals such as iron and zinc are relatively low. The WCC Navan Facility leachate has much lower concentrations because it is not generated from municipal waste.

002528

Parameter	WCC Navan Waste Recycling and Disposal Facility L5 *			Trail Road & Nepean Landfills [1]			Ontario Landfills [2]		
	Min.	Max.	Avg.	Min.	Max.	Avg.	Min.	Max.	Avg.
Boron	0.37	29.3	15.3	3.92	6.22	5.348	0.8	52	10.4
Ammonia	0.01	112	44.5	----	----	----	7.6	1,820	175
BOD_5	1.6	662	99.9	111	1,790	652	1	66,000	4,975
Conductivity	669	5,640	3,866	----	----	----	475	26,100	6,088
TDS	1,690	10,300	2,853	----	----	----	196	9,030	4,327
Sodium	53.9	850	541.4	----	----	----	13.8	16,000	936
Manganese	0.066	13.2	1.25	0.0879	1.62	0.627	0.03	793	3.54
COD	69.2	1,240	441	380	4,700	1,493	1	47,300	7,855
Iron	0.003	32.7	7.8	0.798	58.3	13.26	0.01	1,300	58
Copper	<0.0005	0.254	0.011	0.0165	0.374	0.1567	0.007	7	0.045
TSS	<2	1,190	109	2	12,400	92.1	3	8,130	445
Chloride	76.5	1,000	478.8	1,000	1,640	1,308	0.4	12,000	270
Lead	<0.00002	0.1	0.008	<0.05	0.276	----	0.001	2.1	0.070
Zinc	<0.005	4.54[3]	0.11	0.0366	2.21	0.62	----	16	1.42

Notes:
All concentrations are in mg/L except conductivity (µS/cm)

Updated by: ETB
Checked by: RPM

* Calculated using all historical data collected for the Annual Monitoring Report since 1992 for L5.

< Denotes concentration is lower than the Reportable Detection Limit (RDL).

[1] City of Ottawa Trail Road Annual Operating and Monitoring Report – 2000.

[2] Howard and Livingston, "Contaminant Source Audits and Groundwater Quality", Environmental Geology of Urban Areas, 104-116, Ed. by N. Eyles, Geological Association of Canada, 1997.

[3] The concentration of zinc reported in August 2020 is considered anomalous but has been used in the calculation of the average zinc concentration in the leachate monitor.

Water impacted by leachate will typically have high concentrations of dissolved constituents with chemical concentrations ten to several hundred times higher than those measured at reference monitoring locations. Chemical concentrations have a high temporal variability due to variations in the composition, age and moisture of the waste and meteorological conditions.

Leachate monitored in 2021 to assist with assessment of surface water and groundwater quality was sampled on May 27, August 24 and November 24, 2021. Results of the chemical analysis undertaken by Paracel and the field measured parameters are provided along with historical data in Appendix E. The results indicate that leachate generated at the WCC Navan Facility continues to be a relatively weak wastewater when compared to municipal landfill leachate.

One field blank and one laboratory trip blank were analyzed during the August 2021 monitoring session. The results of the VOCs analyses for these two samples were within acceptable tolerance limits with all parameters concentrations below the RDL.

002529

Leachate quality monitoring results for 2021 indicate that the leachate generated at the WCC Navan Facility is not significantly different from previous monitoring events. Concentrations of field measured dissolved oxygen ammonia, boron, potassium, and TKN show a generally increasing trend over time although boron concentrations have been relatively stable in recent years. The concentration of chloride was previously indicated to be increasing but has been stable for approximately five years. The concentrations of DIC and manganese, show a general decreasing trend over time although they have stabilized in recent years. Previously reported decreasing trend in hardness appears to be stabilizing. The concentrations of certain parameters remain above the surface water and groundwater quality near the site.

6.0 GROUNDWATER COMPLIANCE ASSESSMENT

6.1 Compliance Mechanism

The objectives of groundwater trigger mechanisms at the WCC Navan Facility are to utilize the results of the ongoing groundwater monitoring program to assess site compliance and to trigger implementation of the contingency plans, when and if necessary. The purpose of the trigger mechanisms is to prevent leachate-impacted groundwater exceeding a certain negative threshold level from occurring. The trigger mechanism was outlined in the approved Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The MECP has agreed that this is the preferred approach for the Navan Facility.

Traditional methods of site compliance provide very limited useful and/or reliable parameters for assessment of the WCC Navan Facility; therefore, an alternate method must be used. The difference in hydrogeology across the site coupled with the very saline environment of the clay deposit that underlies the Mer Bleue clay have resulted in the MECP accepting that Guideline B-7 (RUPO) is not applicable at this site. The MECP's position in this regard was documented in a November 2000 memorandum issued by the MECP (MOE, 2000). Therefore, the Leachate Indicator Parameter list and the method to determine if leachate from the site is impacting local groundwater was developed in the Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The Leachate Indicator Parameter list includes alkalinity, ammonia, boron, chloride, hardness, magnesium, manganese and potassium.

After the completion of a monitoring session, the concentration of each Leachate Indicator Parameter for all groundwater locations used to assess compliance should be visually checked. If a parameter concentration appears to be elevated, a comparison to the background concentration range should be completed. The potential for an increase in concentration of a Leachate Indicator Parameter will be investigated by comparing the concentrations for each parameter to the background range for its corresponding stratigraphic unit. The background range will be derived from the maximum and minimum data obtained at the locations used to assess compliance from 1998 to present in each stratigraphic unit. In addition, data from monitoring wells MW05-3A to D located to the east of the site and not impacted by landfill leachate will be used to define the background range. Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each location used to assess compliance are presented in time-concentration graphs in Appendix F. The background ranges will be updated annually using the most recent data if it is not deemed impacted by landfill leachate. An exceedance of the background range is considered an exceedance of the trigger mechanism and the implementation of the trigger format outlined in the trigger mechanism report should proceed.

No comments from the MECP have been received on the groundwater aspects of the 2020 annual monitoring report at the time this report was completed.

6.2 Immediately Down-Gradient Wells Used to Assess Compliance

At the down-gradient limit of the landfill, groundwater quality was monitored at three nests of observation wells installed in 1992 and 1994. These wells are located at the southeast corner of the landfill (OW-92-9, OW-92-10 and OW-92-11), east of the landfill centre line at grid line 9 (OW-92-1 to OW-92-8) and at the southwest corner of the landfill (OW-94-1, OW-94-2 and OW-94-3). Two additional wells, MW-C and MW-E, were installed within the upper sand unit and shallow clay in 2000 at the northern boundary of the NCC property (now WCC property) located south of the VIA ROW. These observation wells are referred to as wells used to assess compliance.

MW07-1 is located in line with the wells used to assess compliance, to the southeast of the landfill in an area that has historically not been impacted by landfill leachate. These wells were installed in 2007 and their purpose is to monitor the future performance of the landfill expansion. With the commencement of landfilling operations in the expansion area east of the historical landfill footprint in 2016, these wells will be used along with the wells used in past reports to assess compliance along the southern property line.

New trigger concentrations were proposed in the 2020 monitoring report (Golder, 2021). These trigger concentrations are implemented herein.

In 2005, three sand layer wells used to assess compliance were installed to evaluate some unusual results at OW-94-3, OW-92-8 and OW-92-11. The monitoring wells are called MW05-R3, MW05-8 and MW05-11 and have replaced OW-94-3, OW-92-8 and OW-92-11 for groundwater quality results, respectively, as of November 2006.

6.2.1 Sand Layer

The down-gradient compliance site groundwater quality within the sand layer was monitored during the 2021 groundwater monitoring program through the inclusion of monitors MW05-R3, MW05-8, MW05-11, MW-C, MW-E and MW07-1D.

Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the sand layer are presented in time-concentration graphs in Appendix F-A.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations	
	May 2021 Monitoring Session	November 2021 Monitoring Session
MW-C	None	None
MW-E	None	None
05-R3	None	None
05-8	Manganese	Alkalinity and manganese
05-11	None	None
07-1D	None	None

Input: ETB
Checked: RPM

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6.2.2 Weathered Clay Deposit

The down-gradient compliance site groundwater quality within the weathered clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of monitors OW-92-7, OW-92-10, OW-94-2 and MW07-1C.

Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the weathered clay deposit are presented in time-concentration graphs in Appendix F-B.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations	
	May 2021 Monitoring Session	November 2021 Monitoring Session
92-7	None	None
92-10	Hardness, magnesium, and manganese	Manganese
94-2	None	None
07-1C	None	None

Input: ETB
Checked: RPM

6.2.3 Intact Clay Deposit

The down-gradient compliance site groundwater quality within the intact clay deposit was monitored during the 2021 groundwater monitoring program through the inclusion of monitors OW-94-1, OW-92-5, OW-92-9 and MW07-1B.

Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the intact clay deposit are presented in time-concentration graphs in Appendix F-C.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations
	November 2021 Monitoring Session
94-1	None
92-5	None
92-9	None
07-1B	Ammonia

Input: ETB
Checked: RPM

The manganese concentration reported at OW-94-1 in May 2020 was unusually elevated and returned to typical historic concentration levels in November 2021, below the trigger concentration.

6.2.4 Glacial Till/Upper Bedrock Zone

The down-gradient compliance site groundwater quality within the glacial till/upper bedrock zone was monitored during the 2021 groundwater monitoring program through the inclusion of monitors OW-92-1 and MW-07-1A.

Groundwater Leachate Indicator Parameter trigger mechanisms and concentrations for each well used to assess compliance completed in the glacial till/upper bedrock zone are presented in time-concentration graphs in Appendix F-D.

Parameters exceeding the trigger concentrations are as follows:

Groundwater Monitor	Parameter(s) Exceeding Trigger Concentrations November 2021 Monitoring Session
92-1	None
07-1A	Hardness, magnesium

Input: ETB
Checked: RPM

The manganese concentration reported at OW-92-1 in May 2020 was unusually elevated but not as high as has been observed historically. The concentration of manganese at OW-92-1 returned to typical historic concentration levels below the trigger concentration in 2021.

6.3 Results

The Leachate Indicator Parameters at all groundwater monitoring locations used to assess compliance were graphed and visually checked for exceedances of the 1998 to 2020 background range.

As proposed in the 2020 Annual Monitoring Report (Golder, 2021), the maximum background potassium concentration in the sand stratigraphic unit was increased to 18.3 mg/L and the maximum background manganese concentration in the glacial till stratigraphic unit was increased to 0.025 mg/L.

After the reported 2018 increases in several parameter concentrations above the background ranges observed in the sand stratigraphic unit, the increasing trend for manganese at MW05-8 has stabilized in 2020 with concentrations reported lower than in 2019, although still above the trigger concentration. Manganese concentrations at MW05-8 in 2021 were lower than 2020, but still elevated above the trigger concentration.

Manganese concentrations at this location have been variable in the past but overall there is a general increasing trend. The maximum historical manganese concentration observed in the groundwater at MW05-8 is slightly higher than the maximum concentration of manganese reported for leachate from L5 (13.2 mg/L). As such, it is possible that the overall increasing trend of manganese concentrations is not caused entirely by landfill leachate.

Exceedances of trigger concentration for alkalinity in November 2021 at MW05-8 does not appear to be a part of an overall increasing trend. Previously reported increasing concentrations at MW05-11 for ammonia, continued to decrease in 2021 and are below the trigger concentration.

Therefore, there were no continued increases throughout 2021 above the background ranges observed in the sand stratigraphic unit in 2021 at trigger locations.

002533

There were no continued increases above the background ranges observed in the weathered clay stratigraphic unit in 2021 at trigger locations except for the manganese concentration at OW-92-10 in May and November 2021. The concentration in May (1.33 mg/L) increased from the previous concentration in November 2020 of 0.911 mg/L. This increase was followed by another increase in November 2021 to 1.65 mg/L which marks a confirmed exceedance. In November 2018, there were spikes in concentrations of leachate indicator parameters in the sand unit. As a contingency measure, WCC purchased a spare leachate pump to reduce the downtime when pumps require servicing. This course of action effectively reduced parameter concentrations in the sand unit. Some of these concentration increases were also observed in the weathered clay unit, including manganese. Due to the lower hydraulic conductivity within the weather clay unit compared to the sand unit, the parameter concentrations are taking longer to dissipate in the weathered clay. However, the manganese concentrations in the sand unit are still elevated above the respective trigger concentration. The water quality within the sand unit influences the water quality in the weathered clay unit due to the slight downward hydraulic gradient from the sand to the weathered clay. The maximum manganese concentration in the sand unit is elevated above the maximum leachate concentration, indicating that elevated manganese concentrations are likely not entirely caused by landfill leachate. Therefore, the elevated manganese concentrations in the weathered clay unit may be a delayed result of the implementation of the parameter spike increase and slower dissipation but may also not be entirely resulting from landfill leachate.

Concentrations of hardness and magnesium at OW-92-10 exceeded their corresponding background concentrations in May 2021 (550 mg/L for hardness and 79.7 mg/L for magnesium, respectively). In both cases, they decreased slightly in the fall 2021 below the maximum background concentrations. While other leachate indicator parameters at this location were reported to be well within the background range, an increasing trend since 2012 in concentrations of alkalinity and ammonia has been observed. The concentrations of alkalinity, ammonia, and chloride in the groundwater from the weathered clay are lower than the concentrations observed in the groundwater from the underlying intact clay. The historic upward gradients between the intact clay and weathered clay and potential release of porewater within the intact clay may, at least in part, be the source of the increased concentrations overtime observed in the weathered clay.

Groundwater quality in the intact clay and glacial till/upper bedrock unit was monitored during the fall 2021 monitoring session. Monitoring of these stratigraphic units occurs every 18 months with the next scheduled session in spring 2023.

Concentrations of Leachate Indicator Parameters in groundwater samples collected in 2021 from compliance monitors screened in the intact clay unit were all below the respective trigger concentrations, except for the concentration of ammonia at MW07-1B. The exceedance for ammonia at MW07-1B was preceded by a concentration reported above the maximum background level, marking two increased concentrations and a confirmed exceedance. If future results do not reflect an upward trend and the data appears to be reasonably accurate, a recommendation to increase the trigger concentration could be made if groundwater quality in the MW07-1B monitoring well is still considered unimpacted by landfill leachate.

Concentrations of Leachate Indicator Parameters in groundwater samples collected from compliance monitors screened in the glacial till/upper bedrock unit in 2021 were all below the respective trigger concentrations, except for the concentrations of hardness and magnesium from monitoring well MW07-1A reported in November 2021. Both concentrations reported at MW07-1A follow exceedances reported in the spring of 2017, the fall of 2018, and the spring of 2020 with a slight decrease in both concentrations in the fall of 2021. This is two consecutive monitoring sessions marking a decrease in both concentrations since the fall of 2018. Leachate indicator parameter concentrations within the intact clay are fairly stable and there are no increasing trends amongst other parameters or

monitoring wells. Previous exceedances have been reported at MW07-1B and other monitoring wells within the intact clay but typically decrease below the max background during the next scheduled monitoring session. Given the lack of increasing trends amongst other monitoring wells and parameters, it is not interpreted that this exceedance is a result of landfill leachate. If future results do not reflect an upward trend and the data appears to be reasonably accurate, a recommendation to increase the trigger concentration could be made if groundwater quality in this monitoring well is still considered unimpacted by landfill leachate.

6.3.1 Confirmed Exceedances and Proposed Course of Action

As mentioned above, there are two confirmed exceedances (continued increase above the background range) of the trigger concentrations for the weathered clay and intact clay stratigraphic units in the 2021 monitoring session.

Following the confirmed exceedances reported in the 2018 annual monitoring report (Golder, 2019), in accordance with ECA Condition 123 (a), WCC informed the MECP Ottawa District Office of these exceedances in a phone call on March 6, 2019. Trigger results of the spring and fall monitoring sessions were reported by Golder, on behalf of WCC, to the MECP Ottawa District Office via email on August 8, 2019 and December 24, 2019, respectively. In accordance with the proposed course of action presented to the MECP in the 2018 annual monitoring report and communications in 2019, WCC acquired a spare leachate pump to reduce down time when a pump requires servicing and WCC intends to proactively maintain the forcemain in good working condition in a continuing effort to achieve a drained state in the leachate collection system.

Leachate pumping and disposal operating issues reported in the fall 2018 had an impact to groundwater quality in the sand and weathered clay units in monitoring wells located immediately downgradient of the leachate collection system (less than 10 m south of the leachate collection system and close to the south toe collector).

Concentrations of some Leachate Indicator Parameters in the sand unit spiked in November 2018, but the efforts from WCC in 2019 were successful in limiting the continued increases in concentrations. Concentrations have since stabilized or decreased in the sand and weathered clay units, confirming that these corrective actions should continue to be implemented. Since the hydraulic conductivity of the sand is greater than the weathered clay, elevated concentrations have been taking longer to dissipate in the weathered clay unit.

Golder contacted the MECP Ottawa District Office via email on July 9, 2020 to update them on the trigger exceedances and notify them that no trigger exceedance reported in the spring of 2020 was following two previous exceedances showing an increasing trend and that there was no need to implement a contingency plan at this time.

In 2021, WCC continued to implement the proposed voluntary action plan to control potential increases in concentrations. Manganese concentration in the weathered clay at OW-92-10 in November 2021 marked a confirmed increase and the ammonia concentration in the intact clay at MW-07-1B also marked a confirmed exceedance. These two confirmed exceedances were reported to the MECP in an email dated February 4, 2022. It was proposed that the confirmed exceedances would be assessed in this report and a contingency plan proposed, if required. It is interpreted that these exceedances are not the result of further landfill leachate migration. Therefore, Golder does not recommend any further contingency action in addition to the voluntary action WCC is currently taking but will continue to assess the exceedances and trends in subsequent monitoring sessions. A copy of this correspondence is provided in Appendix H.

It is WCC's intention to continue implementing in 2022 the proposed voluntary action plan to control potential increases in concentrations.

7.0 SURFACE WATER QUALITY ASSESSMENT

7.1 Quality Control/Quality Assurance

One blind sample duplicate was analyzed per surface water monitoring session in 2021 as part of the QA/QC protocol. In addition, the laboratory performs equipment blanks as an internal method of QA/QC.

Analytical results on blind sample duplicates are deemed to be outside of acceptable tolerance limits if the RPD between the original sample and its duplicate is greater than 50% when both analytical results are between 10 and 20 times the RDL or if the RPD is greater than 30% when both analytical results are greater than 20 times the RDL.

All duplicate results for surface water were within acceptable tolerance limits in 2021 with the exception of manganese and total suspended solids (TSS) concentrations in August 2021 from the sample collected from S9 (identified as S-9 in the laboratory report) and its duplicate (identified as Dupe-1 in the laboratory report). A data check was requested for the sample collected at S9 in August 2021 and its duplicate; it was determined that there was more particulate matter in the duplicate sample than the original. Higher metals concentrations were also noted in the duplicate compared to the original which could be attributed to the variability in results. The surface water analytical results are considered acceptable.

7.2 Surface Water Quality Monitoring

A total of eleven surface water stations continue to be monitored on an on-going basis at this site. The monitoring stations have been located to obtain representative information on water quality up-gradient from the landfill at stations S1, S3, S15, S16 and S17 (background), on water quality at compliance sites down-gradient from the landfill at stations S5, S8 and S9 and on water quality in the Mer Bleue Bog at S10 (SW-W), S11 (SW-C) and S12 (SW-E). Monitoring locations SW-W, SW-C and SW-E are location references used by the NCC.

Stations S1 and S17 are located northeast and up-gradient from the landfill and are considered not to be impacted by the landfill operations. Stations S3, S15 and S16 are located to the west/northwest and up-gradient from the landfill and are considered not to be impacted by the landfill operations. Station S1 is located at the northeast corner of the landfill below a culvert that discharges into a south flowing east perimeter ditch. Station S3 is located at the northwest corner within the site buffer, down-gradient from where a north diversion ditch flows into a west drainage channel. Station S15 is located to the west of the landfill where the north ditch flows into a southward flowing west perimeter ditch. Station S16 is located northwest of the site in a ditch along the south side of Navan Road and up-gradient from station S15. Station S17 is located in an east ditch along the south side of Navan Road and up-gradient from station S1. These stations are considered to be representative of up-gradient background surface water quality.

Stations S5, S8 and S9 are located down-gradient from the landfill. Station S5 is located at a culvert beneath the VIA Rail right-of-way (ROW) just east of the landfill centre line near grid line 10 and is dry throughout most of the year. Station S8 is located in a wide and shallow westward flowing channel having a swamp environment and is down-gradient from the southwest corner of the landfill and north of the VIA ROW, immediately west from where the west drainage channel discharges into the ditch. Station S9 is located near a large concrete box culvert beneath the VIA ROW and down-gradient from the southeast corner of the landfill. Since the fall of 2013, water has been backing up upstream of surface water station S9 as a result of blockage in the box culvert by aggressive beaver activity. Steps were taken by WCC in spring 2017 to reduce the beaver activity in the area and no blockage was observed during the fall monitoring session. No specific beaver activity was noted in 2021.

Surface water sampling stations S10, S11 and S12, also referred to by the NCC in other reports as SW-W, SW-C and SW-E, respectively, are located south of the landfill at the northern edge of the Mer Bleue Bog and consist of stagnant bog water. Stations S10, S11 and S12 were added in 1995 to obtain data considered to be representative of water quality in the receiving water at the perimeter of the bog.

For the purpose of surface water quality assessment, the background surface water quality is assumed to be represented by the data available from stations located in close proximity to the landfill and up-gradient of surface water flow. For the 2021 monitoring program, the PWQO is being applied for the purpose of water quality assessment at the surface water sampling stations.

Surface water monitoring for 2021 was carried out on May 27, August 24, and November 24 at up-gradient control sites S1, S3, S15, S16 and S17, sites S5, S8 and S9 and the down-gradient control sites S10, S11 and S12. Analytical test reports submitted by Paracel for water samples obtained in 2021 are provided in Appendix B. Historical data are also provided in Appendix G.

Station S5, S8, and S16 were found to be dry during the summer monitoring session in 2021. Station S5 was also dry in the spring monitoring session. Therefore, samples could not be collected at these stations at those times.

Water quality data was compared to historical data obtained at each station and trends in the concentration of key indicator parameters were examined.

The PWQO criteria for chromium changed in 1999 from chromium to chromium III and chromium VI. The laboratory reports total chromium and the exceedances noted in the tables in the following sections are values of total chromium that are greater than the PWQO for chromium III, i.e. 8.9 µg/L (there is no PWQO for total chromium). Should current data show an increasing trend, attempts will be made to separate the analysis into chromium III and chromium VI.

7.2.1 Up-Gradient Control Stations

The up-gradient surface water quality was monitored during the 2021 monitoring program through the inclusion of up-gradient stations S1, S3, S15, S16 and S17.

The surface water quality during 2021 met the PWQO for all parameters analyzed with the exception of the following:

Surface Water Station	Parameter(s) Exceeding or Outside PWQO		
	May 2021 Monitoring Session	August 2021 Monitoring Session	November 2021 Monitoring Session
S1	Dissolved oxygen, iron, and phenols	Iron	Cobalt, copper, iron, and phenols
S3	Dissolved oxygen, total phosphorous, cobalt, iron, and phenols	Dissolved oxygen, total phosphorous, cobalt, iron, and zinc	Dissolved oxygen, cobalt, iron total phosphorous, zinc, and phenols
S15	Iron and phenols	Dissolved oxygen and iron	Iron and phenols
S16	Cobalt, iron, and phenols	[No sample collected due to dry conditions]	Dissolved oxygen, total phosphorous, cadmium, chromium, cobalt, copper, lead, zinc, and phenols
S17	Total phosphorus, iron and phenols	Iron	Phenols

Input: ETB
Checked: RPM

002537

As apparent from the above table, the up-gradient surface water quality is characterized by concentrations of the following parameters which exceed or are outside the PWQO: cobalt, copper, dissolved oxygen, iron, lead, phenols, total phosphorus. Occasional PWQO exceedances of cadmium, chromium, boron, and zinc have been observed in the past as well.

Surface water quality is generally consistent over time (with seasonal variability). An increasing trend in concentrations of alkalinity, chloride, and conductivity, can be observed at surface water station S1 over time. Previously observed overall increasing trends for concentrations of DIC, sodium, TDS, and hardness at surface water station S1, concentrations of alkalinity, ammonia, DIC and iron at surface water station S3, and concentrations of iron, magnesium, manganese, sodium and TDS at surface water station S15 appear to have stabilized, with seasonal variability remaining. Similarly, the previously observed decreasing trend in dissolved oxygen concentrations at surface water stations S3 appears to have stabilized with seasonal variability remaining. A slight increasing trend in magnesium is observed at S16 and S17. Hardness is also observed to be increasing at S16.

The current or historical increases in concentrations of parameters at these locations is not related to leachate impact as these stations are up-gradient of the site.

7.2.2 Down-Gradient Control Stations

The down-gradient surface water quality was monitored during the 2021 monitoring program through the inclusion of down-gradient stations S10, S11 and S12.

The surface water quality during 2021 met the PWQO for all parameters analyzed with the exception of the following:

Surface Water Monitor	Parameter(s) Exceeding or Outside PWQO		
	May 2021 Monitoring Session	August 2021 Monitoring Session	November 2021 Monitoring Session
S10	Dissolved oxygen, iron, total phosphorous, cadmium, chromium, cobalt, copper, lead, zinc, and phenols	Dissolved oxygen, pH, total phosphorous, cobalt, copper, iron, lead, and phenols	Dissolved oxygen, cobalt, iron, zinc, phenols and total phosphorus
S11	Dissolved oxygen, cobalt, iron, total phosphorus, and phenols	Dissolved oxygen, total phosphorous, cadmium, chromium, cobalt, copper, iron, lead, and zinc	Cobalt, dissolved oxygen, iron, phenols, and total phosphorus
S12	Dissolved oxygen, cobalt, iron, total phosphorus, and phenols	Dissolved oxygen, iron, phenols, and total phosphorous	Dissolved oxygen, iron, phenols, and total phosphorus

Input: ETB
Checked: RPM

As apparent from the above table, the down-gradient surface water quality is characterized by dissolved oxygen, iron, and total phosphorus concentrations which exceed or are outside the PWQO. Occasional PWQO exceedances of boron, cadmium, cobalt, copper, chromium, phenols and zinc have been observed.

The concentrations of most of the parameters that exceeded the PWQO in the down-gradient control stations S10 and S11 during the May, August and November 2021 monitoring sessions were generally similar or slightly elevated compared to the surface water quality at the up-gradient station S16 during the spring monitoring session. During the fall monitoring session, parameter concentrations tended to be similar or lower than at S16.

Surface water quality at the control down-gradient stations is generally consistent over the years with no specific trends observed with the exception of boron. Boron concentrations at S10, S11, and S12 were previously elevated in the mid to late 1990s, but have since decreased and remained stable, at concentrations slightly higher or similar to up-gradient surface water quality at most up-gradient stations for approximately 20 years.

7.3 Surface Water Compliance Assessment

As previously mentioned, surface water data at the WCC Navan Facility is variable over time and the Mer Bleue Bog surface water quality is poor. It becomes increasingly difficult to assess surface water site compliance with scattered data. The WCC Navan Facility is an engineered landfill site. Therefore, an excursion of leachate would be apparent in the underlying stratigraphic units prior to a surface water impact. As such, a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. A site-specific groundwater-based trigger mechanism is the appropriate approach for the WCC Navan Facility. Surface water quality monitoring will continue at the site, with the samples analyzed for appropriate parameters of concern and evaluated for potential impacts. This approach was outlined in the approved Hydrogeology, Hydrology and Geotechnical Study Report (Golder, 2008). The MECP has agreed that this is the preferred approach for the WCC Navan Facility.

8.0 SEDIMENTS

Sediment samples SED-W, SED-C and SED-E were obtained at the surface water sampling stations SW-10, SW-11 and SW-12, respectively, on May 27 and November 24, 2021. Laboratory reports are presented in Appendix B and the results are summarized in Table 4 and Table 5. Included for comparison in Table 4 and Table 5 are the MECP Table 1 sediment criteria and Table 2 and Table 4 Recreation/Parkland soil criteria (MOE, 2011) and the CCME freshwater sediment and Recreation/Parkland soil criteria (CCME, 1999). The table below summarizes the parameters which exceeded sediment criteria.

Sediment Monitor	Parameter(s) Exceeding MECP Table 1 Sediment		Parameter(s) Exceeding CCME Freshwater Sediment	
	May 2021 Monitoring Session	November 2021 Monitoring Session	May 2021 Monitoring Session	November 2021 Monitoring Session
SED-E	Arsenic, chromium, copper, nickel	[None]	[None]	Arsenic
SED-C	[None]	Copper	[None]	[None]
SED-W	Chromium, copper, nickel	Copper	[None]	[None]

Input: ETB
Checked: RPM

Analytical results on the sediment samples indicate that no parameters exceed the CCME Guidelines for freshwater sediment except for arsenic at SED-E. This is the highest arsenic concentration reported at SED-E (9.1 ug/g) with the previous highest concentration reported in May 2009 (7 ug/g). The laboratory was requested to re-analyzed the sample and similar results were reported. Arsenic, copper, chromium and nickel concentrations exceed the MECP Table 1 sediment criteria. The analytical results observed at the sampling locations are consistent with historical results observed at the respective locations.

002539

The following table summarizes the parameters which exceeded the soil criteria in 2021.

Sediment Monitor	Parameter(s) Exceeding MECP Table 2/Table 4 Soil		Parameter(s) Exceeding CCME Soil	
	May 2021 Monitoring Session	November 2021 Monitoring Session	May 2021 Monitoring Session	November 2021 Monitoring Session
SED-E	Boron	[None]	Selenium	[None]
SED-C	Boron	[None]	[None]	[None]
SED-W	Boron	Boron	Selenium	[None]

Input: ETB
Checked: RPM

Analytical results on the sediment samples indicate that boron exceeds MECP Table 2 and Table 4 soil criteria during the spring monitoring session at each sampling location. Boron also exceeded MECP Table 2 and Table 4 during the fall monitoring session at SED-W. Selenium exceeded the CCME soil criteria during the spring monitoring session at SED-E and SED-W. In general, parameter concentrations measured in the sediment were similar to previously reported concentrations.

Natural wetland systems have been used to treat a variety of wastewater including agricultural and surface mine runoff, irrigation return flows, leachate, urban storm water discharge and other sources of water pollution (U.S. Environmental Protection Agency, 1987). Today, increasing attention is being given to artificial wetlands for the treatment of wastewater. Approximately 90% of Canada's 127 million hectares of wetlands are classified as peatlands where peaty soils are predominant (NAWCC, 1994). The value of peat as an agent for pollution prevention and control has been recognized during the last three decades. Peat's value is directly related to its unique physical and chemical properties. Compared to other mineral soils, peat has a very high organic content (60% carbon), with lignin and cellulose as its main constituents. Peat has a large specific area and is highly porous, properties similar to natural zeolites and activated carbon, which makes it a good adsorbent material (McLellan and Rock, 1988). These contain some functional organic groups such as carboxyl and amino groups that form complexes with metal ions (Dissanayake and Weerasooriya, 1981). Peat is also reported to exhibit ion exchange capacities (Sharma and Froster, 1993). The combination of the above mentioned properties, i.e., being a good adsorbent, forming complexes with metals and having ion exchange capacity makes peat an excellent metal trapping media. Peat is proven to be effective in removal of lead, cadmium, zinc and chromium from raw wastewater (Zhipie et al., 1984), removal of hexavalent chromium from wastewater, removal of copper, iron, manganese, zinc, lead and potassium from industrial wastewater (Cameron, 1978). Sphagnum peat, such as the peat found in eastern Ontario, is reported to be the most suitable peat to use for wastewater treatment systems, in terms of decay resistance (Warith, 1996).

The peat deposit in the Mer Bleue Bog predates any human activity in this area. Having filtered hundreds of years of surface runoff water into the perimeter portion of the bog, it should not be surprising to find contaminants in this natural sink. Water levels in the Mer Bleue Bog fluctuate naturally from time to time and have been aggressively drained (in the early 1930's) to promote agricultural exploitation of the bog. Drainage of the Mer Bleue Bog is now under the management of the NCC. In more recent years, water levels have been allowed to rise and agricultural use of the bog has been significantly reduced. From time to time, given the right water levels and environment,

002540

the release of constituents absorbed by the peat can be expected. Therefore, it would appear that metals in excess of sediment criteria are the result of natural peat processes and not impacts from the landfill.

In 2002/2003, an assessment of the WCC site operations was undertaken in support of a WCC-NCC exchange of land parcels located south of the Navan landfill along the northern margin of the Mer Bleue. The assessment concluded that the landfill site had not caused impacts to soil, sediment, groundwater or surface water quality within the Mer Bleue. These findings were accepted by the NCC.

9.0 PROPOSED 2022 MONITORING PROGRAM

The proposed 2022 Environmental Monitoring Program is the same as was conducted in 2021, with the exception of VOCs which are proposed to be removed from the list of parameters of the groundwater monitoring program and sediment monitoring which is proposed to be discontinued (these proposed changes were also listed in the 2020 Annual Monitoring Report).

In groundwater samples, VOCs were detected at times in groundwater monitoring wells located immediately downstream of the waste footprint, with most occurrences of VOC detections happening in 2007 and 2008 in wells MW05-11 and MW05-8 when spikes were also experienced in other leachate indicator parameter concentrations. Even then, the VOC concentrations were well below the ODWQS with no recorded exceedance of ODWQS in downgradient wells with the exception of benzene concentrations at MW05-11 more than 10 years ago (in November 2007, May 2008 and November 2008) and MW05-8 (November 2008, December 2008 and May 2009). Some VOCs (relatively low concentrations of one or more of benzene, toluene or ethylbenzene) are sometimes detected in leachate samples (location L5) with some exceedances slightly above the ODWQS. It is proposed to continue monitoring VOCs in leachate and monitoring for VOCs in downgradient monitoring wells could be resumed if an increase in VOCs in leachate is observed.

As explained in Section 7.3, the MECP agreed that an excursion of landfill leachate would be apparent in the underlying stratigraphic units prior to a surface water impact and a surface water trigger mechanism would not be an effective component for the site trigger for the purpose of effectively protecting the off-site surface water/bog water regime. Therefore, it is proposed to discontinue sediment monitoring and rely on the groundwater and surface water monitoring programs to assess off-site leachate impacts. With MECP concurrence, sediment monitoring could resume temporarily if leachate impacts and trigger exceedances are reported at the site.

As per Condition 109 of the ECA No. A460702, the monitoring wells located in borehole 09-1 will be sampled once per year to assess the groundwater quality in the Mer Bleue. However, due to the on-going inability to collect water samples because of the frozen conditions necessary to access the wells in the winter, efforts will be made to collect a sample during a dry period (i.e., in the summer) as it was done since 2014.

Note that, as per the approved monitoring program, sampling of monitoring wells screened in the intact clay and the glacial till/upper bedrock is planned to occur on an 18-month schedule. Groundwater samples from these units were collected during November 2021 monitoring session and will be monitored again in the spring of 2023.

002541

The objectives of the 2022 environmental monitoring program are:

- to comply with the annual monitoring and reporting requirements stipulated in Conditions 109, 112, 135 and 136 of ECA No. A460702
- to assess any potential impacts on water quality at the site resulting from landfill operations
- to continue the monitoring of water quality for key parameters at target locations up-gradient and down-gradient from the landfill
- to document the chemical composition of groundwater and surface water in the vicinity of the landfill
- to assess site compliance with site specific trigger levels relating to groundwater impacts due to leachate
- to document the chemical composition of sediment in the Mer Bleue Bog

10.0 LIMITATIONS AND USE OF REPORT

This report was prepared for the exclusive use of Waste Connections of Canada. The report, which specifically includes all tables and figures, is based on data and information collected by Golder and is based solely on the conditions of the properties at the time of the work, supplemented by historical information and data obtained by Golder as described in this report.

Golder has relied in good faith on all information provided and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in the report as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation.

The assessment of environmental conditions and possible hazards at this site has been made using the results of physical measurements from a number of locations. The site conditions between sampling locations have been inferred based on conditions observed. Groundwater, leachate and/or surface water quality conditions may vary from these sampled locations.

The services performed, as described in this report, were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Signature Page

We trust this report satisfies your current requirements. If you have any further questions regarding this report, please contact the undersigned.

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Table 1a: Summary of Water Sampling Stations for May 2021

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16 S17	S5* S8 S9	S10 (SW-W) S11 (SW-C) S12 (SW-E)
Sand Layer	92-19 95-4/05-1D 95-8	94-3/05-R3 92-8/05-8 92-11/05-11 05-3D 07-1D MW-C MW-E	94-6 95-3 (MW-W) 95-7
Weathered Clay Deposit	92-18 98-1 98-4/05-1C	92-7 92-10 94-2 05-3C 07-1C	94-5 95-2 95-6
Leachate	L-5		
Sediments			SED-W SED-C SED-E

Table 1b: Summary of Water Sampling Stations for August 2021

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16* S17	S5* S8* S9	S10 (SW-W) S11 (SW-C) S12 (SW-E)
Sand Layer			09-1D*
Weathered Clay Deposit			09-1C
Intact Clay Deposit			09-1B
Glacial Till/Upper Bedrock			09-1A
Leachate	L-5		

Notes: * Dry conditions did not permit sampling at this station.

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Checked by: RPM

Table 1c: Summary of Water Sampling Stations for November 2021

Water System	Up-Gradient Control Sites	Immediate Downgradient Sites or Sites in Line with Downgradient Locations	Mer Bleue Bog Sampling Sites
Surface Water	S1 S3 S15 S16 S17	S5 S8 S9	S10 (SW-W) S11 (SW-C) S12 (SW-E)
Sand Layer	92-19 95-8 95-4/05-1D	94-3/05-R3 92-8/05-8 92-11/05-11 05-3D 07-1D MW-C MW-E	94-6 95-3 (MW-W) 95-7
Weathered Clay Deposit	92-18 98-1 98-4/05-1C	92-7 92-10 94-2 05-3C 07-1C	94-5 95-2 95-6
Intact Clay Deposit	92-16 98-3/05-1B 98-2/11-1	92-5 92-9 94-1 05-3B 07-1B	94-4 95-1** 95-5
Glacial Till/Upper Bedrock	92-12 05-1A	92-1 05-3A 07-1A	95-9**
Leachate	L-5		
Sediments			SED-W SED-C SED-E

Notes:
* Monitoring location was dry during this sampling event. No sample was collected.
** Monitoring location was frozen during this sampling event. No sample was collected.

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Table 2: List of Parameters Analyzed or Calculated in 2021

Parameter	Surface Water	Leachate	Groundwater	Sediments
Hardness ($CaCO_3$)	X	X	X	
Alkalinity ($CaCO_3$)	X	X	X	
Total Suspended Solids	X	X		
Bicarbonate (HCO_3)			X	
Carbonate (CO_3)			X	
Calcium	X	X	X	
Chloride	X	X	X	
Magnesium	X	X	X	
Total Phosphorous	X	X	X	
Potassium	X	X	X	
Sodium	X	X	X	
Sulphate	X	X	X	
Nitrate nitrogen	X	X	X	
Nitrite nitrogen	X	X	X	
Ammonia nitrogen[1]	X	X	X	
Total Kjeldahl nitrogen	X	X	X	
TDS	X	X	X	
Metals				
Arsenic	X	X	X	X
Boron	X	X	X	X
Cadmium	X	X	X	X
Chromium	X	X	X	X
Cobalt	X	X	X	X
Copper	X	X	X	X
Iron	X	X	X	X
Lead	X	X	X	X
Manganese	X	X	X	X
Mercury				X
Molybdenum				X
Nickel				X
Selenium				X
Zinc	X	X	X	X

002546

Parameter	Surface Water	Leachate	Groundwater	Sediments
Bulk Organics				
Phenols	X	X	X	
BOD_5	X	X		
COD (Chemical Oxygen Demand)	X	X	X	
DIC (Dissolved Inorganic Carbon)	X	X		
DOC (Dissolved Organic Carbon)	X	X		
1,1-Dichloroethane		X	X	
Benzene		X	X	
Ethylbenzene		X	X	
Methylene Chloride		X	X	
Toluene		X	X	
Vinyl Chloride		X	X	
Xylene – m/p		X	X	
Xylene – o		X	X	
Field Measured Parameters				
pH	X	X	X	
Conductivity	X	X	X	
Temperature	X	X	X	
Dissolved Oxygen	X	X		
Flow	X			

Notes: [1] Unionized ammonia calculated for surface water.

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002547

Table 3: 2021 Monitoring Well Network Condition Survey

Well Number	Properly Cased?	Cap?	Lock?	Comments
OW-92-1	√	√	√	
OW-92-2	√	√	√	
OW-92-3	√	√	√	
OW-92-4	√	√	√	
OW-92-5	√	√	√	
OW-92-6	√	√	√	
OW-92-7	√	√	√	
OW-92-8	√	√	√	
OW-92-9	√	√	√	
OW-92-10	√	√	√	
OW-92-11	√	√	√	
OW-92-12	√	√	√	
OW-92-13	√	√	√	
OW-92-14	√	√	√	
OW-92-15	√	√	√	
OW-92-16	√	√	√	
OW-92-17	√	√	√	
OW-92-18	√	√	√	
OW-92-19	√	√	√	
OW-94-1	√	√	√	
OW-94-2	√	√	√	
OW-94-3	√	√	√	
OW-94-4	√	√	√	
OW-94-5	√	√	√	
OW-94-6	√	√	√	
OW-95-1	√	√	√	
OW-95-2	√	√	√	
OW-95-3	√	√	√	
OW-95-4				Abandoned, well removed.
OW-95-5	√	√	√	
OW-95-6	√	√	√	
OW-95-7	√	√	√	
OW-95-8	√	√	√	
OW-95-9	√	√	√	
OW-98-1	√	√	√	
OW-98-3				Abandoned, well removed.
OW-98-4				Abandoned, well removed.
MW05-R3	√	√	√	
MW05-8	√	√	√	
MW05-11	√	√	√	
MW-C	√	√	√	
MW-E	√	√	√	

Well Number	Properly Cased?	Cap?	Lock?	Comments
MW05-1A	√	√	√	
MW05-1B	√	√	√	
MW05-1C	√	√	√	
MW05-1D	√	√	√	
MW05-2A	√	√	√	
MW05-2B	√	√	√	
MW05-2C	√	√	√	
MW05-2D	√	√	√	
MW05-3A	√	√	√	
MW05-3B	√	√	√	
MW05-3C	√	√	√	
MW05-3D	√	√	√	
MW07-1A	√	√	√	
MW07-1B	√	√	√	
MW07-1C	√	√	√	
MW07-1D	√	√	√	
MW09-1A	√	√	√	
MW09-1B	√	√	√	
MW09-1C	√	√	√	
MW09-1D	√	√	√	
MW11-1	√	√	√	

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Checked by: RPM

Table 4: Summary of Analytical Results – Sediments (May 2021)

Parameter	May 27, 2021			MECP[1]		CCME[2]	MECP[1]	CCME[2]
	SED-E (SW-E)	SED-C (SW-C)	SED-W (SW-W)	Table 2 Residential/ Parkland	Table 4 Residential/ Parkland Surface Soil	Residential/ Parkland	Table 1 Sediment	Freshwater Sediment
Arsenic	**9.1**	1.1	3.4	18	18	12	6	5.9
Boron*	**4.2**	**1.9**	**10.6**	1.5	1.5	nac	nac	nac
Cadmium	<0.5	<0.5	<0.5	1.2	1.2	10	0.6	0.6
Chromium	**35.8**	13.3	**30.5**	160	160	64	26	37.3
Cobalt	7.9	2.0	5.4	22	22	50	50	nac
Copper	**17.1**	<5.0	**23.7**	180	180	63	16	35.7
Iron	82,800	4,950	13,100	nac	nac	nac	nac	nac
Lead	10.0	4.2	10.6	120	120	140	31	35.0
Manganese	1,260	88	322	nac	nac	nac	nac	nac
Mercury	<0.1	<0.1	<0.1	1.8	1.8	6.6	0.2	0.170
Molybdenum	1.3	<1	3.9	6.9	6.9	10	nac	nac
Nickel	**22.5**	6.2	**19.2**	130	130	45	16	nac
Selenium	**1.2**	<1	**1.4**	2.4	2.4	1	nac	nac
Zinc	76.5	<20.0	72.8	340	340	250	120	123

Notes:
All concentrations are reported in µg/g dry.
nac - no applicable criteria for this parameter. **Bold** indicates that a concentration exceeds one or more of the applicable soil quality guidelines in this table.
[1] MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*, revised version April 15, 2011 (MOE, 2011).
[2] Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment, Update 2018 (CCME, 1999).
* Criteria based on a hot water extract for available boron.

Prepared by: ETB
Checked by: RPM

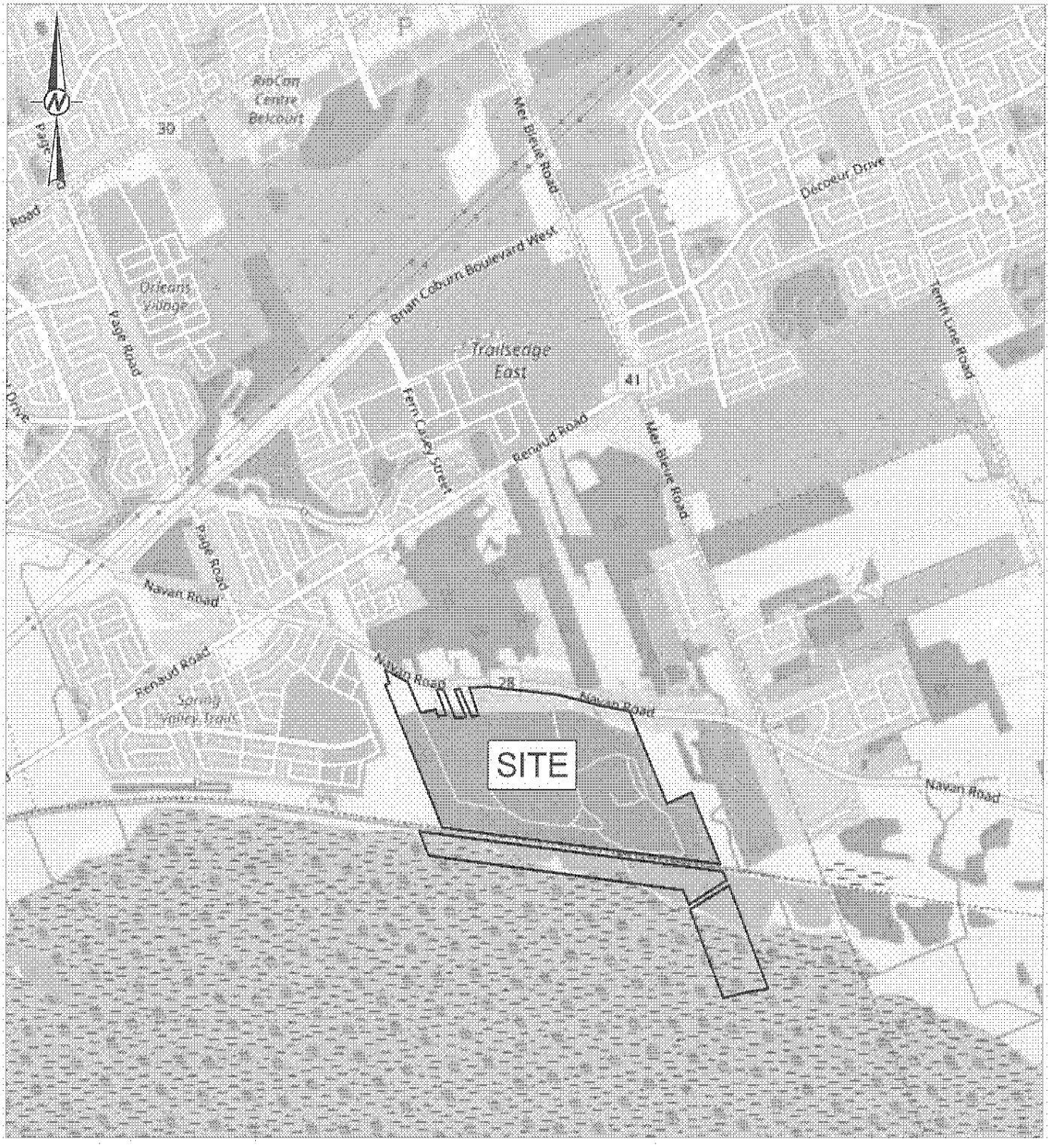
Table 5: Summary of Analytical Results – Sediments (November 2021)

Parameter	November 24, 2021			MECP[1]		CCME[2]	MECP[1]	CCME[2]
	SED-E (SW-E)	SED-C (SW-C)	SED-W (SW-W)	Table 2 Residential/ Parkland	Table 4 Residential/ Parkland Surface Soil	Residential/ Parkland	Table 1 Sediment	Freshwater Sediment
Arsenic	<1	1.5	2.1	18	18	12	6	5.9
Boron*	<0.5	1.0	**7.2**	1.5	1.5	nac	nac	nac
Cadmium	<0.5	<0.5	<0.5	1.2	1.2	10	0.6	0.6
Chromium	10.5	13.5	16.2	160	160	64	26	37.3
Cobalt	1.6	2.0	3.2	22	22	50	50	nac
Copper	<5.0	**16.2**	**16.3**	180	180	63	16	35.7
Iron	6,290	5,100	8,340	nac	nac	nac	nac	nac
Lead	4.8	4.2	6.2	120	120	140	31	35.0
Manganese	68	74	268	nac	nac	nac	nac	nac
Mercury	<0.1	<0.1	<0.1	1.8	1.8	6.6	0.2	0.170
Molybdenum	<1	<1	2.1	6.9	6.9	10	nac	nac
Nickel	<5.0	6.2	11.6	130	130	45	16	nac
Selenium	<1	<1	<1	2.4	2.4	1	nac	nac
Zinc	<20	<20	54.9	340	340	200	120	123

Notes:
All concentrations are reported in µg/g dry.
nac - no applicable criteria for this parameter. **Bold** indicates that a concentration exceeds one or more of the applicable soil quality guidelines in this table.
[1] MECP Soil, Ground Water and Sediment Standards for Use Under Part XV.1 of the *Environmental Protection Act*, revised version April 15, 2011 (MOE, 2011).
[2] Canadian Environmental Quality Guidelines, Canadian Council of Ministers of the Environment, Update 2007 (CCME, 1999).
* Criteria based on a hot water extract for available boron.

Prepared by: ETB
Checked by: RPM

002551



WASTE CONNECTIONS OF CANADA

0 500 1,000
1:25,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

CLIENT
WASTE CONNECTIONS OF CANADA

CONSULTANT
WSP GOLDER

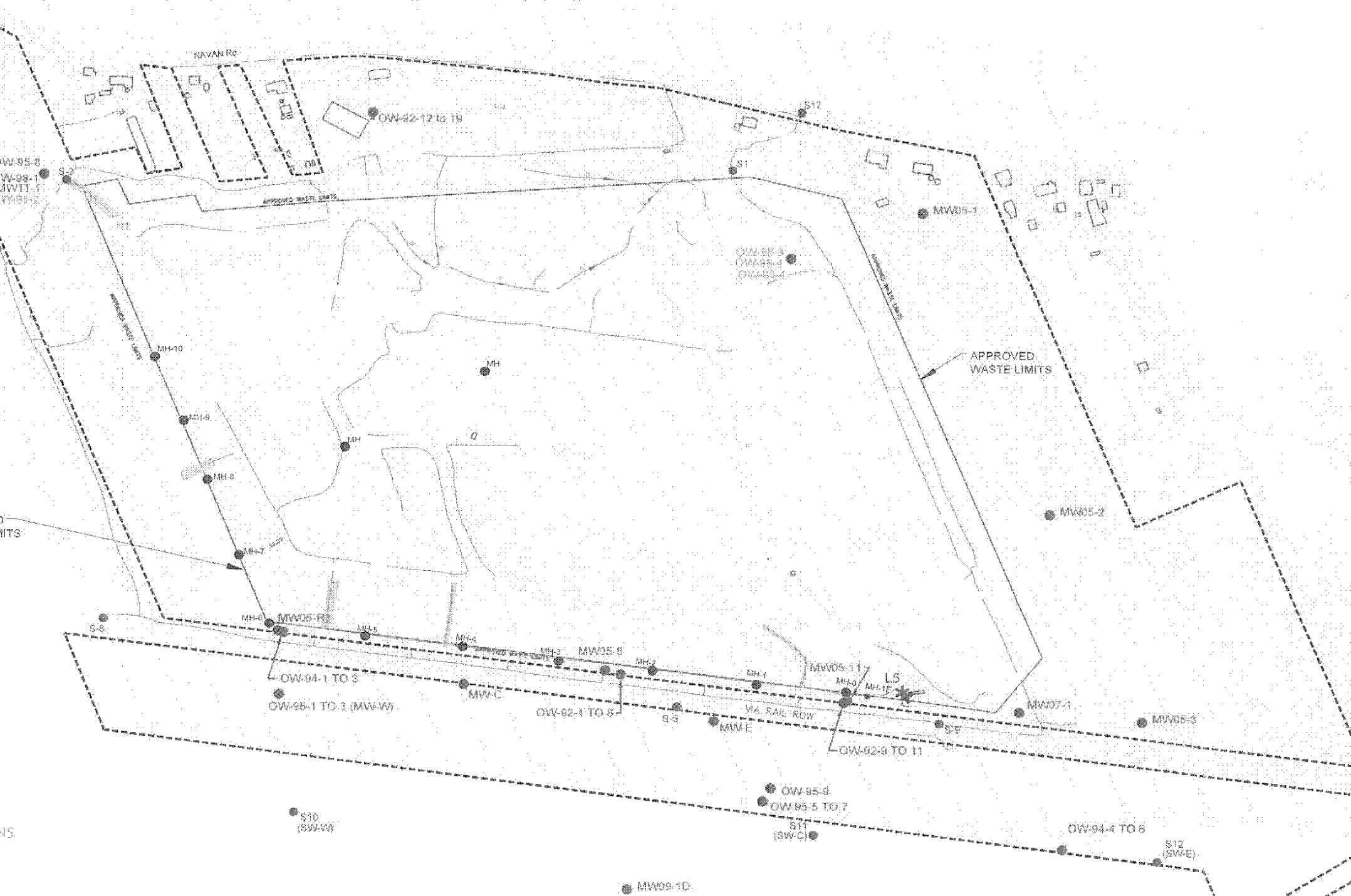
YYYY-MM-DD	2022-01-05
DESIGNED	YJM
PREPARED	ABD
REVIEWED	YJM
APPROVED	PLE

PROJECT
REPORT ON 2021 LANDFILL MONITORING
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD, OTTAWA, ONTARIO

TITLE
KEY PLAN

PROJECT NO.	CONTROL	REV.	FIGURE
21497772	0002	0	

002552



FENCE LINE

SURFACE WATER SAMPLING STATION

GROUNDWATER SAMPLING STATION

002553

REFERENCE(S)

1. PROPERTY LINE PROVIDED IN ELECTRONIC FORMAT BY: FARLEY, SMITH & DENIS SURVEYING LTD. FILE NO.: 508-05, DATED: APRIL 13, 2007.
2. BASE INFORMATION PROVIDED BY THE BASE MAPPING CO. LTD. IN A DIGITAL FORMAT FROM CONTRACT No. 2748.21, DATED MAY 1, 2021.
3. COORDINATE SYSTEM NAD 83-UTM, VERTICAL DATUM: GEODETIC

CLIENT
WASTE CONNECTIONS OF CANADA

PROJECT
REPORT ON 2021
NAVAN WASTE RE
3354 NAVAN ROAD

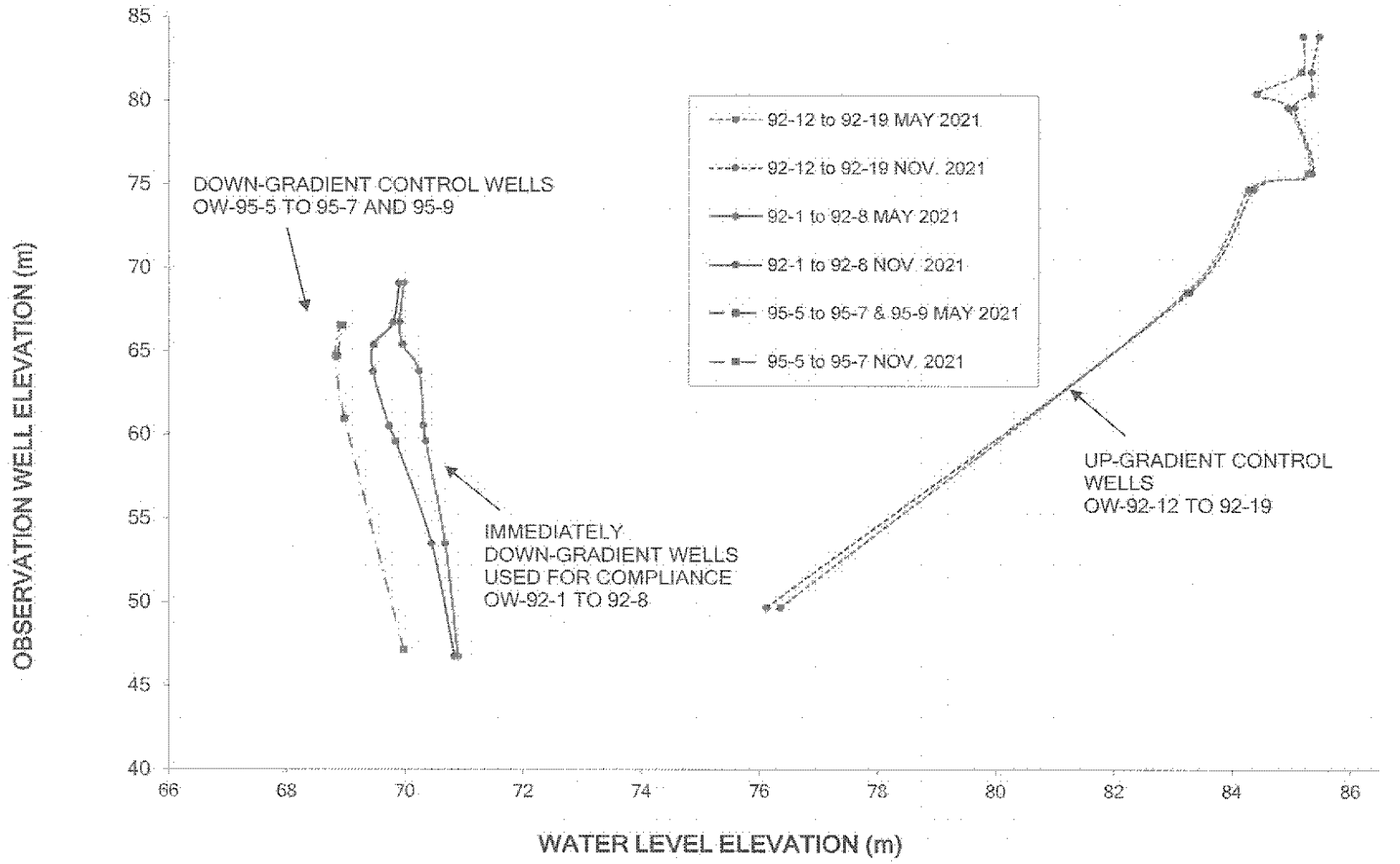


FIGURE 3

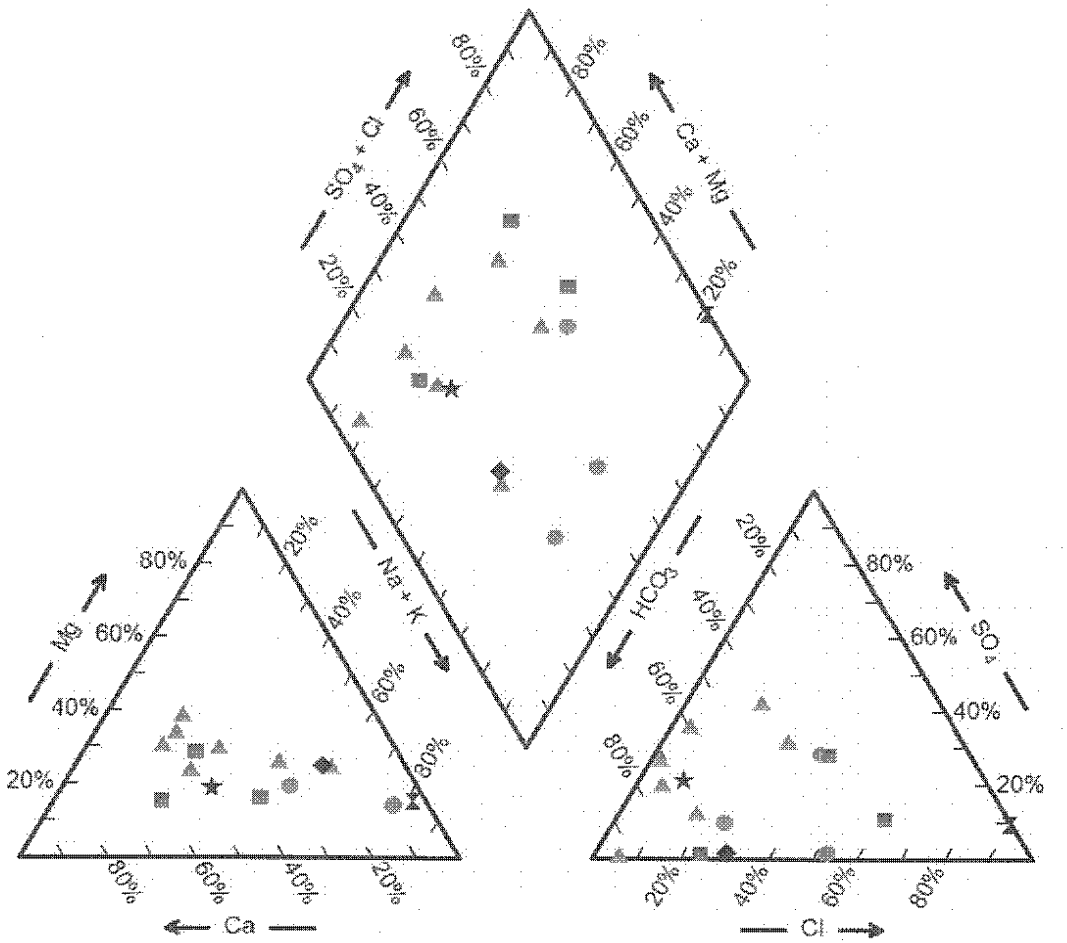
Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

HYDRAULIC HEAD PROFILES

WSP GOLDER

002554



Legend

- 05-11
- 05-3D
- 05-8
- 05-R3
- 07-1D
- MW-C
- MW-E
- 94-6
- 95-3
- 95-7
- 05-1D
- 92-19
- 95-8
- L5
- Potable GW
- Sea Water

WCC NAVAN FACILITY

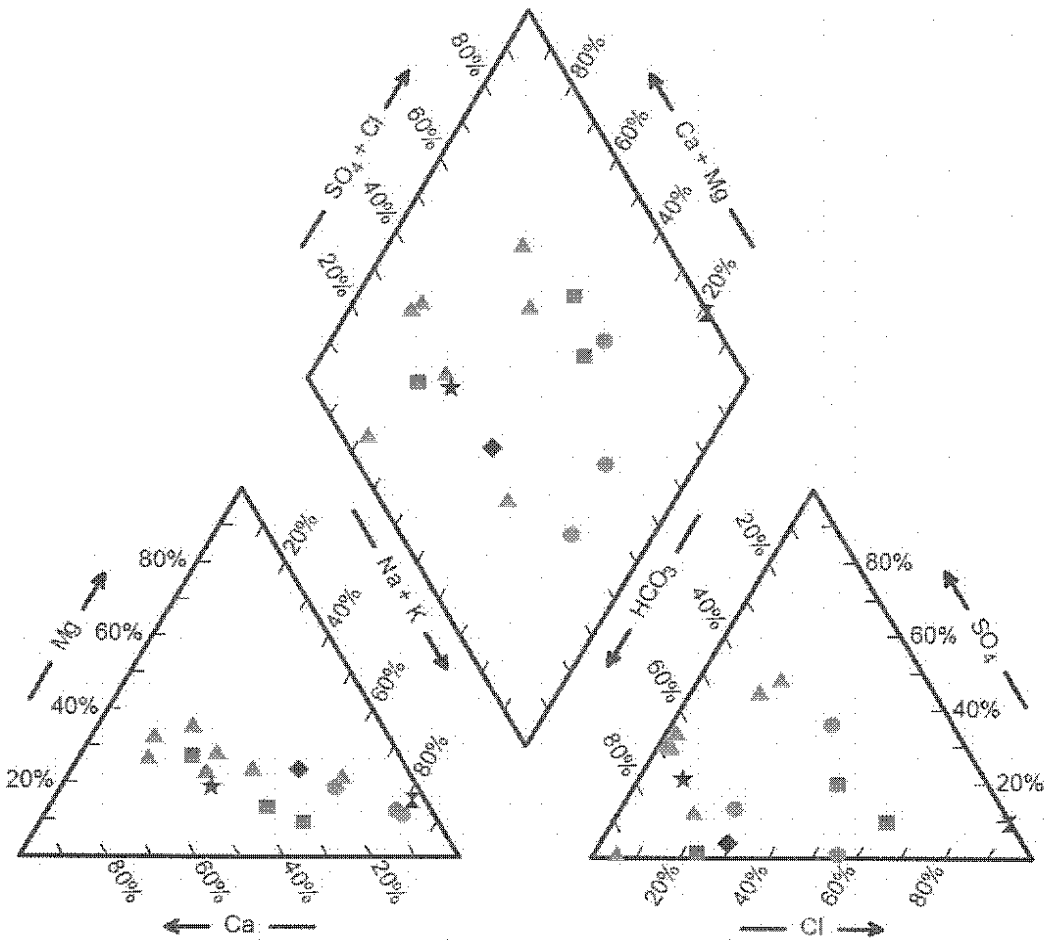
GOLDER

Drawn By	YJM
Checked By	ETB
Reviewed By	PLE

Chemical Analyses of Groundwater
Plotted on a Piper Trilinear Diagram
Sand Deposit (May 2021)

March 2022	21497772-02	Figure 4

002555



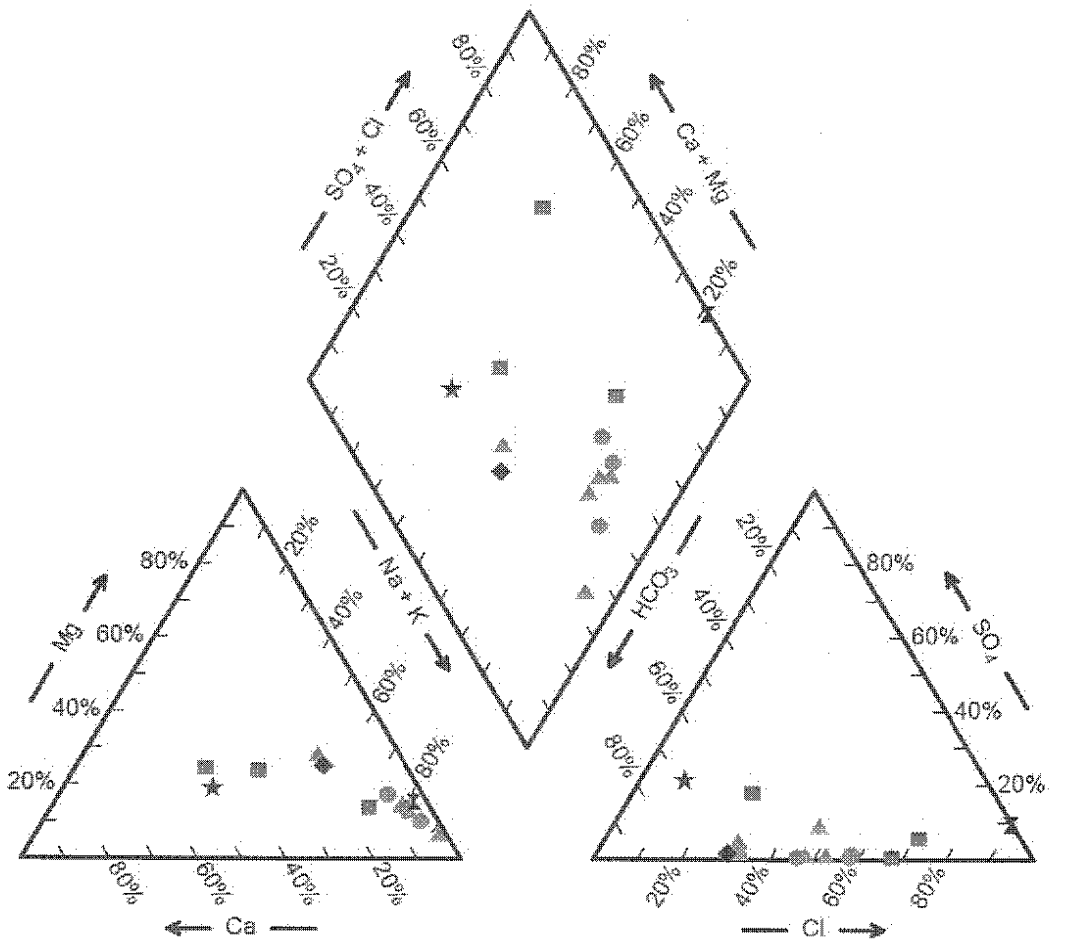
Legend

- 05-11
- 05-3D
- 05-8
- 05-R3
- 07-1D
- MW-C
- MW-E
- 94-6
- 95-3
- 95-7
- 05-1D
- 92-19
- 95-8
- L5
- Potable GW
- Sea Water

WCC NAVAN FACILITY

wsp GOLDER	Drawn By:	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Sand Deposit (November 2021)	
	Checked By:	ETB		
	Reviewed By:	PLE	March 2022	21497772-02	Figure 5

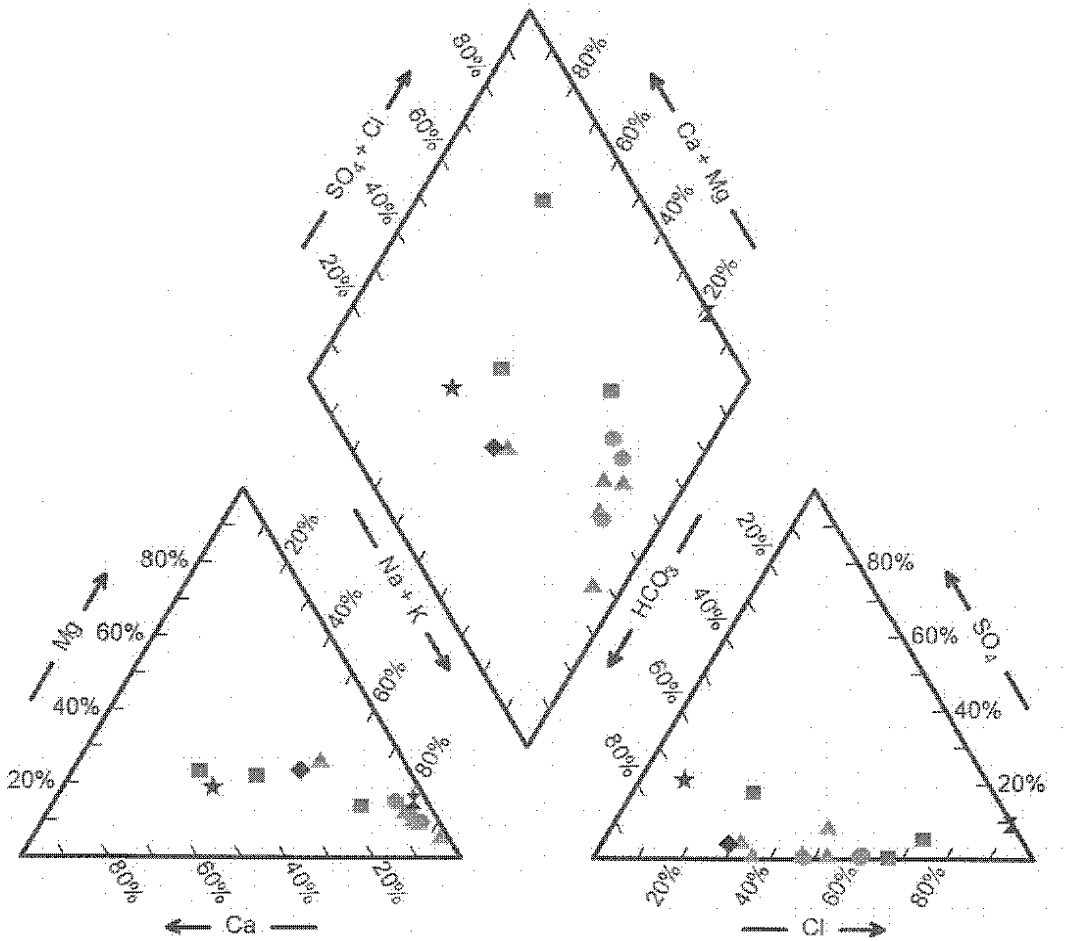
002556



WCC NAVAN FACILITY

GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Weathered Clay Deposit (May 2021)	
	Checked By	ETB		
	Reviewed By	PLE	March 2022	21497772-02	Figure 6

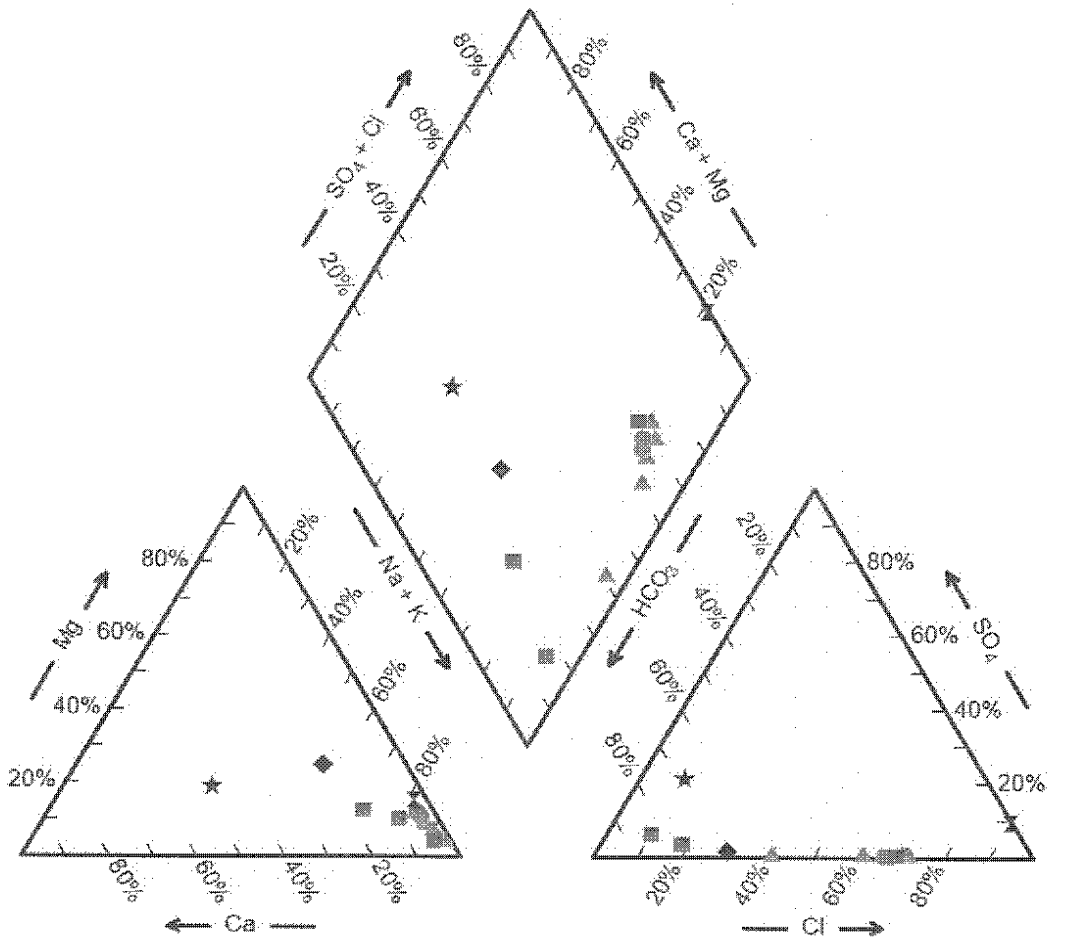
002557



WCC NAVAN FACILITY

WSP GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Weathered Clay Deposit (November 2021)
	Checked By	ETB	
	Reviewed By	PLE	March 2021 | 21497772-02 | Figure 7

002558



Legend

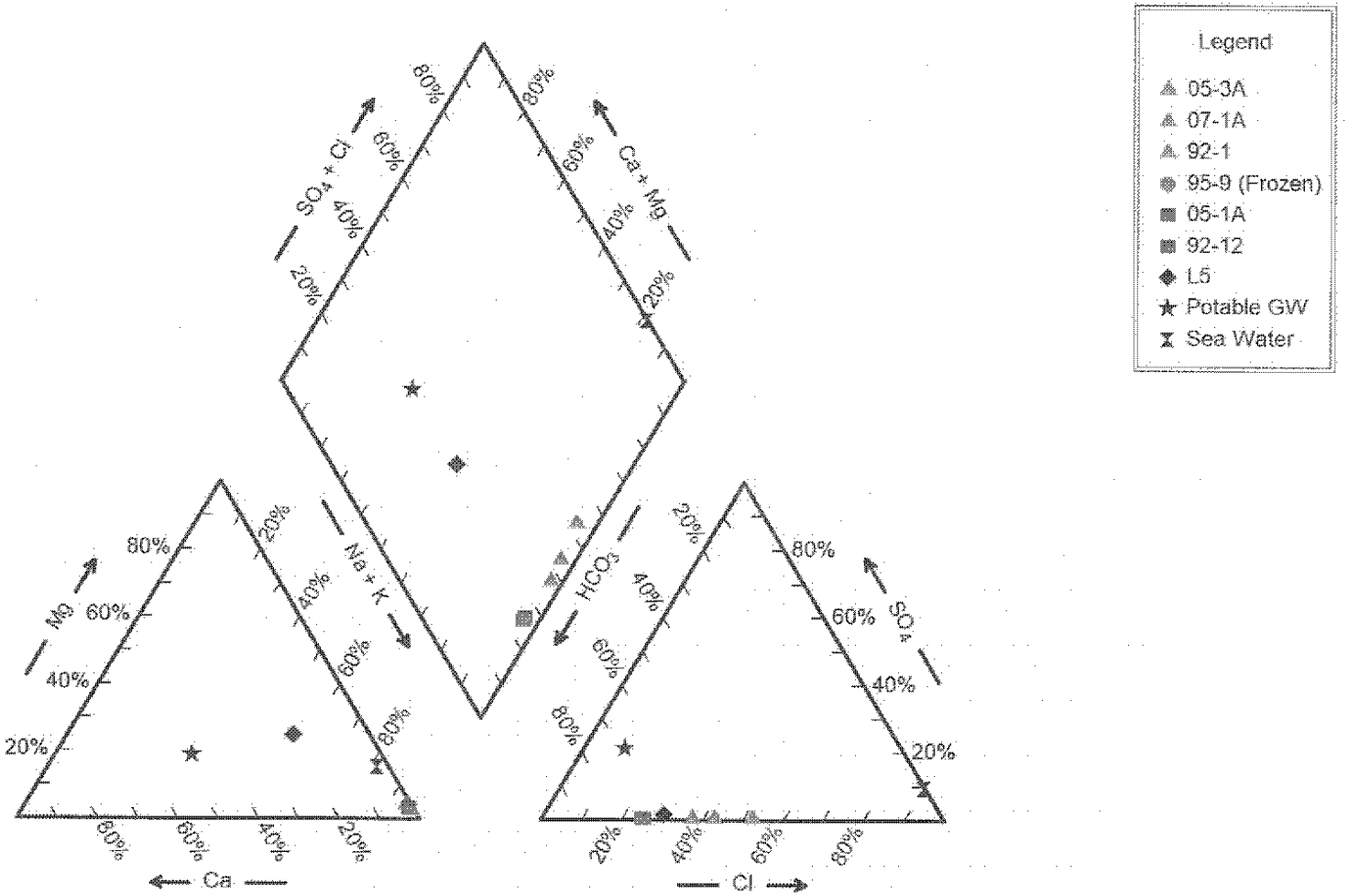
- 05-3B
- 07-1B
- 92-5
- 92-9
- 94-1
- 94-4
- 95-1 (Frozen)
- 95-5
- 05-1B
- 11-1
- 92-16
- L5
- Potable GW
- Sea Water

WCC NAVAN FACILITY

Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Intact Clay Deposit (November 2021)
Checked By	ETB	
Reviewed By	PLE	March 2022 | 21497772-02 | Figure 8

wsp GOLDER

002559



WCC NAVAN FACILITY

GOLDER	Drawn By	YJM	Chemical Analyses of Groundwater Plotted on a Piper Trilinear Diagram Glacial Till / Upper Bedrock Zone (November 2021)
	Checked By	ETB	
	Reviewed By	PLE	March 2022 | 21497772-02 | Figure 9

002560

APPENDIX A

Record of Borehole Sheets

Please refer to the electronic version of the appendix provided on the USB at the end of this report

APPENDIX B

Laboratory Certificates of Analysis

Please refer to the electronic version of the appendix provided on the USB at the end of this report

APPENDIX C

Groundwater Level Records

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	24-Mar-92 Elevation	25-Mar-92 Elevation	26-Mar-92 Elevation	30-Mar-92 Elevation	31-Mar-92 Elevation	01-Apr-92 Elevation	02-Apr-92 Elevation	03-Apr-92 Elevation	06-Apr-9 Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	71.10	70.00	70.00	69.96		69.95		69.80	
73.50		71.10	18.32	53.53	52.03	53.25	58.88	60.78	67.15		68.15		69.28	
73.64		71.10	12.22	59.63	58.13		63.48	64.58	67.28		67.78		68.38	
73.67		71.10	g	60.54	59.04		62.54	63.09	65.12		65.73		66.69	
73.64		71.10	8.06	63.79	62.29		65.04	65.54	67.22		67.67		68.29	
73.74		71.10	6.47	65.38	63.88		69.06	69.30	69.76		69.73		69.63	
73.59		71.10	5.13	66.72	65.22		69.32	69.41	69.84		69.87		69.77	
73.52		71.10	2.8	69.05	67.55		69.49	69.58	69.85		69.84		69.69	
73.39		70.67	7.6	63.82	62.32			64.27	66.67		67.44		68.12	
73.27		70.70	4.6	66.85	65.35			69.35	69.75		69.75		69.75	
73.33		70.75	2.6	68.9	67.4			69.40	69.78		69.79		69.76	
87.41		86.03	37.1	49.68	48.18					74.31	74.25	74.25	74.25	74.25
87.26		86.03	18.22	68.56	67.06							80.61	81.01	81.68
87.24		86.03	12.11	74.67	73.17								79.12	82.95
87.35		86.03	11.11	75.67	74.17								76.62	79.92
87.19		86.03	7.19	79.59	78.09								81.36	82.72
87.37		86.03	6.38	80.4	78.9								83.75	84.29
87.28		86.03	5.05	81.73	80.23								84.12	84.92
87.22		86.03	2.93	83.85	82.35								84.35	85.39
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02									
72.84		71.33	4.57	67.51	66.01									
72.74		71.33	2.58	69.5	68									
69.61		68.7	8.38	61.07	59.57									
70.2		68.7	3.55	65.9	64.4									
70.13		68.7	1.91	67.54	66.04									
70.23														
70.87														
86.27														
86.33														
86.34														
86.39														
81.38														
81.31														
81.20														
81.25														
70.93	74.53													
70.85	74.47													
70.80	74.52													
70.91	74.46													

ed in November 2005

002566

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	14-May-92 Elevation	01-Jun-92 Elevation	17-Jun-92 Elevation	30-Jun-92 Elevation	21-Jul-92 Elevation	05-Aug-92 Elevation	19-Jul-93 Elevation	02-Nov-93 Elevation	04-Apr-[illegible] Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	60.49	66.30	68.85	69.35	69.63	69.66	69.81	69.82	69.85
73.50		71.10	18.32	53.63	52.03	67.93	69.51	69.58	69.60	69.60	69.58	69.65	69.58	69.50
73.64		71.10	12.22	59.83	58.13	67.66	69.16	69.40	69.43	69.42	69.44	69.63	69.42	69.27
73.67		71.10	g	60.54	59.04	65.99	68.60	69.29	69.37	69.38	69.43	69.62	69.40	69.24
73.64		71.10	8.06	63.79	62.29	68.54	69.17	69.28	69.25	69.31	69.36	69.38	69.43	69.09
73.74		71.10	6.47	65.38	63.88	69.44	69.45	69.13	69.14	69.59	69.67	69.10	69.43	69.74
73.59		71.10	5.13	66.72	65.22	69.29	69.50	69.12	69.17	69.55	69.67	69.11	69.41	69.85
73.52		71.10	2.8	69.05	67.55	69.40	69.49	69.12	69.16	69.54	69.66	69.07	69.37	69.75
73.39		70.67	7.6	63.82	62.32	67.29	69.09	69.14	69.12	69.23	69.23	69.14	69.22	68.95
73.27		70.70	4.6	66.85	65.35	69.29	69.34	69.12	69.16	69.38	69.44	68.94	69.24	69.36
73.33		70.75	2.6	68.9	67.4	69.33	69.38	69.15	69.17	69.40	69.46	68.98	69.27	69.40
87.41		86.03	37.1	49.68	48.18	74.64	74.68	74.57	74.53	74.64	74.65	74.72	74.43	
87.26		86.03	18.22	68.56	67.06	81.01	82.31	82.44	82.46	82.51	82.50	82.42	82.46	82.47
87.24		86.03	12.11	74.67	73.17	83.34	83.50	83.56	83.58	83.62	83.63	83.57	83.55	83.41
87.35		86.03	11.11	75.67	74.17	82.12	83.70	83.78	83.78	83.83	83.82	83.77	83.76	83.57
87.19		86.03	7.19	79.59	78.09	83.32	84.18	84.32	84.29	84.41	84.43	84.32	84.41	84.12
87.37		86.03	6.38	80.4	78.9	84.19	84.50	84.55	84.49	84.75	84.72	84.51	84.69	84.44
87.26		86.03	5.05	81.73	80.23	84.19	84.58	84.62	84.56	84.86	84.82	84.57	84.75	84.92
87.22		86.03	2.93	83.85	82.35	84.74	84.88	84.56	84.57	85.14	85.29	84.48	84.82	85.24
		86.96				-	84.61	84.49	85.13	84.99	84.56			
		71.99				68.67	70.37	70.32	70.28	70.56	70.46			
		72.00				68.99	70.41	70.64	70.59	70.62	70.52			
72.83		71.33	8.56	63.52	62.02									
72.84		71.33	4.57	67.51	66.01									
72.74		71.33	2.58	69.5	68									
69.61		68.7	8.38	61.07	59.57									
70.2		68.7	3.55	65.9	64.4									
70.13		68.7	1.91	67.54	66.04									
70.23														
70.87														
86.27														
86.33														
86.34														
86.39														
81.38														
81.31														
81.20														
81.25														
70.93	74.53													
70.85	74.47													
70.80	74.52													
70.91	74.46													

ed in November 2005

002567

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	25-Oct-94 Elevation	06-Dec-94 Elevation	28-Mar-95 Elevation	20-Apr-95 Elevation	16-May-95 Elevation	23-Jun-95 Elevation	12-Jul-95 Elevation	26-Jul-95 Elevation	09-Aug- Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	69.88	69.83	69.90	69.88	69.92	69.92			
73.50		71.10	18.32	53.53	52.03	69.56	69.50	69.81	69.77	69.72	69.70			
73.64		71.10	12.22	59.63	58.13	69.39	69.28	69.61	69.63	69.57	69.58			
73.67		71.10	g	60.54	59.04	69.35	69.21	69.54	69.57	69.53	69.56			
73.64		71.10	8.06	63.79	62.29	69.15	69.27	69.45	69.43	69.40	69.50			
73.74		71.10	6.47	65.38	63.88	69.01	69.51	69.49	69.48	69.72	69.21			
73.59		71.10	5.13	66.72	65.22	69.00	69.50	69.48	69.49	69.82	69.23			
73.52		71.10	2.8	69.05	67.55	68.94	69.43	69.05	69.43	69.76	69.20			
73.39		70.67	7.6	63.82	62.32	69.05	69.15	69.17	69.21	69.16	69.18			
73.27		70.70	4.6	66.85	65.35	68.90	69.32	69.25	69.32	69.44	69.08			
73.33		70.75	2.6	68.9	67.4	68.92	69.36	69.29	69.35	69.50	69.11			
87.41		86.03	37.1	49.68	48.18	74.57	74.33	74.59	74.69	74.97	74.86			
87.26		86.03	18.22	68.56	67.06	82.47	82.50	82.52	82.49	82.47	82.44			
87.24		86.03	12.11	74.67	73.17	83.48	83.49	83.48	83.48	83.50	83.50			
87.35		86.03	11.11	75.67	74.17	83.65	83.68	83.65	83.65	83.66	83.71			
87.19		86.03	7.19	79.59	78.09	84.18	84.26	84.15	84.24	84.20	84.26			
87.37		86.03	6.38	80.4	78.9	84.40	84.54	84.46	84.52	84.46	84.47			
87.28		86.03	5.05	81.73	80.23	84.52	84.63	84.55	84.62	84.85	84.54			
87.22		86.03	2.93	83.85	82.35	84.48	84.85	84.85	84.73	84.46	84.45			
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02					71.09	71.09			
72.84		71.33	4.57	67.51	66.01					70.52	70.47			
72.74		71.33	2.58	69.5	68					70.39	70.33			
69.61		68.7	8.38	61.07	59.57					68.54	68.54			
70.2		68.7	3.55	65.9	64.4					68.51	68.35			
70.13		68.7	1.91	67.54	66.04					68.42	68.32			
70.23														
70.87														
86.27														
86.33														
86.34														
86.39														
81.38														
81.31														
81.20														
81.25														
70.93	74.53													
70.85	74.47													
70.80	74.52													
70.91	74.46													

ned in November 2005

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Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	21-Aug-95 Elevation	28-Aug-95 Elevation	13-Sep-95 Elevation	18-Sep-95 Elevation	29-Sep-95 Elevation	11-Nov-95 Elevation	06-Jun-96 Elevation	08-Aug-96 Elevation	04-Sep-9 Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25					69.8	69.97	69.89	69.9	69.89
73.50		71.10	18.32	53.53	52.03					69.95	69.92	69.7	69.63	69.6
73.64		71.10	12.22	59.63	58.13					69.89	69.9	69.62	69.39	69.45
73.67		71.10	g	60.54	59.04					69.89	69.87	69.62	69.38	69.44
73.64		71.10	8.06	63.79	62.29					69.45	69.77	69.54	69.24	69.34
73.74		71.10	6.47	65.38	63.88					69.13	69.55	69.35	69.2	69.17
73.59		71.10	5.13	66.72	65.22					69.13	69.5	69.4	69.17	69.17
73.52		71.10	2.8	69.05	67.55					69.1	69.46	69.35	69.11	69.17
73.39		70.67	7.6	63.82	62.32					68.99	69.36	69.21	69.08	69.15
73.27		70.70	4.6	66.85	65.35					68.92	69.34	69.22	68.97	69
73.33		70.75	2.6	68.9	67.4					68.91	69.36	69.23	68.99	69.03
87.41		86.03	37.1	49.68	48.18					74.67	74.69	74.82	74.62	74.49
87.26		86.03	18.22	68.56	67.06					82.4	82.45	82.62	82.58	82.77
87.24		86.03	12.11	74.67	73.17					83.41	83.55	83.72	83.56	83.51
87.35		86.03	11.11	75.67	74.17					83.6	83.74	83.9	83.7	83.67
87.19		86.03	7.19	79.59	78.09					84.04	84.37	84.42	84.25	84.24
87.37		86.03	6.38	80.4	78.9					84.22	84.63	84.58	84.47	84.42
87.28		86.03	5.05	81.73	80.23					84.24	84.66	84.64	84.62	84.47
87.22		86.03	2.93	83.85	82.35					84.24	84.79	84.57	84.47	84.41
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02					69.13	69.29	69.626	69.316	68.81
72.84		71.33	4.57	67.51	66.01					68.65	69.31	68.911	68.951	68.91
72.74		71.33	2.58	69.5	68					68.62	69.62	69.041	68.891	68.85
69.61		68.7	8.38	61.07	59.57					67.7	68.08	68.51	68.25	68.28
70.2		68.7	3.55	65.9	64.4					68.13	68.5	68.38	67.95	67.54
70.13		68.7	1.91	67.54	66.04					68.83	69.02	68.35	68.01	67.51
70.23														
70.87														
86.27														
86.33														
86.34														
86.39														
81.38														
81.31														
81.20														
81.25														
70.93	74.53													
70.85	74.47													
70.80	74.52													
70.91	74.46													

ed in November 2005

002569

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	14-Aug-98 Elevation	26-Oct-98 Elevation	03-May-99 Elevation	11-Oct-99 Elevation	02-May-00 Elevation	20-Oct-00 Elevation	08-Jun-01 Elevation	03-Oct-01 Elevation	17-May-[illegible] Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	70.01	70.01	70.2	70.12	70.2	70.28	70.32	70.31	70.37
73.50		71.10	18.32	53.53	52.03	70.08	70.15	69.81	70.16	69.87	70.18	70.24	70.23	70.4
73.64		71.10	12.22	59.63	58.13	69.92	69.86	69.31	69.67	69.97	69.79	69.91	69.74	70.2
73.67		71.10	g	60.54	59.04				69.57	69.97	69.7	69.84	69.6	70.27
73.64		71.10	8.06	63.79	62.29	69.35	69.54	68.95	69.17	69.97	69.2	69.51	68.98	69.91
73.74		71.10	6.47	65.38	63.88	69.08	69.36	69.4	69.02	69.84	68.95	69.4	69.07	69.89
73.59		71.10	5.13	66.72	65.22	69.03	69.33	69.4	68.96	69.69	68.85	69.37	68.79	69.95
73.52		71.10	2.8	69.05	67.55	69.07	69.34	69.39	68.96	69.74	68.86	69.41	68.8	69.97
73.39		70.67	7.6	63.82	62.32	69.06	69.2	69.29	68.99	69.33	68.96	69.63	69.02	69.59
73.27		70.70	4.6	66.85	65.35	68.99	69.21	69.21		69.28	68.82	69.3	68.88	69.66
73.33		70.75	2.6	68.9	67.4	69.12	69.23	69.18	68.96	69.25	68.76	69.27	68.86	69.67
87.41		86.03	37.1	49.68	48.18	74.61	74.6	75.13	74.58	74.89	74.89	75.04	74.66	75.16
87.26		86.03	18.22	68.56	67.06	82.53	82.57	82.61	82.61	82.6	82.6	82.62	82.55	82.58
87.24		86.03	12.11	74.67	73.17	83.52	83.58	83.69	83.61	83.65	83.57	83.59	83.46	83.52
87.35		86.03	11.11	75.67	74.17	83.7	83.75	84.01	83.76	83.85	83.82	84.23	83.65	84.42
87.19		86.03	7.19	79.59	78.09	84.18	84.32	84.46	84.35	84.53	84.17	84.31	84.04	84.52
87.37		86.03	6.38	80.4	78.9	84.36	84.32	84.67	84.6	84.78	84.33	84.49	84.21	84.72
87.28		86.03	5.05	81.73	80.23	84.43	84.54	84.77	84.76	84.89	84.46	84.74	84.5	84.72
87.22		86.03	2.93	83.85	82.35	84.34	84.54	84.67	84.59	84.81	84.3	84.49	84.2	85.2
		86.96												
		71.99												
		72.00												
72.63		71.33	8.56	63.52	62.02	69.2	69.29	69.52	68.9	69.6	69.2	69.41	69.4	69.77
72.64		71.33	4.57	67.51	66.01	68.68	69.01	69.25	68.52	69.51	68.72	69.17	69.28	69.65
72.74		71.33	2.58	69.5	68	68.64	68.98	69.21	68.53	69.46	68.69	69.06	69.22	69.69
69.61		68.7	8.38	61.07	59.57	68.25	68.48	68.58	68.13	68.58	68.52	68.6	68.08	68.65
70.2		68.7	3.55	65.9	64.4	67.66	68.36	68.34	68.27	68.45	68.31	68.4	67.92	68.46
70.13		68.7	1.91	67.54	66.04	67.74	68.44	68.38	68.32	68.48	68.32	68.43	67.93	68.48
70.23														
70.87														
86.27														
86.33														
86.34														
86.39														
81.38														
81.31														
81.20														
81.25														
70.93	74.53													
70.85	74.47													
70.80	74.52													
70.91	74.46													

ned in November 2005

002570

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	05-Nov-03 Elevation	08-May-04 Elevation	05-Nov-04 Elevation	29-May-05 Elevation	16-Nov-05 Elevation	19-May-06 Elevation	14-Nov-06 Elevation	07-May-07 Elevation	19-Nov-0 Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	70.49	70.51	70.53	70.47	70.4	70.48	70.57	70.52	70.47
73.50		71.10	18.32	53.53	52.03	70.35	70.40	70.20	70.32	70.14	70.27	70.35	70.35	70.44
73.64		71.10	12.22	59.63	58.13	69.87	70.09	69.84	70.07	69.63	70.03	70.07	70.02	69.94
73.67		71.10	g	60.54	59.04	69.77	70.05	69.76	70.02	69.55	69.99	70.015	70.03	69.84
73.64		71.10	8.06	63.79	62.29	69.48	69.88	69.33	69.83	69.11	69.78	69.899	69.88	69.41
73.74		71.10	6.47	65.38	63.88	69.52	69.80	69.2	69.61	68.98	70.13	69.818	69.73	69.33
73.59		71.10	5.13	66.72	65.22	69.57	69.70	69.25	69.44	69.94	70.22	70.16	69.60	69.34
73.52		71.10	2.6	69.05	67.55	69.57	69.70	69.25	69.44	68.93	70.21	70.24	69.60	69.37
73.39		70.67	7.6	63.82	62.32	69.55	69.67	69.32	69.59	69.22	69.61	69.679	69.53	69.33
73.27		70.70	4.6	66.85	65.35	69.63	69.61	69.19	69.34	69.16	70.1	70.165	69.46	69.32
73.33		70.75	2.6	68.9	67.4	69.64	69.59	69.27	69.42	69.15	70.09	70.102	69.45	69.44
87.41		86.03	37.1	49.68	48.18	74.80	75.16	74.88	75.23	74.84	75.35	75.33	75.46	75.36
87.26		86.03	18.22	68.56	67.06	82.57	82.59	82.54	82.58	82.53	82.63	82.675	82.70	82.59
87.24		86.03	12.11	74.67	73.17	83.55	83.54	83.46	83.63	83.52	83.72	83.756	83.71	83.51
87.35		86.03	11.11	75.67	74.17	85.00	85.02	84.69	85	84.87	85.15	85.057	85.19	84.57
87.19		86.03	7.19	79.59	78.09	84.32	84.43	84.20	84.44	84.22	84.6	84.606	84.55	84.17
87.37		86.03	6.38	80.4	78.9	84.59	84.66	84.36	84.63	84.44	84.88	84.841	84.76	84.37
87.28		86.03	5.05	81.73	80.23	84.66	84.75	84.42	83.7	84.5	84.81	84.9	84.85	82.87
87.22		86.03	2.93	83.85	82.35	85.00	84.92	84.53	84.69	84.67	85.42	85.486	84.81	84.52
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02	69.60	69.76	69.55	69.756	69.506	69.756	70.03	69.91	70.06
72.84		71.33	4.57	67.51	66.01	69.52	69.53	68.99	69.331	69.361	69.671	69.576	69.45	69.22
72.74		71.33	2.58	69.5	68	69.56	69.56	69.06	69.301	69.361	69.841	70.111	69.42	69.21
69.61		68.7	8.38	61.07	59.57	68.48	68.55	68.63	68.67	68.49	68.69	68.755	68.67	68.45
70.2		68.7	3.55	65.9	64.4	68.56	68.51	68.50	68.47	68.44	68.46	68.485	68.37	68.30
70.13		68.7	1.91	67.54	66.04	68.54	68.51	68.51	68.48	68.45	68.56	68.507	68.41	68.35
70.23														
70.87														
86.27													78.55	78.68
86.33													84.275	83.975
86.34													84.915	84.625
86.39													84.88	84.58
81.38													66.21	66.11
81.31													68.195	67.535
81.20													70.38	67.99
81.25													71.2	68.02
70.93	74.53												70.02	70.02
70.85	74.47												69.9	69.91
70.80	74.52												69.46	69.43
70.91	74.46												69.355	69.405

ned in November 2005

002571

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	18-Nov-09 Elevation	17-May-10 Elevation	13-Oct-10 Elevation	16-May-11 Elevation	22-Nov-11 Elevation	23-May-12 Elevation	20-Nov-12 Elevation	21-May-13 Elevation	20-Nov-[illegible] Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	70.49	70.52	70.01	70.38	70.49	70.59	70.53	70.62	70.56
73.50		71.10	18.32	53.53	52.03	70.35	70.37	70.03	70.20	70.33	70.43	70.24	70.37	70.26
73.64		71.10	12.22	59.63	58.13	69.96	70.21	69.69	70.09	69.86	70.21	69.87	70.17	69.85
73.67		71.10	g	60.54	59.04	69.90	70.28	69.63	70.07	69.78	70.20	69.80	70.15	69.78
73.64		71.10	8.06	63.79	62.29	69.47	69.88	69.60	70.00	69.23	70.03	69.45	69.92	69.48
73.74		71.10	6.47	65.38	63.88	70.27	69.55	69.72	69.95	69.02	69.94	69.32	69.82	69.46
73.59		71.10	5.13	66.72	65.22	69.17	69.40	69.89	70.05	68.93	69.77	69.23	69.69	69.63
73.52		71.10	2.8	69.05	67.55	69.10	69.41	69.66	69.44	68.93	69.77	69.26	69.73	69.59
73.39		70.67	7.6	63.82	62.32	69.39	69.76	69.64	69.61	69.73	69.80	69.62	69.65	69.65
73.27		70.70	4.6	66.85	65.35	69.19	69.41	69.66	69.80	69.85	69.73	69.63	69.62	69.88
73.33		70.75	2.6	68.9	67.4	69.18	69.42	69.16	69.80	69.81	69.68	69.59	69.58	69.86
87.41		86.03	37.1	49.68	48.18	75.46	75.36	74.71	75.43	75.00	75.01	75.35	75.81	75.64
87.26		86.03	18.22	68.56	67.06	82.90	82.84	82.94	83.03	83.13	83.21	83.18	83.23	83.24
87.24		86.03	12.11	74.67	73.17	83.94	83.83	83.91	84.05	84.13	84.32	84.30	84.33	84.31
87.35		86.03	11.11	75.67	74.17	84.57	84.58	85.15	85.32	84.70	85.46	85.11	85.32	84.73
87.19		86.03	7.19	79.59	78.09	84.50	84.57	84.70	84.77	84.60	85.01	84.86	84.99	84.78
87.37		86.03	6.38	80.4	78.9	84.62	84.74	84.94	84.98	84.81	85.24	85.05	85.20	85.00
87.28		86.03	5.05	81.73	80.23	84.60	84.81	85.03	85.04	84.73	85.26	85.01	85.22	85.01
87.22		86.03	2.93	83.85	82.35	84.51	84.80	85.01	85.27	84.74	85.35	85.00	85.20	85.15
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02	69.57	68.79	69.53	69.86	69.58	69.96	69.81	70.00	69.65
72.84		71.33	4.57	67.51	66.01	69.05	69.11	69.51	69.53	68.97	69.60	69.31	69.44	69.17
72.74		71.33	2.58	69.5	68	69.04	69.13	69.50	69.67	68.92	69.45	69.28	69.39	69.20
69.61		68.7	8.38	61.07	59.57	67.69	68.72	68.71	68.73	69.07	69.10	69.17	69.08	69.14
70.2		68.7	3.55	65.9	64.4	68.38	68.39	68.41	68.46	68.89	68.98	68.96	68.99	68.96
70.13		68.7	1.91	67.54	66.04	68.40	68.46	68.46	68.55	68.89	68.98	68.97	68.99	68.98
70.23										68.31	69.16	69.00	69.16	68.83
70.87										68.79	69.74	69.40	69.68	69.05
86.27						78.43	78.66	78.16	78.70	78.43	78.50	78.17	78.37	78.38
86.33						83.82	83.71	83.65	83.67	83.60	83.61	83.60	83.71	83.56
86.34						84.26	84.22	84.45	84.73	84.13	84.34	84.23	84.30	84.34
86.39						84.27	84.21	85.01	84.81	84.18	84.36	84.28	84.31	84.42
81.38						66.23	66.27	65.72	66.28	73.94	74.05	74.32	74.66	74.54
81.31						67.97	68.14	67.75	68.11	76.00	76.29	75.99	76.33	76.42
81.20						69.50	69.70	69.82	69.93	77.37	78.00	77.92	78.10	78.07
81.25						70.34	70.04	71.01	71.17	77.80	78.65	78.55	78.55	78.99
70.93	74.53					69.99	70.05	69.65	69.87	70.18	70.19	70.13	70.23	70.15
70.85	74.47					70.14	70.17	70.17	70.22	70.44	70.51	70.52	70.72	70.83
70.80	74.52					69.77	69.86	69.82	69.80	70.07	70.14	70.29	70.47	70.62
70.91	74.46					69.60	69.60	69.67	69.71	70.04	70.12	70.28	70.43	70.54

ned in November 2005.

002572

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	26-Aug-15 Elevation	19-Nov-15 Elevation	19-May-16 Elevation	18-Aug-16 Elevation	10-Nov-16 Elevation	17-May-17 Elevation	28-Aug-17 Elevation	22-Nov-17 Elevation	15-May-[illegible] Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25		70.77	70.88		70.81	71.00		70.98	71.06
73.50		71.10	18.32	53.53	52.03		70.25	70.53		70.22	70.50		70.78	71.10
73.64		71.10	12.22	59.63	58.13		69.77	70.37		69.70	70.34		70.31	71.00
73.67		71.10	g	60.54	59.04		69.67	70.35		69.60	70.33		70.22	70.99
73.64		71.10	8.06	63.79	62.29		69.18	70.06		69.16	70.78		70.41	71.18
73.74		71.10	6.47	65.38	63.88		69.07	69.92		69.09	71.07		70.51	71.18
73.59		71.10	5.13	66.72	65.22		69.07	69.78		69.16	71.03		70.64	71.34
73.52		71.10	2.8	69.05	67.55		69.06	69.79		69.04	71.07		70.74	71.46
73.39		70.67	7.6	63.82	62.32		69.57	69.79		69.56	70.11		70.06	70.45
73.27		70.70	4.6	66.85	65.35		69.75	69.63		69.78	70.22		70.12	70.32
73.33		70.75	2.6	68.9	67.4		69.72	69.59		69.75	70.23		70.11	70.34
87.41		86.03	37.1	49.68	48.18		75.90	76.23		75.99	76.73		76.45	76.69
87.26		86.03	18.22	68.56	67.06		83.23	83.29		83.20	83.30		83.39	83.36
87.24		86.03	12.11	74.67	73.17		84.22	84.40		84.21	84.44		84.41	84.41
87.35		86.03	11.11	75.67	74.17		84.74	85.32		84.62	85.54		86.17	85.34
87.19		86.03	7.19	79.59	78.09		84.76	85.02		84.79	85.27		85.06	85.08
87.37		86.03	6.38	80.4	78.9		84.97	85.21		85.05	85.56		85.39	85.30
87.28		86.03	5.05	81.73	80.23		84.99	85.23		85.06	85.63		85.37	85.34
87.22		86.03	2.93	83.85	82.35		85.08	85.23		85.13	85.53		85.47	85.34
		86.96												
		71.99												
		72.00												
72.83		71.33	8.56	63.52	62.02		69.59	70.09		69.50	70.25		70.09	70.55
72.84		71.33	4.57	67.51	66.01		69.02	69.37		68.94	69.80		69.62	69.84
72.74		71.33	2.58	69.5	68		69.03	69.38		68.94	69.75		69.66	69.80
69.61		68.7	8.38	61.07	59.57		69.16	69.12		69.02	69.13		69.18	69.15
70.2		68.7	3.55	65.9	64.4		68.88	68.86		68.88	68.86		68.89	68.85
70.13		68.7	1.91	67.54	66.04		68.96	68.95		68.96	68.97		68.99	68.94
70.23							68.63	69.15		68.08	69.24		69.24	69.24
70.87							69.24	69.69		69.26	69.80		69.83	69.74
86.27							78.44	78.32		78.25	78.83		78.45	78.75
86.33							83.56	83.78		83.44	83.78		83.71	83.80
86.34							84.33	84.33		84.18	84.68		84.51	84.46
86.39							84.37	84.32		84.23	84.59		84.65	84.41
81.38							74.74	75.08		74.82	75.55		75.31	75.52
81.31							76.55	76.82		76.51	76.86		76.96	77.10
81.20							78.07	78.49		77.90	78.71		78.42	78.76
81.25							78.81	78.94			79.36		79.21	79.19
70.93	74.53						70.33	70.49		70.92	70.59		70.64	70.73
70.85	74.47						70.85	70.85		72.18	71.32		71.49	71.46
70.80	74.52						70.57	70.65		71.46	70.81		70.80	70.99
70.91	74.46						70.54	70.57			70.83		70.87	70.75

ed in November 2005

002573

Nov 2011 Top of Riser	May 2017 Top of Riser	Original Surface Elevation	Depth below Original Grade	Elevation Centre of Well Screen	Elevation Bottom of Well	13-Jun-19 Elevation	14-Nov-19 Elevation	13-May-20 Elevation	17-Nov-20 Elevation	19-May-21 Elevation	23-Nov-21 Elevation
m	m	m	m	m	m	m	m	m	m	m	m
73.67		71.10	25.1	46.75	45.25	71.12	70.95	70.95	70.87	70.90	70.84
73.50		71.10	18.32	53.53	52.03	71.04	70.63	70.70	70.48	70.68	70.45
73.64		71.10	12.22	59.63	58.13	70.69	69.95	70.38	69.85	70.35	69.84
73.67		71.10	g	60.54	59.04	70.63	69.82	70.35	69.73	70.31	69.73
73.64		71.10	8.06	63.79	62.29	70.19	69.45	70.37	69.35	70.24	69.46
73.74		71.10	6.47	65.38	63.88	69.92	69.32	70.26	69.21	69.96	69.47
73.59		71.10	5.13	66.72	65.22	69.95	69.47	70.13	69.30	69.91	69.80
73.52		71.10	2.8	69.05	67.55	70.04	69.57	70.21	69.38	69.98	69.90
73.39		70.67	7.6	63.82	62.32	70.09	69.72	70.13	69.85	70.01	69.99
73.27		70.70	4.6	66.85	65.35	69.86	69.87	69.82	69.68	69.68	70.09
73.33		70.75	2.6	68.9	67.4	69.84	69.84	69.79	69.65	69.66	70.07
87.41		86.03	37.1	49.68	48.18	76.74	76.30	76.59	76.16	76.35	76.12
87.26		86.03	18.22	68.56	67.06	83.29	83.26	83.27	83.21	83.23	83.28
87.24		86.03	12.11	74.67	73.17	84.39	84.27	84.34	84.21	84.28	84.36
87.35		86.03	11.11	75.67	74.17	85.33	85.25	85.41	84.63	85.29	85.35
87.19		86.03	7.19	79.59	78.09	85.04	84.80	85.04	84.74	84.94	85.05
87.37		86.03	6.38	80.4	78.9	85.23	85.10	85.26	84.99	84.41	85.34
87.28		86.03	5.05	81.73	80.23	85.28	85.10	85.30	84.94	85.16	85.34
87.22		86.03	2.93	83.85	82.35	85.34	85.16	85.28	84.96	85.20	85.47
		86.96									
		71.99									
		72.00									
72.83		71.33	8.56	63.52	62.02	70.21	69.61	70.13	69.61	69.99	69.68
72.84		71.33	4.57	67.51	66.01	69.41	69.27	69.58	69.14	69.44	69.53
72.74		71.33	2.58	69.5	68	69.37	69.30	69.57	69.08	69.35	69.50
69.61		68.7	8.38	61.07	59.57	69.16	68.74	69.12	69.03	69.09	69.21
70.2		68.7	3.55	65.9	64.4	68.85	68.74	68.82	68.78	68.77	68.84
70.13		68.7	1.91	67.54	66.04	68.97	68.88	68.92	68.89	68.89	68.95
70.23						69.10	68.55	69.18	68.32	69.04	69.00
70.87						69.59	69.07	69.76	68.98	69.61	69.68
86.27						78.58	78.39	78.66	77.85	78.13	78.11
86.33						83.79	83.44	83.75	83.49	83.71	83.49
86.34						84.31	84.18	84.41	84.14	84.24	84.38
86.39						84.26	84.26	84.39	84.22	84.23	84.47
81.38						75.54	75.14	75.38	75.02	75.15	74.94
81.31						77.26	77.07	77.04	76.86	77.09	76.87
81.20						78.72	78.35	78.71	78.28	78.64	78.45
81.25						79.04	79.01	79.21	78.83	78.97	79.45
70.93	74.53					70.81	70.64	70.66	70.55	70.60	70.53
70.85	74.47					71.32	71.29	71.30	71.26	71.22	71.23
70.80	74.52					70.90	70.87	70.87	70.92	70.81	70.86
70.91	74.46					70.77	70.77	70.75	70.66	70.69	70.75

ed in November 2005

002574

2009 op of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	23-Jun-95 Elevation	12-Jul-95 Elevation	26-Jul-95 Elevation	9-Aug-95 Elevation	13-Sep-95 Elevation	15-Aug-95 Elevation	18-Aug-95 Elevation	21-Aug-95 Elevation	25-Aug-95 Elevation	28- Elev
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	
		69.232	8.12	61.2	60.45	68.8	68.576	68.686				68.736			
	69.65	69.232	4.57	64.7	63.95	68.6	68.206	68.366				68.596			
	69.81	69.232	2.33	66.7	66.325	68.52	68.276	68.486				68.536			
	85.67	85.312	2.72	83.34	82.59	83.01	82.57	83.46				83.22			
	69.73	68.477	8.25	60.98	60.23	68.55	68.367	68.437				68.507			
	69.7	68.477	4.52	64.71	63.96	68.46	68.27	68.352				68.432			
	69.83	68.477	2.31	66.55	66.18	68.45	68.41	68.377				68.427			
84.46	84.62	79.32	2.72	77.35	76.6	78.38	79.1	78.99				78.68			
	70.93	68.73	22.30	47.18	46.43	68.96	69.222	69.282				69.232			
84.3		79.32	4.57	75.5	74.75										
84.79	84.4	79.32	8.19	71.88	71.13										
	85.84	85.312	7.09	78.97	78.22										
	85.87	85.312	4.51	81.55	80.8										
	85.08				73.58										
			3.06				69.888		70.988	70.888	70.918	70.988	70.708	70.928	71.
			2.54				70.246		70.946	70.886	70.986	71.016	70.876	71.086	71.
			2.05				70.696		70.856	70.936	71.086	71.116	71.096	71.346	71.
			1.52				DRY		70.758	71.038	71.108	71.118	71.198	71.488	71.
			3.07				69.745		70.925	70.845	70.905	70.985	70.705	70.925	71.
			2.5				70.578		70.828	70.868	71.018	71.068	70.918	71.168	71.
			2.04				70.783		70.753	70.883	71.023	71.073	71.033	71.283	71.
			1.53				DRY		70.599	71.079	71.079	71.109	71.189	71.469	71.
			3.04				69.89		70.84	70.81	70.83	70.92	70.62	70.75	71
			2.52				70.326		70.826	70.786	70.846	70.956	70.756	70.876	71.
			2.01				70.631		70.351	70.881	71.061	71.081	71.021	71.201	71.
			1.52				DRY		69.974	71.414	71.134	71.124	71.204	71.474	71.
			3.05				69.752		70.822	70.692	70.792	70.852	70.502	70.562	71.
			2.49				70.192		70.562	70.812	70.962	71.012	70.822	70.972	71.
			2.01				70.505		70.305	70.905	71.085	71.105	71.025	71.205	71.
			1.53				DRY		70.058	71.308	71.108	71.108	71.198	71.418	71.
			3.05				69.782		71.042	70.902	70.892	70.912	70.602	71.392	71.
			2.56				70.353		70.863	70.943	71.083	71.143	70.953	71.16	71.
			2.02				70.684		70.724	71.184	71.144	71.164	71.114	71.414	71.
			1.53				DRY		70.66	71.28	71.11	71.12	71.21	71.53	71
												70.821	70.791	70.681	70.
												70.857	70.837	70.737	70.
	73.85			57.86	55.36										
	74.11			58.48	55.98										
	73.858			58.655	56.155										
	71.645		23.9	47.49	46.73										
	71.605		8.53	62.86	62.1										
	71.635		4.72	66.64	65.88										
	71.815		2.44	68.925	68.16										
	69.87														
	69.79														
	69.79														

. 20 ew survey done in Nov. 2011 for top of riser.
d fo November 2015 groundwater elevation
p ol d in November 2015 compared to the

002575

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	16-Oct-95	29-Oct-95	11-Nov-95	6-Jun-96	8-Aug-96	4-Sep-96	9-Jun-97	12-Oct-97	3-Jun-98	14-Aug-9_
m	m	m	m	m	m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m	Elevation m
		69.232	8.12	61.2	60.45			68.756	68.756	68.589	68.636		68.376		
	69.65	69.232	4.57	64.7	63.95			68.576	68.506	68.386	68.316	68.426	68.106	68.356	68.326
	69.81	69.232	2.33	66.7	66.325			68.536	68.436	68.266	68.096	68.286	67.966	68.256	
	85.67	85.312	2.72	83.34	82.59			84.24	82.79	82.56	82.56	82.76	82.59	82.67	82.6
	69.73	68.477	8.25	60.98	60.23			68.507	68.447	68.327	68.297		67.957		
	69.7	68.477	4.52	64.71	63.96			68.382	68.312	68.052	67.752	68.232	68.972	68.062	67.982
	69.83	68.477	2.31	66.55	66.18			68.427	68.387	68.027	67.727	68.217	67.627	68.047	67.917
84.46	84.62	79.32	2.72	77.35	76.6			77.81	78.79	78.48	78.26	78.4	78.23	79.45	78.2
	70.93	68.73	22.30	47.18	46.43			69.292	69.182	69.282	69.282			69.232	69.282
84.3		79.32	4.57	75.5	74.75										
84.79	84.4	79.32	8.19	71.88	71.13										
	85.84	85.312	7.09	78.97	78.22										
	85.87	85.312	4.51	81.55	80.8										
	85.08				73.58										
			3.06			71.448	71.428								69.838
			2.54			71.456	71.356								70.006
			2.05			71.426	70.966								70.516
			1.52			71.458	70.258								71.188
			3.07			71.445	71.345								69.965
			2.5			71.428	71.158								70.438
			2.04			71.433	70.983								71.413
			1.53			71.419	70.089								71.139
			3.04			71.46	71.43								69.72
			2.52			71.466	71.426								70.426
			2.01			71.441	71.021								71.011
			1.52			70.434	70.214								71.224
			3.05			71.462	71.422								69.932
			2.49			71.342	71.212								70.242
			2.01			71.406	70.925								70.745
			1.53			71.428	70.188								71.228
			3.05			71.472	71.462								69.452
			2.56			71.483	71.153								70.173
			2.02			71.474	70.244								70.654
			1.53			71.47	2.54								71.36
						71.021	71.061				69.911				70.941
						71.127	71.107				70.147				70.877
	73.85			57.86	55.36										
	74.11			58.48	56.98										
	73.858			58.655	56.155										
	71.645		23.9	47.49	46.73										
	71.605		8.53	62.86	62.1										
	71.635		4.72	66.64	65.88										
	71.815		2.44	68.925	68.16										
	69.87														
	69.79														
	69.79														

. 20(ew survey done in Nov. 2011 for top of riser.
d for November 2015 groundwater elevation
p ol d in November 2015 compared to the

002576

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	18-Oct-00 Elevation	8-Jun-01 Elevation	3-Oct-01 Elevation	17-May-02 Elevation	30-Oct-02 Elevation	22-May-03 Elevation	1-Oct-03 Elevation	5-Nov-03 Elevation	8-May-04 Elevation	5-Nov- Elevatio
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45	68.806	68.76	68.51	68.78	68.386	68.67	68.54	68.71	68.84	68.76
	69.65	69.232	4.57	64.7	63.95	68.566	68.55	68.29	68.56	68.186	68.55	68.28	68.49	68.59	68.52
	69.81	69.232	2.33	66.7	66.325	68.476	68.48	68.28	68.51	68.146	68.5	68.24	68.47	68.46	68.44
	85.67	85.312	2.72	83.34	82.59	82.68	82.68	82.43	82.19	81.98	82.53	82.59	82.60	82.59	82.34
	69.73	68.477	8.25	60.98	60.23	68.507	68.49	68.07	68.54	68.047	68.34	67.95	68.37	68.53	68.48
	69.7	68.477	4.52	64.71	63.96	68.402	68.43	67.99	68.51	67.972	68.41	68.05	68.41	68.44	68.40
	69.83	68.477	2.31	66.55	66.18	68.297	68.32	67.92	68.37	67.897	68.18	67.90	68.41	68.43	68.40
84.46	84.62	79.32	2.72	77.35	76.6	78.71	78.92	78.45	79.13	78.42	79.08	78.61	79.15	79.12	79.15
	70.93	68.73	22.30	47.18	46.43	69.432	69.48	69.38	69.48	69.482	69.4	69.90	69.98	69.98	70.00
84.3		79.32	4.57	75.5	74.75	79.01	78.07	78.42	79.09	78.39	79.03	78.59	79.14	79.08	79.12
84.79	84.4	79.32	8.19	71.88	71.13	79.02	77.87	78.02	78.9	77.91	78.82	78.34	78.93	78.88	78.96
	85.84	85.312	7.09	78.97	78.22	81.43	81.39	81.24	81.51	81.31	81.44	81.34	81.48	81.44	81.46
	85.87	85.312	4.51	81.55	80.8	82.01	82.03	81.94	82.16	81.95	82.09	81.93	81.99	82.07	82.03
	85.08				73.58										
			3.06												
			2.54												
			2.05												
			1.52												
			3.07												
			2.5												
			2.04												
			1.53												
			3.04												
			2.52												
			2.01												
			1.52												
			3.05												
			2.49												
			2.01												
			1.53												
			3.05												
			2.56												
			2.02												
			1.53												
	73.85			57.86	55.36										
	74.11			58.48	55.98										
	73.858			58.655	56.155										
	71.645		23.9	47.49	46.73										
	71.605		8.53	62.86	62.1										
	71.635		4.72	66.64	65.88										
	71.815		2.44	68.925	68.16										
	69.87														
	69.79														
	69.79														

. 20(ew survey done in Nov. 2011 for top of riser.
d foi November 2015 groundwater elevation
p ol d in November 2015 compared to the

002577

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	14-Nov-06 Elevation	7-May-07 Elevation	19-Nov-07 Elevation	13-May-08 Elevation	3-Nov-08 Elevation	11-May-09 Elevation	18-Nov-09 Elevation	17-May-10 Elevation	13-Oct-10 Elevation	16- Eleva
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45	68.896	68.82	68.826	68.78	68.83	68.83	frozen	68.86	68.85	68.
	69.65	69.232	4.57	64.7	63.95	68.579	68.61	67.416	68.56	68.67	68.67	68.57	68.57	68.59	68.
	69.81	69.232	2.33	66.7	66.325	68.351	68.31	68.226	68.30	68.39	68.39	68.32	68.31	68.55	68.
	85.67	85.312	2.72	83.34	82.59	82.665	82.55	82.44	82.63	81.53	81.53	82.43	82.44	81.53	82.
	69.73	68.477	8.25	60.98	60.23	68.632	68.60	68.337	68.51	68.57	68.57	68.40	68.61	68.62	68.
	69.7	68.477	4.52	64.71	63.96	68.507	68.44	68.282	68.42	68.49	68.49	68.38	68.43	68.47	68.
	69.83	68.477	2.31	66.55	66.18	68.36	68.27	68.127	68.34	68.33	68.33	68.31	68.25	68.29	68.
84.46	84.62	79.32	2.72	77.35	76.6	79.178	79.12	78.8	79.06	79.16	79.16	79.80	79.74	79.66	79.
	70.93	68.73	22.30	47.18	46.43	68.769	68.68	68.762	68.72	68.82	68.82	68.67		68.30	68.
84.3		79.32	4.57	75.5	74.75	79.16	79.08	78.78	79.03	79.14	79.14	79.92	79.53	79.54	79.
84.79	84.4	79.32	8.19	71.88	71.13	79.005	78.90	76.99	78.86	78.88	78.88	80.02	80.24	80.24	80.
	85.84	85.312	7.09	78.97	78.22	81.784	81.73	81.57	81.76	81.65	81.65	81.67	81.65	81.71	81.
	85.87	85.312	4.51	81.55	80.8	82.255	82.19	81.98	82.28	82.12	82.12	81.98	82.08	82.21	82.
	85.08				73.58										
			3.06												
			2.54												
			2.05												
			1.52												
			3.07												
			2.5												
			2.04												
			1.53												
			3.04												
			2.52												
			2.01												
			1.52												
			3.05												
			2.49												
			2.01												
			1.53												
			3.05												
			2.56												
			2.02												
			1.53												
	73.85			57.86	55.36	69.43	68.82	68.60	68.87	68.60	68.83	68.39	68.51	68.90	69.
	74.11			58.48	55.98	69.52	68.99	68.80	69.63	68.98	69.17	68.58	68.79	69.08	69.
	73.858			58.655	56.155	69.56	68.87	68.78	69.22	68.94	69.06	68.60	68.91	69.08	69.
	71.645		23.9	47.49	46.73			69.87	69.94	69.90	69.92	69.85	69.93	69.56	69.
	71.605		8.53	62.86	62.1			69.33	69.46	69.46	69.54	69.50	69.61	69.57	69.
	71.635		4.72	66.64	65.88			69.23	69.21	69.55	69.47	69.41	69.25	69.66	69.
	71.815		2.44	68.925	68.16			69.23	69.21	69.50	69.45	69.39	69.24	69.70	69.
	69.87												69.51	69.41	69.
	69.79												68.65	68.77	68.
	69.79												68.56	68.58	68.
													69.20	69.25	69.

. 20 ew survey done in Nov. 2011 for top of riser.
ed fo November 2015 groundwater elevation.
up o ed in November 2015 compared to the

002578

2009 op of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	21-May-13 Elevation	20-Nov-13 Elevation	23-May-14 Elevation	27-Aug-14 Elevation	12-Nov-14 Elevation	26-May-15 Elevation	26-Aug-15 Elevation	19-Nov-15 Elevation	19-May-16 Elevation	1? Ele
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m	
		69.232	8.12	61.2	60.45	68.79	68.85	68.82		68.84	68.81		68.74	68.79	
	69.65	69.232	4.57	64.7	63.95	68.83	68.80	68.81		68.83	68.73		68.74	68.76	
	69.81	69.232	2.33	66.7	66.325	68.79	68.80	68.80		68.82	68.80		68.78	68.74	
	85.67	85.312	2.72	83.34	82.59										
	69.73	68.477	8.25	60.98	60.23	68.94	69.05	68.98		69.04	68.99		69.01	69.00	
	69.7	68.477	4.52	64.71	63.96	68.88	68.90	68.92		68.92	68.89		68.90	68.88	
	69.83	68.477	2.31	66.55	66.18	68.92	68.93	68.95		69.00	68.94		68.97	68.91	
84.46	84.62	79.32	2.72	77.35	76.6	80.32	79.79	80.41		80.04	80.18		79.97	80.48	
	70.93	68.73	22.30	47.18	46.43	69.79		69.93		69.89	69.91		69.88	69.96	
84.3		79.32	4.57	75.5	74.75	80.20	79.71	80.30		79.92	80.06		79.85	80.34	
84.79	84.4	79.32	8.19	71.88	71.13										
	85.84	85.312	7.09	78.97	78.22										
	85.87	85.312	4.51	81.55	80.8										
	85.08				73.58	80.52	79.98	80.58		80.24	80.33		80.09	80.61	
			3.06												
			2.54												
			2.05												
			1.52												
			3.07												
			2.5												
			2.04												
			1.53												
			3.04												
			2.52												
			2.01												
			1.52												
			3.05												
			2.49												
			2.01												
			1.53												
			3.05												
			2.56												
			2.02												
			1.53												
	73.85			57.86	55.36	69.48	69.30	69.78		69.33	69.38		69.11	69.46	
	74.11			58.48	55.98	69.67	69.61	70.13		69.38	69.63		69.05	69.78	
	73.858			58.655	56.155	69.61	69.89	69.81		69.92	69.73		69.74	69.62	
	71.645		23.9	47.49	46.73	69.95	69.86	70.02		70.02	70.03		70.01	70.19	
	71.605		8.53	62.86	62.1	69.82	69.99	69.94		70.18	69.85		69.87	69.94	
	71.635		4.72	66.64	65.88	69.73	69.85	69.80		70.09	69.81		69.85	69.73	
	71.815		2.44	68.925	68.16	69.87	69.98	69.93		70.22	69.94		69.98	69.87	
	69.87					69.47	68.52	69.40	69.45	69.47	69.45	69.43	69.73	69.60	6
	69.79					68.60	68.75	68.75	68.76	68.80	68.81	68.71	68.81	68.84	6
	69.79					68.73	69.43	68.62	68.60	68.63	68.62	68.56	68.61	68.61	6
									69.25	70.80		69.17			6

. 20(ew survey done in Nov. 2011 for top of riser.
d for November 2015 groundwater elevation
p of d in November 2015 compared to the

002579

2009 Top of Riser	Nov 2011 Top of Riser	Original Surface Elevation	Depth below original grade	Elevation Centre of well screen	Elevation Bottom of well	22-Nov-17 Elevation	15-May-18 Elevation	3-Aug-18 Elevation	22-Nov-18 Elevation	13-Jun-19 Elevation	14-Nov-19 Elevation	13-May-20 Elevation	17-Nov-20 Elevation	19-May-21 Elevation
m	m	m	m	m	m	m	m	m	m	m	m	m	m	m
		69.232	8.12	61.2	60.45	68.87	68.87		68.88	68.83	68.73	68.67	68.71	68.77
	69.65	69.232	4.57	64.7	63.95	68.82	68.79		68.74	68.76	68.76	68.93	68.73	68.74
	69.81	69.232	2.33	66.7	66.325	68.80	68.77		68.73	68.76	68.72	68.77	68.72	68.71
	85.67	85.312	2.72	83.34	82.59									
	69.73	68.477	8.25	60.98	60.23	68.89	69.03		69.09	69.02	68.95	69.02	68.93	68.97
	69.7	68.477	4.52	64.71	63.96	68.90	68.86		68.88	68.84	68.79	68.83	68.81	68.82
	69.83	68.477	2.31	66.55	66.18	68.96	68.94		68.96	68.94	68.87	68.90	68.90	68.90
84.46	84.62	79.32	2.72	77.35	76.6	80.29	80.76		79.97	80.76	80.08	80.47	80.00	80.38
	70.93	68.73	22.30	47.18	46.43	70.03	70.11		frozen	70.11	frozen	70.00	69.93	69.97
84.3		79.32	4.57	76.5	74.75	80.14	80.62		79.83	80.63	79.94	80.34	79.89	80.27
84.79	84.4	79.32	8.19	71.88	71.13									
	85.84	85.312	7.09	78.97	78.22									
	85.87	85.312	4.51	81.55	80.8									
	85.08				73.58	80.43	80.87		80.10	80.83	80.18	80.58	80.15	80.51
			3.06											
			2.54											
			2.05											
			1.52											
			3.07											
			2.5											
			2.04											
			1.53											
			3.04											
			2.52											
			2.01											
			1.52											
			3.05											
			2.49											
			2.01											
			1.53											
			3.05											
			2.56											
			2.02											
			1.53											
	73.85			57.86	55.36	69.83	70.36		69.67	69.53	69.45	69.69	69.18	69.49
	74.11			58.48	55.98	70.58	71.32		70.21	69.86	69.43	70.05	69.26	69.82
	73.858			58.655	56.155	70.13	70.35		70.13	69.86	69.86	69.82	69.67	69.67
	71.645		23.9	47.49	46.73	70.33	70.39		70.30	70.46	70.29	70.29	70.21	70.26
	71.605		8.53	62.86	62.1	70.28	70.23		70.12	70.16	70.09	70.12	70.05	70.08
	71.635		4.72	66.64	65.88	70.05	69.83		69.81	69.91	69.90	69.91	69.88	69.81
	71.815		2.44	68.925	68.16	70.20	69.96		69.94	70.04	70.03	70.04	70.02	69.94
	69.87					Frozen	69.70	69.69	frozen	artesian	frozen	69.67	69.58	69.67
	69.79					70.20	68.90	68.76	70.20	68.88	68.74	68.86	68.83	68.86
	69.79					70.20	68.63	68.47	70.20	68.62	68.58	68.61	68.62	68.62
						70.20	69.28	69.18	70.20	Not monitored	69.22	Not monitored	69.16	Not monitored

. 20 ew survey done in Nov. 2011 for top of riser.
d fo November 2015 groundwater elevation
p o ed in November 2015 compared to the

002580

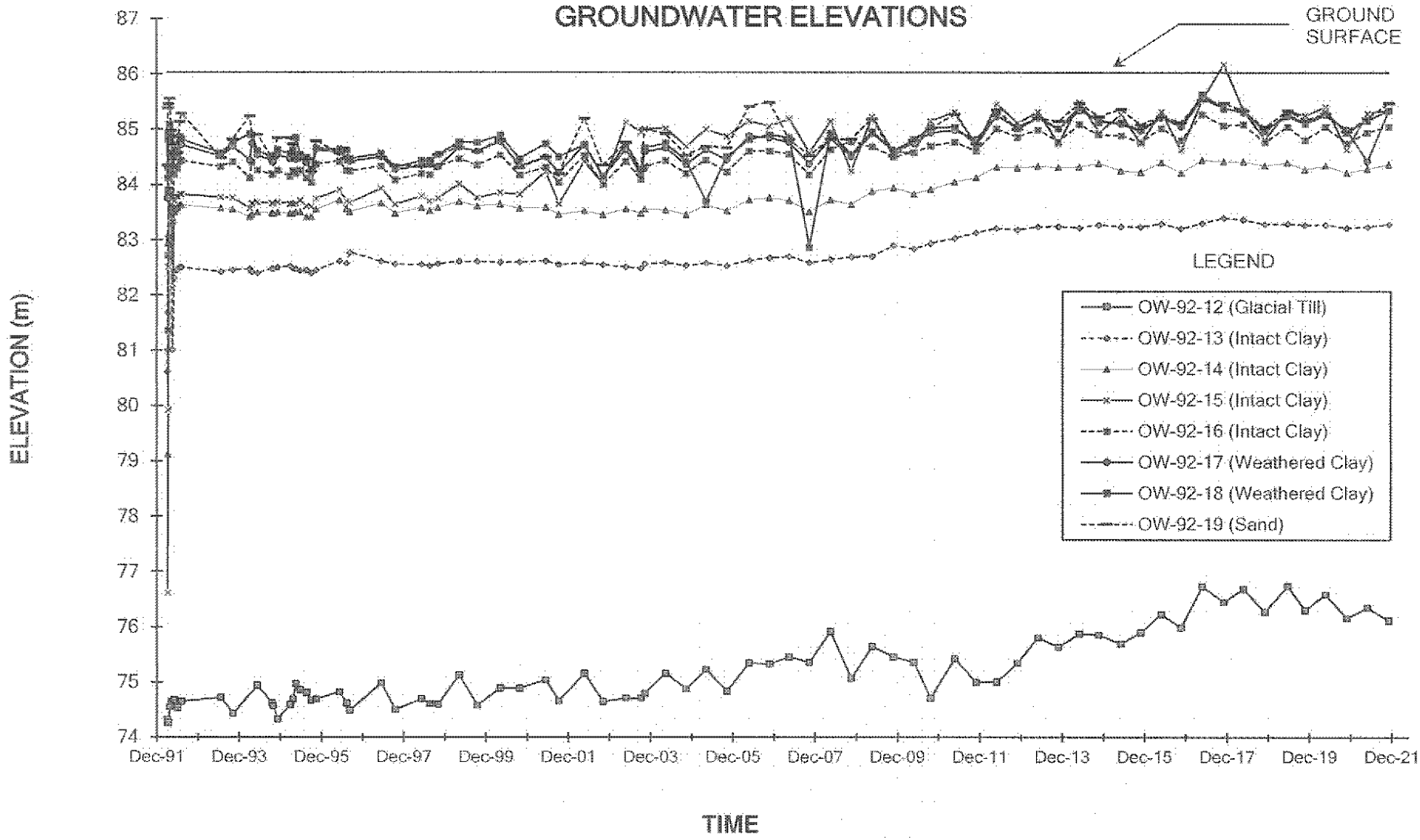


FIGURE C1

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-12 TO OW-92-19

WSP GOLDER

002581

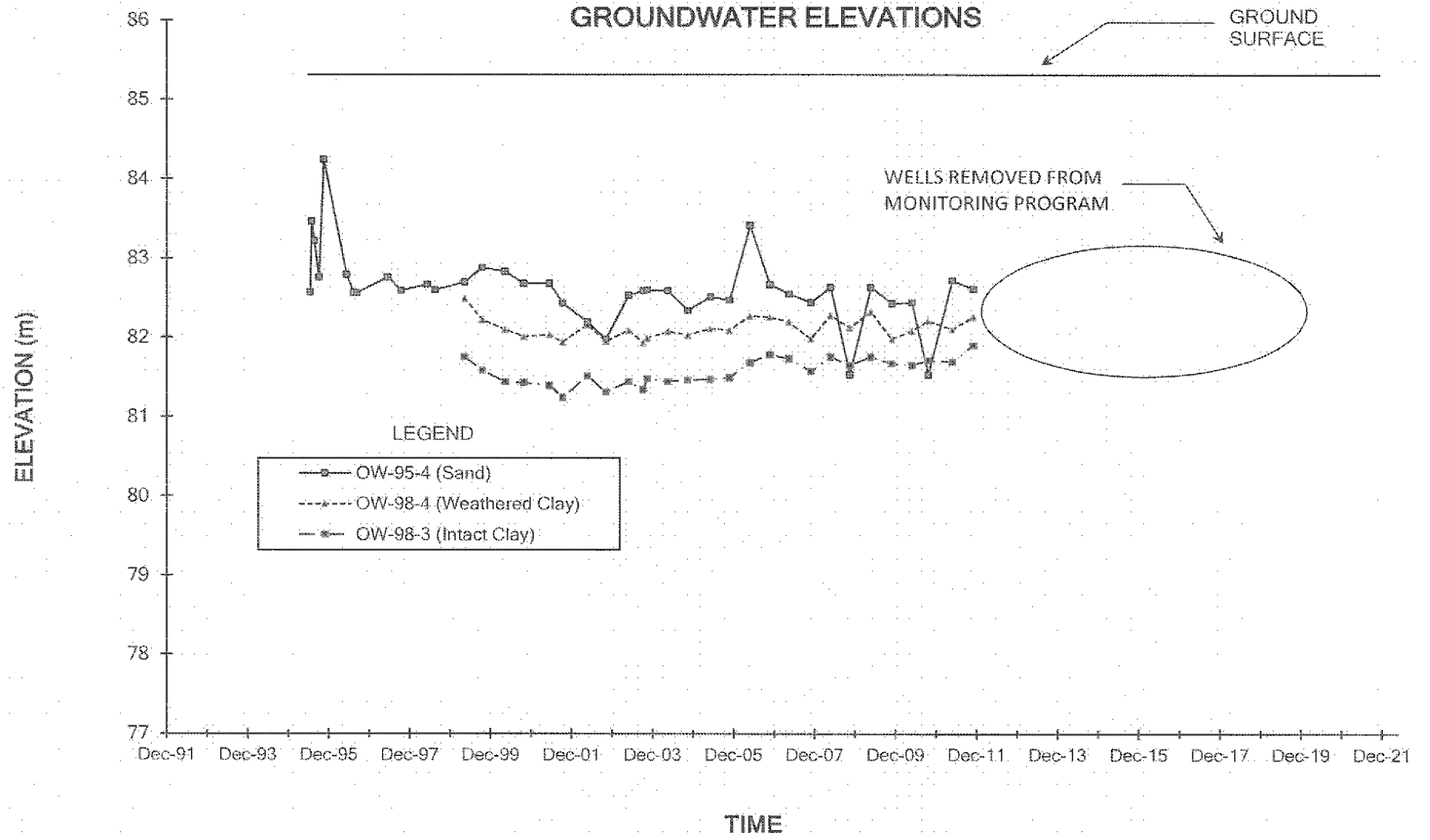


FIGURE C2

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-4 & OW-98-3 & 4

WSP GOLDER

002582

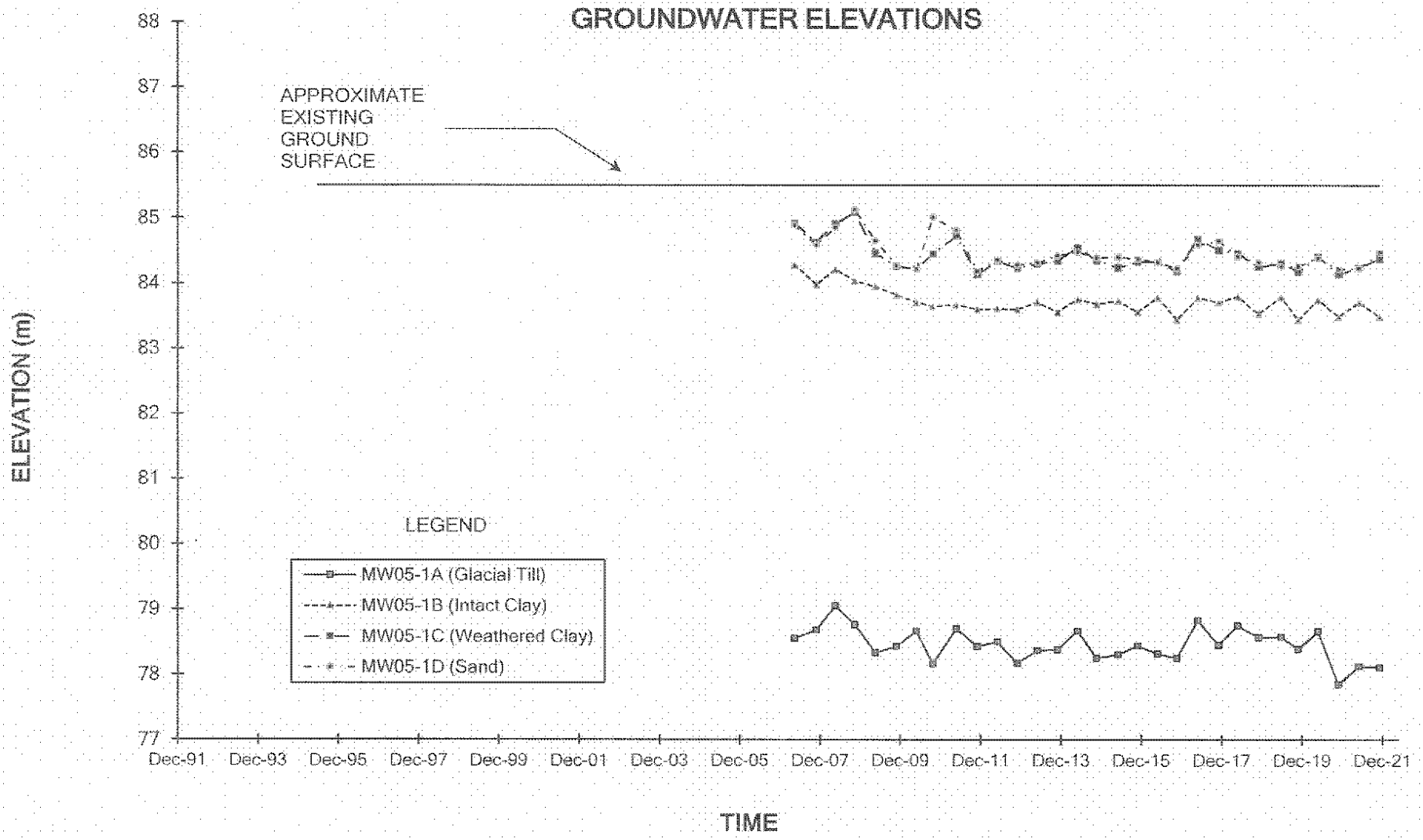


FIGURE C3

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS MW05-1A to MW05-1D

WSP GOLDER

002583

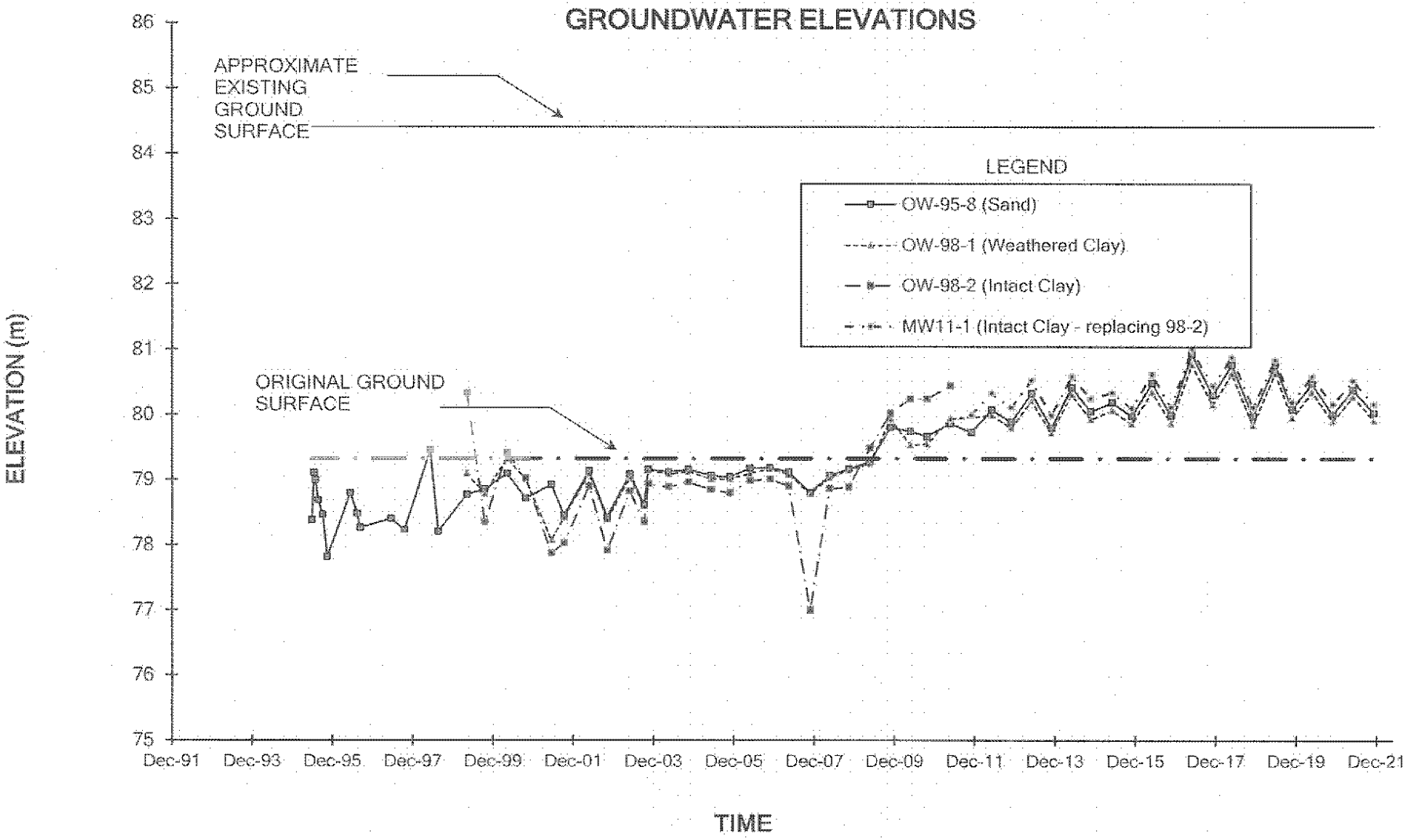


FIGURE C4

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

UP-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-8, OW-98-1-2 & MW11-1

WSP GOLDER

002584

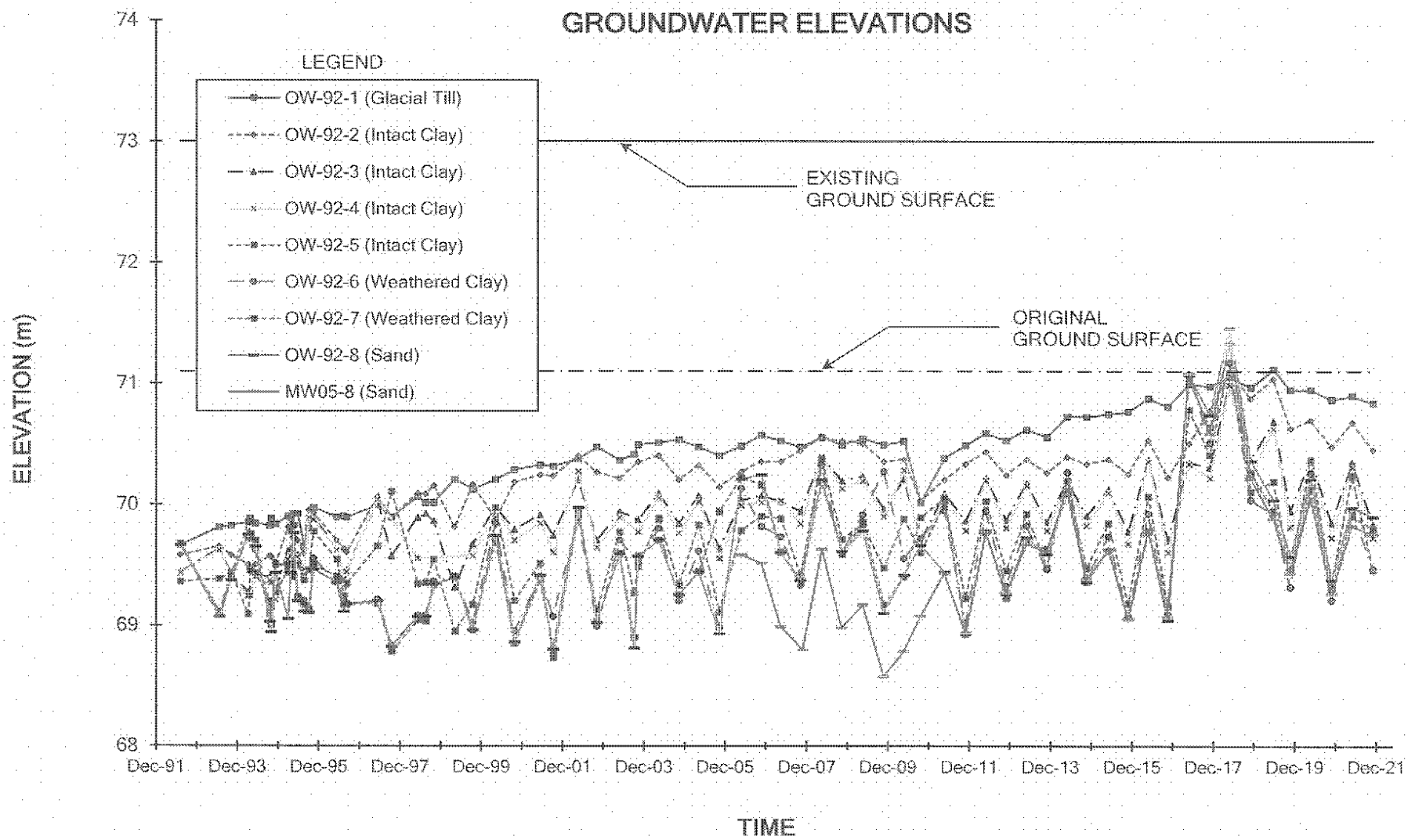


FIGURE C5

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-1 TO 92-8 & MW05-8

WSP GOLDER

002585

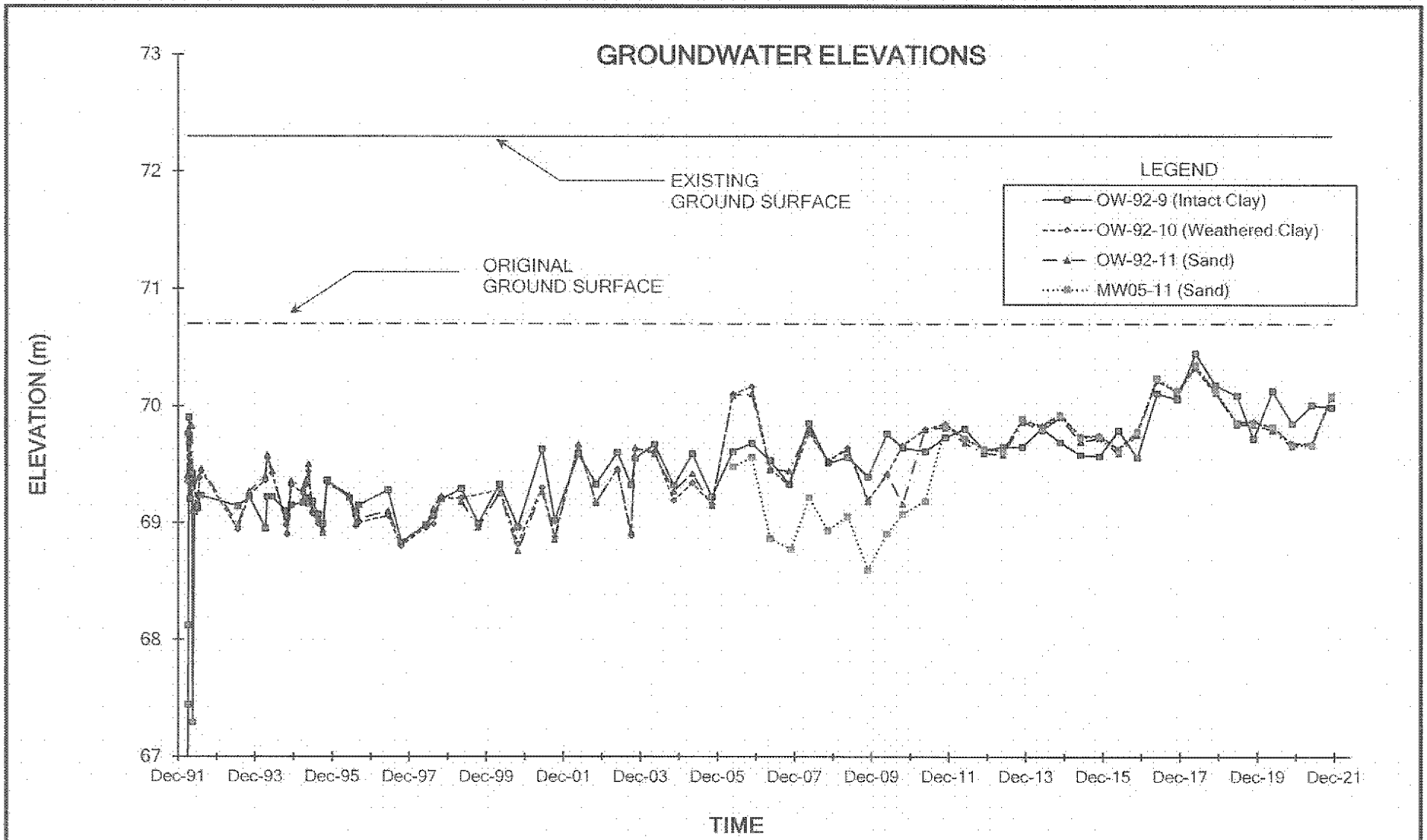


FIGURE C6

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-92-9 TO 92-11 & MW05-11

WSP GOLDER

002586

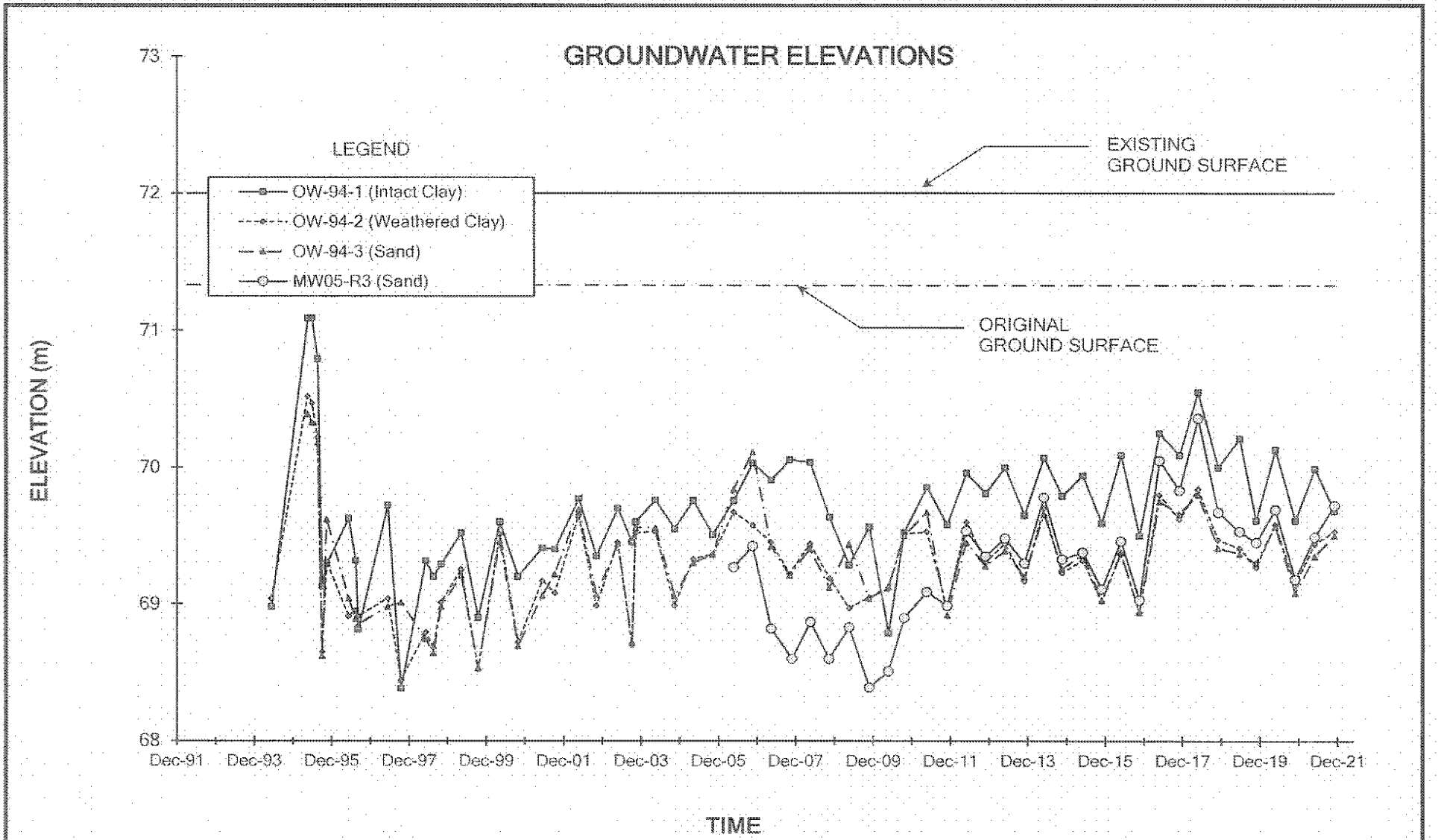


FIGURE C7

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

IMMEDIATELY DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-94-1 TO 94-3 & MW05-R3

WSP GOLDER

002587

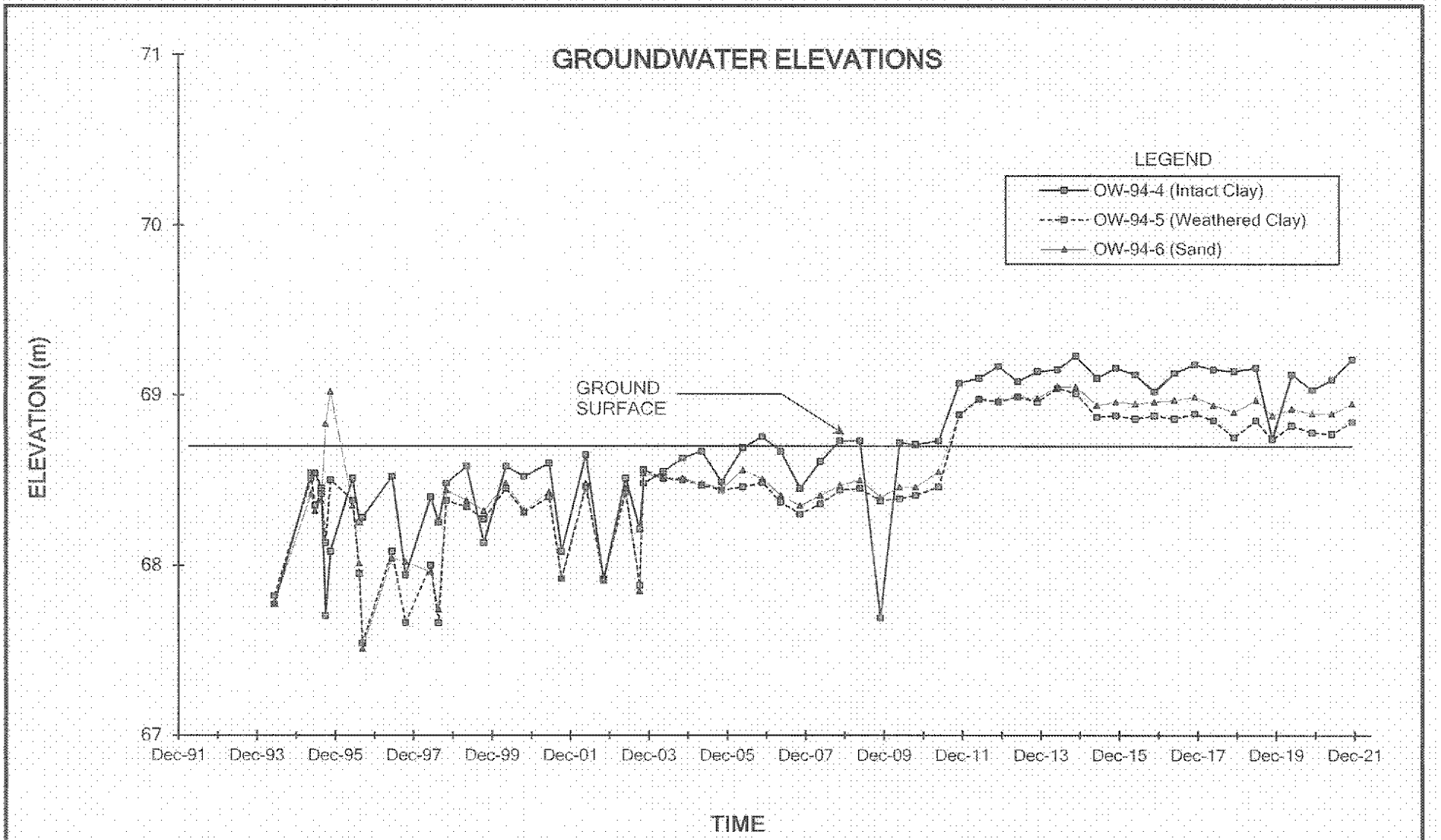


FIGURE C8

Project No. 20412275
Prepared by: ETB
Checked by: YJM June 2021

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-94-4 TO 94-6

WSP GOLDER

002588

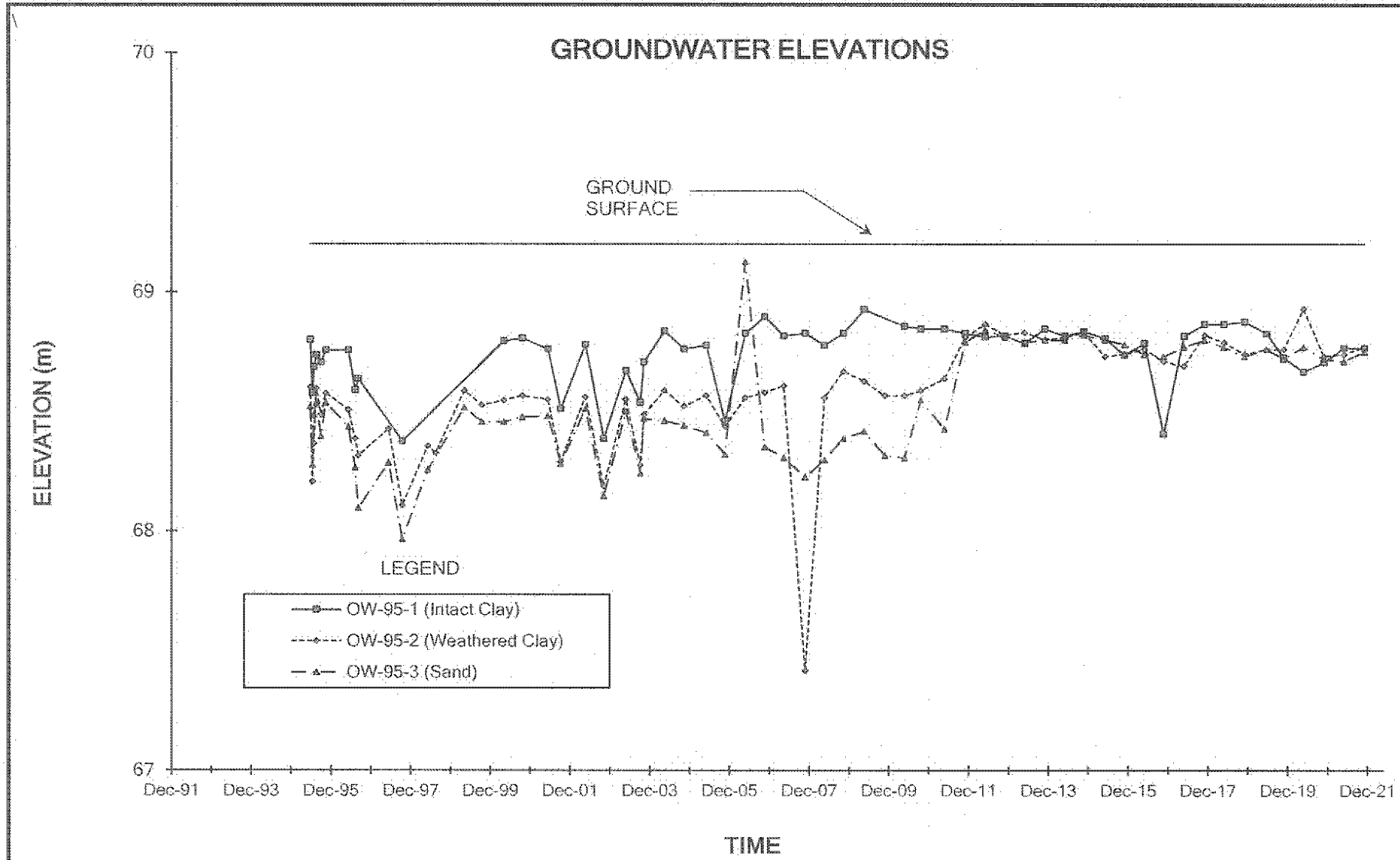


FIGURE C9

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-1 TO 95-3

WSP GOLDER

002589

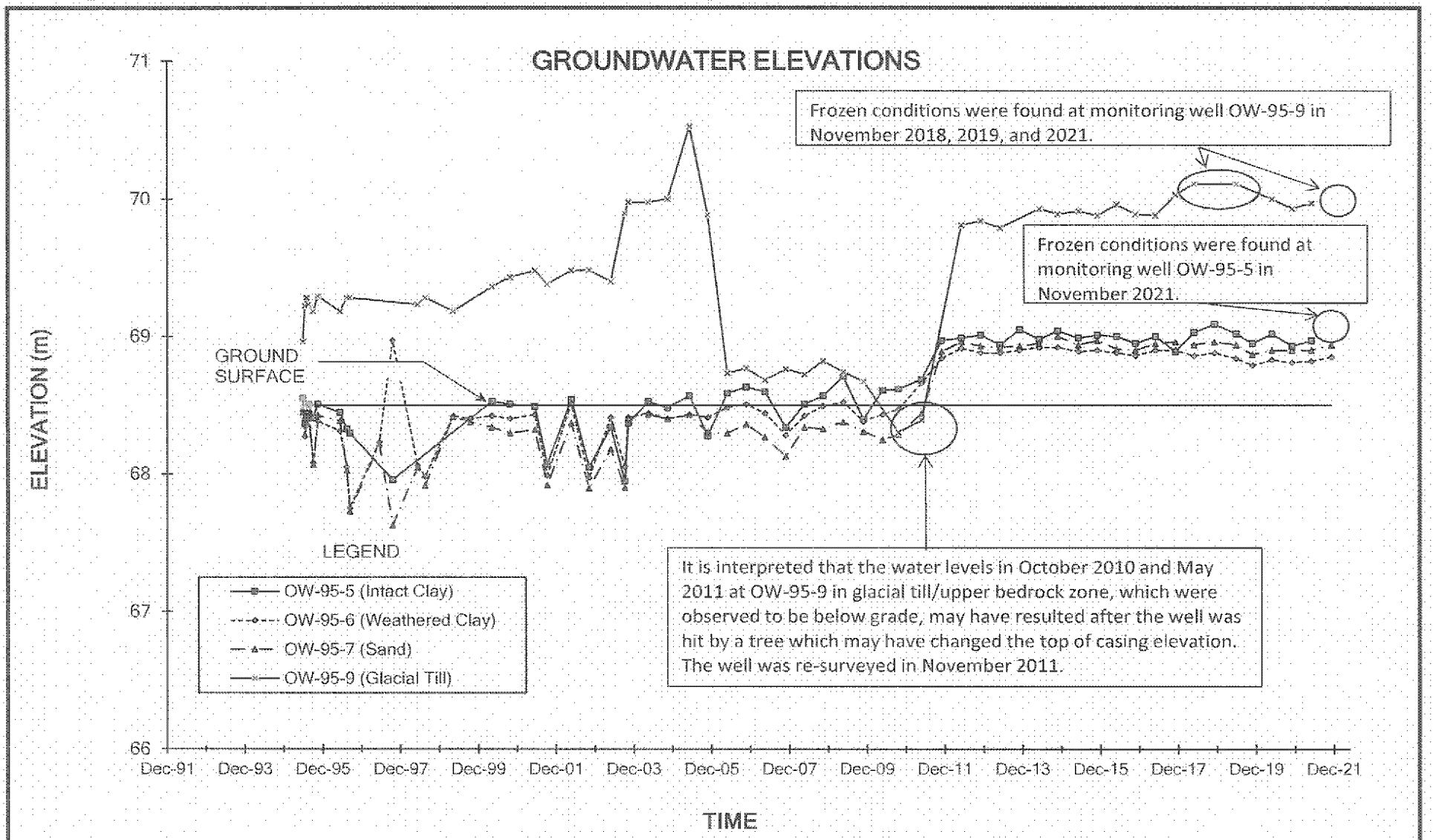


FIGURE C10

Project No. 20412275
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

DOWN-GRADIENT SITE
GROUND WATER ELEVATIONS
OBSERVATION WELLS OW-95-5 TO 95-7 & 95-9

WSP GOLDER

002590

APPENDIX D

Groundwater Results of Field and Laboratory Chemical and Physical Analyses

Please refer to the electronic version of the appendix provided on the USB at the end of this report

APPENDIX E

Leachate Results of Field and Laboratory Chemical and Physical Analyses

Please refer to the electronic version of the appendix provided on the USB at the end of this report

APPENDIX F

Groundwater Leachate Indicator Parameter Concentrations

Appendix F-A – Sand Layer

Appendix F-B – Weathered Clay Deposit

Appendix F-C – Intact Clay Deposit

Appendix F-D – Glacial Till/Upper Bedrock Zone

APPENDIX F-A

Sand Layer

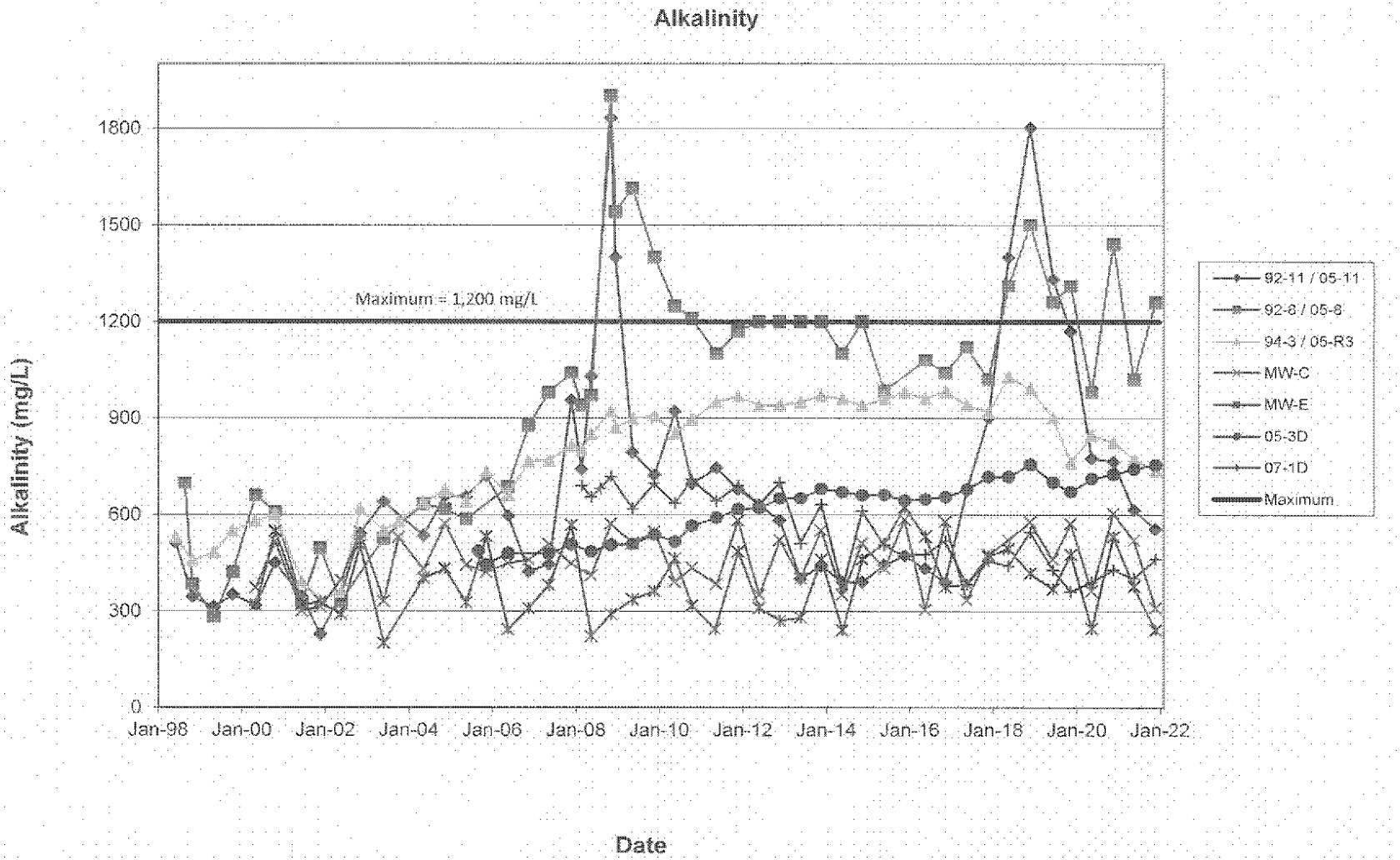


FIGURE FA1

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
SAND

GOLDER

002597

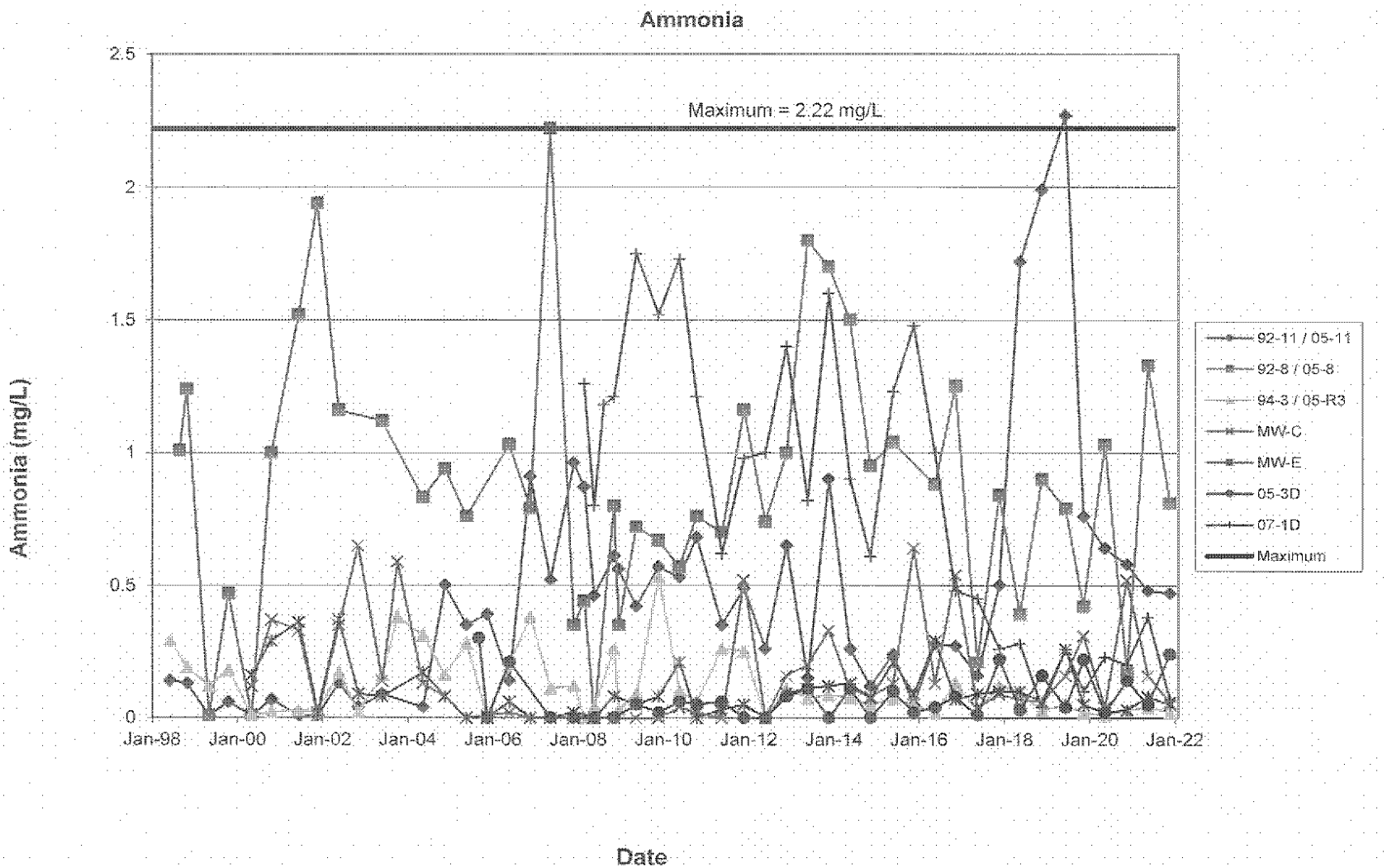


FIGURE FA2

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

002598

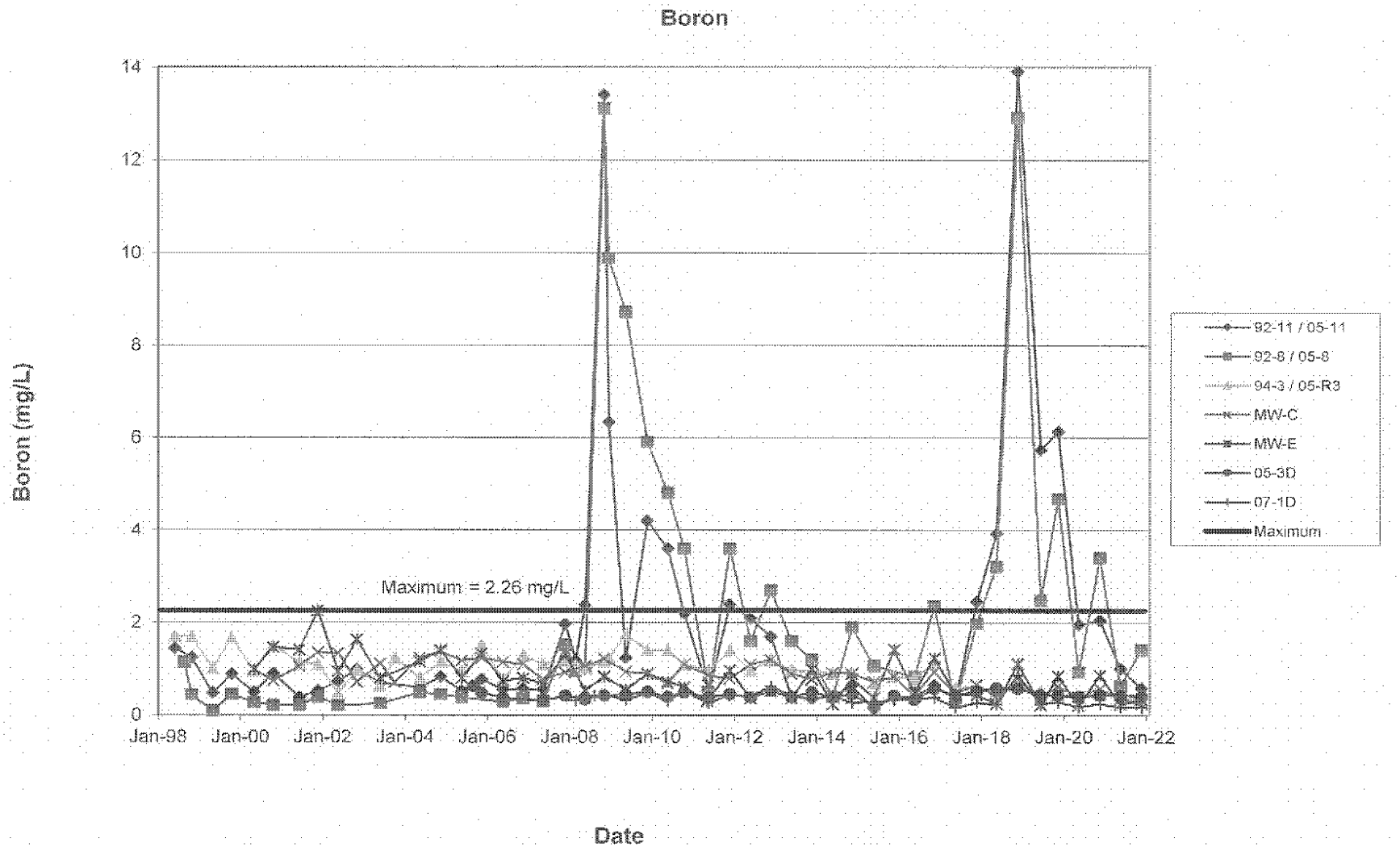


FIGURE FA3

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

002599

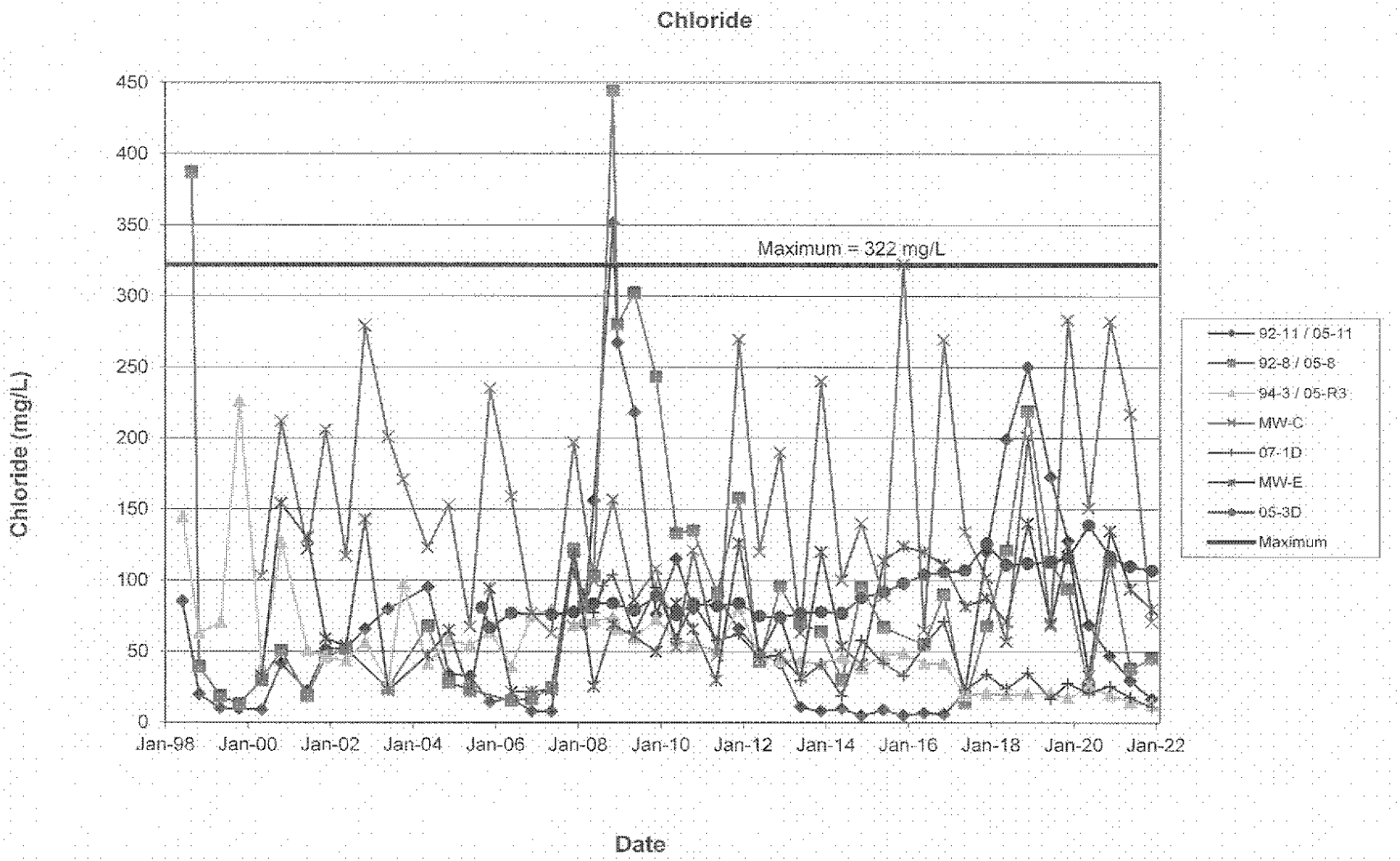


FIGURE FA4

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
SAND

GOLDER

002600

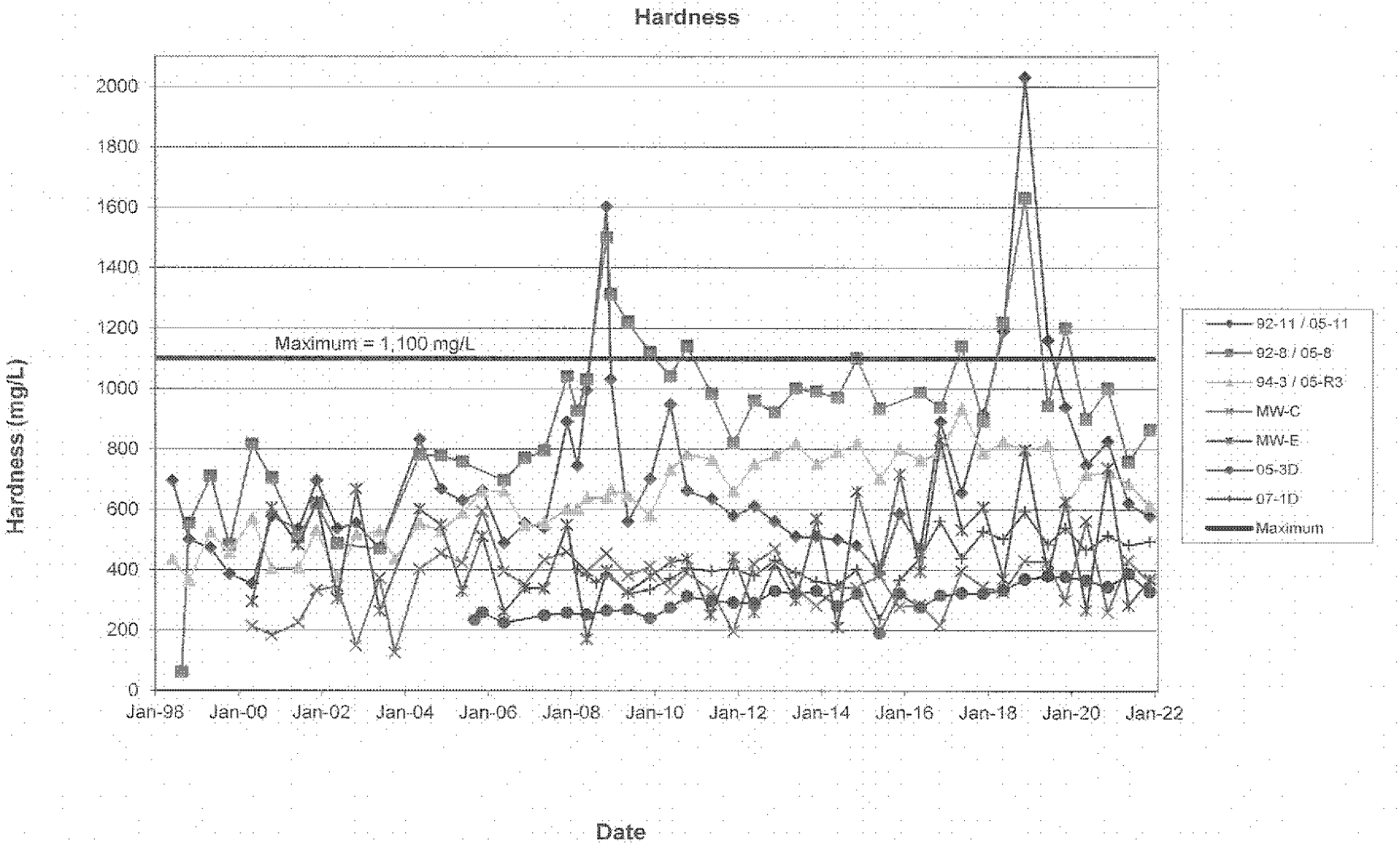


FIGURE FA5

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
SAND

GOLDER

002601

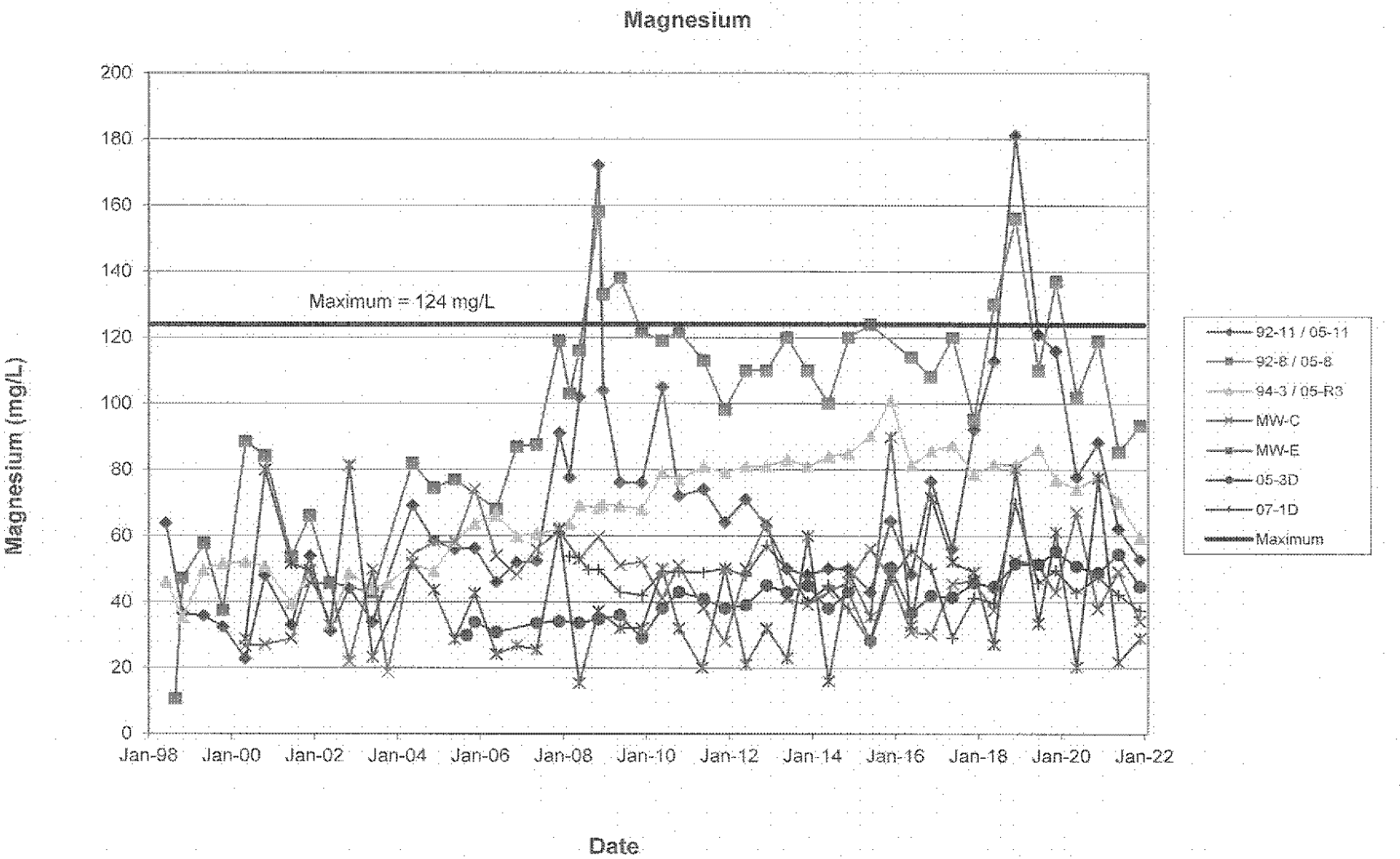


FIGURE FA6

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

SAND

GOLDER

002602

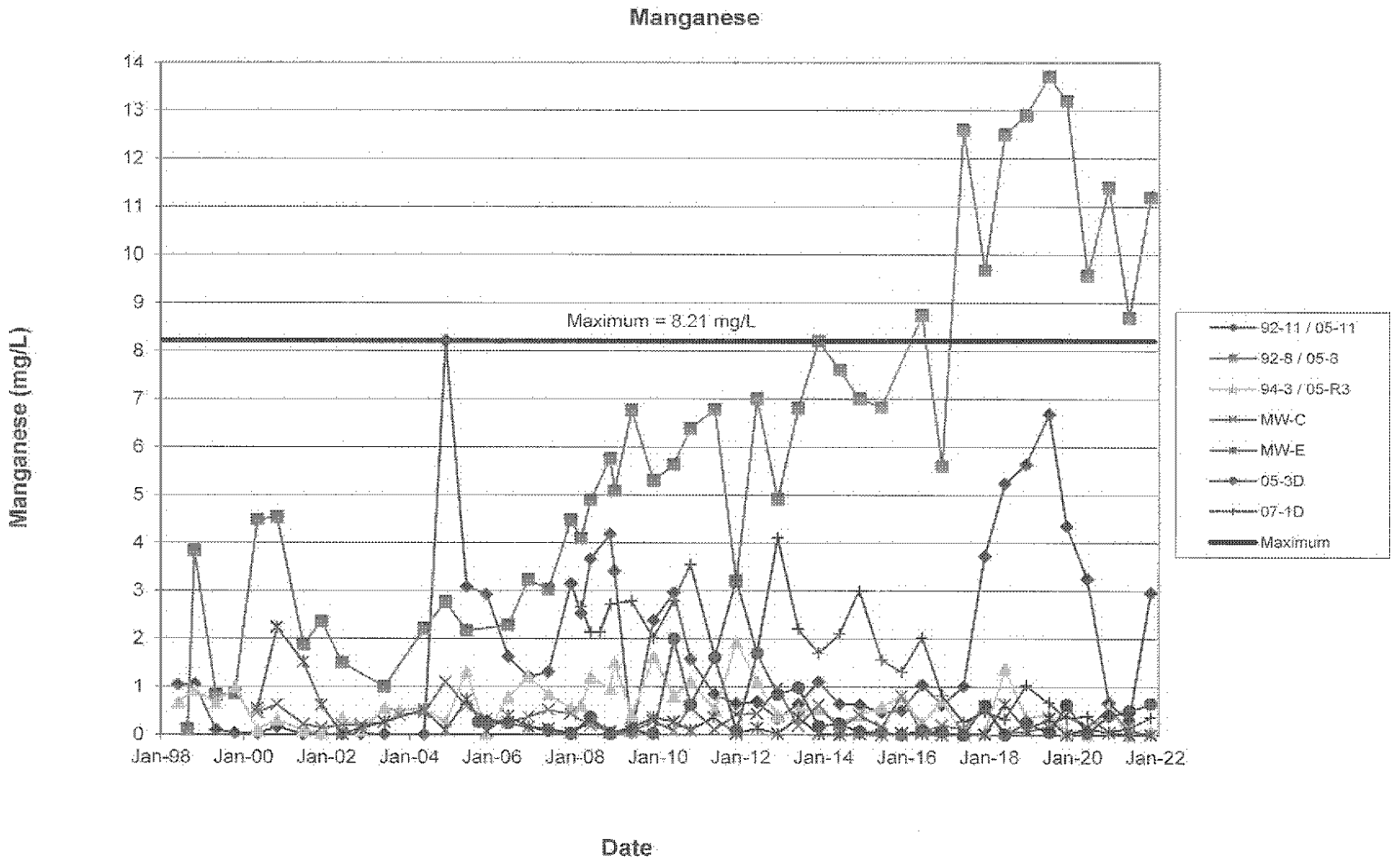


FIGURE FA7

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

SAND

WSP GOLDER

002603

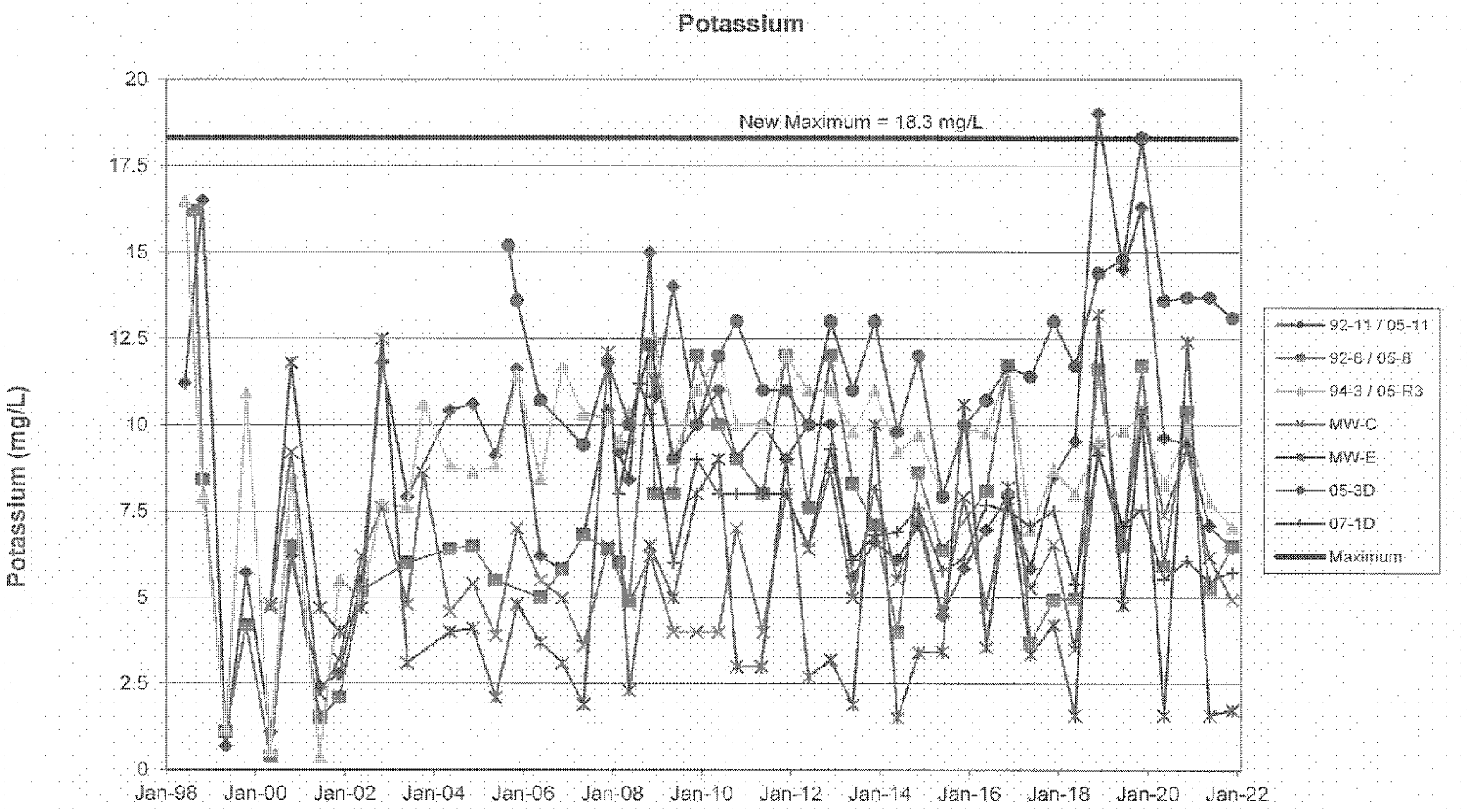


FIGURE FA8

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
SAND

WSP GOLDER

002604

APPENDIX F-B

Weathered Clay Deposit

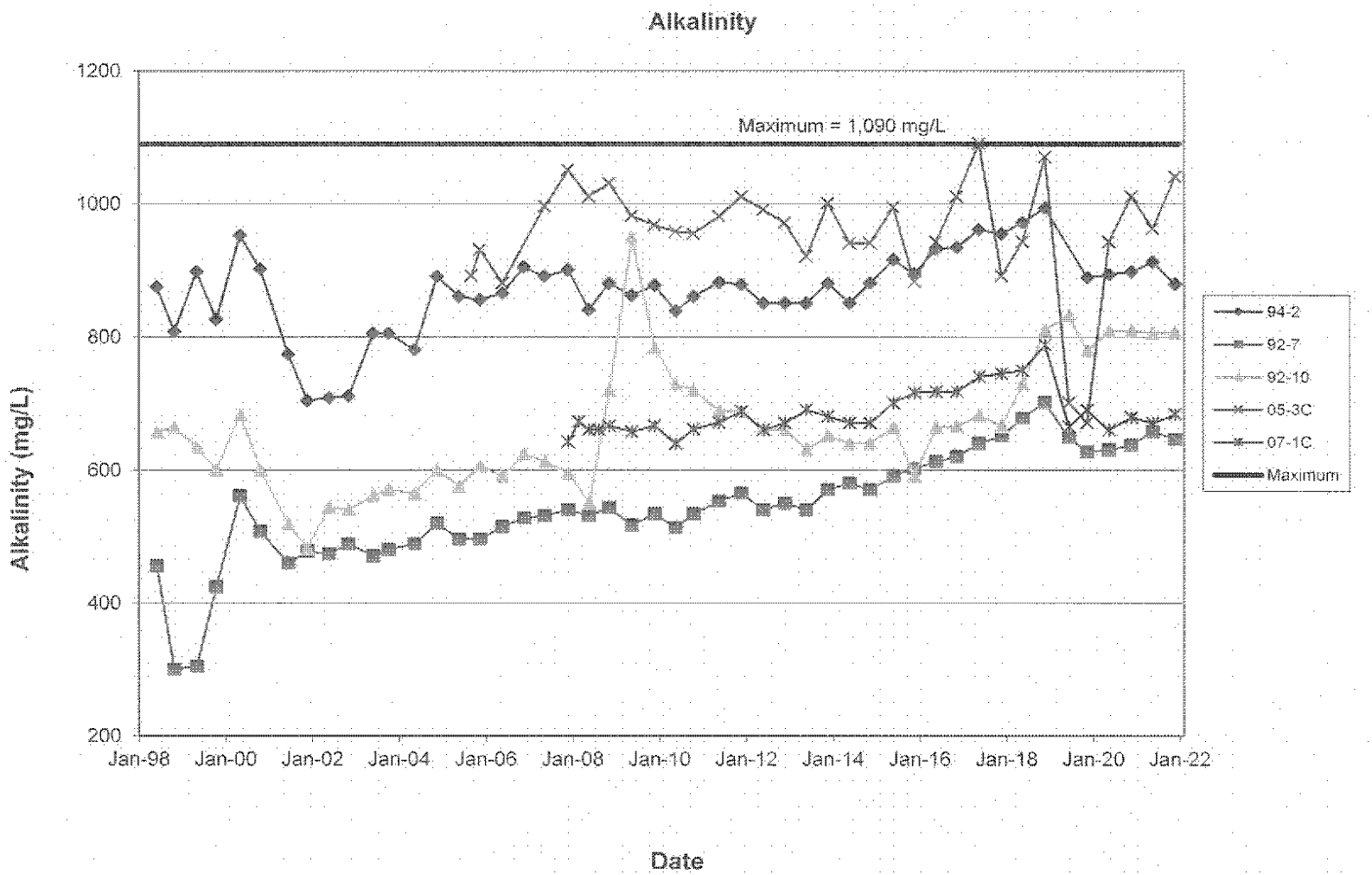


FIGURE FB1

Project No. 21497772
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

WSP GOLDER

002606

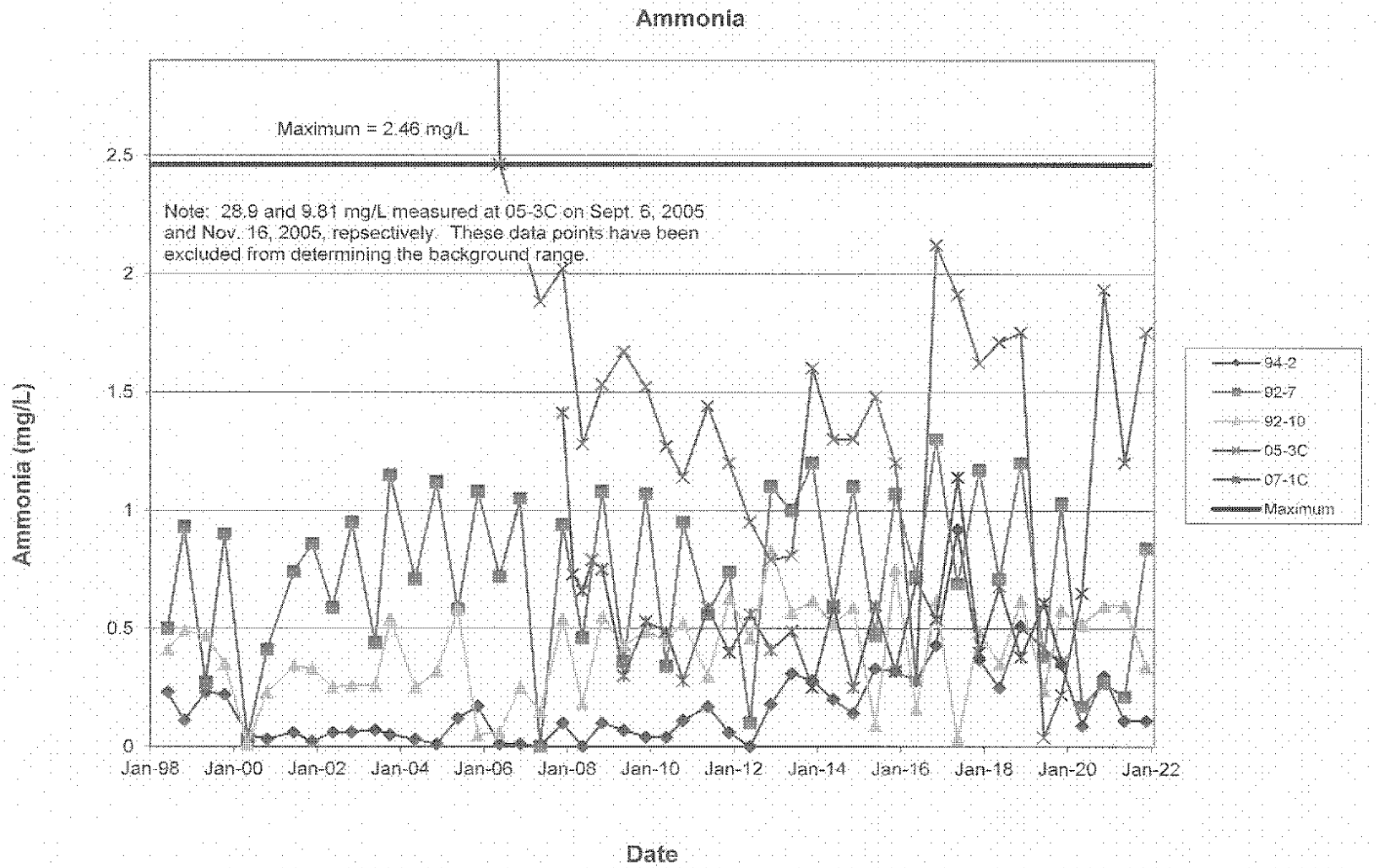


FIGURE FB2

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

002607

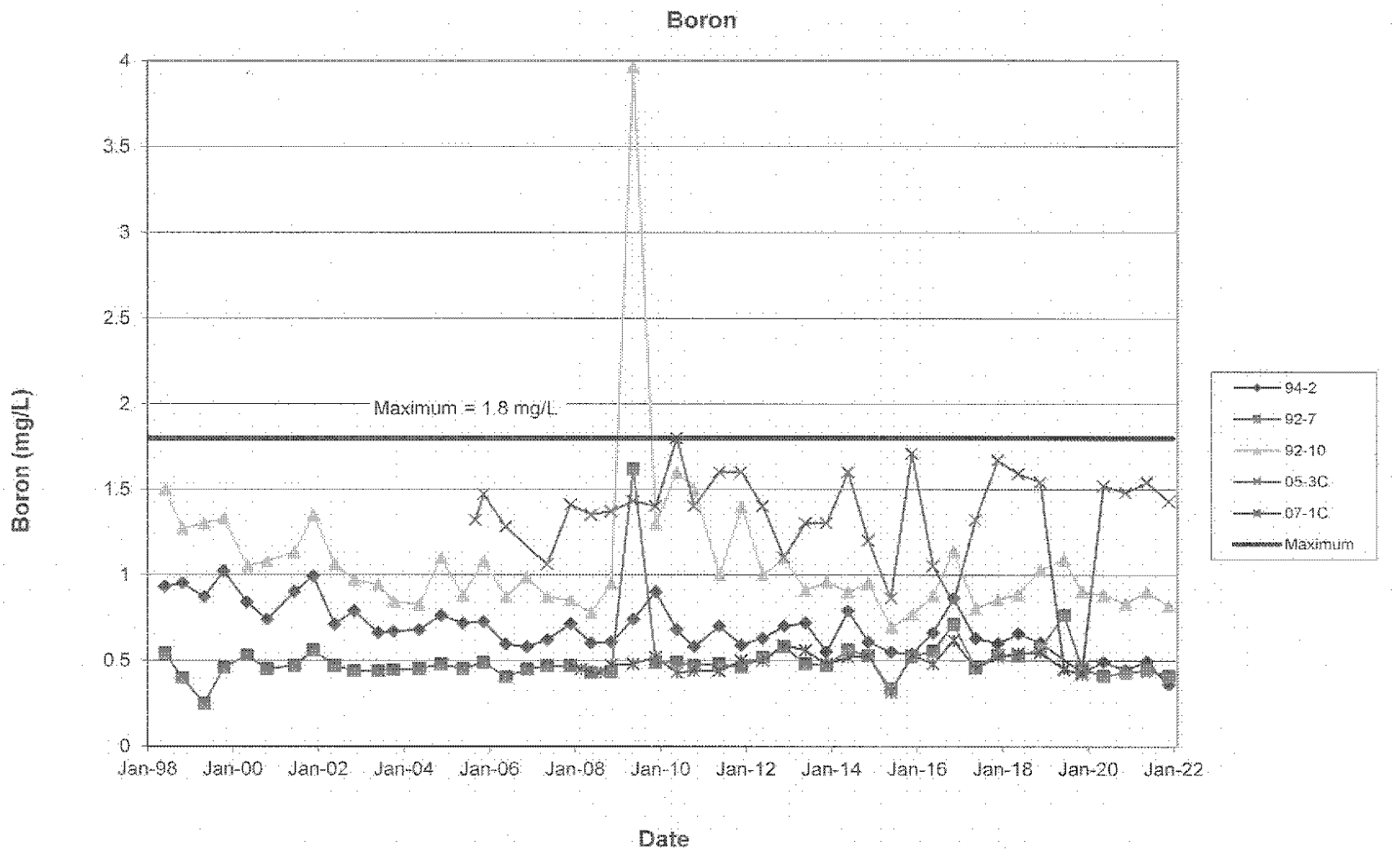


FIGURE FB3

Project No. 21497772
Prepared by: ETB
Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

002608

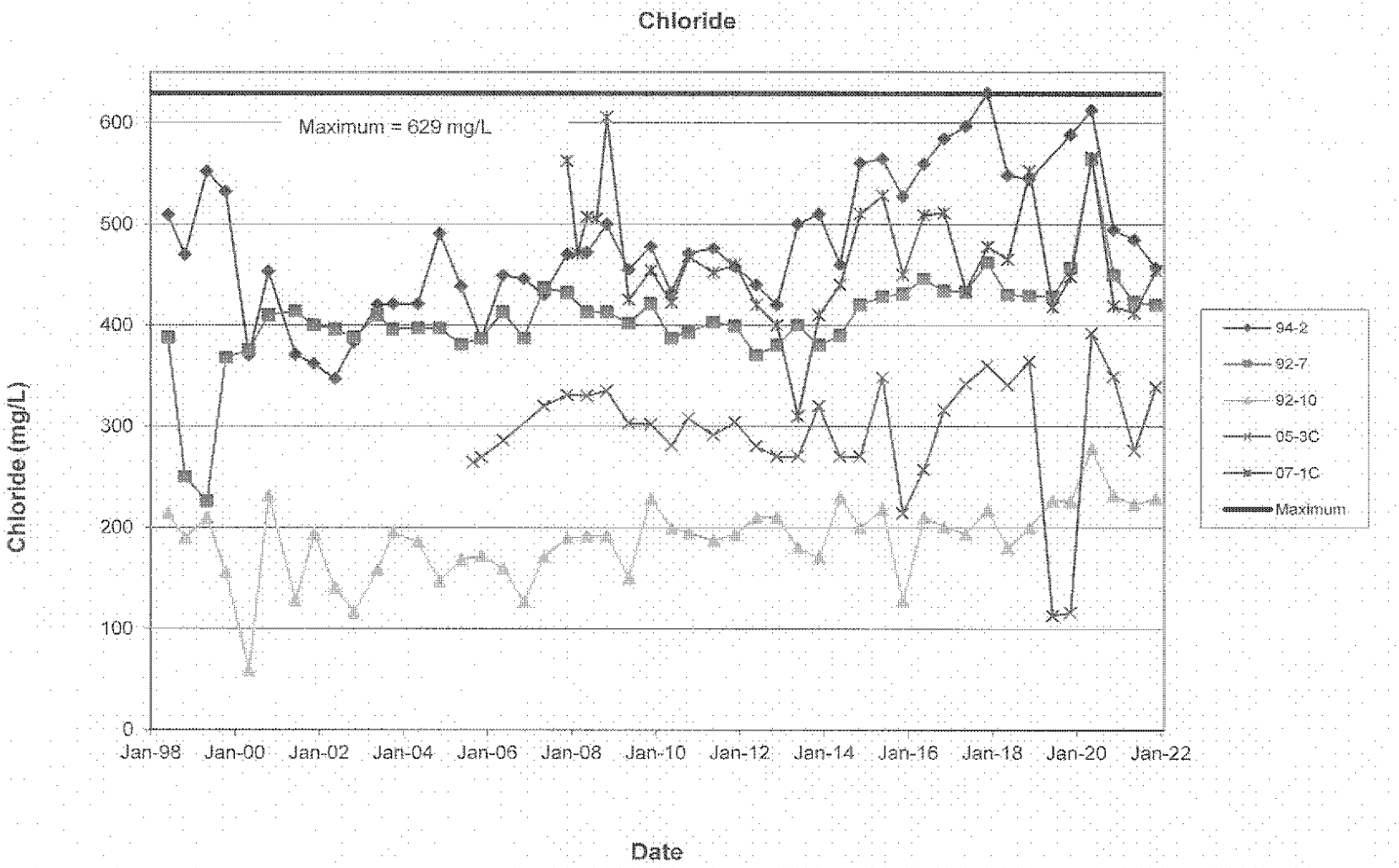


FIGURE FB4

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

WEATHERED CLAY

GOLDER

002609

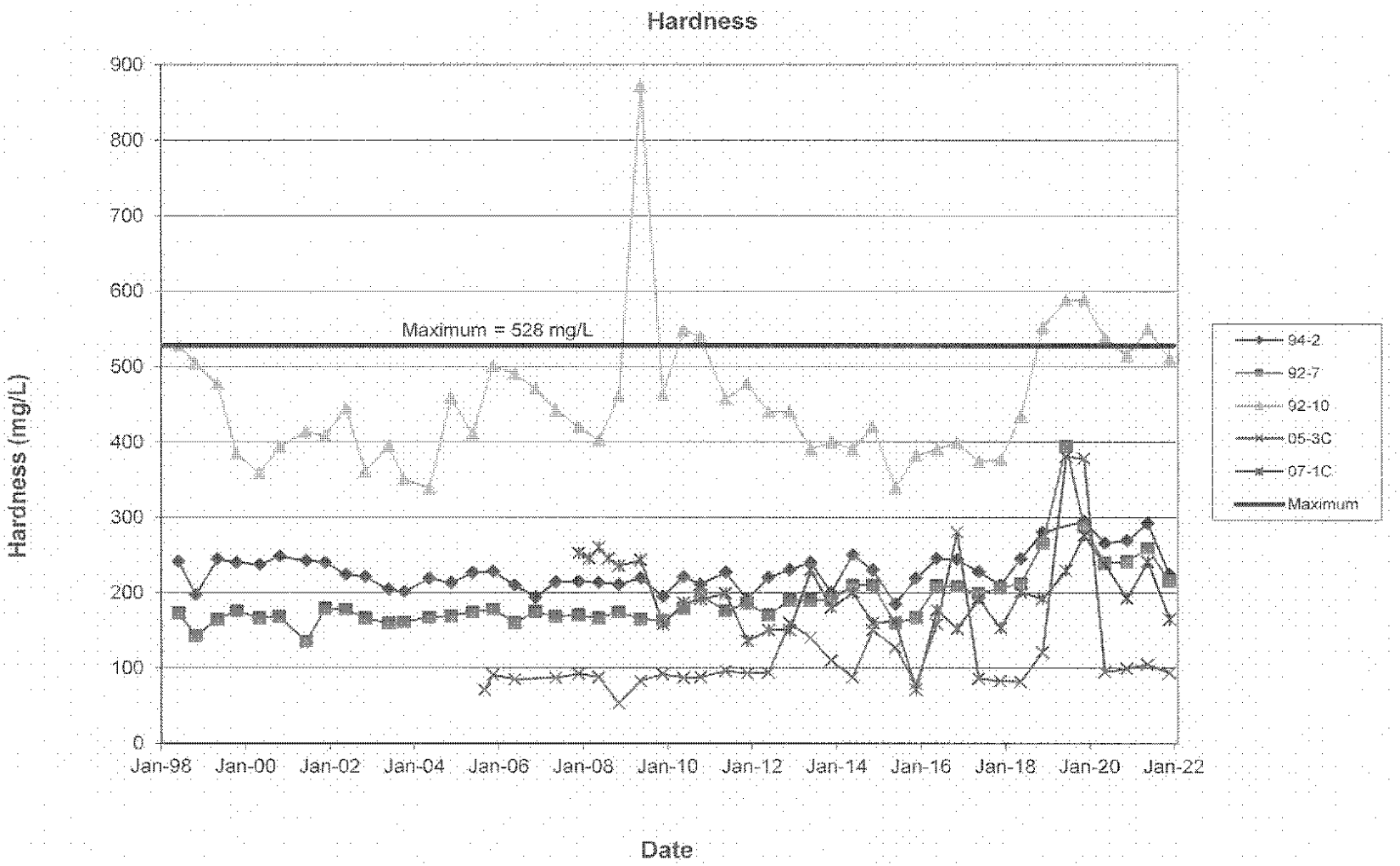


FIGURE FB5

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

002610

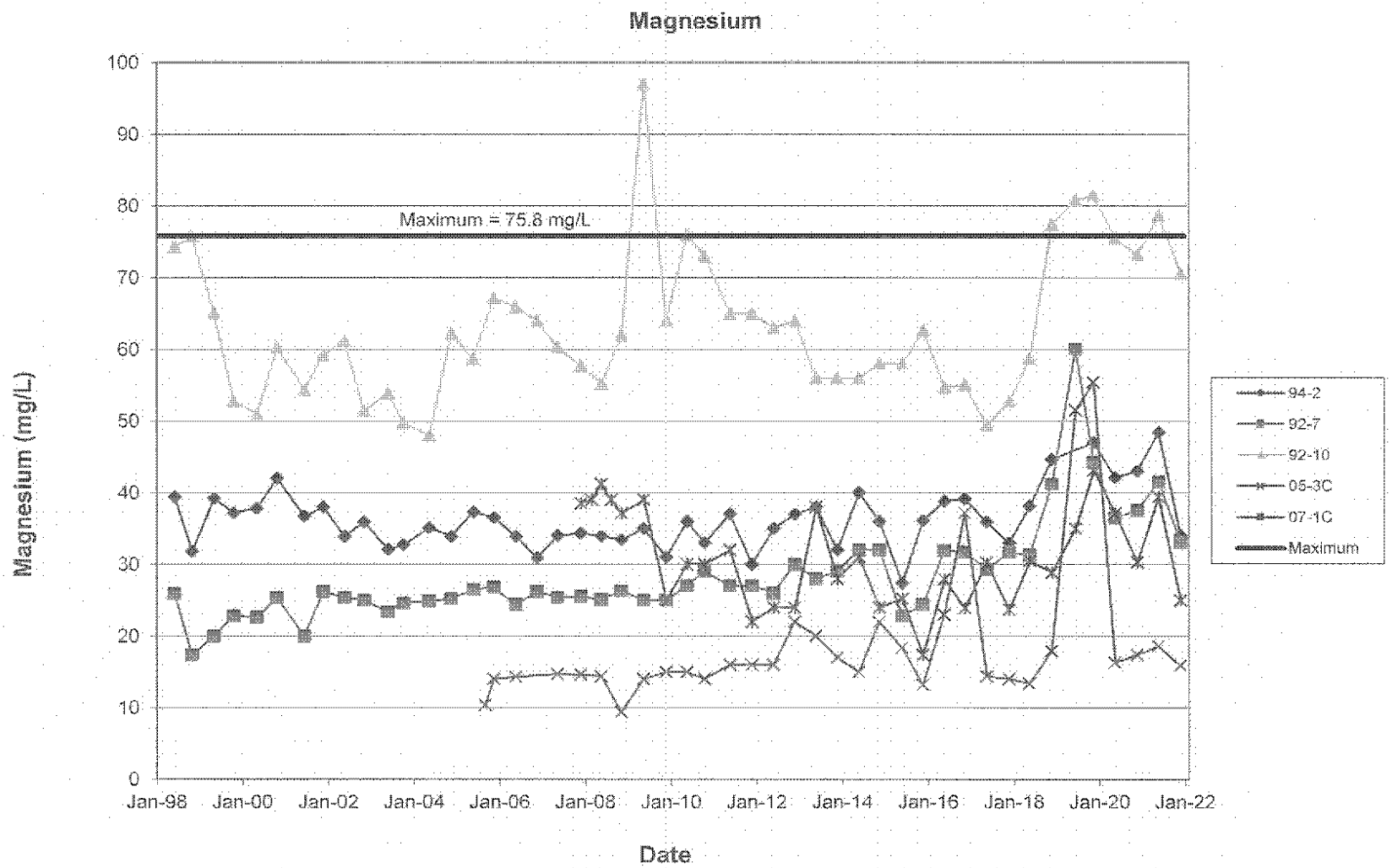


FIGURE FB6

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

WSP GOLDER

002611

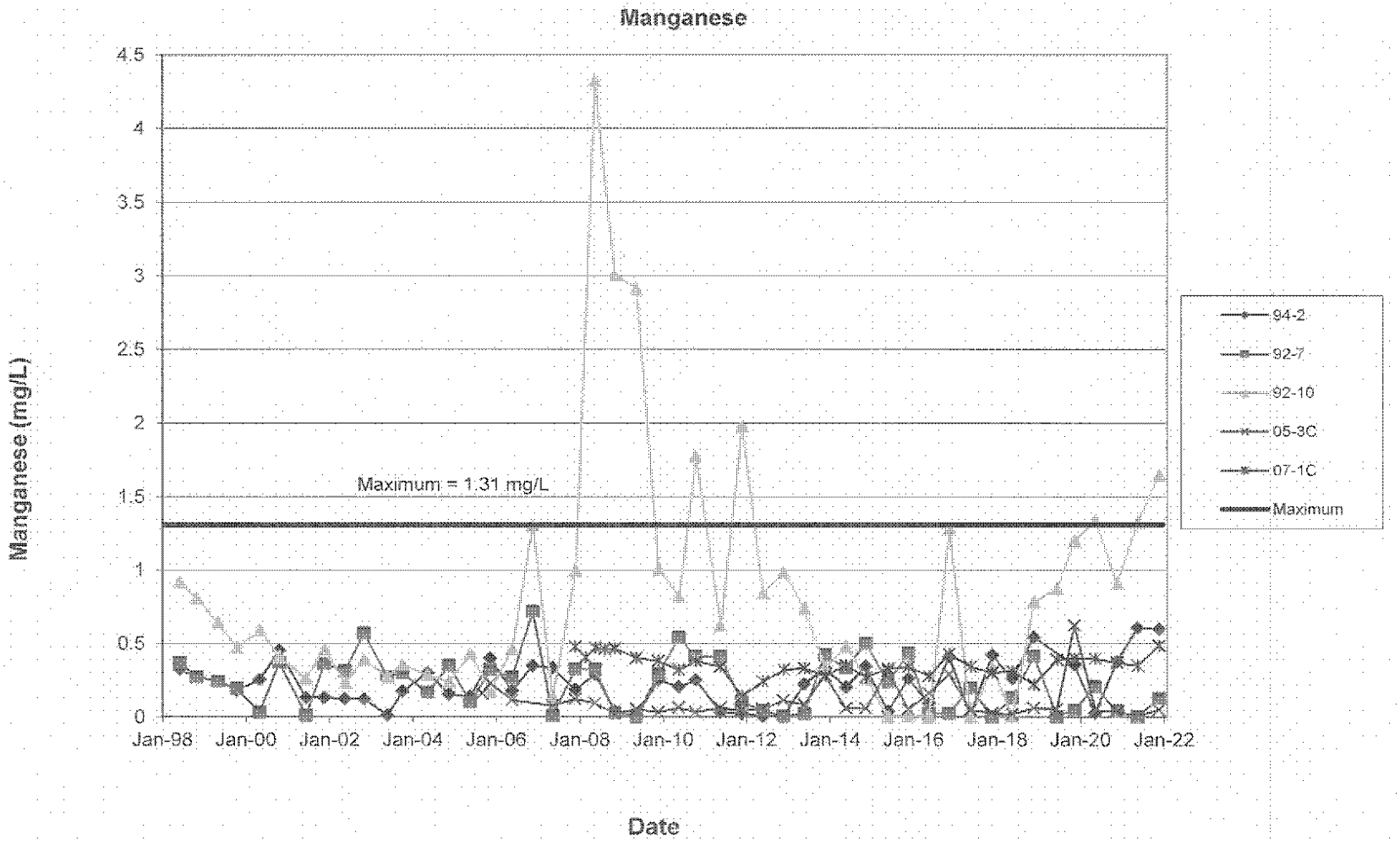


FIGURE FB7

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

002612

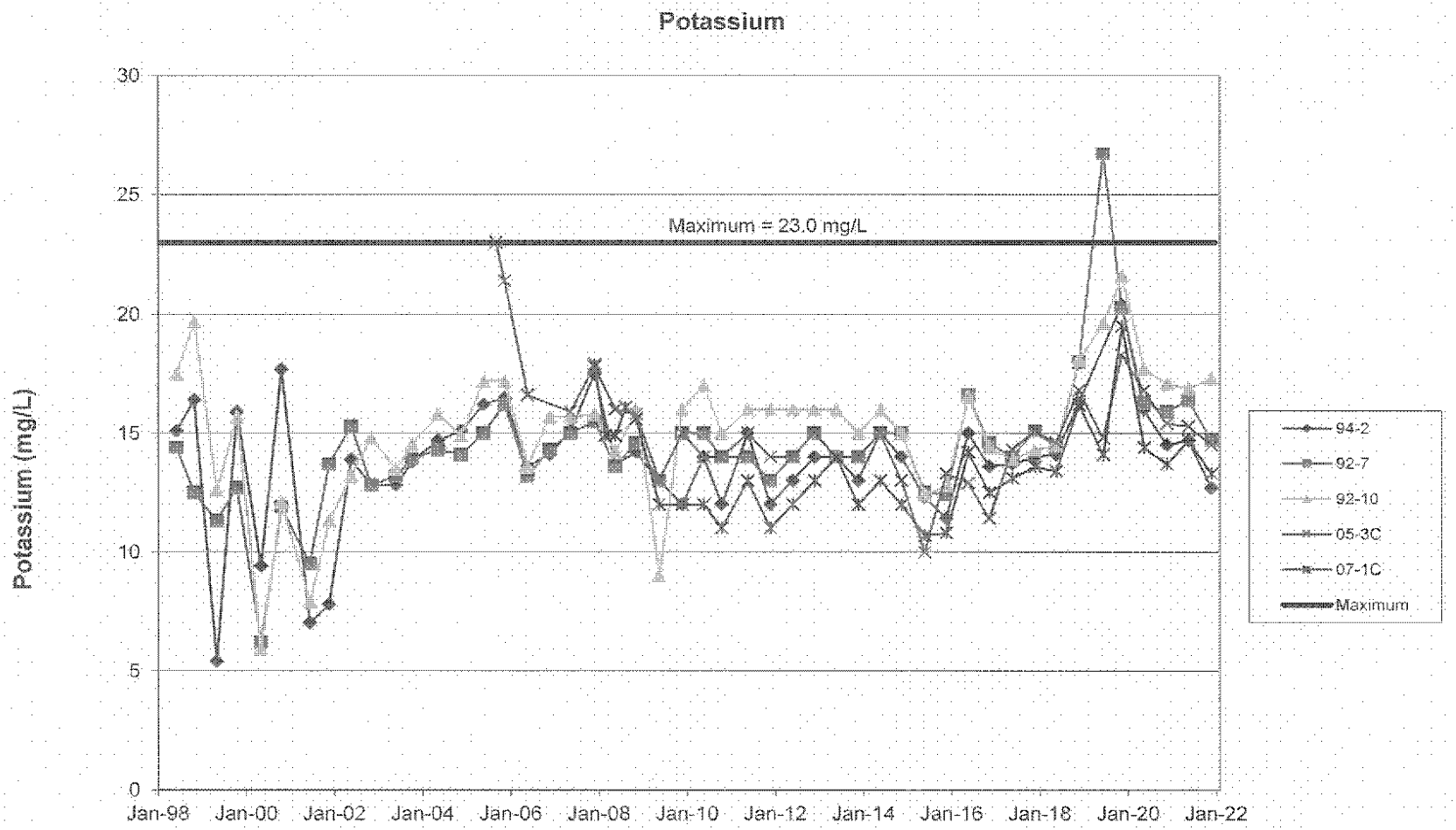


FIGURE FB8

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
WEATHERED CLAY

GOLDER

002613

APPENDIX F-C

Intact Clay Deposit

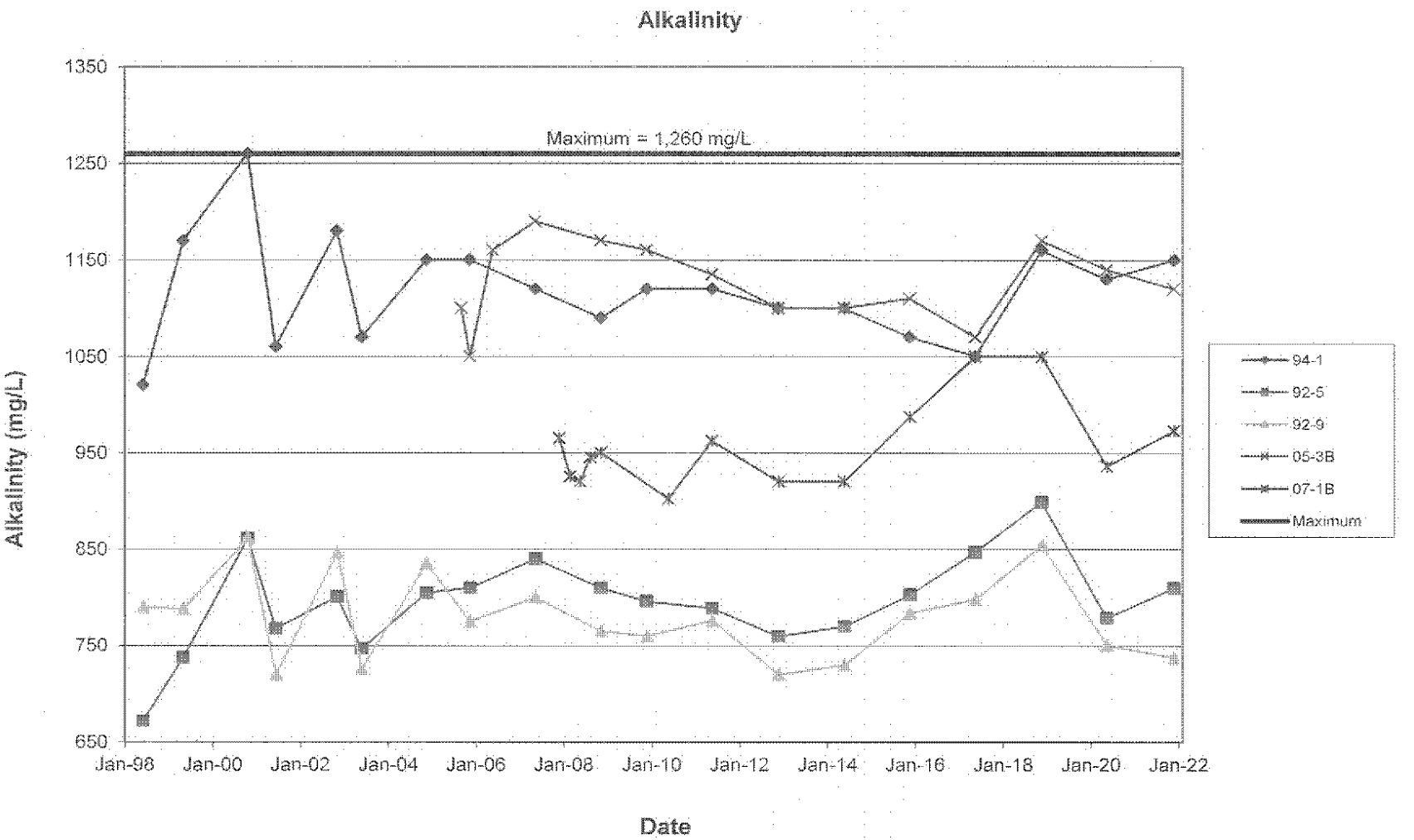


FIGURE FC1

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

INTACT CLAY

WSP GOLDER

002615

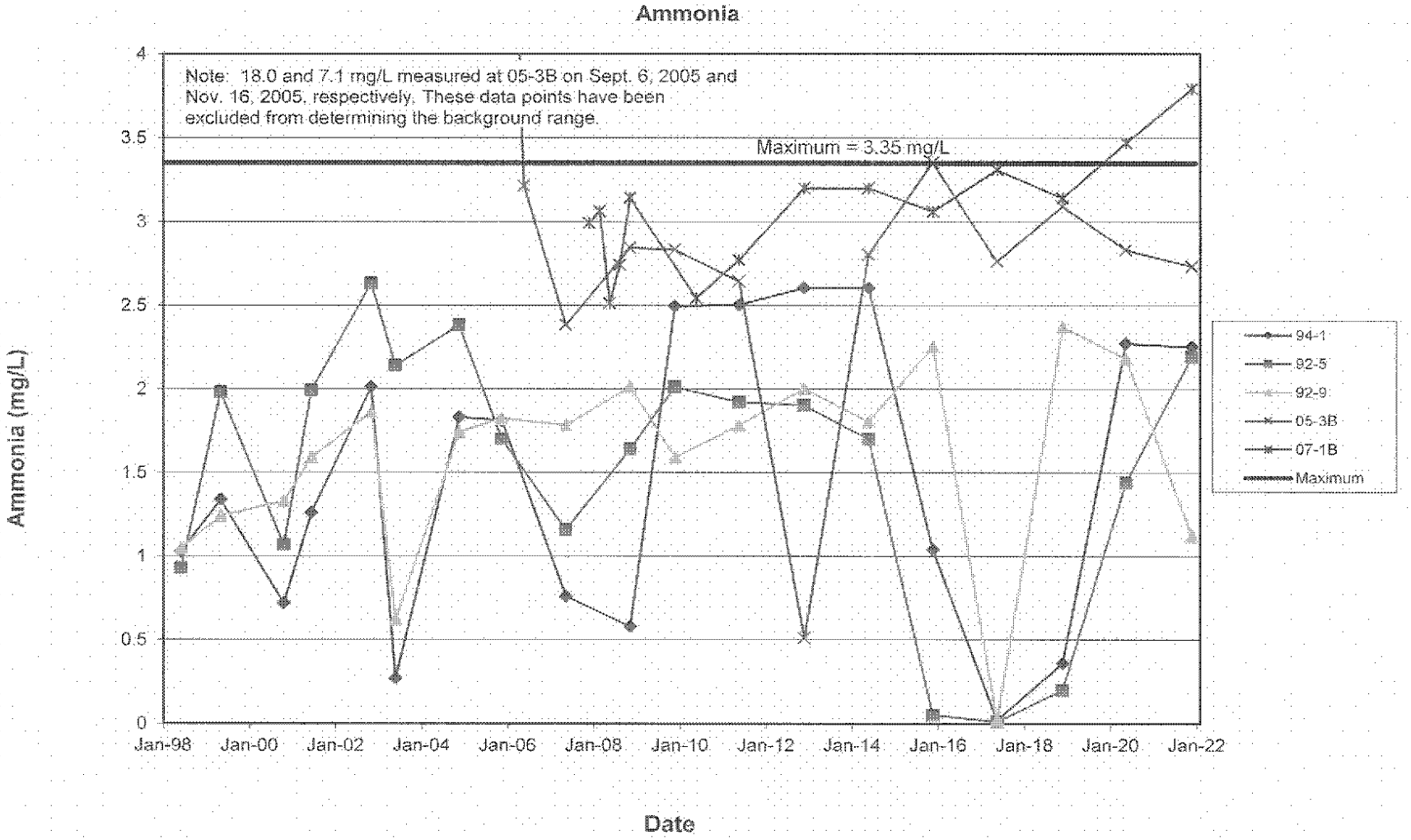


FIGURE FC2

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

002616

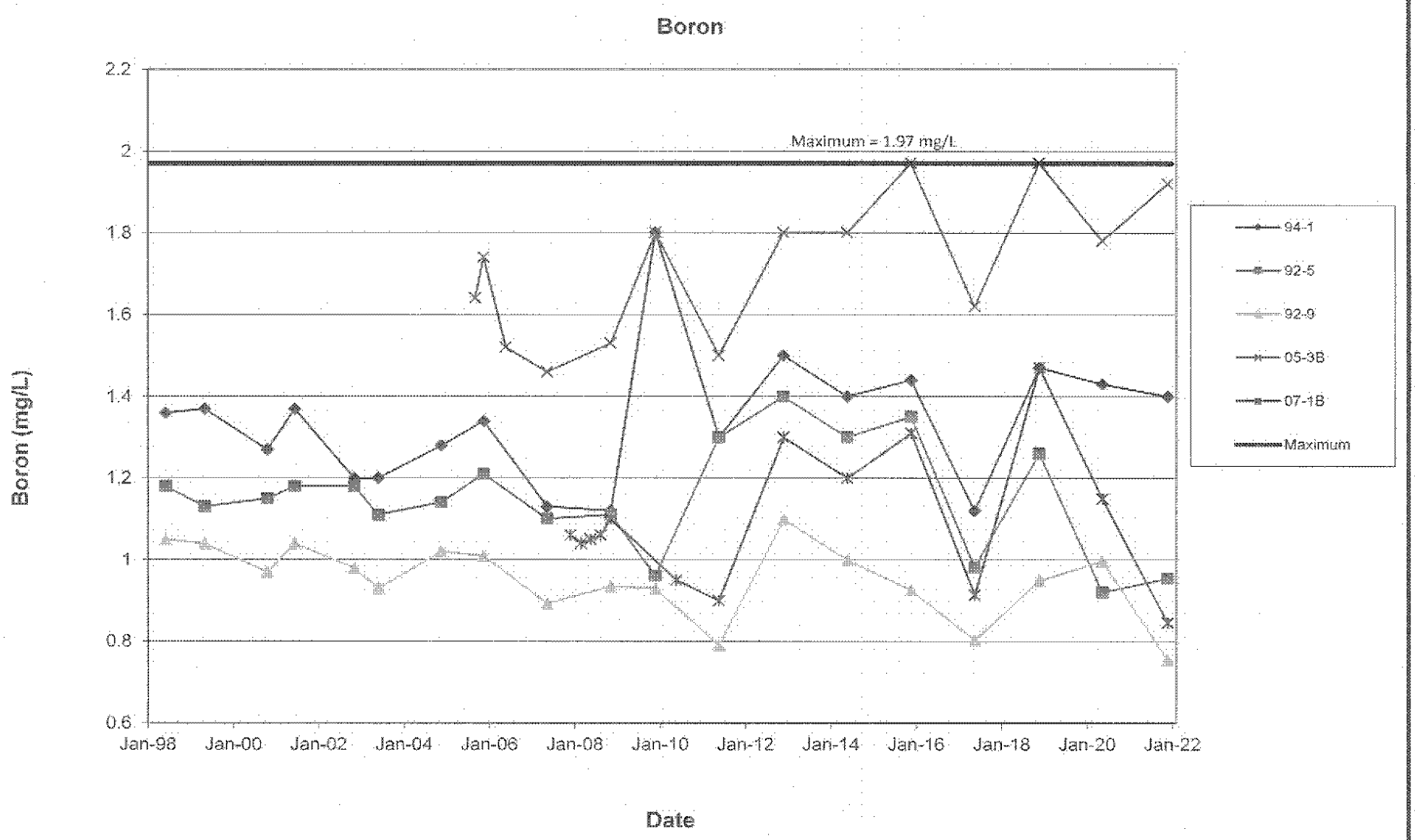


FIGURE FC3

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

WSP GOLDER

002617

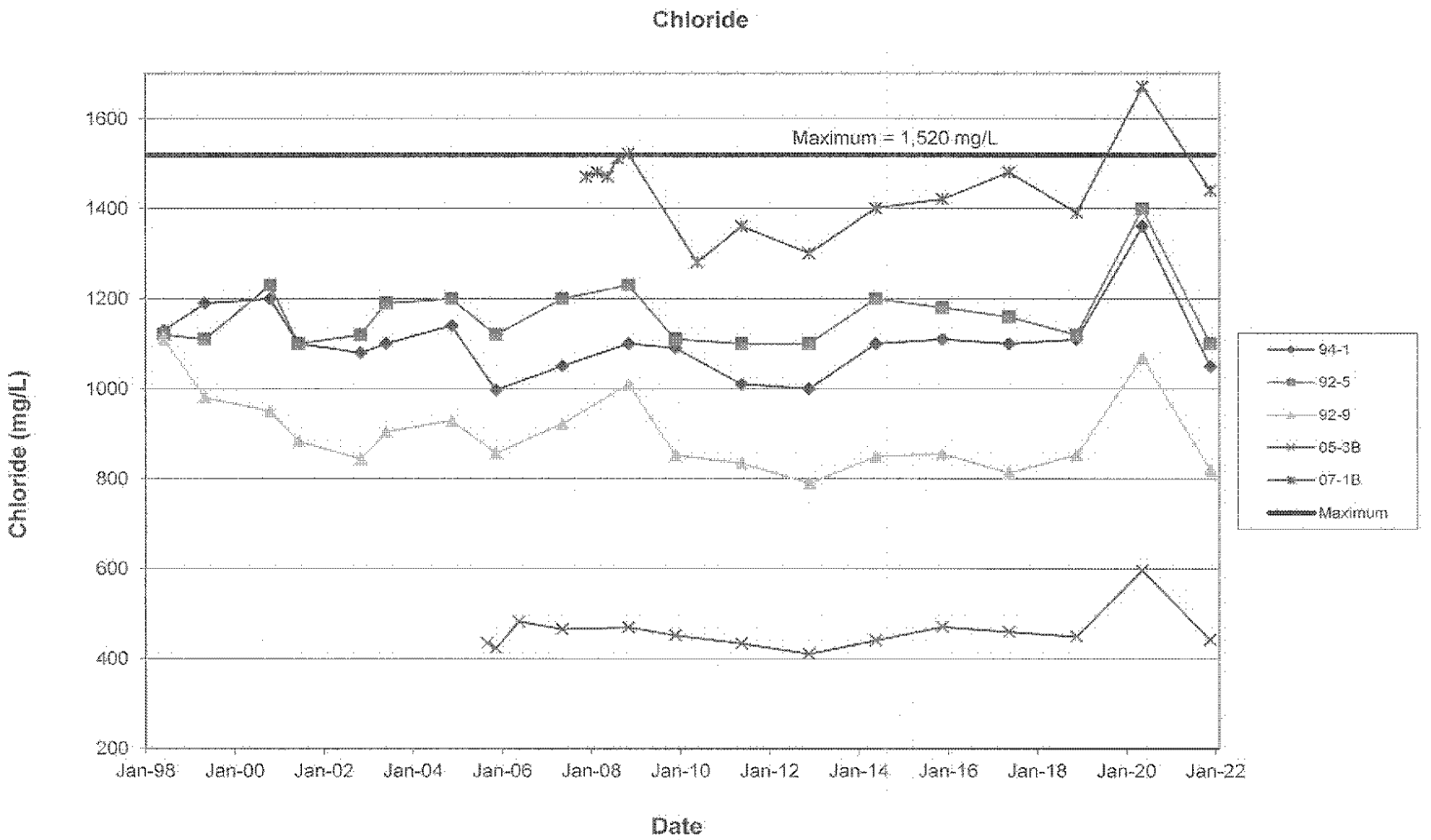


FIGURE FC4

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

WSP GOLDER

002618

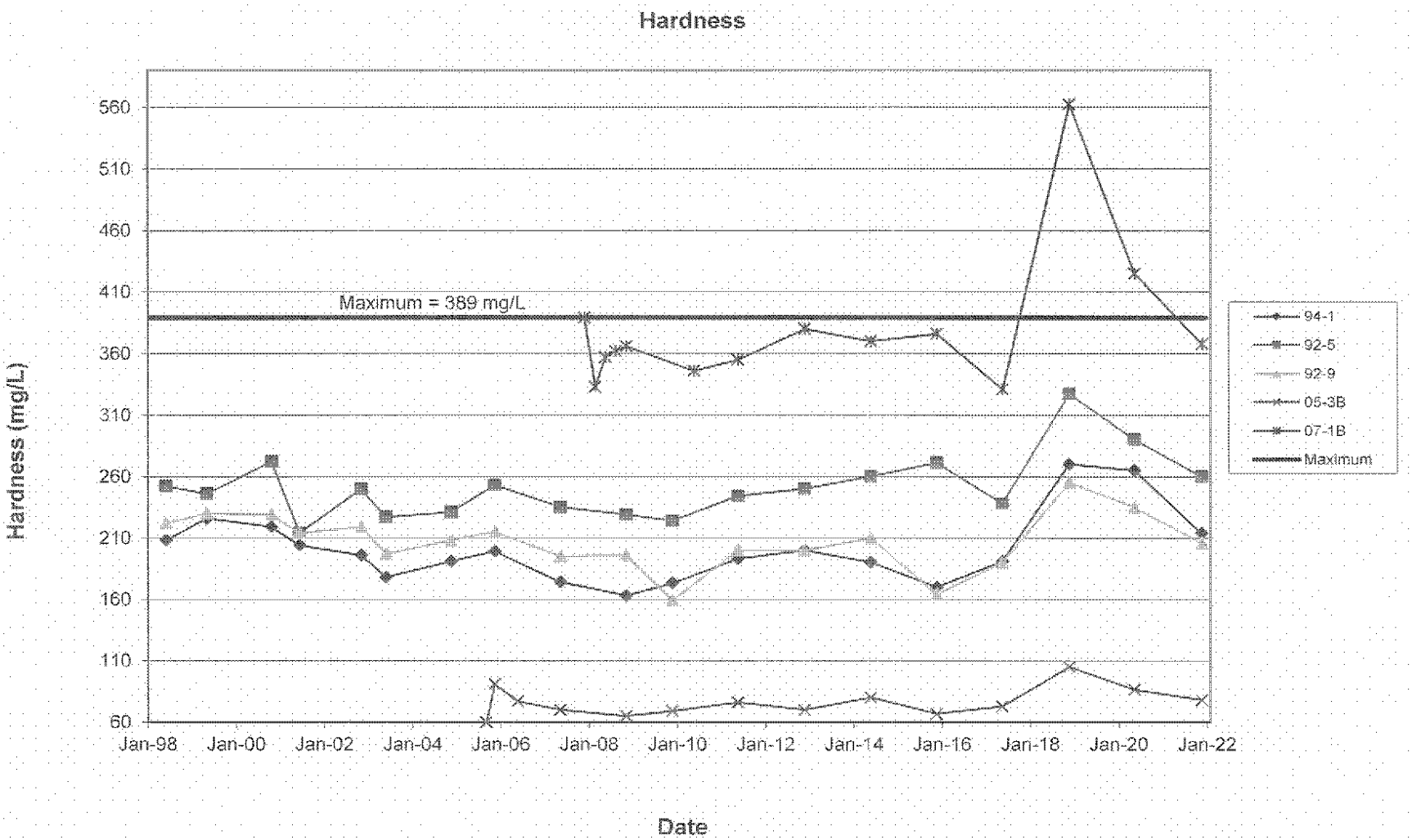


FIGURE FC5

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

002619

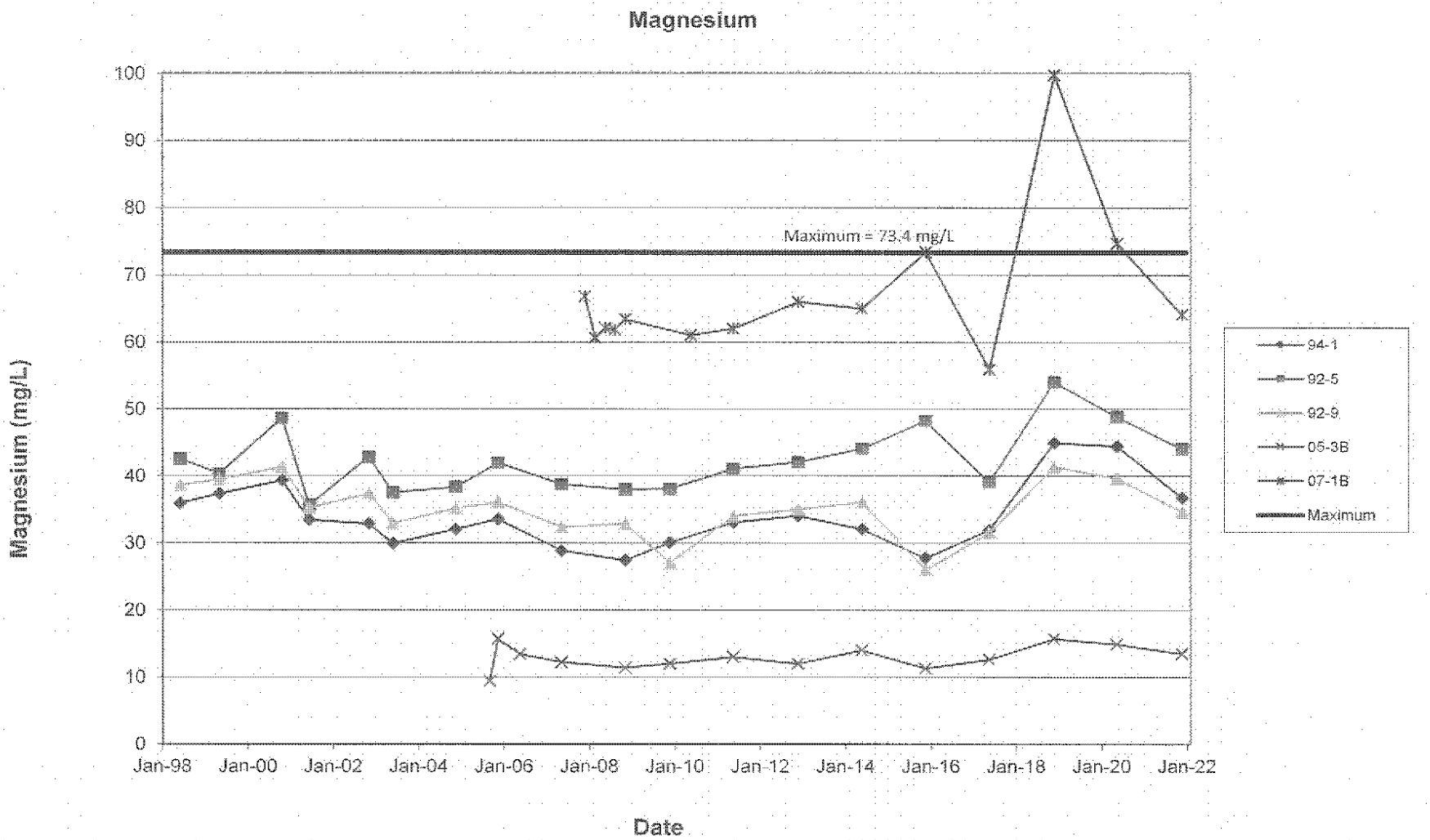


FIGURE FC6

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

002620

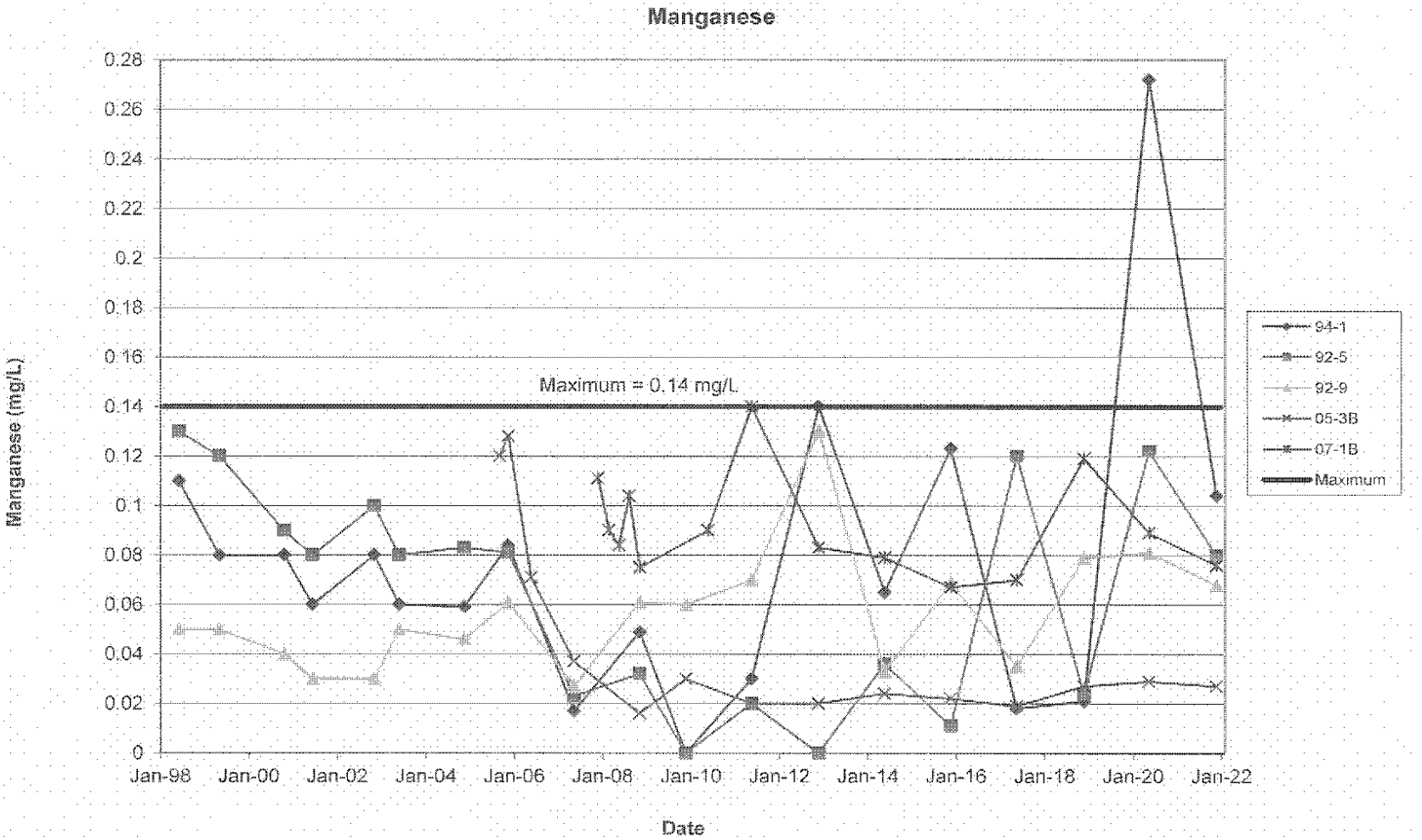


FIGURE FC7

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

002621

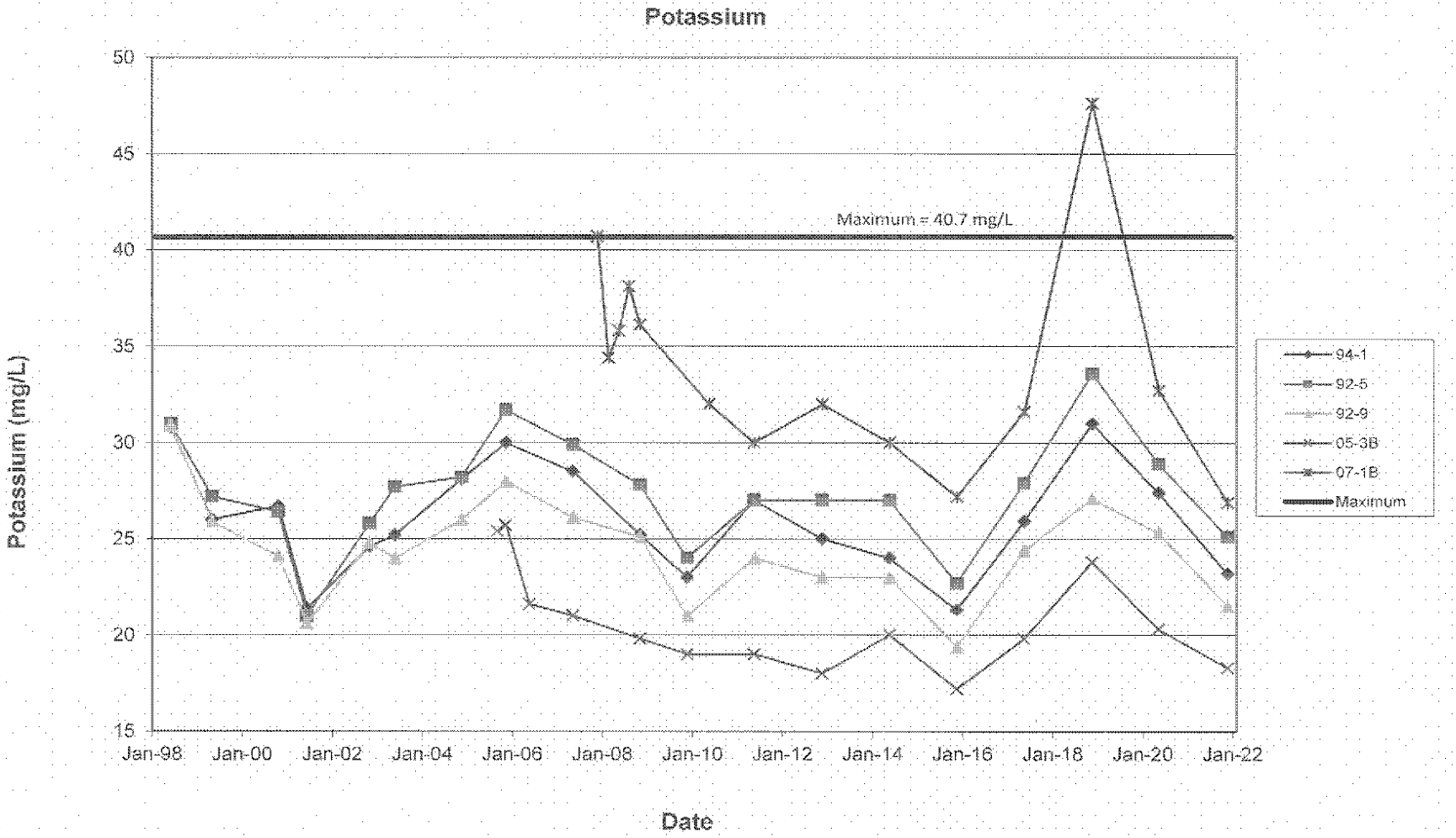


FIGURE FC8

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER
INTACT CLAY

GOLDER

002622

APPENDIX F-D

Glacial Till/Upper Bedrock Zone

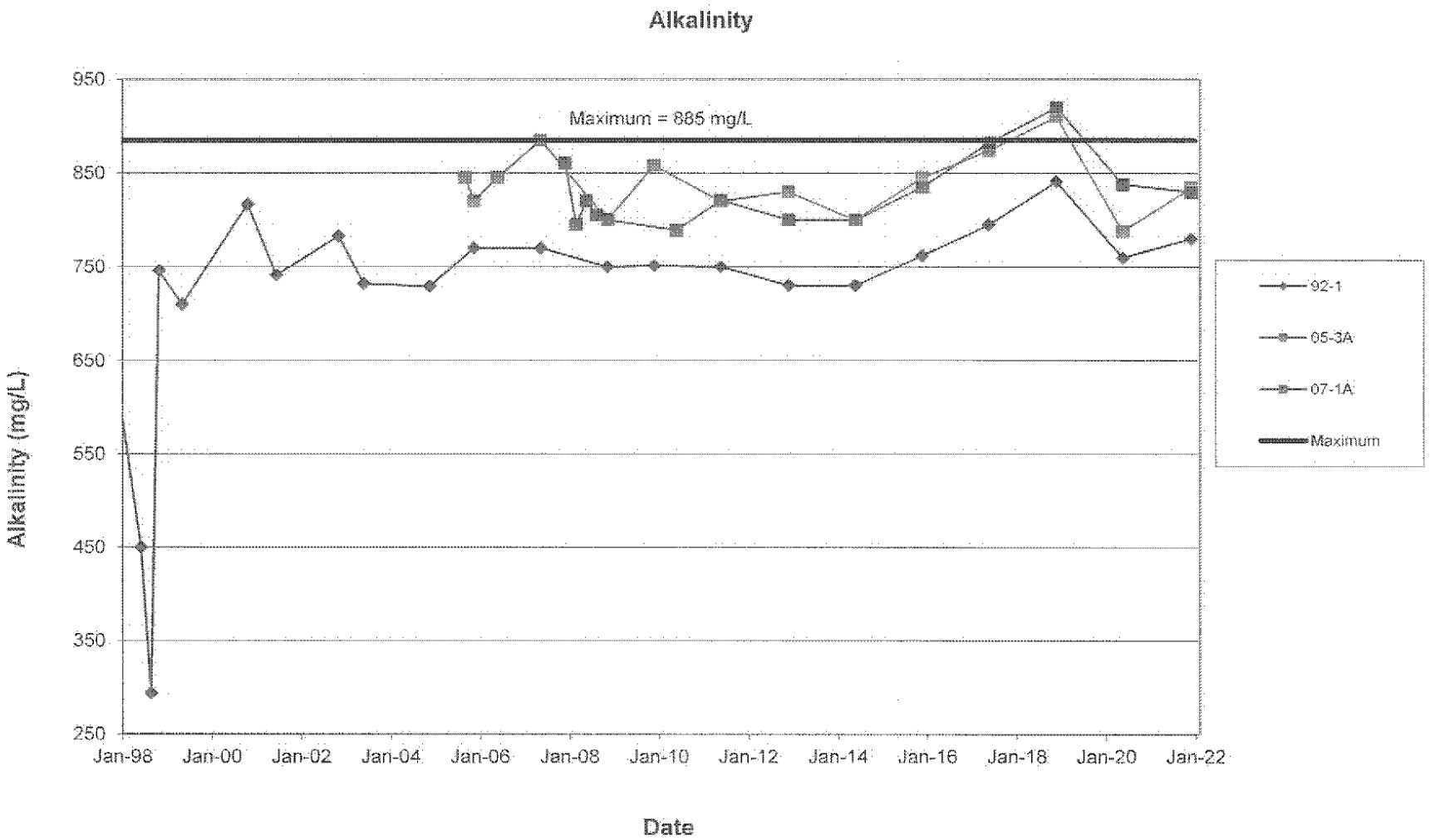


FIGURE FD1

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002624

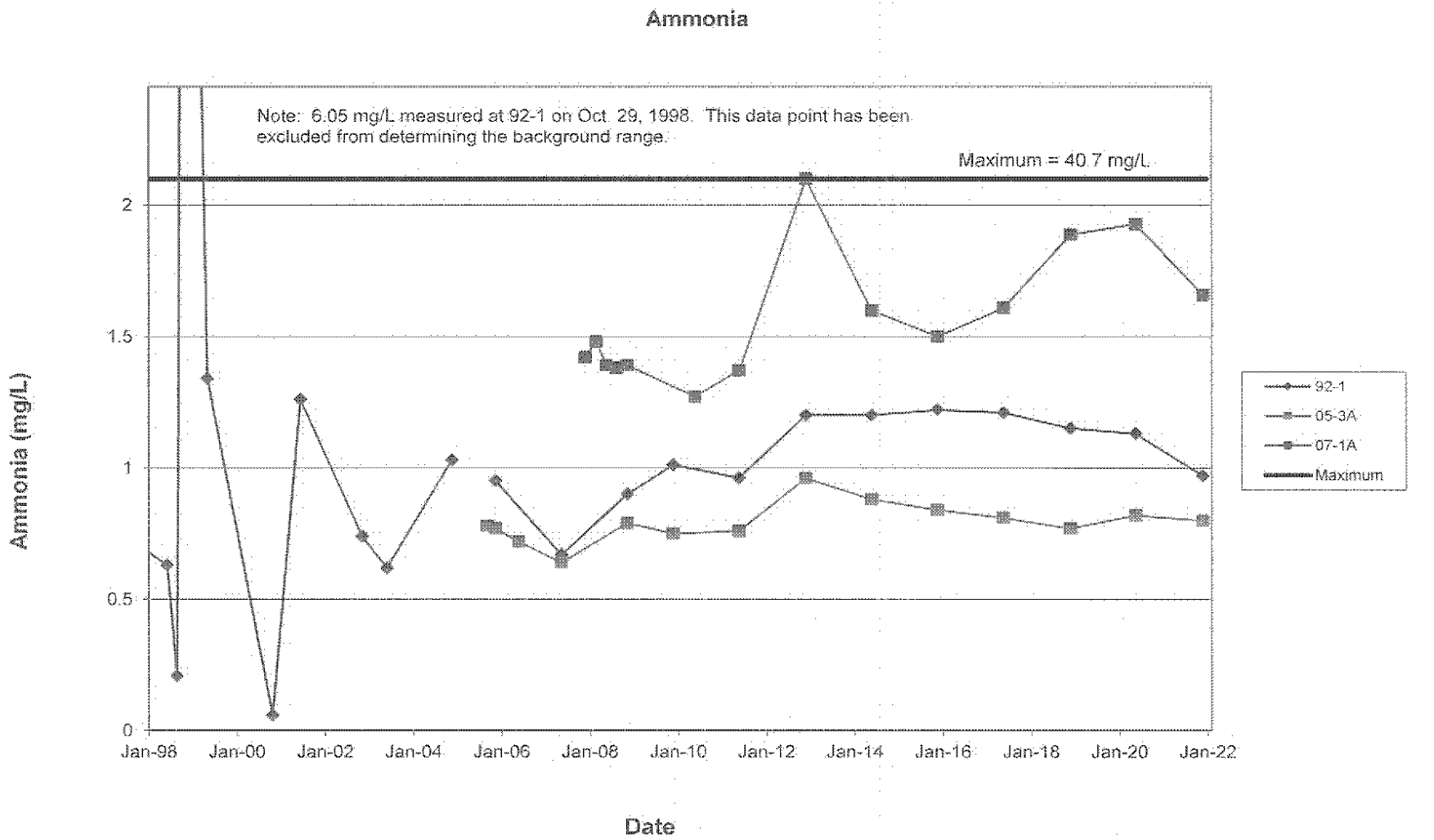


FIGURE FD2

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002625

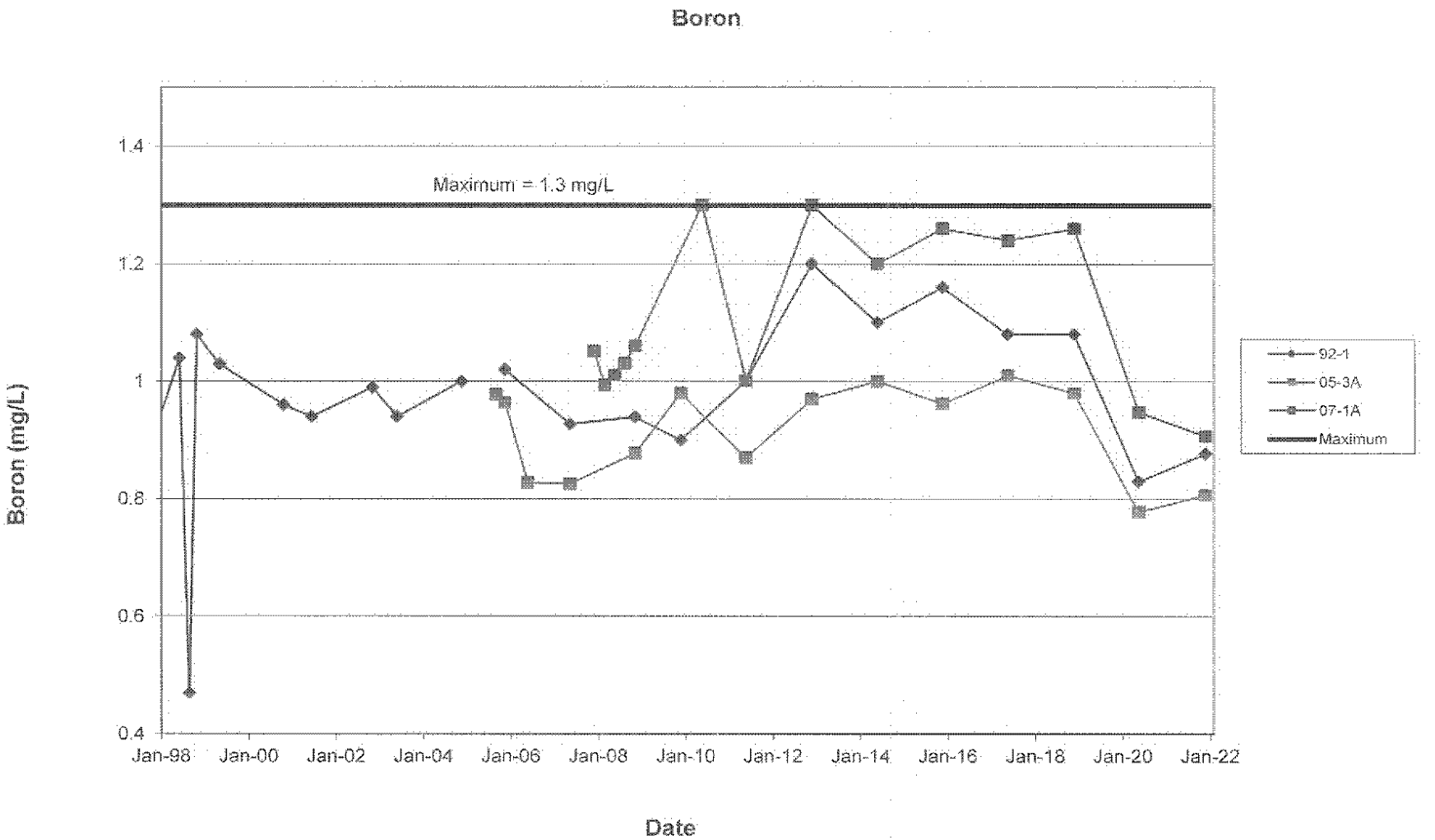


FIGURE FD3

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002626

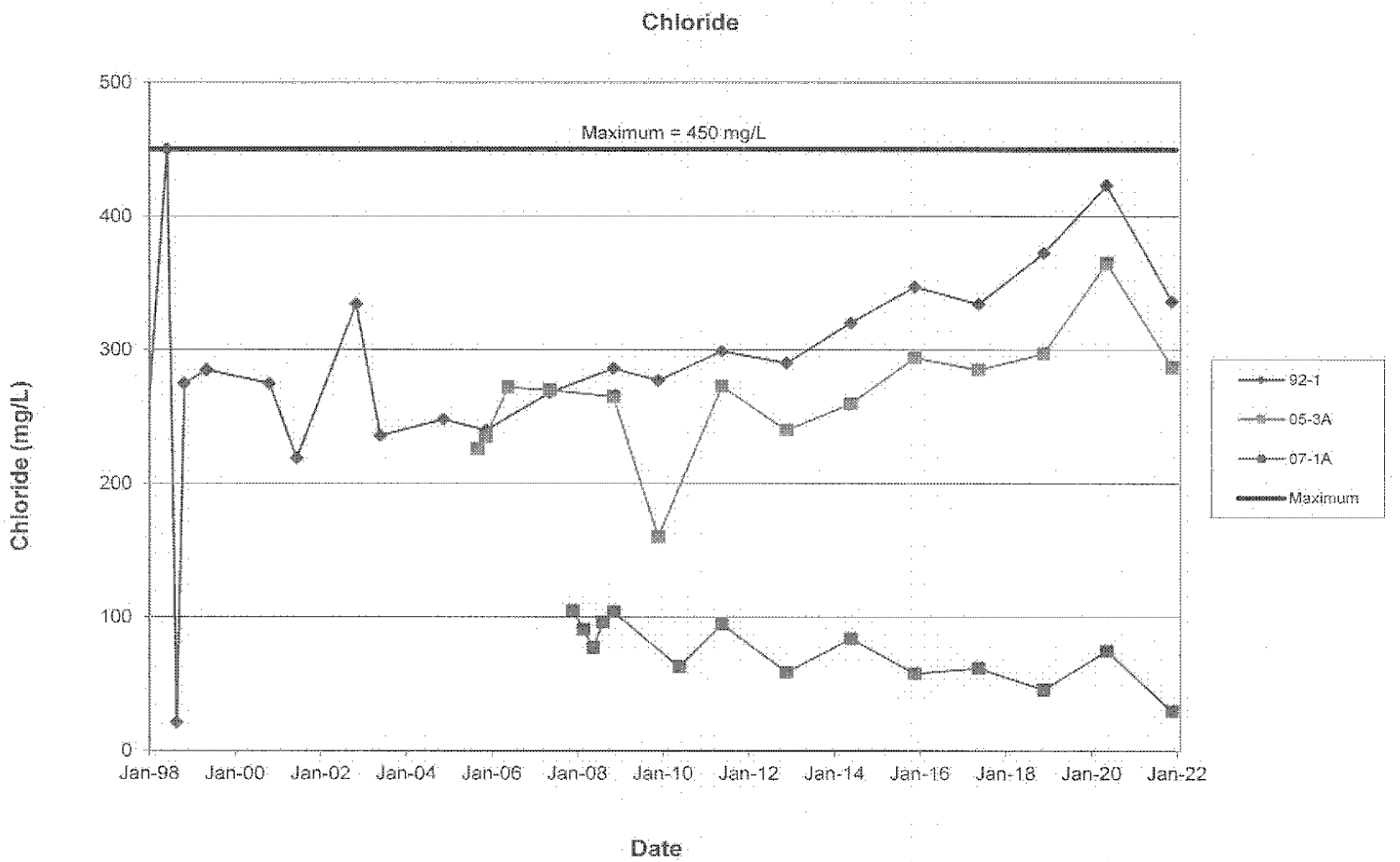


FIGURE FD4

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002627

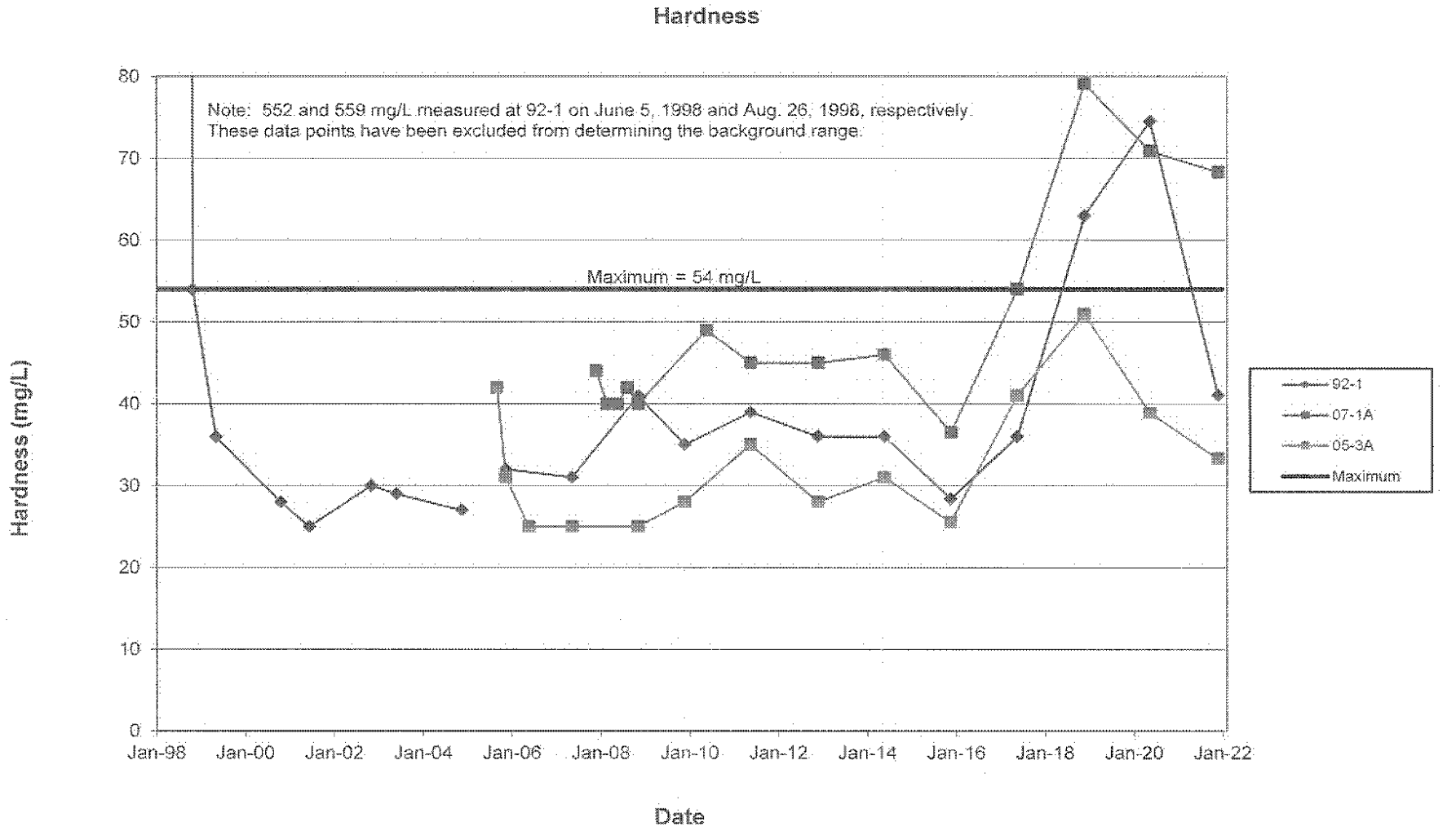


FIGURE FD5

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

GOLDER

002628

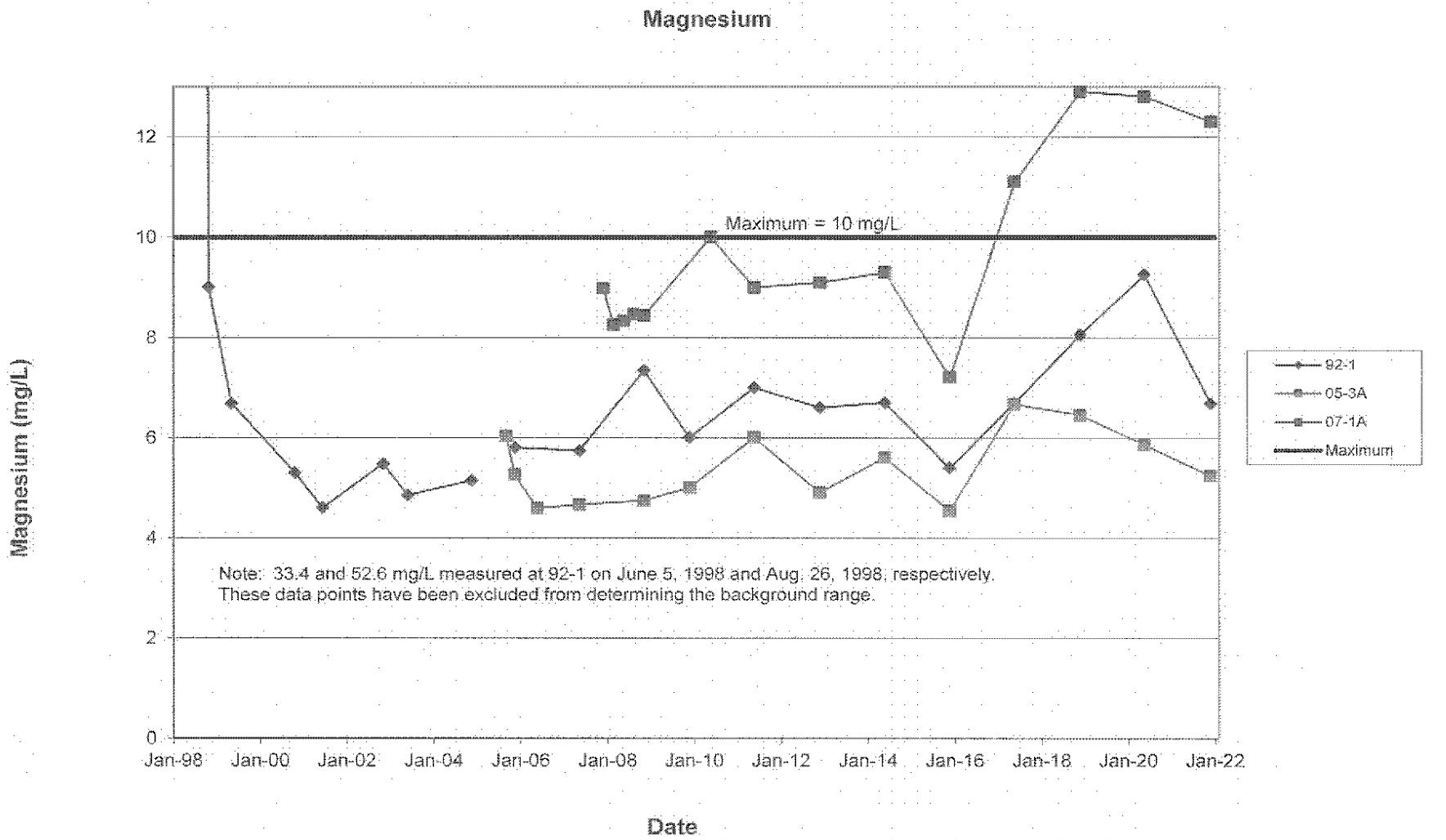


FIGURE FD6

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002629

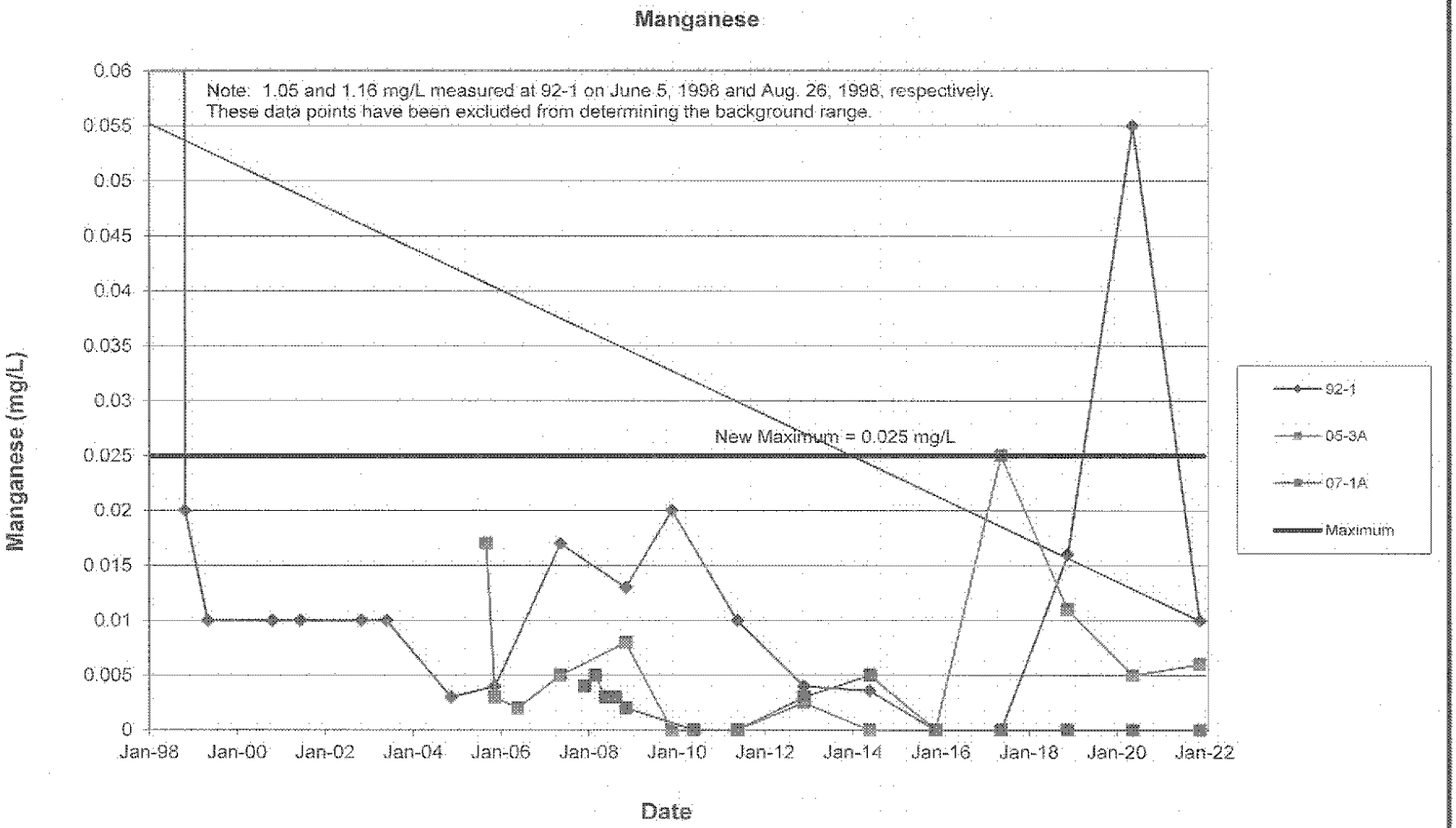


FIGURE FD7

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002630

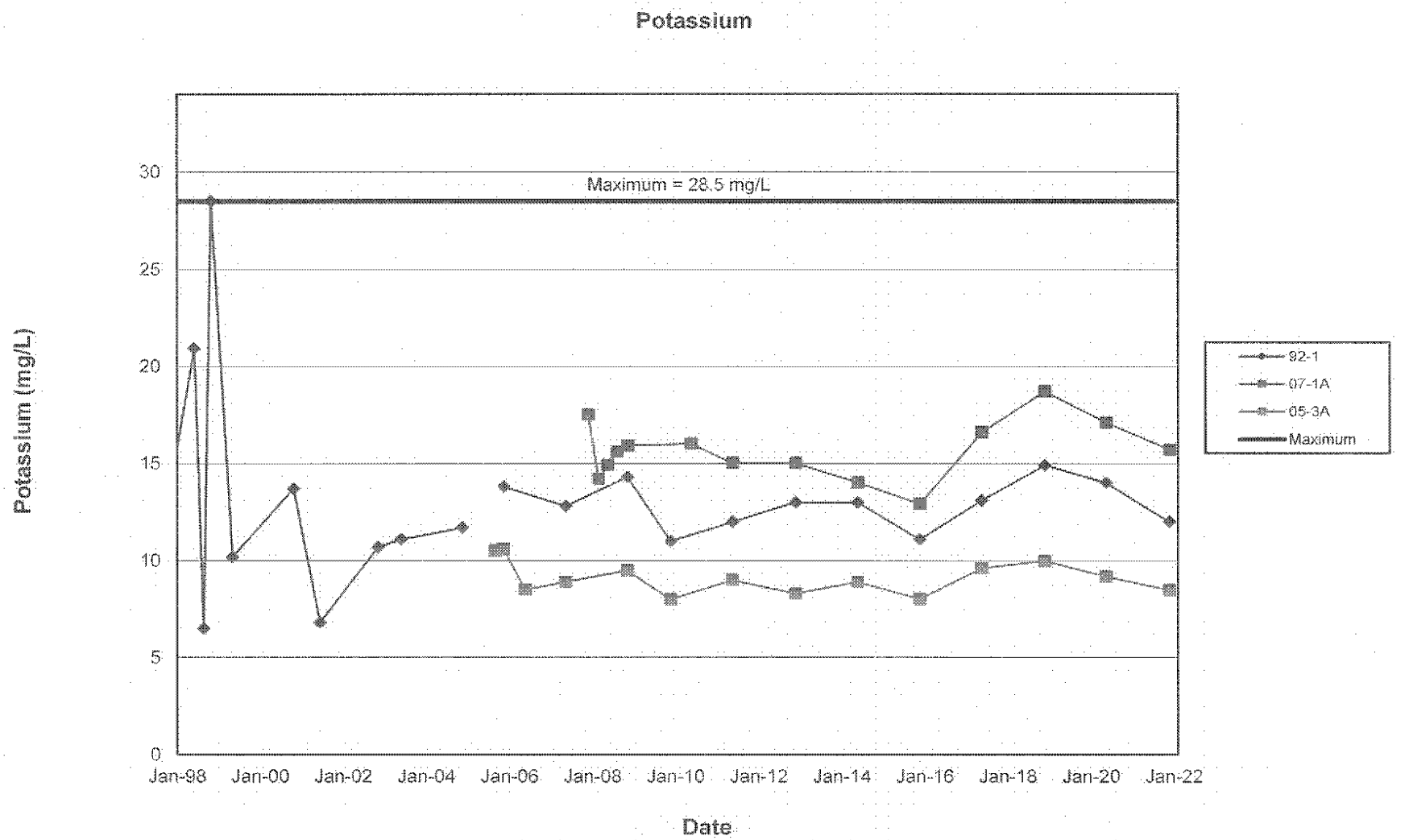


FIGURE FD8

Project No. 21497772

Prepared by: ETB

Checked by: YJM March 2022

WCC NAVAN FACILITY

GROUNDWATER

GLACIAL TILL/UPPER BEDROCK

WSP GOLDER

002631

APPENDIX G

Surface Water Results of Field and Laboratory Chemical and Physical Analyses

Please refer to the electronic version of the appendix provided on the USB at the end of this report

Pages 2634 to / à 2636

are not relevant

sont non pertinentes

LIST OF ABBREVIATIONS

The abbreviations commonly employed on Records of Boreholes, on figures, and in the text of the report are as follows:

I. SAMPLE TYPE

AS	Auger sample
BS	Block sample
CS	Chunk sample
DO or DP	Seamless open-ended, driven or pushed tube samplers
DS	Denison type sample
FS	Foil sample
RC	Rock core
SC	Soil core
SS	Split spoon sampler
ST	Slotted tube
TO	Thin-walled, open
TP	Thin-walled, piston
WS	Wash sample
DT	Dual tube sample
DD	Diamond drilling

II. PENETRATION RESISTANCE

Standard Penetration Resistance (SPT), N:

The number of blows by a 63.5 kg. (140 lb.) hammer dropped 760 mm (30 in.) required to drive a 50 mm (2 in.) split spoon sampler for a distance of 300 mm (12 in.).

Dynamic Cone Penetration Resistance (DCPT); N_d:

The number of blows by a 63.5 kg (140 lb.) hammer dropped 760 mm (30 in.) to drive an uncased 50 mm (2 in.) diameter, 60^0 cone attached to "A" size drill rods for a distance of 300 mm (12 in.).

PH:	Sampler advanced by hydraulic pressure
PM:	Sampler advanced by manual pressure
WH:	Sampler advanced by static weight of hammer
WR:	Sampler advanced by weight of sampler and rod

Cone Penetration Test (CPT):

An electronic cone penetrometer with a 60^0 conical tip and a projected end area of 10 cm^2 pushed through ground at a penetration rate of 2 cm/s. Measurements of tip resistance (q_t), porewater pressure (u) and friction along a sleeve are recorded electronically at 25 mm penetration intervals.

III. SOIL DESCRIPTION

(a) Cohesionless Soils

Density Index (Relative Density)	**N** Blows/300 mm Or Blows/ft.
Very loose	0 to 4
Loose	4 to 10
Compact	10 to 30
Dense	30 to 50
Very dense	over 50

(b) Cohesive Soils

C_u or S_u

Consistency	kPa	Psf
Very soft	0 to 12	0 to 250
Soft	12 to 25	250 to 500
Firm	25 to 50	500 to 1,000
Stiff	50 to 100	1,000 to 2,000
Very stiff	100 to 200	2,000 to 4,000
Hard	Over 200	Over 4,000

IV. SOIL TESTS

w	Water content
w_p or PL	Plastic limited
w_1 or LL	Liquid limit
C	Consolidaiton (oedometer) test
CHEM	Chemical analysis (refer to text)
CID	Consolidated isotropically drained triaxial test[1]
CIU	Consolidated isotropically undrained triaxial test with porewater pressure measurement[1]
D_R	Relative density
DS	Direct shear test
Gs	Specific gravity
M	Sieve analysis for particle size
MH	Combined sieve and hydrometer (H) analysis
MPC	Modified Proctor compaction test
SPC	Standard Proctor compaction test
OC	Organic content test
SO_4	Concentration of water-soluble sulphates
UC	Unconfined compression test
UU	Unconsolidated undrained triaxial test
V	Field vane test (LV-laboratory vane test)
γ	Unit weight

Note: [1] Tests which are anisotropically consolidated prior shear are shown as CAD, CAU.

LIST OF SYMBOLS

Unless otherwise stated, the symbols employed in the report are as follows:

I. GENERAL

π	3.1416
ln x	natural logarithm of x
$\log_{10}$ x or log x	logarithm of x to base 10
g	acceleration due to gravity
t	time
FOS	factor of safety
V	volume
W	weight

II. STRESS AND STRAIN

γ	shear strain
Δ	change in, e.g. in stress: $\Delta \sigma'$
ε	linear strain
ε_v	volumetric strain
η	coefficient of viscosity
ν	Poisson's ratio
σ	total stress
σ'	effective stress ($\sigma' = \sigma - u$)
σ'_{vo}	initial vertical effective overburden stress
$\sigma_1\sigma_2\sigma_3$	principal stresses (major, intermediate, minor)
σ_{oct}	mean stress or octahedral stress $= (\sigma_1 + \sigma_2 + \sigma_3) / 3$
τ	shear stress
u	porewater pressure
E	modulus of deformation
G	shear modulus of deformation
K	bulk modulus of compressibility

III. SOIL PROPERTIES

(a) Index Properties

$\rho(\gamma)$	bulk density (bulk unit weight)*
$\rho_d(\gamma_d)$	dry density (dry unit weight)
$\rho_w(\gamma_w)$	density (unit weight) of water
$\rho_s(\gamma_s)$	density (unit weight) of solid particles
γ'	unit weight of submerged soil ($\gamma' = \gamma - \gamma_w$)
D_R	relative density (specific gravity) of solid particles ($D_R = \rho_s / \rho_w$) formerly (G_s)
e	void ratio
n	porosity
S	degree of saturation

* Density symbol is ρ. Unit weight symbol is γ where $\gamma = \rho g$ (i.e. mass density multiplied by acceleration due to gravity)

(a) Index Properties (continued)

w	water content
w_1 or LL	liquid limit
w_p or PL	plastic limit
I_p or PI	plasticity Index = $(w_1 - w_p)$
w_s	shrinkage limit
I_L	liquidity index = $(w - w_p) / I_p$
I_c	consistency index = $(w_1 - w) / I_p$
e_{max}	void ratio in loosest state
e_{min}	void ratio in densest state
I_D	density index = $(e_{max} - e) / (e_{max} - e_{min})$ (formerly relative density)

(b) Hydraulic Properties

h	hydraulic head or potential
q	rate of flow
v	velocity of flow
i	hydraulic gradient
k	hydraulic conductivity (coefficient of permeability)
j	seepage force per unit volume

(c) Consolidation (one-dimensional)

C_c	compression index (normally consolidated range)
C_r	recompression index (overconsolidated range)
C_s	swelling index
C_α	coefficient of secondary consolidation
m_v	coefficient of volume change
c_v	coefficient of consolidation (vertical direction)
T_v	time factor (vertical direction)
U	degree of consolidation
σ'_p	pre-consolidation stress
OCR	overconsolidation ratio = σ'_p / σ'_{vo}

(d) Shear Strength

τ_p or τ_r	peak and residual shear strength
ϕ'	effective angle of internal friction
δ	angle of interface friction
μ	coefficient of friction = tan δ
c'	effective cohesion
c_u or s_u	undrained shear strength ($\phi = 0$ analysis)
p	mean total stress $(\sigma_1 + \sigma_3) / 2$
p'	mean effective stress $(\sigma'_1 + \sigma'_3) / 2$
q	$(\sigma_1 - \sigma_3) / 2$ or $(\sigma'_1 - \sigma'_3) / 2$
q_u	compressive strength $(\sigma_1 - \sigma_3)$
S_t	sensitivity

Notes:
[1] $\tau = c' + \sigma' \tan \phi'$
[2] shear strength = (compressive strength) / 2

PROJECT: 11-1125-0017

RECORD OF BOREHOLE: BH11-1

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: August 30, 2011

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) (20 40 60 80)	ADDITIONAL LAB TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE											
0	Power Auger 200 mm Diam. (Hollow Stem)	Very loose to loose grey brown silty fine sand and silty clay (FILL)		0.00	1	50 DO	1						Bentonite Seal
1					2	50 DO	WH						Native Backfill
2					3	50 DO	4						
3					4	50 DO	5						
3		Grey brown silty clay, some sand (FILL)		3.51									
4		Loose brown SILTY fine SAND, trace gravel, clay and organic matter		3.66	5	50 DO	7						
5					6	50 DO	7						
5		Stiff red brown SILTY CLAY, trace sand (Weathered Crust)		5.18	7	50 DO	8						Bentonite Seal
6		Very soft grey SILTY CLAY		5.94	8	50 DO	1						
7					9	50 DO	PM						
8					10	50 DO	PM						
9													Silica Sand
10					11	50 DO	PM						
10		End of Borehole		10.67	12	50 DO	PM						50 mm Diam. PVC #10 Slot Screen
11													
12													
13													
14													
15													

DEPTH SCALE

1 : 75

LOGGED: DG

CHECKED: LEB

002732

MIS-BHS 001 1111250017-01.GPJ GAL-MIS.GDT 12/23/11 P.G

PROJECT: 09-1125-0008

RECORD OF BOREHOLE: 09-1A

SHEET 1 OF 2

LOCATION: N ;E

BORING DATE: 02/03/2009

DATUM: Geodetic

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 (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		68.76				SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80)	WATER CONTENT PERCENT Wp W Wl (20 40 60 80)		
		Black SANDY SILT with organic matter		0.00							Protective casing
				68.23							
		Loose brown fine SANDY SILT		0.53	1	SS DO	6				Bentonite Seal
				67.77							
1		Stiff grey brown SILTY CLAY (Weathered Crust)		0.99	2	SS DO	4				
					3	SS DO	WH				
2				66.17							
		Grey SILTY CLAY		2.59	4	SS DO	WH				
3											
4					5	SS DO	PM				
				63.88							
5		Grey SILTY CLAY, trace of black organic matter		4.88							
6					6	SS DO	PM				
					7	SS DO	PM				
	Power Auger 203mm Diam. (Hollow Stem)			60.84							
8		Grey SILTY CLAY, occasional rust brown layers, traces black organic matter		7.92							Native Backfill
9					8	SS DO	PM				
10				58.48							
		Grey SILTY CLAY, trace black organic matter		10.32	9	SS DO	PM				
11					10	SS DO	PM				
12											
13					11	SS DO	PM				
14											
15		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 75

Golder Associates

LOGGED: D.G.

CHECKED: MKF

002733

MIS-BHS 001 09112532080000.GPJ GAL-MIS.GDT 3/8/10

PROJECT: 09-1125-0008

RECORD OF BOREHOLE: 09-1A

SHEET 2 OF 2

LOCATION: N ;E

BORING DATE: 02/03/2009

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV DEPTH (m)	SAMPLES NUMBER	SAMPLES TYPE	SAMPLES BLOWS/0.3m	DYNAMIC PENETRATION RESISTANCE, BLOWS/0.3m (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + ⊡ - ●, 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) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
15	Power Auger 200mm Diam. (Hollow Stem)	— CONTINUED FROM PREVIOUS PAGE —											
15		Grey SILTY CLAY, trace black organic matter			12	SS DO	PM						
16													
17					13	SS DO	PM						Notfrey Backfill
18				50.78									
18		Grey SILTY CLAY		17.94	14	SS DO	WH						
19													Bentonite Seal
19				49.00	15	SS DO	>50						
20		Very dense grey SANDY SILT, some gravel and clay (GLACIAL TILL)		19.76									Silica Sand
20													32mm diam. PVC #10 slot screen
21				47.65									
21		End of Borehole		21.11	16	SS DO	>50						
22													Well Screen frozen to Elev. 68.67 m on Feb 8, 2010
23													
24													
25													
26													
27													
28													
29													
30													

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.G.

CHECKED: MKF

002734

GINT 9.6.02 - 2010-02-25 - 08:41 - C:\GINT\1125\0008-2010.GPJ - GAL-MIS.GDT

PROJECT: 09-1125-0008

RECORD OF BOREHOLE: 09-1B&C

SHEET 1 OF 1

LOCATION: N ;E

BORING DATE: 04/03/2009

DATUM: Geodetic

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 (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-4} 10^{-5} 10^{-6} 10^{-7})	WATER CONTENT PERCENT (Wp ⊢—○ W —⊣ Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0	Power Auger 200mm Diam. (Nominal Size)	GROUND SURFACE		68.72									
		For subsurface stratigraphy refer to record of borehole 09-B2A		0.00									Protective Casing; Bentonite Seal; Native Backfill; Silica Sand; 32mm diam. PVC #10 slot screen C; Silica Sand; Bentonite Seal; Native Backfill and Bentonite; Bentonite Seal; Silica Sand; 32mm diam. PVC #10 slot screen B
10		End of Borehole		58.67 10.05									W.L. in Screen B at Elev. 67.43 m; W.L. in Screen C at Elev. 67.57 m on Feb. 8, 2010

DEPTH SCALE

1 : 75

LOGGED: D.G.

CHECKED: WKF

Golder Associates

002735

M:\2-10 001 GN\1125\0008-2009 BH GA_MS GDT 3/9/10

PROJECT: 09-1125-0008

RECORD OF BOREHOLE: 09-1D

SHEET 1 OF 1

LOCATION: N ;E

BORING DATE: 08/02/2010

DATUM: Geodetic

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 (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) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		69.58									
0	Hand Auger Open Hole	PEAT		0.00	1	50 DO	WH						Bentonite Seal
1					2	50 DO	1						Silica Sand Backfill; 32mm Dia. PVC # 10 Slot Screen
2				67.60	3	50 DO	WH						
		End of Borehole		1.98									Well Installed Elev. 68.40 m Feb. 8, 2010
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													

DEPTH SCALE

1 : 75

Golder Associates

LOGGED: J.D.

CHECKED: MKC

002736

MIS-BHS 001 09112500008-2000.GPJ GAL-MIS.GDT 3/9/10

PROJECT: 07-1122-0203-200

RECORD OF BOREHOLE: BH07-1

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: August 27, 2007

DATUM: Geodetic

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		32.34							
		TOPSOIL (FILL)		32.25							Protective Casing
		Brown SANDY SILTY some gravel trace brick (FILL)		31.95							Bentonite Seal
		Brown SILTY SAND, trace topsoil (FILL)		0.39	1	50 DO	8				Silica Sand
		Dark grey brown SILTY SAND, trace topsoil (FILL)		30.46	2	50 DO	3				50mm Diam. PVC #10 Slot Screen D
		Stiff grey brown SILTY CLAY (Weathered Crust)		29.84	3	50 DO	WH				
		Grey SILTY CLAY, occasional red brown layer, trace black organic matter		2.50	4	50 DO	WH				Bentonite Seal
					5	50 DO	PH				38mm Diam. PVC #10 Slot Screen C
					6	50 DO	PH				Native Backfill
					7	50 DO	PH				Bentonite Seal
		Grey SILTY CLAY, trace black organic matter		23.61							Silica Sand
				8.53	8	50 DO	PH				38mm Diam. PVC #10 Slot Screen B
					9	50 DO	PH				
		Grey SILTY CLAY, trace to some black organic matter		20.56							
				11.58	10	50 DO	PH				
					11	50 DO	PH				Native Backfill
					12	50 DO	PH				
					13	50 DO	PH				
					14	50 DO	PH				
		CONTINUED NEXT PAGE									

Barrel Hydr 105mm Diam. (Rotator Barrel)

DEPTH SCALE

1 : 100

LOGGED: D.J.S

CHECKED: P.L.E

Golder Associates

002737

MISSING 021 07-1122-0203-200 EP1 BLOG 23 NOV 2007

PROJECT: 07-1122-0203-200

RECORD OF BOREHOLE: BH07-1

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: August 27, 2007

DATUM: Geodetic

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 (10⁻⁴ 10⁻⁵ 10⁻⁶ 10⁻⁷)	WATER CONTENT PERCENT (Wp — W — Wl; 10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
20	Power Auger 200mm diam. (Hollow Stem)	— CONTINUED FROM PREVIOUS PAGE —											
		Grey SILTY CLAY, trace to some black organic matter			15	SS DO	PM						Native Backfill
		Grey SILTY CLAY, occasional clayey silt seam		20.70									
22		Compact dark grey SANDY SILT, some gravel and clay, occasional cobbles (GLACIAL TILL)		21.73	16	SS DO	HAM						Bentonite Seal
					17	SS DO	13						Silica Sand
24		End of Borehole Auger Refusal		23.90									38mm Diam. PVC #10 Slot Screen
26													
28													
30													
32													
34													
36													
38													
40													

Note: monitoring well screens A and B are each installed in their own boreholes and monitoring well screens C and D are installed in one borehole.

DEPTH SCALE

1 : 100

Golder Associates

LOGGED: O.J.S.

CHECKED: P.L.E.

002738

GTA-S-GEO_07-1122-0203-200.GPJ GLOBAL_CAN.GDT 9/19/07

PROJECT: 05-1120-732-303

RECORD OF BOREHOLE: 05-11

SHEET 1 OF 1

LOCATION: See Site Plan

BORING DATE: Aug. 17, 2005

DATUM:

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 (net V. +, Q - ●; rem V. ⊕, U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10⁻⁵ 10⁻⁴ 10⁻³ 10⁻²)	WATER CONTENT PERCENT Wp, W, Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		72.81									
		Stone dust (FILL)		0.00									
				72.04									
		Grey brown silty clay, trace sand and organic matter (FILL)		0.77									Protective steel casing set in bentonite
1	Power Auger 200mm Diam. (Hollow Stem)				1	SS	7						
					2	SS	5						Native Backfill
				70.81									
		Dark grey TOPSOIL		2.00									
		Compact brown fine SAND, trace to some silt		70.65	3	SS	10						Bentonite Seal
													Silica Sand
4					4	SS	12						
		Grey SILTY CLAY		68.91 3.90									30mm Diam. PVC #10 Slot Screen
					5	SS	WH/1						
5		End of Borehole		64.03 4.88									
6													
7													
8													
9													
10													

DEPTH SCALE

1 : 50

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

002739

BOREHOLE 05-1120-732-303.GPJ GLDR_CAN.GDT 2/2/06

PROJECT: 05-1120-732-303

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 05-8

BORING DATE: Aug. 17, 2005

SHEET 1 OF 1

DATUM:

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)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-4} 10^{-5} 10^{-6} 10^{-7})	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		73.16 / 0.00				SHEAR STRENGTH Cu, kPa: net V. + Q - ●; rem V. ⊕ U - ○ (20 40 60 80)	WATER CONTENT PERCENT: Wp W Wl (10 20 30 40)		
		Stone dust (FILL)		72.86 / 0.30							Protective steel casing set in bentonite
1		Asphalt and gravel (FILL)									
		Dark brown and grey brown silty clay and sandy silt, trace organic matter (FILL)		71.84 / 1.32	1	50 DO	7				
2	Power Auger 200mm Diam. (Hollow Stem)	Brown sand with plastic and metal (FILL)		71.00 / 2.07	2	60 DO	27				Native Backfill
		TOPSOIL		69.96 / 3.20	3	50 DO	19				Bentonite Seal
3		Compact brown fine SAND, trace to some silt		3.35							Silica Sand
4					4	50 DO	16				
		Grey SILTY CLAY		68.83 / 4.33							38mm Diam. PVC #10 Slot Screen
5					5	50 DO	1				
		End of Borehole		68.13 / 5.03							
6											
7											
8											
9											
10											

DEPTH SCALE

1:50

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

BOREHOLE 05-1120-732-303.GPJ GLDR_CAN.GDT 2/2/06

002740

PROJECT: 05-1120-732-303

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 05-R3

BORING DATE: Aug. 18, 2005

SHEET 1 OF 1

DATUM:

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^{-4} 10^{-5} 10^{-6} 10^{-7}) / WATER CONTENT PERCENT Wp — W — Wl (10 20 30 40)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
0		GROUND SURFACE		72.93							
		Grey stone dust (FILL)		0.00							Protective steel casing set in bentonite
		Brown sandy silt; some gravel (FILL)		72.50 / 0.43							
		Grey brown silty clay, trace sand, organic matter and gravel (FILL)		72.08 / 0.85	1	SS DO	8				Native Backfill
					2	SS DO	9				
		Grey brown and red brown SILTY CLAY (Weathered Crust)		69.88 / 3.05	3	SS DO	6				Bentonite Seal
					4	SS DO	7				Silica Sand
		Grey SILTY CLAY		68.60 / 4.33	5	SS DO	WH				38mm Diam. PVC #10 Slot Screen
		End of Borehole		67.75 / 5.18							

DEPTH SCALE
1 : 50

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

002741

BOREHOLE 05-1120-732-303.GPJ GLDR_CAN.GDT 2/5/08

PROJECT: 04-1120-143-3000

RECORD OF BOREHOLE: 05-4

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 16, 2005

DATUM: Geodetic

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)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		GROUND SURFACE		85.00				SHEAR STRENGTH Cu, kPa: nat V. + Q - ● rem V. ⊕ U - ○ (20 40 60 80)	WATER CONTENT PERCENT: Wp — W — Wl (20 40 60 80)		
0	Power Auger 200mm Diam. (Hollow Stem)	Brown stratified fine SAND, some silt		0.00							
				84.45							
		Grey brown SILTY CLAY (Weathered Crust)		0.55							
1				83.93	1	50 DO	WH				
		Soft to stiff grey SILTY CLAY		1.07							
					2	50 DO	WH				
2				82.87							
		End of Borehole		2.13							
3	Nilcon Vane										
4											
5											
6											
7											
8											
9											
10											
11											
12											
13											
14											
15		CONTINUED NEXT PAGE									

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

MIS-BHS 001 06-1122-273.GPJ GLDR_CAN.GDT 1/17/07

PROJECT: 04-1120-143-3000

RECORD OF BOREHOLE: 05-4

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 16, 2005

DATUM: Geodetic

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 (20 40 60 80)	SHEAR STRENGTH Cu, kPa (nat V. + Q - ● / rem V. ⊕ U - ○) (20 40 60 80)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-5} 10^{-6} 10^{-4} 10^{-3})	WATER CONTENT PERCENT (Wp — W — Wl) (20 40 60 80)	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
15		*— CONTINUED FROM PREVIOUS PAGE —*											
16	Nilson Vane							+					
17								+					
18								+					
19								+					
20								+					
21								+					
22								+					
23													
24													
25													
26													
27													
28													
29													
30													

DEPTH SCALE
1 : 75

Golder Associates

LOGGED: D.J.S.
CHECKED: P.L.E.

MIS-BHS 001 06-1122-273.GPJ GLDR_CAN.GDT 1/17/07

002743

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-3

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 8, 2005

DATUM: Geodetic

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
		GROUND SURFACE		69.85							
0	Power Auger 200mm Diam. (Hollow Stem)	Grey and grey brown silty clay (FILL)		0.00							
		Firm to stiff grey brown SILTY CLAY (Weathered Crust)		69.39 / 0.46							
		Grey SILTY CLAY, occasional red brown layer, trace organic matter		68.78 / 1.07	1	50 DO	2				Bentonite Seal; Silica Sand; 38mm Diam. PVC #10 Slot Screen D
2					2	50 DO	WH				
					3	50 DO	PH				Bentonite Seal
					4	50 DO	WH				Silica Sand
4					5	50 DO	WH				38mm Diam. PVC #10 Slot Screen C
6					6	50 DO	PH				Native Backfill
8					7	50 DO	PM				Bentonite Seal; Silica Sand
					8	50 DO	PM				38mm Diam. PVC #10 Slot Screen B
10					9	50 DO	PM				Silica Sand
		Grey SILTY CLAY, trace black organic matter		58.27 / 11.58							
12					10	50 DO	PH				
14					11	50 DO	PM				Native Backfill
					12	50 DO	PM				
16					13	50 DO	PM				
18		Grey SILTY CLAY		51.87 / 17.98							
					14	50 DO	PM				
		Grey layered SILTY CLAY and CLAYEY SILT		50.65 / 19.20							Bentonite Seal
20					15		26				
		CONTINUED NEXT PAGE									

DEPTH SCALE

1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-3

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 8, 2005

DATUM: Geodetic

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)	HYDRAULIC CONDUCTIVITY, k, cm/s (10^{-6} 10^{-5} 10^{-4} 10^{-3})	ADDITIONAL LAB. TESTING	PIEZOMETER OR STANDPIPE INSTALLATION
		— CONTINUED FROM PREVIOUS PAGE —						SHEAR STRENGTH Cu, kPa: nat V. + Q- ● rem V. ⊕ U- ○ (20 40 60 80)	WATER CONTENT PERCENT: Wp W Wl (10 20 30 40)		
20	Power Auger 200mm Diam. (Hollow Stem)	Very loose to compact grey to dark grey SANDY SILT, some gravel, trace clay (GLACIAL TILL)		48.78 20.12	15	50 DO	26				Silica Sand
22					16	50 DO	3				38mm Diam. PVC #10 Slot Screen A
		End of Borehole Auger Refusal		47.39 22.46							
24											
26											
28											
30											
32											
34											
36											
38											
40											

DEPTH SCALE
1 : 100

Golder Associates

LOGGED: D.J.S.
CHECKED: P.L.E.

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-2

SHEET 1 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 10, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	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
		GROUND SURFACE		80.08							
0		Brown fine SAND, some silt		0.00							Protective casing set in bentonite Bentonite Seal
				79.50							
		Very stiff to stiff grey brown SILTY CLAY, occasional red brown layer, fine sand and silt seam (Weathered Crust)		0.58	1	50 DO	12				
2					2	50 DO	6				Native Backfill
					3	50 DO	6				Bentonite Seal
					4	50 DO	5				Silica Sand
4					5	50 DO	5				38mm Diam. PVC #10 Slot Screen D
					6	50 DO	2				
				74.84							
		Grey SILTY CLAY, occasional red brown layer, trace black organic matter		5.24	7	50 DO	WH				Bentonite Seal
6					8	50 DO	PH				
											Native Backfill
8					9	50 DO	WH				
											Bentonite Seal
					10	50 DO	PH				Silica Sand
10											38mm Diam. PVC #10 Slot Screen C
					11	50 DO	PM				
12					12	50 DO	PM				
14					13	50 DO	PM				Native Backfill
					14	50 DO	WR				
16					15	50 DO	WR				
											Bentonite Seal
18											Silica Sand
					16	50 DO	PH				
											38mm Diam. PVC #10 Slot Screen B
20					17		WR				

Power Auger 200mm Diam. (Hollow Stem)

CONTINUED NEXT PAGE

DEPTH SCALE
1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

002746

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-2

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 10, 2005

DATUM: Geodetic

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
20	Power Auger 200mm Diam. (Hollow Stem)	--- CONTINUED FROM PREVIOUS PAGE ---									
		Grey SILTY CLAY, occasional red brown layer, trace black organic matter			17	50 DO	WR				
22					18	50 DO	WR				
				57.52							
		Grey SILTY CLAY, slight trace black organic matter		22.58	19	50 DO	WR				Native Backfill
24					20	50 DO	WR				
26					21	50 DO	WR				
				52.60							Bentonite Seal
		Grey layered SILTY CLAY and CLAYEY SILT		27.58	22	50 DO	WR				
28		Compact to dense grey to dark grey SANDY SILT, some gravel and clay with cobbles (GLACIAL TILL)		27.89							Silica Sand
					23	50 DO	41				38mm Diam. PVC #10 Slot Screen A
				50.58							
		Probably weathered SHALE BEDROCK		29.50							
30		End of Borehole Auger Refusal		29.72							
32											
34											
36											
38											
40											

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 3/12/07

DEPTH SCALE
1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

002747

PROJECT: 05-1120-732-110

LOCATION: See Site Plan

SAMPLER HAMMER, 64kg; DROP, 760mm

RECORD OF BOREHOLE: 05-1

BORING DATE: Aug. 2, 2005

SHEET 1 OF 2

DATUM: Geodetic

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		85.53							
		Grey crushed stone (FILL)		0.12							Protective casing
		Compact brown stratified fine SAND, trace silt			1	50 DO	15				Silica Sand
				84.01							38mm Diam. PVC #10 Slot Screen D
2		Grey SILTY CLAY, occasional red brown layer with depth		1.52	2	50 DO	WH				Native Backfill
											Bentonite Seal
					3	50 DO	PM				Silica Sand
4					4	50 DO	PH				38mm Diam. PVC #10 Slot Screen C
6					5	50 DO	PM				Native Backfill
8					6	50 DO	PM				Bentonite Seal
					7	50 DO	PM				Silica Sand
10	Power Auger 200mm Diam. (Hollow Stem)										38mm Diam. PVC #10 Slot Screen B
					8	50 DO	PH				
				73.95							
12		Grey SILTY CLAY, occasional red brown layer, scattered trace black organic matter		11.58	9	50 DO	PM				Native Backfill
14					10	50 DO	PM				
					11	50 DO	PM				
16											Bentonite Seal
					12	50 DO	WR				
18					13	50 DO	PM				Native Backfill
20		CONTINUED NEXT PAGE			14		WR				

DEPTH SCALE
1 : 100

Golder Associates

LOGGED: D.J.S.

CHECKED: P.L.E.

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 10/19/06

002748

PROJECT: 05-1120-732-110

RECORD OF BOREHOLE: 05-1

SHEET 2 OF 2

LOCATION: See Site Plan

BORING DATE: Aug. 2, 2005

DATUM: Geodetic

SAMPLER HAMMER, 64kg; DROP, 760mm

PENETRATION TEST HAMMER, 64kg; DROP, 760mm

DEPTH SCALE METRES	BORING METHOD	DESCRIPTION	STRATA PLOT	ELEV. DEPTH (m)	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
20		— CONTINUED FROM PREVIOUS PAGE —											
	Power Auger 200mm Diam. (Hollow Stem)	Grey SILTY CLAY, occasional red brown layer, scattered trace black organic matter			14	50 DO	WR						
22					15	50 DO	WR						
		Grey SILTY CLAY, occasional red brown layer, trace to some black organic matter		62.97 22.56	16	50 DO	WR						
24					17	50 DO	PM						
26					18	50 DO	WR						Native Backfill
28					19	50 DO	WR						
					20	50 DO	WR						
30					21	50 DO	WR						
32					22	50 DO	WR						
		Layered SILTY CLAY and CLAYEY SILT		52.29 33.24									Bentonite Seal
34					23	50 DO	WR						Silica Sand
		Grey CLAYEY SILT, some gravel		51.53 34.14									
		Compact to dense dark grey SANDY SILT, some gravel and clay (GLACIAL TILL)			24	50 DO	>100						38mm Diam. PVC #10 Slot Screen A
		End of Borehole Auger Refusal		50.33 35.20									
36													
38													
40													

DEPTH SCALE

1 : 100

Golder Associates

LOGGED: D.J.S.

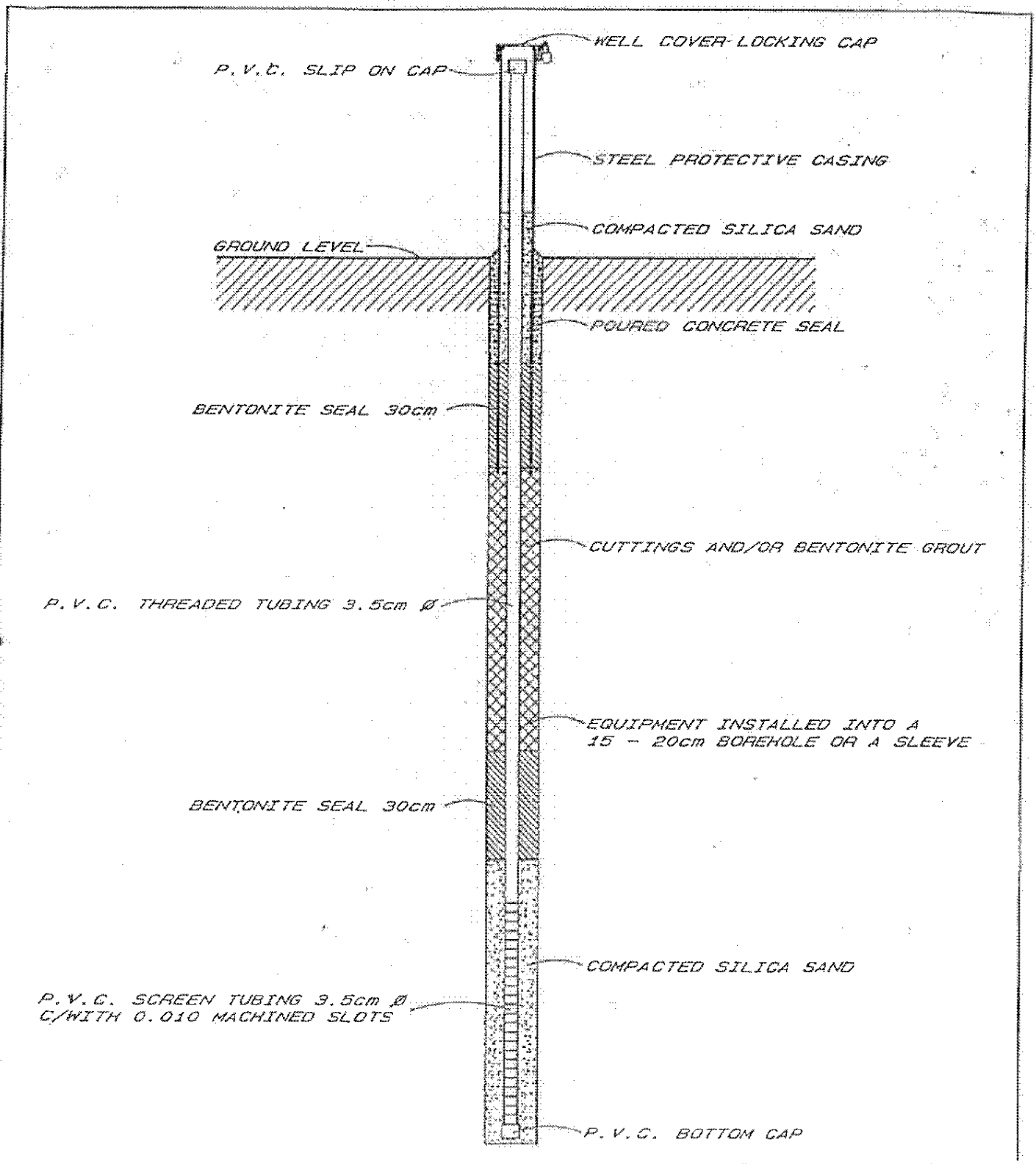
CHECKED: P.L.E.

002749

MIS-BHS 001 05-1120-732-110.GPJ GLDR_CAN.GDT 10/19/06

TYPICAL MONITORING WELL INSTALLATION

INSTALLATION TYPIQUE D'UN PUIT D'OBSERVATION



002750

PROJECT NO. WSI006

BOREHOLE NO. MW-4 (MW-4)

PROJECT HUNEAULT LANDFILL

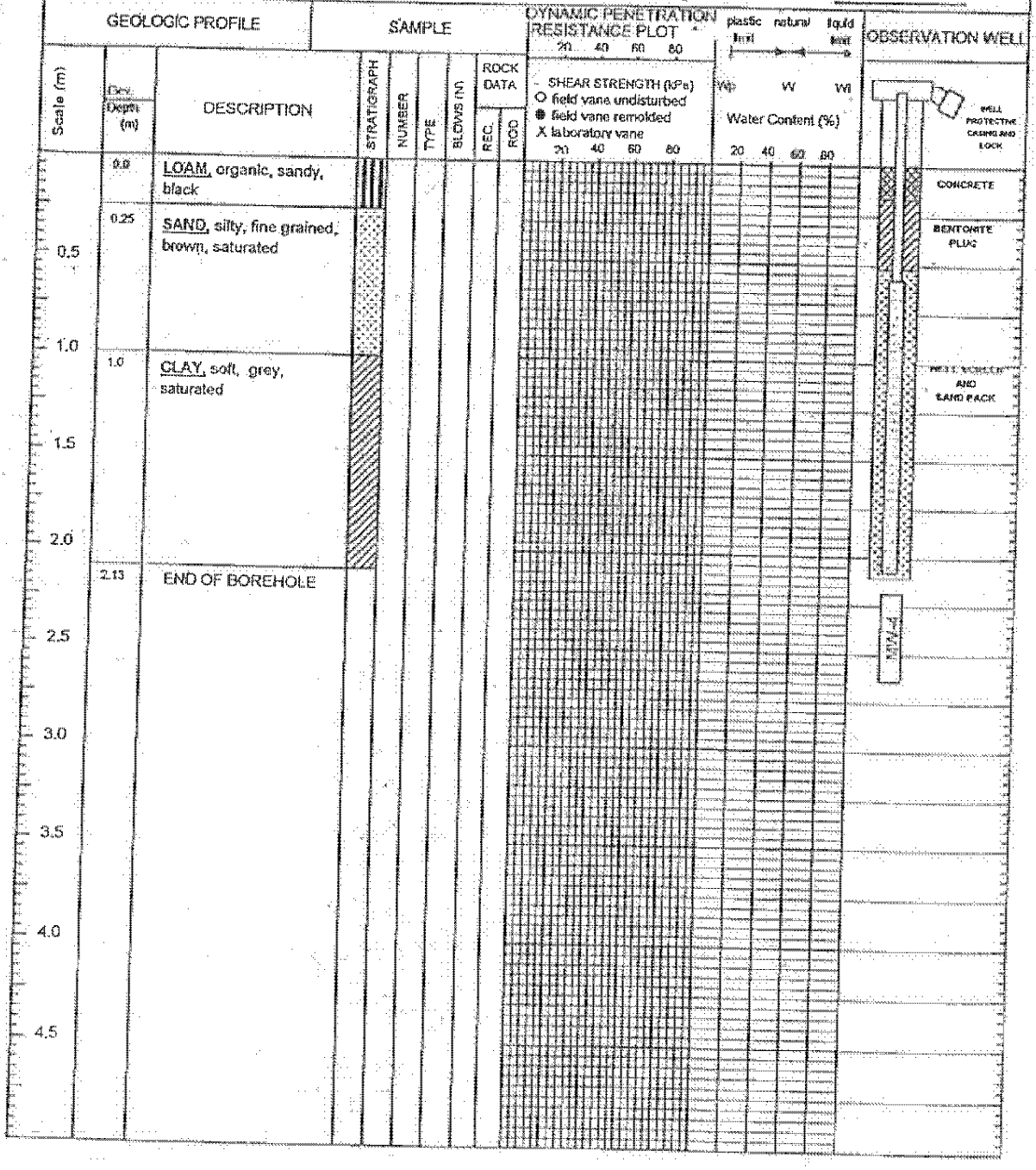
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM Arbitrary BOREHOLE TYPE HAND AUGER

DRILLING DATE 19-May-00

REPORT DATE Sep-00

COMPILED BY N.C.



PROJECT NO. WSI006

BOREHOLE NO. MW-5 (MW-E)

PROJECT HUNEAULT LANDFILL

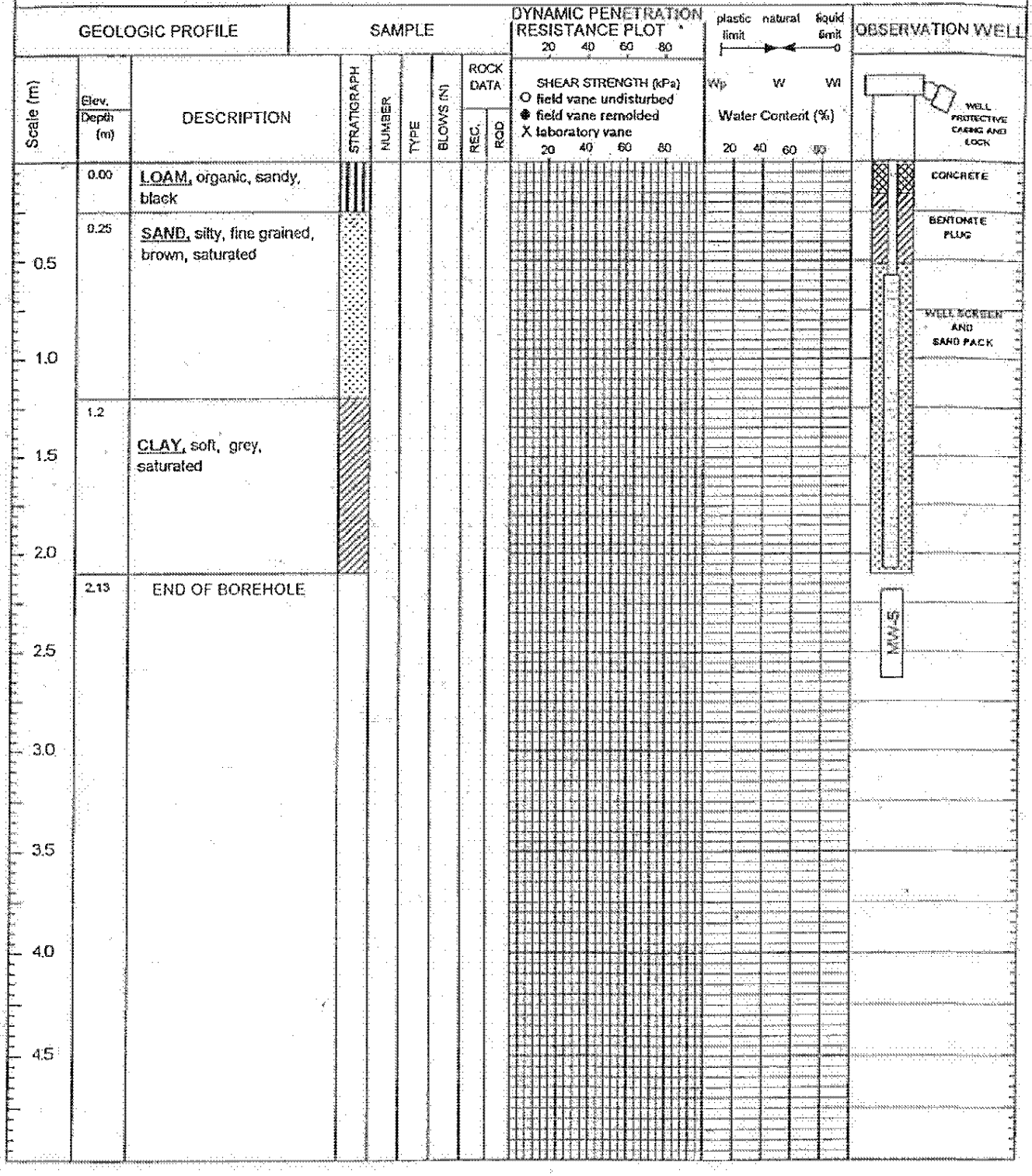
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM Arbitrary BOREHOLE TYPE HAND AUGER

DRILLING DATE 19-May-00

REPORT DATE Sep-00

COMPILED BY N.C.



PROJECT NO. E9701

BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

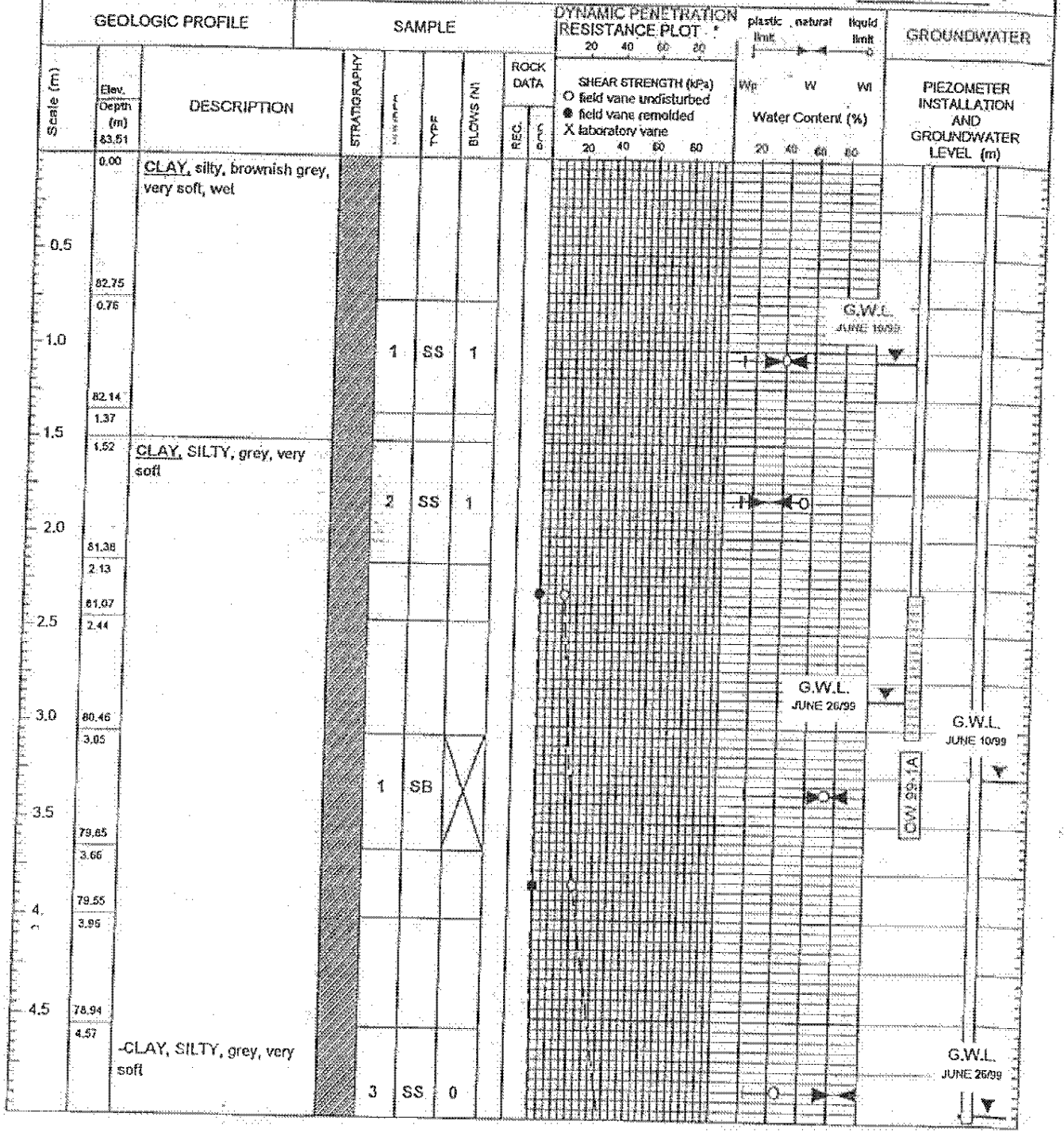
DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Jun-99

REPORT DATE Jan-00

COMPILED BY V.G.

Page1/4



PROJECT NO. E9701 BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL DRILLING DATE Jun-99
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Jan-00
DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS COMPILED BY V.G.

GEOLOGIC PROFILE | SAMPLE | DYNAMIC PENETRATION RESISTANCE PLOT | plastic limit | natural | liquid limit | GROUNDWATER

Scale (m)	Elev. / Depth (m) 78.51	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	TYPE	BLOWS (N)	ROCK DATA REC.	ROCK DATA	SHEAR STRENGTH (kPa) O field vane undisturbed ● field vane remolded X laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	5.00										
	5.18										
	78.02										
5.5	5.49										
	77.41										
6.0	6.10	-CLAY, SILTY, grey, very soft, wet		4	SS	0					
	76.8										
6.5	6.71										
	76.50										
7.0	7.01										
	75.89										
7.5	7.62	-CLAY, SILTY, grey, very soft, wet		5	SS	0					
	75.28										
	6.23										
8.0	74.98										
	8.53										
8.5	74.37										
	9.14										
9.0	73.76			2	SB	X					
	9.75										
9.5											

PROJECT NO. E9701

BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL

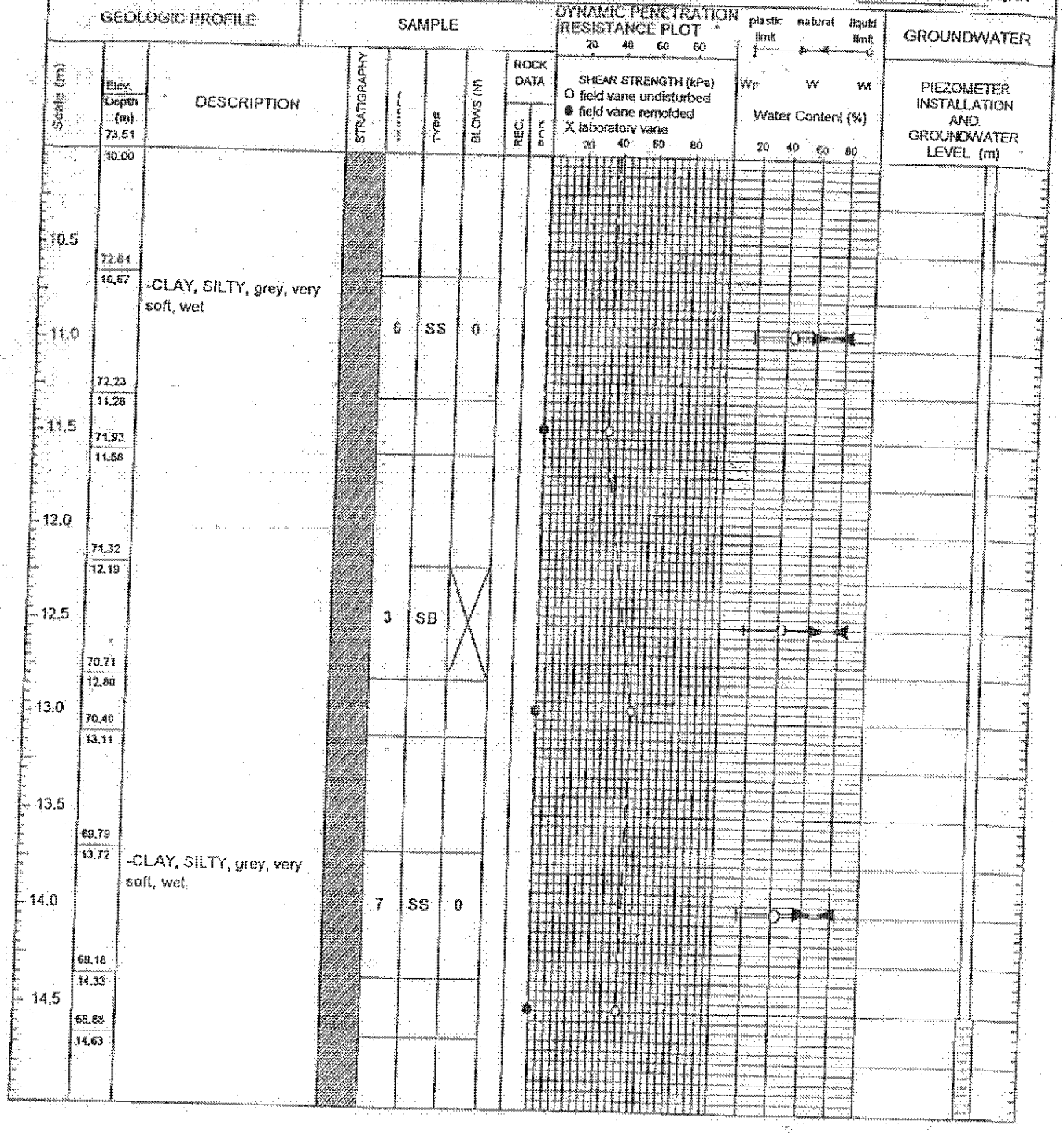
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Jun-99

REPORT DATE Jan-00

COMPILED BY V.G.



PROJECT NO. E9701

BOREHOLE NO. 99-1

PROJECT HUNEAULT LANDFILL

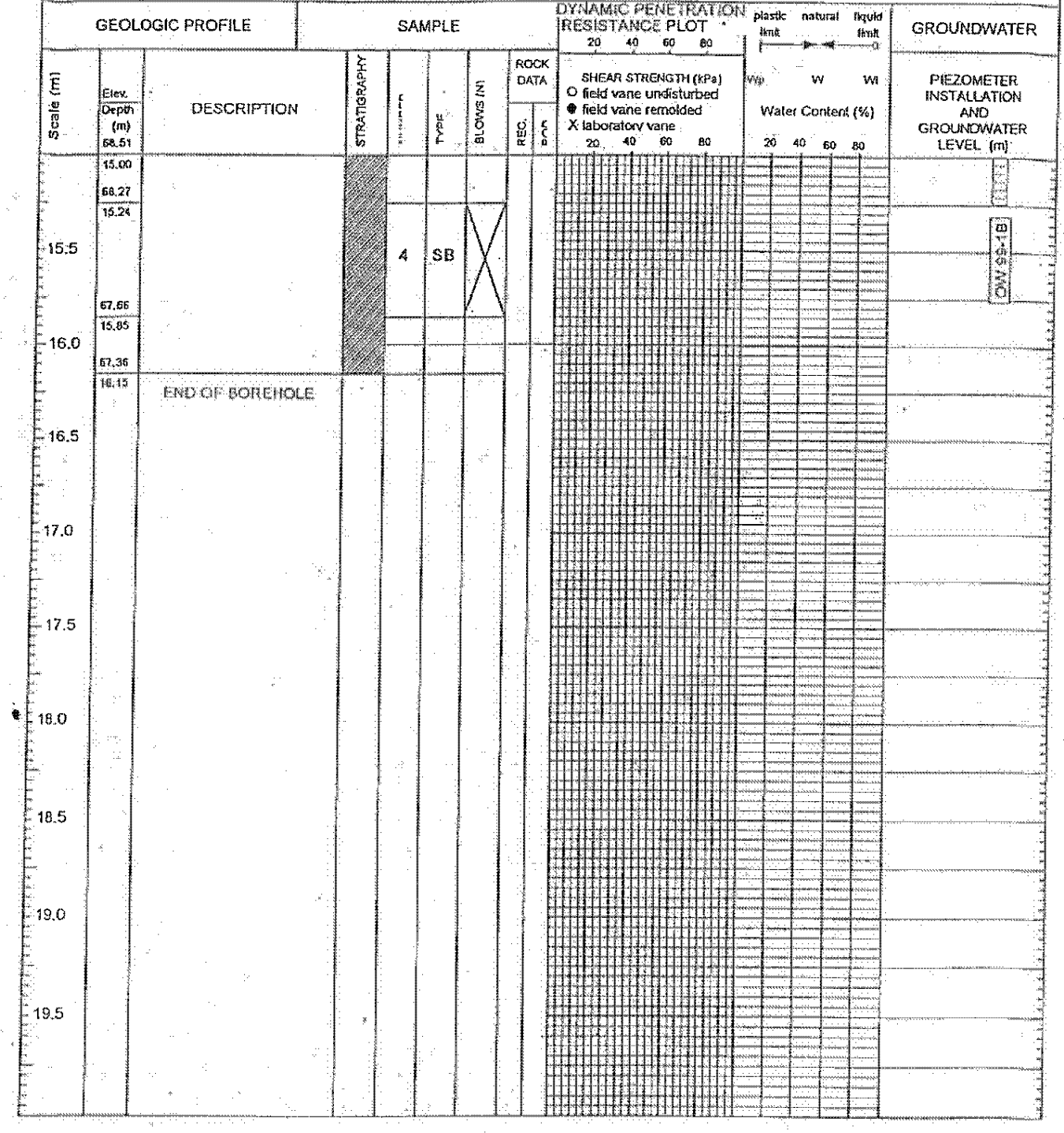
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Jun-99

REPORT DATE Jan-00

COMPILED BY V.G.



PROJECT NO. E8401

BOREHOLE NO. 98-1

PROJECT HUNEAULT LANDFILL

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

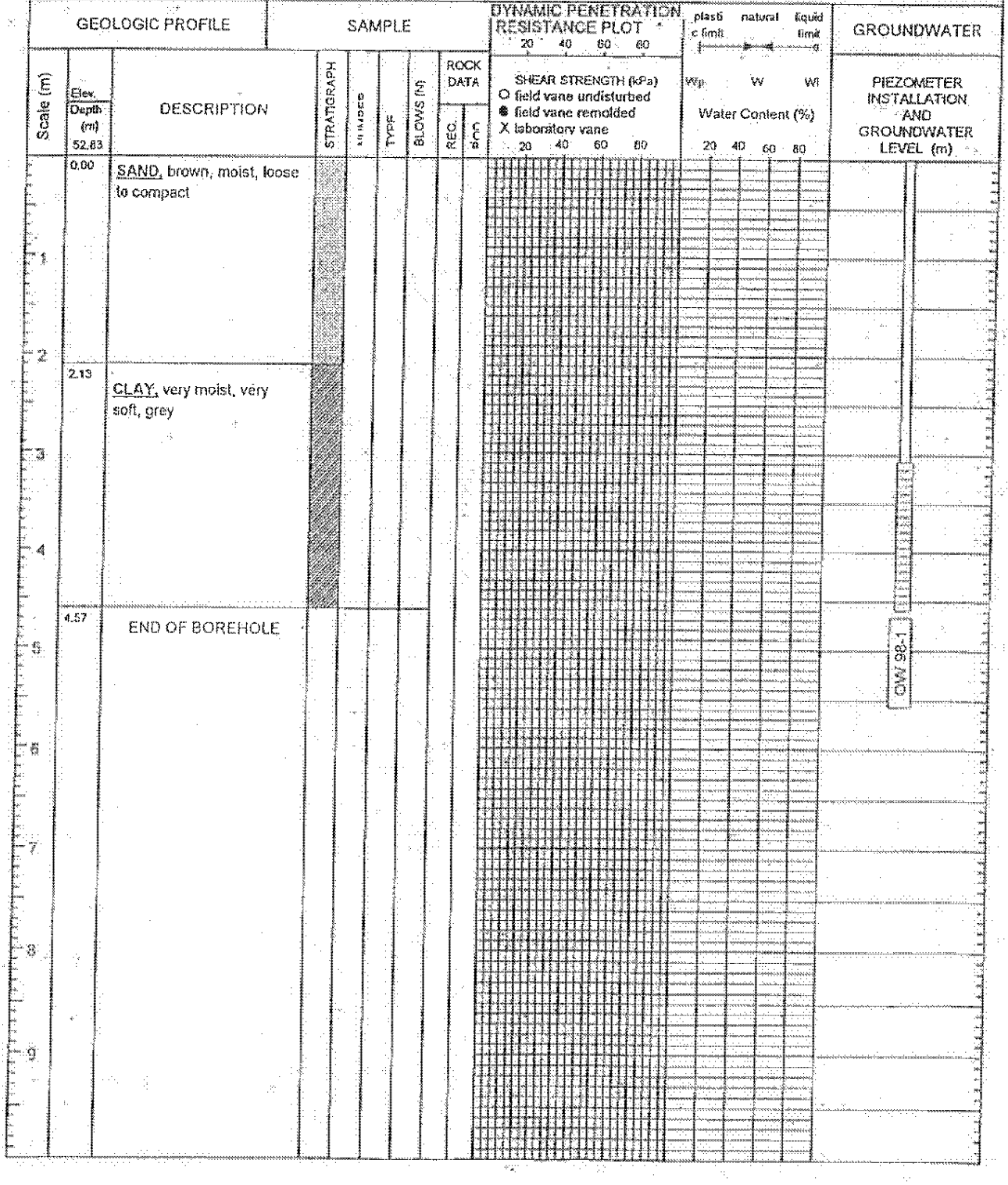
DATUM GEODETIC

BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Oct-98

REPORT DATE Oct-98

COMPILED BY V.G.



PROJECT NO. E8401

BOREHOLE NO. 98-2

PROJECT HUNEAULT LANDFILL

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DRILLING DATE Oct-98

REPORT DATE Oct-98

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - 108MM LOW STEM AUGERS

COMPILED BY V.G.

GEOLOGIC PROFILE			SAMPLE				ROCK DATA		DYNAMIC PENETRATION RESISTANCE PLOT		GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPH	Sequence	TYPE	BLOWS (N)	REC.	RQD	SHEAR STRENGTH (kPa) ○ field vane undisturbed ● field vane remolded X laboratory vane 20 40 60 80	plasti c limit / natural / liquid limit; Wp W Wl; Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
1	0.00	SAND, brown, moist, loose to compact		1	S	1					
	1.37			2	S	0					
2	2.13	CLAY, very moist, very soft, grey		3	S	0					
3	2.90			4	S	0					
	3.66			5	S	0					
4	4.42										
5											
6				6	S	0					
	6.71										
7	7.62			7	S	0					
8	8.23	END OF BOREHOLE									OW 98-2
9											

PROJECT NO. E8401

BOREHOLE NO. 98-3

PROJECT HUNEAULT LANDFILL

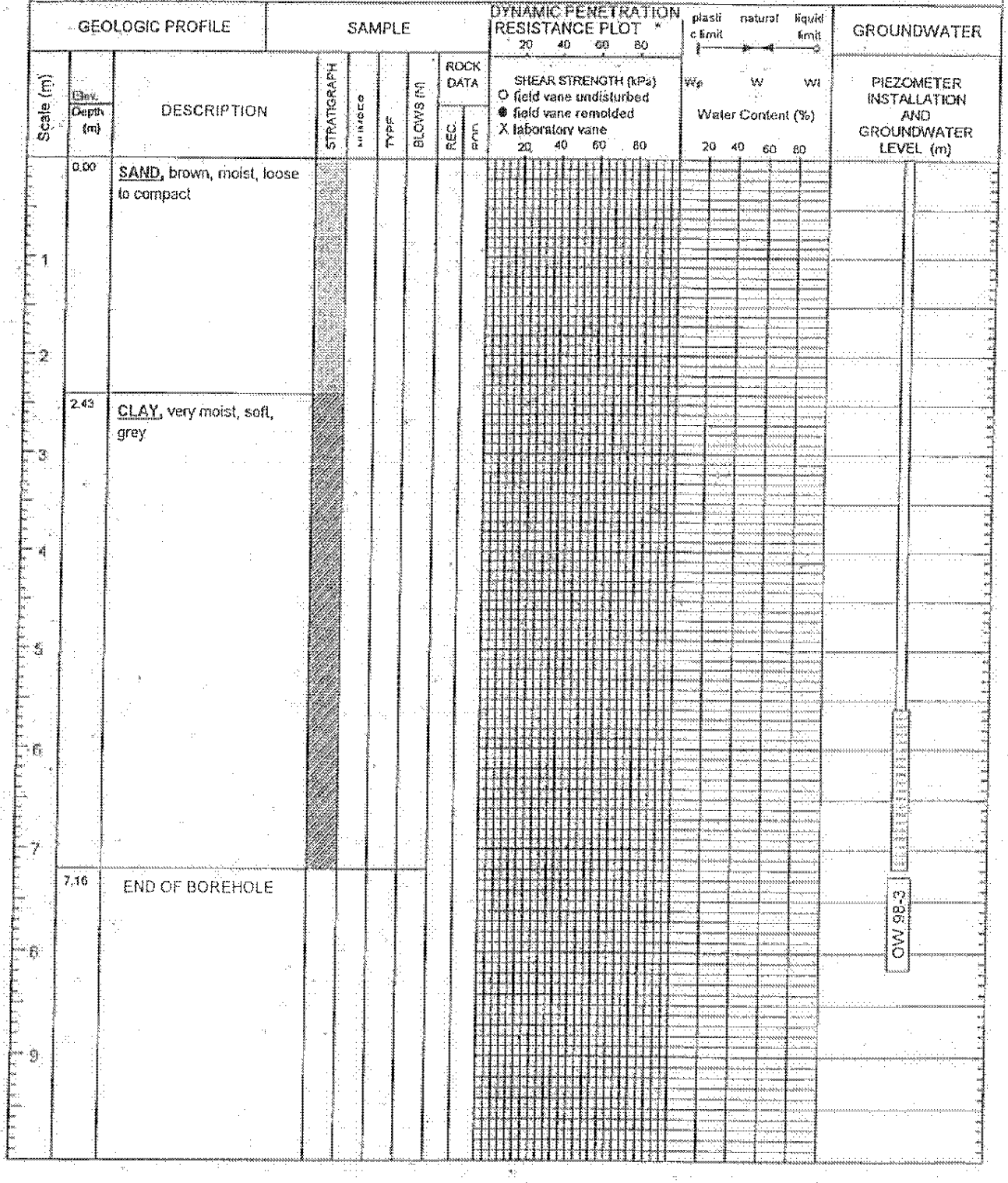
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS

DRILLING DATE Oct-98

REPORT DATE Oct-98

COMPILED BY V.G.



PROJECT NO. E8401 BOREHOLE NO. 98-4

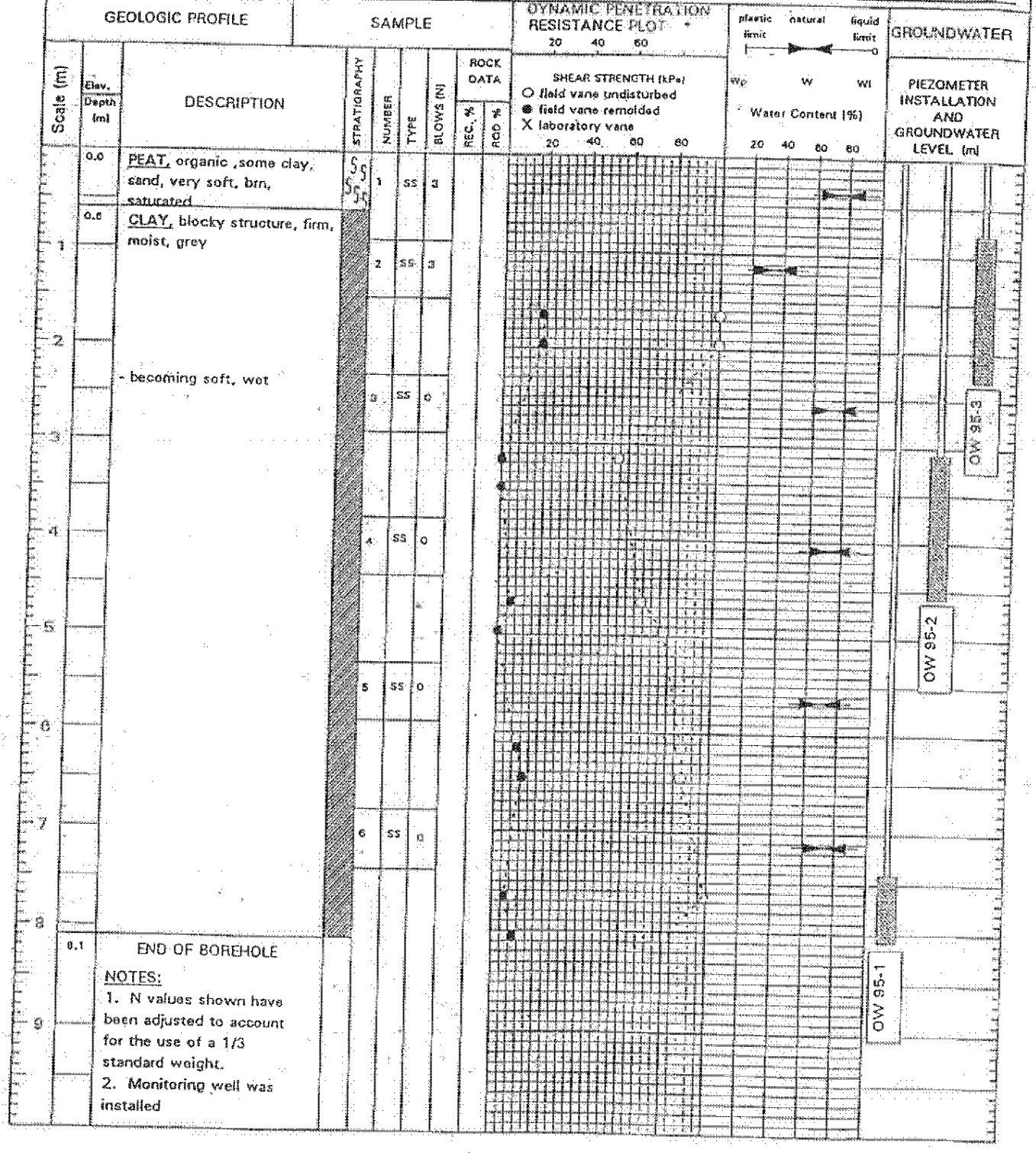
PROJECT HUNEAULT LANDFILL DRILLING DATE Oct-98
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Oct-98
DATUM GEODETIC BOREHOLE TYPE TRUCK MOUNTED - HOLLOW STEM AUGERS COMPILED BY V.G.

GEOLOGIC PROFILE			SAMPLE					DYNAMIC PENETRATION RESISTANCE PLOT		GROUNDWATER
Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPH	NUMBER	TYPE	BLOWS /0.3m	ROCK DATA REC.	SHEAR STRENGTH (kPa) O field vane undisturbed ● field vane remolded X laboratory vane	plasti c limit — natural — liquid limit; Wp W Wl; Water Content (%)	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	0.00	SAND, brown, dry, loose to compact								
	2.13	CLAY, very moist, soft, grey								
	4.57	END OF BOREHOLE								OW 98-4

002760

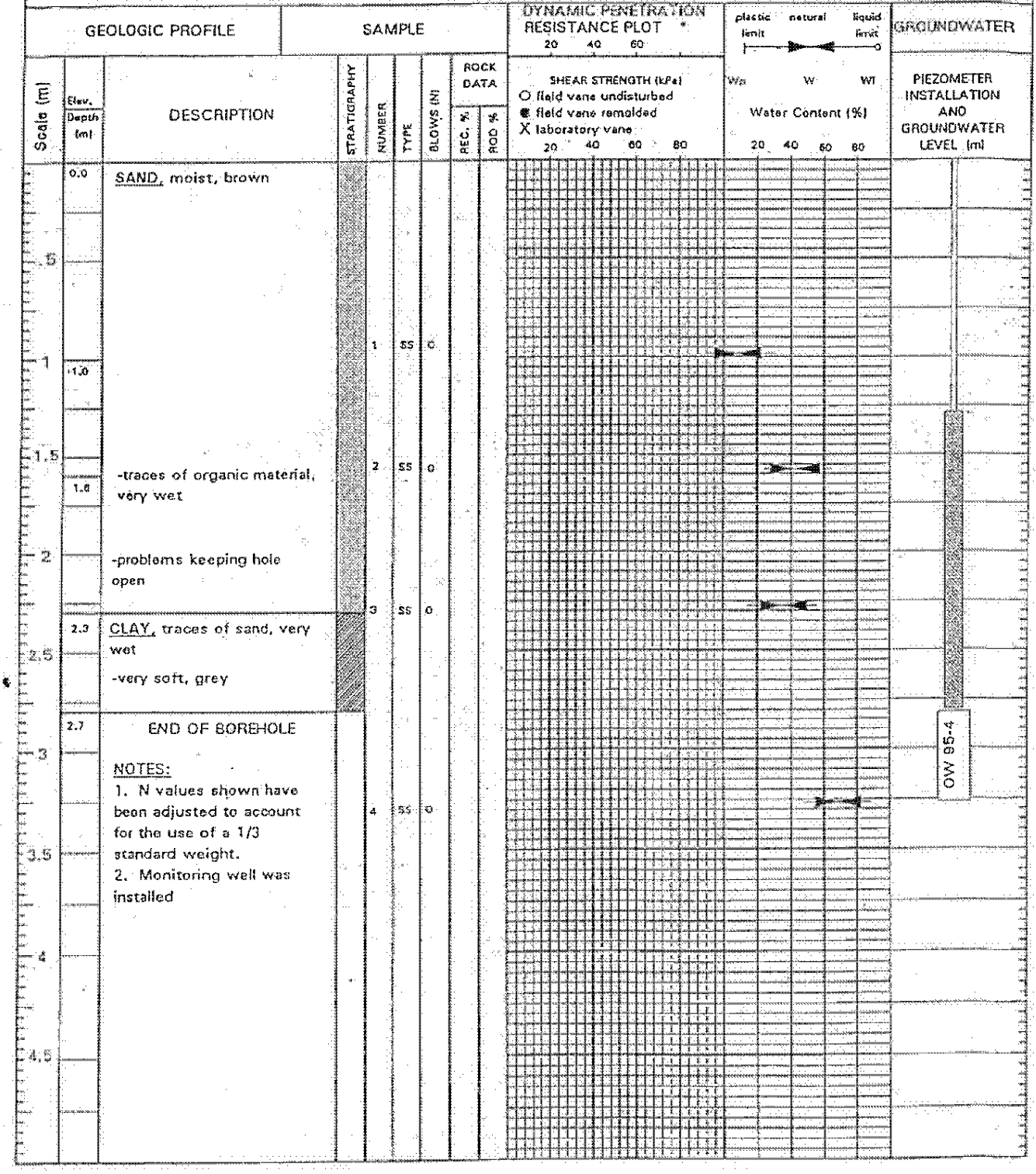
PROJECT NO. E0100 BOREHOLE NO. 95-1

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.



PROJECT NO. E0100 BOREHOLE NO. 95-4

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.



PROJECT NO. E0100 BOREHOLE NO. 95-5

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.

Soils (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	ROCK DATA: REC. %	ROCK DATA: RQD %
	0.0	PEAT, organic, soft, wet, brn		1	SS	0		
	0.3			2	SS	0		
	0.6	SAND, moist, brown						
1		CLAY, moist, brown		3	SS	7		
		-grey, moist						
2				4	SS	5		
3		-soft, moist		5	SS	0		
4								
5		-becoming stiff, grey, traces of brown and black color		6	SS	0		
6				7	SS	0		
		-stiff, grey, traces of brown and black color						
7								
8				8	SS	0		
	8.25	END OF BOREHOLE						

NOTES:
1. N values shown have been adjusted to account for the use of a 1/3 standard weight.
2. Monitoring well was installed

DYNAMIC PENETRATION RESISTANCE PLOT * (20 40 60)

SHEAR STRENGTH (kPa)
○ field vane undisturbed
● field vane remolded
X laboratory vane
20 40 60 80

plastic limit — natural — liquid limit
Wp W Wl
Water Content (%)
20 40 60 80

GROUNDWATER
PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW 95-7
OW 95-8
OW 95-9

002763

PROJECT NO. E0100

BOREHOLE NO. 95-8

PROJECT HUNEAULT WASTE MANAGEMENT

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO

DATU GEODETIC

BOREHOLE TYP PORTABLE DRILLING

DRILLING DATE Jun-95

REPORT DATE Aug-95

COMPILED BY V.G.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	ROCK DATA REC. %	ROCK DATA RQD %
0	0.0	SAND, moist, brown		1	SS	0		
.5				2	SS	0		
1	1.0			3	SS	0		
1.5	1.55	- CLAY, very soft, very moist, grey		4	SS	0		
2								
2.5	2.3			5	SS	0		
3	2.7	END OF BOREHOLE NOTES: 1. N values shown have been adjusted to account for the use of a 1/3 standard weight. 2. Monitoring well was installed						
3.5								
4								
4.5								

DYNAMIC PENETRATION RESISTANCE PLOT * 20 40 60

SHEAR STRENGTH (kPa)
○ field vane undisturbed
● field vane remolded
X laboratory vane
20 40 60 80

plastic limit — natural — liquid limit
Wp W Wl
Water Content (%)
20 40 60 80

GROUNDWATER

PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW 95-8

002764

PROJECT NO. E0100 BOREHOLE NO. 95-9

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jun-95
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Aug-95
DATU GEODETIC BOREHOLE TYP PORTABLE DRILLING COMPILED BY V.G.

Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	ROCK DATA REC. %	ROCK DATA ROD %
	0.0							
2.5								
5								
7.5								
10								
12.5		CLAY, very soft, very moist, grey		1	SS	0		
15				2	SS	0		
17.5								
20				3	SS	5		
22.5		TILL,		4	SS	R		
	22.0	END OF BOREHOLE						

NOTE:
1. N values shown have been adjusted to account for the use of a 1/2 standard weight

DYNAMIC PENETRATION RESISTANCE PLOT 20 40 60

SHEAR STRENGTH (kPa)
○ field vane undisturbed
● field vane remolded
X laboratory vane
20 40 60 80

plastic limit — natural — liquid limit
Wp W Wl
Water Content (%)
20 40 60 80

GROUNDWATER
PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW 95-9

002765

PROJECT NO. E0100 BOREHOLE NO. OW-1A-D

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jul-95

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE

DATU GEODETIC BOREHOLE TYP AUGER TYPE COMPILED BY V.G.

GEOLOGIC PROFILE			SAMPLE					DYNAMIC PENETRATION RESISTANCE PLOT * 20 40 60	plastic limit — natural — liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	ROCK DATA REC. %	ROD %	SHEAR STRENGTH (kPa) ○ field vane undisturbed ● field vane remolded X laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	0.0	PEAT, organic, very soft, brn, moist									
1.5	1.7	SAND, med. grained, brn, very moist									
2		END OF BOREHOLE NOTES: 1. Monitoring well was installed									OW 1A OW 1B OW 1C OW 1D

002766

PROJECT NO. E0100 BOREHOLE NO. OW-2A-D

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE Jul-95

LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE

DATU GEODETIC BOREHOLE TYP AUGER TYPE COMPILED BY V.G.

GEOLOGIC PROFILE			SAMPLE					DYNAMIC PENETRATION RESISTANCE PLOT		GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS/0.3m	ROCK DATA REC. %	ROD %	SHEAR STRENGTH (kPa) ○ field vane undisturbed ● field vane remolded X laboratory vane 20 40 60 80	Water Content (%) plastic limit Wp, natural W, liquid limit Wl 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
0	0.0	PEAT, organic, very soft, brn, moist									
1	1.7	SAND, med. grained, brn, very moist									
2		END OF BOREHOLE NOTES: 1. Monitoring well was installed									OW 2A OW 2B OW 2C OW 2D

002767

CASTONGUAY Technologies Inc.
Environmental and Geotechnical Engineering

PROJECT NO. E0100 BOREHOLE NO. 94-1

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE May 19/94
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Oct-94
DATU GEODETIC BOREHOLE TYP BOA DRILL - HOLLOW STEM COMPILED BY N.G.C.

GEOLOGIC PROFILE | SAMPLE | DYNAMIC PENETRATION RESISTANCE PLOT | GROUNDWATER

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	ROCK DATA REC. %	ROCK DATA RQD %
1	0.0	FILL, mixture: sand, gravel, silt, clay, loose to compact, moist, med. brn						
	0.8	SAND, med. grained, tr. silt, very moist, reddish brn, loose, wet @ 1.1m		1	SS	14		
2	1.5	CLAY, blocky structure, firm, moist, brown to 1.8m becoming grey		2	SS	3		
3		- becoming soft, grey, saturated		3	SS	1		
4				4	SS	1		
5								
6				5	SS	0		
7								
8				6	SS	0		
	8.5	END OF BOREHOLE						
9								

DYNAMIC PENETRATION RESISTANCE PLOT * (20, 40, 60)
SHEAR STRENGTH (kPa)
○ field vane undisturbed
● field vane remolded
X laboratory vane
(20, 40, 60, 80)

plastic limit — natural — liquid limit
Wp W Wl
Water Content (%)
(20, 40, 60, 80)

PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

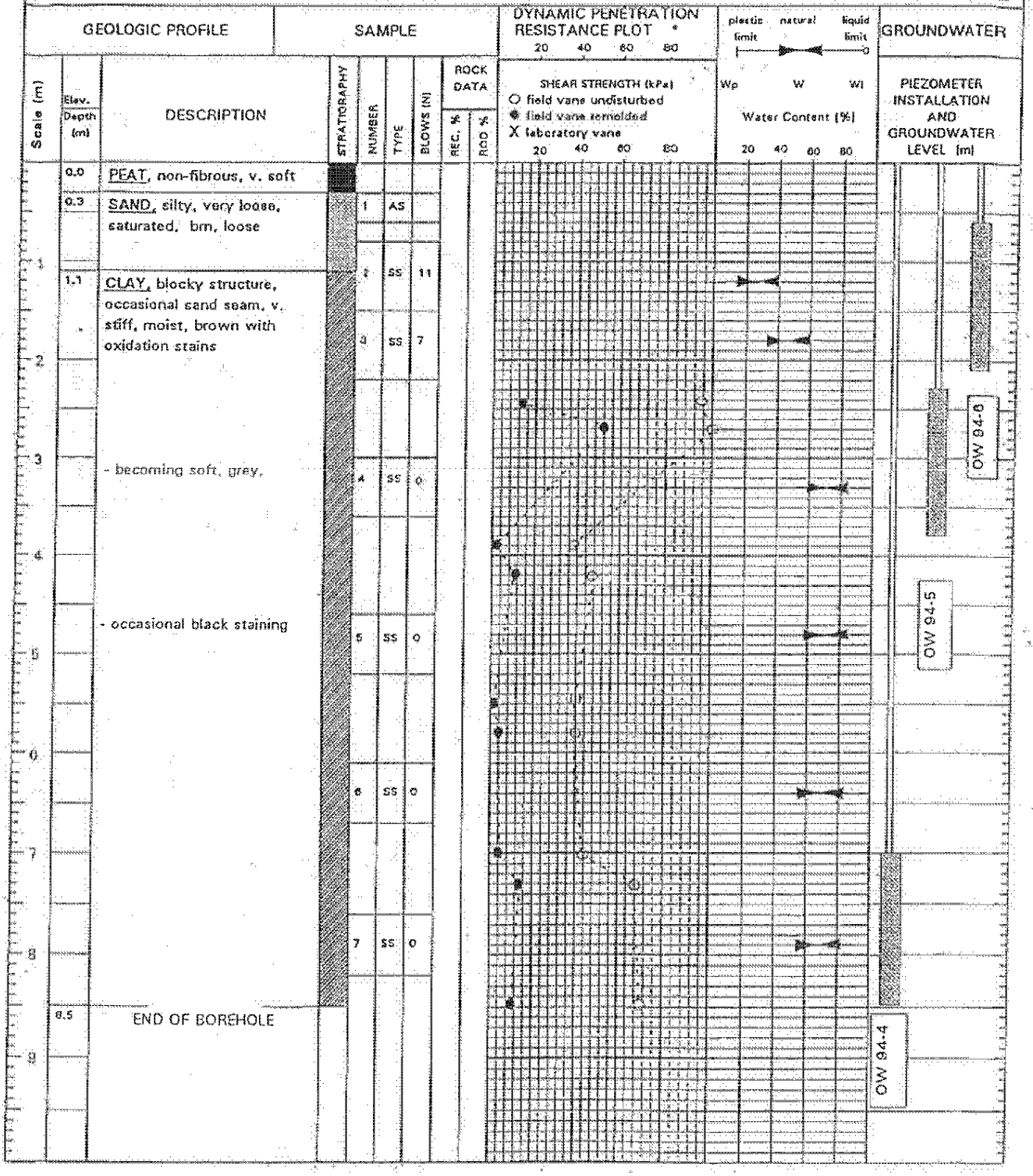
OW 94-3
OW 94-2
OW 94-1

002768

CASTONGUAY Technologies Inc.
Environmental and Geotechnical Engineering

PROJECT NO. E0100 BOREHOLE NO. 94-4

PROJECT HUNEAULT WASTE MANAGEMENT DRILLING DATE May 19/94
LOCATION 3354 NAVAN ROAD, GLOUCESTER, ONTARIO REPORT DATE Oct-94
DATU GEODETIC BOREHOLE TYP BOA DRILL - HOLLOW STEM COMPILED BY N.G.C.



002769

O-8550E

FONDEX

BOREHOLE No. OW-92-01

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-03-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME 55

COMPILED BY B.G.S.

Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	Rock Data REC. %	Rock Data RQD %
	71.10							
	0.00	SILTY CLAY (FILL) : SOFT, BLACK, MOIST, ORGANIC ODOUR, PIECES OF ASPHALT.						
1	69.70							
	1.40	SAND : LOOSE, BROWN CHANGING TO GREY AND MOIST.						
2								
	68.10							
3	3.00	CLAY : SOFT, GREY, MOIST, BLOCKY STRUCTURE.						
4				1	ST			
		- BECOMING LAYERED.						
5								
				2	ST			
6								
7				3	ST			
		- WITH ALTERNATING BROWN LAYERS.						
8		- SEA SHELLS VISIBLE AT A DEPTH OF 8.80m.						
		- ALTERNATING GREY AND BLACK LAYERS.						

Dynamic Cone Penetration Resistance Plot — 20 40 60 80

Shear Strength (kPa)
- ° field vane undisturbed
- × field vane remolded
- • laboratory vane

20 40 60 80

plastic limit — natural — liquid limit

Wp W Wl

Water Content (%)

20 40 60 80

GROUNDWATER

PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW-92-1

002770

O-8550E

FOND DX

BOREHOLE No. OW-92-01

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-03-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME 55

COMPILED BY B.G.S.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	BLOWS (N)	Rock Data REC. %	Rock Data ROD %
	61.10 / 10.00	CLAY : SOFT, WITH ALTERNATING GREY AND BROWN LAYERS.		4	ST			
11								
12								
13								
14		- BECOMING WET.						
15		- BECOMING DARK GREY, VARVED STRUCTURE.						
16								
17								
18								

Dynamic Cone Penetration Resistance Plot ▲ 20 40 60 80

Shear Strength (kPa)
- • field vane undisturbed
- × field vane remolded
- • laboratory vane

20 40 60 80

plastic limit — natural — liquid limit

Wp W Wl

Water Content (%)

20 40 60 80

GROUNDWATER

PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)

OW-92-1

002771

O-8550E

FONDEX

BOREHOLE No. OW-92-01

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-03-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME 55

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot ▲ 20 40 60 80	plastic limit — natural — liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data ROD %	Shear Strength (kPa) ° field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	51.10 20.00	CLAY : DARK GREY, WET, VARVED STRUCTURE.									OW-92-1
21	49.90 21.20	- BECOMING VERY SOFT, TRACE OF SILT AND GRAVEL AT A DEPTH OF 21.80m.									
22											
23		- BECOMING TILL-LIKE ACCORDING TO SOUND AND DIFFICULTY OF DRILLING.									
24	47.15 23.95	SAND AND GRAVEL TILL : ACCORDING TO SOUND AND DIFFICULTY OF DRILLING.									
25	45.80 25.30	PRACTICAL AUGER REFUSAL END OF BOREHOLE									

NOTE :
THE SOIL PROFILE PRESENTED IS REPRESENTATIVE OF THE PIEZOMETER NEST. CONTINUOUS SAMPLING WAS CARRIED OUT AT OW-92-01 TO A DEPTH OF APPROXIMATELY 21.0m. SHELBY TUBE SAMPLES WERE OBTAINED AT VARIOUS ELEVATIONS AT OTHER BOREHOLES WITHIN THE PIEZOMETER NEST.

O-8550E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

Scale (m)	Elev. / Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS (N)	Rock Data REC. %	Rock Data ROD %	Dynamic Cone Penetration Resistance Plot 20 40 60 80 / Shear Strength (kPa) ○ field vane undisturbed × field vane remolded • laboratory vane 20 40 60 80	plastic limit / natural / liquid limit — Wp W Wl — Water Content (%) 20 40 60 80	GROUNDWATER PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	76.03										
	10.00	CLAY : TRACE OF SILT, SOFT, GREY, WET.		4	ST						OW-92-12
	75.03										
11	1.00	SILTY CLAY : SOFT, GREY, WET.									
12											
13											
14											
15											
16											
17											
18		- BECOMING SATURATED, ORGANIC ODOUR DETECTED.									

002773

O-B550E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot ▲ 20 40 60 80	plastic limit / natural / liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data RQD %	Shear Strength (kPa) • field vane undisturbed × field vane remolded ▪ laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	0.00	200mm OF GRAVEL OVER SAND : FINE GRAINED, LOOSE, BROWN, WET.									OW-92-12
		- BECOMING GREY.		1	ST						
	1.43										
	4.60	CLAY : TRACE OF SILT, SOFT, GREY, WET.		2	ST						
				3	ST						

002774

O-B530E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

GEOLOGIC PROFILE			SAMPLE						Dynamic Cone Penetration Resistance Plot ▲ 20 40 60 80	plastic limit — natural — liquid limit	GROUNDWATER
Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	NUMBER	TYPE	BLOWS (N)	Rock Data REC. %	Rock Data ROD %	Shear Strength (kPa) • field vane undisturbed × field vane remolded ◦ laboratory vane 20 40 60 80	Wp W Wl Water Content (%) 20 40 60 80	PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	28.03										
	20.00	SILTY CLAY : SOFT, GREY, SATURATED.									OW 92-12
21											
22											
23											
24		- ASSUMED SILTY CLAY BASED ON SOUND AND EASE OF DRILLING									
25											
26											
27											
28											
9											

002775

O-B550E

FONDEX

BOREHOLE No. OW-92-12

PROJECT PERIMETER DRAINAGE SYSTEM

DRILLING DATE 01-04-92

LOCATION HUNEAULT LANDFILL, GLOUCESTER, ONTARIO

REPORT DATE APRIL 92

DATUM GEODETIC

BOREHOLE TYPE CME

COMPILED BY B.G.S.

Scale (m)	Elev. Depth (m)	DESCRIPTION	STRATIGRAPHY	SAMPLE NUMBER	SAMPLE TYPE	SAMPLE BLOWS (N)	Rock Data REC. %	Rock Data RQD %	Dynamic Cone Penetration Resistance Plot (20 40 60 80) / Shear Strength (kPa): field vane undisturbed, field vane remolded, laboratory vane (20 40 60 80)	plastic limit / natural / liquid limit; Wp W Wl; Water Content (%) (20 40 60 80)	GROUNDWATER: PIEZOMETER INSTALLATION AND GROUNDWATER LEVEL (m)
	36.03										
	30.00	SILTY CLAY : (ASSUMED)									OW-92-12
31											
32											
33	52.53										
	33.50	SAND AND GRAVEL TILL :									
34		- ENCOUNTERED COBBLES AND BOULDERS.									
35											
36											
37	48.83										
	37.20	PRACTICAL TRICONE REFUSAL									
		END OF BOREHOLE									

NOTE :
THE SOIL PROFILE PRESENTED IS REPRESENTATIVE OF THE PIEZOMETER NEST. CONTINUOUS SAMPLING WAS CARRIED OUT AT OW-92-12 TO A DEPTH OF APPROXIMATELY 22,0m. SHELBY TUBE SAMPLES WERE OBTAINED AT VARIOUS ELEVATIONS AT OTHER BOREHOLES WITHIN THE PIEZOMETER NEST.

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OW2-5

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 15, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
							lockable steel protective casing.
TOPSOIL fine to medium grained, dark brown, wet, come organic material (FILL).							stick-up 0.90m.
							bentonite grout.
			1		5		50mm Ø sch 40 threaded PVC riser pipe.
SAND fine to medium grained, reddish brown, wet, compact, some red and black staining.			2				
			3		10		bentonite seal.
CLAY grey, wet, cohesive, plastic, laminated compact, weathered							silica sand filter pack.
CLAY grey, wet, very cohesive, plastic, soft, laminated. Frequent black vertical staining (0.5cm thick) from 5m to depth. Red banding (1cm thick) 10-15cm apart from 3.6m to depth.			4		15		50mm Ø continuously wound PVC #8 slot well screen.
			5				
END OF HOLE 5.26m bgl.			6		20		end cap.
			7				
					25		
			8				
			9				

002777

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OW2-8

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED Noverber 15, 1989

DESCRIPTION	DEPTH metres / feet	SAMPLE no. / type / "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
				lockable steel protective casing. stick-up 0.91m
TOPSOIL fine to medium grained sand, dark brown, wet, some organic material (FILL).	1 / 5			50mm Ø sch 40 threaded PVC riser pipe.
SAND fine to medium grained, reddish brown, wet, compact, some red and black staining.	2			
CLAY grey, wet, cohesive plastic, laminated, compact, weathered.	3 / 10			bentonite grout.
CLAY grey, wet, very cohesive, plastic, soft, laminated. Frequent black vertical staining (0.5cm thick) from 5m to depth. Red banding (1cm thick) 10-15cm apart from 3.6m to depth.	4 / 15			
	5			bentonite seal.
	6 / 20			silica sand filter pack.
	7			50mm Ø continuously wound PVC #8 slot well screen.
	25			
END OF HOLE 7.92m bgl.	8			end cap.
	9 / 30			

WL-040181

002778

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OW3-5

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 16, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
							lockable steel protective casing.
							stick-up 1.08m
TOPSOIL fine to medium sand with some very fine gravel, brown to dark brown with some organic material wet, compact, becoming black (FILL).	1	5					50mmØ sch 40 threaded PVC riser pipe.
SAND fine to medium grained, orangish brown becoming dark brown, saturated, loose	2						bentonite grout.
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, weathered.	3	10					bentonite seal.
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, some black vertical staining (1cm thick) from 3.5m. Red banding (1-2cm thick) from 5.0m.	4	15					silica sand filter pack.
	5						50mm Ø continuously wound PVC #8 slot well screen.
END OF HOLE 5.15m bgl.	6	20					end cap.
	7						
	8	25					
	9						

WL-040181

002779

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OW3-8

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 16, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
						lockable steel protective casing, stick-up 0.75m	
TOPSOIL fine to medium sand with some very fine gravel, brown to dark brown with some organic material, wet, compact, becoming black (FILL).							
SAND fine to medium grained, orangish brown becoming dark brown, saturated, loose.	1	5				50mm Ø sch 40 threaded PVC riser pipe.	
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, weathered.	2						
	3	10				bentonite grout.	
CLAY grey, moist, very cohesive, plastic, soft (moldable), laminated, some black vertical staining (1cm thick) from 3.5m. Red banding (1-2cm thick) from 5.0m.	4	15					
	5					bentonite seal.	
	6	20				silica sand filter pack.	
	7					50mm Ø continuously wound PVC #8 slot well screen.	
		25					
END OF HOLE 7.92m bgl.	8					end cap.	
	9						

002780

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OW4-5

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 17, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
							lockable steel protective casing.
TOPSOIL fine to medium grained sand, brown, moist, loose (FILL).							50mmØ sch40 threaded PVC riser pipe.
SAND fine to medium grained, orangish to greenish brown, wet, loose.		5					bentonite grout.
CLAY grey, moist, compact, cohesive, plastic, laminated, weathered.		2					bentonite seal.
		3			10		
		4					50mmØ continuously wound PVC #8 slot well screen.
CLAY grey, moist, very cohesive, soft (moldable) Black vertical staining (1cm thick) every 4 to 5cm from 5m. Red banding (1cm thick) every 4 to 5cm from 5m.		15					
		5					silica sand filter pack.
END OF HOLE 5.27m bgl.		6			20		end cap.
		7					
		25					
		8					
		9					

002781

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OW4-8

CLIENT HUNEAULT LANDFILL FILE NO. 245-891

PROJECT GROUNDWATER MONITORING LOCATION GLOUCESTER, ONTARIO

GEOLOGIST/ENGINEER KEW DATE COMPLETED November 17, 1989

DESCRIPTION	DEPTH metres	DEPTH feet	SAMPLE no.	SAMPLE type	SAMPLE "N"	WELL DETAIL	REMARKS BLOWS PER FOOT 10 20 30 40 50 60 70 80 90
							lockable steel protective casing. stick-up 0.82m.
TOPSOIL fine to medium grained sand, brown, moist, loose (FILL).			1		5		
SAND fine to medium grained, orangish to greenish brown, wet, loose.			2				50mm Ø sch 40 threaded PVC riser pipe.
CLAY grey, moist, compact, cohesive, plastic, laminated, weathered.			3		10		bentointe grout.
			4				
CLAY grey, moist, very cohesive, soft, (moldable) Black vertical staining (1cm thick) every 4 to 5 cm from 5m. Red banding (1cm thick) every 4 to 5cm from 5m.					15		bentonite seal.
			5				
			6		20		silica sand filter pack.
			7				50mm Ø continuously wound PVC #8 slot well screen.
					25		
END OF HOLE 7.92m bgl.			8				end cap.
			9		30		

002782

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-21-00015
Project: 20412275
Custody:

Report Date: 10-Mar-2022
Order Date: 25-Aug-2021

Revised Report

Order #: 2135394

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2135394-01	L-5

Approved By:



Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 10-Mar-2022

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	26-Aug-21	26-Aug-21
Ammonia, as N	EPA 351.2 - Auto Colour	26-Aug-21	27-Aug-21
Anions	EPA 300.1 - IC	26-Aug-21	27-Aug-21
Biochemical Oxygen Demand	SM 5210B - DO Probe	26-Aug-21	26-Aug-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	26-Aug-21	26-Aug-21
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	26-Aug-21	26-Aug-21
Hardness	Hardness as CaCO3	26-Aug-21	26-Aug-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	26-Aug-21	26-Aug-21
Phenolics	EPA 420.2 - Auto Colour, 4AAP	2-Sep-21	2-Sep-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	26-Aug-21	30-Aug-21
Total Dissolved Carbon	MOE 3247B - Combustion IR	26-Aug-21	26-Aug-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	25-Aug-21	26-Aug-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	26-Aug-21	31-Aug-21
Total Suspended Solids	SM 2540D - Gravimetric	25-Aug-21	26-Aug-21
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	27-Aug-21	27-Aug-21

Certificate of Analysis

Report Date: 10-Mar-2022

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	L-5	-	-	-
	Sample Date:	24-Aug-21 15:05	-	-	-
	Sample ID:	2135394-01	-	-	-
	MDL/Units	Water	-	-	-
General Inorganics					
Alkalinity, total	5 mg/L	1980	-	-	-
Ammonia as N	0.01 mg/L	91.6 [3]	-	-	-
BOD	2 mg/L	<60 [1]	-	-	-
Chemical Oxygen Demand	10 mg/L	392	-	-	-
Dissolved Inorganic Carbon	5.00 mg/L	468	-	-	-
Dissolved Organic Carbon	0.5 mg/L	103	-	-	-
Total Dissolved Carbon	0.5 mg/L	570	-	-	-
Hardness	mg/L	1110	-	-	-
Phenolics	0.001 mg/L	<0.010 [2]	-	-	-
Phosphorus, total	0.01 mg/L	0.23	-	-	-
Total Dissolved Solids	10 mg/L	2880	-	-	-
Total Suspended Solids	2 mg/L	75	-	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	86.7	-	-	-
Anions					
Chloride	1 mg/L	542	-	-	-
Nitrate as N	0.1 mg/L	<0.5 [2]	-	-	-
Nitrite as N	0.05 mg/L	<0.05	-	-	-
Sulphate	1 mg/L	28	-	-	-
Metals					
Arsenic	1 ug/L	2	-	-	-
Boron	10 ug/L	16400	-	-	-
Cadmium	0.1 ug/L	<0.1	-	-	-
Calcium	100 ug/L	161000	-	-	-
Chromium	1 ug/L	12	-	-	-
Cobalt	0.5 ug/L	4.8	-	-	-
Copper	0.5 ug/L	<0.5	-	-	-
Iron	100 ug/L	3820	-	-	-
Lead	0.1 ug/L	<0.1	-	-	-
Magnesium	200 ug/L	172000	-	-	-
Manganese	5 ug/L	278	-	-	-
Potassium	100 ug/L	115000	-	-	-
Sodium	200 ug/L	645000	-	-	-
Zinc	5 ug/L	<5	-	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Report Date: 10-Mar-2022

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	L-5	-	-	-
	Sample Date:	24-Aug-21 15:05	-	-	-
	Sample ID:	2135394-01	-	-	-
	MDL/Units	Water	-	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	-	-	-
Ethylbenzene	0.5 ug/L	<0.5	-	-	-
Methylene Chloride	5.0 ug/L	<5.0	-	-	-
Toluene	0.5 ug/L	<0.5	-	-	-
Vinyl chloride	0.5 ug/L	<0.5	-	-	-
m,p-Xylenes	0.5 ug/L	<0.5	-	-	-
o-Xylene	0.5 ug/L	<0.5	-	-	-

Certificate of Analysis

Report Date: 10-Mar-2022

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						

Certificate of Analysis

Report Date: 10-Mar-2022

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	400	5	mg/L	393			1.8	10	
Nitrate as N	ND	0.1	mg/L	ND			NC	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	ND	1	mg/L	ND			NC	10	
General Inorganics									
Alkalinity, total	854	5	mg/L	867			1.5	14	
Ammonia as N	ND	0.01	mg/L	ND			NC	18	
BOD	ND	150	mg/L	ND			NC	20	BOD01
Chemical Oxygen Demand	37	10	mg/L	37			0.0	12	
Dissolved Organic Carbon	2.6	0.5	mg/L	3.1			17.0	37	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	0.117	0.01	mg/L	0.115			1.8	15	
Total Dissolved Solids	702	10	mg/L	746			6.1	10	
Total Suspended Solids	13.0	2	mg/L	12.0			8.0	10	
Total Kjeldahl Nitrogen	0.49	0.1	mg/L	0.48			3.2	16	
Metals									
Arsenic	ND	1	ug/L	ND			NC	20	
Boron	ND	10	ug/L	ND			NC	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	ND	0.5	ug/L	ND			NC	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	ND	200	ug/L	ND			NC	20	
Manganese	ND	5	ug/L	ND			NC	20	
Potassium	ND	100	ug/L	ND			NC	20	
Sodium	ND	200	ug/L	ND			NC	20	
Zinc	ND	5	ug/L	ND			NC	20	
Volatiles									
Benzene	ND	0.5	ug/L				NC	30	
1,1-Dichloroethane	ND	0.5	ug/L				NC	30	
Ethylbenzene	ND	0.5	ug/L				NC	30	
Methylene Chloride	ND	5.0	ug/L				NC	30	
Toluene	ND	0.5	ug/L				NC	30	
Vinyl chloride	ND	0.5	ug/L				NC	30	
m,p-Xylenes	ND	0.5	ug/L				NC	30	
o-Xylene	ND	0.5	ug/L				NC	30	

Certificate of Analysis

Report Date: 10-Mar-2022

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	8.58	1	mg/L	ND	85.8	85-115			
Nitrate as N	1.04	0.1	mg/L	ND	104	79-120			
Nitrite as N	1.02	0.05	mg/L	ND	102	84-117			
Sulphate	8.74	1	mg/L	ND	87.4	74-126			
General Inorganics									
Ammonia as N	0.260	0.01	mg/L	ND	104	81-124			
BOD	222	2	mg/L	ND	111	71-121			
Chemical Oxygen Demand	243	10	mg/L	37	103	85-111			
Dissolved Organic Carbon	13.8	0.5	mg/L	3.1	107	60-133			
Phenolics	0.022	0.001	mg/L	ND	89.3	69-132			
Phosphorus, total	0.629	0.01	mg/L	0.115	103	80-120			
Total Dissolved Solids	102	10	mg/L	ND	102	75-125			
Total Suspended Solids	20.0	2	mg/L	ND	100	75-125			
Total Kjeldahl Nitrogen	2.56	0.1	mg/L	0.48	104	81-126			
Metals									
Arsenic	53.3	1	ug/L	ND	107	80-120			
Boron	48	10	ug/L	ND	95.8	80-120			
Cadmium	51.0	0.1	ug/L	ND	102	80-120			
Chromium	52.9	1	ug/L	ND	105	80-120			
Cobalt	51.5	0.5	ug/L	ND	103	80-120			
Copper	51.1	0.5	ug/L	ND	102	80-120			
Iron	2430	100	ug/L	ND	97.0	80-120			
Lead	52.0	0.1	ug/L	ND	104	80-120			
Magnesium	9620	200	ug/L	ND	96.1	80-120			
Manganese	51.5	5	ug/L	ND	103	80-120			
Potassium	9800	100	ug/L	ND	97.9	80-120			
Sodium	9730	200	ug/L	ND	97.2	80-120			
Zinc	54	5	ug/L	ND	106	80-120			
Volatiles									
Benzene	31.6	0.5	ug/L	ND	79.1	60-130			
1,1-Dichloroethane	33.5	0.5	ug/L	ND	83.6	60-130			
Ethylbenzene	29.4	0.5	ug/L	ND	73.6	60-130			
Methylene Chloride	28.9	5.0	ug/L	ND	72.3	60-130			
Toluene	32.7	0.5	ug/L	ND	81.8	60-130			
Vinyl chloride	31.0	0.5	ug/L	ND	77.6	50-140			
m,p-Xylenes	61.5	0.5	ug/L	ND	76.9	60-130			
o-Xylene	30.3	0.5	ug/L	ND	75.8	60-130			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-21-00015

Report Date: 10-Mar-2022
Order Date: 25-Aug-2021
Project Description: 20412275

Qualifier Notes:

Login Qualifiers :

Container and COC sample IDs don't match - 1 Voc vial reads: "QC"
Applies to samples: L-5

Samples received submerged in water, possibly melted ice. This condition can compromise sample integrity.
Applies to samples: L-5

Sample Qualifiers :

1 : Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

2 : Elevated Reporting Limit due to matrix interference.

3 : Note that Ammonia (as N) results are greater than TKN results due to the error associated to higher than normal sample dilutions.

QC Qualifiers :

BOD01 : Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

Sample Data Revisions

None

Work Order Revisions / Comments:

Revision-1: This report now includes data for calcium, and an updated calculation for hardness.

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

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Paracel ID: 2135394

Chain of Custody
(Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 204122275	TAT: ☑ Regular ☐ 1 Day	
Contact Name: Yannick Marcoux	Quote #: 19- 799 Leachate	☐ 2 Day ☐ 3 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7145-21-00015	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marcoux@golder.com, emily_bacon@golder.com, lanni.hunsault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ S.U.B (Sanitary/ Municipality) ☑ Other: OWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 2135394

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote										
1	L-6	WL		9	08/04/21	3:05PM	✓										
2																	
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Comments: Invoice to Waste Connections of Canada, with PO#7145-21-00015 to be sent along with the results

RCo 8 facility code 6253

Method of Delivery: Swift

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab: Dimitri	Verified By:
Relinquished By (Print): M. MARCOUX	Date/Time:	Date/Time: 08/05/2021 11:50	Date/Time: 08/05/2021 11:50
Date/Time: 08/04/21	Temperature: °C	Temperature: 3.2 °C	pH Verified ☐ By:

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO:
Project: 20412275
Custody:

Report Date: 3-Jun-2021
Order Date: 27-May-2021

Revised Report

Order #: 2122411

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2122411-01	SED-W
2122411-02	SED-C
2122411-03	SED-E

Approved By:



Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 03-Jun-2021

Order Date: 27-May-2021

Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.7 - ICP-OES	31-May-21	31-May-21
Mercury by CVAA	EPA 7471B - CVAA, digestion	2-Jun-21	2-Jun-21
Metals, ICP-MS	EPA 6020 - Digestion - ICP-MS	2-Jun-21	2-Jun-21
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	31-May-21	1-Jun-21
Solids, %	Gravimetric, calculation	2-Jun-21	2-Jun-21

Certificate of Analysis

Report Date: 03-Jun-2021

Client: **Golder Associates Ltd. (Ottawa)**

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

	Client ID:	SED-W	SED-C	SED-E	-
	Sample Date:	27-May-21 09:20	27-May-21 09:55	27-May-21 10:55	-
	Sample ID:	2122411-01	2122411-02	2122411-03	-
	MDL/Units	Sediment	Sediment	Sediment	-
Physical Characteristics					
% Solids	0.1 % by Wt.	11.0	51.2	13.1	-
Metals					
Arsenic	1.0 ug/g dry	3.4	1.1	9.1	-
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Boron	5.0 ug/g dry	28.7	<5.0	15.8	-
Boron, available	0.5 ug/g dry	10.6	1.9	4.2	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Chromium	5.0 ug/g dry	30.5	13.3	35.8	-
Cobalt	1.0 ug/g dry	5.4	2.0	7.9	-
Copper	5.0 ug/g dry	23.7	<5.0	17.1	-
Iron	200 ug/g dry	13100	4950	82800	-
Lead	1.0 ug/g dry	10.6	4.2	10.0	-
Manganese	5 ug/g dry	322	88	1260	-
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	-
Molybdenum	1.0 ug/g dry	3.9	<1.0	1.3	-
Nickel	5.0 ug/g dry	19.2	6.2	22.5	-
Selenium	1.0 ug/g dry	1.4	<1.0	1.2	-
Zinc	20.0 ug/g dry	72.8	<20.0	76.5	-

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Arsenic	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Iron	ND	200	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Manganese	ND	5	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Zinc	ND	20.0	ug/g						

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Arsenic	2.6	1.0	ug/g dry	2.7			5.0	30	
Beryllium	ND	0.5	ug/g dry	ND			NC	30	
Boron, available	ND	0.5	ug/g dry	ND			NC	35	
Boron	7.3	5.0	ug/g dry	6.2			15.7	30	
Cadmium	ND	0.5	ug/g dry	ND			NC	30	
Chromium	13.6	5.0	ug/g dry	13.0			4.1	30	
Cobalt	5.3	1.0	ug/g dry	4.9			8.5	30	
Copper	10.3	5.0	ug/g dry	9.9			3.7	30	
Iron	6350	200	ug/g dry	7350			14.6	30	
Lead	7.8	1.0	ug/g dry	8.1			3.4	30	
Mercury	ND	0.1	ug/g dry	ND			NC	30	
Manganese	182	5	ug/g dry	201			10.1	30	
Molybdenum	ND	1.0	ug/g dry	ND			NC	30	
Nickel	11.4	5.0	ug/g dry	10.6			7.2	30	
Selenium	ND	1.0	ug/g dry	ND			NC	30	
Zinc	61.4	20.0	ug/g dry	54.6			11.7	30	
Physical Characteristics									
% Solids	98.6	0.1	% by Wt.	99.6			1.0	25	

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Arsenic	50.2	1.0	ug/g	1.1	98.3	70-130			
Beryllium	46.0	0.5	ug/g	ND	91.8	70-130			
Boron, available	4.59	0.5	ug/g	ND	91.8	70-122			
Boron	43.5	5.0	ug/g	ND	82.0	70-130			
Cadmium	46.1	0.5	ug/g	ND	92.1	70-130			
Chromium	54.0	5.0	ug/g	5.2	97.6	70-130			
Cobalt	50.5	1.0	ug/g	2.0	97.0	70-130			
Copper	50.4	5.0	ug/g	ND	92.8	70-130			
Iron	5400	200	ug/g	2940	98.5	70-130			
Lead	46.9	1.0	ug/g	3.2	87.3	70-130			
Mercury	1.64	0.1	ug/g	ND	109	70-130			
Manganese	139	5	ug/g	80.6	117	70-130			
Molybdenum	47.1	1.0	ug/g	ND	93.8	70-130			
Nickel	51.3	5.0	ug/g	ND	94.1	70-130			
Selenium	44.9	1.0	ug/g	ND	89.7	70-130			
Zinc	67.6	20.0	ug/g	21.8	91.5	70-130			

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

Revision 1 - This report includes an updated parameter list.

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Paracel ID: 2122411

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Chain of Custody
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Page 1 of 1

Client Name: Golder Associates	Project Reference: 20412275
Contact Name: Yannick Marceau	Quote #: 19-801
Address: 1931 Robertson Rd, Ottawa, Ontario K2H 5B7	PO #:
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com, emily_hiscox@golder.com, henri.hureault@wasteconnections.com

TAT: ☑ Regular ☐ 3 Day ☐ 2 Day ☐ 1 Day

Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ REC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: ODWOS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

	Paracel Order Number: 2122411 / Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	SED-W	SED		1	05/17/21	9:20am	✓
2	SED-C	SED		1	"	9:55am	✓
3	SED-E	SED		1	"	10:55am	✓
4							
5							
6							
7							
8							
9							
10							

Comments: Invoice to Waste Connections of Canada, with POR to be sent along with the results

EQuIS facility code 8253

Method of Delivery: Fed Ex

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished by (Print):	Date/Time:	Date/Time: 19/05/21 13:00	Date/Time: 19/05/21 13:16
Date/Time:	Temperature: °C	Temperature: 10.2 °C	pH Verified ☐ By:

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Emily Bacon

Client PO: 7145-21-00015
Project: NAVAN 20412275
Custody: 61596,61595,61594

Report Date: 3-Jun-2021
Order Date: 26-May-2021

Order #: 2122249

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2122249-01	92-19
2122249-02	92-18
2122249-03	05-1C
2122249-04	05-1D
2122249-05	05-3C
2122249-06	05-3D
2122249-07	07-1C
2122249-08	07-1D
2122249-09	92-1D
2122249-10	05-11
2122249-11	Dupe-2
2122249-12	05-8
2122249-13	92-7
2122249-14	05-R3
2122249-15	95-8
2122249-16	98-1
2122249-17	Dupe-3
2122249-18	94-2
2122249-19	95-3
2122249-20	95-2
2122249-21	MW-C
2122249-22	MW-E
2122249-23	95-7
2122249-24	95-6
2122249-25	94-6
2122249-26	94-5

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO: 7145-21-00015

Report Date: 03-Jun-2021

Order Date: 26-May-2021

Project Description: NAVAN 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, bicarbonate	calculated from EPA 310.1 - Titration to pH 4.5	27-May-21	27-May-21
Alkalinity, carbonate	calculated from EPA 310.1 - Titration to pH 4.5	27-May-21	27-May-21
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	27-May-21	27-May-21
Ammonia, as N	EPA 351.2 - Auto Colour	31-May-21	1-Jun-21
Anions	EPA 300.1 - IC	27-May-21	27-May-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	27-May-21	27-May-21
Hardness	Hardness as CaCO3	27-May-21	28-May-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	27-May-21	28-May-21
Phenolics	EPA 420.2 - Auto Colour, 4AAP	28-May-21	28-May-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	27-May-21	28-May-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	27-May-21	28-May-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	27-May-21	28-May-21
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	28-May-21	27-May-21

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	92-19	92-18	05-1C	05-1D
	Sample Date:	26-May-21 08:20	26-May-21 08:30	26-May-21 08:40	26-May-21 09:45
	Sample ID:	2122249-01	2122249-02	2122249-03	2122249-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	312	200	173	297
Alkalinity, bicarbonate	5 mg/L	312	199	172	296
Alkalinity, carbonate	5 mg/L	<5	<5	<5	<5
Ammonia as N	0.01 mg/L	0.06	0.07	0.28	0.03
Chemical Oxygen Demand	10 mg/L	20	20	<10	13
Hardness	mg/L	500	522	161	486
Phenolics	0.001 mg/L	0.002	<0.001	<0.001	0.002
Phosphorus, total	0.01 mg/L	0.08	0.35	0.46	0.03
Total Dissolved Solids	10 mg/L	1030	954	342	1060
Total Kjeldahl Nitrogen	0.1 mg/L	0.4	0.1	0.4	0.2
Anions					
Chloride	1 mg/L	222	353	50	370
Nitrate as N	0.1 mg/L	<0.1	0.2	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	210	36	44	86
Metals					
Arsenic	1 ug/L	<1	4	2	<1
Boron	10 ug/L	50	23	63	24
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	160000	137000	38200	136000
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Copper	0.5 ug/L	2.1	1.6	1.1	5.6
Iron	100 ug/L	<100	<100	252	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	24200	44000	15900	35700
Manganese	5 ug/L	472	<5	54	14
Potassium	100 ug/L	18200	7200	4920	11600
Sodium	200 ug/L	64700	98200	51100	187000
Zinc	5 ug/L	7	5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	92-19	92-18	05-1C	05-1D
	Sample Date:	26-May-21 08:20	26-May-21 08:30	26-May-21 08:40	26-May-21 09:45
	Sample ID:	2122249-01	2122249-02	2122249-03	2122249-04
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	118%	120%	120%	119%

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	05-3C	05-3D	07-1C	07-1D
	Sample Date:	26-May-21 09:05	26-May-21 09:15	26-May-21 09:25	26-May-21 09:30
	Sample ID:	2122249-05	2122249-06	2122249-07	2122249-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	962	742	670	402
Alkalinity, bicarbonate	5 mg/L	954	738	667	401
Alkalinity, carbonate	5 mg/L	8	<5	<5	<5
Ammonia as N	0.01 mg/L	1.20	0.05	0.58	0.38
Chemical Oxygen Demand	10 mg/L	71	<10	38	251
Hardness	mg/L	105	388	241	483
Phenolics	0.001 mg/L	<0.004 [1]	<0.001	<0.004 [1]	<0.001
Phosphorus, total	0.01 mg/L	1.89	0.10	0.58	3.23
Total Dissolved Solids	10 mg/L	1560	1040	1550	670
Total Kjeldahl Nitrogen	0.1 mg/L	2.9	0.2	0.9	5.7
Anions					
Chloride	1 mg/L	276	110	412	18
Nitrate as N	0.1 mg/L	0.1	<0.1	<0.1	0.7
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	12	96	97	186
Metals					
Arsenic	1 ug/L	4	<1	3	<1
Boron	10 ug/L	1540	441	409	173
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	11300	65600	31400	123000
Chromium	1 ug/L	1	<1	<1	<1
Cobalt	0.5 ug/L	0.6	<0.5	0.8	<0.5
Copper	0.5 ug/L	6.2	4.4	0.9	2.6
Iron	100 ug/L	194	<100	287	184
Lead	0.1 ug/L	0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	18600	54500	39400	42300
Manganese	5 ug/L	6	494	348	144
Potassium	100 ug/L	15300	13700	14700	5470
Sodium	200 ug/L	553000	244000	501000	43800
Zinc	5 ug/L	7	13	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	05-3C	05-3D	07-1C	07-1D
	Sample Date:	26-May-21 09:05	26-May-21 09:15	26-May-21 09:25	26-May-21 09:30
	Sample ID:	2122249-05	2122249-06	2122249-07	2122249-08
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	118%	120%	118%	113%

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	92-1D	05-11	Dupe-2	05-8
	Sample Date:	26-May-21 09:40	26-May-21 09:50	26-May-21 00:00	26-May-21 10:15
	Sample ID:	2122249-09	2122249-10	2122249-11	2122249-12
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	806	614	814	1020
Alkalinity, bicarbonate	5 mg/L	803	613	810	1010
Alkalinity, carbonate	5 mg/L	<5	<5	<5	<25
Ammonia as N	0.01 mg/L	0.60	0.48	0.62	1.33
Chemical Oxygen Demand	10 mg/L	79	25	67	72
Hardness	mg/L	550	621	543	758
Phenolics	0.001 mg/L	<0.004 [1]	0.003	0.014	0.006
Phosphorus, total	0.01 mg/L	0.25	0.06	0.28	0.14
Total Dissolved Solids	10 mg/L	1210	744	1250	1090
Total Kjeldahl Nitrogen	0.1 mg/L	1.3	0.8	1.2	2.9
Anions					
Chloride	1 mg/L	223	30	220	38
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	39	126	40	<1
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	904	1010	893	640
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	90300	146000	89300	163000
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Copper	0.5 ug/L	2.9	1.9	4.0	1.9
Iron	100 ug/L	<100	388	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	78700	62100	77700	85300
Manganese	5 ug/L	1330	310	1110	8690
Potassium	100 ug/L	16900	7080	16900	5250
Sodium	200 ug/L	281000	61700	285000	72500
Zinc	5 ug/L	<5	5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	92-1D	05-11	Dupe-2	05-8
	Sample Date:	26-May-21 09:40	26-May-21 09:50	26-May-21 00:00	26-May-21 10:15
	Sample ID:	2122249-09	2122249-10	2122249-11	2122249-12
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	100%	120%	106%	119%

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	92-7	05-R3	95-8	98-1
	Sample Date:	26-May-21 10:05	26-May-21 10:25	26-May-21 10:50	26-May-21 10:55
	Sample ID:	2122249-13	2122249-14	2122249-15	2122249-16
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	658	774	935	417
Alkalinity, bicarbonate	5 mg/L	652	772	934	412
Alkalinity, carbonate	5 mg/L	6	<5	<5	<5
Ammonia as N	0.01 mg/L	0.21	0.04	2.51	0.69
Chemical Oxygen Demand	10 mg/L	25	<10	107	<10
Hardness	mg/L	259	688	833	302
Phenolics	0.001 mg/L	<0.004 [1]	<0.001	0.004	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.23	0.03	0.03	0.19
Total Dissolved Solids	10 mg/L	1380	1020	1250	1250
Total Kjeldahl Nitrogen	0.1 mg/L	0.6	0.2	2.3	1.0
Anions					
Chloride	1 mg/L	423	15	174	503
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	2	222	11	<1
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	442	373	53	161
Cadmium	0.1 ug/L	<0.1	<0.1	0.3	<0.1
Calcium	100 ug/L	35200	160000	206000	61800
Chromium	1 ug/L	<1	2	11	<1
Cobalt	0.5 ug/L	<0.5	<0.5	2.1	<0.5
Copper	0.5 ug/L	2.6	2.0	91.9	1.2
Iron	100 ug/L	<100	<100	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	41500	70200	77500	35800
Manganese	5 ug/L	<5	<5	9670	47
Potassium	100 ug/L	16400	7780	17000	14100
Sodium	200 ug/L	454000	135000	122000	352000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	92-7	05-R3	95-8	98-1
	Sample Date:	26-May-21 10:05	26-May-21 10:25	26-May-21 10:50	26-May-21 10:55
	Sample ID:	2122249-13	2122249-14	2122249-15	2122249-16
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	119%	120%	118%	116%

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	Dupe-3	94-2	95-3	95-2
	Sample Date:	26-May-21 00:00	26-May-21 12:10	26-May-21 12:35	26-May-21 12:25
	Sample ID:	2122249-17	2122249-18	2122249-19	2122249-20
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	915	912	699	1160
Alkalinity, bicarbonate	5 mg/L	913	900	696	1140
Alkalinity, carbonate	5 mg/L	<5	11	<5	<25
Ammonia as N	0.01 mg/L	2.57	0.11	0.17	1.67
Chemical Oxygen Demand	10 mg/L	113	36	137	70
Hardness	mg/L	846	292	176	259
Phenolics	0.001 mg/L	<0.004 [1]	<0.004 [1]	<0.004 [1]	<0.010 [1]
Phosphorus, total	0.01 mg/L	0.03	0.46	1.70	1.05
Total Dissolved Solids	10 mg/L	1190	1770	1090	2240
Total Kjeldahl Nitrogen	0.1 mg/L	3.2	0.6	1.5	2.1
Anions					
Chloride	1 mg/L	172	485	158	574
Nitrate as N	0.1 mg/L	<0.5 [1]	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	9	5	81	2
Metals					
Arsenic	1 ug/L	<1	2	<1	2
Boron	10 ug/L	54	494	705	851
Cadmium	0.1 ug/L	0.2	<0.1	<0.1	<0.1
Calcium	100 ug/L	211000	37100	26700	30200
Chromium	1 ug/L	11	<1	<1	<1
Cobalt	0.5 ug/L	1.6	0.6	0.5	<0.5
Copper	0.5 ug/L	97.9	1.1	1.1	1.6
Iron	100 ug/L	<100	113	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	0.2
Magnesium	200 ug/L	77500	48400	26400	44700
Manganese	5 ug/L	9820	605	639	89
Potassium	100 ug/L	17200	14700	5790	17200
Sodium	200 ug/L	123000	515000	281000	731000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	Dupe-3	94-2	95-3	95-2
	Sample Date:	26-May-21 00:00	26-May-21 12:10	26-May-21 12:35	26-May-21 12:25
	Sample ID:	2122249-17	2122249-18	2122249-19	2122249-20
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	119%	119%	119%	120%

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	MW-C	MW-E	95-7	95-6
	Sample Date:	26-May-21 12:45	26-May-21 13:00	26-May-21 13:20	26-May-21 13:15
	Sample ID:	2122249-21	2122249-22	2122249-23	2122249-24
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	520	377	629	955
Alkalinity, bicarbonate	5 mg/L	516	375	623	942
Alkalinity, carbonate	5 mg/L	<5	<5	6	13
Ammonia as N	0.01 mg/L	0.16	0.08	0.42	1.98
Chemical Oxygen Demand	10 mg/L	61	23	43	46
Hardness	mg/L	431	284	234	405
Phenolics	0.001 mg/L	0.002	0.002	<0.004 [1]	<0.010 [1]
Phosphorus, total	0.01 mg/L	0.86	0.19	0.24	0.67
Total Dissolved Solids	10 mg/L	1310	868	1350	2190
Total Kjeldahl Nitrogen	0.1 mg/L	1.2	0.7	1.0	2.2
Anions					
Chloride	1 mg/L	217	94	416	763
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.25 [2]
Sulphate	1 mg/L	315	300	13	<1
Metals					
Arsenic	1 ug/L	2	<1	2	1
Boron	10 ug/L	363	245	353	684
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	91400	77700	34100	48300
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	0.7	0.7
Copper	0.5 ug/L	2.0	2.4	2.2	1.3
Iron	100 ug/L	455	<100	460	258
Lead	0.1 ug/L	<0.1	<0.1	<0.1	0.1
Magnesium	200 ug/L	49200	21900	36200	69100
Manganese	5 ug/L	107	6	1890	190
Potassium	100 ug/L	6170	1600	7710	20300
Sodium	200 ug/L	165000	47700	372000	764000
Zinc	5 ug/L	<5	<5	5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	MW-C	MW-E	95-7	95-6
	Sample Date:	26-May-21 12:45	26-May-21 13:00	26-May-21 13:20	26-May-21 13:15
	Sample ID:	2122249-21	2122249-22	2122249-23	2122249-24
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	119%	121%	120%	119%

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	94-6	94-5	-	-
	Sample Date:	26-May-21 13:55	26-May-21 13:45	-	-
	Sample ID:	2122249-25	2122249-26	-	-
	MDL/Units	Water	Water	-	-
General Inorganics					
Alkalinity, total	5 mg/L	345	875	-	-
Alkalinity, bicarbonate	5 mg/L	344	867	-	-
Alkalinity, carbonate	5 mg/L	<5	8	-	-
Ammonia as N	0.01 mg/L	0.07	0.91	-	-
Chemical Oxygen Demand	10 mg/L	34	60	-	-
Hardness	mg/L	323	409	-	-
Phenolics	0.001 mg/L	0.002	<0.010 [1]	-	-
Phosphorus, total	0.01 mg/L	0.40	1.14	-	-
Total Dissolved Solids	10 mg/L	972	2130	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	0.8	1.4	-	-
Anions					
Chloride	1 mg/L	224	721	-	-
Nitrate as N	0.1 mg/L	<0.1	<0.1	-	-
Nitrite as N	0.05 mg/L	<0.05	<0.05	-	-
Sulphate	1 mg/L	226	13	-	-
Metals					
Arsenic	1 ug/L	<1	1	-	-
Boron	10 ug/L	157	381	-	-
Cadmium	0.1 ug/L	<0.1	<0.1	-	-
Calcium	100 ug/L	77900	53900	-	-
Chromium	1 ug/L	<1	<1	-	-
Cobalt	0.5 ug/L	2.7	0.8	-	-
Copper	0.5 ug/L	2.0	1.1	-	-
Iron	100 ug/L	329	423	-	-
Lead	0.1 ug/L	<0.1	<0.1	-	-
Magnesium	200 ug/L	31200	66600	-	-
Manganese	5 ug/L	2140	2320	-	-
Potassium	100 ug/L	5540	9620	-	-
Sodium	200 ug/L	156000	551000	-	-
Zinc	5 ug/L	<5	<5	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

	Client ID:	94-6	94-5	-	-
	Sample Date:	26-May-21 13:55	26-May-21 13:45	-	-
	Sample ID:	2122249-25	2122249-26	-	-
	MDL/Units	Water	Water	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene-d8	Surrogate	119%	119%	-	-

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Alkalinity, bicarbonate	ND	5	mg/L						
Alkalinity, carbonate	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Surrogate: Toluene-d8	*95.0*		*ug/L*		*119*	*50-140*			

Certificate of Analysis

Report Date: 03-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 26-May-2021

Client PO: 7145-21-00015

Project Description: NAVAN 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	81.4	1	mg/L	81.0			0.5	10	
Nitrate as N	ND	0.1	mg/L	ND			NC	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	87.0	1	mg/L	87.1			0.1	10	
General Inorganics									
Alkalinity, total	153	5	mg/L	154			0.5	14	
Alkalinity, bicarbonate	151	5	mg/L	151			0.6	14	
Alkalinity, carbonate	ND	5	mg/L	ND			NC	14	
Ammonia as N	0.067	0.01	mg/L	0.057			15.0	18	
Chemical Oxygen Demand	18	10	mg/L	20			10.5	12	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	1.54	0.02	mg/L	1.58			2.6	15	
Total Dissolved Solids	ND	10	mg/L	ND			NC	10	
Total Kjeldahl Nitrogen	16.4	1.0	mg/L	18.5			12.3	16	
Metals									
Arsenic	ND	1	ug/L	ND			NC	20	
Boron	ND	10	ug/L	ND			NC	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	ND	100	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	ND	0.5	ug/L	ND			NC	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	ND	200	ug/L	ND			NC	20	
Manganese	ND	5	ug/L	ND			NC	20	
Potassium	ND	100	ug/L	ND			NC	20	
Sodium	ND	200	ug/L	ND			NC	20	
Zinc	ND	5	ug/L	ND			NC	20	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	*95.4*		*ug/L*		*119*	*50-140*			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-21-00015

Report Date: 03-Jun-2021
Order Date: 26-May-2021
Project Description: NAVAN 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	88.8	1	mg/L	81.0	77.8	77-123			
Nitrate as N	1.03	0.1	mg/L	ND	103	79-120			
Nitrite as N	0.871	0.05	mg/L	ND	87.1	84-117			
Sulphate	95.8	1	mg/L	87.1	86.8	74-126			
General Inorganics									
Ammonia as N	0.297	0.01	mg/L	0.057	95.7	81-124			
Chemical Oxygen Demand	223	10	mg/L	20	102	85-111			
Phenolics	0.021	0.001	mg/L	ND	86.0	69-132			
Phosphorus, total	0.463	0.01	mg/L	ND	92.7	80-120			
Total Dissolved Solids	102	10	mg/L	ND	102	75-125			
Total Kjeldahl Nitrogen	2.28	0.1	mg/L	0.27	101	81-126			
Metals									
Arsenic	52.7	1	ug/L	ND	105	80-120			
Boron	46	10	ug/L	ND	90.8	80-120			
Cadmium	51.2	0.1	ug/L	ND	102	80-120			
Calcium	9950	100	ug/L	ND	99.4	80-120			
Chromium	51.6	1	ug/L	ND	103	80-120			
Cobalt	50.4	0.5	ug/L	ND	101	80-120			
Copper	49.8	0.5	ug/L	ND	99.6	80-120			
Iron	2460	100	ug/L	ND	98.2	80-120			
Lead	45.2	0.1	ug/L	ND	90.4	80-120			
Magnesium	9740	200	ug/L	ND	97.4	80-120			
Manganese	51.0	5	ug/L	ND	102	80-120			
Potassium	9850	100	ug/L	ND	98.4	80-120			
Sodium	9440	200	ug/L	ND	94.2	80-120			
Zinc	54	5	ug/L	ND	102	80-120			
Volatiles									
Benzene	29.2	0.5	ug/L	ND	73.0	60-130			
1,1-Dichloroethane	29.2	0.5	ug/L	ND	73.0	60-130			
Ethylbenzene	33.2	0.5	ug/L	ND	82.9	60-130			
Methylene Chloride	28.8	5.0	ug/L	ND	72.1	60-130			
Toluene	33.2	0.5	ug/L	ND	83.0	60-130			
Vinyl chloride	27.5	0.5	ug/L	ND	68.7	50-140			
m,p-Xylenes	67.1	0.5	ug/L	ND	83.9	60-130			
o-Xylene	32.4	0.5	ug/L	ND	81.0	60-130			
Surrogate: Toluene-d8	*81.0*		*ug/L*		*101*	*50-140*			

Qualifier Notes:

Sample Qualifiers :

1 : Elevated Reporting Limit due to matrix interference.

2 : Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Paracel ID: 2122249

PAL LABORATORY

Head Office: 300-4019 St. Laurent Blvd, Ottawa, Ontario K1G 4J8 | t: 1-800-749-1947 | e: paracel@paracellabs.com | www.paracellabs.com

Paracel Order Number (Lab Use Only): 2122249

Chain Of Custody (Lab Use Only): № 61596

Client Name: Golder Assoc. Ltd

Contact Name: Emily Bacon

Address: 1931 Robertson Rd, Ottawa ON

Telephone: 613-592-9600

Project Ref: NAUGM 20412225 21000-02

Quote #: 19-797 GW

PO: 7145-21-00015

Email: ymercerou@golder.com, ebacon@golder.ca, henri.hunegault@wsteconnections.com

Page: 1 of 3

Turnaround Time: ☐ 1 day ☐ 3 day ☐ 2 day ☒ Regular

Date Required:

Regulation: ☐ REG 153/04 ☐ REG 406/19 | Other Regulations

Table: ☐ 1 ☐ 2 ☐ 3 ☐ Res/Park ☐ Med/Fine ☐ Agri/Other ☐ Table

For RSC: ☐ Yes ☐ No

Matrix: ☐ PW ☐ (Cist) ☐ Water ☐ SW (Storm/Surface Water) ☐ SW (Storm/Sanitary Sewer) ☒ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis

Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Time	19-797 GW	METALS, PB & TOTALS
1	92-9	GW	6	05/26/21	8:20AM	✓	✓
2	92-8				8:30AM	✓	✓
3	05-1C				8:40AM	✓	✓
4	05-1D				8:45AM	✓	✓
5	05-3C				9:05AM	✓	✓
6	05-3D				9:15AM	✓	✓
7	07-1C				9:25AM	✓	✓
8	07-1D				9:30AM	✓	✓
9	92-10				9:40AM	✓	✓
10	05-11				9:50AM	✓	✓

Comments: INVOICES TO GO TO HENRI HUNEAULT FROM WCC. THE FACILITY # FOR EQUIS IS 6253. THIS APPLIES TO ALL 3 COC'S.

Method of Delivery: Drop Box

Relinquished By (Sign):

Relinquished By (Print): Mike Armitage

Date/Time: 05 26 21

Received By Driver/Depot:

Received at Lab: Jumeghan Delumpa

Date/Time: May 26, 2021 04:10

Temperature: 5.1 °C

Date/Time: May 26/21 1649

Custody Seal Intact: ☐ Yes ☐ No ☐ N/A

Temperature °C

Chain of Custody (Blank).xlsx

Revised 3.0

002820

PARA LABORATORIES

Paracel ID: 2122249

Paracel Order Number (Lab Use Only): 2122249

Chain Of Custody (Lab Use Only): No. 61595

Client Name: Golder Assoc. Ltd

Contact Name: Emily Bacon

Address: 1931 Robertson Rd Ottawa ON

Telephone: 613 592-9600

Project Ref: AOWA 20412225

Quote #: 19-797 GW

P.O. #: 7145-21-00015

Email: ymarcoux@golder.com, ebacon@golder.com, henri.lamoureux@wastecon sultants.com

Page 2 of 3

Turnaround Time: 1 day, 3 day, 2 day, Regular (X), Date Required:

Regulation: SUB, REC Water, Other Regulation

Matrix Types: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis: 19-797 GW Metals (13 Plus) Hardness

Other: DOW as

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Time
1	DUP1-2	GW	76		05/21/21	
2	05-8					10:15AM
3	92-7					10:40AM
4	05-R3					10:25AM
5	95-8					10:50AM
6	98-1					10:55AM
7	DUP1-3					
8	94-2					12:10PM
9	95-3					12:35PM
10	95-2					12:25PM

Comments:

Special Instructions:

Relinquished By (Sign): Mike Armitage

Relinquished By (Print): Mike Armitage

Date/Time: 05/26/21

Received By Driver/Depot:

Date/Time:

Temperature:

Received at Lab: Junkeguan Ouyang

Date/Time: May 26, 2021 04:10

Temperature: 5.1 °C

Verified By: [signature]

Date/Time: May 26 2021 16:45

Chain of Custody (Blank).doc

Revised: Oct

002821

PARA LABORATORIES

Paracel ID: 2122249

Paracel Order Number: 2122249 2122252

Chain Of Custody (Laboratory Use Only) No: 61594

Client Name: GOLDER ASSOC. LTD

Contact Name: EMILY BACON

Address: 1931 ROBERTSON RD OTTAWA ON

Telephone: 613 592 9600

Project No: NAVFM 2041 2275

Quote #: 19-797 GW + 19-800-QA/QC

P.O. #: 7145-21-00015

Email: fmercer@golder.com, ebacon@golder.com, henri.hunsinger@waterecconnect.com

Page 3 of 3

Turnaround Time: 1 day, 3 day, 2 day, Regular

Date Required:

Regulation: RSC: Table 1, Res/Park, Med/Fine; Table 2, Ind/Comm, Coarse; Table 3, Agri/Other; Table; For RSC: Yes, No; MISA; PWQO; CCME; SU - Sani; SU - Storm; Other: OOW QS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis: 19-797 GW PETROLEUM HYDROCARBONS; 19-800 QA/QC

	Sample ID/Description	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	19-797 GW	19-800 QA/QC
1	MW-C	GW		6	05/21/21	12:45 pm	✓	✓
2	MW-B					1 pm	✓	✓
3	95-7					1:20 pm	✓	✓
4	95-6					1:45 pm	✓	✓
5	94-6					1:55 pm	✓	✓
6	945					1:45 pm	✓	✓
7	FIELD BLANK					12:25 pm	✓	✓
8	TRIP BLANK				May 20, 2021			✓
9								
10								

Comments:

Relinquished By (Sign): Received By Driver/Depot: Received at Lab: Verified By:

Relinquished By (Print): MIKE ARMITAGE Date/Time: May 20, 2021 Temperature: °C Date/Time: May 21, 2021 16:10 Temperature: 5.1 °C

Chain of Custody (Blank).xlsx

Revision 4.0

002822

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO:
Project: 20412275
Custody:

Report Date: 4-Jun-2021
Order Date: 27-May-2021

Order #: 2122437

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2122437-01	S-21
2122437-02	S-1
2122437-03	S-3
2122437-04	S-15
2122437-05	S-16
2122437-06	S-17
2122437-07	S-8
2122437-08	S-9
2122437-09	S-10
2122437-10	S-11
2122437-11	S-12
2122437-12	Dupe-1

Approved By:

Mark Foto, M.Sc.
Lab Supervisor

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Client: Golder Associates Ltd. (Ottawa)

Client PO:

Report Date: 04-Jun-2021

Order Date: 27-May-2021

Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	28-May-21	28-May-21
Ammonia, as N	EPA 351.2 - Auto Colour	31-May-21	1-Jun-21
Anions	EPA 300.1 - IC	28-May-21	28-May-21
Biochemical Oxygen Demand	SM 5210B - DO Probe	28-May-21	2-Jun-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	28-May-21	31-May-21
Dissolved Organic Carbon	MOE E3247B - Combustion IR, filtration	28-May-21	31-May-21
Hardness	Hardness as CaCO3	1-Jun-21	1-Jun-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	1-Jun-21	1-Jun-21
Phenolics	EPA 420.2 - Auto Colour, 4AAP	2-Jun-21	2-Jun-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	31-May-21	31-May-21
Total Dissolved Carbon	MOE 3247B - Combustion IR	31-May-21	28-May-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	28-May-21	31-May-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	31-May-21	31-May-21
Total Suspended Solids	SM 2540D - Gravimetric	28-May-21	31-May-21

Certificate of Analysis

Report Date: 04-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

	Client ID:	S-21	S-1	S-3	S-15
	Sample Date:	27-May-21 12:25	27-May-21 12:55	27-May-21 14:15	27-May-21 13:55
	Sample ID:	2122437-01	2122437-02	2122437-03	2122437-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	212	399	392	298
Ammonia as N	0.01 mg/L	0.03	0.14	0.49	0.08
BOD	2 mg/L	2	<2	5	<2
Chemical Oxygen Demand	10 mg/L	32	34	51	34
Dissolved Inorganic Carbon	0.500 mg/L	46.8	82.5	86.6	67.4
Dissolved Organic Carbon	0.5 mg/L	11.0	12.8	13.7	10.6
Total Dissolved Carbon	0.5 mg/L	57.8	95.3	100	78.1
Hardness	mg/L	371	631	470	601
Phenolics	0.001 mg/L	0.003	0.003	0.007	0.002
Phosphorus, total	0.01 mg/L	0.02	<0.01	0.05	<0.01
Total Dissolved Solids	10 mg/L	758	1380	1000	892
Total Suspended Solids	2 mg/L	2	2	24	3
Total Kjeldahl Nitrogen	0.1 mg/L	0.6	0.6	1.3	0.6
Anions					
Chloride	1 mg/L	196	387	289	86
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.5	0.4
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	190	194	116	317
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	142	121	65	66
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	85600	184000	142000	179000
Chromium	1 ug/L	<1	2	2	<1
Cobalt	0.5 ug/L	<0.5	0.8	1.3	<0.5
Copper	0.5 ug/L	1.1	1.3	1.8	1.0
Iron	100 ug/L	<100	1640	6480	415
Lead	0.1 ug/L	<0.1	0.5	0.5	0.2
Magnesium	200 ug/L	38100	41600	28100	37100
Manganese	5 ug/L	28	390	1530	509
Potassium	100 ug/L	9070	13800	9290	12200
Sodium	200 ug/L	139000	218000	178000	66000
Zinc	5 ug/L	<5	5	28	6

Certificate of Analysis

Report Date: 04-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

	Client ID:	S-16	S-17	S-8	S-9
	Sample Date:	27-May-21 14:55	27-May-21 14:35	27-May-21 09:05	27-May-21 10:20
	Sample ID:	2122437-05	2122437-06	2122437-07	2122437-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	256	247	441	337
Ammonia as N	0.01 mg/L	0.06	0.21	0.30	0.09
BOD	2 mg/L	<2	9	12	<2
Chemical Oxygen Demand	10 mg/L	28	45	112	65
Dissolved Inorganic Carbon	0.500 mg/L	56.2	56.6	92.1	69.9
Dissolved Organic Carbon	0.5 mg/L	9.7	13.7	19.0	13.9
Total Dissolved Carbon	0.5 mg/L	65.9	70.3	111	83.8
Hardness	mg/L	615	416	528	423
Phenolics	0.001 mg/L	0.002	0.005	0.010	0.004
Phosphorus, total	0.01 mg/L	0.03	0.09	0.46	0.10
Total Dissolved Solids	10 mg/L	834	1300	994	744
Total Suspended Solids	2 mg/L	24	5	64	35
Total Kjeldahl Nitrogen	0.1 mg/L	0.6	1.1	2.5	0.9
Anions					
Chloride	1 mg/L	35	533	100	127
Nitrate as N	0.1 mg/L	0.4	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	370	99	222	150
Metals					
Arsenic	1 ug/L	<1	<1	1	<1
Boron	10 ug/L	69	47	92	112
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	188000	127000	138000	112000
Chromium	1 ug/L	2	1	3	4
Cobalt	0.5 ug/L	1.0	0.6	3.1	1.0
Copper	0.5 ug/L	1.7	1.3	3.2	3.4
Iron	100 ug/L	1260	844	1050	1470
Lead	0.1 ug/L	0.7	0.3	0.5	0.5
Magnesium	200 ug/L	35500	24100	44600	34900
Manganese	5 ug/L	216	438	12800	145
Potassium	100 ug/L	10400	9390	12800	8920
Sodium	200 ug/L	30300	300000	125000	115000
Zinc	5 ug/L	6	<5	9	8

Certificate of Analysis

Report Date: 04-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

	Client ID:	S-10	S-11	S-12	Dupe-1
	Sample Date:	27-May-21 09:20	27-May-21 09:55	27-May-21 10:55	27-May-21 09:00
	Sample ID:	2122437-09	2122437-10	2122437-11	2122437-12
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	215	204	166	213
Ammonia as N	0.01 mg/L	0.09	0.09	0.06	0.03
BOD	2 mg/L	<150 [1]	11	8	2
Chemical Oxygen Demand	10 mg/L	766	103	149	31
Dissolved Inorganic Carbon	0.500 mg/L	52.5	50.0	44.4	54.8
Dissolved Organic Carbon	0.5 mg/L	30.7	29.9	29.6	11.5
Total Dissolved Carbon	0.5 mg/L	83.2	79.9	74.0	66.3
Hardness	mg/L	279	204	146	388
Phenolics	0.001 mg/L	0.012	0.003	0.007	0.003
Phosphorus, total	0.01 mg/L	2.92	0.17	1.80	0.01
Total Dissolved Solids	10 mg/L	416	436	284	780
Total Suspended Solids	2 mg/L	221	4	59	2
Total Kjeldahl Nitrogen	0.1 mg/L	11.1	1.5	3.8	0.6
Anions					
Chloride	1 mg/L	71	104	47	192
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	2	16	<1	190
Metals					
Arsenic	1 ug/L	6	1	2	<1
Boron	10 ug/L	143	117	63	127
Cadmium	0.1 ug/L	0.3	<0.1	<0.1	<0.1
Calcium	100 ug/L	76700	53600	40100	90400
Chromium	1 ug/L	33	2	3	<1
Cobalt	0.5 ug/L	9.1	1.1	2.3	<0.5
Copper	0.5 ug/L	23.7	0.7	1.3	1.0
Iron	100 ug/L	54200	1180	9170	<100
Lead	0.1 ug/L	13.6	0.3	0.6	<0.1
Magnesium	200 ug/L	21300	16900	11100	39500
Manganese	5 ug/L	1970	1130	684	30
Potassium	100 ug/L	11300	8230	5860	9590
Sodium	200 ug/L	71800	79200	43500	147000
Zinc	5 ug/L	108	6	9	<5

Certificate of Analysis

Report Date: 04-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
BOD	ND	2	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Dissolved Organic Carbon	ND	0.5	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Suspended Solids	ND	2	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						

Certificate of Analysis

Report Date: 04-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	35.0	1	mg/L	34.9			0.4	10	
Nitrate as N	0.37	0.1	mg/L	0.37			0.1	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	373	5	mg/L	370			1.0	10	
General Inorganics									
Alkalinity, total	291	5	mg/L	295			1.3	14	
Ammonia as N	0.067	0.01	mg/L	0.057			15.0	18	
BOD	36	2	mg/L	37			2.5	20	
Chemical Oxygen Demand	31	10	mg/L	32			3.2	12	
Dissolved Organic Carbon	2.4	0.5	mg/L	2.6			10.4	37	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	0.018	0.01	mg/L	0.018			1.9	15	
Total Dissolved Solids	1250	10	mg/L	1350			7.2	10	
Total Suspended Solids	7.0	2	mg/L	7.0			0.0	10	
Total Kjeldahl Nitrogen	0.59	0.1	mg/L	0.62			5.5	16	
Metals									
Arsenic	ND	1	ug/L	ND			NC	20	
Boron	ND	10	ug/L	ND			NC	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	ND	100	ug/L	ND			NC	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	1.26	0.5	ug/L	1.33			5.3	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	ND	200	ug/L	ND			NC	20	
Manganese	ND	5	ug/L	ND			NC	20	
Potassium	ND	100	ug/L	ND			NC	20	
Sodium	262	200	ug/L	258			1.5	20	
Zinc	ND	5	ug/L	ND			NC	20	

Certificate of Analysis

Report Date: 04-Jun-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 27-May-2021

Client PO:

Project Description: 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	43.7	1	mg/L	34.9	88.2	77-123			
Nitrate as N	1.45	0.1	mg/L	0.37	108	79-120			
Nitrite as N	0.903	0.05	mg/L	ND	90.3	84-117			
Sulphate	9.02	1	mg/L	ND	90.2	86-114			
General Inorganics									
Ammonia as N	0.297	0.01	mg/L	0.057	95.7	81-124			
BOD	145	2	mg/L	ND	72.5	71-121			
Chemical Oxygen Demand	227	10	mg/L	32	97.5	85-111			
Dissolved Organic Carbon	13.6	0.5	mg/L	2.6	110	60-133			
Phenolics	0.025	0.001	mg/L	ND	98.8	69-132			
Phosphorus, total	0.494	0.01	mg/L	0.018	95.2	80-120			
Total Dissolved Solids	90.0	10	mg/L	ND	90.0	75-125			
Total Suspended Solids	18.0	2	mg/L	ND	90.0	75-125			
Total Kjeldahl Nitrogen	2.62	0.1	mg/L	0.62	99.8	81-126			
Metals									
Arsenic	49.4	1	ug/L	ND	98.6	80-120			
Boron	46	10	ug/L	ND	88.4	80-120			
Cadmium	50.1	0.1	ug/L	ND	100	80-120			
Calcium	9480	100	ug/L	ND	94.2	80-120			
Chromium	48.0	1	ug/L	ND	95.6	80-120			
Cobalt	47.6	0.5	ug/L	ND	95.2	80-120			
Copper	48.1	0.5	ug/L	1.33	93.5	80-120			
Iron	2330	100	ug/L	ND	93.4	80-120			
Lead	42.8	0.1	ug/L	ND	85.6	80-120			
Magnesium	9140	200	ug/L	ND	91.4	80-120			
Manganese	47.0	5	ug/L	ND	93.7	80-120			
Potassium	9040	100	ug/L	ND	90.2	80-120			
Sodium	9000	200	ug/L	258	87.4	80-120			
Zinc	49	5	ug/L	ND	97.5	80-120			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO:

Report Date: 04-Jun-2021
Order Date: 27-May-2021
Project Description: 20412275

Qualifier Notes:

Login Qualifiers :

Samples received submerged in water, possibly melted ice. This condition can compromise sample integrity.

Applies to samples: S-11

Sample Qualifiers :

1 : Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

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Paracel ID: 2122437

Chain of Custody (Lab Use Only)

Page 1 of 2

Client Name: Golder Associates	Project Reference: 20412275	TAT: ☑ Regular ☐ 3 Day
Contact Name: Yannick Marcoux	Quote #: 19-738	☐ 2 Day ☐ 1 Day
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	Date Required:
Telephone: 613-592-9600	Email Address: yannick_marcoux@golder.com, emily_bacon@golder.com, hemlihomeault@maxxecconstruction.com	

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ___ ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2122437

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per Guide	Required Analyses
1	~~S-20~~	~~SW~~			05/27/21		☑	
2	S-21	SW		7		12:25 PM	☑	
3	S-1	SW				12:55 PM	☑	
4	S-3	SW				2:15 PM	☑	
5	S-15	SW				1:35 PM	☑	
6	S-16	SW				2:55 PM	☑	
7	S-17	SW				2:35 PM	☑	
8	~~S-5-c~~	~~SW~~					☑	
9	S-6	SW				9:05 AM	☑	
10	S-9	SW				10:20 AM	☑	

Comments: Invoice to Waste Connections of Canada, with POW to be sent along with the results

EQuIS facility code (250)

Method of Delivery: Drop Box

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): M. MARCOUX	Date/Time:	Date/Time: 27/05/21 16:20	Date/Time: 28/05/21 08:30
Date/Time: 05/27/21	Temperature: °C	Temperature: 16.2 °C	pH Verified ☐ By:

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Paracel ID: 2122437

Chain of Custody
(Lab Use Only)

Page 2 of 2

Client Name: Golder Associates	Project Reference: 20412275	TAT: ☑ Regular ☐ 3 Day
Contact Name: Yannick Marcoux	Quote #: 19-798	☐ 2 Day ☐ 1 Day
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	Date Required:
Telephone: 613-592-9600	Email Address: yannick_marcoux@golder.com, emily_bacon@golder.com, hamil.hancock@wasteconnections.com	

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: COMOS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2122437

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote	Required Analyses
1	S-10	SW		7	05/27/21	9:20a	✓	
2	S-11	SW				9:55a	✓	
3	S-12	SW				10:55a	✓	
4	Dupe-1	SW					✓	
5								
6								
7								
8								
9								
10								

Comments: Invoice to Waste Connections of Canada, with PO# to be sent along with the results

EDD/MS facility code (625)

Method of Delivery: Drop Off

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): A. Arbuthnot	Date/Time:	Date/Time: May 27 2021 16:40	Date/Time: 05/28/2021 08:30
Date/Time: 05/27/21	Temperature: °C	Temperature: 10.2 °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

002833

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-21-00015
Project: 20412275
Custody:

Report Date: 30-Aug-2021
Order Date: 25-Aug-2021

Order #: 2135404

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2135404-01	Trip Blank
2135404-02	Field Blank

Approved By:



Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 30-Aug-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	27-Aug-21	27-Aug-21

Certificate of Analysis

Report Date: 30-Aug-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	Trip Blank	Field Blank	-	-
	Sample Date:	23-Aug-21 09:00	24-Aug-21 11:00	-	-
	Sample ID:	2135404-01	2135404-02	-	-
	MDL/Units	Water	Water	-	-
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	-	-
Benzene	0.5 ug/L	<0.5	<0.5	-	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	-	-
Bromoform	0.5 ug/L	<0.5	<0.5	-	-
Bromomethane	0.5 ug/L	<0.5	<0.5	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	-	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
Chloroethane	1.0 ug/L	<1.0	<1.0	-	-
Chloroform	0.5 ug/L	<0.5	<0.5	-	-
Chloromethane	3.0 ug/L	<3.0	<3.0	-	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Hexane	1.0 ug/L	<1.0	<1.0	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	-	-
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Styrene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-

Certificate of Analysis

Report Date: 30-Aug-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	Trip Blank	Field Blank	-	-
	Sample Date:	23-Aug-21 09:00	24-Aug-21 11:00	-	-
	Sample ID:	2135404-01	2135404-02	-	-
	MDL/Units	Water	Water	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	-	-
4-Bromofluorobenzene	Surrogate	98.4%	101%	-	-
Dibromofluoromethane	Surrogate	85.3%	86.0%	-	-
Toluene-d8	Surrogate	103%	103%	-	-

Certificate of Analysis

Report Date: 30-Aug-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroethane	ND	1.0	ug/L						
Chloroform	ND	0.5	ug/L						
Chloromethane	ND	3.0	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dibromoethane	ND	0.2	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloroethylene, total	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L						
Methyl Isobutyl Ketone	ND	5.0	ug/L						
Methyl tert-butyl ether	ND	2.0	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Styrene	ND	0.5	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.5	ug/L						
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
1,3,5-Trimethylbenzene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: 4-Bromofluorobenzene	*68.6*		*ug/L*		*85.7*	*50-140*			
Surrogate: Dibromofluoromethane	*59.2*		*ug/L*		*74.0*	*50-140*			
Surrogate: Toluene-d8	*82.8*		*ug/L*		*104*	*50-140*			

Certificate of Analysis

Report Date: 30-Aug-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	3.18	0.5	ug/L	2.83			11.6	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroethane	ND	1.0	ug/L	ND			NC	30	
Chloroform	9.52	0.5	ug/L	7.95			18.0	30	
Chloromethane	ND	3.0	ug/L	ND			NC	30	
Dibromochloromethane	1.82	0.5	ug/L	1.98			8.4	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dibromoethane	ND	0.2	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
1,3,5-Trimethylbenzene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*79.4*		*ug/L*		*99.2*	*50-140*			
Surrogate: Dibromofluoromethane	*70.3*		*ug/L*		*87.9*	*50-140*			
Surrogate: Toluene-d8	*82.4*		*ug/L*		*103*	*50-140*			

Certificate of Analysis

Report Date: 30-Aug-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 25-Aug-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	110	5.0	ug/L	ND	110	50-140			
Benzene	31.6	0.5	ug/L	ND	79.1	60-130			
Bromodichloromethane	29.0	0.5	ug/L	ND	72.6	60-130			
Bromoform	39.5	0.5	ug/L	ND	98.6	60-130			
Bromomethane	28.0	0.5	ug/L	ND	70.0	50-140			
Carbon Tetrachloride	30.3	0.2	ug/L	ND	75.8	60-130			
Chlorobenzene	31.5	0.5	ug/L	ND	78.8	60-130			
Chloroethane	30.4	1.0	ug/L	ND	75.9	50-140			
Chloroform	31.2	0.5	ug/L	ND	78.1	60-130			
Chloromethane	27.2	3.0	ug/L	ND	68.0	50-140			
Dibromochloromethane	39.9	0.5	ug/L	ND	99.7	60-130			
Dichlorodifluoromethane	32.8	1.0	ug/L	ND	82.1	50-140			
1,2-Dibromoethane	39.7	0.2	ug/L	ND	99.4	60-130			
1,2-Dichlorobenzene	28.3	0.5	ug/L	ND	70.8	60-130			
1,3-Dichlorobenzene	29.1	0.5	ug/L	ND	72.8	60-130			
1,4-Dichlorobenzene	29.0	0.5	ug/L	ND	72.4	60-130			
1,1-Dichloroethane	33.5	0.5	ug/L	ND	83.6	60-130			
1,2-Dichloroethane	34.1	0.5	ug/L	ND	85.4	60-130			
1,1-Dichloroethylene	29.3	0.5	ug/L	ND	73.3	60-130			
cis-1,2-Dichloroethylene	28.1	0.5	ug/L	ND	70.4	60-130			
trans-1,2-Dichloroethylene	28.2	0.5	ug/L	ND	70.4	60-130			
1,2-Dichloropropane	30.9	0.5	ug/L	ND	77.4	60-130			
cis-1,3-Dichloropropylene	34.2	0.5	ug/L	ND	85.6	60-130			
trans-1,3-Dichloropropylene	27.5	0.5	ug/L	ND	68.8	60-130			
Ethylbenzene	29.4	0.5	ug/L	ND	73.6	60-130			
Hexane	37.1	1.0	ug/L	ND	92.8	60-130			
Methyl Ethyl Ketone (2-Butanone)	73.1	5.0	ug/L	ND	73.1	50-140			
Methyl Butyl Ketone (2-Hexanone)	81.1	10.0	ug/L	ND	81.1	50-140			
Methyl Isobutyl Ketone	108	5.0	ug/L	ND	108	50-140			
Methyl tert-butyl ether	70.5	2.0	ug/L	ND	70.5	50-140			
Methylene Chloride	28.9	5.0	ug/L	ND	72.3	60-130			
Styrene	33.9	0.5	ug/L	ND	84.6	60-130			
1,1,1,2-Tetrachloroethane	41.9	0.5	ug/L	ND	105	60-130			
1,1,2,2-Tetrachloroethane	34.1	0.5	ug/L	ND	85.2	60-130			
Tetrachloroethylene	40.4	0.5	ug/L	ND	101	60-130			
Toluene	32.7	0.5	ug/L	ND	81.8	60-130			
1,1,1-Trichloroethane	28.4	0.5	ug/L	ND	71.0	60-130			
1,1,2-Trichloroethane	30.3	0.5	ug/L	ND	75.6	60-130			
Trichloroethylene	27.1	0.5	ug/L	ND	67.8	60-130			
Trichlorofluoromethane	33.9	1.0	ug/L	ND	84.7	60-130			
1,3,5-Trimethylbenzene	30.1	0.5	ug/L	ND	75.2	60-130			
Vinyl chloride	31.0	0.5	ug/L	ND	77.6	50-140			
m,p-Xylenes	61.5	0.5	ug/L	ND	76.9	60-130			
o-Xylene	30.3	0.5	ug/L	ND	75.8	60-130			
Surrogate: 4-Bromofluorobenzene	*79.8*		*ug/L*		*99.7*	*50-140*			
Surrogate: Dibromofluoromethane	*72.4*		*ug/L*		*90.5*	*50-140*			
Surrogate: Toluene-d8	*82.1*		*ug/L*		*103*	*50-140*			

Certificate of Analysis
Client: Golder Associates Ltd. (Ottawa)
Client PO: 7145-21-00015

Report Date: 30-Aug-2021
Order Date: 25-Aug-2021
Project Description: 20412275

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

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Paracel ID: 2135404

Chain of Custody (Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 20412275	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marceau	Quote #: 19-899 QAQC	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd, Ottawa, Ontario K2H 5B7	PO #: 7146-21-80015	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com, emily_bacon@golder.com, kerri.bureau@wastecorrections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: OCWDS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2135404

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analyses: Per quote
1	Trip Blank			1	Aug 24, 2021		☑
2	Field Blank			2	Aug 24, 2021	11 AM	☑
3							
4							
5							
6							
7							
8							
9							
10							

Comments: Invoice to Waste Corrections of Canada

Method of Delivery: Courier

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab: Aug 25/2021 11:55	Verified By:
Relinquished By (Print): Yannick Marceau	Date/Time:	Date/Time:	Date/Time: Aug 25 2021 13:05
Date/Time: Aug 24 21	Temperature: °C	Temperature: 4.2 °C	pH Verified: ☐ By:

Chain of Custody (Blank) - Rev 0.3 Dec. 2014

002842

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Emily Bacon

Client PO:
Project: 20412275
Custody: 63337

Report Date: 30-Nov-2021
Order Date: 24-Nov-2021

Order #: 2148345

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2148345-01	SED-W
2148345-02	SED-C
2148345-03	SED-E

Approved By:



Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 30-Nov-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 24-Nov-2021

Client PO:

Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Boron, available	MOE (HWE), EPA 200.8 - ICP-MS	29-Nov-21	29-Nov-21
Mercury by CVAA	EPA 7471B - CVAA, digestion	30-Nov-21	30-Nov-21
Metals, ICP-MS	EPA 6020 - Digestion - ICP-MS	29-Nov-21	29-Nov-21
REG 153: Metals by ICP/MS, soil	EPA 6020 - Digestion - ICP-MS	29-Nov-21	29-Nov-21
Solids, %	Gravimetric, calculation	26-Nov-21	26-Nov-21

Certificate of Analysis

Report Date: 30-Nov-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 24-Nov-2021

Client PO:

Project Description: 20412275

	Client ID:	SED-W	SED-C	SED-E	-
	Sample Date:	24-Nov-21 09:20	24-Nov-21 10:00	24-Nov-21 10:45	-
	Sample ID:	2148345-01	2148345-02	2148345-03	-
	MDL/Units	Soil	Soil	Soil	-
Physical Characteristics					
% Solids	0.1 % by Wt.	8.3	54.7	61.2	-
Metals					
Antimony	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Arsenic	1.0 ug/g dry	2.1	1.5	<1.0	-
Barium	1.0 ug/g dry	52.8	27.1	16.7	-
Beryllium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Boron	5.0 ug/g dry	26.7	<5.0	<5.0	-
Boron, available	0.5 ug/g dry	7.2	1.0	<0.5	-
Cadmium	0.5 ug/g dry	<0.5	<0.5	<0.5	-
Chromium	5.0 ug/g dry	16.2	13.5	10.5	-
Cobalt	1.0 ug/g dry	3.2	2.0	1.6	-
Copper	5.0 ug/g dry	16.3	16.2	<5.0	-
Iron	200 ug/g dry	8340	5100	6290	-
Lead	1.0 ug/g dry	6.2	4.2	4.8	-
Manganese	5 ug/g dry	268	74	68	-
Mercury	0.1 ug/g dry	<0.1	<0.1	<0.1	-
Molybdenum	1.0 ug/g dry	2.1	<1.0	<1.0	-
Nickel	5.0 ug/g dry	11.6	6.2	<5.0	-
Selenium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Silver	0.3 ug/g dry	<0.3	<0.3	<0.3	-
Thallium	1.0 ug/g dry	<1.0	<1.0	<1.0	-
Uranium	1.0 ug/g dry	1.7	<1.0	<1.0	-
Vanadium	10.0 ug/g dry	17.2	13.4	16.5	-
Zinc	20.0 ug/g dry	54.9	<20.0	<20.0	-

Certificate of Analysis

Report Date: 30-Nov-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 24-Nov-2021

Client PO:

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	ND	1.0	ug/g						
Arsenic	ND	1.0	ug/g						
Barium	ND	1.0	ug/g						
Beryllium	ND	0.5	ug/g						
Boron, available	ND	0.5	ug/g						
Boron	ND	5.0	ug/g						
Cadmium	ND	0.5	ug/g						
Chromium	ND	5.0	ug/g						
Cobalt	ND	1.0	ug/g						
Copper	ND	5.0	ug/g						
Iron	ND	200	ug/g						
Lead	ND	1.0	ug/g						
Mercury	ND	0.1	ug/g						
Manganese	ND	5	ug/g						
Molybdenum	ND	1.0	ug/g						
Nickel	ND	5.0	ug/g						
Selenium	ND	1.0	ug/g						
Silver	ND	0.3	ug/g						
Thallium	ND	1.0	ug/g						
Uranium	ND	1.0	ug/g						
Vanadium	ND	10.0	ug/g						
Zinc	ND	20.0	ug/g						

Certificate of Analysis

Report Date: 30-Nov-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 24-Nov-2021

Client PO:

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	1.5	1.0	ug/g dry	ND			NC	30	
Arsenic	8.9	1.0	ug/g dry	9.2			3.4	30	
Barium	80.0	1.0	ug/g dry	85.1			6.2	30	
Beryllium	0.6	0.5	ug/g dry	0.6			2.7	30	
Boron, available	ND	0.5	ug/g dry	ND			NC	35	
Boron	13.6	5.0	ug/g dry	13.1			3.9	30	
Cadmium	ND	0.5	ug/g dry	ND			NC	30	
Chromium	20.5	5.0	ug/g dry	20.8			1.6	30	
Cobalt	11.7	1.0	ug/g dry	11.8			1.3	30	
Copper	16.3	5.0	ug/g dry	17.0			3.8	30	
Lead	9.3	1.0	ug/g dry	9.6			3.8	30	
Mercury	ND	0.1	ug/g dry	ND			NC	30	
Molybdenum	2.9	1.0	ug/g dry	2.8			6.6	30	
Nickel	25.6	5.0	ug/g dry	27.1			5.5	30	
Selenium	ND	1.0	ug/g dry	ND			NC	30	
Silver	ND	0.3	ug/g dry	ND			NC	30	
Thallium	ND	1.0	ug/g dry	ND			NC	30	
Uranium	ND	1.0	ug/g dry	ND			NC	30	
Vanadium	30.6	10.0	ug/g dry	32.5			5.8	30	
Zinc	49.5	20.0	ug/g dry	48.4			2.1	30	
Physical Characteristics									
% Solids	95.1	0.1	% by Wt.	96.3			1.2	25	

Certificate of Analysis

Report Date: 30-Nov-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 24-Nov-2021

Client PO:

Project Description: 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Metals									
Antimony	39.1	1.0	ug/g	ND	77.9	70-130			
Arsenic	49.6	1.0	ug/g	3.7	91.8	70-130			
Barium	73.7	1.0	ug/g	34.1	79.2	70-130			
Beryllium	43.5	0.5	ug/g	ND	86.6	70-130			
Boron, available	3.83	0.5	ug/g	ND	76.7	70-122			
Boron	47.1	5.0	ug/g	5.3	83.6	70-130			
Cadmium	41.3	0.5	ug/g	ND	82.5	70-130			
Chromium	53.5	5.0	ug/g	8.3	90.3	70-130			
Cobalt	49.8	1.0	ug/g	4.7	90.1	70-130			
Copper	48.9	5.0	ug/g	6.8	84.2	70-130			
Iron	2780	200	ug/g	ND	111	70-130			
Lead	43.1	1.0	ug/g	3.8	78.5	70-130			
Mercury	1.53	0.1	ug/g	ND	102	70-130			
Manganese	56.4	5	ug/g	ND	113	70-130			
Molybdenum	45.2	1.0	ug/g	1.1	88.1	70-130			
Nickel	53.8	5.0	ug/g	10.8	85.8	70-130			
Selenium	42.9	1.0	ug/g	ND	85.6	70-130			
Silver	45.5	0.3	ug/g	ND	90.9	70-130			
Thallium	40.6	1.0	ug/g	ND	81.0	70-130			
Uranium	40.9	1.0	ug/g	ND	81.1	70-130			
Vanadium	57.7	10.0	ug/g	13.0	89.4	70-130			
Zinc	59.8	20.0	ug/g	ND	80.9	70-130			

Certificate of Analysis

Report Date: 30-Nov-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 24-Nov-2021

Client PO:

Project Description: 20412275

Qualifier Notes:

None

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Soil results are reported on a dry weight basis when the units are denoted with 'dry'.
Where %Solids is reported, moisture loss includes the loss of volatile hydrocarbons.

Paracel ID: 2148345

PARACEL LABORATORIES LTD.

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2148345	№ 63337

Client Name: GOLDER ASSOC.
Contact Name: EMILY BACON
Address: 1931 ROBERTSON RD OTTAWA ON
Telephone: 613 592-9600

Project Ref: 20912275
Quote #: 19-798-SW, 19-801-SED, 19-799 LEACHATE
PO #:
Email: ebacon@golder.com

Page 2 of 2

Turnaround Time
☐ 1 day ☐ 3 day
☐ 2 day ☑ Regular
Date Required:

☐ REG 153/04 ☐ REG 406/19

Other Regulation: ☐ REG 558 ☐ SewerCan ☐ COME ☐ MISA ☐ SU - Sani ☐ SU - Storm ☐ Other

Table: ☐ 1 ☐ Res/Park ☐ Med/Fine ☐ 2 ☐ Ind/Comm ☐ Coarse ☐ 3 ☐ Agri/Other ☐ For RSC: ☐ Yes ☐ No

Mun:

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analysis: 19-798-SW; 19-801-SED; 19-799 LEACHATE

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	19-798-SW	19-801-SED	19-799 LEACHATE
1	S-15	SW		7	11 24 21	1:30 PM	✓		
2	S-3	SW		1		1:45 PM	✓		
3	S-17	SW				2:10 PM	✓		
4	S-16	SW		↓		2:30 PM	✓		
5	SED-W	S		1		9:20 AM		✓	
6	SED-C	S		1		10 AM		✓	
7	SED-E	S		1		10:45 AM		✓	
8	L-5	GW		01	↓	12:25 PM			✓
9									
10									

Comments: FACILITY #6253 FOR EQUIS FILES.
INVOICE WASTE CONNECTIONS OF CANADA (HENRI HUNEAULT)

Method of Delivery: DROP OFF

Relinquished By (Sign)	Received By Driver/Depot	Received at Lab	Verified By
Relinquished By (Print): P. MACMILLAN	Date/Time	Date/Time: NOV 24/21 16:30	Date/Time: Nov 24, 2021 17:07
Date/Time: 11 24 21	Temperature: °C	Temperature: 4.7 °C	pH Verified: ☑ By:

Chain of Custody (Blank).xlsx

PARACEL LABORATORIES LTD

Paracel ID: 2148345

Paracel Order Number (Lab Use Only)	Chain Of Custody (Lab Use Only)
2148342 - (19-798)	Nº 63338
2148345 - SW1	
2148346 - (19-798)	

Client Name: GOLDER ASSOC.	Project Ref: 20412275	Page 1 of 2
Contact Name: EMILY BACON	Quote #: 19-798-SW	Turnaround Time: ☐ 1 day ☐ 3 day ☐ 2 day ☒ Regular
Address: 1931 ROBERTSON RD OTTAWA ON	PO #:	Date Required:
Telephone: 613-592-9600	E-mail: EBacon@golder.com henri.hunegnaw@wasteconnections.com	

☐ REG 153/04 ☐ REG 406/19	Other Regulation	Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)
☐ Table 1 ☐ Res/Park ☐ Med/Fine	☐ REG 558 ☒ PWQO	
☐ Table 2 ☐ Ind/Comm ☐ Coarse	☐ ICSME ☐ MISA	
☐ Table 3 ☐ Agri/Other	☐ SU - Sani ☐ SU - Storm	
☐ Table ___	Mun:	
For RSC: ☐ Yes ☐ No	☐ Other:	

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Required Analysis: SVOC + PAH - SW
1	S-8	SW		7	11/24/21	8:50 AM	✓
2	S-10					9:10 AM	✓
3	S-5					9:55 AM	✓
4	S-11					9:55 AM	✓
5	S-9					10:15 AM	✓
6	S-12					10:40 AM	✓
7	DUP-1					/	✓
8	S-20					11 AM	✓
9	S-21					12:45 PM	✓
10	S-1					1:10 PM	✓

Comments: FACILITY # 6253 PER GOULD FILES.
INVOICE WASTE CONNECTIONS OF CANADA (HENRI HUNEGNAW)

Method of Delivery: DELIVERY

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): F. ARMITAGE	Date/Time:	Date/Time: NOV 24, 2021 16:30	Date/Time: NOV 24, 2021 17:01
Date/Time: 11/24/21	Temperature: °C	Temperature: 7.3 °C	pH Verified: ✓ By:

Chain of Custody (Blank).xls

Revision 5.0

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-21-00015
Project: 20412275
Custody:

Report Date: 6-Dec-2021
Order Date: 2-Dec-2021

Order #: 2149553

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2149553-01	Trip Blank
2149553-02	Field Blank

Approved By:



Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

Certificate of Analysis

Report Date: 06-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	5-Dec-21	5-Dec-21

Certificate of Analysis

Report Date: 06-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	Trip Blank	Field Blank	-	-
	Sample Date:	30-Nov-21 09:00	30-Nov-21 09:00	-	-
	Sample ID:	2149553-01	2149553-02	-	-
	MDL/Units	Water	Water	-	-
Volatiles					
Acetone	5.0 ug/L	<5.0	<5.0	-	-
Benzene	0.5 ug/L	<0.5	<0.5	-	-
Bromodichloromethane	0.5 ug/L	<0.5	<0.5	-	-
Bromoform	0.5 ug/L	<0.5	<0.5	-	-
Bromomethane	0.5 ug/L	<0.5	<0.5	-	-
Carbon Tetrachloride	0.2 ug/L	<0.2	<0.2	-	-
Chlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
Chloroethane	1.0 ug/L	<1.0	<1.0	-	-
Chloroform	0.5 ug/L	<0.5	<0.5	-	-
Chloromethane	3.0 ug/L	<3.0	<3.0	-	-
Dibromochloromethane	0.5 ug/L	<0.5	<0.5	-	-
Dichlorodifluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,2-Dibromoethane	0.2 ug/L	<0.2	<0.2	-	-
1,2-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,4-Dichlorobenzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
cis-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,2-Dichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloroethylene, total	0.5 ug/L	<0.5	<0.5	-	-
1,2-Dichloropropane	0.5 ug/L	<0.5	<0.5	-	-
cis-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
trans-1,3-Dichloropropylene	0.5 ug/L	<0.5	<0.5	-	-
1,3-Dichloropropene, total	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Hexane	1.0 ug/L	<1.0	<1.0	-	-
Methyl Ethyl Ketone (2-Butanone)	5.0 ug/L	<5.0	<5.0	-	-
Methyl Butyl Ketone (2-Hexanone)	10.0 ug/L	<10.0	<10.0	-	-
Methyl Isobutyl Ketone	5.0 ug/L	<5.0	<5.0	-	-
Methyl tert-butyl ether	2.0 ug/L	<2.0	<2.0	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Styrene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-

Certificate of Analysis

Report Date: 06-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	Trip Blank	Field Blank	-	-
	Sample Date:	30-Nov-21 09:00	30-Nov-21 09:00	-	-
	Sample ID:	2149553-01	2149553-02	-	-
	MDL/Units	Water	Water	-	-
1,1,2,2-Tetrachloroethane	0.5 ug/L	<0.5	<0.5	-	-
Tetrachloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-
1,1,1-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
1,1,2-Trichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Trichloroethylene	0.5 ug/L	<0.5	<0.5	-	-
Trichlorofluoromethane	1.0 ug/L	<1.0	<1.0	-	-
1,3,5-Trimethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Xylenes, total	0.5 ug/L	<0.5	<0.5	-	-
4-Bromofluorobenzene	Surrogate	105%	105%	-	-
Dibromofluoromethane	Surrogate	91.8%	93.2%	-	-
Toluene-d8	Surrogate	92.0%	91.7%	-	-

Certificate of Analysis

Report Date: 06-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L						
Benzene	ND	0.5	ug/L						
Bromodichloromethane	ND	0.5	ug/L						
Bromoform	ND	0.5	ug/L						
Bromomethane	ND	0.5	ug/L						
Carbon Tetrachloride	ND	0.2	ug/L						
Chlorobenzene	ND	0.5	ug/L						
Chloroethane	ND	1.0	ug/L						
Chloroform	ND	0.5	ug/L						
Chloromethane	ND	3.0	ug/L						
Dibromochloromethane	ND	0.5	ug/L						
Dichlorodifluoromethane	ND	1.0	ug/L						
1,2-Dibromoethane	ND	0.2	ug/L						
1,2-Dichlorobenzene	ND	0.5	ug/L						
1,3-Dichlorobenzene	ND	0.5	ug/L						
1,4-Dichlorobenzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
1,2-Dichloroethane	ND	0.5	ug/L						
1,1-Dichloroethylene	ND	0.5	ug/L						
cis-1,2-Dichloroethylene	ND	0.5	ug/L						
trans-1,2-Dichloroethylene	ND	0.5	ug/L						
1,2-Dichloroethylene, total	ND	0.5	ug/L						
1,2-Dichloropropane	ND	0.5	ug/L						
cis-1,3-Dichloropropylene	ND	0.5	ug/L						
trans-1,3-Dichloropropylene	ND	0.5	ug/L						
1,3-Dichloropropene, total	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Hexane	ND	1.0	ug/L						
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L						
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L						
Methyl Isobutyl Ketone	ND	5.0	ug/L						
Methyl tert-butyl ether	ND	2.0	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Styrene	ND	0.5	ug/L						
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L						
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L						
Tetrachloroethylene	ND	0.5	ug/L						
Toluene	ND	0.5	ug/L						
1,1,1-Trichloroethane	ND	0.5	ug/L						
1,1,2-Trichloroethane	ND	0.5	ug/L						
Trichloroethylene	ND	0.5	ug/L						
Trichlorofluoromethane	ND	1.0	ug/L						
1,3,5-Trimethylbenzene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Xylenes, total	ND	0.5	ug/L						
Surrogate: 4-Bromofluorobenzene	*78.0*		*ug/L*		*97.5*	*50-140*			
Surrogate: Dibromofluoromethane	*58.7*		*ug/L*		*73.4*	*50-140*			
Surrogate: Toluene-d8	*75.0*		*ug/L*		*93.7*	*50-140*			

Certificate of Analysis

Report Date: 06-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	ND	5.0	ug/L	ND			NC	30	
Benzene	ND	0.5	ug/L	ND			NC	30	
Bromodichloromethane	ND	0.5	ug/L	ND			NC	30	
Bromoform	ND	0.5	ug/L	ND			NC	30	
Bromomethane	ND	0.5	ug/L	ND			NC	30	
Carbon Tetrachloride	ND	0.2	ug/L	ND			NC	30	
Chlorobenzene	ND	0.5	ug/L	ND			NC	30	
Chloroethane	ND	1.0	ug/L	ND			NC	30	
Chloroform	ND	0.5	ug/L	ND			NC	30	
Chloromethane	ND	3.0	ug/L	ND			NC	30	
Dibromochloromethane	ND	0.5	ug/L	ND			NC	30	
Dichlorodifluoromethane	ND	1.0	ug/L	ND			NC	30	
1,2-Dibromoethane	ND	0.2	ug/L	ND			NC	30	
1,2-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,3-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,4-Dichlorobenzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
cis-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
trans-1,2-Dichloroethylene	ND	0.5	ug/L	ND			NC	30	
1,2-Dichloropropane	ND	0.5	ug/L	ND			NC	30	
cis-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
trans-1,3-Dichloropropylene	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Hexane	ND	1.0	ug/L	ND			NC	30	
Methyl Ethyl Ketone (2-Butanone)	ND	5.0	ug/L	ND			NC	30	
Methyl Butyl Ketone (2-Hexanone)	ND	10.0	ug/L	ND			NC	30	
Methyl Isobutyl Ketone	ND	5.0	ug/L	ND			NC	30	
Methyl tert-butyl ether	ND	2.0	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Styrene	ND	0.5	ug/L	ND			NC	30	
1,1,1,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2,2-Tetrachloroethane	ND	0.5	ug/L	ND			NC	30	
Tetrachloroethylene	ND	0.5	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
1,1,1-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
1,1,2-Trichloroethane	ND	0.5	ug/L	ND			NC	30	
Trichloroethylene	ND	0.5	ug/L	ND			NC	30	
Trichlorofluoromethane	ND	1.0	ug/L	ND			NC	30	
1,3,5-Trimethylbenzene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: 4-Bromofluorobenzene	*84.6*		*ug/L*		*106*	*50-140*			
Surrogate: Dibromofluoromethane	*76.4*		*ug/L*		*95.6*	*50-140*			
Surrogate: Toluene-d8	*75.4*		*ug/L*		*94.3*	*50-140*			

Certificate of Analysis

Report Date: 06-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Volatiles									
Acetone	99.7	5.0	ug/L	ND	99.7	50-140			
Benzene	34.8	0.5	ug/L	ND	87.0	60-130			
Bromodichloromethane	29.2	0.5	ug/L	ND	73.0	60-130			
Bromoform	33.1	0.5	ug/L	ND	82.8	60-130			
Bromomethane	42.2	0.5	ug/L	ND	105	50-140			
Carbon Tetrachloride	34.5	0.2	ug/L	ND	86.3	60-130			
Chlorobenzene	33.9	0.5	ug/L	ND	84.7	60-130			
Chloroethane	37.9	1.0	ug/L	ND	94.8	50-140			
Chloroform	33.8	0.5	ug/L	ND	84.6	60-130			
Chloromethane	41.0	3.0	ug/L	ND	102	50-140			
Dibromochloromethane	37.2	0.5	ug/L	ND	92.9	60-130			
Dichlorodifluoromethane	40.9	1.0	ug/L	ND	102	50-140			
1,2-Dibromoethane	37.3	0.2	ug/L	ND	93.2	60-130			
1,2-Dichlorobenzene	33.7	0.5	ug/L	ND	84.2	60-130			
1,3-Dichlorobenzene	34.3	0.5	ug/L	ND	85.8	60-130			
1,4-Dichlorobenzene	33.7	0.5	ug/L	ND	84.4	60-130			
1,1-Dichloroethane	33.3	0.5	ug/L	ND	83.2	60-130			
1,2-Dichloroethane	30.3	0.5	ug/L	ND	75.8	60-130			
1,1-Dichloroethylene	44.3	0.5	ug/L	ND	111	60-130			
cis-1,2-Dichloroethylene	31.3	0.5	ug/L	ND	78.2	60-130			
trans-1,2-Dichloroethylene	33.4	0.5	ug/L	ND	83.6	60-130			
1,2-Dichloropropane	36.0	0.5	ug/L	ND	90.0	60-130			
cis-1,3-Dichloropropylene	39.3	0.5	ug/L	ND	98.2	60-130			
trans-1,3-Dichloropropylene	39.2	0.5	ug/L	ND	98.0	60-130			
Ethylbenzene	33.1	0.5	ug/L	ND	82.8	60-130			
Hexane	37.8	1.0	ug/L	ND	94.4	60-130			
Methyl Ethyl Ketone (2-Butanone)	92.4	5.0	ug/L	ND	92.4	50-140			
Methyl Butyl Ketone (2-Hexanone)	112	10.0	ug/L	ND	112	50-140			
Methyl Isobutyl Ketone	108	5.0	ug/L	ND	108	50-140			
Methyl tert-butyl ether	117	2.0	ug/L	ND	117	50-140			
Methylene Chloride	36.4	5.0	ug/L	ND	90.9	60-130			
Styrene	32.2	0.5	ug/L	ND	80.4	60-130			
1,1,1,2-Tetrachloroethane	37.2	0.5	ug/L	ND	93.1	60-130			
1,1,2,2-Tetrachloroethane	40.2	0.5	ug/L	ND	100	60-130			
Tetrachloroethylene	32.9	0.5	ug/L	ND	82.2	60-130			
Toluene	33.4	0.5	ug/L	ND	83.4	60-130			
1,1,1-Trichloroethane	34.9	0.5	ug/L	ND	87.2	60-130			
1,1,2-Trichloroethane	38.7	0.5	ug/L	ND	96.8	60-130			
Trichloroethylene	36.0	0.5	ug/L	ND	90.0	60-130			
Trichlorofluoromethane	33.0	1.0	ug/L	ND	82.6	60-130			
1,3,5-Trimethylbenzene	34.7	0.5	ug/L	ND	86.7	60-130			
Vinyl chloride	35.7	0.5	ug/L	ND	89.2	50-140			
m,p-Xylenes	64.8	0.5	ug/L	ND	81.0	60-130			
o-Xylene	32.5	0.5	ug/L	ND	81.2	60-130			
Surrogate: 4-Bromofluorobenzene	*102*		*ug/L*		*128*	*50-140*			
Surrogate: Dibromofluoromethane	*90.5*		*ug/L*		*113*	*50-140*			
Surrogate: Toluene-d8	*73.4*		*ug/L*		*91.7*	*50-140*			

Certificate of Analysis

Report Date: 06-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Qualifier Notes:

Login Qualifiers :

Samples received submerged in water, possibly melted ice. This condition can compromise sample integrity.

Applies to samples: Trip , Field

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Paracel ID: 2149553

PARACEL LABORATORIES LTD. | RELIABLE.

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Ottawa, Ontario K1G 4J8
t: 1-800-749-1947
e: paracel@paracellabs.com
www.paracellabs.com

Chain of Custody (Lab Use Only)

Page 1 of 1

Client Name:	Golder Associates	Project Reference:	20417275
Contact Name:	Yannick Marcoux	Quote #:	19-809 QAQC
Address:	1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #:	7146-21-00015
Telephone:	613-592-9600	Email Address:	yannick_marcoux@golder.com, emily_bacon@golder.com hasan.hamoudi@wasteconnections.com

TAT: ☑ Regular ☐ 3 Day ☐ 2 Day ☐ 1 Day

Date Required:

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality ☑ Other: GQWQS

Matrix Types: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2149553

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote	Required Analyses
1	Trip Blank				11/30/21		✓	
2	Field Blank				"		✓	
3								
4								
5								
6								
7								
8								
9								
10								

Comments: Invoice to Waste Connections of Canada PO#7146-21-00015
EQuIS Facility Number 6053

Method of Delivery: Walked

Relinquished By (Sign):	Received By Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): M. MacLeod	Date/Time: 1203/21 4:10pm	Date/Time: Dec 3 2021 10:04	Date/Time: DEC 3 2021 1451
Date/Time: 1203 21	Temperature: 8.3 °C	Temperature: 5.7 °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 8.3 Oct. 2014

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Certificate of Analysis

Golder Associates Ltd. (Ottawa)

1931 Robertson Rd.
Ottawa, ON K2H 5B7
Attn: Yannick Marcerou

Client PO: 7145-21-00015
Project: 20412275
Custody:

Report Date: 15-Dec-2021
Order Date: 2-Dec-2021

Order #: 2149547

This Certificate of Analysis contains analytical data applicable to the following samples as submitted:

Paracel ID	Client ID
2149547-01	92-19
2149547-02	05-1D
2149547-03	95-8
2149547-04	92-18
2149547-05	98-1
2149547-06	05-1C
2149547-07	05-R3
2149547-08	05-8
2149547-09	05-11
2149547-10	05-3D
2149547-11	07-1D
2149547-12	MW-C
2149547-13	MW-E
2149547-14	92-7
2149547-15	92-10
2149547-16	94-2
2149547-17	94-6
2149547-18	95-3
2149547-19	95-7
2149547-20	05-3C
2149547-21	07-1C
2149547-22	94-5
2149547-23	95-2
2149547-24	95-6
2149547-25	92-16
2149547-26	05-1B
2149547-27	11-1
2149547-28	92-5
2149547-29	92-9
2149547-30	94-1

Approved By:



Dale Robertson, BSc
Laboratory Director

Any use of these results implies your agreement that our total liabilty in connection with this work, however arising, shall be limited to the amount paid by you for this work, and that our employees or agents shall not under any circumstances be liable to you in connection with this work.

2149547-31	05-3B
2149547-32	07-1B
2149547-33	94-4
2149547-34	95-5
2149547-35	92-12
2149547-36	05-1A
2149547-37	92-1
2149547-38	05-3A
2149547-39	07-1A
2149547-40	Dupe-2
2149547-41	Dupe-3
2149547-42	Dupe-4

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Analysis Summary Table

Analysis	Method Reference/Description	Extraction Date	Analysis Date
Alkalinity, bicarbonate	calculated from EPA 310.1 - Titration to pH 4.5	6-Dec-21	6-Dec-21
Alkalinity, carbonate	calculated from EPA 310.1 - Titration to pH 4.5	6-Dec-21	6-Dec-21
Alkalinity, total to pH 4.5	EPA 310.1 - Titration to pH 4.5	6-Dec-21	6-Dec-21
Ammonia, as N	EPA 351.2 - Auto Colour	6-Dec-21	6-Dec-21
Anions	EPA 300.1 - IC	6-Dec-21	6-Dec-21
Chemical Oxygen Demand	EPA 410.1 - Digestion, Colourimetric	6-Dec-21	6-Dec-21
Hardness	Hardness as CaCO3	3-Dec-21	15-Dec-21
Metals, ICP-MS	EPA 200.8 - ICP-MS	3-Dec-21	3-Dec-21
Phenolics	EPA 420.2 - Auto Colour, 4AAP	7-Dec-21	7-Dec-21
Phosphorus, total, water	EPA 365.4 - Auto Colour, digestion	6-Dec-21	7-Dec-21
Total Dissolved Solids	SM 2540C - gravimetric, filtration	6-Dec-21	6-Dec-21
Total Kjeldahl Nitrogen	EPA 351.2 - Auto Colour, digestion	7-Dec-21	8-Dec-21
VOCs by P&T GC-MS	EPA 624 - P&T GC-MS	4-Dec-21	4-Dec-21

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	92-19	05-1D	95-8	92-18
	Sample Date:	30-Nov-21 13:50	30-Nov-21 17:20	30-Nov-21 11:30	30-Nov-21 13:30
	Sample ID:	2149547-01	2149547-02	2149547-03	2149547-04
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	412	321	904	199
Alkalinity, bicarbonate	5 mg/L	412	320	903	197
Alkalinity, carbonate	5 mg/L	<5	<5	<5	<5
Ammonia as N	0.01 mg/L	0.37	0.04	2.16	0.09
Chemical Oxygen Demand	10 mg/L	180	23	124	114
Hardness	mg/L	487	425	751	445
Phenolics	0.001 mg/L	<0.001	<0.001	<0.002 [1]	<0.001
Phosphorus, total	0.01 mg/L	4.69	0.07	0.96	0.90
Total Dissolved Solids	10 mg/L	1230	1130	1230	896
Total Kjeldahl Nitrogen	0.1 mg/L	1.4	0.3	3.7	0.4
Anions					
Chloride	1 mg/L	323	412	163	368
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	188	86	8	35
Metals					
Arsenic	1 ug/L	<1	<1	<1	3
Boron	10 ug/L	51	19	47	25
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	151000	125000	191000	120000
Chromium	1 ug/L	<1	<1	8	<1
Cobalt	0.5 ug/L	1.4	<0.5	1.9	<0.5
Copper	0.5 ug/L	7.8	5.4	41.5	2.5
Iron	100 ug/L	<100	<100	1150	<100
Lead	0.1 ug/L	0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	27000	27300	66400	35100
Manganese	5 ug/L	2520	15	8290	582
Potassium	100 ug/L	16700	7120	14800	6050
Sodium	200 ug/L	324000	187000	110000	79900
Zinc	5 ug/L	6	7	<5	7
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	92-19	05-1D	95-8	92-18
	Sample Date:	30-Nov-21 13:50	30-Nov-21 17:20	30-Nov-21 11:30	30-Nov-21 13:30
	Sample ID:	2149547-01	2149547-02	2149547-03	2149547-04
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	93.0%	92.7%	93.0%	93.0%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	98-1	05-1C	05-R3	05-8
	Sample Date:	30-Nov-21 11:45	30-Nov-21 17:15	30-Nov-21 12:20	30-Nov-21 12:40
	Sample ID:	2149547-05	2149547-06	2149547-07	2149547-08
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	401	176	737	1260
Alkalinity, bicarbonate	5 mg/L	398	174	733	1260
Alkalinity, carbonate	5 mg/L	<5	<5	<5	<25
Ammonia as N	0.01 mg/L	0.97	0.10	0.02	0.81
Chemical Oxygen Demand	10 mg/L	40	13	26	130
Hardness	mg/L	276	139	615	863
Phenolics	0.001 mg/L	<0.001	<0.001	<0.001	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.40	0.35	0.02	0.16
Total Dissolved Solids	10 mg/L	1120	236	1050	1260
Total Kjeldahl Nitrogen	0.1 mg/L	1.4	0.3	0.2	3.0
Anions					
Chloride	1 mg/L	470	51	13	45
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.2	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	2	44	252	<1
Metals					
Arsenic	1 ug/L	<1	2	<1	<1
Boron	10 ug/L	145	60	367	1410
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	59000	34300	148000	192000
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	0.8
Copper	0.5 ug/L	0.7	1.3	1.6	1.1
Iron	100 ug/L	647	280	<100	6170
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	31200	12800	59600	93300
Manganese	5 ug/L	388	35	65	11200
Potassium	100 ug/L	12600	4380	7030	6490
Sodium	200 ug/L	293000	44700	123000	108000
Zinc	5 ug/L	<5	10	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	98-1	05-1C	05-R3	05-8
	Sample Date:	30-Nov-21 11:45	30-Nov-21 17:15	30-Nov-21 12:20	30-Nov-21 12:40
	Sample ID:	2149547-05	2149547-06	2149547-07	2149547-08
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	92.7%	93.2%	93.0%	93.3%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	05-11	05-3D	07-1D	MW-C
	Sample Date:	30-Nov-21 14:25	30-Nov-21 16:15	30-Nov-21 15:30	30-Nov-21 08:55
	Sample ID:	2149547-09	2149547-10	2149547-11	2149547-12
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	555	755	461	310
Alkalinity, bicarbonate	5 mg/L	554	748	459	306
Alkalinity, carbonate	5 mg/L	<5	7	<5	<5
Ammonia as N	0.01 mg/L	0.47	0.24	0.07	0.06
Chemical Oxygen Demand	10 mg/L	64	18	51	163
Hardness	mg/L	578	328	495	357
Phenolics	0.001 mg/L	<0.004 [1]	<0.001	<0.001	<0.001
Phosphorus, total	0.01 mg/L	0.07	0.12	0.71	1.45
Total Dissolved Solids	10 mg/L	746	1010	720	770
Total Kjeldahl Nitrogen	0.1 mg/L	1.1	0.5	1.2	2.1
Anions					
Chloride	1 mg/L	17	107	11	71
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.6	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	188	94	187	266
Metals					
Arsenic	1 ug/L	<1	<1	<1	2
Boron	10 ug/L	592	418	175	251
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	145000	57500	136000	86500
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	1.0	0.5	<0.5	<0.5
Copper	0.5 ug/L	0.9	1.8	2.7	5.8
Iron	100 ug/L	3750	<100	898	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	0.2
Magnesium	200 ug/L	52800	44800	37400	34200
Manganese	5 ug/L	2950	648	369	<5
Potassium	100 ug/L	6450	13100	5750	4950
Sodium	200 ug/L	41600	244000	39800	112000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	05-11	05-3D	07-1D	MW-C
	Sample Date:	30-Nov-21 14:25	30-Nov-21 16:15	30-Nov-21 15:30	30-Nov-21 08:55
	Sample ID:	2149547-09	2149547-10	2149547-11	2149547-12
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	91.4%	93.0%	92.0%	92.8%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	MW-E	92-7	92-10	94-2
	Sample Date:	30-Nov-21 09:10	30-Nov-21 12:50	30-Nov-21 14:35	30-Nov-21 08:05
	Sample ID:	2149547-13	2149547-14	2149547-15	2149547-16
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	241	646	807	879
Alkalinity, bicarbonate	5 mg/L	239	636	801	866
Alkalinity, carbonate	5 mg/L	<5	9	5	13
Ammonia as N	0.01 mg/L	0.05	0.84	0.34	0.11
Chemical Oxygen Demand	10 mg/L	73	46	159	83
Hardness	mg/L	370	215	511	224
Phenolics	0.001 mg/L	<0.001	<0.001	<0.004 [1]	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.31	0.43	0.18	0.70
Total Dissolved Solids	10 mg/L	772	1330	1170	1670
Total Kjeldahl Nitrogen	0.1 mg/L	0.9	1.5	0.9	0.8
Anions					
Chloride	1 mg/L	80	420	229	457
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	271	1	39	9
Metals					
Arsenic	1 ug/L	<1	<1	<1	3
Boron	10 ug/L	343	412	820	360
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	100000	31300	87800	33600
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	0.7	0.5
Copper	0.5 ug/L	3.9	1.0	1.5	1.1
Iron	100 ug/L	<100	182	781	397
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	29100	33100	70700	34100
Manganese	5 ug/L	<5	124	1650	599
Potassium	100 ug/L	1740	14700	17300	12700
Sodium	200 ug/L	75900	419000	277000	555000
Zinc	5 ug/L	10	<5	6	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	MW-E	92-7	92-10	94-2
	Sample Date:	30-Nov-21 09:10	30-Nov-21 12:50	30-Nov-21 14:35	30-Nov-21 08:05
	Sample ID:	2149547-13	2149547-14	2149547-15	2149547-16
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	93.3%	93.2%	91.9%	92.6%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	94-6	95-3	95-7	05-3C
	Sample Date:	30-Nov-21 10:15	30-Nov-21 08:20	30-Nov-21 09:40	30-Nov-21 16:10
	Sample ID:	2149547-17	2149547-18	2149547-19	2149547-20
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	316	612	622	1040
Alkalinity, bicarbonate	5 mg/L	315	604	612	1030
Alkalinity, carbonate	5 mg/L	<5	8	10	<25
Ammonia as N	0.01 mg/L	0.03	0.21	0.03	1.75
Chemical Oxygen Demand	10 mg/L	63	96	80	84
Hardness	mg/L	349	159	231	93.7
Phenolics	0.001 mg/L	<0.001	<0.001	<0.001	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.40	16.1	0.40	2.27
Total Dissolved Solids	10 mg/L	1170	1000	1440	1720
Total Kjeldahl Nitrogen	0.1 mg/L	0.9	5.1	0.9	3.1
Anions					
Chloride	1 mg/L	245	150	452	339
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	325	101	8	3
Metals					
Arsenic	1 ug/L	<1	<1	1	5
Boron	10 ug/L	274	819	401	1430
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	70900	25200	36200	11300
Chromium	1 ug/L	<1	<1	<1	1
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	1.1
Copper	0.5 ug/L	2.2	1.4	3.3	1.6
Iron	100 ug/L	248	<100	<100	939
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	41700	23200	34100	15900
Manganese	5 ug/L	871	195	808	46
Potassium	100 ug/L	5090	6900	9280	14500
Sodium	200 ug/L	263000	320000	408000	562000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	94-6	95-3	95-7	05-3C
	Sample Date:	30-Nov-21 10:15	30-Nov-21 08:20	30-Nov-21 09:40	30-Nov-21 16:10
	Sample ID:	2149547-17	2149547-18	2149547-19	2149547-20
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	93.2%	92.8%	92.4%	91.5%

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Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

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Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	07-1C	94-5	95-2	95-6
	Sample Date:	30-Nov-21 15:20	30-Nov-21 10:40	30-Nov-21 08:30	30-Nov-21 09:50
	Sample ID:	2149547-21	2149547-22	2149547-23	2149547-24
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	684	870	1200	955
Alkalinity, bicarbonate	5 mg/L	674	857	1190	950
Alkalinity, carbonate	5 mg/L	10	13	<25	<25
Ammonia as N	0.01 mg/L	0.31	0.52	1.20	1.47
Chemical Oxygen Demand	10 mg/L	51	91	82	72
Hardness	mg/L	165	369	227	326
Phenolics	0.001 mg/L	<0.001	<0.004 [1]	<0.004 [1]	<0.004 [1]
Phosphorus, total	0.01 mg/L	0.56	0.83	0.92	0.54
Total Dissolved Solids	10 mg/L	1650	2120	2230	2270
Total Kjeldahl Nitrogen	0.1 mg/L	0.8	1.2	2.1	2.4
Anions					
Chloride	1 mg/L	454	779	631	846
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	97	15	2	<1
Metals					
Arsenic	1 ug/L	3	<1	1	1
Boron	10 ug/L	398	473	799	650
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	25100	49900	28600	43600
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	0.7	0.9	<0.5	0.6
Copper	0.5 ug/L	1.1	2.5	0.9	1.0
Iron	100 ug/L	241	<100	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	25000	59200	37800	52700
Manganese	5 ug/L	488	2360	41	187
Potassium	100 ug/L	13300	11500	15900	17300
Sodium	200 ug/L	457000	581000	641000	685000
Zinc	5 ug/L	6	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	07-1C	94-5	95-2	95-6
	Sample Date:	30-Nov-21 15:20	30-Nov-21 10:40	30-Nov-21 08:30	30-Nov-21 09:50
	Sample ID:	2149547-21	2149547-22	2149547-23	2149547-24
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	92.4%	92.6%	91.9%	91.4%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	92-16	05-1B	11-1	92-5
	Sample Date:	30-Nov-21 14:05	30-Nov-21 17:05	30-Nov-21 12:00	30-Nov-21 13:00
	Sample ID:	2149547-25	2149547-26	2149547-27	2149547-28
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	194	268	545	810
Alkalinity, bicarbonate	5 mg/L	188	260	537	790
Alkalinity, carbonate	5 mg/L	5	7	8	19
Ammonia as N	0.01 mg/L	0.96	0.24	0.89	2.19
Chemical Oxygen Demand	10 mg/L	207	78	37	303
Hardness	mg/L	52.4	20.4	257	260
Phenolics	0.001 mg/L	<0.001	<0.001	<0.004 [1]	<0.004 [1]
Phosphorus, total	0.01 mg/L	13.7	2.18	0.43	13.9
Total Dissolved Solids	10 mg/L	316	338	1610	2700
Total Kjeldahl Nitrogen	0.1 mg/L	7.5	0.9	1.2	7.3
Anions					
Chloride	1 mg/L	26	19	696	1100
Nitrate as N	0.1 mg/L	<0.1	0.5	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	<0.05	<0.05
Sulphate	1 mg/L	6	14	1	<1
Metals					
Arsenic	1 ug/L	2	4	2	3
Boron	10 ug/L	114	258	252	954
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	11900	4190	48900	31600
Chromium	1 ug/L	<1	<1	<1	<1
Cobalt	0.5 ug/L	<0.5	<0.5	1.4	0.7
Copper	0.5 ug/L	2.9	2.6	1.5	3.5
Iron	100 ug/L	<100	<100	102	322
Lead	0.1 ug/L	<0.1	<0.1	<0.1	0.2
Magnesium	200 ug/L	5520	2410	32700	44000
Manganese	5 ug/L	50	10	479	80
Potassium	100 ug/L	4860	5710	16900	25100
Sodium	200 ug/L	58200	106000	492000	812000
Zinc	5 ug/L	<5	5	6	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	92-16	05-1B	11-1	92-5
	Sample Date:	30-Nov-21 14:05	30-Nov-21 17:05	30-Nov-21 12:00	30-Nov-21 13:00
	Sample ID:	2149547-25	2149547-26	2149547-27	2149547-28
	MDL/Units	Water	Water	Water	Water
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	91.2%	91.0%	92.6%	90.3%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	92-9	94-1	05-3B	07-1B
	Sample Date:	30-Nov-21 14:25	30-Nov-21 07:55	30-Nov-21 16:00	30-Nov-21 15:10
	Sample ID:	2149547-29	2149547-30	2149547-31	2149547-32
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	738	1150	1120	973
Alkalinity, bicarbonate	5 mg/L	734	1140	1110	967
Alkalinity, carbonate	5 mg/L	<5	<25	<25	6
Ammonia as N	0.01 mg/L	1.12	2.25	2.73	3.79
Chemical Oxygen Demand	10 mg/L	86	92	91	124
Hardness	mg/L	206	214	78.1	368
Phenolics	0.001 mg/L	<0.004 [1]	<0.004 [1]	<0.004 [1]	<0.004 [1]
Phosphorus, total	0.01 mg/L	1.01	1.74	6.33	1.62
Total Dissolved Solids	10 mg/L	2130	2940	1890	3360
Total Kjeldahl Nitrogen	0.1 mg/L	2.4	3.2	4.2	5.5
Anions					
Chloride	1 mg/L	820	1050	442	1440
Nitrate as N	0.1 mg/L	<0.1	<0.1	0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	0.39	<1.00 [2]
Sulphate	1 mg/L	1	<1	3	<1
Metals					
Arsenic	1 ug/L	3	3	2	3
Boron	10 ug/L	755	1400	1920	846
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	25300	25000	9000	41700
Chromium	1 ug/L	<1	<1	1	<1
Cobalt	0.5 ug/L	0.6	<0.5	<0.5	0.6
Copper	0.5 ug/L	1.2	0.8	1.2	1.2
Iron	100 ug/L	<100	128	519	<100
Lead	0.1 ug/L	<0.1	<0.1	0.1	<0.1
Magnesium	200 ug/L	34600	36700	13500	64100
Manganese	5 ug/L	68	104	27	76
Potassium	100 ug/L	21500	23200	18300	26900
Sodium	200 ug/L	669000	909000	637000	874000
Zinc	5 ug/L	<5	<5	<5	<5
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	92-9	94-1	05-3B	07-1B
	Sample Date:	30-Nov-21 14:25	30-Nov-21 07:55	30-Nov-21 16:00	30-Nov-21 15:10
	Sample ID:	2149547-29	2149547-30	2149547-31	2149547-32
	MDL/Units	Water	Water	Water	Water
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	90.9%	90.9%	91.2%	90.7%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	94-4	95-5	92-12	05-1A
	Sample Date:	30-Nov-21 10:25	30-Nov-21 09:30	30-Nov-21 13:45	30-Nov-21 16:50
	Sample ID:	2149547-33	2149547-34	2149547-35	2149547-36
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	1340	1250	669	1080
Alkalinity, bicarbonate	5 mg/L	1330	1250	655	1060
Alkalinity, carbonate	5 mg/L	<25	<25	14	<25 [2]
Ammonia as N	0.01 mg/L	4.34	3.60	1.06	1.93
Chemical Oxygen Demand	10 mg/L	195	129	48	333
Hardness	mg/L	451	355	29.3	46.7
Phenolics	0.001 mg/L	<0.004 [1]	<0.004 [1]	<0.001	<0.002 [1]
Phosphorus, total	0.01 mg/L	5.57	1.67	2.30	8.55
Total Dissolved Solids	10 mg/L	3970	3580	910	1770
Total Kjeldahl Nitrogen	0.1 mg/L	7.4	5.0	1.7	8.0
Anions					
Chloride	1 mg/L	1630	1420	131	203
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<1.00 [2]	<1.00 [2]	<0.05	<0.05
Sulphate	1 mg/L	<1	2	<1	2
Metals					
Arsenic	1 ug/L	2	2	<1	2
Boron	10 ug/L	1570	1620	861	1490
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Calcium	100 ug/L	44800	37500	3880	4790
Chromium	1 ug/L	<1	<1	<1	1
Cobalt	0.5 ug/L	0.5	0.5	<0.5	<0.5
Copper	0.5 ug/L	1.1	1.1	1.2	1.0
Iron	100 ug/L	101	151	<100	<100
Lead	0.1 ug/L	<0.1	<0.1	<0.1	<0.1
Magnesium	200 ug/L	82300	63400	4760	8440
Manganese	5 ug/L	105	77	<5	<5
Potassium	100 ug/L	29900	28800	9730	13300
Sodium	200 ug/L	1090000	963000	308000	504000
Zinc	5 ug/L	<5	<5	6	6
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	94-4	95-5	92-12	05-1A
	Sample Date:	30-Nov-21 10:25	30-Nov-21 09:30	30-Nov-21 13:45	30-Nov-21 16:50
	Sample ID:	2149547-33	2149547-34	2149547-35	2149547-36
	MDL/Units	Water	Water	Water	Water
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	91.4%	91.4%	90.3%	90.9%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	92-1	05-3A	07-1A	Dupe-2
	Sample Date:	30-Nov-21 13:10	30-Nov-21 15:50	30-Nov-21 15:00	30-Nov-21 09:00
	Sample ID:	2149547-37	2149547-38	2149547-39	2149547-40
	MDL/Units	Water	Water	Water	Water
General Inorganics					
Alkalinity, total	5 mg/L	780	834	830	905
Alkalinity, bicarbonate	5 mg/L	763	820	816	904
Alkalinity, carbonate	5 mg/L	16	14	14	<5
Ammonia as N	0.01 mg/L	0.97	0.80	1.66	2.57
Chemical Oxygen Demand	10 mg/L	65	34	38	131
Hardness	mg/L	41.1	33.3	68.3	761
Phenolics	0.001 mg/L	<0.001	<0.002 [1]	<0.001	0.002
Phosphorus, total	0.01 mg/L	1.25	0.17	0.42	0.04
Total Dissolved Solids	10 mg/L	1350	1280	1720	1200
Total Kjeldahl Nitrogen	0.1 mg/L	1.7	1.2	2.0	3.5
Anions					
Chloride	1 mg/L	336	287	522	169
Nitrate as N	0.1 mg/L	<0.1	<0.1	<0.1	<0.1
Nitrite as N	0.05 mg/L	<0.05	<0.05	0.21	<0.05
Sulphate	1 mg/L	<1	<1	<1	9
Metals					
Arsenic	1 ug/L	<1	<1	<1	<1
Boron	10 ug/L	877	807	906	52
Cadmium	0.1 ug/L	<0.1	<0.1	<0.1	0.1
Calcium	100 ug/L	5420	4700	7150	195000
Chromium	1 ug/L	<1	<1	<1	7
Cobalt	0.5 ug/L	<0.5	<0.5	<0.5	1.1
Copper	0.5 ug/L	4.0	1.0	0.9	73.7
Iron	100 ug/L	<100	<100	142	<100
Lead	0.1 ug/L	0.2	<0.1	<0.1	<0.1
Magnesium	200 ug/L	6690	5240	12300	66400
Manganese	5 ug/L	10	6	<5	8330
Potassium	100 ug/L	12000	8480	15700	14400
Sodium	200 ug/L	490000	489000	570000	110000
Zinc	5 ug/L	<5	5	<5	7
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Ethylbenzene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Methylene Chloride	5.0 ug/L	<5.0	<5.0	<5.0	<5.0
Toluene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	92-1	05-3A	07-1A	Dupe-2
	Sample Date:	30-Nov-21 13:10	30-Nov-21 15:50	30-Nov-21 15:00	30-Nov-21 09:00
	Sample ID:	2149547-37	2149547-38	2149547-39	2149547-40
	MDL/Units	Water	Water	Water	Water
Vinyl chloride	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
o-Xylene	0.5 ug/L	<0.5	<0.5	<0.5	<0.5
Toluene-d8	Surrogate	90.4%	91.2%	92.2%	91.2%

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	Dupe-3	Dupe-4	-	-
	Sample Date:	30-Nov-21 09:00	30-Nov-21 09:00	-	-
	Sample ID:	2149547-41	2149547-42	-	-
	MDL/Units	Water	Water	-	-
General Inorganics					
Alkalinity, total	5 mg/L	646	270	-	-
Alkalinity, bicarbonate	5 mg/L	639	266	-	-
Alkalinity, carbonate	5 mg/L	7	<5	-	-
Ammonia as N	0.01 mg/L	0.83	0.20	-	-
Chemical Oxygen Demand	10 mg/L	43	106	-	-
Hardness	mg/L	218	21.2	-	-
Phenolics	0.001 mg/L	<0.001	<0.001	-	-
Phosphorus, total	0.01 mg/L	0.45	2.01	-	-
Total Dissolved Solids	10 mg/L	1360	390	-	-
Total Kjeldahl Nitrogen	0.1 mg/L	1.4	0.8	-	-
Anions					
Chloride	1 mg/L	426	19	-	-
Nitrate as N	0.1 mg/L	<0.1	0.5	-	-
Nitrite as N	0.05 mg/L	0.16	<0.05	-	-
Sulphate	1 mg/L	<1	14	-	-
Metals					
Arsenic	1 ug/L	<1	4	-	-
Boron	10 ug/L	458	247	-	-
Cadmium	0.1 ug/L	<0.1	<0.1	-	-
Calcium	100 ug/L	33100	4240	-	-
Chromium	1 ug/L	<1	<1	-	-
Cobalt	0.5 ug/L	<0.5	<0.5	-	-
Copper	0.5 ug/L	<0.5	3.6	-	-
Iron	100 ug/L	402	<100	-	-
Lead	0.1 ug/L	<0.1	<0.1	-	-
Magnesium	200 ug/L	33000	2570	-	-
Manganese	5 ug/L	257	9	-	-
Potassium	100 ug/L	14200	5670	-	-
Sodium	200 ug/L	401000	106000	-	-
Zinc	5 ug/L	9	<5	-	-
Volatiles					
Benzene	0.5 ug/L	<0.5	<0.5	-	-
1,1-Dichloroethane	0.5 ug/L	<0.5	<0.5	-	-
Ethylbenzene	0.5 ug/L	<0.5	<0.5	-	-
Methylene Chloride	5.0 ug/L	<5.0	<5.0	-	-
Toluene	0.5 ug/L	<0.5	<0.5	-	-

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

	Client ID:	Dupe-3	Dupe-4	-	-
	Sample Date:	30-Nov-21 09:00	30-Nov-21 09:00	-	-
	Sample ID:	2149547-41	2149547-42	-	-
	MDL/Units	Water	Water	-	-
Vinyl chloride	0.5 ug/L	<0.5	<0.5	-	-
m,p-Xylenes	0.5 ug/L	<0.5	<0.5	-	-
o-Xylene	0.5 ug/L	<0.5	<0.5	-	-
Toluene-d8	Surrogate	91.4%	92.0%	-	-

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Blank

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	ND	1	mg/L						
Nitrate as N	ND	0.1	mg/L						
Nitrite as N	ND	0.05	mg/L						
Sulphate	ND	1	mg/L						
General Inorganics									
Alkalinity, total	ND	5	mg/L						
Alkalinity, bicarbonate	ND	5	mg/L						
Alkalinity, carbonate	ND	5	mg/L						
Ammonia as N	ND	0.01	mg/L						
Chemical Oxygen Demand	ND	10	mg/L						
Phenolics	ND	0.001	mg/L						
Phosphorus, total	ND	0.01	mg/L						
Total Dissolved Solids	ND	10	mg/L						
Total Kjeldahl Nitrogen	ND	0.1	mg/L						
Metals									
Arsenic	ND	1	ug/L						
Boron	ND	10	ug/L						
Cadmium	ND	0.1	ug/L						
Calcium	ND	100	ug/L						
Chromium	ND	1	ug/L						
Cobalt	ND	0.5	ug/L						
Copper	ND	0.5	ug/L						
Iron	ND	100	ug/L						
Lead	ND	0.1	ug/L						
Magnesium	ND	200	ug/L						
Manganese	ND	5	ug/L						
Potassium	ND	100	ug/L						
Sodium	ND	200	ug/L						
Zinc	ND	5	ug/L						
Volatiles									
Benzene	ND	0.5	ug/L						
1,1-Dichloroethane	ND	0.5	ug/L						
Ethylbenzene	ND	0.5	ug/L						
Methylene Chloride	ND	5.0	ug/L						
Toluene	ND	0.5	ug/L						
Vinyl chloride	ND	0.5	ug/L						
m,p-Xylenes	ND	0.5	ug/L						
o-Xylene	ND	0.5	ug/L						
Surrogate: Toluene-d8	*75.0*		*ug/L*		*93.7*	*50-140*			

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Duplicate

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	109	1	mg/L	107			1.3	10	
Nitrate as N	ND	0.1	mg/L	ND			NC	10	
Nitrite as N	ND	0.05	mg/L	ND			NC	10	
Sulphate	94.3	1	mg/L	94.1			0.2	10	
General Inorganics									
Alkalinity, total	408	5	mg/L	412			0.9	14	
Alkalinity, bicarbonate	408	5	mg/L	412			0.9	14	
Alkalinity, carbonate	ND	5	mg/L	ND			NC	14	
Ammonia as N	0.744	0.02	mg/L	0.676			9.7	18	
Chemical Oxygen Demand	22	10	mg/L	23			4.4	12	
Phenolics	ND	0.001	mg/L	ND			NC	10	
Phosphorus, total	0.074	0.01	mg/L	0.072			3.4	15	
Total Dissolved Solids	1190	10	mg/L	1230			3.6	10	
Total Kjeldahl Nitrogen	0.33	0.1	mg/L	0.34			4.2	16	
Metals									
Arsenic	ND	1	ug/L	ND			NC	20	
Boron	19	10	ug/L	19			1.4	20	
Cadmium	ND	0.1	ug/L	ND			NC	20	
Calcium	30000	100	ug/L	30100			0.3	20	
Chromium	ND	1	ug/L	ND			NC	20	
Cobalt	ND	0.5	ug/L	ND			NC	20	
Copper	0.94	0.5	ug/L	0.95			1.5	20	
Iron	ND	100	ug/L	ND			NC	20	
Lead	ND	0.1	ug/L	ND			NC	20	
Magnesium	7440	200	ug/L	7310			1.9	20	
Manganese	ND	5	ug/L	ND			NC	20	
Potassium	1360	100	ug/L	1370			0.7	20	
Sodium	13900	200	ug/L	13500			3.0	20	
Zinc	9	5	ug/L	10			11.7	20	
Volatiles									
Benzene	ND	0.5	ug/L	ND			NC	30	
1,1-Dichloroethane	ND	0.5	ug/L	ND			NC	30	
Ethylbenzene	ND	0.5	ug/L	ND			NC	30	
Methylene Chloride	ND	5.0	ug/L	ND			NC	30	
Toluene	ND	0.5	ug/L	ND			NC	30	
Vinyl chloride	ND	0.5	ug/L	ND			NC	30	
m,p-Xylenes	ND	0.5	ug/L	ND			NC	30	
o-Xylene	ND	0.5	ug/L	ND			NC	30	
Surrogate: Toluene-d8	*75.4*		*ug/L*		*94.3*	*50-140*			

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Method Quality Control: Spike

Analyte	Result	Reporting Limit	Units	Source Result	%REC	%REC Limit	RPD	RPD Limit	Notes
Anions									
Chloride	115	1	mg/L	107	81.3	77-123			
Nitrate as N	1.07	0.1	mg/L	ND	107	79-120			
Nitrite as N	1.04	0.05	mg/L	ND	104	84-117			
Sulphate	102	1	mg/L	94.1	76.5	74-126			
General Inorganics									
Ammonia as N	0.556	0.01	mg/L	0.342	85.6	81-124			
Chemical Oxygen Demand	221	10	mg/L	23	99.0	85-111			
Phenolics	0.024	0.001	mg/L	ND	96.1	69-132			
Phosphorus, total	0.560	0.01	mg/L	0.072	97.8	80-120			
Total Dissolved Solids	94.0	10	mg/L	ND	94.0	75-125			
Total Kjeldahl Nitrogen	2.13	0.1	mg/L	0.34	89.3	81-126			
Metals									
Arsenic	49.6	1	ug/L	ND	98.4	80-120			
Boron	40	10	ug/L	ND	80.3	80-120			
Cadmium	48.5	0.1	ug/L	ND	97.1	80-120			
Calcium	38300	100	ug/L	30100	82.5	80-120			
Chromium	45.8	1	ug/L	ND	91.2	80-120			
Cobalt	45.2	0.5	ug/L	ND	90.4	80-120			
Copper	44.9	0.5	ug/L	0.95	87.9	80-120			
Iron	2190	100	ug/L	ND	86.0	80-120			
Lead	43.2	0.1	ug/L	ND	86.2	80-120			
Magnesium	15600	200	ug/L	7310	83.4	80-120			
Manganese	50.1	5	ug/L	ND	94.8	80-120			
Potassium	10600	100	ug/L	1370	91.9	80-120			
Sodium	21500	200	ug/L	13500	80.3	80-120			
Zinc	53	5	ug/L	10	85.9	80-120			
Volatiles									
Benzene	34.8	0.5	ug/L	ND	87.0	60-130			
1,1-Dichloroethane	33.3	0.5	ug/L	ND	83.2	60-130			
Ethylbenzene	33.1	0.5	ug/L	ND	82.8	60-130			
Methylene Chloride	36.4	5.0	ug/L	ND	90.9	60-130			
Toluene	33.4	0.5	ug/L	ND	83.4	60-130			
Vinyl chloride	35.7	0.5	ug/L	ND	89.2	50-140			
m,p-Xylenes	64.8	0.5	ug/L	ND	81.0	60-130			
o-Xylene	32.5	0.5	ug/L	ND	81.2	60-130			
Surrogate: Toluene-d8	*73.4*		*ug/L*		*91.7*	*50-140*			

Certificate of Analysis

Report Date: 15-Dec-2021

Client: Golder Associates Ltd. (Ottawa)

Order Date: 2-Dec-2021

Client PO: 7145-21-00015

Project Description: 20412275

Qualifier Notes:

Login Qualifiers :

Samples received submerged in water, possibly melted ice. This condition can compromise sample integrity.

Applies to samples: 92-19, 05-1D, 95-8, 92-18, 98-1, 05-1C, 05-R3, 05-8, 05-11, 05-3D, 07-1D, MW-C, MW-E, 92-7, 92-10, 94-2, 94-6, 95-3, 95-7, 05-3C, 07-1C, 94-5, 95-2, 95-6, 92-16, 05-1B, 11-1, 92-5, 92-9, 94-1, 05-3B, 07-1B, 94-4, 95-5, 92-12, 05-1A, 92-1, 05-3A, 07-1A, Dupe-2, Dupe-3, Dupe-4

Sample Qualifiers :

1 : Elevated Reporting Limit due to matrix interference.

2 : Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.

Sample Data Revisions

None

Work Order Revisions / Comments:

None

Other Report Notes:

n/a: not applicable
ND: Not Detected
MDL: Method Detection Limit
Source Result: Data used as source for matrix and duplicate samples
%REC: Percent recovery.
RPD: Relative percent difference.
NC: Not Calculated

Paracel ID: 2149547

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Page 1 of 2

Client Name: Golder Associates	Project Reference: 20412275		
Contact Name: Yannick Marcantou	Quote #: 19-797		
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7145-21-80015		
Telephone: 613-592-9600	Email Address: yannick_marcantou@golder.com, emily_bacon@golder.com, hanni.huneault@wasteconnections.com		

TAT: ☑ Regular ☐ 3 Day ☐ 2 Day ☐ 1 Day

Date Required: _____

Criteria: ☐ O. Reg. 153/04 (As Amended) Table __ ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: _____ ☑ Other: COWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 2149547

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	92-19	GW			11 Aug 21	1:50 PM	✓
2	05-10	GW				5:10 PM	✓
3	05-8	GW				11:30 AM	✓
4	92-18	GW				1:20 PM	✓
5	88-1	GW				11:45 AM	✓
6	05-1C	GW				5:15 PM	✓
7	05-R3	GW				12:20 PM	✓
8	05-8	GW				12:40 PM	✓
9	05-11	GW				2:25 PM	✓
10	05-3D	GW			↓	4:15 PM	✓

Comments: Invoice to Waste Connections of Canada, with PO#7145-21-80015 to be sent along with the results

#Out5 facility code 6755

Method of Delivery: Courier

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): Hanni Huneault	Date/Time: 12/08/21 9:20	Date/Time: DEC 3 2021 8:55	Date/Time: DEC 3 2021 10:1
Date/Time: 11/30/21	Temperature: 5.5 °C	Temperature: 0.2 °C	Initial Verified By: CS

Chain of Custody (Blank) - Rev 6.3 Oct. 2014

002890

Paracel ID: 2149547

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Chain of Custody
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Page 1 of 1

Client Name: Golder Associates	Project Reference: 20412275	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yannick Marceau	Quote #: 19-267	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7145-21-00015	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marceau@golder.com, emily_bacon@golder.com henri.hunault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 2149547

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	97-1D	GW			11/30/21	3:30pm	✓
2	MW-C	GW				8:55am	✓
3	MW-E	GW				9:10 am	✓
4	92-7	GW				12:50pm	✓
5	92-10	GW				2:35pm	✓
6	94-2	GW				10:50am	✓
7	94-6	GW				10:15am	✓
8	95-3	GW				8:20am	✓
9	95-7	GW				9:40 AM	✓
10	95-3C	GW			↓	9:10 AM	✓

Comments: Invoice to Waste Connections of Canada, with PO#7145-21-00015 to be sent along with the results
RQuIS facility code 6253

Method of Delivery:

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): H. MARCEAU	Date/Time: 12/2/21 11:00	Date/Time: DEC 2 2021 8:55	Date/Time: DEC 2 2021 [illegible]
Date/Time: 11/30/21	Temperature: 5.2 °C	Temperature: 5.2 °C	pH Verified: ☐ By:

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Paracel ID: 2149547

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Page 1 of 1

Client Name: Golder Associates	Project Reference: 20412276		TAT: ☑ Regular ☐ 3 Day
Contact Name: Yannick Marcoux	Quote #: 19-797		☐ 2 Day ☐ 1 Day
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7143-21-30015		Date Required:
Telephone: 613-592-9600	Email Address: yannick_marcoux@golder.com, emily_bocon@golder.com henri.bureault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality: ☑ Other: DDWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Required Analyses

Paracel Order Number: 2149547

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken: Date	Sample Taken: Time	Per quote
1	07-10	GW			11/30/21	3:20pm	✓
2	04-5	GW				10:40am	✓
3	05-2	GW				8:30am	✓
4	05-6	GW				9:50am	✓
5	02-16	GW				2:05pm	✓
6	06-16	GW				5:05pm	✓
7	11-1	GW				12 pm	✓
8	02-5	GW				1 pm	✓
9	02-9	GW				2:45pm	✓
10	04-1	GW				7:55am	✓

Comments: Invoice to Waste Connections of Canada, with PO#7143-21-30015 to be sent along with the results

EQuIS facility code 6255

Method of Delivery: Walk-in

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): M. MARRIAGE	Date/Time: 11/30/21 9:10pm	Date/Time: DEC 2 8:55	Date/Time:
Date/Time: 11/30/21	Temperature: 8.4°C	Temperature: 5.2 °C	pH Verified ☐ By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

002892

Paracel ID: 2149547

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Page 1 of 6

Client Name: Golder Associates	Project Reference: 20412275	TAT: ☑ Regular ☐ 1 Day	
Contact Name: Yannick Marcotte	Quote #: 15-797	☐ 2 Day ☐ 3 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7145-21-00015	Date Required:	
Telephone: 613-592-9600	Email Address: yannick_marcotte@golder.com, emily_bacon@golder.com henri.hunsault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ RSC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality ☑ Other: OWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number: 2149547

	Sample ID/Location Name	Matrix	Air Volume	# of Containers	Sample Taken Date	Sample Taken Time	Required Analyses: Per quote
1	05-3B	GW			14/04/21	4 PM	✓
2	07-1B	GW				3:10 PM	✓
3	94-4	GW				10:25AM	✓
4	~~96-1~~	~~GW~~					✓
5	96-5	GW				9:30 AM	✓
6	92-12	GW				1:45 PM	✓
7	05-1A	GW				4:50 PM	✓
8	92-1	GW				1:10 PM	✓
9	05-3A	GW				3:50 PM	✓
10	07-1A	GW				3 PM	✓

Comments: Invoice to Waste Connections of Canada, with PO#7145-21-00015 to be sent along with the results
EQuIS facility code K253

Method of Delivery:

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:
Relinquished By (Print): H. HUNSAULT	Date/Time: 14/04/21 4:10 PM	Date/Time: 15/04/21 10:55
Date/Time: 14/04/21	Temperature: 5.6 °C	Temperature: 21.1 °C
		Verified By:
		Date/Time:
		pH Verified [ ] By:

Chain of Custody (Blank) - Rev 0.3 Oct. 2014

002893

Paracel ID: 2149547

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Chain of Custody (Lab Use Only)

Page 1 of 1

Client Name: Golder Associates	Project Reference: 20412275	TAT: ☑ Regular ☐ 3 Day	
Contact Name: Yasnick Marcenac	Quote #: 19-797	☐ 2 Day ☐ 1 Day	
Address: 1931 Robertson Rd. Ottawa, Ontario K2H 5B7	PO #: 7145-21-00015	Date Required:	
Telephone: 613-592-9600	Email Address: yasnick_marcenac@golder.com, emily_bacon@golder.com, Henri.Puneault@wasteconnections.com		

Criteria: ☐ O. Reg. 153/04 (As Amended) Table ☐ REC Filing ☐ O. Reg. 558/00 ☑ PWQO ☐ CCME ☐ SUB (Storm) ☐ SUB (Sanitary) Municipality ☑ Other: ODWQS

Matrix Type: S (Soil/Sed.) GW (Ground Water) SW (Surface Water) SS (Storm/Sanitary Sewer) P (Paint) A (Air) O (Other)

Paracel Order Number:		Matrix	Air Volume	# of Containers	Sample Taken		Required Analyses: Per quote
	Sample ID/Location Name				Date	Time	
1	~~Dupe-1~~	~~GW~~					✓
2	Dupe-2	GW			17 Jun 21		✓
3	Dupe-3	GW			↓		✓
4	Dupe-4	GW					✓
5	~~Dupe-5~~	~~GW~~					✓
6							
7							
8							
9							
10							

Comments: Invoice to Waste Connections of Canada, with PO#7145-21-00015 to be sent along with the results

EQuIS facility code 8253

Method of Delivery:

Relinquished By (Sign):	Received by Driver/Depot:	Received at Lab:	Verified By:
Relinquished By (Print): M. Arbitrage	Date/Time: 17/06/21 10:00	Date/Time: 18/06/21 08:55	Date/Time: 18/06/21 09:30
Date/Time: 17/06/21	Temperature: 20 °C	Temperature: 5 °C	pH Verified: ☐ By:

Chain of Custody (Blank) - Rev 8.3 Oct. 2014

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1A 06-Sep-2005	05-1A 16-Nov-2005	05-1A 25-May-2006	05-1A 31-May-2012	05-1A 28-Nov-2012	05-1A 29-May-2014 [3]	05-1A 26-Nov-2015
							05-1A	05-1A	05-1A	05-1A
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1180	228	1020	950	980	950	954
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	24	20	35	<25 [6]
Alkalinity (Total as CaCO3)	mg/l	--	--	969	935	1020	970	1000	990	975
Ammonia Nitrogen	mg/l	--	--	1.68	1.94	1.76	1.8	2.0	2.5	2.03
Chemical Oxygen Demand	mg/l	--	--	263	117	134	110	120	400	177
Chloride	mg/l	--	250	174	180	198	180	180	200	219
Conductivity (Field)	uS/cm	--	--	1950	2100	1300	2042	2125	2135	2315
Hardness, Calcium Carbonate	mg/l	--	--	49	54	44	46	50	49	39.3
Nitrate as N	mg/l	10.0	--	0.2	0.1	<0.1	<0.10	<0.10	<0.50	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	0.037	<0.010	<0.050	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	6.64	4.38	4.84	3.9	4.9	28	4.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	<0.10	<0.50	--
pH	-	--	--	--	--	--	8.44	--	8.59	--
pH (Field)	-	--	--	8.3	--	8.5	8.44	8.53	7.63	8.49
Phosphorus	mg/l	--	--	6.87	2.93	--	2.6	3.5	11	3.04
Sulphate	mg/l	--	500 [4]	17	18	16	<1	<1	<1	1
Temperature (Field)	deg c	--	15	16.3	--	6	9.9	7.1	9.3	8.9
Total Dissolved Solids	mg/l	--	500	1380	1420	1410	1480	1590	1820	1840
Total Organic Carbon	mg/l	--	--	199	47.7	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	2720	58	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.004	<0.001	0.001	0.0011	0.003	0.0031	0.002
Boron, dissolved	mg/l	5	--	1.43	1.54	1.33	1.5	1.7	1.7	1.64
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.00010	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	6.22	5.92	4.05	4.3	4.9	4.3	4.16
Chromium, dissolved	mg/l	0.05	--	<0.002	0.002	<0.002	<0.0050	<0.005	<0.0050	0.001
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	<0.0005	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	0.0019	<0.001	<0.0010	<0.0005
Iron, dissolved	mg/l	--	0.3	0.111	0.241	0.071	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0008	0.001	0.0002	<0.00050	<0.0005	<0.00050	0.0001
Magnesium, dissolved	mg/l	--	--	8.05	9.48	8.19	8.6	9.1	9.2	7.03
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.005	0.0080	0.006	0.0039	<0.005
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.2	17.7	14.8	14	16	16	12.7
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	587	638	573	550	580	580	612
Zinc, dissolved	mg/l	--	5	0.006	0.008	0.007	0.0070	<0.005	<0.0050	0.009
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	0.0014	<0.002 [7]
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	<0.00050	<0.00010	<0.0005
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	<0.00050	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	<0.00050	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	<0.00050	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	<0.0025	<0.00050	<0.0050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	<0.00050	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	<0.0010	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	<0.0010	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1A 24-May-2017 05-1A	05-1A 29-Nov-2018 05-1A	05-1A 21-May-2020 05-1A	05-1A 30-Nov-2021 05-1A
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1050	1040	1040	1060
Alkalinity, Carbonate as CaCO3	mg/l	--	--	23	<25 [8]	27	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	1080	1070	1060	1080
Ammonia Nitrogen	mg/l	--	--	1.92	1.65	2.31	1.93
Chemical Oxygen Demand	mg/l	--	--	183	181	788	333
Chloride	mg/l	--	250	189	214	243	203
Conductivity (Field)	uS/cm	--	--	2265	2042	2128	2188
Hardness, Calcium Carbonate	mg/l	--	--	46	64	54.5	46.7
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	4.0	3.5	6.6	8.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.38	8.31	8.46	8.51
Phosphorus	mg/l	--	--	3.49	3.24	9.44	8.55
Sulphate	mg/l	--	500 [4]	2	2	2	2
Temperature (Field)	deg c	--	15	10.4	7.1	10.0	6.3
Total Dissolved Solids	mg/l	--	500	1840	1720	1900	1770
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.004	0.002	0.001	0.002
Boron, dissolved	mg/l	5	--	1.57	1.65	1.42	1.49
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	4.03	9.36	5.71	4.79
Chromium, dissolved	mg/l	0.05	--	0.009	0.001	0.001	0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0007	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0011	0.0026	0.0033	0.0010
Iron, dissolved	mg/l	--	0.3	<0.1	0.119	0.151	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	0.0002	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	8.68	9.83	9.77	8.44
Manganese, dissolved	mg/l	--	0.05	<0.005	<0.005	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.7	16.4	15.3	13.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	580	566	557	504
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.009	0.006
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [7]	<0.001	0.010	<0.002 [10]
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1B 06-Sep-2005	05-1B 16-Nov-2005	05-1B 25-May-2006	05-1B 31-May-2012	05-1B 28-Nov-2012	05-1B 29-May-2014	05-1B 26-Nov-2015
							05-1B	05-1B	05-1B	05-1B
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	310	163	262	250	260	240	262
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	3.6	4.0	5.3	6
Alkalinity (Total as CaCO3)	mg/l	--	--	254	268	262	250	270	250	268
Ammonia Nitrogen	mg/l	--	--	0.8	0.98	0.69	0.36	0.94	0.28	0.33
Chemical Oxygen Demand	mg/l	--	--	40	44	31	36	73	20	45
Chloride	mg/l	--	250	24	21.6	20.8	19	21	29	20
Conductivity (Field)	uS/cm	--	--	460	480	490	555	557	568	598
Hardness, Calcium Carbonate	mg/l	--	--	28	32	26	27	26	24	21.9
Nitrate as N	mg/l	10.0	--	0.1	1.5	0.2	<0.10	0.13	0.22	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	<0.010	0.019	0.026	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	10.1	5.89	2.28	1.5	<1.0 [11]	<2.0 [11]	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	0.15	0.25	--
pH	-	--	--	--	--	--	8.19	--	8.36	--
pH (Field)	-	--	--	7.5	--	8.1	8.55	8.26	7.95	8.40
Phosphorus	mg/l	--	--	2.07	0.59	--	1.8	6.1	1.5	1.72
Sulphate	mg/l	--	500 [4]	47	36	32	27	23	24	18
Temperature (Field)	deg c	--	15	11.7	--	8	9.6	7.4	8.9	9.4
Total Dissolved Solids	mg/l	--	500	380	390	350	344	516	468	446
Total Organic Carbon	mg/l	--	--	89.2	17.7	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	1810	120	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.003	<0.001	<0.001	0.0051	0.004	0.0045	0.004
Boron, dissolved	mg/l	5	--	0.263	0.267	0.228	0.24	0.28	0.27	0.244
Cadmium, dissolved	mg/l	0.005	--	<0.0001	0.0003	<0.005	<0.00010	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	6.27	6.91	5.46	5.3	5.5	4.9	4.7
Chromium, dissolved	mg/l	0.05	--	<0.002	0.003	<0.002	<0.0050	<0.005	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	<0.0005	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.004	0.004	0.003	0.0078	0.007	0.0032	0.0014
Iron, dissolved	mg/l	--	0.3	0.086	0.261	0.104	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0005	<0.0002	0.0003	<0.00050	<0.0005	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	3.02	3.51	3.11	3.3	3	2.8	2.46
Manganese, dissolved	mg/l	--	0.05	0.052	0.054	0.026	0.0051	0.012	0.018	0.013
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.01	0.02	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8	8.8	6.8	6.1	6.4	6.7	5.17
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	145	153	130	120	130	130	140
Zinc, dissolved	mg/l	--	5	0.006	0.009	0.01	<0.0050	<0.005	<0.0050	0.007
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.001
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.0005
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	<0.00020	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	<0.00020	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1B 24-May-2017 05-1B	05-1B 29-Nov-2018 05-1B	05-1B 21-May-2020 05-1B	05-1B 30-Nov-2021 05-1B
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	268	283	252	260
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	6	6	7
Alkalinity (Total as CaCO3)	mg/l	--	--	273	288	258	268
Ammonia Nitrogen	mg/l	--	--	0.02	0.15	0.19	0.24
Chemical Oxygen Demand	mg/l	--	--	23	29	39	78
Chloride	mg/l	--	250	17	19	24	19
Conductivity (Field)	uS/cm	--	--	560	553	558	574
Hardness, Calcium Carbonate	mg/l	--	--	27	34	22.5	20.4
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.4	0.5
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.6	0.5	0.8	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.36	8.47	8.89	8.12
Phosphorus	mg/l	--	--	0.85	0.69	1.54	2.18
Sulphate	mg/l	--	500 [4]	20	18	22	14
Temperature (Field)	deg c	--	15	9.7	7.5	9.4	6.3
Total Dissolved Solids	mg/l	--	500	372	396	450	338
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.004	0.004	0.003	0.004
Boron, dissolved	mg/l	5	--	0.278	0.263	0.248	0.258
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	5.27	8.1	4.59	4.19
Chromium, dissolved	mg/l	0.05	--	0.002	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0046	0.0092	0.0066	0.0026
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0002	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	3.3	3.35	2.67	2.41
Manganese, dissolved	mg/l	--	0.05	<0.005	0.008	0.009	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.37	6.74	6.36	5.71
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	122	122	118	106
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	0.002	<0.001
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1C 06-Sep-2005	05-1C 16-Nov-2005	05-1C 25-May-2006	05-1C 31-May-2012 05-1C	05-1C 28-Nov-2012 05-1C	05-1C 29-May-2013 05-1C	05-1C 26-Nov-2013 GW-6	05-1C 29-May-2014 05-1C
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	190	201	136	170	180	170	170	170
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	1.6	1.9	1.8	1.4	2.1
Alkalinity (Total as CaCO3)	mg/l	--	--	156	165	136	170	180	170	170	170
Ammonia Nitrogen	mg/l	--	--	1.73	0.9	0.06	<0.050	0.11	0.090	0.081	0.29
Chemical Oxygen Demand	mg/l	--	--	36	11	21	36	14	17	10	10
Chloride	mg/l	--	250	59.5	52.2	25.4	41	42	44	42	45
Conductivity (Field)	uS/cm	--	--	480	510	350	548	541	528	518	531
Hardness, Calcium Carbonate	mg/l	--	--	216	229	156	170	160	180	160	180
Nitrate as N	mg/l	10.0	--	<0.1	0.2	0.7	0.32	0.44	0.29	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	<0.010	<0.010	<0.010	<0.010	0.013
Nitrogen, Total Kjeldahl	mg/l	--	--	18.9	5.2	0.73	1.2	0.64	0.46	0.66	0.88
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	0.32	0.44	0.29	<0.10	0.10
pH	-	--	--	--	--	--	8.00	--	8.05	7.94	8.12
pH (Field)	-	--	--	7.1	--	7.8	7.74	7.85	7.51	7.69	6.71
Phosphorus	mg/l	--	--	2.23	0.65	--	1.1	0.85	0.41	0.36	0.42
Sulphate	mg/l	--	500 [4]	113	86	46	53	48	57	54	50
Temperature (Field)	deg c	--	15	11.5	10.4	7	9.1	7.8	8.3	8.6	8.7
Total Dissolved Solids	mg/l	--	500	405	373	234	326	364	366	310	318
Total Organic Carbon	mg/l	--	--	65.1	8.3	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	2670	520	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	0.003	0.0032	0.003	0.0019	0.0025	0.0023
Boron, dissolved	mg/l	5	--	0.08	0.074	0.028	0.078	0.083	0.077	0.082	0.072
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	52.7	55.9	42.7	40	40	44	39	42
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.0050	<0.005	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.003	<0.002	0.0018	0.002	0.0018	0.0012	0.0025
Iron, dissolved	mg/l	--	0.3	0.167	0.025	0.009	0.38	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.0002	<0.0002	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	20.5	21.7	11.8	16	15	17	15	17
Manganese, dissolved	mg/l	--	0.05	0.232	0.112	0.044	0.032	0.002	0.045	0.023	0.062
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.02	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.9	7.7	6.9	5.2	5.5	5.6	5.2	5
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	61.9	56.1	23.3	50	49	53	50	54
Zinc, dissolved	mg/l	--	5	0.007	0.008	0.011	<0.0050	<0.005	<0.0050	0.012	<0.0050
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	<0.00020	<0.00020	0.00079	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1C 19-Nov-2014	05-1C 02-Jun-2015	05-1C 26-Nov-2015	05-1C 26-May-2016	05-1C 17-Nov-2016	05-1C 24-May-2017	05-1C 29-Nov-2017	05-1C 24-May-2018
				05-1C	05-1C	05-1C	05-1C	05-1C	05-1C	05-1C	05-1C
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	170	170	175	178	179	187	185	190
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.8	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	170	171	176	179	180	188	186	191
Ammonia Nitrogen	mg/l	--	--	0.096	0.30	0.09	0.30	0.27	0.02	0.16	0.29
Chemical Oxygen Demand	mg/l	--	--	5.1	15	17	<10	11	44	51	15
Chloride	mg/l	--	250	45	51	50	55	49	53	58	55
Conductivity (Field)	uS/cm	--	--	592	576	565	578	619	579	553	584
Hardness, Calcium Carbonate	mg/l	--	--	170	115	138	168	164	165	158	173
Nitrate as N	mg/l	10.0	--	<0.10	0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.024	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.39	0.4	0.4	0.5	0.5	0.4	0.4	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--	--	--
pH	-	--	--	8.06	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.01	7.75	7.99	7.59	7.22	7.94	6.95	7.77
Phosphorus	mg/l	--	--	0.40	0.29	0.26	0.30	0.32	0.32	0.35	0.39
Sulphate	mg/l	--	500 [4]	50	53	52	56	52	53	55	51
Temperature (Field)	deg c	--	15	5.6	8.4	9.7	9.2	10.0	9.5	8.4	8.7
Total Dissolved Solids	mg/l	--	500	296	324	336	368	314	354	314	344
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.0027	0.002	0.002	0.002	0.003	0.002	0.003	0.002
Boron, dissolved	mg/l	5	--	0.075	0.066	0.071	0.072	0.081	0.074	0.095	0.07
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	42	21.2	31.4	40.3	40.5	38.4	38.1	45
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	<0.001	<0.001	0.003	0.002	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0014	<0.0005	<0.0005	0.0009	0.0031	0.0024	0.0022	0.0010
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.109	0.231
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	17	15	14.1	16.2	15.4	16.8	15.3	14.8
Manganese, dissolved	mg/l	--	0.05	0.021	0.069	0.019	0.038	<0.005	0.005	0.026	0.056
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.4	4.17	4.45	5.45	5.26	5.14	5.34	4.66
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	55	53.2	62	48.4	52.5	53.2	52.2	51.5
Zinc, dissolved	mg/l	--	5	0.0074	<0.005	0.009	<0.005	0.02	0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1C 29-Nov-2018	05-1C 19-Jun-2019	05-1C 20-Nov-2019	05-1C 21-May-2020	05-1C 26-Nov-2020	05-1C 26-May-2021	05-1C 30-Nov-2021
				05-1C	05-1C	05-1C	05-1C	05-1C	05-1C	05-1C
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	198	181	166	176	176	172	174
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	199	183	167	178	178	173	176
Ammonia Nitrogen	mg/l	--	--	0.08	0.29	0.17	0.27	0.18	0.28	0.10
Chemical Oxygen Demand	mg/l	--	--	11	19	21	18	33	<10	13
Chloride	mg/l	--	250	56	55	53	64	51	50	51
Conductivity (Field)	uS/cm	--	--	518	540	567	547	541	574	571
Hardness, Calcium Carbonate	mg/l	--	--	171	172	192	161	158	161	139
Nitrate as N	mg/l	10.0	--	<0.1	0.2	0.2	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.3	0.5	0.4	0.5	0.4	0.4	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.79	6.89	7.98	9.04	8.02	8.03	7.86
Phosphorus	mg/l	--	--	0.34	0.91	0.33	0.45	0.42	0.46	0.35
Sulphate	mg/l	--	500 [4]	51	52	50	62	48	44	44
Temperature (Field)	deg c	--	15	7.4	10.2	8.0	8.1	8.3	10.1	7.5
Total Dissolved Solids	mg/l	--	500	270	330	356	334	302	342	236
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	0.002	0.002	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	0.113	0.071	0.077	0.061	0.066	0.063	0.06
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	41.3	41.6	46.2	38.4	37.8	38.2	34.3
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0027	0.0025	0.0016	0.0031	0.0011	0.0011	0.0013
Iron, dissolved	mg/l	--	0.3	0.129	0.188	0.311	0.297	0.311	0.252	0.28
Lead, dissolved	mg/l	0.01	--	0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	16.5	16.6	18.6	15.7	15.6	15.9	12.8
Manganese, dissolved	mg/l	--	0.05	0.016	0.046	0.074	0.058	0.035	0.054	0.035
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.32	5.53	6.8	4.81	4.87	4.92	4.38
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	54.1	53	57.3	51.5	52	51.1	44.7
Zinc, dissolved	mg/l	--	5	<0.005	0.005	<0.005	<0.005	0.009	<0.005	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1D 06-Sep-2005	05-1D 16-Nov-2005	05-1D 25-May-2006	05-1D 31-May-2012 05-1D	05-1D 28-Nov-2012 [13] 05-1D	05-1D 29-May-2013 05-1D	05-1D 26-Nov-2013 GW-1	05-1D 29-May-2014 95-1D
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	218	218	169	240	--	220	200	240
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	2.0	--	1.5	1.4	1.4
Alkalinity (Total as CaCO3)	mg/l	--	--	179	179	169	240	--	220	200	240
Ammonia Nitrogen	mg/l	--	--	4.94	0.26	0.56	<0.050	--	0.082	<0.050	0.063
Chemical Oxygen Demand	mg/l	--	--	37	12	20	13	--	78	11	16
Chloride	mg/l	--	250	46.9	27.2	53	30	--	170	200	480
Conductivity (Field)	uS/cm	--	--	550	440	470	601	--	922	952	1734
Hardness, Calcium Carbonate	mg/l	--	--	303	204	191	250	--	470	460	860
Nitrate as N	mg/l	10.0	--	0.4	1.4	0.7	<0.10	--	<0.10	0.13	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	<0.010	--	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	30.3	1.45	2.1	0.93	--	0.99	0.28	0.68
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<0.10	--	<0.10	0.13	<0.10
pH	-	--	--	--	--	--	7.96	--	7.86	7.87	7.79
pH (Field)	-	--	--	6.9	--	7.8	7.59	--	7.36	7.25	6.26
Phosphorus	mg/l	--	--	1.45	0.66	--	0.30	--	0.38	0.16	0.22
Sulphate	mg/l	--	500 [4]	163	53	82	49	--	56	58	110
Temperature (Field)	deg c	--	15	17.5	9.9	6	11.0	--	10.0	8.4	9.5
Total Dissolved Solids	mg/l	--	500	476	301	351	342	--	796	780	1690
Total Organic Carbon	mg/l	--	--	78.8	5.5	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	1380	420	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	<0.0010	--	<0.0010	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	0.053	0.039	0.057	0.039	--	0.042	0.033	0.038
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	<0.00010	--	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	87.1	56.9	45.9	69	--	140	130	250
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.0050	--	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.00050	--	<0.00050	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.004	<0.002	0.0037	--	0.0035	0.0040	0.0064
Iron, dissolved	mg/l	--	0.3	0.077	0.005	0.123	<0.1	--	<0.1	<0.1	0.5
Lead, dissolved	mg/l	0.01	--	<0.0002	<0.0002	0.0003	<0.00050	--	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	20.8	15	18.5	18	--	32	34	56
Manganese, dissolved	mg/l	--	0.05	0.422	0.081	0.1	0.03	--	0.016	0.023	0.0095
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.9	9.8	5.7	7	--	9.5	9.2	12
Selenium, dissolved	mg/l	0.05	--	<0.001	0.001	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	42.6	34.5	46.4	30	--	51	46	69
Zinc, dissolved	mg/l	--	5	0.007	0.01	0.019	<0.0050	--	0.0097	0.022	0.052
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.0010	--	<0.0010	<0.0010	<0.0010
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.00010	--	<0.00010	<0.00010	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.00010	--	<0.00010	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.00010	--	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.00010	--	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.00050	--	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.00010	--	<0.00010	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.00020	--	<0.00020	0.00037	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.00020	--	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1D 19-Nov-2014 05-1D	05-1D 02-Jun-2015 05-1D	05-1D 26-Nov-2015 05-1D	05-1D 26-May-2016 05-1D	05-1D 17-Nov-2016 05-1D	05-1D 24-May-2017 05-1D	05-1D 29-Nov-2017 05-1D	05-1D 24-May-2018 05-1D
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	240	242	234	259	248	244	251	269
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<1.0	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	240	243	234	259	249	245	251	270
Ammonia Nitrogen	mg/l	--	--	<0.050	0.06	0.03	0.03	0.03	0.03	0.05	0.02
Chemical Oxygen Demand	mg/l	--	--	8.1	17	42	31	15	25	14	37
Chloride	mg/l	--	250	510	469	418	475	285	374	271	524
Conductivity (Field)	uS/cm	--	--	2164	1924	1782	1940	1444	1600	961	2163
Hardness, Calcium Carbonate	mg/l	--	--	890	628	674	644	486	502	358	589
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	0.1	<0.1	0.3	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.37	0.3	0.4	0.4	0.3	0.2	0.5	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--	--	--
pH	-	--	--	7.63	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.16	7.24	7.44	7.41	7.03	7.40	7.05	7.30
Phosphorus	mg/l	--	--	0.33	0.20	0.12	0.20	0.17	0.08	0.05	0.13
Sulphate	mg/l	--	500 [4]	120	121	122	127	86	103	76	109
Temperature (Field)	deg c	--	15	5.8	9.1	8.9	10.5	9.2	9.9	7.6	8.2
Total Dissolved Solids	mg/l	--	500	1530	1400	1250	1550	832	1170	718	1630
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.034	0.031	0.033	0.031	0.04	0.024	0.061	0.029
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	250	169	180	181	139	153	102	180
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	<0.001	<0.001	0.006	0.005	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0022	0.0009	0.0011	0.0033	0.0051	0.0046	0.0032	0.0034
Iron, dissolved	mg/l	--	0.3	0.12	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	63	50.1	54.4	46.4	34	29.3	24.7	34
Manganese, dissolved	mg/l	--	0.05	0.14	0.042	0.059	0.06	<0.005	<0.005	0.109	0.043
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13	10.7	9.88	12.6	10.6	10.1	8.35	10.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	110	121	122	138	121	136	136	227
Zinc, dissolved	mg/l	--	5	0.0063	<0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.001	<0.001	0.002	<0.001	<0.001	<0.001	<0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-1D 29-Nov-2018 05-1D	05-1D 19-Jun-2019 05-1D	05-1D 20-Nov-2019 05-1D	05-1D 21-May-2020 05-1D	05-1D 26-Nov-2020 05-1D	05-1D 26-May-2021 05-1D	05-1D 30-Nov-2021 05-1D
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	246	247	269	268	313	296	320
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	246	248	270	269	315	297	321
Ammonia Nitrogen	mg/l	--	--	0.06	0.09	0.02	0.02	0.02	0.03	0.04
Chemical Oxygen Demand	mg/l	--	--	19	<10	11	24	19	13	23
Chloride	mg/l	--	250	277	528	323	591	358	370	412
Conductivity (Field)	uS/cm	--	--	1089	1920	1721	1889	1601	1843	1758
Hardness, Calcium Carbonate	mg/l	--	--	428	617	474	501	479	486	425
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.4	0.4	0.2	0.4	0.3	0.2	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.45	7.04	7.23	8.01	7.63	7.36	7.40
Phosphorus	mg/l	--	--	0.04	0.08	0.10	0.04	0.04	0.03	0.07
Sulphate	mg/l	--	500 [4]	57	99	85	126	88	86	86
Temperature (Field)	deg c	--	15	6.7	11	7.6	8.8	6.1	13.2	6.9
Total Dissolved Solids	mg/l	--	500	720	1400	970	1300	1010	1060	1130
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.039	0.04	0.028	0.02	0.02	0.024	0.019
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	119	175	128	142	131	136	125
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0053	0.0069	0.0054	0.0060	0.0048	0.0056	0.0054
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	31.5	43.4	37.3	35.5	37	35.7	27.3
Manganese, dissolved	mg/l	--	0.05	0.01	<0.005	0.005	0.047	0.006	0.014	0.015
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	15	11.1	12.8	7.87	11.6	7.12
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	152	240	173	210	196	187	187
Zinc, dissolved	mg/l	--	5	0.005	<0.005	<0.005	0.005	0.009	<0.005	0.007
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.004 [10]	0.002	<0.001
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	11-1 29-Nov-2011 [14] 11-1	11-1 28-Nov-2012 11-1	11-1 29-May-2014 MW11-1	11-1 26-Nov-2015 11-1	11-1 24-May-2017 11-1	11-1 22-Nov-2018 11-1	11-1 21-May-2020 11-1	11-1 30-Nov-2021 11-1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	480	460	470	477	527	570	461	537
Alkalinity, Carbonate as CaCO3	mg/l	--	--	10	4.5	10	9	9	8	8	8
Alkalinity (Total as CaCO3)	mg/l	--	--	490	460	480	486	536	578	469	545
Ammonia Nitrogen	mg/l	--	--	1.20	1.2	1.3	1.05	0.03	0.68	0.60	0.89
Chemical Oxygen Demand	mg/l	--	--	50	28	27	46	32	48	45	37
Chloride	mg/l	--	250	657	700	780	770	630	742	912	696
Conductivity	uS/cm	--	--	3000	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2787	2473	2552	2975	3214	2823	2664	3057
Hardness, Calcium Carbonate	mg/l	--	--	292	270	270	219	243	314	277	257
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.31	<0.1	0.6	0.1	0.6	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	0.015	0.226	<0.05	<0.25 [8]	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.48	1.7	1.8	1.7	0.5	1.5	1.1	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	0.53	--	--	--	--	--
pH	-	--	--	8.33	--	8.36	--	--	--	--	--
pH (Field)	-	--	--	7.93	8.15	7.26	8.29	8.04	7.92	7.58	8.04
Phosphorus	mg/l	--	--	0.65	0.53	0.62	0.24	0.14	0.49	0.25	0.43
Sulphate	mg/l	--	500 [4]	8	<1	<1	<1	3	2	<1	1
Temperature (Field)	deg c	--	15	7.0	6.3	9.7	8.0	11.7	7.8	11.4	7.0
Total Dissolved Solids	mg/l	--	500	1950	1650	1650	1630	1550	1660	1640	1610
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.01	0.002	0.0022	0.001	0.005	0.002	0.001	0.002
Boron, dissolved	mg/l	5	--	0.30	0.36	0.37	0.328	0.281	0.442	0.236	0.252
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	61	49	49	35.7	46.2	61.9	52.2	48.9
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.0050	<0.001	0.013	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0015	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	0.0014
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0034	<0.0005	0.0029	0.0046	0.0048	0.0015
Iron, dissolved	mg/l	--	0.3	<0.03	0.5	0.16	0.158	<0.1	<0.1	0.189	0.102
Lead, dissolved	mg/l	0.01	--	<0.001	<0.0005	<0.00050	<0.0001	<0.0001	0.0001	0.0007	<0.0001
Magnesium, dissolved	mg/l	--	--	34	36	36	31.5	30.9	38.7	35.5	32.7
Manganese, dissolved	mg/l	--	0.05	0.39	0.11	0.11	0.081	<0.005	0.027	0.046	0.479
Potassium, dissolved	mg/l	--	--	16	19	19	15.6	16.8	20.4	18.7	16.9
Sodium, dissolved	mg/l	--	200 [5]	490	590	520	646	523	611	554	492
Zinc, dissolved	mg/l	--	5	0.01	<0.005	0.0063	0.016	0.006	0.006	0.005	0.006
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.001	<0.002 [7]	<0.001	<0.001	<0.004 [10]
VOCs											
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-12 09-Jun-1992	92-12 01-Nov-1992	92-12 15-Jun-1994	92-12 02-Nov-1994	92-12 22-Nov-1995	92-12 12-Oct-1996	92-12 06-Nov-1997	92-12 05-Jun-1998	92-12 06-May-1999
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	756	822	--	771	787	--	--	--	821
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	13	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	684	674	680	642	672	676	332	654	673
Ammonia Nitrogen	mg/l	--	--	--	--	--	0.72	0.69	0.97	0.62	0.6	0.94
Chemical Oxygen Demand	mg/l	--	--	--	--	386	113	50	38	36	46	45
Chloride	mg/l	--	250	121	122.8	170	125	109	133	300	118	117
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1528	1516	1620	1564	1610	1570	1460	1566	1500
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	6.42	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	37.65	34	78	34	36	32.9	29	32	28
Nitrate as N	mg/l	10.0	--	--	--	0.01	0.34	0.4	0.1	0.1	1.1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	5.75	--	--	--	2.18
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	5.06	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.47	8.21	8.57	8.8	8.72	8.39	8.21	--	8.4
Phosphate	mg/l	--	--	--	--	--	--	2.6	--	--	--	--
Phosphorus	mg/l	--	--	--	--	3.2	2.288	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	4.1	1	6.7	2.5	2	2	69	37	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	820	785	800	790	730	790	750
Total Organic Carbon	mg/l	--	--	--	--	19	19.6	15.4	14.5	15.6	16.5	18.8
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	480	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.1	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.202	--	--	--	--	--
Boron, dissolved	mg/l	5	--	--	--	1.04	0.89	0.87	0.84	0.91	0.99	1
Cadmium, dissolved	mg/l	0.005	--	--	--	--	0.01	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	3.7	5.42	10.3	2.698	3.97	3.62	2.67	2.62	1.1
Chromium, dissolved	mg/l	0.05	--	--	--	0.037	0.01	0.02	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0215	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	11.42	0.1	1.39	0.39	0.38	0.84	0.16
Lead, dissolved	mg/l	0.01	--	--	--	0.0032	0.1	0.0021	0.0002	0.0002	0.0002	0.0006
Magnesium, dissolved	mg/l	--	--	6.9	5.04	12.7	1.778	6.2	5.27	5.45	6.03	6
Manganese, dissolved	mg/l	--	0.05	--	--	0.179	0.012	0.03	0.02	0.01	0.02	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.039	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.2	12.2	25.3	7.441	13.4	11.9	13.1	15.4	5.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	358.9	387	313	333.9	373	314	316	416	370
Zinc, dissolved	mg/l	--	5	--	--	0.034	0.01	0.01	0.01	0.01	0.02	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.074	0.001	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-12 24-Oct-2000	92-12 14-Jun-2001	92-12 06-Nov-2002	92-12 30-May-2003	92-12 19-Nov-2004	92-12 16-Nov-2005	92-12 15-May-2007	92-12 10-Nov-2008	92-12 26-Nov-2009 M-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	887	765	794	811	856	171	690	699	648
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	7	1	1	1	<5	<5	<5	26
Alkalinity (Total as CaCO3)	mg/l	--	--	727	639	651	645	702	700	690	699	674
Ammonia Nitrogen	mg/l	--	--	0.47	0.88	0.99	0.73	0.87	1.02	0.89	0.98	0.94
Chemical Oxygen Demand	mg/l	--	--	--	35	54	108	52	42	54	28	45
Chloride	mg/l	--	250	133	132	128	127	110	129	131	129	129
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	1610
Conductivity (Field)	uS/cm	--	--	1570	1300	1410	1370	1690	1600	1100	1300	1442
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	27	28	28	27	26	31	27	26	28
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	<1	0.1	<0.1	<0.1	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.62	2.75	1.83	1.61	1.73	1.78	1.8	1.72	1.54
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	8.63
pH (Field)	-	--	--	8.33	8.6	8.4	7.4	8.4	--	8.8	8.5	8.48
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.25	3.37	2.43	2.42	2.3	2.12	--	--	2.32
Sulphate	mg/l	--	500 [4]	1	1	1	1	10	<1	6	<1	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	10.9	8.3	7	9.3
Total Dissolved Solids	mg/l	--	500	928	900	876	685	845	981	941	945	1050
Total Organic Carbon	mg/l	--	--	--	14.8	15.9	17.8	15.9	19.5	--	--	--
Total Suspended Solids	mg/l	--	--	22	239	33	12	6	13	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	<0.001	0.0008	0.0006	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.93	0.99	0.98	0.94	0.992	1	0.919	0.919	1.0
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.0005	<0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	2.85	2.43	2.44	2.76	2.19	3.08	2.39	2.14	3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002	0.006
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005	0.006	<0.005	<0.0002
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002	0.001
Iron, dissolved	mg/l	--	0.3	0.15	0.1	0.06	0.19	0.093	0.09	0.06	0.054	0.07
Lead, dissolved	mg/l	0.01	--	0.0022	0.0002	0.0011	0.0004	0.0004	0.0004	0.00007	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	4.92	5.27	5.29	3	5.03	5.57	5.06	4.95	5
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.01	0.01	0.003	0.002	0.013	0.002	<0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01	--	--	--
Potassium, dissolved	mg/l	--	--	10.5	6.2	8.6	10.8	11.1	13	11.7	11.5	11
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	430	353	368	363	374	420	370	377	397
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.005	0.006	0.008	<0.005	<0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.022	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005	0.0006	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-12 24-May-2011 G-10	92-12 28-Nov-2012 92-12	92-12 29-May-2014 [3] 92-12	92-12 26-Nov-2015 92-12	92-12 24-May-2017 92-12	92-12 29-Nov-2018 92-12	92-12 21-May-2020 92-12	92-12 30-Nov-2021 92-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	637	630	630	661	680	729	647	655
Alkalinity, Carbonate as CaCO3	mg/l	--	--	33	22	28	19	17	18	29	14
Alkalinity (Total as CaCO3)	mg/l	--	--	670	650	660	680	697	747	676	669
Ammonia Nitrogen	mg/l	--	--	0.94	1.1	1.1	1.04	1.04	0.93	1.10	1.06
Chemical Oxygen Demand	mg/l	--	--	45	49	49	54	38	46	60	48
Chloride	mg/l	--	250	128	130	140	138	108	139	160	131
Conductivity	uS/cm	--	--	1640	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1472	1484	1383	1512	1595	1393	1530	1537
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	28	28	30	24.6	29	43	35.5	29.3
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.50	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.010	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.60	2.9	1.9	1.7	2.0	2.0	1.8	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	<0.50	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.74	--	8.67	--	--	--	--	--
pH (Field)	-	--	--	8.79	8.72	8.14	8.86	8.30	8.36	7.20	8.82
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.39	2.5	2.2	2.11	2.06	2.09	2.31	2.30
Sulphate	mg/l	--	500 [4]	<1	<1	<1	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	12.8	6.9	11.2	9.3	10.5	7.3	11.2	7.0
Total Dissolved Solids	mg/l	--	500	1070	946	916	936	956	974	980	910
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.96	1.1	1.1	0.106	1.07	1.06	0.821	0.861
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	3	2.5	2.9	2.57	2.7	7.63	5.04	3.88
Chromium, dissolved	mg/l	0.05	--	0.005	<0.005	<0.0050	0.001	0.008	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0003	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0012	<0.0005	0.0011	<0.0005	<0.0005	0.0012
Iron, dissolved	mg/l	--	0.3	0.07	<0.1	<0.1	<0.1	<0.1	0.106	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.0005	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	5	5.2	5.5	4.41	5.32	5.86	5.57	4.76
Manganese, dissolved	mg/l	--	0.05	<0.01	0.002	0.0028	<0.005	5.32	<0.005	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	11	11	9.57	10.9	12.2	10.3	9.73
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	344	370	390	393	383	408	365	308
Zinc, dissolved	mg/l	--	5	0.02	<0.005	0.0051	0.01	<0.005	<0.005	<0.005	0.006
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.002 [7]	<0.002 [7]	0.003	0.004	<0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.00050	0.00016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0025	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0010	0.00031	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-16 09-Jun-1992	92-16 01-Nov-1992	92-16 08-Jun-1993	92-16 04-Nov-1993	92-16 15-Jun-1994	92-16 02-Nov-1994	92-16 28-Jun-1995	92-16 22-Nov-1995
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	224	226	201	195	--	190	205	218
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	--	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	184	185	165	160	164	156	168	179
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	0.95	0.62	0.27
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	42	194	350	23
Chloride	mg/l	--	250	31	12	4	6	4	2	7.7	2.5
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	556	398	358	446	400	391	460	380
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	7	9.65	--
Hardness, Calcium Carbonate	mg/l	--	--	95.53	68	58	76	63	70	59	56
Nitrate as N	mg/l	10.0	--	--	--	0.42	0.48	0.24	0.54	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	0.1	0.1	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	11.5	3.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	10.88	2.83
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.87	7.52	7.74	8.33	8.14	8.95	8.35	8.38
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	0.8
Phosphorus	mg/l	--	--	--	--	--	--	1.86	0.262	14.5	--
Sulphate	mg/l	--	500 [4]	43	21.2	19.2	28.3	27.7	24.8	22	22
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	280	212	200	197	190	180
Total Organic Carbon	mg/l	--	--	--	--	--	--	8.3	4.8	5.5	3.9
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	1.827	0.42	--	1.039	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	**0.1**	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	0.022	--	--
Boron, dissolved	mg/l	5	--	--	--	--	--	0.12	0.129	0.11	0.07
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**	0.0001	0.0001
Calcium, dissolved	mg/l	--	--	20.1	14	12.4	14.9	12.4	13.67	13.5	11.4
Chromium, dissolved	mg/l	0.05	--	--	--	0.014	0.01	0.01	0.01	0.01	0.02
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.1	0.01	0.007	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	1.109	0.1	1.25	1.293	0.03	0.76
Lead, dissolved	mg/l	0.01	--	--	--	**0.1**	0.0033	0.0004	**0.1**	0.0001	0.0009
Magnesium, dissolved	mg/l	--	--	11	7.99	6.6	9.3	7.8	2.614	5.95	6.7
Manganese, dissolved	mg/l	--	0.05	--	--	0.04	0.022	0.046	0.058	0.02	0.04
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	6.7	6.81	7.4	7.7	7.8	6.645	--	11.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	88.5	73.5	57.9	119	55	56.14	58.1	65.2
Zinc, dissolved	mg/l	--	5	--	--	0.048	0.01	0.01	0.03	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.002	0.053	0.001	0.001	--
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-16 12-Oct-1996	92-16 06-Nov-1997	92-16 05-Jun-1998	92-16 06-May-1999	92-16 24-Oct-2000	92-16 14-Jun-2001	92-16 16-Dec-2002	92-16 30-May-2003
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	217	226	210	187	205
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	174	186	190	178	185	172	153	168
Ammonia Nitrogen	mg/l	--	--	0.74	0.27	0.2	0.04	0.03	0.48	0.38	0.13
Chemical Oxygen Demand	mg/l	--	--	5	3	22	3	--	18	23	9
Chloride	mg/l	--	250	2.4	3	2.8	2.3	2.8	2.8	16.4	4.2
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	370	380	370	350	346	340	374	300
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	50	59	68	56	46	52	47	47
Nitrate as N	mg/l	10.0	--	0.1	0.2	1	--	0.2	0.2	1.4	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	1.39	0.46	1.88	0.08	0.64
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.93	7.4	--	7.9	7.79	8.2	8.2	7.2
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.67	6.07	3	1.49
Sulphate	mg/l	--	500 [4]	19	18	49	15	15	15	30	13
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	180	190	184	180	214	250	236	150
Total Organic Carbon	mg/l	--	--	4.1	4.5	5	4.6	--	4.2	4	4.1
Total Suspended Solids	mg/l	--	--	1900	--	--	--	256	2760	2120	516
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.003	0.003	0.003	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.12	0.11	0.21	0.13	0.12	0.14	0.12	0.12
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	10	12.9	12.7	11.8	10.5	12	9.48	10.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.61	1.17	6.26	0.02	0.02	0.02	0.02	0.04
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0003	0.0002	0.0002	0.0006	0.0002
Magnesium, dissolved	mg/l	--	--	5.87	6.5	8.72	6.36	4.81	5.45	5.58	5.07
Manganese, dissolved	mg/l	--	0.05	0.03	0.06	0.12	0.01	0.02	0.03	0.01	0.02
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	4.3	8.6	9.4	1.9	5.9	2.3	1.5	5.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	57.3	56.7	77.6	66.3	61.5	63	72.9	64.9
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.07	0.02	0.01	0.01	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.024	0.001	0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-16 19-Nov-2004	92-16 16-Nov-2005	92-16 15-May-2007	92-16 10-Nov-2008	92-16 26-Nov-2009 M-7	92-16 24-May-2011 [14] G-2	92-16 28-Nov-2012 92-16	92-16 29-May-2014 92-16
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	220	233	186	183	179	178	180	180
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<2 [15]	4	2.7	2.6
Alkalinity (Total as CaCO3)	mg/l	--	--	180	191	186	180	179	182	180	180
Ammonia Nitrogen	mg/l	--	--	0.07	0.23	0.1	0.2	0.14	0.10	0.33	0.16
Chemical Oxygen Demand	mg/l	--	--	14	21	86	<5	15	25	14	7.3
Chloride	mg/l	--	250	4.3	5.4	7.1	6.4	11	13	21	25
Conductivity	uS/cm	--	--	--	--	--	--	390	404	--	--
Conductivity (Field)	uS/cm	--	--	440	350	280	390	360	379	391	366
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	44	48	43	47	41	48	48	52
Nitrate as N	mg/l	10.0	--	0.2	0.2	0.3	0.1	<0.10	0.17	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.61	0.79	0.39	0.23	0.12	0.15	0.78	0.95
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	8.16	8.38	--	8.19
pH (Field)	-	--	--	8.2	8.93	8.4	8	7.8	8.02	8.16	8.07
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.68	1.41	--	--	0.61	0.87	0.60	0.59
Sulphate	mg/l	--	500 [4]	19	16	12	11	11	10	10	10
Temperature (Field)	deg c	--	15	--	11.6	8.7	7	8.5	10.6	7.5	10.7
Total Dissolved Solids	mg/l	--	500	220	229	224	218	254	263	340	414
Total Organic Carbon	mg/l	--	--	4.1	5.5	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	910	1800	--	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.0045	0.0035	0.003	<0.01	0.002	0.0025
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.118	0.12	0.107	0.105	0.12	0.11	0.12	0.12
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	9.89	10.8	9.42	10.5	10	11	11	12
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.001	<0.001	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	--	<0.005	0.015	<0.005	<0.0002	0.0002	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	0.002	0.004	<0.002	0.003	0.005	0.006	0.003	0.0045
Iron, dissolved	mg/l	--	0.3	0.01	0.012	0.261	<0.005	<0.03	<0.03	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0002	<0.0002	0.00034	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	4.8	5.17	4.62	5	4	5	5.2	5.6
Manganese, dissolved	mg/l	--	0.05	0.017	0.018	0.044	<0.001	<0.01	<0.01	<0.002	<0.0020
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.1	6.1	5.4	5.7	5	5	5.2	5.3
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	68.4	75.5	72.2	68.8	65	64	65	70
Zinc, dissolved	mg/l	--	5	0.005	0.008	<0.005	<0.005	0.01	0.01	0.006	<0.0050
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-16 26-Nov-2015 92-16	92-16 24-May-2017 92-16	92-16 29-Nov-2018 92-16	92-16 21-May-2020 92-16	92-16 30-Nov-2021 92-16
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	188	200	215	177	188
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	6	<5	5
Alkalinity (Total as CaCO3)	mg/l	--	--	189	202	221	180	194
Ammonia Nitrogen	mg/l	--	--	0.24	0.03	0.51	0.14	0.96
Chemical Oxygen Demand	mg/l	--	--	32	27	122	39	207
Chloride	mg/l	--	250	17	19	21	33	26
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	417	409	394	410	508
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	43.4	56	74	56.4	52.4
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.5	0.7	2.3	0.5	7.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.14	7.82	8.21	8.06	7.82
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.54	0.38	6.56	0.49	13.7
Sulphate	mg/l	--	500 [4]	8	9	6	10	6
Temperature (Field)	deg c	--	15	9.7	9.7	7.9	8.3	8.0
Total Dissolved Solids	mg/l	--	500	256	272	270	276	316
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.003	0.002	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.11	0.145	0.114	0.112	0.114
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	9.82	12.1	19.3	12.5	11.9
Chromium, dissolved	mg/l	0.05	--	<0.001	0.002	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0037	0.0038	0.0032	0.0029
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	0.233	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	4.58	6.3	6.31	6.15	5.52
Manganese, dissolved	mg/l	--	0.05	0.028	<0.005	<0.005	0.066	0.05
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.34	5.65	5.76	5.35	4.86
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	79.3	68.3	70.4	65.3	58.2
Zinc, dissolved	mg/l	--	5	0.006	<0.005	0.007	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 09-Jun-1992	92-18 01-Nov-1992	92-18 04-Nov-1993	92-18 15-Jun-1994	92-18 02-Nov-1994	92-18 28-Jun-1995	92-18 22-Nov-1995	92-18 12-Jun-1996
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	244	198	210	--	190	193	195	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	--	1	1	5	--
Alkalinity (Total as CaCO3)	mg/l	--	--	200	162	172	140	156	158	168	273
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	0.17	0.16	0.01	0.04
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	67	62	170	25	18
Chloride	mg/l	--	250	87	35.8	38	26	22	23	23.1	368
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	831	540	539	480	453	460	440	1790
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	11.65	9.65	--	--
Hardness, Calcium Carbonate	mg/l	--	--	276.9	178	150	136	138	144	137	587
Nitrate as N	mg/l	10.0	--	--	--	0.44	0.1	0.48	0.1	0.4	0.1
Nitrite as N	mg/l	1.0	--	--	--	0.1	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	7.8	0.87	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	7.64	0.86	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.96	7.78	8.1	7.9	8.25	7.82	8.18	7
Phosphate	mg/l	--	--	--	--	--	--	--	--	0.2	--
Phosphorus	mg/l	--	--	--	--	--	2.96	0.148	7.62	--	--
Sulphate	mg/l	--	500 [4]	88	68.8	40.3	44.9	36.4	36	31	117
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	248	250	228	230	220	900
Total Organic Carbon	mg/l	--	--	--	--	--	6.8	4.8	6.3	3.1	7.2
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	579
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	**0.1**	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	0.022	--	--	--
Boron, dissolved	mg/l	5	--	--	--	--	0.03	0.06	0.04	0.01	0.038
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	**0.01**	0.0001	0.0001	--
Calcium, dissolved	mg/l	--	--	69.62	45.4	38.3	35.3	32.09	38.7	35.6	169
Chromium, dissolved	mg/l	0.05	--	--	--	0.01	0.01	0.01	0.01	0.02	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.01	0.003	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	0.124	0.336	0.103	0.02	1.04	1.17
Lead, dissolved	mg/l	0.01	--	--	--	0.0062	0.0002	**0.1**	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	25	15.7	13.3	11.7	4.599	11.3	11.5	39.9
Manganese, dissolved	mg/l	--	0.05	--	--	0.032	0.086	0.028	0.04	0.02	0.97
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	3.9	4.54	5.3	4.9	1.864	--	7.7	8.88
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	77.76	53.6	72	33	37.41	40.3	42.6	286
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.01	0.01	0.01	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.111	0.001	0.001	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 09-Jun-1992	92-18 01-Nov-1992	92-18 04-Nov-1993	92-18 15-Jun-1994	92-18 02-Nov-1994	92-18 28-Jun-1995	92-18 22-Nov-1995	92-18 12-Jun-1996
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 12-Oct-1996	92-18 18-Jun-1997	92-18 06-Nov-1997	92-18 05-Jun-1998	92-18 29-Oct-1998	92-18 06-May-1999	92-18 19-Oct-1999	92-18 05-May-2000
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	380	386	427	488
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	273	297	842	304	312	632	350	400
Ammonia Nitrogen	mg/l	--	--	0.14	0.65	0.05	0.1	0.11	0.04	0.11	0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	3	10	25	38	5	15	12	45
Chloride	mg/l	--	250	470	339	916	685	580	403	627	400
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1790	1670	2990	3060	3170	1870	2413	2850
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	3.16	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	590	608	829	543	379	482	593	551
Nitrate as N	mg/l	10.0	--	0.8	1	1.5	1.3	--	--	0.1	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	0.48	0.51	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.63	6.85	6.29	--	6.5	6.5	7.1	6.5
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	107	109	1	147	116	111	106	80
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	900	890	1500	1516	1590	930	1206	1425
Total Organic Carbon	mg/l	--	--	7.2	7.7	8.9	11.4	13.1	9.3	8.9	7.2
Total Suspended Solids	mg/l	--	--	1030	665	--	--	--	--	506	828
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.07	0.05	0.05	0.14	0.05	0.06	0.14	0.14
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	176	184	249	173	121	172	180	160
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.02	0.02	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.57	1.52	1.41	0.31	1.44	0.02	1.78	0.61
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	35.7	35.3	49.5	26.6	18.7	34.8	34.3	36.4
Manganese, dissolved	mg/l	--	0.05	0.81	1.01	1.8	1.26	1.82	1.14	2.51	1.61
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	7	7.4	7.7	9.7	12	2.7	10.6	3.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	232	253	437	343	358	387	400	300
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.23	0.01	0.01	0.11	0.22
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 12-Oct-1996	92-18 18-Jun-1997	92-18 06-Nov-1997	92-18 05-Jun-1998	92-18 29-Oct-1998	92-18 06-May-1999	92-18 19-Oct-1999	92-18 05-May-2000
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 24-Oct-2000	92-18 14-Jun-2001	92-18 23-Nov-2001	92-18 23-May-2002	92-18 06-Nov-2002	92-18 30-May-2003	92-18 09-Oct-2003	92-18 14-May-2004
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	356	315	304	216	198	200	--	194
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	7	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	292	258	249	189	162	164	161	159
Ammonia Nitrogen	mg/l	--	--	0.07	0.21	0.2	0.03	0.02	0.01	0.03	0.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	1	--
Chemical Oxygen Demand	mg/l	--	--	--	13	22	3	9	2	2	11
Chloride	mg/l	--	250	614	468	1470	89.1	103	102	100	108
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2490	1750	454	640	468	540	720	710
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	37	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	394	379	866	191	186	199	197	211
Nitrate as N	mg/l	10.0	--	0.7	0.4	0.9	0.2	0.2	0.2	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.52	0.46	0.67	0.05	0.21	0.12	0.19	0.28
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.6	6.8	6.08	7.21	8.2	7.1	7.5	8.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.28	0.58	0.13	0.17	0.19	0.24	0.4	1.41
Sulphate	mg/l	--	500 [4]	85	72	146	29	29	28	36	25
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1290	1150	2900	436	340	270	365	355
Total Organic Carbon	mg/l	--	--	--	6.1	11	16	2.8	3.5	5	2.4
Total Suspended Solids	mg/l	--	--	348	415	117	94	251	100	280	1180
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.002	0.003	0.002	0.002	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.06	0.05	0.07	0.05	0.06	0.04	0.043	0.038
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	123	124	282	50.8	49.2	53	51.3	56.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.002	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.003	0.002
Iron, dissolved	mg/l	--	0.3	0.59	0.03	0.05	0.02	0.02	0.11	0.792	0.005
Lead, dissolved	mg/l	0.01	--	0.0022	0.0002	0.0002	0.0002	0.0009	0.0003	0.0003	0.0002
Magnesium, dissolved	mg/l	--	--	21	16.8	39.3	15.6	15.4	16.1	16.8	17.2
Manganese, dissolved	mg/l	--	0.05	2.38	1.68	1.5	0.01	0.01	0.01	0.012	0.003
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.04	0.02	0.02	0.02	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	14.6	6.2	22.7	5.3	5.6	4.3	4.8	4.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	411	272	730	56.7	55.8	61.5	58.2	57.4
Zinc, dissolved	mg/l	--	5	0.02	0.01	0.01	0.01	0.02	0.01	0.005	0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.042	0.001	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 24-Oct-2000	92-18 14-Jun-2001	92-18 23-Nov-2001	92-18 23-May-2002	92-18 06-Nov-2002	92-18 30-May-2003	92-18 09-Oct-2003	92-18 14-May-2004
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 19-Nov-2004	92-18 24-May-2005	92-18 16-Nov-2005	92-18 25-May-2006	92-18 21-Nov-2006	92-18 15-May-2007	92-18 30-Nov-2007	92-18 22-May-2008
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	212	220	220	172	184	177	183	150
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	170	180	180	170	184	177	183	150
Ammonia Nitrogen	mg/l	--	--	0.05	<0.01	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	8	6	<5	<5	7	27	47	<5
Chloride	mg/l	--	250	117	135	132	156	156	175	176	175
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	900	1200	1000	400	725	700	525	850
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	215	258	258	244	265	297	281	301
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.3	0.1	<0.1	0.2	0.2	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.31	0.31	0.05	0.13	0.1	0.1	0.28	0.18
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8	6	8	8.3	6.9	8.3	7.5	7.4
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.18	0.8	0.12	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	25	31	29	29	27	30	28	28
Temperature (Field)	deg c	--	15	--	12.6	10.5	5.5	5	8.8	6	11
Total Dissolved Solids	mg/l	--	500	450	437	429	432	456	489	481	467
Total Organic Carbon	mg/l	--	--	2.5	1.9	3.5	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	468	1560	531	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	0.002	0.001	0.001	0.0035	0.0041	0.0037	0.0036
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.049	0.026	0.049	0.034	0.041	0.037	0.042	0.037
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	57.4	67.5	68.6	64.6	69.9	79.2	74.5	81.1
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.004	0.003	0.005	0.01	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.01	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Lead, dissolved	mg/l	0.01	--	0.0002	0.0005	<0.0002	<0.0002	<0.0001	0.00004	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	17.3	21.8	21	20.2	22	24.2	23	23.9
Manganese, dissolved	mg/l	--	0.05	0.01	<0.001	0.002	0.001	0.178	0.002	0.027	0.002
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.3	4.9	6.1	4.5	5.5	5.2	5.5	4.9
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	57	73	68.9	59.3	64.7	67.7	63.7	63.7
Zinc, dissolved	mg/l	--	5	0.005	0.008	0.01	<0.005	0.008	<0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 19-Nov-2004	92-18 24-May-2005	92-18 16-Nov-2005	92-18 25-May-2006	92-18 21-Nov-2006	92-18 15-May-2007	92-18 30-Nov-2007	92-18 22-May-2008
Semi-VOCs											
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--	<0.0006
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 10-Nov-2008	92-18 19-May-2009 G-1	92-18 26-Nov-2009 M-12	92-18 25-May-2010 [14] M-2	92-18 20-Oct-2010 [14] G-2	92-18 24-May-2011 [14] G-5	92-18 29-Nov-2011 [14] 92-18	92-18 31-May-2012 92-18
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	183	174	175	168	172	174	177	170
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [15]	<2 [15]	<2 [15]	<2 [15]	<2 [15]	<2 [15]	1.8
Alkalinity (Total as CaCO3)	mg/l	--	--	180	174	175	168	172	174	177	180
Ammonia Nitrogen	mg/l	--	--	<0.01	0.02	0.02	<0.02	0.03	<0.02	0.04	<0.050
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	<5	5	13	10	15	8	25	12
Chloride	mg/l	--	250	182	179	197	193	215	213	226	210
Conductivity	uS/cm	--	--	--	1000	1010	1060	1060	1090	1120	--
Conductivity (Field)	uS/cm	--	--	825	800	834	1119	1020	1021	1028	1076
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	296	315	297	345	365	352	358	410
Nitrate as N	mg/l	10.0	--	0.2	0.24	0.13	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.08	0.16	<0.10	<0.10	<0.10	<0.10	0.14	0.51
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	7.98	8.09	8.11	7.91	8.22	8.15	8.05
pH (Field)	-	--	--	7.8	--	7.58	6.95	7.61	7.85	7.71	6.73
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	0.18	0.15	0.08	0.09	0.11	0.07	0.054
Sulphate	mg/l	--	500 [4]	27	26	31	28	28	28	29	27
Temperature (Field)	deg c	--	15	9	7	9.7	14.8	10.1	13.6	9.3	10.2
Total Dissolved Solids	mg/l	--	500	491	650	657	689	689	708	728	836
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.0032	0.003	0.002	<0.01	<0.01	<0.01	<0.01	0.0028
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.036	0.05	0.05	0.04	0.04	0.04	0.05	0.043
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	79.8	85	81	92	100	93	97	110
Chromium, dissolved	mg/l	0.05	--	<0.002	0.005	0.004	0.002	0.004	0.003	0.003	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.0002	<0.0002	<0.0002	0.0005	0.0003	<0.0002	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	0.003	0.003	0.003	0.001	0.004	<0.001	0.0036
Iron, dissolved	mg/l	--	0.3	<0.005	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	23.4	25	23	28	28	29	28	33
Manganese, dissolved	mg/l	--	0.05	<0.001	<0.01	<0.01	<0.01	0.40	<0.01	0.21	0.079
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.4	5	5	6	5	5	5	5.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	62.9	63	65	66	68	64	67	76
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	0.01	0.01	<0.01	0.01	<0.01	0.011
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 10-Nov-2008	92-18 19-May-2009 G-1	92-18 26-Nov-2009 M-12	92-18 25-May-2010 [14] M-2	92-18 20-Oct-2010 [14] G-2	92-18 24-May-2011 [14] G-5	92-18 29-Nov-2011 [14] 92-18	92-18 31-May-2012 92-18
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 28-Nov-2012 92-18	92-18 29-May-2013 92-18	92-18 26-Nov-2013 GW-17	92-18 29-May-2014 92-18	92-18 19-Nov-2014 92-18	92-18 02-Jun-2015 92-18	92-18 26-Nov-2015 92-18	92-18 26-May-2016 92-18
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	190	170	170	180	180	181	184	195
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.5	1.7	1.7	2.0	1.5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	190	170	180	180	180	182	185	196
Ammonia Nitrogen	mg/l	--	--	0.093	0.082	<0.050	<0.050	0.051	0.08	0.07	0.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	22	6.8	23	6.3	<4.0	21	13	12
Chloride	mg/l	--	250	220	230	230	270	260	356	340	329
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1084	1032	1081	1105	1215	1238	1282	1362
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	370	430	310	460	410	395	358	469
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.36	0.31	0.30	0.43	0.22	0.2	0.2	0.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.04	8.02	8.09	7.97	--	--	--
pH (Field)	-	--	--	7.81	6.40	6.42	7.57	7.95	7.40	8.11	7.42
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.13	0.20	0.11	0.089	0.26	0.15	0.11	0.15
Sulphate	mg/l	--	500 [4]	28	28	26	31	30	31	30	35
Temperature (Field)	deg c	--	15	7.5	9.6	7.7	11.8	5.4	9.1	9.5	10.1
Total Dissolved Solids	mg/l	--	500	636	852	836	912	778	884	836	1080
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.002	0.0030	0.0023	0.0032	0.0028	0.003	0.003	0.004
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.04	0.033	0.042	0.04	0.034	0.024	0.033	0.025
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	97	120	83	120	110	92.8	98.2	123
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.001	0.0027	0.0012	0.0031	0.0020	<0.0005	<0.0005	0.0013
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0005	0.00051	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	31	34	25	37	34	39.7	27.2	39
Manganese, dissolved	mg/l	--	0.05	0.004	0.0048	0.0080	<0.0020	<0.0020	<0.005	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.5	5.7	5.4	6.1	5.7	5.15	4.89	7.06
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	67	76	57	85	76	86.4	85.3	83.8
Zinc, dissolved	mg/l	--	5	<0.005	<0.0050	0.0056	0.0051	<0.0050	0.007	0.007	0.006
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 28-Nov-2012 92-18	92-18 29-May-2013 92-18	92-18 26-Nov-2013 GW-17	92-18 29-May-2014 92-18	92-18 19-Nov-2014 92-18	92-18 02-Jun-2015 92-18	92-18 26-Nov-2015 92-18	92-18 26-May-2016 92-18
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 17-Nov-2016 92-18	92-18 24-May-2017 92-18	92-18 29-Nov-2017 92-18	92-18 24-May-2018 92-18	92-18 29-Nov-2018 92-18	92-18 19-Jun-2019 92-18	92-18 20-Nov-2019 92-18	92-18 21-May-2020 92-18
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	193	204	202	213	213	197	187	200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	193	205	203	214	214	198	189	202
Ammonia Nitrogen	mg/l	--	--	0.12	0.03	0.11	0.03	0.03	0.03	0.03	0.08
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	12	39	22	53	30	72	14	17
Chloride	mg/l	--	250	307	325	361	348	333	356	393	456
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1439	1373	1318	1463	1331	1395	1505	1434
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	462	495	442	499	455	511	539	499
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.2	0.3	0.3	0.3	0.3	0.1	<0.1	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.61	7.44	6.53	7.34	6.5	6.24	7.65	7.76
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.18	0.19	0.49	0.27	0.44	0.09	0.10	0.30
Sulphate	mg/l	--	500 [4]	33	33	36	36	36	38	<1	48
Temperature (Field)	deg c	--	15	10.9	9.3	8.9	8.8	8.2	12.1	7.6	9.7
Total Dissolved Solids	mg/l	--	500	886	1080	882	1280	882	1040	976	1140
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.004	0.004	0.004	0.003	0.003	0.004	0.004	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.03	0.029	0.06	0.028	0.048	0.026	0.031	0.024
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	0.0003	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	126	140	117	134	119	132	140	130
Chromium, dissolved	mg/l	0.05	--	0.004	0.005	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0030	0.0019	0.0013	0.0013	0.0023	0.0022	0.0028	0.0038
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	35.9	35.4	36.4	40	38.2	43.8	46.4	42.4
Manganese, dissolved	mg/l	--	0.05	<0.005	0.018	<0.005	0.008	<0.005	<0.005	0.182	0.013
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.1	5.87	6.15	6.17	6.83	7.89	8.73	7.02
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	82.6	84.6	79.4	89.6	81.5	96	97.6	95.6
Zinc, dissolved	mg/l	--	5	0.014	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 17-Nov-2016 92-18	92-18 24-May-2017 92-18	92-18 29-Nov-2017 92-18	92-18 24-May-2018 92-18	92-18 29-Nov-2018 92-18	92-18 19-Jun-2019 92-18	92-18 20-Nov-2019 92-18	92-18 21-May-2020 92-18
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 26-Nov-2020 92-18	92-18 26-May-2021 92-18	92-18 30-Nov-2021 92-18
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	210	199	197
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	212	200	199
Ammonia Nitrogen	mg/l	--	--	0.29	0.07	0.09
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	166	20	114
Chloride	mg/l	--	250	363	353	368
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1387	1563	1533
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	484	522	445
Nitrate as N	mg/l	10.0	--	<0.1	0.2	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.8	0.1	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	7.43	7.79	7.84
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	5.50	0.35	0.90
Sulphate	mg/l	--	500 [4]	36	36	35
Temperature (Field)	deg c	--	15	7.4	10.0	6.9
Total Dissolved Solids	mg/l	--	500	1090	954	896
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	0.003	0.004	0.003
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	0.025	0.023	0.025
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	126	137	120
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0015	0.0016	0.0025
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	41.2	44	35.1
Manganese, dissolved	mg/l	--	0.05	0.02	<0.005	0.582
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.46	7.2	6.05
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	92.7	98.2	79.9
Zinc, dissolved	mg/l	--	5	0.008	0.005	0.007
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-18 26-Nov-2020 92-18	92-18 26-May-2021 92-18	92-18 30-Nov-2021 92-18
Semi-VOCs						
Naphthalene	mg/l	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--
VOCs						
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--
Chloroform	mg/l	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 09-Jun-1992	92-19 01-Nov-1992	92-19 08-Jun-1993	92-19 15-Jun-1994	92-19 02-Nov-1994	92-19 28-Jun-1995	92-19 22-Nov-1995	92-19 12-Jun-1996
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	390	283	381	--	326	336	327	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	--	1	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	320	232	312	320	267	276	268	242
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	0.1	0.06	0.01	0.02
Chemical Oxygen Demand	mg/l	--	--	--	--	--	34	77	35	33	11
Chloride	mg/l	--	250	254	97.8	315	860	400	250	156	25
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1688	934	1750	2490	1950	2120	1180	470
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	9.69	8.52	--	--
Hardness, Calcium Carbonate	mg/l	--	--	687.61	459	719	637	561	605	525	137
Nitrate as N	mg/l	10.0	--	--	--	0.6	0.1	0.42	0.1	0.7	0.6
Nitrite as N	mg/l	1.0	--	--	--	0.1	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	2.3	29	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	2.24	28.99	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.69	7.09	6.35	6.5	6.73	6.64	6.9	7.88
Phosphate	mg/l	--	--	--	--	--	--	--	--	0.4	--
Phosphorus	mg/l	--	--	--	--	--	0.3	0.203	0.62	--	--
Sulphate	mg/l	--	500 [4]	165	146.5	154	147	116	107	118	35
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	--	--	--	--	--	4900
Total Organic Carbon	mg/l	--	--	--	--	--	9	9.4	8.8	55	4.1
Total Suspended Solids	mg/l	--	--	--	--	1140	1260	980	1060	590	240
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	0.168	--	0.093	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.1	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	0.164	--	--	--
Boron, dissolved	mg/l	5	--	--	--	--	0.07	0.078	0.01	0.01	0.04
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	0.01	0.0001	0.0001	--
Calcium, dissolved	mg/l	--	--	189.1	138	210	167	154.8	176	157	34.9
Chromium, dissolved	mg/l	0.05	--	--	--	0.015	0.01	0.01	0.02	0.03	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.012	0.0113	0.01	0.02	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	0.47	0.621	0.412	0.02	0.36	0.492
Lead, dissolved	mg/l	0.01	--	--	--	0.1	0.0008	0.1	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	52.18	27.8	47.3	53.4	23.506	39.6	31.7	11.9
Manganese, dissolved	mg/l	--	0.05	--	--	2.722	1.449	1.056	1.02	0.52	0.054
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.03	0.02	0.02
Potassium, dissolved	mg/l	--	--	5.39	5.33	6.9	11.6	3.634	--	8.9	4.03
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	89.81	33.5	112	185	164.6	180	130	45.7
Zinc, dissolved	mg/l	--	5	--	--	0.037	0.01	0.018	0.01	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.047	0.001	0.001	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 09-Jun-1992	92-19 01-Nov-1992	92-19 08-Jun-1993	92-19 15-Jun-1994	92-19 02-Nov-1994	92-19 28-Jun-1995	92-19 22-Nov-1995	92-19 12-Jun-1996
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 12-Oct-1996	92-19 18-Jun-1997	92-19 06-Nov-1997	92-19 05-Jun-1998	92-19 29-Oct-1998	92-19 06-May-1999	92-19 19-Oct-1999	92-19 05-May-2000
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	205	222	244	227
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	183	158	188	174	168	182	200	186
Ammonia Nitrogen	mg/l	--	--	0.36	0.41	0.14	0.11	0.07	0.01	0.11	0.03
Chemical Oxygen Demand	mg/l	--	--	15	6	5	20	3	3	3	3
Chloride	mg/l	--	250	26.3	28	29	40.5	41.9	46.1	46.8	51.8
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	450	480	450	521	493	540	521	575
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	3.75	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	134	160	152	153	129	163	168	174
Nitrate as N	mg/l	10.0	--	0.4	0.1	0.1	1	--	--	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	0.51	0.4	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.62	7.64	6.05	--	7.5	7.4	7.8	7.9
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	32	33	21	61	28	30	24	25
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2580	2740	--	--	--	--	3100	5840
Total Organic Carbon	mg/l	--	--	3.6	3.2	3.9	3.1	4.8	3.2	3.2	3.4
Total Suspended Solids	mg/l	--	--	230	240	220	260	245	270	260	288
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.05	0.04	0.04	0.21	0.22	0.05	0.15	0.13
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	35.6	43.4	41.1	38.8	35.5	40	44.6	46.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.02	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.02	0.02	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.07	0.56	0.53	2.24	2.03	0.02	1.94	2.87
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0003
Magnesium, dissolved	mg/l	--	--	10.8	12.4	11.9	13.4	9.83	13.8	13.6	14
Manganese, dissolved	mg/l	--	0.05	0.05	0.04	0.05	0.07	0.08	0.01	0.09	0.06
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	3.8	0.9	6.8	8	4.5	4.2	4.4	2.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	40.7	40.1	39.7	67.8	50	55.6	60	62.1
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.12	0.08	0.02	0.03	0.03
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 12-Oct-1996	92-19 18-Jun-1997	92-19 06-Nov-1997	92-19 05-Jun-1998	92-19 29-Oct-1998	92-19 06-May-1999	92-19 19-Oct-1999	92-19 05-May-2000
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 24-Oct-2000	92-19 14-Jun-2001	92-19 23-Nov-2001	92-19 23-May-2002	92-19 06-Nov-2002	92-19 30-May-2003	92-19 09-Oct-2003	92-19 14-May-2004
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	228	216	201	395	326	355	--	381
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	7	1	1	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	187	189	165	324	267	291	273	312
Ammonia Nitrogen	mg/l	--	--	0.01	0.08	0.11	0.24	0.31	0.1	0.23	0.06
Chemical Oxygen Demand	mg/l	--	--	--	6	4	10	28	14	21	26
Chloride	mg/l	--	250	63.5	75.9	76.7	502	617	168	582	293
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	564	500	508	1890	2630	1440	3020	2230
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	62	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	144	181	189	554	503	441	418	469
Nitrate as N	mg/l	10.0	--	0.2	0.2	0.2	0.5	0.4	0.6	0.3	1.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.37	0.37	0.22	0.36	0.73	0.45	0.6	0.82
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.62	8	7.49	6.68	8.66	6.4	7	6.8
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.9	1.49	0.14	0.2	0.21	0.22	0.35	0.66
Sulphate	mg/l	--	500 [4]	28	29	28	103	117	166	109	146
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	870	3910	136	168	308	246	294	796
Total Organic Carbon	mg/l	--	--	--	2.6	4	6	9	8.7	10	9.1
Total Suspended Solids	mg/l	--	--	310	366	320	1370	1510	720	1307	1115
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	0.003	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.05	0.05	0.07	0.07	0.06	0.06	0.06	0.057
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	37.5	49.5	49.7	183	165	150	140	159
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.005	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.008	0.004
Iron, dissolved	mg/l	--	0.3	0.05	0.02	0.13	0.02	0.11	0.51	2.3	0.019
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0016	0.0002	0.0007	0.0002
Magnesium, dissolved	mg/l	--	--	12.3	13.9	15.7	23.6	22	16.2	16.6	17.5
Manganese, dissolved	mg/l	--	0.05	0.02	0.01	0.02	1.8	1.35	0.74	1.77	0.847
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.03	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	3.4	0.4	1.9	16.7	16.9	11.3	14.7	13.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	52.4	55.2	60.6	284	320	151	367	202
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.03	0.01	0.01	0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.002	0.048	0.001	0.001	0.001	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 24-Oct-2000	92-19 14-Jun-2001	92-19 23-Nov-2001	92-19 23-May-2002	92-19 06-Nov-2002	92-19 30-May-2003	92-19 09-Oct-2003	92-19 14-May-2004
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 19-Nov-2004	92-19 24-May-2005	92-19 16-Nov-2005	92-19 25-May-2006	92-19 21-Nov-2006	92-19 15-May-2007	92-19 30-Nov-2007	92-19 22-May-2008
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	370	332	227	286	284	364	332	237
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	303	272	186	286	284	364	332	240
Ammonia Nitrogen	mg/l	--	--	0.19	0.06	0.1	0.27	0.06	0.14	0.31	<0.01
Chemical Oxygen Demand	mg/l	--	--	23	21	22	9	9	97	61	14
Chloride	mg/l	--	250	736	199	271	298	463	571	957	318
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3060	1400	1400	1425	2100	1400	2700	1800
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	436	179	146	371	484	367	421	354
Nitrate as N	mg/l	10.0	--	1	0.2	0.1	0.2	0.9	1.1	0.7	1.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.73	0.6	0.45	0.54	0.5	0.91	0.87	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	5.8	8.57	7.5	6.5	7.7	6.5	6.7
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.73	0.51	0.55	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	110	87	60	119	82	121	111	105
Temperature (Field)	deg c	--	15	--	10.8	9.2	7	7	8.9	5	10
Total Dissolved Solids	mg/l	--	500	296	695	715	855	1150	1420	1920	887
Total Organic Carbon	mg/l	--	--	8.7	9.5	10.7	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	1530	250	118	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	<0.001	0.0013	0.0011	0.0018	0.0014
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.064	0.04	0.067	0.037	0.045	0.078	0.071	0.063
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	0.0005	<0.005	0.0002	0.00014	0.00012	<0.00002
Calcium, dissolved	mg/l	--	--	147	55.8	46.8	127	164	125	145	121
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	0.008	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.006	0.007	0.008	0.003	0.003	0.006	0.004	0.002
Iron, dissolved	mg/l	--	0.3	0.128	0.015	0.062	0.071	0.032	0.1	0.06	0.006
Lead, dissolved	mg/l	0.01	--	0.0006	0.0004	<0.0002	<0.0002	<0.0001	0.00006	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	16.5	9.61	6.94	13.2	18.1	13.6	14.4	12.4
Manganese, dissolved	mg/l	--	0.05	1.74	0.118	0.399	0.598	1.56	1.19	1.65	0.774
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13.7	6.3	5.9	7.9	11.5	10.1	9.7	7.7
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	413	179	219	125	237	357	478	175
Zinc, dissolved	mg/l	--	5	0.005	0.006	0.009	0.006	0.009	<0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 19-Nov-2004	92-19 24-May-2005	92-19 16-Nov-2005	92-19 25-May-2006	92-19 21-Nov-2006	92-19 15-May-2007	92-19 30-Nov-2007	92-19 22-May-2008
Semi-VOCs											
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--	<0.0006
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 10-Nov-2008	92-19 19-May-2009 G-2	92-19 26-Nov-2009 J-16	92-19 25-May-2010 M-1	92-19 20-Oct-2010 G-1	92-19 24-May-2011 G-1	92-19 29-Nov-2011 92-19	92-19 31-May-2012 92-19
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	264	290	361	235	344	336	362	320
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [15]	<2 [15]	<2 [15]	<2 [15]	<2 [15]	<2 [15]	<1.0
Alkalinity (Total as CaCO3)	mg/l	--	--	260	290	361	235	344	336	362	320
Ammonia Nitrogen	mg/l	--	--	0.17	0.09	0.25	0.07	<0.02	<0.02	<0.02	<0.050
Chemical Oxygen Demand	mg/l	--	--	22	13	33	28	30	25	28	24
Chloride	mg/l	--	250	459	432	594	325	738	434	67	110
Conductivity	uS/cm	--	--	--	2120	2700	1740	3100	2220	1020	--
Conductivity (Field)	uS/cm	--	--	3100	1900	2300	926	2994	1943	1044	1192
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	351	411	391	283	725	440	419	340
Nitrate as N	mg/l	10.0	--	0.8	0.59	0.16	<0.10	1.28	0.81	1.07	4.1
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.6	0.33	0.48	0.20	0.48	0.35	0.18	0.88
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	4.2
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	7.17	7.50	7.67	7.04	7.76	7.61	7.51
pH (Field)	-	--	--	6.7	--	6.63	6.70	6.46	6.52	6.64	6.69
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	1.13	0.20	0.99	0.29	0.76	0.30	0.22
Sulphate	mg/l	--	500 [4]	72	86	90	56	118	109	85	140
Temperature (Field)	deg c	--	15	11	7	9.6	13.6	11.3	11.4	10.0	9.5
Total Dissolved Solids	mg/l	--	500	1060	1380	1760	1130	2010	1440	663	774
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.044	0.05	0.08	0.05	0.07	0.07	0.06	0.052
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	120	140	130	92	244	148	143	120
Chromium, dissolved	mg/l	0.05	--	<0.002	0.009	<0.005	0.003	0.009	0.007	0.004	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	0.0005	0.0009	0.0019	0.0021	0.0016	0.0008	<0.00050
Copper, dissolved	mg/l	--	1	0.002	0.004	0.007	0.005	0.008	0.010	0.003	0.0035
Iron, dissolved	mg/l	--	0.3	0.305	<0.03	<0.03	0.08	0.09	0.12	0.10	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	12.2	15	16	13	28	17	15	11
Manganese, dissolved	mg/l	--	0.05	0.29	0.22	0.60	1.09	1.51	0.74	0.37	0.13
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.7	8	8	7	12	8	6	5.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	227	246	466	221	290	266	49	100
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	<0.01	<0.01	0.01	0.02	<0.01	<0.0050
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 10-Nov-2008	92-19 19-May-2009 G-2	92-19 26-Nov-2009 J-16	92-19 25-May-2010 M-1	92-19 20-Oct-2010 G-1	92-19 24-May-2011 G-1	92-19 29-Nov-2011 92-19	92-19 31-May-2012 92-19
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 28-Nov-2012	92-19 29-May-2013	92-19 26-Nov-2013	92-19 29-May-2014	92-19 19-Nov-2014	92-19 02-Jun-2015	92-19 26-Nov-2015	92-19 26-May-2016
				92-19	92-19	GW-18	92-19	92-19	92-19	92-19	92-19
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	360	360	310	360	260	300	391	328
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.6	1.1	<1.0	<1.0	<1.0	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	360	360	310	360	260	300	391	328
Ammonia Nitrogen	mg/l	--	--	0.082	0.080	<0.050	0.14	<0.050	0.06	0.04	0.05
Chemical Oxygen Demand	mg/l	--	--	23	31	20	34	9.3	30	53	30
Chloride	mg/l	--	250	110	84	220	170	100	118	163	84
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1256	1200	1449	1579	1081	1493	1583	1308
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	570	440	430	420	270	294	470	353
Nitrate as N	mg/l	10.0	--	2.1	<0.10	<0.10	<0.10	0.39	0.3	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.60	0.72	0.68	0.95	0.32	0.4	0.5	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	2.1	<0.10	<0.10	<0.10	0.39	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	7.50	7.50	7.45	7.39	--	--	--
pH (Field)	-	--	--	6.64	6.13	6.53	6.80	6.83	6.66	6.84	6.92
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.26	0.48	0.20	0.14	0.19	0.11	0.10	0.11
Sulphate	mg/l	--	500 [4]	180	210	190	300	98	231	268	255
Temperature (Field)	deg c	--	15	7.3	8.7	9.5	10.4	8.5	8.5	10.1	8.6
Total Dissolved Solids	mg/l	--	500	1080	840	952	1100	458	836	990	866
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.046	0.071	0.06	0.074	0.08	0.057	0.074	0.067
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	0.00011	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	200	150	140	140	92	92.8	154	108
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0010	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.003	0.0062	0.0048	0.0081	0.0045	<0.0005	0.0024	0.0038
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	19	17	17	18	10	15	20.5	20
Manganese, dissolved	mg/l	--	0.05	0.27	0.62	0.18	0.49	0.079	0.012	0.141	0.114
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.9	7.7	6.5	7.1	5	4.28	6.65	6.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	89	230	110	210	65	70.3	173	121
Zinc, dissolved	mg/l	--	5	<0.005	<0.0050	0.032	0.011	0.0059	0.007	0.008	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 28-Nov-2012	92-19 29-May-2013	92-19 26-Nov-2013	92-19 29-May-2014	92-19 19-Nov-2014	92-19 02-Jun-2015	92-19 26-Nov-2015	92-19 26-May-2016
				92-19	92-19	GW-18	92-19	92-19	92-19	92-19	92-19
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 17-Nov-2016 92-19	92-19 24-May-2017 92-19	92-19 29-Nov-2017 92-19	92-19 24-May-2018 92-19	92-19 29-Nov-2018 92-19	92-19 19-Jun-2019 92-19	92-19 20-Nov-2019 92-19	92-19 21-May-2020 92-19
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	381	354	309	290	400	191	332	266
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	381	354	309	291	400	191	332	267
Ammonia Nitrogen	mg/l	--	--	0.04	0.10	0.07	0.07	0.17	0.10	0.04	0.08
Chemical Oxygen Demand	mg/l	--	--	36	36	45	92	45	14	30	21
Chloride	mg/l	--	250	85	115	119	60	420	76	93	47
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1414	1291	1081	949	1625	719	1113	767
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	408	457	392	303	393	213	428	270
Nitrate as N	mg/l	10.0	--	0.3	<0.1	4.7	0.2	<0.1	<0.1	0.3	0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.4	0.6	0.5	0.5	0.8	0.2	0.2	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.67	6.94	6.41	6.86	6.54	6.48	6.72	7.68
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.14	0.16	0.11	0.14	0.19	0.17	0.16	0.08
Sulphate	mg/l	--	500 [4]	250	171	199	96	158	39	123	115
Temperature (Field)	deg c	--	15	11.2	9.5	7.9	8.0	8.5	10.5	9.4	8.1
Total Dissolved Solids	mg/l	--	500	750	782	756	520	1280	406	662	464
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.077	0.067	0.106	0.054	0.111	0.047	0.078	0.052
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	130	150	127	97.6	127	67.7	137	86.3
Chromium, dissolved	mg/l	0.05	--	0.007	0.004	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0019	0.0014
Copper, dissolved	mg/l	--	1	0.0064	0.0064	0.0051	0.0033	0.0035	0.0027	0.0021	0.0076
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.199
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	20	20.2	18.2	14.5	18.6	10.7	21.1	13.3
Manganese, dissolved	mg/l	--	0.05	0.096	0.12	0.05	0.612	0.436	0.023	1.04	3.13
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.15	5.7	5.31	4.22	7.3	3.12	10.8	6.54
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	137	124	86.4	48.1	38	42.3	69.8	69.5
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.006	<0.005	0.009	<0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.004

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 17-Nov-2016	92-19 24-May-2017	92-19 29-Nov-2017	92-19 24-May-2018	92-19 29-Nov-2018	92-19 19-Jun-2019	92-19 20-Nov-2019	92-19 21-May-2020
				92-19	92-19	92-19	92-19	92-19	92-19	92-19	92-19
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 26-Nov-2020 92-19	92-19 26-May-2021 92-19	92-19 30-Nov-2021 92-19
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	338	312	412
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	339	312	412
Ammonia Nitrogen	mg/l	--	--	0.05	0.06	0.37
Chemical Oxygen Demand	mg/l	--	--	50	20	180
Chloride	mg/l	--	250	143	222	323
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1342	1663	1801
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	403	500	487
Nitrate as N	mg/l	10.0	--	0.3	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.4	0.4	1.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	6.84	6.62	6.77
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	0.13	0.08	4.69
Sulphate	mg/l	--	500 [4]	148	210	188
Temperature (Field)	deg c	--	15	9.1	11.6	7.7
Total Dissolved Solids	mg/l	--	500	738	1030	1230
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Aluminum, dissolved	mg/l	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	0.06	0.05	0.051
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	129	160	151
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0012	<0.0005	0.0014
Copper, dissolved	mg/l	--	1	0.0027	0.0021	0.0078
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	19.5	24.2	27
Manganese, dissolved	mg/l	--	0.05	0.695	0.472	2.52
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.4	18.2	16.7
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	86	64.7	324
Zinc, dissolved	mg/l	--	5	0.009	0.007	0.006
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.002	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-19 26-Nov-2020 92-19	92-19 26-May-2021 92-19	92-19 30-Nov-2021 92-19
Semi-VOCs						
Naphthalene	mg/l	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--
VOCs						
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--
Chloroform	mg/l	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-4 28-Jun-1995	95-4 22-Nov-1995	95-4 12-Jun-1996	95-4 12-Oct-1996	95-4 18-Jun-1997	95-4 06-Nov-1997	95-4 05-Jun-1998	95-4 29-Oct-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	158	142	--	--	--	--	--	239
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	130	116	143	179	123	170	156	196
Ammonia Nitrogen	mg/l	--	--	0.04	0.01	0.01	0.05	0.17	0.01	0.03	0.04
Chemical Oxygen Demand	mg/l	--	--	40	25	11	8	3	5	3	3
Chloride	mg/l	--	250	42	18.8	22	15.7	12.2	14.3	11.9	14.1
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	610	430	--	--	410	500	497	520
Dissolved Oxygen (Field)	mg/l	--	--	7.45	--	--	--	5.96	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	265	180	242	223	212	273	212	239
Nitrate as N	mg/l	10.0	--	11.6	5.8	9.1	7.7	5.6	6.8	6.7	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.5	0.48	--	--	--	--	--	0.47
Nitrogen, Organic	mg/l	--	--	3.46	0.47	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.99	7.35	--	--	7.31	6.15	--	7
Phosphate	mg/l	--	--	--	0.2	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.44	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	59	42	50	40	37	38	71	47
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	310	220	--	--	210	250	250	260
Total Organic Carbon	mg/l	--	--	2	1.7	2.3	2.8	2.2	3.1	1.7	4.2
Total Suspended Solids	mg/l	--	--	--	--	201	640	873	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.01	0.01	0.018	0.04	0.02	0.04	0.07	0.06
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	78.6	52.7	70	64.1	62.8	81.6	59.1	73.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	1.11	0.03	0.07	0.15	0.1	0.06	0.17
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	16.5	11.7	16.3	15.1	13.1	16.5	15.5	13.6
Manganese, dissolved	mg/l	--	0.05	0.06	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Nickel, dissolved	mg/l	--	--	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	9.5	4.6	4.6	0.6	6.5	5	5.3
Sodium, dissolved	mg/l	--	200 [5]	10.6	6.2	11.6	8.8	8.6	7.9	14.5	10.4
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.019	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--	--
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-4 06-May-1999	95-4 19-Oct-1999	95-4 05-May-2000	95-4 24-Oct-2000	95-4 14-Jun-2001	95-4 23-Nov-2001	95-4 23-May-2002 [13]	95-4 06-Nov-2002 [13]
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	176	268	382	277	251	306	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	1	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	144	220	313	227	206	251	--	--
Ammonia Nitrogen	mg/l	--	--	0.01	0.04	0.01	0.01	0.01	0.01	--	--
Chemical Oxygen Demand	mg/l	--	--	4	6	3	--	5	3	--	--
Chloride	mg/l	--	250	7.1	10.2	37.7	16.9	11	10.3	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	370	460	850	630	500	522	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	185	233	479	216	268	302	--	--
Nitrate as N	mg/l	10.0	--	--	2.4	12.8	4.3	2.9	0.6	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.36	--	--	0.46	0.33	0.29	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.9	7.7	6.9	7.06	7.5	--	--	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	0.08	0.1	0.06	--	--
Sulphate	mg/l	--	500 [4]	34	39	97	63	47	30	--	--
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	190	230	425	354	320	468	--	--
Total Organic Carbon	mg/l	--	--	3.6	2.4	6.5	--	3.6	5	--	--
Total Suspended Solids	mg/l	--	--	--	182	154	108	259	74	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001	--	--
Boron, dissolved	mg/l	5	--	0.03	0.19	0.12	0.04	0.02	0.04	--	--
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	54.2	66.8	135	54.2	75.4	81	--	--
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	--	--
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	--	--
Iron, dissolved	mg/l	--	0.3	0.02	0.13	0.05	0.02	0.02	0.02	--	--
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0007	--	--
Magnesium, dissolved	mg/l	--	--	13.3	15.8	33.4	19.7	19.4	21	--	--
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.01	0.01	0.01	0.02	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	--	--
Potassium, dissolved	mg/l	--	--	0.4	5.1	2.2	5.4	2	0.4	--	--
Sodium, dissolved	mg/l	--	200 [5]	9.5	22.1	16.7	30	14.5	15.6	--	--
Zinc, dissolved	mg/l	--	5	0.01	0.1	0.14	0.03	0.01	0.01	--	--
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.007	0.001	--	--
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-4 30-May-2003 [13]	95-4 09-Oct-2003 [13]	95-4 14-May-2004 [13]	95-4 19-Nov-2004 [13]	95-4 24-May-2005 [13]	95-4 16-Nov-2005 [13]	95-4 25-May-2006	95-4 16-Nov-2006 [13]
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	222	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	<5	--
Alkalinity (Total as CaCO3)	mg/l	--	--	--	--	--	--	--	--	222	--
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	--	<0.01	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--	--	36	--
Chloride	mg/l	--	250	--	--	--	--	--	--	5	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	--	--	--	--	460	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	--	--	--	--	--	323	--
Nitrate as N	mg/l	10.0	--	--	--	--	--	--	--	1.1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	0.64	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	--	--	--	--	7.8	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	--	--	--	--	--	--	124	--
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	9.5	--
Total Dissolved Solids	mg/l	--	500	--	--	--	--	--	--	393	--
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001	--
Boron, dissolved	mg/l	5	--	--	--	--	--	--	--	0.021	--
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.005	--
Calcium, dissolved	mg/l	--	--	--	--	--	--	--	--	84	--
Chromium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.002	--
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005	--
Copper, dissolved	mg/l	--	1	--	--	--	--	--	--	0.003	--
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--	--	<0.005	--
Lead, dissolved	mg/l	0.01	--	--	--	--	--	--	--	<0.0002	--
Magnesium, dissolved	mg/l	--	--	--	--	--	--	--	--	27.5	--
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--	--	0.187	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	--	--	--	--	--	5.6	--
Sodium, dissolved	mg/l	--	200 [5]	--	--	--	--	--	--	14.2	--
Zinc, dissolved	mg/l	--	5	--	--	--	--	--	--	0.013	--
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	<0.001	--
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-4 15-May-2007 [13]	95-4 30-Nov-2007 [16]	95-4 22-May-2008 [13]	95-4 10-Nov-2008 [13]	95-4 19-May-2009 [13]	95-4 27-Nov-2009
								95-4	J-52
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	112
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	<2 [15]
Alkalinity (Total as CaCO3)	mg/l	--	--	--	--	--	--	--	112
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	<0.02
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--	33
Chloride	mg/l	--	250	--	--	--	--	--	10
Conductivity	uS/cm	--	--	--	--	--	--	--	341
Conductivity (Field)	uS/cm	--	--	--	--	--	--	--	309
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	--	--	--	--	76
Nitrate as N	mg/l	10.0	--	--	--	--	--	--	0.20
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	8.17
pH (Field)	-	--	--	--	--	--	--	--	8.97
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	0.21
Sulphate	mg/l	--	500 [4]	--	--	--	--	--	42
Temperature (Field)	deg c	--	15	--	--	--	--	--	8.4
Total Dissolved Solids	mg/l	--	500	--	--	--	--	--	222
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.004
Boron, dissolved	mg/l	5	--	--	--	--	--	--	0.07
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	--	--	--	--	--	19
Chromium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.0002
Copper, dissolved	mg/l	--	1	--	--	--	--	--	0.001
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--	<0.03
Lead, dissolved	mg/l	0.01	--	--	--	--	--	--	<0.001
Magnesium, dissolved	mg/l	--	--	--	--	--	--	--	7
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	--	--	--	--	4
Sodium, dissolved	mg/l	--	200 [5]	--	--	--	--	--	40
Zinc, dissolved	mg/l	--	5	--	--	--	--	--	<0.01
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	<0.001
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	<0.0004
Benzene	mg/l	0.001	--	--	--	--	--	--	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	<0.0040
o-Xylene	mg/l	--	--	--	--	--	--	--	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	--	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-4 20-Oct-2010 G-13	95-4 24-May-2011 G-44	95-4 22-Nov-2011 [13] 95-4	95-4 31-May-2012 [17] 95-4
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	310	244	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [15]	6	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	310	250	--	--
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.02	--	--
Chemical Oxygen Demand	mg/l	--	--	25	10	--	--
Chloride	mg/l	--	250	10	8	--	--
Conductivity	uS/cm	--	--	701	550	--	--
Conductivity (Field)	uS/cm	--	--	701	552	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	342	267	--	--
Nitrate as N	mg/l	10.0	--	<0.10	0.15	--	--
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.34	0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	8.16	8.40	--	--
pH (Field)	-	--	--	7.46	7.49	--	--
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.09	0.07	--	--
Sulphate	mg/l	--	500 [4]	63	42	--	--
Temperature (Field)	deg c	--	15	13.8	16.9	--	--
Total Dissolved Solids	mg/l	--	500	456	358	--	--
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	--	--
Boron, dissolved	mg/l	5	--	0.05	0.03	--	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	--	--
Calcium, dissolved	mg/l	--	--	86	69	--	--
Chromium, dissolved	mg/l	0.05	--	0.003	<0.001	--	--
Cobalt, dissolved	mg/l	--	--	0.0005	0.0003	--	--
Copper, dissolved	mg/l	--	1	0.003	0.006	--	--
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	--	--
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	--	--
Magnesium, dissolved	mg/l	--	--	31	23	--	--
Manganese, dissolved	mg/l	--	0.05	0.25	0.03	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6	4	--	--
Sodium, dissolved	mg/l	--	200 [5]	18	15	--	--
Zinc, dissolved	mg/l	--	5	<0.01	0.02	--	--
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	--	--
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	--	--
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	--	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	--	--
o-Xylene	mg/l	--	--	<0.0005	<0.0005	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 28-Jun-1995	95-8 22-Nov-1995	95-8 12-Jun-1996	95-8 12-Oct-1996	95-8 18-Jun-1997	95-8 06-Nov-1997	95-8 05-Jun-1998	95-8 29-Oct-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	173	174	--	--	--	--	--	161
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	142	143	151	143	123	150	150	132
Ammonia Nitrogen	mg/l	--	--	0.18	0.15	0.12	0.11	0.01	0.09	0.22	0.13
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	50	33	13	15	3	3	19	3
Chloride	mg/l	--	250	122	121	115	130	136	146	140	142
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	840	860	810	850	840	770	836	888
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	8.18	--	--	--	2.84	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	251	265	259	234	288	288	242	227
Nitrate as N	mg/l	10.0	--	0.1	0.3	0.1	0.1	0.1	0.1	1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.5	4.5	--	--	--	--	--	0.49
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	2.32	4.35	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	7.23	6.87	7.26	7	6.18	--	6.7
Phosphate	mg/l	--	--	--	1.4	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.66	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	74	84	76	79	72	64	92	75
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	420	440	410	430	420	360	416	445
Total Organic Carbon	mg/l	--	--	7.3	3.6	5.9	4.8	3.8	5.3	5.2	6.2
Total Suspended Solids	mg/l	--	--	--	--	1480	1780	1230	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.01	0.01	0.021	0.05	0.03	0.04	0.14	0.07
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	56.3	56	57.7	50.7	69.5	65	52.3	50.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	1.75	3.79	0.56	2.22	0.4	1.58	2.72
Lead, dissolved	mg/l	0.01	--	0.0002	0.0004	0.0002	0.0002	0.0002	0.0015	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	26.7	30	27.4	25.7	27.3	30.1	26.6	24.8
Manganese, dissolved	mg/l	--	0.05	0.24	0.27	0.383	0.25	0.39	0.27	0.3	0.37
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02
Potassium, dissolved	mg/l	--	--	--	7.6	6.98	3.8	7.7	7.5	6.5	9.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	63	67.7	78.5	71.1	71.8	61.4	93.9	69.1
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.35	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 28-Jun-1995	95-8 22-Nov-1995	95-8 12-Jun-1996	95-8 12-Oct-1996	95-8 18-Jun-1997	95-8 06-Nov-1997	95-8 05-Jun-1998	95-8 29-Oct-1998
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 06-May-1999	95-8 19-Oct-1999	95-8 05-May-2000	95-8 24-Oct-2000	95-8 14-Jun-2001	95-8 23-Nov-2001	95-8 23-May-2002	95-8 06-Nov-2002
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	178	220	177	187	160	150	173	194
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	146	180	145	153	131	123	142	159
Ammonia Nitrogen	mg/l	--	--	0.03	0.08	0.01	0.04	0.31	0.03	0.22	0.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	3	3	13	--	11	4	3	12
Chloride	mg/l	--	250	135	151	138	152	139	136	144	158
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	840	908	700	780	850	750	770	652
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	266	269	259	208	230	238	250	247
Nitrate as N	mg/l	10.0	--	--	0.1	0.2	0.2	0.2	0.2	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.84	--	--	0.52	0.86	0.66	1.4	0.33
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.4	7.4	7.2	7.14	7.1	6.23	6.74	7.2
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	1.28	2.22	1.01	0.6	0.48
Sulphate	mg/l	--	500 [4]	68	71	67	75	76	79	77	64
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	430	450	350	486	496	448	564	576
Total Organic Carbon	mg/l	--	--	4.8	3.8	6	--	5	6	5	5.2
Total Suspended Solids	mg/l	--	--	--	712	598	1010	2150	682	436	554
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.04	0.16	0.12	0.04	0.04	0.05	0.04	0.05
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	61.4	61.4	58.2	41.6	54.3	51	53.1	53
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	2.17	1.47	1.73	0.03	0.08	0.04	1.8	0.75
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0012	0.0002	0.0002	0.0002	0.0008
Magnesium, dissolved	mg/l	--	--	27.1	27.6	27.2	25.2	22.9	26.8	28.4	27.9
Manganese, dissolved	mg/l	--	0.05	0.37	0.28	0.32	0.26	0.23	0.28	0.23	0.23
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	5	7	2	4.5	2.4	2.6	6.5	7.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	81.3	90.5	71.7	90	70.1	71.1	64.6	76.7
Zinc, dissolved	mg/l	--	5	0.01	0.16	0.12	0.01	0.01	0.01	0.01	0.02
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.05	0.001	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 06-May-1999	95-8 19-Oct-1999	95-8 05-May-2000	95-8 24-Oct-2000	95-8 14-Jun-2001	95-8 23-Nov-2001	95-8 23-May-2002	95-8 06-Nov-2002
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 30-May-2003	95-8 09-Oct-2003	95-8 14-May-2004	95-8 19-Nov-2004	95-8 24-May-2005	95-8 16-Nov-2005	95-8 25-May-2006	95-8 21-Nov-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	154	--	162	275	310	222	358	492
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	126	184	133	230	254	364	358	492
Ammonia Nitrogen	mg/l	--	--	0.16	0.1	0.16	0.09	0.05	0.11	0.13	0.16
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	1	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	7	12	13	24	13	31	16	28
Chloride	mg/l	--	250	145	142	153	166	193	181	193	167
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	780	940	840	1110	1400	1300	1000	1300
Dissolved Inorganic Carbon	mg/l	--	--	--	44	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	231	265	233	310	366	579	408	552
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.2	0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.38	0.36	0.498	0.57	0.44	0.56	0.51	0.92
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.4	7	6.9	6.7	5.9	--	6.9	7.8
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.25	0.19	0.608	1.06	0.33	0.29	--	--
Sulphate	mg/l	--	500 [4]	65	73	71	77	79	107	90	103
Temperature (Field)	deg c	--	15	--	--	--	--	6.6	10.7	4	7.5
Total Dissolved Solids	mg/l	--	500	390	512	420	550	631	800	734	866
Total Organic Carbon	mg/l	--	--	5.2	10	3.6	5	5.2	10.2	--	--
Total Suspended Solids	mg/l	--	--	128	132	424	528	149	165	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001	0.0007
Boron, dissolved	mg/l	5	--	0.03	0.039	0.027	0.038	0.025	0.044	0.038	0.043
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001	<0.005	0.0001
Calcium, dissolved	mg/l	--	--	48.9	56.5	48.9	66.9	75.8	124	86.3	119
Chromium, dissolved	mg/l	0.05	--	0.01	0.005	0.001	0.002	<0.002	0.003	<0.002	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.007	0.003	0.002	<0.002	0.007	0.004	0.011
Iron, dissolved	mg/l	--	0.3	1.13	2.73	0.497	0.205	2.02	0.674	2.16	1.17
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0006	<0.0002	<0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	26.4	30.2	27	34.8	42.9	65.7	46.7	62
Manganese, dissolved	mg/l	--	0.05	0.18	0.203	0.17	0.242	0.344	0.312	0.328	0.443
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	5.5	6.9	5.7	6.7	6.2	9.3	6.3	8.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [5]	68.4	90.3	70.9	89.2	85.1	103	100	110
Zinc, dissolved	mg/l	--	5	0.01	0.005	0.005	0.005	0.008	0.008	0.008	0.008
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.002	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 30-May-2003	95-8 09-Oct-2003	95-8 14-May-2004	95-8 19-Nov-2004	95-8 24-May-2005	95-8 16-Nov-2005	95-8 25-May-2006	95-8 21-Nov-2006
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	<0.0007	--	--	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 15-May-2007	95-8 30-Nov-2007	95-8 22-May-2008	95-8 10-Nov-2008	95-8 19-May-2009 G-12	95-8 27-Nov-2009 J-1	95-8 25-May-2010 [14] M-4	95-8 20-Oct-2010 G-11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	507	531	501	519	417	417	475	452
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [15]	<2 [15]	<2 [15]	<2 [15]
Alkalinity (Total as CaCO3)	mg/l	--	--	507	531	501	519	417	417	475	452
Ammonia Nitrogen	mg/l	--	--	0.52	1.45	0.85	1.14	0.68	1.68	1.60	1.77
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	92	48	36	27	23	35	45	40
Chloride	mg/l	--	250	172	161	171	151	152	157	126	145
Conductivity	uS/cm	--	--	--	--	--	--	1350	1350	1410	1360
Conductivity (Field)	uS/cm	--	--	1100	1200	1300	1250	1000	1209	1511	1395
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	537	517	518	521	432	423	445	478
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	<0.1	<0.10	<0.10	<0.10	0.13
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.49	2.49	2	1.95	1.00	1.90	2.00	2.31
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	7.25	7.32	7.31	7.21
pH (Field)	-	--	--	7	6.7	6.5	6.5	--	6.64	6.48	6.63
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.4	0.09	0.11	0.06
Sulphate	mg/l	--	500 [4]	101	89	88	80	59	51	58	56
Temperature (Field)	deg c	--	15	6.3	5	8.5	7	5	4.7	9.4	8.8
Total Dissolved Solids	mg/l	--	500	881	879	871	857	878	878	917	884
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.0011	0.0011	0.0013	0.001	<0.001	0.001	<0.01	<0.001
Boron, dissolved	mg/l	5	--	0.038	0.044	0.036	0.042	0.07	0.05	0.05	0.05
Cadmium, dissolved	mg/l	0.005	--	0.00007	<0.00002	<0.00002	0.00025	<0.0001	<0.0001	0.0003	0.0001
Calcium, dissolved	mg/l	--	--	115	117	117	122	97	97	104	114
Chromium, dissolved	mg/l	0.05	--	0.003	<0.002	0.002	0.002	0.007	0.008	0.008	0.007
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.0014	0.0017	0.0029	0.0017
Copper, dissolved	mg/l	--	1	0.003	0.005	<0.002	0.045	0.010	0.005	0.046	0.005
Iron, dissolved	mg/l	--	0.3	3.16	1.55	3.35	0.038	0.03	3.11	0.54	2.83
Lead, dissolved	mg/l	0.01	--	0.00011	<0.00002	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	60.7	54.6	54.7	52.5	46	44	45	47
Manganese, dissolved	mg/l	--	0.05	0.508	0.551	0.593	1.36	1.12	1.57	2.30	1.54
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.5	10.7	9.4	12.4	8	10	10	11
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	114	127	125	124	111	116	102	116
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.005	<0.005	<0.01	0.01	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 15-May-2007	95-8 30-Nov-2007	95-8 22-May-2008	95-8 10-Nov-2008	95-8 19-May-2009 G-12	95-8 27-Nov-2009 J-1	95-8 25-May-2010 [14] M-4	95-8 20-Oct-2010 G-11
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 24-May-2011 [18] G-6	95-8 29-Nov-2011 95-8	95-8 31-May-2012 95-8	95-8 28-Nov-2012 95-8	95-8 29-May-2013 [19] 95-8	95-8 26-Nov-2013 GW-13	95-8 29-May-2014 95-8	95-8 19-Nov-2014 95-8
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	486	521	540	690	700	670	710	670
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [15]	<2 [15]	1.2	1.6	1.5	1.2	1.9	1.0
Alkalinity (Total as CaCO3)	mg/l	--	--	486	521	540	690	700	670	720	680
Ammonia Nitrogen	mg/l	--	--	2.03	2.08	2.3	2.6	3.6	2.5	2.7	2.8
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	38	45	53	90	75	59	70	65
Chloride	mg/l	--	250	142	137	130	120	130	140	160	170
Conductivity	uS/cm	--	--	1410	1450	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1342	--	1416	1467	1448	1415	1576	1781
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	569	516	510	700	730	680	760	700
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.30	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.010	<0.010	0.010	<0.010	0.068	0.013
Nitrogen, Total Kjeldahl	mg/l	--	--	2.64	2.27	3.3	3.6	4.4	3.1	3.3	3.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	0.30	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	7.78	7.40	7.36	--	7.36	7.27	7.45	7.22
pH (Field)	-	--	--	6.57	--	6.51	6.51	6.61	6.73	6.57	6.62
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.02	0.08	0.058	0.052	0.19	0.11	0.07	0.063
Sulphate	mg/l	--	500 [4]	56	70	69	69	67	55	42	45
Temperature (Field)	deg c	--	15	13.2	--	11.0	7.4	12	8.7	9.2	6.0
Total Dissolved Solids	mg/l	--	500	916	942	872	990	1050	1010	1050	1010
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.0010	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	0.05	0.04	0.056	0.052	0.054	0.057	0.065	0.063
Cadmium, dissolved	mg/l	0.005	--	0.0002	0.0002	0.00027	0.0004	0.00025	0.00023	0.00048	0.00050
Calcium, dissolved	mg/l	--	--	139	129	130	170	180	170	190	180
Chromium, dissolved	mg/l	0.05	--	0.006	0.006	<0.0050	<0.005	<0.0050	0.0059	0.0054	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0030	0.0020	0.0013	0.0029	0.0035	0.0032	0.0034	0.0027
Copper, dissolved	mg/l	--	1	0.037	0.046	0.054	0.05	0.011	0.031	0.015	0.0040
Iron, dissolved	mg/l	--	0.3	0.10	<0.03	<0.1	<0.1	1.6	<0.1	1.6	3.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.00050	<0.0005	0.00060	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	54	47	49	64	64	62	69	64
Manganese, dissolved	mg/l	--	0.05	3.44	2.61	2.6	6.7	7.4	6.9	8.2	6.7
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16	13	13	19	18	16	17	16
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	94	100	100	100	100	100	120	120
Zinc, dissolved	mg/l	--	5	0.01	<0.01	0.0064	<0.005	0.0093	0.0087	0.0082	<0.0050
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 24-May-2011 [18] G-6	95-8 29-Nov-2011 95-8	95-8 31-May-2012 95-8	95-8 28-Nov-2012 95-8	95-8 29-May-2013 [19] 95-8	95-8 26-Nov-2013 GW-13	95-8 29-May-2014 95-8	95-8 19-Nov-2014 95-8
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.004	<0.0004	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.005	<0.0005	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.005	<0.0005	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.01	<0.0005	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.04	<0.0040	<0.00050	<0.0013	<0.0013	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.005	<0.0005	<0.00010	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.005	<0.0005	<0.00020	<0.00050	<0.00050	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.002	<0.0002	<0.00020	<0.00050	<0.00050	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 02-Jun-2015	95-8 26-Nov-2015	95-8 26-May-2016	95-8 17-Nov-2016	95-8 24-May-2017	95-8 29-Nov-2017	95-8 24-May-2018	95-8 22-Nov-2018
				95-8	95-8	95-8	95-8	95-8	95-8	95-8	95-8
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	712	779	768	773	856	836	941	953
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	713	779	768	773	856	836	942	953
Ammonia Nitrogen	mg/l	--	--	2.57	2.60	2.83	2.25	1.80	2.17	2.42	1.92
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	81	94	91	88	286	94	129	117
Chloride	mg/l	--	250	185	177	188	181	172	226	200	199
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1782	1822	1817	1894	1915	1818	2068	1819
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	650	826	776	712	769	771	962	1120
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.7	3.7	3.5	3.2	3.0	3.3	4.0	3.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.57	6.74	6.77	7.05	6.62	6.67	6.48	6.68
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.05	0.05	0.07	0.06	0.02	0.06	0.04	0.08
Sulphate	mg/l	--	500 [4]	37	32	39	33	26	25	17	16
Temperature (Field)	deg c	--	15	10.7	8.4	13.5	10.4	12.0	8.3	11.9	6.8
Total Dissolved Solids	mg/l	--	500	1080	1110	1180	1030	1130	1140	1410	1210
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	0.001	0.002	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.059	0.068	0.084	0.058	0.051	0.083	0.065	0.091
Cadmium, dissolved	mg/l	0.005	--	0.0003	0.0003	0.0003	0.0003	0.0002	0.0004	0.0005	0.0003
Calcium, dissolved	mg/l	--	--	148	197	197	185	209	200	263	313
Chromium, dissolved	mg/l	0.05	--	0.004	0.006	0.006	0.014	0.014	0.007	0.008	0.007
Cobalt, dissolved	mg/l	--	--	0.0031	0.0034	0.0035	0.0012	0.0026	0.0031	0.0033	0.0035
Copper, dissolved	mg/l	--	1	0.0196	0.0571	0.0351	0.0547	0.0371	0.0087	0.112	0.107
Iron, dissolved	mg/l	--	0.3	<0.1	0.226	<0.1	<0.1	<0.1	1.33	<0.1	0.124
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	68	81.1	68.7	60.6	59.8	65.9	73.8	82.8
Manganese, dissolved	mg/l	--	0.05	10.2	8.9	9.2	5.7	8.23	8.27	11.8	5.83
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.7	16.7	21.5	16.5	16.5	17.8	17.9	20.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	116	139	120	129	128	125	117	145
Zinc, dissolved	mg/l	--	5	<0.005	0.016	0.006	0.008	0.008	<0.005	0.007	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [7]	<0.001	0.006	<0.002 [7]	<0.002 [7]	<0.001	<0.002 [7]	0.004

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 02-Jun-2015	95-8 26-Nov-2015	95-8 26-May-2016	95-8 17-Nov-2016	95-8 24-May-2017	95-8 29-Nov-2017	95-8 24-May-2018	95-8 22-Nov-2018
				95-8	95-8	95-8	95-8	95-8	95-8	95-8	95-8
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 19-Jun-2019 95-8	95-8 20-Nov-2019 95-8	95-8 21-May-2020 95-8	95-8 26-Nov-2020 95-8	95-8 26-May-2021 95-8	95-8 30-Nov-2021 95-8
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	943	916	1010	1160	934	903
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<25 [9]	<25	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	944	916	1010	1170	935	904
Ammonia Nitrogen	mg/l	--	--	2.25	2.66	2.82	1.70	2.51	2.16
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	124	121	138	169	107	124
Chloride	mg/l	--	250	161	165	198	166	174	163
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1848	2070	1876	1855	1973	1966
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	864	911	853	925	833	751
Nitrate as N	mg/l	10.0	--	0.3	<0.1	<0.1	<0.5 [10]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.07	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.4	3.3	3.5	3.0	3.5 [20]	3.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	6.5	7.14	6.8	6.49	6.6
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.02	0.02	0.03	0.04	0.03	0.96
Sulphate	mg/l	--	500 [4]	14	14	15	9	11	8
Temperature (Field)	deg c	--	15	12.5	7.1	16.7	6.8	11.7	6.6
Total Dissolved Solids	mg/l	--	500	1260	1250	1350	1270	1250	1230
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.073	0.067	0.05	0.057	0.053	0.047
Cadmium, dissolved	mg/l	0.005	--	0.0003	0.0004	0.0001	0.0002	0.0003	<0.0001
Calcium, dissolved	mg/l	--	--	213	225	212	230	206	191
Chromium, dissolved	mg/l	0.05	--	0.009	0.013	0.013	0.011	0.011	0.008
Cobalt, dissolved	mg/l	--	--	0.0027	0.0043	0.0042	0.0027	0.0021	0.0019
Copper, dissolved	mg/l	--	1	0.0948	0.0094	0.0096	0.0926	0.0919	0.0415
Iron, dissolved	mg/l	--	0.3	<0.1	4.02	3.51	<0.1	<0.1	1.15
Lead, dissolved	mg/l	0.01	--	0.0001	0.0002	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	80.6	84.9	78.6	85.4	77.5	66.4
Manganese, dissolved	mg/l	--	0.05	11.3	10.6	10.9	10.8	9.67	8.29
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	22.6	24.2	19.3	18.8	17	14.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	124	131	132	125	122	110
Zinc, dissolved	mg/l	--	5	<0.005	0.008	0.006	0.014	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.010 [7]	0.009	<0.004 [10]	0.004	<0.002 [10]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-8 19-Jun-2019 95-8	95-8 20-Nov-2019 95-8	95-8 21-May-2020 95-8	95-8 26-Nov-2020 95-8	95-8 26-May-2021 95-8	95-8 30-Nov-2021 95-8
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 29-Oct-1998	98-1 06-May-1999	98-1 05-May-2000	98-1 24-Oct-2000	98-1 14-Jun-2001	98-1 23-Nov-2001	98-1 23-May-2002	98-1 06-Nov-2002
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	293	342	357	323	272	267	266	271
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	1	4	1
Alkalinity (Total as CaCO3)	mg/l	--	--	240	280	293	265	223	219	224	222
Ammonia Nitrogen	mg/l	--	--	0.34	0.63	0.01	0.01	0.34	0.33	0.26	0.16
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	3	7	6	--	12	5	3	13
Chloride	mg/l	--	250	210	290	197	209	184	181	189	182
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1066	1420	1200	1260	1050	1140	1210	1190
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	256	214	218	233	273	278	266	253
Nitrate as N	mg/l	10.0	--	--	--	0.3	0.5	0.4	0.2	0.3	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.87	0.99	--	0.5	0.57	0.62	0.5	0.43
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	7.1	7.7	7.7	7.7	6.87	7.06	7.6
Phosphorus	mg/l	--	--	--	--	--	0.13	0.12	0.07	0.09	0.06
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	116	33	47	55	63	77	63	61
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	536	710	600	612	584	556	20800	588
Total Organic Carbon	mg/l	--	--	13.8	8.4	4.6	--	3.8	6	4	4.6
Total Suspended Solids	mg/l	--	--	--	--	284	98	74	91	80	74
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.001	0.001	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.12	0.13	0.19	0.08	0.06	0.09	0.07	0.08
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	64.6	45.2	48.5	49.4	65.9	63.4	61.2	58.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.13	2.41	0.42	0.03	0.02	0.02	0.02	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0012	0.0002	0.0002	0.0002	0.0004
Magnesium, dissolved	mg/l	--	--	22.9	24.3	23.1	26.7	26.3	29.1	27.6	26
Manganese, dissolved	mg/l	--	0.05	0.53	0.27	0.18	0.19	0.26	0.33	0.33	0.28
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.5	6.7	8.2	12.4	3.4	5.3	9.3	8.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	150	238	200	148	114	131	120	120
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.08	0.01	0.01	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 29-Oct-1998	98-1 06-May-1999	98-1 05-May-2000	98-1 24-Oct-2000	98-1 14-Jun-2001	98-1 23-Nov-2001	98-1 23-May-2002	98-1 06-Nov-2002
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.055	0.001	0.001	0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 30-May-2003	98-1 09-Oct-2003	98-1 14-May-2004	98-1 19-Nov-2004	98-1 24-May-2005	98-1 16-Nov-2005	98-1 25-May-2006	98-1 21-Nov-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	271	--	282	329	310	178	310	300
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	222	227	231	270	254	292	310	300
Ammonia Nitrogen	mg/l	--	--	0.3	0.22	0.27	0.48	0.23	<0.01	0.16	0.04
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	2	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	10	7	16	248	9	9	6	6
Chloride	mg/l	--	250	192	196	183	199	191	246	205	224
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1060	1280	1200	1170	1800	930	1075	1100
Dissolved Inorganic Carbon	mg/l	--	--	--	53	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	268	242	263	284	222	258	263	260
Nitrate as N	mg/l	10.0	--	0.3	0.3	0.4	0.4	0.2	0.5	0.4	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.99	0.62	0.659	2.82	0.54	0.2	0.37	0.33
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	7.4	7.5	7.3	6.1	--	7.7	8.2
Phosphorus	mg/l	--	--	0.55	0.36	0.136	3.09	0.11	0.09	--	--
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	57	51	57	63	55	35	52	42
Temperature (Field)	deg c	--	15	--	--	--	--	6.9	11.2	5	7
Total Dissolved Solids	mg/l	--	500	530	626	600	585	681	725	701	723
Total Organic Carbon	mg/l	--	--	4.6	8	4	6.2	4	5.4	--	--
Total Suspended Solids	mg/l	--	--	627	340	66	740	38	22	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.0001	0.001	<0.001	<0.001	0.002
Boron, dissolved	mg/l	5	--	0.05	0.072	0.065	0.062	0.095	0.089	0.074	0.084
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001	<0.005	<0.0001
Calcium, dissolved	mg/l	--	--	62.4	54.4	60.3	66.8	47.7	59.3	59	58.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.004	0.001	0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.002	0.003	0.006	<0.002	0.004	0.009	0.003
Iron, dissolved	mg/l	--	0.3	0.19	1.02	0.01	0.007	0.013	0.007	0.014	0.008
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0005	<0.0002	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	27.2	25.7	27.4	28.5	25.1	26.6	28	27.7
Manganese, dissolved	mg/l	--	0.05	0.38	0.274	0.408	0.454	0.215	0.192	0.32	0.022
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	7.5	8.8	8.6	8.2	10.1	10.3	8.3	9.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [5]	114	153	148	119	208	180	169	180
Zinc, dissolved	mg/l	--	5	0.01	0.005	0.005	0.005	<0.005	0.009	<0.005	0.009

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 30-May-2003	98-1 09-Oct-2003	98-1 14-May-2004	98-1 19-Nov-2004	98-1 24-May-2005	98-1 16-Nov-2005	98-1 25-May-2006	98-1 21-Nov-2006
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.002	<0.001	<0.001	<0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	<0.0007	--	--	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	<0.0004	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	<0.0001	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	<0.0002	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	<0.0001	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	<0.0001	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	<0.0002	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	<0.002	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	<0.0002	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	<0.0002	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	<0.0003	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	<0.0002	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	<0.0001	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	<0.0001	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 15-May-2007	98-1 30-Nov-2007	98-1 22-May-2008	98-1 10-Nov-2008	98-1 19-May-2009 G-18	98-1 27-Nov-2009 J-4	98-1 25-May-2010 [14] M-3	98-1 20-Oct-2010 [14] G-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	328	336	333	327	364	369	476	502
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<2 [15]	<2 [15]	<2 [15]	<2 [15]
Alkalinity (Total as CaCO3)	mg/l	--	--	328	336	333	327	364	369	476	502
Ammonia Nitrogen	mg/l	--	--	0.21	<0.01	0.02	0.08	0.27	0.57	1.09	1.28
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	47	10	<5	20	25	28	35
Chloride	mg/l	--	250	275	214	247	265	341	467	714	819
Conductivity	uS/cm	--	--	--	--	--	--	1830	2120	3320	3480
Conductivity (Field)	uS/cm	--	--	1100	1100	1250	1300	1200	750	3200	3190
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	246	291	278	251	292	213	246	260
Nitrate as N	mg/l	10.0	--	0.3	0.5	0.3	0.3	0.15	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.78	0.25	0.69	0.4	0.46	0.66	1.16	1.61
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	7.77	8.22	8.29	8.21
pH (Field)	-	--	--	8.2	7.6	--	7.4	--	7.15	7.78	7.82
Phosphorus	mg/l	--	--	--	--	--	--	--	0.32	0.54	0.53
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	0.76	--	--	--
Sulphate	mg/l	--	500 [4]	37	48	43	38	24	6	8	2
Temperature (Field)	deg c	--	15	6.9	6	--	6	6	5.5	12.6	8.7
Total Dissolved Solids	mg/l	--	500	824	788	798	822	1190	1380	2160	2260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.0029	0.0028	0.0025	0.0023	0.003	0.004	<0.01	<0.01
Boron, dissolved	mg/l	5	--	0.109	0.095	0.092	0.109	0.21	0.18	0.26	0.30
Cadmium, dissolved	mg/l	0.005	--	0.00003	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	54.6	67	63.6	56.7	64	44	44	48
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	0.009	<0.005	0.007	<0.005
Cobalt, dissolved	mg/l	--	--	0.007	<0.005	<0.005	<0.005	0.0003	0.0004	0.0004	0.0003
Copper, dissolved	mg/l	--	1	<0.002	0.003	0.002	0.003	0.001	0.006	0.003	0.002
Iron, dissolved	mg/l	--	0.3	0.235	0.056	0.013	<0.005	0.22	<0.03	<0.03	0.08
Lead, dissolved	mg/l	0.01	--	0.00007	<0.00002	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	26.7	30.2	28.9	26.5	32	25	33	34
Manganese, dissolved	mg/l	--	0.05	0.19	0.319	0.379	0.039	0.27	0.27	0.11	0.09
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	10.2	9.1	10.4	11	11	18	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	222	215	206	229	243	386	516	578
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.01	0.01	<0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 15-May-2007	98-1 30-Nov-2007	98-1 22-May-2008	98-1 10-Nov-2008	98-1 19-May-2009 G-18	98-1 27-Nov-2009 J-4	98-1 25-May-2010 [14] M-3	98-1 20-Oct-2010 [14] G-12
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 24-May-2011 [14] G-3	98-1 08-Dec-2011 [14] B-1	98-1 31-May-2012 98-1	98-1 28-Nov-2012 98-1	98-1 29-May-2013 98-1	98-1 26-Nov-2013 GW-4	98-1 29-May-2014 98-1	98-1 19-Nov-2014 98-1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	355	343	370	390	350	400	300	380
Alkalinity, Carbonate as CaCO3	mg/l	--	--	7	<2 [15]	3.7	3.3	3.2	3.8	3.2	4.1
Alkalinity (Total as CaCO3)	mg/l	--	--	362	343	370	390	360	410	300	380
Ammonia Nitrogen	mg/l	--	--	0.88	0.84	0.12	0.77	1.2	0.92	0.89	0.94
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	33	20	23	30	36	23	29	21
Chloride	mg/l	--	250	488	389	320	360	400	260	330	470
Conductivity	uS/cm	--	--	2260	1860	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1897	2049	1615	1676	1459	1659	1613	1934
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	222	245	240	280	320	340	250	290
Nitrate as N	mg/l	10.0	--	<0.10	0.37	0.80	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	0.075	0.10	0.22	0.018	0.165	0.064
Nitrogen, Total Kjeldahl	mg/l	--	--	1.46	1.09	0.79	1.1	1.4	1.4	1.4	1.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	0.88	0.19	0.26	<0.10	0.19	<0.10
pH	-	--	--	8.32	8.16	8.02	--	7.98	8.00	8.06	8.06
pH (Field)	-	--	--	7.75	7.93	7.59	7.48	7.40	7.63	7.44	7.52
Phosphorus	mg/l	--	--	0.66	0.65	0.073	0.30	0.47	0.48	0.46	0.49
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	9	6	9	4	10	12	28	5
Temperature (Field)	deg c	--	15	12.6	7.1	11.0	7.2	10.1	7.3	9.4	7.9
Total Dissolved Solids	mg/l	--	500	1470	1210	974	986	1040	1100	1050	1090
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	0.0016	0.001	<0.0010	<0.0010	0.0015	0.0017
Boron, dissolved	mg/l	5	--	0.16	0.13	0.21	0.21	0.15	0.11	0.16	0.17
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	46	57	50	58	82	80	65	68
Chromium, dissolved	mg/l	0.05	--	0.005	0.004	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0004	0.0003	<0.00050	<0.0005	0.00096	0.00053	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0017	<0.001	0.0012	0.0012	0.0027	<0.0020
Iron, dissolved	mg/l	--	0.3	<0.03	0.58	<0.1	0.52	<0.1	0.26	0.85	1.6
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	26	25	28	34	28	35	20	30
Manganese, dissolved	mg/l	--	0.05	0.10	0.14	0.25	0.35	0.78	0.34	0.17	0.46
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	10	12	14	14	15	12	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	388	271	350	350	230	140	250	300
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.0091	<0.005	<0.0050	<0.0050	0.0054	<0.0050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 24-May-2011 [14] G-3	98-1 08-Dec-2011 [14] B-1	98-1 31-May-2012 98-1	98-1 28-Nov-2012 98-1	98-1 29-May-2013 98-1	98-1 26-Nov-2013 GW-4	98-1 29-May-2014 98-1	98-1 19-Nov-2014 98-1
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0005	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.00050	<0.0013	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 02-Jun-2015	98-1 26-Nov-2015	98-1 26-May-2016	98-1 17-Nov-2016	98-1 24-May-2017	98-1 29-Nov-2017	98-1 24-May-2018	98-1 29-Nov-2018
				98-1	98-1	98-1	98-1	98-1	98-1	98-1	98-1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	404	389	426	477	442	547	501	548
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	406	392	428	479	445	549	504	550
Ammonia Nitrogen	mg/l	--	--	0.92	0.98	1.49	1.28	1.43	2.00	1.73	1.28
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	28	30	28	56	35	47	42	48
Chloride	mg/l	--	250	465	472	406	430	458	455	478	423
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1909	2143	2053	2259	2194	1982	2196	1901
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	293	235	399	322	315	357	330	400
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.6	0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.07
Nitrogen, Total Kjeldahl	mg/l	--	--	1.5	1.4	1.8	1.6	1.8	2.5	3.0	2.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.52	8.02	7.95	7.39	7.75	7.61	7.44	7.47
Phosphorus	mg/l	--	--	0.39	0.36	0.31	0.41	0.35	0.46	0.45	0.69
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	5	3	7	3	3	3	2	3
Temperature (Field)	deg c	--	15	10.1	8.1	13.8	9.7	11.2	7.7	10.9	7.3
Total Dissolved Solids	mg/l	--	500	1200	1180	1090	1130	1130	1170	1390	1120
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.002	0.001	0.002	0.003	0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.112	0.175	0.17	0.31	0.154	0.201	0.173	0.153
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	56.8	51.7	63.5	70.4	74.9	78.8	74	82.4
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	0.008	0.006	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0008	<0.0005	0.0009
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0010	0.0053	0.0012	0.0008	0.0008	0.0031
Iron, dissolved	mg/l	--	0.3	<0.1	0.584	<0.1	<0.1	0.942	4.67	0.699	0.581
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	36.7	25.8	36.3	35.5	31.1	39	35.2	47.2
Manganese, dissolved	mg/l	--	0.05	0.162	0.285	0.066	0.119	0.816	0.8	0.352	0.504
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11.6	10.8	15.3	14.5	12.8	15	13.5	16.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	164	376	283	319	353	317	335	332
Zinc, dissolved	mg/l	--	5	0.067	0.012	<0.005	0.017	0.009	<0.005	0.006	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 02-Jun-2015 98-1	98-1 26-Nov-2015 98-1	98-1 26-May-2016 98-1	98-1 17-Nov-2016 98-1	98-1 24-May-2017 98-1	98-1 29-Nov-2017 98-1	98-1 24-May-2018 98-1	98-1 29-Nov-2018 98-1
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	0.003	0.003	<0.001	<0.001	<0.001	<0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 19-Jun-2019 98-1	98-1 20-Nov-2019 98-1	98-1 21-May-2020 98-1	98-1 26-Nov-2020 98-1	98-1 26-May-2021 98-1	98-1 30-Nov-2021 98-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	523	501	409	429	412	398
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	6	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	526	505	414	435	417	401
Ammonia Nitrogen	mg/l	--	--	2.15	1.23	0.63	1.12	0.69	0.97
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	42	51	39	37	<10	40
Chloride	mg/l	--	250	433	413	588	508	503	470
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2053	2260	1960	2033	2131	2161
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	414	412	312	334	302	276
Nitrate as N	mg/l	10.0	--	0.2	0.5	0.2	<0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.33	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.1	1.7	1.1	1.5	1.0	1.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.37	7.7	7.57	8.07	7.71	7.69
Phosphorus	mg/l	--	--	0.39	0.40	0.18	0.58	0.19	0.40
Phosphorus, dissolved	mg/l	--	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [4]	3	2	3	1	<1	2
Temperature (Field)	deg c	--	15	13.2	5.5	13.2	7.0	11.0	7.8
Total Dissolved Solids	mg/l	--	500	1170	1080	1190	1210	1250	1120
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.163	0.157	0.163	0.156	0.161	0.145
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	93.7	87	66.1	69.8	61.8	59
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0009	0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0011	0.0016	0.0031	0.0008	0.0012	0.0007
Iron, dissolved	mg/l	--	0.3	6.58	0.77	<0.1	2.47	<0.1	0.647
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	43.8	47.2	35.7	38.7	35.8	31.2
Manganese, dissolved	mg/l	--	0.05	1.39	0.288	0.222	0.344	0.047	0.388
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	18.6	19.2	14.4	14.9	14.1	12.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	327	322	354	345	352	293
Zinc, dissolved	mg/l	--	5	0.006	<0.005	0.006	0.008	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-1 19-Jun-2019 98-1	98-1 20-Nov-2019 98-1	98-1 21-May-2020 98-1	98-1 26-Nov-2020 98-1	98-1 26-May-2021 98-1	98-1 30-Nov-2021 98-1
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	0.002	<0.004 [10]	<0.004 [10]	<0.001
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-2 06-May-1999	98-2 19-Oct-1999	98-2 24-Oct-2000	98-2 14-Jun-2001	98-2 06-Nov-2002	98-2 30-May-2003	98-2 19-Nov-2004	98-2 16-Nov-2005
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	610	584	382	289	296	215	348	189
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	13	1	2	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	500	500	313	241	243	176	290	314
Ammonia Nitrogen	mg/l	--	--	0.83	1.12	0.35	0.76	0.36	0.31	0.36	1.1
Chemical Oxygen Demand	mg/l	--	--	18	10	--	8	34	12	13	70
Chloride	mg/l	--	250	831	834	355	278	305	171	255	350
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	1710	1050	2100	890	1540	1800
Hardness, Calcium Carbonate	mg/l	--	--	263	268	189	198	207	195	211	198
Nitrate as N	mg/l	10.0	--	--	4.5	0.3	0.4	0.6	0.4	2	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.5	--	1.8	1.66	0.56	1.09	0.64	2.65
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	7.88	7.7	7.9	6.9	7.5	--
Phosphorus	mg/l	--	--	--	--	4.33	2.68	1.97	2.54	0.17	8.32
Sulphate	mg/l	--	500 [4]	11	13	42	46	46	54	40	39
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	11.4
Total Dissolved Solids	mg/l	--	500	--	--	836	764	738	445	770	958
Total Organic Carbon	mg/l	--	--	11.8	10	--	5.2	4.7	4.5	1.8	8.8
Total Suspended Solids	mg/l	--	--	--	1020	5450	3560	2430	2170	32	404
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	0.002	0.001	0.004	0.001	0.001	<0.001
Boron, dissolved	mg/l	5	--	0.32	0.44	0.17	0.1	0.09	0.06	0.097	0.252
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	44.8	48.6	35.3	44.1	46.2	42.3	44.8	36.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.02	2.15	0.2	0.02	0.07	0.14	0.105	0.051
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0022	0.0002	0.0005	0.0003	0.0005	<0.0002
Magnesium, dissolved	mg/l	--	--	31.5	35.2	24.4	21.4	22.2	21.8	24	25.7
Manganese, dissolved	mg/l	--	0.05	0.08	0.24	0.33	0.38	0.53	0.49	0.217	0.197
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	16.8	19.2	8.4	2.5	8.3	7	12.6	12.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [5]	586	718	340	200	213	112	226	314
Zinc, dissolved	mg/l	--	5	0.01	0.06	0.01	0.01	0.01	0.01	0.005	0.007
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.001	0.049	0.001	0.001	0.001	<0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-2 15-May-2007	98-2 10-Nov-2008	98-2 27-Nov-2009 J-11
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	422	423	533
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [15]
Alkalinity (Total as CaCO3)	mg/l	--	--	422	423	533
Ammonia Nitrogen	mg/l	--	--	0.43	1.14	1.40
Chemical Oxygen Demand	mg/l	--	--	77	17	55
Chloride	mg/l	--	250	594	547	913
Conductivity	uS/cm	--	--	--	--	3710
Conductivity (Field)	uS/cm	--	--	1900	2550	2870
Hardness, Calcium Carbonate	mg/l	--	--	236	229	247
Nitrate as N	mg/l	10.0	--	0.3	0.4	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.2	2.28	1.65
pH	-	--	--	--	--	8.25
pH (Field)	-	--	--	8.1	7.8	8.8
Phosphorus	mg/l	--	--	--	--	1.66
Sulphate	mg/l	--	500 [4]	31	32	3
Temperature (Field)	deg c	--	15	8.2	9	4.3
Total Dissolved Solids	mg/l	--	500	1430	1320	2410
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	0.0049	0.0034	0.005
Boron, dissolved	mg/l	5	--	0.243	0.197	0.37
Cadmium, dissolved	mg/l	0.005	--	0.00003	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	45	45.8	43
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	0.007
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.0006
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.339	<0.005	<0.03
Lead, dissolved	mg/l	0.01	--	0.0002	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	30	27.7	34
Manganese, dissolved	mg/l	--	0.05	0.202	0.002	0.19
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17.2	13.1	18
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	460	399	635
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.01
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-3 06-May-1999	98-3 24-Oct-2000	98-3 14-Jun-2001	98-3 06-Nov-2002	98-3 30-May-2003	98-3 19-Nov-2004	98-3 16-Nov-2005	98-3 15-May-2007
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	184	282	154	194	181	198	217	165
Alkalinity, Carbonate as CaCO3	mg/l	--	--	29	1	13	1	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	200	231	150	159	148	160	178	165
Ammonia Nitrogen	mg/l	--	--	2.03	1.3	1.19	0.17	0.09	0.98	0.26	<0.01
Chemical Oxygen Demand	mg/l	--	--	92	--	47	11	2	257	16	27
Chloride	mg/l	--	250	3.4	4.1	2	20.8	2.6	2	2.9	2.6
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	440	375	270	320	370	376	240
Hardness, Calcium Carbonate	mg/l	--	--	15	8	13	26	29	26	22	28
Nitrate as N	mg/l	10.0	--	--	0.2	0.3	2.3	1.2	0.9	0.4	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	4.24	2.52	4.05	0.05	0.29	0.98	0.39	0.26
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	8.31	9	8.8	7.5	8.2	--	8.8
Phosphorus	mg/l	--	--	--	4.11	5.9	1.29	0.96	7.9	1.31	--
Sulphate	mg/l	--	500 [4]	34	38	42	33	27	26	19	28
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	8.7
Total Dissolved Solids	mg/l	--	500	--	340	260	400	160	185	218	216
Total Organic Carbon	mg/l	--	--	9	--	3.8	2.7	3.4	3.2	3.6	--
Total Suspended Solids	mg/l	--	--	--	11600	8900	1380	1300	2310	11400	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	0.006	0.008	0.006	0.005	0.004	<0.001	0.0077
Boron, dissolved	mg/l	5	--	0.16	0.14	0.15	0.15	0.14	0.144	0.147	0.135
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	0.00005
Calcium, dissolved	mg/l	--	--	2.37	2	3.29	5.72	7	6.34	5.57	6.56
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005	0.008
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	0.004	<0.002
Iron, dissolved	mg/l	--	0.3	1.1	0.12	0.02	0.02	0.03	0.009	0.007	0.197
Lead, dissolved	mg/l	0.01	--	0.0026	0.0006	0.0003	0.0014	0.0005	0.0002	<0.0002	0.00079
Magnesium, dissolved	mg/l	--	--	2.22	0.82	1.24	2.82	2.86	2.57	2.07	2.83
Manganese, dissolved	mg/l	--	0.05	0.03	0.01	0.01	0.03	0.01	0.015	0.015	0.015
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	0.01	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	<0.01	--
Potassium, dissolved	mg/l	--	--	2.4	3	0.4	0.4	3.2	3.1	3.7	3.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.001	--
Sodium, dissolved	mg/l	--	200 [5]	99.3	120	83.9	78.3	72.1	67.6	79.6	72.1
Zinc, dissolved	mg/l	--	5	0.05	0.01	0.01	0.01	0.01	0.005	<0.005	<0.005
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	0.003	0.049	0.001	0.001	0.001	<0.001	<0.001
VOCs											
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	<0.0001
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-3 10-Nov-2008	98-3 27-Nov-2009 J-50	98-3 24-May-2011 [14] G-36
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	158	153	156
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	4	4
Alkalinity (Total as CaCO3)	mg/l	--	--	160	158	160
Ammonia Nitrogen	mg/l	--	--	0.2	0.15	<0.02
Chemical Oxygen Demand	mg/l	--	--	<100	25	10
Chloride	mg/l	--	250	2	4	3
Conductivity	uS/cm	--	--	--	342	360
Conductivity (Field)	uS/cm	--	--	335	331	338
Hardness, Calcium Carbonate	mg/l	--	--	24	30	30
Nitrate as N	mg/l	10.0	--	0.4	1.05	1.15
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.62	0.15	0.14
pH	-	--	--	--	8.48	8.43
pH (Field)	-	--	--	8.2	7.74	8.36
Phosphorus	mg/l	--	--	--	1.34	0.67
Sulphate	mg/l	--	500 [4]	20	21	21
Temperature (Field)	deg c	--	15	9	8.3	20.8
Total Dissolved Solids	mg/l	--	500	202	222	234
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	0.007	0.006	<0.01
Boron, dissolved	mg/l	5	--	0.131	0.16	0.14
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	5.74	7	7
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.005	<0.0002	0.0002
Copper, dissolved	mg/l	--	1	<0.002	0.004	0.005
Iron, dissolved	mg/l	--	0.3	<0.005	<0.03	<0.03
Lead, dissolved	mg/l	0.01	--	0.00011	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	2.39	3	3
Manganese, dissolved	mg/l	--	0.05	0.013	0.01	<0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.7	4	3
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	71.9	75	71
Zinc, dissolved	mg/l	--	5	<0.005	0.01	<0.01
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 29-Oct-1998	98-4 06-May-1999	98-4 19-Oct-1999	98-4 05-May-2000	98-4 24-Oct-2000	98-4 14-Jun-2001	98-4 23-Nov-2001	98-4 23-May-2002
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	151	148	159	143	134	140	131	131
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	2	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	124	121	130	117	110	119	107	107
Ammonia Nitrogen	mg/l	--	--	0.08	0.02	0.04	0.01	0.01	0.03	0.01	0.21
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	15	3	6	4	--	3	6	3
Chloride	mg/l	--	250	8.2	6.9	8	7.1	8.8	8.5	9.5	8.8
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	888	360	--	330	325	340	340	320
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	125	117	114	100	83	100	95	97
Nitrate as N	mg/l	10.0	--	--	--	0.6	0.6	0.6	0.7	0.6	0.6
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.04	1.27	--	--	0.32	0.32	0.45	0.14
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	6.9	--	7.9	7.55	7.9	7.65	7.32
Phosphorus	mg/l	--	--	--	--	--	--	0.26	0.67	0.5	0.3
Sulphate	mg/l	--	500 [4]	116	57	59	49	51	52	50	50
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	445	180	--	165	193	292	212	306
Total Organic Carbon	mg/l	--	--	12.7	5.1	3.9	2.8	--	1.9	4	2
Total Suspended Solids	mg/l	--	--	--	--	352	728	324	1060	1620	1220
Metals											
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.002	0.002	0.004	0.002
Boron, dissolved	mg/l	5	--	0.08	0.06	0.17	0.14	0.07	0.06	0.08	0.06
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	37.8	29.3	29	25.7	21.4	26.2	23.9	24.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.05	0.02	1.64	1.12	0.03	0.02	0.05	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	7.34	10.6	9.97	8.51	7.14	8.42	8.51	9.02
Manganese, dissolved	mg/l	--	0.05	0.19	0.07	0.06	0.03	0.03	0.02	0.03	0.03
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	5	0.8	5.9	0.4	4.3	0.4	0.4	5.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	53.3	35.7	44.8	39.9	36.5	35.1	40.1	36.7
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.07	0.02	0.01	0.01	0.01	0.01
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.047	0.001	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 29-Oct-1998	98-4 06-May-1999	98-4 19-Oct-1999	98-4 05-May-2000	98-4 24-Oct-2000	98-4 14-Jun-2001	98-4 23-Nov-2001	98-4 23-May-2002
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 06-Nov-2002	98-4 30-May-2003	98-4 09-Oct-2003	98-4 14-May-2004	98-4 19-Nov-2004	98-4 24-May-2005	98-4 16-Nov-2005	98-4 25-May-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	132	134	--	118	137	132	138	108
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	1	1	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	108	110	102	97	112	110	113	108
Ammonia Nitrogen	mg/l	--	--	0.01	0.03	0.02	0.06	0.02	<0.01	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	1	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	6	9	4	2	5	6	<5	10
Chloride	mg/l	--	250	8.9	8.5	8.2	9.2	8.4	8.7	8.9	9.6
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	241	290	360	320	450	360	320	280
Dissolved Inorganic Carbon	mg/l	--	--	--	--	25	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	87	88	87	88	87	92	91	81
Nitrate as N	mg/l	10.0	--	0.7	0.5	0.6	0.5	0.6	0.4	0.3	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.24	0.67	0.13	0.16	0.16	0.14	0.06	0.32
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.2	7.2	7.4	8.2	8.1	6.4	--	8.1
Phosphorus	mg/l	--	--	0.1	1	0.2	0.332	0.17	0.21	0.21	--
Sulphate	mg/l	--	500 [4]	48	49	46	49	51	49	47	48
Temperature (Field)	deg c	--	15	--	--	--	--	--	9.7	10.9	11.5
Total Dissolved Solids	mg/l	--	500	222	145	185	160	225	192	196	186
Total Organic Carbon	mg/l	--	--	2.1	2.3	4	1.5	1.4	1.5	3.3	--
Total Suspended Solids	mg/l	--	--	974	1480	564	416	113	108	96	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.004	0.003	0.003	0.001	0.002	0.002	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.07	0.05	0.063	0.05	0.067	0.042	0.071	0.05
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001	<0.0001	<0.005
Calcium, dissolved	mg/l	--	--	22.2	22.5	19.8	22.3	22.3	22.9	23.2	20.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.009	0.001	0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.004	0.002	0.002	<0.002	<0.002	0.003
Iron, dissolved	mg/l	--	0.3	0.02	0.05	0.23	0.006	0.005	<0.005	0.025	<0.005
Lead, dissolved	mg/l	0.01	--	0.0003	0.0002	0.0002	0.0002	0.0002	0.0003	<0.0002	<0.0002
Magnesium, dissolved	mg/l	--	--	7.64	7.69	9.01	7.75	7.62	8.34	7.99	7.38
Manganese, dissolved	mg/l	--	0.05	0.02	0.01	0.057	0.001	0.004	<0.001	0.003	0.002
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006	<0.00006	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01	<0.01	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.01	0.01	0.01	<0.01	<0.01	--
Potassium, dissolved	mg/l	--	--	1.1	3.5	5.3	3.8	4.1	3.6	4.5	3.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001	<0.001	--
Sodium, dissolved	mg/l	--	200 [5]	36.6	37.7	35.5	37.3	38.4	36.2	39.9	33.7
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.011	0.005	0.005	<0.005	<0.005	0.006
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 06-Nov-2002	98-4 30-May-2003	98-4 09-Oct-2003	98-4 14-May-2004	98-4 19-Nov-2004	98-4 24-May-2005	98-4 16-Nov-2005	98-4 25-May-2006
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	<0.0007	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	<0.0004	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	<0.0001	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	<0.0002	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	<0.0001	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	<0.0002	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	<0.0005	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	<0.002	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	<0.0002	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	<0.0002	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	<0.0003	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	<0.001	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	<0.0003	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	<0.0005	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	<0.0002	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	<0.0005	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	<0.0001	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	<0.0001	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	<0.0002	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 21-Nov-2006	98-4 15-May-2007	98-4 30-Nov-2007	98-4 22-May-2008	98-4 10-Nov-2008	98-4 19-May-2009 G-3	98-4 26-Nov-2009 [13] 98-4	98-4 25-May-2010 [14] M-16
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	115	117	112	109	108	109	--	107
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2 [15]	--	<2 [15]
Alkalinity (Total as CaCO3)	mg/l	--	--	115	117	112	109	108	109	--	107
Ammonia Nitrogen	mg/l	--	--	<0.01	<0.01	<0.01	<0.01	<0.01	<0.02	--	<0.02
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	<5	8	42	7	<5	8	--	10
Chloride	mg/l	--	250	8.6	9.2	8.2	8.8	8.8	9	--	10
Conductivity	uS/cm	--	--	--	--	--	--	--	332	--	336
Conductivity (Field)	uS/cm	--	--	350	220	380	320	340	340	--	344
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	88	86	84	83	79	76	--	83
Nitrate as N	mg/l	10.0	--	0.3	0.4	0.4	0.3	0.2	0.50	--	0.13
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.12	0.07	0.05	0.15	0.05	<0.10	--	0.14
pH	-	--	--	--	--	--	--	--	8.03	--	8.14
pH (Field)	-	--	--	7.8	8.8	8.8	8.2	8.1	--	--	8.07
Phosphorus	mg/l	--	--	--	--	--	--	--	0.25	--	0.18
Sulphate	mg/l	--	500 [4]	45	45	45	46	44	42	--	43
Temperature (Field)	deg c	--	15	10.5	0	9.5	8.5	10	6	--	18.6
Total Dissolved Solids	mg/l	--	500	199	197	193	193	186	216	--	218
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.0051	0.0041	0.0048	0.0033	0.0044	0.004	--	<0.01
Boron, dissolved	mg/l	5	--	0.059	0.052	0.061	0.049	0.056	0.05	--	0.09
Cadmium, dissolved	mg/l	0.005	--	<0.0001	0.00003	<0.00002	<0.00002	<0.00002	<0.0001	--	<0.0001
Calcium, dissolved	mg/l	--	--	22.4	21.6	21.6	21.2	20.4	19	--	20
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.001	--	0.002
Cobalt, dissolved	mg/l	--	--	<0.005	0.008	<0.005	<0.005	<0.005	<0.0002	--	<0.0002
Copper, dissolved	mg/l	--	1	0.002	<0.002	<0.002	<0.002	<0.002	0.002	--	0.029
Iron, dissolved	mg/l	--	0.3	<0.005	0.048	<0.005	0.008	0.017	<0.03	--	<0.03
Lead, dissolved	mg/l	0.01	--	<0.0001	0.00006	<0.00002	<0.00002	<0.00002	<0.001	--	<0.001
Magnesium, dissolved	mg/l	--	--	7.75	7.8	7.44	7.35	6.78	7	--	8
Manganese, dissolved	mg/l	--	0.05	<0.001	0.011	<0.001	<0.001	0.001	<0.01	--	<0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.1	3.6	4	3.6	4	3	--	4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	41.1	38.1	37.3	38.8	36.9	32	--	38
Zinc, dissolved	mg/l	--	5	0.005	<0.005	<0.005	<0.005	<0.005	0.01	--	0.02
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 21-Nov-2006	98-4 15-May-2007	98-4 30-Nov-2007	98-4 22-May-2008	98-4 10-Nov-2008	98-4 19-May-2009 G-3	98-4 26-Nov-2009 [13] 98-4	98-4 25-May-2010 [14] M-16
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	<0.0006	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	--	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	--	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	--	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 20-Oct-2010 [14] G-14	98-4 24-May-2011 [14] G-45	98-4 29-Nov-2011 [14] 98-4	98-4 31-May-2012 [17] 98-4
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	111	108	111	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [15]	2	<2 [15]	--
Alkalinity (Total as CaCO3)	mg/l	--	--	111	110	111	--
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.02	0.02	--
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	8	<5	5	--
Chloride	mg/l	--	250	10	10	10	--
Conductivity	uS/cm	--	--	336	344	340	--
Conductivity (Field)	uS/cm	--	--	339	330	374	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	89	85	88	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	--
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.25	<0.10	<0.10	--
pH	-	--	--	8.11	8.32	8.19	--
pH (Field)	-	--	--	7.96	8.02	8.43	--
Phosphorus	mg/l	--	--	0.22	0.19	0.14	--
Sulphate	mg/l	--	500 [4]	44	43	42	--
Temperature (Field)	deg c	--	15	13.3	12.7	9.9	--
Total Dissolved Solids	mg/l	--	500	218	224	221	--
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	--
Boron, dissolved	mg/l	5	--	0.07	0.05	0.08	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	--
Calcium, dissolved	mg/l	--	--	24	21	22	--
Chromium, dissolved	mg/l	0.05	--	0.002	<0.001	0.002	--
Cobalt, dissolved	mg/l	--	--	<0.0002	0.0002	<0.0002	--
Copper, dissolved	mg/l	--	1	0.003	0.003	0.002	--
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	<0.03	--
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	--
Magnesium, dissolved	mg/l	--	--	7	8	8	--
Manganese, dissolved	mg/l	--	0.05	<0.01	<0.01	0.02	--
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4	3	4	--
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [5]	41	37	38	--
Zinc, dissolved	mg/l	--	5	<0.01	0.03	<0.01	--
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	98-4 20-Oct-2010 [14] G-14	98-4 24-May-2011 [14] G-45	98-4 29-Nov-2011 [14] 98-4	98-4 31-May-2012 [17] 98-4
Semi-VOCs							
Naphthalene	mg/l	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	--
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	--

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2020).
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised July 2017).
(3)	Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(4)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L
(5)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(6)	Elevated detection limit due to dilution required because of high target analyte concentration.
(7)	Elevated Reporting Limit due to matrix interference.
(8)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(9)	GEN04 Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes
(10)	GEN02 Elevated Reporting Limit due to matrix interference.
(11)	Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly.
(12)	REV 1 Revision 1 - This report now includes data for Xylenes
(13)	Monitoring location was dry during this sampling event. No sample was collected.
(14)	Arsenic MRL elevated due to matrix interference.
(15)	pH < 8.3. Calculations not available.
(16)	Insufficient water for sample collection or analysis at this monitoring location during sampling event.
(17)	Monitoring location has been decommissioned.
(18)	Due to matrix interference 10x dilution factor required for VOCs.
(19)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.
(20)	REV 1 Revision 1 - This report includes revised TKN data based on re-digestion and analysis.

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 06-Sep-2005 [3]	05-11 16-Nov-2005	05-11 25-May-2006	05-11 21-Nov-2006	05-11 15-May-2007	05-11 30-Nov-2007	05-11 28-Feb-2008	05-11 22-May-2008	05-11 10-Nov-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	157	474	422	444	955	740	1030	1830
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	--	645	474	422	444	955	740	1030	1830
Ammonia Nitrogen	mg/l	--	--	--	2	0.93	0.91	0.52	0.96	0.87	0.46	0.61
Chemical Oxygen Demand	mg/l	--	--	--	54	26	25	53	112	41	86	242
Chloride	mg/l	--	250	--	38	26.5	7.9	7.9	118	68.6	156	351
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1700	1025	1400	1100	1500	--	2000	3300
Hardness, Calcium Carbonate	mg/l	--	--	--	645	427	553	539	889	745	995	1600
Nitrate as N	mg/l	10.0	--	--	<0.1	0.1	0.2	0.2	<0.1	0.3	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	3.79	1.56	1.49	1.15	2.23	2.08	2.49	4.27
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	7.3	7	7.4	7.3	--	6.6	6.7
Phosphorus	mg/l	--	--	--	0.6	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	--	320	240	540	360	183	230	153	69
Temperature (Field)	deg c	--	15	--	--	8.5	10.5	11.8	11	--	10	9
Total Dissolved Solids	mg/l	--	500	--	1180	822	1140	937	1390	1150	1460	2500
Total Organic Carbon	mg/l	--	--	--	16.3	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	1310	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	0.005	<0.001	0.0007	0.0006	0.0032	0.0016	0.0027	0.0035
Boron, dissolved	mg/l	5	--	--	0.832	0.566	0.572	0.547	1.97	1.19	2.38	13.4
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.005	<0.0001	0.00003	<0.00002	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	--	153	98.7	136	130	206	170	231	356
Chromium, dissolved	mg/l	0.05	--	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	--	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	0.006
Iron, dissolved	mg/l	--	0.3	--	17.3	5	3.01	4.59	19.1	9.53	13.9	4.13
Lead, dissolved	mg/l	0.01	--	--	<0.0002	<0.0002	<0.0001	0.00003	<0.00002	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	--	63.9	43.9	51.9	52.3	91.1	77.6	102	172
Manganese, dissolved	mg/l	--	0.05	--	2.14	1.13	1.21	1.3	3.14	2.52	3.65	4.17
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	10.6	7.4	5.8	6.8	10.4	9.2	8.4	15
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	197	119	143	102	191	130	176	430
Zinc, dissolved	mg/l	--	5	--	0.015	0.01	0.008	<0.005	<0.005	0.01	0.006	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	<0.0006	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	0.0013	--	0.0007	<0.0001
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	0.0014	<0.0005	0.0013	0.0012
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	0.0009	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	0.0006	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 19-Dec-2008	05-11 19-May-2009 G-8	05-11 26-Nov-2009 J-19	05-11 25-May-2010 [4] M-11	05-11 20-Oct-2010 [4] G-6	05-11 24-May-2011 G-18	05-11 29-Nov-2011 05-11	05-11 31-May-2012 05-11	05-11 28-Nov-2012 05-11
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1400	793	723	921	696	744	678	630	580
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	3.5	1.4
Alkalinity (Total as CaCO3)	mg/l	--	--	1400	793	723	921	696	744	678	630	580
Ammonia Nitrogen	mg/l	--	--	0.56	0.42	0.57	0.53	0.68	0.35	0.49	0.26	0.65
Chemical Oxygen Demand	mg/l	--	--	117	45	63	73	55	35	40	30	32
Chloride	mg/l	--	250	267	218	76	115	80	89	66	49	42
Conductivity	uS/cm	--	--	--	2190	1700	2120	1650	1760	1550	--	--
Conductivity (Field)	uS/cm	--	--	2100	--	2119	2095	1805	934	1151	1015	1085
Hardness, Calcium Carbonate	mg/l	--	--	1030	558	700	947	661	634	578	610	560
Nitrate as N	mg/l	10.0	--	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.018	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	2.63	1.14	1.26	1.30	1.57	0.85	0.77	0.75	0.82
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
pH	-	--	--	--	7.56	7.47	7.47	7.23	7.96	7.72	7.77	--
pH (Field)	-	--	--	607	--	6.54	6.63	7	6.86	6.74	6.85	6.73
Phosphorus	mg/l	--	--	--	0.40	0.06	0.05	0.08	0.03	0.03	<0.020	0.024
Sulphate	mg/l	--	500 [6]	107	97	146	128	135	117	131	130	160
Temperature (Field)	deg c	--	15	5	--	11.0	21.3	11.3	15.8	9.5	9.9	10.5
Total Dissolved Solids	mg/l	--	500	1810	1420	1110	1380	1070	1140	1010	744	878
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.003	<0.01	<0.01	<0.001	<0.001	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	6.33	1.24	4.2	3.6	2.2	0.51	2.4	2.1	1.7
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	240	98	155	206	146	132	126	130	120
Chromium, dissolved	mg/l	0.05	--	<0.002	0.009	0.009	0.004	0.006	0.005	0.004	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	0.0002	0.0014	0.0035	0.0012	0.0016	0.0008	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	0.004	0.002	0.002	0.001	0.004	0.002	<0.0010	<0.001
Iron, dissolved	mg/l	--	0.3	3.29	<0.03	12.0	12.5	9.65	<0.03	<0.03	3.6	2.2
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	104	76	76	105	72	74	64	71	63
Manganese, dissolved	mg/l	--	0.05	3.4	0.04	2.37	2.95	1.57	0.84	0.65	0.69	0.34
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.8	14	10	11	9	10	9	10	10
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	235	241	105	149	111	111	106	110	83
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	0.01	0.01	<0.01	0.01	<0.01	<0.0050	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00025	<0.00050
Benzene	mg/l	0.001	--	0.001	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.00025	<0.00050
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025	<0.00050
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013	<0.0025
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0010
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.0010

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 29-May-2013 05-11	05-11 26-Nov-2013 [5] GW-25	05-11 29-May-2014 05-11	05-11 19-Nov-2014 05-11	05-11 02-Jun-2015 05-11	05-11 26-Nov-2015 05-11	05-11 26-May-2016 05-11	05-11 17-Nov-2016 05-11	05-11 24-May-2017 05-11
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	400	440	390	390	442	471	432	389	672
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1.2	1.6	1.6	<1.0	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	400	440	390	390	443	472	432	389	673
Ammonia Nitrogen	mg/l	--	--	0.15	0.90	0.26	0.12	0.24	0.05	0.28	0.27	0.16
Chemical Oxygen Demand	mg/l	--	--	27	34	15	17	21	33	24	24	24
Chloride	mg/l	--	250	11	8	10	5	9	5	7	6	22
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	822	889	813	908	973	1097	979	1785	1337
Hardness, Calcium Carbonate	mg/l	--	--	510	510	500	480	389	585	473	890	655
Nitrate as N	mg/l	10.0	--	0.11	<0.10	<0.10	<0.10	<0.1	0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.018	0.027	0.048	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.34	1.3	0.52	0.48	0.3	0.4	0.5	0.5	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.12	<0.10	0.13	<0.10	--	--	--	--	--
pH	-	--	--	7.50	7.60	7.65	7.38	--	--	--	--	--
pH (Field)	-	--	--	6.82	7.09	6.88	6.88	6.91	6.82	7.10	6.91	6.81
Phosphorus	mg/l	--	--	0.035	0.048	0.045	0.056	<0.01	0.01	0.09	0.06	0.03
Sulphate	mg/l	--	500 [6]	150	160	150	110	148	183	136	708	130
Temperature (Field)	deg c	--	15	8.6	9.0	9.8	6.8	8.5	10.4	11.8	12.0	10.4
Total Dissolved Solids	mg/l	--	500	682	650	650	526	662	732	630	1320	812
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.41	0.36	0.41	0.65	0.148	0.405	0.397	0.663	0.361
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	120	130	120	110	84.6	128	110	230	170
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001	0.006	0.005
Cobalt, dissolved	mg/l	--	--	0.0016	0.0026	0.0016	0.00057	0.0009	0.0011	0.0020	0.0010	0.0024
Copper, dissolved	mg/l	--	1	0.0015	0.0015	0.0034	0.0018	<0.0005	<0.0005	0.0008	0.0013	0.0057
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	0.0007
Magnesium, dissolved	mg/l	--	--	50	48	50	50	43	64.4	48.4	76.4	56
Manganese, dissolved	mg/l	--	0.05	0.64	1.1	0.64	0.63	0.472	0.51	1.04	0.626	1.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.6	6.6	6.1	7.1	4.48	5.84	6.96	7.92	5.83
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	37	39	33	41	23.3	43.4	33.5	42.8	22.7
Zinc, dissolved	mg/l	--	5	<0.0050	0.0090	<0.0050	<0.0050	0.005	0.01	0.006	<0.005	0.008
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	0.003	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0013	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-11 29-Nov-2017	05-11 24-May-2018	05-11 29-Nov-2018	05-11 19-Jun-2019	05-11 20-Nov-2019	05-11 21-May-2020	05-11 26-Nov-2020	05-11 26-May-2021	05-11 30-Nov-2021
				05-11	05-11	05-11	05-11	05-11	05-11	05-11	05-11	05-11
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	900	1400	1800	1330	1170	773	762	613	554
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [9]	<25 [9]	<25 [9]	<25 [9]	<25	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	901	1400	1800	1330	1170	775	764	614	555
Ammonia Nitrogen	mg/l	--	--	0.50	1.72	1.99	2.27	0.76	0.64	0.58	0.48	0.47
Chemical Oxygen Demand	mg/l	--	--	93	138	192	124	129	66	65	25	64
Chloride	mg/l	--	250	120	199	250	173	128	69	47	30	17
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1913	3123	3102	2431	2670	1412	1575	1453	1252
Hardness, Calcium Carbonate	mg/l	--	--	916	1190	2030	1160	939	748	826	621	578
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.1	<0.1	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.6	4.6	5.2	4.1	2.8	1.5	1.4	0.8	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.51	6.69	6.67	6.85	6.97	7.14	7.06	6.86	6.55
Phosphorus	mg/l	--	--	0.11	0.13	0.17	0.12	0.16	0.10	0.10	0.06	0.07
Sulphate	mg/l	--	500 [6]	63	64	35	44	77	126	267	126	188
Temperature (Field)	deg c	--	15	9.3	10.2	9.1	14.2	8.5	12.0	8.3	10.9	8.5
Total Dissolved Solids	mg/l	--	500	1130	2060	2210	1660	1480	978	1130	744	746
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	0.002	0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	2.46	3.93	13.9	5.73	6.13	1.96	2.05	1.01	0.592
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	215	288	516	266	185	171	186	146	145
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.002	0.001	0.002	0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0053	0.0027	0.0059	0.0029	0.0026	0.0012	<0.0005	<0.0005	0.0010
Copper, dissolved	mg/l	--	1	0.0008	0.0014	0.0036	0.0013	0.0007	0.0034	0.0040	0.0019	0.0009
Iron, dissolved	mg/l	--	0.3	5.8	<0.1	1.17	<0.1	10.2	10.4	<0.1	0.388	3.75
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	92.2	113	181	121	116	77.7	88.2	62.1	52.8
Manganese, dissolved	mg/l	--	0.05	3.72	5.23	5.63	6.68	4.34	3.24	0.678	0.31	2.95
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.5	9.51	19	14.5	16.3	9.61	9.44	7.08	6.45
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	79.9	166	335	189	189	89.7	98.4	61.7	41.6
Zinc, dissolved	mg/l	--	5	<0.005	0.007	<0.005	<0.005	<0.005	0.007	0.005	0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	0.004	0.003	<0.004 [10]	0.009	<0.004 [11]	0.003	<0.004 [11]
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3A 06-Sep-2005	05-3A 16-Nov-2005	05-3A 25-May-2006	05-3A 15-May-2007	05-3A 10-Nov-2008	05-3A 26-Nov-2009 M-11	05-3A 24-May-2011 [4] G-42	05-3A 29-Nov-2012 05-3A	05-3A 29-May-2014 05-3A
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1030	200	845	885	800	829	778	790	770
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	29	42	34	30
Alkalinity (Total as CaCO3)	mg/l	--	--	845	820	845	885	800	858	820	830	800
Ammonia Nitrogen	mg/l	--	--	0.78	0.77	0.72	0.64	0.79	0.75	0.76	0.96	0.88
Chemical Oxygen Demand	mg/l	--	--	278	33	351	83	93	85	575	45	39
Chloride	mg/l	--	250	226	235	272	270	265	160	273	240	260
Conductivity	uS/cm	--	--	--	--	--	--	--	2330	2410	--	--
Conductivity (Field)	uS/cm	--	--	1900	3000	1800	1700	1800	2075	2157	1898	1998
Hardness, Calcium Carbonate	mg/l	--	--	42	31	25	25	25	28	35	28	31
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	0.1	0.1	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	6.01	1.2	1.99	1.42	2.16	0.82	1.55	2.2	2.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
pH	-	--	--	--	--	--	--	--	8.57	8.76	8.66	8.62
pH (Field)	-	--	--	8.4	--	8.5	8.9	8.4	8.83	8.71	8.65	7.79
Phosphorus	mg/l	--	--	8.2	0.15	--	--	--	2.48	1.09	0.51	0.26
Sulphate	mg/l	--	500 [6]	5	<1	1	2	2	2	<1	<1	<1
Temperature (Field)	deg c	--	15	11.8	--	7	8.8	4	8.7	12.0	6.9	9.0
Total Dissolved Solids	mg/l	--	500	1380	1340	1320	1280	1300	1510	1570	1310	1320
Total Organic Carbon	mg/l	--	--	53.2	10.9	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	6760	63	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	<0.001	0.0015	0.0021	0.002	<0.01	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	0.978	0.964	0.828	0.826	0.878	0.98	0.87	0.97	1
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	0.00002	<0.00002	<0.0001	<0.0001	0.00011	<0.00010
Calcium, dissolved	mg/l	--	--	7.05	3.62	2.32	2.41	2.38	3	4	3.2	3.3
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.009	<0.005	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0002	0.0003	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	0.002	<0.002	<0.002	<0.002	0.001	0.002	<0.0010	0.0023
Iron, dissolved	mg/l	--	0.3	0.334	0.08	0.062	0.128	<0.005	0.08	0.07	0.12	<0.1
Lead, dissolved	mg/l	0.01	--	0.0008	0.0017	0.0002	0.00002	<0.00002	<0.001	<0.001	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	6.03	5.26	4.59	4.66	4.74	5	6	4.9	5.6
Manganese, dissolved	mg/l	--	0.05	0.017	0.003	0.002	0.005	0.008	<0.01	<0.01	0.0025	<0.0020
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.5	10.6	8.5	8.9	9.5	8	9	8.3	8.9
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	625	599	535	461	533	493	476	540	580
Zinc, dissolved	mg/l	--	5	0.007	0.007	0.01	0.02	<0.005	<0.01	0.01	<0.0050	<0.0050
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3A 26-Nov-2015 05-3A	05-3A 24-May-2017 05-3A	05-3A 29-Nov-2018 05-3A	05-3A 21-May-2020 05-3A	05-3A 30-Nov-2021 05-3A
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	823	858	889	788	820
Alkalinity, Carbonate as CaCO3	mg/l	--	--	22	16	20	33	14
Alkalinity (Total as CaCO3)	mg/l	--	--	845	874	910	822	834
Ammonia Nitrogen	mg/l	--	--	0.84	0.81	0.77	0.82	0.80
Chemical Oxygen Demand	mg/l	--	--	118	32	40	51	34
Chloride	mg/l	--	250	294	285	297	365	287
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2246	2266	2042	2116	2177
Hardness, Calcium Carbonate	mg/l	--	--	25.5	41	51	38.9	33.3
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.4	1.5	1.4	1.3	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.64	8.37	8.54	8.76	8.64
Phosphorus	mg/l	--	--	0.67	0.12	0.19	0.25	0.17
Sulphate	mg/l	--	500 [6]	<1	3	<1	<1	<1
Temperature (Field)	deg c	--	15	8.4	10.1	7.8	11.2	6.7
Total Dissolved Solids	mg/l	--	500	1440	1340	1360	1380	1280
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.962	1.01	0.98	0.778	0.807
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	2.73	5.45	9.76	5.91	4.7
Chromium, dissolved	mg/l	0.05	--	<0.001	0.009	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0005	0.0022	0.0031	0.0010
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.13	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	4.54	6.67	6.45	5.86	5.24
Manganese, dissolved	mg/l	--	0.05	<0.005	0.025	0.011	0.005	0.006
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.01	9.62	10	9.19	8.48
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	617	572	536	555	489
Zinc, dissolved	mg/l	--	5	0.01	<0.005	<0.005	<0.005	0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.002 [10]	0.002	0.006	<0.002 [11]
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3B 06-Sep-2005	05-3B 16-Nov-2005	05-3B 25-May-2006	05-3B 15-May-2007	05-3B 10-Nov-2008	05-3B 26-Nov-2009 J-20	05-3B 24-May-2011 [4] G-41	05-3B 29-Nov-2012 05-3B	05-3B 29-May-2014 [13] 05-3B
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1340	256	1160	1190	1170	1130	1080	1100	1100
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	27	52	35	36
Alkalinity (Total as CaCO3)	mg/l	--	--	1100	1050	1160	1190	1170	1160	1135	1100	1100
Ammonia Nitrogen	mg/l	--	--	18	7.1	3.21	2.38	2.84	2.83	2.64	0.51	2.8
Chemical Oxygen Demand	mg/l	--	--	143	139	124	142	104	95	85	41	76
Chloride	mg/l	--	250	434	423	482	465	469	451	433	410	440
Conductivity	uS/cm	--	--	--	--	--	--	--	3410	3510	--	--
Conductivity (Field)	uS/cm	--	--	2800	2100	2900	2400	2900	2820	2563	2776	2865
Hardness, Calcium Carbonate	mg/l	--	--	60	91	77	70	65	69	76	70	80
Nitrate as N	mg/l	10.0	--	<0.1	0.1	0.1	0.1	0.2	<0.10	<0.10	<0.10	<0.50
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	<0.010	<0.050
Nitrogen, Total Kjeldahl	mg/l	--	--	19.7	10.9	6.3	6.12	5.29	4.12	4.70	4.6	4.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.50
pH	-	--	--	--	--	--	--	--	8.41	8.71	8.53	8.54
pH (Field)	-	--	--	7.7	--	8.2	8.5	8.2	8.2	8.40	8.43	8.10
Phosphorus	mg/l	--	--	1.41	3.18	--	--	--	6.94	7.09	7.1	6.6
Sulphate	mg/l	--	500 [6]	109	152	72	23	2	4	<1	<1	<1
Temperature (Field)	deg c	--	15	12.5	--	9	8.6	7	8.0	10.2	6.8	10.2
Total Dissolved Solids	mg/l	--	500	2110	2100	2030	1920	1880	2220	2280	1880	1830
Total Organic Carbon	mg/l	--	--	87	47.6	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	220	30	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.007	**0.013**	0.01	**0.0138**	0.0006	0.010	<0.01	0.0038	0.0034
Boron, dissolved	mg/l	5	--	1.64	1.74	1.52	1.46	1.53	1.8	1.5	1.8	1.8
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	0.00005	<0.00002	<0.0001	<0.0001	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	8.66	10.7	8.92	8.11	7.27	8	9	8.3	9.3
Chromium, dissolved	mg/l	0.05	--	0.005	0.005	0.004	0.003	<0.002	<0.005	<0.005	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0005	0.0005	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.009	0.003	0.009	<0.002	<0.002	0.002	0.003	<0.0010	0.0023
Iron, dissolved	mg/l	--	0.3	0.766	1.15	3.05	1.68	0.374	1.19	0.65	0.45	0.65
Lead, dissolved	mg/l	0.01	--	0.0029	0.0007	0.0013	0.00041	<0.00002	<0.001	<0.001	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	9.43	15.7	13.4	12.2	11.4	12	13	12	14
Manganese, dissolved	mg/l	--	0.05	0.12	0.128	0.071	0.037	0.016	0.03	0.02	0.02	0.024
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.06	0.04	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	25.4	25.7	21.6	21	19.8	19	19	18	20
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	866	862	751	673	669	816	784	740	720
Zinc, dissolved	mg/l	--	5	<0.005	0.01	0.02	<0.005	<0.005	<0.01	<0.01	<0.0050	0.0052
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	<0.0006	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.00020	<0.00020
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.00020	<0.00020
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0010	<0.0010
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00040	<0.00040
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00040	<0.00040

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3B 26-Nov-2015 05-3B	05-3B 24-May-2017 05-3B	05-3B 29-Nov-2018 05-3B	05-3B 21-May-2020 [14] 05-3B	05-3B 30-Nov-2021 05-3B
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1090	1050	1150	1120	1110
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [15]	<25 [9]	<25 [9]	<25 [16]	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1110	1070	1170	1140	1120
Ammonia Nitrogen	mg/l	--	--	3.35	2.76	3.09	2.83	2.73
Chemical Oxygen Demand	mg/l	--	--	115	89	102	120	91
Chloride	mg/l	--	250	470	459	449	596	442
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3230	3248	2919	--	3122
Hardness, Calcium Carbonate	mg/l	--	--	249	73	105	86.4	78.1
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	0.39
Nitrogen, Total Kjeldahl	mg/l	--	--	5.3	4.3	4.7	3.8	4.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.43	8.35	8.49	--	8.47
Phosphorus	mg/l	--	--	6.72	5.73	5.95	5.89	6.33
Sulphate	mg/l	--	500 [6]	<1	5	9	4	3
Temperature (Field)	deg c	--	15	8.5	10.5	7.6	--	6.4
Total Dissolved Solids	mg/l	--	500	2020	1990	2020	2010	1890
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.004	0.01	0.005	0.003	0.002
Boron, dissolved	mg/l	5	--	1.97	1.62	1.97	1.78	1.92
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	8.04	8.55	16.1	10	9
Chromium, dissolved	mg/l	0.05	--	0.006	0.013	0.002	0.002	0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0008	0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0040	0.0035	0.0010	0.0012
Iron, dissolved	mg/l	--	0.3	0.632	0.125	0.805	0.76	0.519
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0003	0.0004	0.0002	0.0001
Magnesium, dissolved	mg/l	--	--	11.3	12.6	15.7	14.9	13.5
Manganese, dissolved	mg/l	--	0.05	0.022	0.019	0.027	0.029	0.027
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17.2	19.8	23.8	20.3	18.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	878	817	842	719	637
Zinc, dissolved	mg/l	--	5	0.009	0.013	<0.005	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.004 [10]	<0.001	0.005	<0.004 [11]
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 06-Sep-2005	05-3C 16-Nov-2005	05-3C 25-May-2006	05-3C 15-May-2007	05-3C 30-Nov-2007	05-3C 22-May-2008	05-3C 10-Nov-2008	05-3C 19-May-2009 G-14	05-3C 26-Nov-2009 J-17
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1090	227	880	995	1050	1010	1030	960	946
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	21	21
Alkalinity (Total as CaCO3)	mg/l	--	--	891	930	880	995	1050	1010	1030	981	967
Ammonia Nitrogen	mg/l	--	--	28.9	9.81	2.46	1.88	2.02	1.28	1.53	1.67	1.52
Chemical Oxygen Demand	mg/l	--	--	139	151	113	134	150	104	91	70	98
Chloride	mg/l	--	250	264	269	286	320	331	330	335	303	302
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	2700	2640
Conductivity (Field)	uS/cm	--	--	2600	860	1950	1500	1700	2300	2100	1300	2287
Hardness, Calcium Carbonate	mg/l	--	--	71	91	85	87	92	88	53	83	92
Nitrate as N	mg/l	10.0	--	<0.1	0.2	1.2	0.1	0.3	0.2	0.2	<0.10	0.23
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	34.8	12.6	4.46	5.04	3.9	3.63	3.55	3.35	2.46
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	8.36	8.38
pH (Field)	-	--	--	7.7	--	8.2	8.6	8.2	8.2	8.1	--	8.27
Phosphorus	mg/l	--	--	2	1.2	--	--	--	--	--	2.12	2.61
Sulphate	mg/l	--	500 [6]	200	119	80	35	19	13	15	14	30
Temperature (Field)	deg c	--	15	14.4	--	6.5	8.8	5.5	10.5	8	11	8.1
Total Dissolved Solids	mg/l	--	500	1770	1700	1560	1530	1770	1620	1560	1760	1720
Total Organic Carbon	mg/l	--	--	72.6	41.3	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	524	2520	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.003	0.008	0.009	**0.013**	**0.0246**	**0.0141**	0.0008	**0.013**	**0.016**
Boron, dissolved	mg/l	5	--	1.32	1.47	1.28	1.06	1.41	1.35	1.37	1.43	1.4
Cadmium, dissolved	mg/l	0.005	--	0.0002	<0.0001	<0.005	0.00008	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	11.4	13.5	10.7	10.6	12.6	11.6	5.92	10	12
Chromium, dissolved	mg/l	0.05	--	0.003	0.005	0.003	0.002	<0.002	<0.002	0.002	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0005	0.0005
Copper, dissolved	mg/l	--	1	0.011	0.006	0.003	0.003	<0.002	<0.002	0.004	0.006	0.011
Iron, dissolved	mg/l	--	0.3	0.199	1.81	1.56	2.05	2.77	2.08	0.477	0.58	0.41
Lead, dissolved	mg/l	0.01	--	0.0012	0.0003	0.0011	0.00032	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	10.4	14	14.3	14.7	14.6	14.4	9.37	14	15
Manganese, dissolved	mg/l	--	0.05	0.156	0.225	0.111	0.074	0.119	0.091	0.021	0.05	0.03
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.04	0.04	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.02	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	23	21.4	16.6	15.9	17.8	16	15.8	13	15
Selenium, dissolved	mg/l	0.05	--	0.001	<0.001	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	711	708	635	536	736	630	560	565	535
Zinc, dissolved	mg/l	--	5	0.009	0.01	0.006	<0.005	<0.005	<0.005	<0.005	<0.01	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	0.0013	<0.0006	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 25-May-2010 [4] M-21	05-3C 20-Oct-2010 [4] G-26	05-3C 24-May-2011 [4] G-43	05-3C 29-Nov-2011 05-3C	05-3C 31-May-2012 05-3C	05-3C 29-Nov-2012 05-3C	05-3C 29-May-2013 [5] 05-3C	05-3C 26-Nov-2013 [17] GW-15	05-3C 29-May-2014 [18] 05-3C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	935	932	936	976	970	950	900	1000	910
Alkalinity, Carbonate as CaCO3	mg/l	--	--	22	22	44	33	21	25	17	22	25
Alkalinity (Total as CaCO3)	mg/l	--	--	957	954	980	1010	990	970	920	1000	940
Ammonia Nitrogen	mg/l	--	--	1.27	1.14	1.44	1.20	0.95	0.79	0.81	1.6	1.3
Chemical Oxygen Demand	mg/l	--	--	70	80	70	55	66	54	53	72	66
Chloride	mg/l	--	250	281	308	291	304	280	270	270	320	270
Conductivity	uS/cm	--	--	2680	2610	2770	2760	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2641	2533	1162	2144	2225	1873	1478	2124	1893
Hardness, Calcium Carbonate	mg/l	--	--	87	88	96	93	94	160	140	110	88
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	0.16	0.23	<1.0	<0.50
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.20	0.10	0.40	0.14	0.287
Nitrogen, Total Kjeldahl	mg/l	--	--	2.27	2.52	2.97	2.08	2.4	2.3	1.8	3.5	3.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	0.26	0.26	0.64	<1.0	<0.50
pH	-	--	--	8.39	8.39	8.70	8.56	8.37	8.44	8.29	8.38	8.46
pH (Field)	-	--	--	8.24	8.4	8.29	8.00	8.12	7.86	7.82	7.73	7.76
Phosphorus	mg/l	--	--	2.38	2.22	2.40	1.57	0.63	1.1	1.0	2.3	1.8
Sulphate	mg/l	--	500 [6]	15	25	10	9	<1	3	8	<1	<1
Temperature (Field)	deg c	--	15	21.4	11.9	11.0	7.3	10.7	7.4	11.4	6.7	9.2
Total Dissolved Solids	mg/l	--	500	1740	1700	1800	1790	1510	1410	1570	1530	1530
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	<0.01	0.0045	0.0039	0.0039	0.0038	0.0042
Boron, dissolved	mg/l	5	--	1.8	1.4	1.6	1.6	1.4	1.1	1.3	1.3	1.6
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	10	12	12	11	12	28	22	17	11
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.005	<0.005	<0.0050	0.0068	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0005	0.0006	0.0006	0.0006	0.00055	0.00058	<0.00050	0.00076	<0.00050
Copper, dissolved	mg/l	--	1	0.002	0.003	0.002	0.002	0.0071	0.0021	0.0018	0.0012	0.0023
Iron, dissolved	mg/l	--	0.3	1.53	0.29	2.64	0.36	0.62	0.26	0.3	0.2	1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.00050	0.00059	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	15	14	16	16	16	22	20	17	15
Manganese, dissolved	mg/l	--	0.05	0.06	0.03	0.06	0.04	0.052	0.11	0.079	0.28	0.057
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14	14	15	14	14	15	14	14	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	559	629	561	615	620	490	530	570	560
Zinc, dissolved	mg/l	--	5	<0.01	0.01	<0.01	<0.01	0.017	0.0077	<0.0050	0.0099	<0.0050
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050	<0.0013	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 19-Nov-2014 [19] 05-3C	05-3C 02-Jun-2015 05-3C	05-3C 26-Nov-2015 05-3C	05-3C 26-May-2016 05-3C	05-3C 17-Nov-2016 05-3D	05-3C 24-May-2017 05-3C	05-3C 29-Nov-2017 05-3C	05-3C 24-May-2018 05-3C	05-3C 29-Nov-2018 05-3C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	920	969	868	928	1000	674	880	932	1050
Alkalinity, Carbonate as CaCO3	mg/l	--	--	18	25	14	14	13	<5	<25 [9]	<25 [9]	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	940	994	882	942	1010	678	891	942	1070
Ammonia Nitrogen	mg/l	--	--	1.3	1.48	1.20	0.28	2.12	0.01	1.62	1.71	1.75
Chemical Oxygen Demand	mg/l	--	--	74	85	58	78	111	28	86	97	88
Chloride	mg/l	--	250	270	348	214	257	316	107	360	341	364
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2090	2319	2053	2106	2751	1537	2439	2639	2434
Hardness, Calcium Carbonate	mg/l	--	--	150	127	79.1	158	280	323	83	82	121
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	<0.1	<0.1	0.1	<0.1	0.3	0.2	<0.1
Nitrite as N	mg/l	1.0	--	0.126	<0.05	<0.05	<0.05	<0.05	<0.05	0.27	0.05	0.08
Nitrogen, Total Kjeldahl	mg/l	--	--	2.9	3.3	2.6	1.5	3.3	0.3	3.3	3.5	3.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.17	--	--	--	--	--	--	--	--
pH	-	--	--	8.31	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.10	8.15	7.94	7.97	7.91	7.64	7.81	8.11	8.39
Phosphorus	mg/l	--	--	2.2	1.77	1.38	0.98	2.41	0.15	2.18	2.05	2.21
Sulphate	mg/l	--	500 [6]	3	10	50	29	16	94	8	11	2
Temperature (Field)	deg c	--	15	3.2	8.8	7.9	9.9	8.9	8.9	7.8	10.6	7.7
Total Dissolved Solids	mg/l	--	500	1470	1560	1270	1440	1610	928	1570	1740	1680
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.0033	0.003	0.004	0.003	0.003	0.001	0.005	0.005	0.005
Boron, dissolved	mg/l	5	--	1.2	0.864	1.71	1.05	0.839	0.434	1.67	1.59	1.54
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	22	20.4	9.86	25.3	50.7	61.3	10.3	10.7	18.8
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	0.001	<0.001	0.008	0.005	0.001	0.001	0.002
Cobalt, dissolved	mg/l	--	--	0.00091	0.0019	<0.0005	0.0005	<0.0005	<0.0005	0.0006	0.0005	0.0014
Copper, dissolved	mg/l	--	1	0.0033	<0.0005	<0.0005	0.0008	0.0044	0.0046	0.0037	0.0030	0.0065
Iron, dissolved	mg/l	--	0.3	0.14	0.621	0.558	0.278	<0.1	<0.1	0.149	0.194	1.32
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0002	0.0003
Magnesium, dissolved	mg/l	--	--	22	18.4	13.2	23	37.2	41.4	14	13.4	17.9
Manganese, dissolved	mg/l	--	0.05	0.055	0.312	0.05	0.159	0.289	<0.005	0.024	0.018	0.058
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13	9.97	13.3	12.9	11.4	11.4	15.1	14.6	16.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	520	470	71.7	420	339	245	608	574	658
Zinc, dissolved	mg/l	--	5	0.011	0.012	0.01	0.006	0.016	0.008	<0.005	0.009	0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.002 [10]	<0.002 [10]	0.006	0.007	<0.001	<0.001	<0.001	0.005
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3C 19-Jun-2019 05-3C	05-3C 20-Nov-2019 05-3C	05-3C 21-May-2020 05-3C	05-3C 26-Nov-2020 05-3C	05-3C 26-May-2021 05-3C	05-3C 30-Nov-2021 05-3C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	957	1030	942	970	954	1030
Alkalinity, Carbonate as CaCO3	mg/l	--	--	25	<25	18	37	8	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	982	1040	960	1010	962	1040
Ammonia Nitrogen	mg/l	--	--	0.62	1.71	0.65	1.93	1.20	1.75
Chemical Oxygen Demand	mg/l	--	--	84	80	92	81	71	84
Chloride	mg/l	--	250	316	385	392	349	276	339
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2497	2730	2565	2368	2672	2608
Hardness, Calcium Carbonate	mg/l	--	--	90.4	121	95.0	99.6	105	93.7
Nitrate as N	mg/l	10.0	--	0.9	0.2	0.9	<0.5 [11]	0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.10	0.40	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.1	2.9	2.1	3.1	2.9	3.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.77	8.27	8.46	8.41	8.28	8.34
Phosphorus	mg/l	--	--	0.83	2.31	1.04	2.30	1.89	2.27
Sulphate	mg/l	--	500 [6]	23	2	25	3	12	3
Temperature (Field)	deg c	--	15	13.3	5.8	12	8.2	11.8	7.3
Total Dissolved Solids	mg/l	--	500	1580	1710	1630	1630	1560	1720
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.004	0.005	0.004	0.003	0.004	0.005
Boron, dissolved	mg/l	5	--	1.49	1.42	1.52	1.48	1.54	1.43
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	10.7	14.4	11.2	11.2	11.3	11.3
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	0.001	0.001	0.001	0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.0006	0.0006	0.0005	0.0006	0.0011
Copper, dissolved	mg/l	--	1	0.0106	0.0031	0.0045	0.0075	0.0062	0.0016
Iron, dissolved	mg/l	--	0.3	0.502	0.429	0.977	0.304	0.194	0.939
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0004	0.0002	0.0002	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	15.4	20.7	16.3	17.4	18.6	15.9
Manganese, dissolved	mg/l	--	0.05	0.029	0.052	0.042	0.034	0.006	0.046
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16.2	21.2	16.8	15.4	15.3	14.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	557	640	641	620	553	562
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.006	0.01	0.007	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	0.008	<0.010 [11]	<0.004 [11]	<0.004 [11]
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3D 06-Sep-2005	05-3D 16-Nov-2005	05-3D 25-May-2006	05-3D 15-May-2007	05-3D 30-Nov-2007	05-3D 22-May-2008	05-3D 10-Nov-2008	05-3D 19-May-2009 G-15	05-3D 26-Nov-2009 J-13
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	593	271	480	478	507	484	505	508	538
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	486	444	480	478	507	484	505	508	538
Ammonia Nitrogen	mg/l	--	--	0.3	<0.01	0.21	<0.01	<0.01	<0.01	<0.01	0.05	0.02
Chemical Oxygen Demand	mg/l	--	--	43	12	28	47	59	15	<5	10	15
Chloride	mg/l	--	250	80.7	66.7	77.1	76	77.8	83.6	84	79	89
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	1310	1370
Conductivity (Field)	uS/cm	--	--	1600	2500	950	900	750	1050	1100	1050	1227
Hardness, Calcium Carbonate	mg/l	--	--	233	258	224	249	257	251	264	268	239
Nitrate as N	mg/l	10.0	--	<0.1	0.2	0.3	0.2	0.2	0.3	0.2	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.82	0.41	0.67	0.44	0.37	0.42	0.37	0.18	<0.10
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	8.04	8.05
pH (Field)	-	--	--	7.4	--	7.7	7.9	8.1	7.5	7.5	--	7.23
Phosphorus	mg/l	--	--	3.35	0.55	--	--	--	--	--	0.15	0.35
Sulphate	mg/l	--	500 [6]	137	101	96	94	91	89	91	78	90
Temperature (Field)	deg c	--	15	17.3	--	8.5	8.5	5	10.5	8	8	7.8
Total Dissolved Solids	mg/l	--	500	843	720	722	701	775	743	771	852	890
Total Organic Carbon	mg/l	--	--	35.2	4.1	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	4570	659	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.005	0.001	0.001	0.0014	0.0019	0.0014	0.0016	0.001	0.001
Boron, dissolved	mg/l	5	--	0.621	0.483	0.376	0.31	0.421	0.346	0.427	0.45	0.51
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.005	0.00013	<0.00002	0.00015	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	44.3	47.5	39.1	44.5	46.8	45.1	48.6	48	48
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.004	0.004
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.0002	<0.0002
Copper, dissolved	mg/l	--	1	0.003	0.006	0.013	0.003	0.004	0.004	0.003	0.006	0.005
Iron, dissolved	mg/l	--	0.3	0.038	0.012	0.014	0.009	0.005	0.02	<0.005	<0.03	<0.03
Lead, dissolved	mg/l	0.01	--	0.0005	0.0004	0.0007	0.0002	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	29.8	33.8	30.8	33.5	34.1	33.6	34.7	36	29
Manganese, dissolved	mg/l	--	0.05	0.255	0.269	0.232	0.079	0.013	0.366	0.004	0.09	0.02
Mercury, dissolved	mg/l	0.001	--	<0.00005	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	0.02	<0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	<0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.2	13.6	10.7	9.4	11.8	10	12.3	9	10
Selenium, dissolved	mg/l	0.05	--	<0.001	<0.001	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	<0.005	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	258	204	189	156	208	190	197	195	207
Zinc, dissolved	mg/l	--	5	0.014	0.017	0.017	0.015	<0.005	0.017	<0.005	0.01	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	<0.0006	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3D 25-May-2010 [4] M-26	05-3D 20-Oct-2010 [4] G-27	05-3D 24-May-2011 G-40	05-3D 29-Nov-2011 [4] 05-3D	05-3D 31-May-2012 05-3D	05-3D 29-Nov-2012 05-3D	05-3D 29-May-2013 05-3D	05-3D 26-Nov-2013 GW-19	05-3D 29-May-2014 05-3D
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	515	565	576	617	610	640	640	670	660
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	14	<2 [8]	6.5	8.5	6.1	6.0	6.8
Alkalinity (Total as CaCO3)	mg/l	--	--	515	565	590	617	620	650	650	680	670
Ammonia Nitrogen	mg/l	--	--	0.06	0.05	0.06	<0.02	<0.050	0.080	0.11	<0.050	0.11
Chemical Oxygen Demand	mg/l	--	--	10	15	10	8	9.2	15	21	11	46
Chloride	mg/l	--	250	76	84	82	84	75	74	77	78	77
Conductivity	uS/cm	--	--	1320	1400	1430	1460	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1246	1400	1122	1437	1313	1341	1241	1324	1324
Hardness, Calcium Carbonate	mg/l	--	--	274	312	296	291	290	330	320	330	280
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010	0.018	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.13	0.12	0.56	0.16	0.64	0.63	0.57	0.54	0.55
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
pH	-	--	--	8.14	8.00	8.42	8.16	8.05	8.15	8.01	7.98	8.04
pH (Field)	-	--	--	7.46	7.62	7.38	7.68	7.95	7.75	7.47	7.55	7.35
Phosphorus	mg/l	--	--	0.17	0.11	0.08	0.06	0.089	0.085	0.17	0.070	0.052
Sulphate	mg/l	--	500 [6]	79	80	79	82	71	71	72	77	72
Temperature (Field)	deg c	--	15	20.2	12.2	15.0	6.9	11.3	6.0	11.8	6.8	8.6
Total Dissolved Solids	mg/l	--	500	858	910	930	949	840	858	920	866	866
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.01	0.001	<0.001	<0.01	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Boron, dissolved	mg/l	5	--	0.40	0.50	0.39	0.46	0.39	0.53	0.4	0.5	0.39
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	47	54	51	54	50	59	56	58	49
Chromium, dissolved	mg/l	0.05	--	0.004	0.006	<0.005	0.005	<0.0050	0.0060	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0011	0.0006	0.0020	<0.0002	0.0017	0.00072	0.0012	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.008	0.003	0.005	0.005	0.0042	0.0033	0.0055	0.0041	0.0044
Iron, dissolved	mg/l	--	0.3	0.05	<0.03	<0.03	<0.03	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	38	43	41	38	39	45	43	45	38
Manganese, dissolved	mg/l	--	0.05	1.99	0.62	1.60	0.08	1.7	0.84	0.98	0.18	0.23
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	13	11	11	10	13	11	13	9.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	209	235	187	216	210	240	220	260	220
Zinc, dissolved	mg/l	--	5	0.02	<0.01	0.02	<0.01	0.015	0.012	0.0070	0.036	0.0090
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3D 19-Nov-2014	05-3D 02-Jun-2015	05-3D 26-Nov-2015	05-3D 26-May-2016	05-3D 17-Nov-2016	05-3D 24-May-2017	05-3D 29-Nov-2017	05-3D 24-May-2018	05-3D 29-Nov-2018
				05-3D	05-3D	05-3D	05-3D	05-3C	05-3D	05-3D	05-3D	05-3D
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	650	658	642	646	651	1070	714	714	753
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.1	<5	<5	<5	<5	17	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	660	661	644	648	654	1090	718	718	756
Ammonia Nitrogen	mg/l	--	--	<0.050	0.10	0.02	0.04	0.08	1.91	0.22	0.03	0.16
Chemical Oxygen Demand	mg/l	--	--	9.6	18	18	19	40	98	33	20	37
Chloride	mg/l	--	250	88	92	98	104	106	342	126	111	112
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1499	1419	1494	1455	1596	2590	1470	1608	1457
Hardness, Calcium Carbonate	mg/l	--	--	320	190	322	276	315	86	322	334	369
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	<0.1	<0.1	0.1	<0.1	<0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.24	0.2	0.3	0.3	0.3	3.2	0.6	0.4	0.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--	--	--	--
pH	-	--	--	7.83	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.49	7.49	7.67	7.78	7.56	8.18	7.40	7.49	7.78
Phosphorus	mg/l	--	--	0.076	<0.01	0.04	0.06	0.25	2.28	0.40	0.10	0.20
Sulphate	mg/l	--	500 [6]	79	83	87	91	100	9	113	107	107
Temperature (Field)	deg c	--	15	5.9	8.7	7.1	9.4	9.7	10.2	8.8	9.0	8.2
Total Dissolved Solids	mg/l	--	500	850	918	874	896	882	1660	970	992	646
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.001	<0.001	<0.001	0.001	0.01	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.46	0.193	0.424	0.343	0.578	1.32	0.523	0.593	0.581
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	57	29.4	45.7	49.8	57	10.9	53.5	60.1	62.7
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	<0.001	<0.001	0.006	0.011	<0.001	<0.001	0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	0.0067	0.0013	0.0006	0.0027	0.0045	0.0008	0.0070	0.0039	0.0109
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.635	<0.1	<0.1	0.499
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0018
Magnesium, dissolved	mg/l	--	--	43	28.3	50.5	36.8	41.9	14.4	45.8	44.7	51.6
Manganese, dissolved	mg/l	--	0.05	0.063	0.06	<0.005	0.091	0.058	0.046	0.6	<0.005	0.248
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12	7.92	10	10.7	11.7	14.3	13	11.7	14.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	260	222	282	188	249	697	247	236	0.283
Zinc, dissolved	mg/l	--	5	0.024	0.007	0.009	0.011	0.007	<0.005	0.01	0.006	0.015
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.001	<0.001	0.002	<0.001	<0.004 [10]	<0.001	<0.001	0.003
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-3D 19-Jun-2019 05-3D	05-3D 20-Nov-2019 05-3D	05-3D 21-May-2020 05-3D	05-3D 26-Nov-2020 05-3D	05-3D 26-May-2021 05-3D	05-3D 30-Nov-2021 05-3D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	694	666	704	719	738	748
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6	5	8	6	<5	7
Alkalinity (Total as CaCO3)	mg/l	--	--	701	671	712	725	742	755
Ammonia Nitrogen	mg/l	--	--	0.04	0.22	0.02	0.14	0.05	0.24
Chemical Oxygen Demand	mg/l	--	--	11	25	25	33	<10	18
Chloride	mg/l	--	250	113	116	139	117	110	107
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1518	1646	1541	1490	1671	1700
Hardness, Calcium Carbonate	mg/l	--	--	380	378	366	344	388	328
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.2	0.4	0.4	0.4	0.2	0.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.53	7.4	8.24	7.64	7.36	7.41
Phosphorus	mg/l	--	--	0.16	0.16	0.12	0.16	0.10	0.12
Sulphate	mg/l	--	500 [6]	111	110	126	103	96	94
Temperature (Field)	deg c	--	15	12.7	9.3	12.4	7.4	10.8	8.1
Total Dissolved Solids	mg/l	--	500	970	1060	1040	1000	1040	1010
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.444	0.435	0.411	0.436	0.441	0.418
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	67.2	60	62.7	57.2	65.6	57.5
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0007	<0.0005	<0.0005	<0.0005	0.0005
Copper, dissolved	mg/l	--	1	0.0051	0.0030	0.0061	0.0018	0.0044	0.0018
Iron, dissolved	mg/l	--	0.3	0.122	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	51.5	55.4	50.9	48.9	54.5	44.8
Manganese, dissolved	mg/l	--	0.05	0.052	0.623	0.04	0.401	0.494	0.648
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.8	18.3	13.6	13.7	13.7	13.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	258	276	272	268	244	244
Zinc, dissolved	mg/l	--	5	0.006	0.008	<0.005	0.01	0.013	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.003	0.004	<0.001	<0.001	<0.001
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 06-Sep-2005 [3]	05-8 16-Nov-2005	05-8 25-May-2006	05-8 21-Nov-2006	05-8 15-May-2007	05-8 30-Nov-2007	05-8 28-Feb-2008	05-8 22-May-2008	05-8 10-Nov-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	159	855	876	980	1040	940	970	1900
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	--	650	855	876	980	1040	940	970	1900
Ammonia Nitrogen	mg/l	--	--	--	3.29	2.02	0.79	2.22	0.35	0.44	<0.01	0.8
Chemical Oxygen Demand	mg/l	--	--	--	61	57	39	169	108	43	67	214
Chloride	mg/l	--	250	--	89.9	27.9	16.8	24.3	122	81.2	103	444
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1600	1400	1425	1300	1500	--	1700	3500
Hardness, Calcium Carbonate	mg/l	--	--	--	649	794	769	794	1040	925	1030	1500
Nitrate as N	mg/l	10.0	--	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	5.48	3.48	1.74	4.35	1.69	1.75	1.81	5.56
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	6.8	6.9	7.2	6.9	--	6.5	6.6
Phosphorus	mg/l	--	--	--	2.06	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	--	220	203	169	79	139	144	123	12
Temperature (Field)	deg c	--	15	--	--	4	11	9	11.5	--	10.5	11
Total Dissolved Solids	mg/l	--	500	--	1100	1120	1070	1080	1370	1200	1260	2560
Total Organic Carbon	mg/l	--	--	--	17.5	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	4590	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	0.007	<0.001	0.0006	0.0013	0.0013	0.0015	0.0011	0.0023
Boron, dissolved	mg/l	5	--	--	0.642	0.262	0.368	0.306	1.51	0.966	1.01	13.1
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.005	<0.0001	0.00007	<0.00002	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	--	136	179	165	174	222	200	223	341
Chromium, dissolved	mg/l	0.05	--	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	--	<0.002	0.045	<0.002	<0.002	<0.002	<0.002	<0.002	0.006
Iron, dissolved	mg/l	--	0.3	--	19.6	21	2.49	9.56	6.03	6.52	4.52	0.054
Lead, dissolved	mg/l	0.01	--	--	<0.0002	0.0008	<0.0001	0.00011	<0.00002	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	--	75.4	84.4	86.9	87.5	119	103	116	158
Manganese, dissolved	mg/l	--	0.05	--	1.63	2.36	3.23	3.02	4.47	4.09	4.88	5.75
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	14.6	5.9	5.8	6.8	6.4	6	4.9	12.3
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	169	86.8	91.4	109	129	93.6	98.4	443
Zinc, dissolved	mg/l	--	5	--	0.016	0.026	0.01	0.005	<0.005	<0.005	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	0.004	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	<0.0006	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	<0.0001
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0011
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 19-Dec-2008	05-8 19-May-2009 G-20	05-8 26-Nov-2009 M-15	05-8 25-May-2010 [4] M-12	05-8 20-Oct-2010 G-8	05-8 24-May-2011 G-14	05-8 29-Nov-2011 [4] 05-8	05-8 31-May-2012 05-8	05-8 28-Nov-2012 05-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1850	1610	1400	1250	1210	1100	1170	1200	1200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	2.7	1.5
Alkalinity (Total as CaCO3)	mg/l	--	--	1850	1613	1400	1248	1210	1100	1170	1200	1200
Ammonia Nitrogen	mg/l	--	--	0.72	0.72	0.67	0.57	0.76	0.70	1.16	0.74	1.0
Chemical Oxygen Demand	mg/l	--	--	272	140	130	75	85	55	85	56	61
Chloride	mg/l	--	250	409	302	243	133	135	91	158	43	96
Conductivity	uS/cm	--	--	--	3450	2960	2490	2420	2110	2380	--	--
Conductivity (Field)	uS/cm	--	--	3200	--	2511	2474	2277	1688	2127	1866	1922
Hardness, Calcium Carbonate	mg/l	--	--	1390	1220	1120	1040	1140	982	818	960	920
Nitrate as N	mg/l	10.0	--	0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	5.34	3.34	2.56	1.51	2.29	1.55	2.71	1.7	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
pH	-	--	--	--	6.71	7.21	7.14	7.02	7.76	7.51	7.38	--
pH (Field)	-	--	--	6.6	--	6.34	6.64	6.64	6.40	6.67	6.56	6.50
Phosphorus	mg/l	--	--	--	0.53	0.79	0.20	0.70	0.50	0.52	0.29	0.29
Sulphate	mg/l	--	500 [6]	7	16	21	29	36	34	5	<1	<1
Temperature (Field)	deg c	--	15	5	--	11.4	16.3	13	16.5	9.3	11.0	10.1
Total Dissolved Solids	mg/l	--	500	2490	2240	1920	1620	1570	1370	1550	1240	1330
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.005	0.003	0.004	<0.01	<0.001	<0.001	<0.01	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	12.6	8.71	5.9	4.8	3.6	0.50	3.6	1.6	2.7
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	325	262	248	222	255	207	166	210	190
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.005	<0.005	0.006	0.006	0.008	<0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	0.0022	0.0015	0.0010	0.0012	0.0010	0.0004	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.003	0.006	0.001	0.006	0.003	0.004	<0.001	0.0016	0.001
Iron, dissolved	mg/l	--	0.3	0.938	<0.03	7.09	0.92	2.39	0.11	13.0	1.8	3.8
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	140	138	122	119	122	113	98	110	110
Manganese, dissolved	mg/l	--	0.05	5.26	6.76	5.29	5.63	6.38	6.78	3.19	7	4.9
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12.5	8	12	10	9	8	12	7.6	12
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	476	297	263	211	194	140	225	130	190
Zinc, dissolved	mg/l	--	5	0.026	0.02	0.01	0.02	0.02	0.02	<0.01	<0.0050	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00050	<0.00050
Benzene	mg/l	0.001	--	0.0015	0.0020	<0.0005	<0.0005	0.0008	<0.0005	<0.0005	<0.00050	<0.00050
Ethylbenzene	mg/l	0.14	0.0016	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050
m,p-Xylenes	mg/l	--	--	0.0053	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00050	<0.00050
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0025	<0.0025
o-Xylene	mg/l	--	--	0.0015	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0010	<0.0010
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0010	<0.0010

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 29-May-2013 [5] 05-8	05-8 26-Nov-2013 [5] GW-23	05-8 29-May-2014 05-8	05-8 19-Nov-2014 [19] 05-8	05-8 02-Jun-2015 05-8	05-8 26-Nov-2015 [3] 05-8	05-8 26-May-2016 05-8	05-8 17-Nov-2016 05-8	05-8 24-May-2017 05-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1200	1200	1100	1200	983	--	1080	1030	1120
Alkalinity, Carbonate as CaCO3	mg/l	--	--	2.2	2.2	1.8	1.9	<50	--	<25 [9]	<25 [9]	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	1200	1200	1100	1200	984	--	1080	1040	1120
Ammonia Nitrogen	mg/l	--	--	1.8	1.7	1.5	0.95	1.04	--	0.88	1.25	0.21
Chemical Oxygen Demand	mg/l	--	--	78	57	51	61	69	--	54	95	54
Chloride	mg/l	--	250	70	64	30	95	67	--	55	90	14
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1733	1727	1566	2174	2045	--	1983	2205	1888
Hardness, Calcium Carbonate	mg/l	--	--	1000	990	970	1100	933	--	987	937	1140
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.05	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.8	2.5	2.4	2.0	2.0	--	1.6	2.1	1.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	--	--	--	--	--
pH	-	--	--	7.29	7.29	7.25	7.21	--	--	--	--	--
pH (Field)	-	--	--	6.52	6.40	6.65	6.86	6.58	--	6.58	6.94	6.65
Phosphorus	mg/l	--	--	0.14	0.13	0.21	0.21	0.09	--	0.18	0.79	0.06
Sulphate	mg/l	--	500 [6]	<1	<1	3	<1	<1	--	2	<1	<1
Temperature (Field)	deg c	--	15	9.7	8.6	10.6	7.0	9.2	--	13.4	11.4	10.4
Total Dissolved Solids	mg/l	--	500	1330	1280	1030	1300	1300	--	1330	1300	1170
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	--	<0.001	0.002	<0.001
Boron, dissolved	mg/l	5	--	1.6	1.2	0.4	1.9	1.07	--	0.824	2.36	0.273
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	220	220	220	230	169	--	208	197	258
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	--	<0.001	0.016	0.01
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0014	<0.0010	0.0023	0.0010	<0.0005	--	<0.0005	0.0017	0.0019
Iron, dissolved	mg/l	--	0.3	0.69	8.8	<0.1	0.76	<0.1	--	<0.1	10	0.46
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	--	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	120	110	100	120	124	--	114	108	120
Manganese, dissolved	mg/l	--	0.05	6.8	8.2	7.6	7	6.82	--	8.74	5.59	12.6
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.3	7.1	4	8.6	6.37	--	8.06	11.7	3.69
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	140	110	49	150	126	--	84.9	159	55.4
Zinc, dissolved	mg/l	--	5	<0.0050	<0.0050	<0.0050	<0.0050	<0.005	--	<0.005	0.005	0.006
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.0056	0.0019	0.0015	0.0048	<0.002 [10]	--	<0.004 [11]	0.007	<0.002 [10]
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00025	<0.00025	0.00033	<0.00020	<0.0005	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.0013	<0.00050	<0.0010	<0.0050	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00025	<0.00010	<0.00020	<0.0005	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00050	<0.00050	<0.00020	<0.00040	<0.0005	--	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00050	<0.00020	<0.00040	<0.0005	--	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-8 29-Nov-2017 05-8	05-8 24-May-2018 05-8	05-8 22-Nov-2018 05-8	05-8 19-Jun-2019 05-8	05-8 20-Nov-2019 05-8	05-8 21-May-2020 05-8	05-8 26-Nov-2020 05-8	05-8 26-May-2021 05-8	05-8 30-Nov-2021 05-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1020	1310	1500	1250	1310	979	1430	1010	1260
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [9]	<25 [9]	<25 [9]	<25 [9]	<25	<25 [16]	<25	<25	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1020	1310	1500	1260	1310	980	1440	1020	1260
Ammonia Nitrogen	mg/l	--	--	0.84	0.39	0.90	0.79	0.42	1.03	0.17	1.33	0.81
Chemical Oxygen Demand	mg/l	--	--	87	134	174	110	141	89	122	72	130
Chloride	mg/l	--	250	68	121	219	113	94	24	113	38	45
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2003	2388	2506	2173	2520	1667	1975	1925	1993
Hardness, Calcium Carbonate	mg/l	--	--	891	1220	1630	942	1200	899	1000	758	863
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.3	2.1	3.5	2.5	2.2	2.4	1.9	2.9	3.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.41	6.52	6.65	6.71	6.87	8.12	6.86	6.64	6.67
Phosphorus	mg/l	--	--	1.95	0.14	0.24	0.13	0.11	0.16	0.14	0.14	0.16
Sulphate	mg/l	--	500 [6]	1	1	3	1	9	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	9.4	12.0	9.8	13.3	6.5	10.8	8.0	11	8.5
Total Dissolved Solids	mg/l	--	500	1130	1570	1700	1400	1550	1020	1420	1090	1260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	1.98	3.21	12.9	2.48	4.67	0.932	3.4	0.64	1.41
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	200	274	396	195	254	191	206	163	192
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.001	0.001	0.002	0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0007	0.0027	0.0009	0.0027	<0.0005	0.0009	<0.0005	0.0008
Copper, dissolved	mg/l	--	1	0.0008	0.0008	0.0012	0.0046	0.0015	0.0031	0.0027	0.0019	0.0011
Iron, dissolved	mg/l	--	0.3	4.12	0.878	7.95	0.21	10.3	11.7	3.26	<0.1	6.17
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0002	<0.0001	0.0003	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	95.1	130	156	110	137	102	119	85.3	93.3
Manganese, dissolved	mg/l	--	0.05	9.67	12.5	12.9	13.7	13.2	9.57	11.4	8.69	11.2
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.93	4.96	11.6	6.52	11.7	5.91	10.4	5.25	6.49
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	90.4	124	226	136	190	88.5	182	72.5	108
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.008	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.002 [11]	0.006	0.003	0.006	0.005	<0.004 [11]	0.006	<0.004 [11]
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 06-Sep-2005 [3]	05-R3 16-Nov-2005	05-R3 25-May-2006	05-R3 21-Nov-2006	05-R3 15-May-2007	05-R3 30-Nov-2007	05-R3 28-Feb-2008	05-R3 22-May-2008	05-R3 10-Nov-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	140	720	765	768	815	800	850	920
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	--	575	720	765	768	815	800	850	920
Ammonia Nitrogen	mg/l	--	--	--	6.74	0.54	0.38	0.11	0.12	<0.01	0.04	0.26
Chemical Oxygen Demand	mg/l	--	--	--	106	25	15	38	57	<5	17	14
Chloride	mg/l	--	250	--	80.2	81.9	76	79.6	68.6	72.8	71.7	74.1
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	1600	1300	1425	1300	1375	--	--	1600
Hardness, Calcium Carbonate	mg/l	--	--	--	556	501	547	554	601	601	639	639
Nitrate as N	mg/l	10.0	--	--	<0.1	0.8	0.8	0.5	0.5	0.4	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	33.1	1.16	0.84	0.67	0.49	0.34	0.5	0.65
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	--	7.2	7.1	7.6	7.6	--	--	6.8
Phosphorus	mg/l	--	--	--	5.05	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	--	300	185	196	198	211	202	186	158
Temperature (Field)	deg c	--	15	--	--	4.5	11.5	11.1	9	--	--	9
Total Dissolved Solids	mg/l	--	500	--	1160	1080	1150	1150	1230	1180	1210	1240
Total Organic Carbon	mg/l	--	--	--	26.6	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	1200	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	0.008	<0.001	0.001	0.0008	0.001	0.001	0.0008	0.0008
Boron, dissolved	mg/l	5	--	--	1.27	1.06	1.28	1.1	1.18	1.08	1.01	1.17
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.005	<0.0001	0.00006	<0.00002	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	--	129	108	121	122	139	136	142	143
Chromium, dissolved	mg/l	0.05	--	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	0.009	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	--	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	--	15.2	0.022	<0.005	0.06	0.089	0.031	0.279	0.099
Lead, dissolved	mg/l	0.01	--	--	<0.0002	<0.0002	<0.0001	0.00005	<0.00002	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	--	57	56.1	59.9	60.5	62	63.6	69.3	68.5
Manganese, dissolved	mg/l	--	0.05	--	1.19	1.18	1.21	0.844	0.551	0.614	1.19	0.964
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	15.3	10.1	11.7	10.3	10.2	9.5	10.3	11.7
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	225	208	220	212	246	213	218	230
Zinc, dissolved	mg/l	--	5	--	0.017	0.006	0.008	<0.005	<0.005	<0.005	0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	<0.0006	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	<0.0001
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 19-Dec-2008	05-R3 19-May-2009 G-24	05-R3 26-Nov-2009 M-16	05-R3 25-May-2010 M-15	05-R3 20-Oct-2010 G-10	05-R3 24-May-2011 G-16	05-R3 29-Nov-2011 05-R3	05-R3 31-May-2012 05-R3	05-R3 28-Nov-2012 05-R3
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	870	899	908	852	896	951	968	940	940
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	4.4	5.0
Alkalinity (Total as CaCO3)	mg/l	--	--	870	899	908	852	896	951	968	940	940
Ammonia Nitrogen	mg/l	--	--	0.03	0.09	0.53	0.10	0.06	0.26	0.25	<0.050	0.11
Chemical Oxygen Demand	mg/l	--	--	15	23	27	23	30	23	25	21	25
Chloride	mg/l	--	250	65.9	60	73	58	55	51	81	46	44
Conductivity	uS/cm	--	--	--	1940	2000	1950	1970	1980	2030	--	--
Conductivity (Field)	uS/cm	--	--	1500	1500	1776	1954	1905	1745	1852	1780	1792
Hardness, Calcium Carbonate	mg/l	--	--	666	646	580	732	784	766	660	750	780
Nitrate as N	mg/l	10.0	--	0.5	0.18	<0.10	0.14	<0.10	<0.10	0.11	0.21	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.37	0.36	0.60	0.28	0.83	0.50	0.62	0.58	0.17
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	0.21	<0.10
pH	-	--	--	--	7.06	7.45	7.76	7.40	7.98	7.76	7.70	--
pH (Field)	-	--	--	7.3	--	6.79	6.88	6.98	6.86	6.83	6.99	6.79
Phosphorus	mg/l	--	--	--	0.06	0.18	0.07	0.04	0.05	0.05	0.059	0.028
Sulphate	mg/l	--	500 [6]	150	173	153	192	193	158	131	160	170
Temperature (Field)	deg c	--	15	5	8	10.7	14.5	11.9	16.7	9.5	10.6	8.6
Total Dissolved Solids	mg/l	--	500	1210	1260	1300	1270	1280	1290	1320	1230	1280
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.0008	<0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	1.24	1.75	1.4	1.4	1.1	0.97	1.4	0.97	1.2
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	152	145	120	163	187	173	134	170	180
Chromium, dissolved	mg/l	0.05	--	<0.002	0.009	0.003	0.005	0.005	0.002	0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	0.0005	0.0008	0.0007	0.0012	0.0007	0.0007	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	0.003	0.002	0.003	0.004	0.006	0.002	0.0024	0.002
Iron, dissolved	mg/l	--	0.3	0.006	<0.03	3.93	0.24	0.31	<0.03	1.18	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	69.5	69	68	79	77	81	79	81	81
Manganese, dissolved	mg/l	--	0.05	1.5	0.42	1.61	0.81	1.10	0.52	1.91	1.1	0.39
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	12.5	9	11	12	10	10	12	11	11
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	236	204	224	218	197	170	222	180	190
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	0.02	0.01	<0.01	0.01	<0.01	0.016	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	--	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	--	<0.0005	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	--	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	--	<0.0002	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 29-May-2013 05-R3	05-R3 26-Nov-2013 [5] GW-22	05-R3 29-May-2014 05-R3	05-R3 19-Nov-2014 05-R3	05-R3 02-Jun-2015 05-R3	05-R3 26-Nov-2015 05-R3	05-R3 26-May-2016 05-R3	05-R3 17-Nov-2016 05-R3	05-R3 24-May-2017 05-R3
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	940	970	960	940	958	978	960	981	939
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.2	4.1	5.2	3.2	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	950	970	960	940	959	980	961	983	941
Ammonia Nitrogen	mg/l	--	--	0.074	0.087	0.075	0.051	0.07	0.05	0.02	0.13	0.03
Chemical Oxygen Demand	mg/l	--	--	27	27	15	17	19	32	16	28	17
Chloride	mg/l	--	250	43	42	46	39	48	49	42	42	20
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1611	1646	1704	1878	1860	1849	1880	2018	1874
Hardness, Calcium Carbonate	mg/l	--	--	820	750	790	820	702	800	764	788	933
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.17	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.50	0.45	0.43	0.33	0.2	0.4	0.3	0.4	0.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	0.17	<0.10	--	--	--	--	--
pH	-	--	--	7.68	7.65	7.76	7.56	--	--	--	--	--
pH (Field)	-	--	--	6.95	6.93	7.27	7.08	6.99	6.98	7.18	7.34	6.89
Phosphorus	mg/l	--	--	0.046	0.053	0.049	0.060	0.04	0.04	0.07	0.08	0.03
Sulphate	mg/l	--	500 [6]	150	150	160	170	184	144	223	168	296
Temperature (Field)	deg c	--	15	9.9	9.0	11.4	7.2	10.2	10.4	13.1	11.8	11.8
Total Dissolved Solids	mg/l	--	500	1250	1220	1220	1180	1290	1250	1320	1200	1290
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.97	0.96	0.91	0.94	0.698	0.838	0.796	1.14	0.58
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	190	170	180	190	132	153	172	174	229
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001	0.012	0.008
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0019	0.0024	0.0031	0.0017	<0.0005	<0.0005	0.0010	0.0026	0.0024
Iron, dissolved	mg/l	--	0.3	<0.1	0.2	<0.1	0.31	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	83	81	84	85	90.3	101	81.5	85.7	87.5
Manganese, dissolved	mg/l	--	0.05	0.51	0.55	0.25	0.41	0.583	0.804	0.233	0.725	0.008
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.8	11	9.2	9.7	7.95	9.9	9.76	11.7	6.97
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	180	180	190	180	195	187	173	169	171
Zinc, dissolved	mg/l	--	5	<0.0050	0.0074	<0.0050	0.0065	0.011	0.01	<0.005	<0.005	0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]	0.001	<0.001	0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0013	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	05-R3 29-Nov-2017 05-R3	05-R3 24-May-2018 05-R3	05-R3 22-Nov-2018 05-R3	05-R3 19-Jun-2019 05-R3	05-R3 20-Nov-2019 05-R3	05-R3 21-May-2020 05-R3	05-R3 26-Nov-2020 05-R3	05-R3 26-May-2021 05-R3	05-R3 30-Nov-2021 05-R3
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	917	1030	991	899	756	845	821	772	733
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	919	1030	992	902	760	848	826	774	737
Ammonia Nitrogen	mg/l	--	--	0.12	0.10	0.03	0.05	0.02	<0.01	0.03	0.04	0.02
Chemical Oxygen Demand	mg/l	--	--	30	48	21	18	23	28	24	<10	26
Chloride	mg/l	--	250	21	20	21	21	18	25	20	15	13
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1656	1790	1435	1560	1625	1516	1436	1570	1598
Hardness, Calcium Carbonate	mg/l	--	--	789	824	797	814	613	719	722	688	615
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.2	1.2	<0.5 [11]	<0.1	0.2
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.3	0.5	0.3	0.3	0.2	0.3	0.3	0.2	0.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.81	6.92	7.25	7.22	7.07	7.69	7.09	6.94	6.94
Phosphorus	mg/l	--	--	0.04	0.06	0.06	0.03	0.04	0.04	0.03	0.03	0.02
Sulphate	mg/l	--	500 [6]	282	131	127	123	162	182	137	222	252
Temperature (Field)	deg c	--	15	10.6	11.2	9.2	14.1	7.4	12.8	8.6	12.4	7.2
Total Dissolved Solids	mg/l	--	500	1130	1150	990	1020	1100	1070	956	1020	1050
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.649	0.501	0.62	0.507	0.446	0.416	0.478	0.373	0.367
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	186	195	185	183	118	165	161	160	148
Chromium, dissolved	mg/l	0.05	--	0.002	<0.001	<0.001	<0.001	0.003	0.001	<0.001	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0016	0.0015	0.0037	0.0019	0.0025	0.0044	0.0041	0.0020	0.0016
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	78.8	81.7	81.5	86.4	77.1	74.3	78.1	70.2	59.6
Manganese, dissolved	mg/l	--	0.05	0.063	1.38	0.363	0.417	0.083	0.014	0.546	<0.005	0.065
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.7	7.99	9.51	9.85	10.2	8.27	9.84	7.78	7.03
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	167	137	123	128	125	117	111	135	123
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	0.003	0.001	<0.001	0.004	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1A 30-Nov-2007	07-1A 28-Feb-2008	07-1A 22-May-2008	07-1A 13-Aug-2008	07-1A 10-Nov-2008	07-1A 25-May-2010 [4] M-8	07-1A 24-May-2011 [4] G-7	07-1A 28-Nov-2012 07-1A	07-1A 29-May-2014 07-1A
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	860	795	820	805	800	761	784	780	770
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	28	37	18	30
Alkalinity (Total as CaCO3)	mg/l	--	--	860	795	820	805	800	789	821	800	800
Ammonia Nitrogen	mg/l	--	--	1.42	1.48	1.39	1.38	1.39	1.27	1.37	2.1	1.6
Chemical Oxygen Demand	mg/l	--	--	68	32	85	45	23	33	33	820	110
Chloride	mg/l	--	250	421	402	407	405	402	343	382	360	380
Conductivity	uS/cm	--	--	--	--	--	--	--	2640	2730	--	--
Conductivity (Field)	uS/cm	--	--	2000	--	2350	2500	2250	2693	2429	2381	2336
Hardness, Calcium Carbonate	mg/l	--	--	44	40	40	42	40	49	45	45	46
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.1	<0.1	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	2.19	2.65	3.92	2.93	1.99	1.66	1.78	13	5.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
pH	-	--	--	--	--	--	--	--	8.59	8.70	--	8.62
pH (Field)	-	--	--	8.6	--	8.6	9	8.5	8.72	8.59	8.64	8.10
Phosphorus	mg/l	--	--	--	--	--	--	--	1.07	0.52	30	3.0
Sulphate	mg/l	--	500 [6]	4	1	2	<1	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	3.5	--	11.5	11	7	11.9	18.0	7.5	9.9
Total Dissolved Solids	mg/l	--	500	1660	1440	1510	1440	1460	1720	1770	1560	1460
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.0044	0.0035	0.0025	0.0008	0.001	<0.01	<0.01	<0.001	<0.0010
Boron, dissolved	mg/l	5	--	1.05	0.993	1.01	1.03	1.06	1.3	1.0	1.3	1.2
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	2.8	2.4	2.4	2.9	2.27	3	3	3.1	3
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.008	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0003	<0.0002	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	0.004	<0.002	0.002	<0.001	<0.001	0.0017
Iron, dissolved	mg/l	--	0.3	0.018	0.071	0.054	0.05	0.015	0.06	0.07	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	0.0002	0.00015	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	8.98	8.25	8.33	8.46	8.44	10	9	9.1	9.3
Manganese, dissolved	mg/l	--	0.05	0.004	0.005	0.003	0.003	0.002	<0.01	<0.01	0.003	0.0050
Potassium, dissolved	mg/l	--	--	17.5	14.2	14.9	15.6	15.9	16	15	15	14
Sodium, dissolved	mg/l	--	200 [7]	687	531	578	518	550	515	606	630	530
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	<0.01	<0.005	<0.0050
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.00020	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.00020	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0010	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00040	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00040	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1A 26-Nov-2015 07-1A	07-1A 24-May-2017 07-1A	07-1A 29-Nov-2018 07-1A	07-1A 21-May-2020 07-1A	07-1A 30-Nov-2021 07-1A
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	815	864	898	800	816
Alkalinity, Carbonate as CaCO3	mg/l	--	--	20	18	22	38	14
Alkalinity (Total as CaCO3)	mg/l	--	--	835	882	920	838	830
Ammonia Nitrogen	mg/l	--	--	1.50	1.61	1.89	1.93	1.66
Chemical Oxygen Demand	mg/l	--	--	56	34	39	45	38
Chloride	mg/l	--	250	406	469	482	728	522
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2585	2885	2620	2706	2966
Hardness, Calcium Carbonate	mg/l	--	--	36.5	54	79	70.8	68.3
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	0.21
Nitrogen, Total Kjeldahl	mg/l	--	--	2.0	2.5	2.7	2.1	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.68	8.51	8.57	8.99	8.67
Phosphorus	mg/l	--	--	0.49	0.34	0.46	0.48	0.42
Sulphate	mg/l	--	500 [6]	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	8.7	10.4	6.8	11.2	6.8
Total Dissolved Solids	mg/l	--	500	1600	1640	1650	1840	1720
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.002	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	1.26	1.24	1.26	0.947	0.906
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	2.73	3.23	10.5	7.23	7.15
Chromium, dissolved	mg/l	0.05	--	<0.001	0.011	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0015	0.0024	0.0016	0.0009
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.182	<0.1	0.142
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	7.21	11.1	12.9	12.8	12.3
Manganese, dissolved	mg/l	--	0.05	<0.005	<0.005	<0.005	<0.005	<0.005
Potassium, dissolved	mg/l	--	--	12.9	16.6	18.7	17.1	15.7
Sodium, dissolved	mg/l	--	200 [7]	677	674	706	669	570
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.005	0.008	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.002 [10]	<0.001	0.003	<0.001
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1B 30-Nov-2007	07-1B 28-Feb-2008	07-1B 22-May-2008	07-1B 13-Aug-2008	07-1B 10-Nov-2008	07-1B 25-May-2010 [4] M-7	07-1B 24-May-2011 [4] G-9	07-1B 28-Nov-2012 07-1B	07-1B 29-May-2014 [5] 07-1B
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	965	925	920	945	950	902	942	910	900
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2 [8]	20	8.5	18
Alkalinity (Total as CaCO3)	mg/l	--	--	965	925	920	945	950	902	962	920	920
Ammonia Nitrogen	mg/l	--	--	2.99	3.06	2.51	2.74	3.14	2.54	2.77	3.2	3.2
Chemical Oxygen Demand	mg/l	--	--	130	82	77	124	68	65	63	69	61
Chloride	mg/l	--	250	1470	1480	1470	1510	1520	1280	1360	1300	1400
Conductivity	uS/cm	--	--	--	--	--	--	--	5690	6020	--	--
Conductivity (Field)	uS/cm	--	--	4500	--	>5000	>5000	>5000	>3999	>3999	>3999	>3999
Hardness, Calcium Carbonate	mg/l	--	--	389	333	357	362	366	346	355	380	370
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	0.1	<0.1	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	5.21	5.31	4.41	5.6	4.85	3.89	3.95	4.3	4.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
pH	-	--	--	--	--	--	--	--	8.28	8.35	--	8.34
pH (Field)	-	--	--	7.8	--	7.8	8.2	7.6	7.54	7.78	7.99	7.73
Phosphorus	mg/l	--	--	--	--	--	--	--	0.67	0.99	0.96	1.5
Sulphate	mg/l	--	500 [6]	200	185	132	73	52	30	7	<1	<1
Temperature (Field)	deg c	--	15	3	--	11.5	12	7	11.0	10.0	7.0	10.5
Total Dissolved Solids	mg/l	--	500	3890	3430	3420	3320	3330	3700	3910	3190	3050
Metals												
Arsenic, dissolved	mg/l	0.01	--	**0.0119**	**0.0216**	**0.0154**	**0.0108**	0.0049	<0.1	<0.1	0.006	0.0077 [20]
Boron, dissolved	mg/l	5	--	1.06	1.04	1.05	1.06	1.1	0.95	0.9	1.3	1.2
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	45.8	33.6	40.7	43.1	42.2	38	40	42	41
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.007	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0010	0.0011	0.0007	0.00074
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.002	<0.002	<0.002	0.002	0.003	<0.001	0.0010
Iron, dissolved	mg/l	--	0.3	0.6	2.71	1.06	0.179	0.033	1.35	1.59	1.3	0.75
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	0.0005	<0.00002	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	66.8	60.6	62.1	61.8	63.4	61	62	66	65
Manganese, dissolved	mg/l	--	0.05	0.111	0.09	0.084	0.104	0.075	0.09	0.14	0.083	0.079
Potassium, dissolved	mg/l	--	--	40.7	34.4	35.8	38.1	36.1	32	30	32	30
Sodium, dissolved	mg/l	--	200 [7]	1440	1070	1120	1030	1040	955	1190	1100	1200
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	0.01	<0.005	<0.0050
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.00050	<0.00020
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00020
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00020
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.00050	<0.00020
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0025	<0.0010
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00020
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0010	<0.00040
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0010	<0.00040

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1B 26-Nov-2015 07-1B	07-1B 24-May-2017 07-1B	07-1B 22-Nov-2018 07-1B	07-1B 21-May-2020 07-1B	07-1B 30-Nov-2021 07-1B
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	967	1030	1040	917	967
Alkalinity, Carbonate as CaCO3	mg/l	--	--	19	17	8	19	6
Alkalinity (Total as CaCO3)	mg/l	--	--	987	1050	1050	936	973
Ammonia Nitrogen	mg/l	--	--	3.06	3.31	3.14	3.47	3.79
Chemical Oxygen Demand	mg/l	--	--	119	91	80	99	124
Chloride	mg/l	--	250	1420	1480	1390	1670	1440
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	>3999	>3999	>3999
Hardness, Calcium Carbonate	mg/l	--	--	376	331	562	425	368
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.50 [9]	<0.05	<0.05	<1.00 [16]
Nitrogen, Total Kjeldahl	mg/l	--	--	4.1	4.1	4.8	3.4	5.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.02	7.94	8.1	8.39	8.11
Phosphorus	mg/l	--	--	0.89	1.05	0.92	0.93	1.62
Sulphate	mg/l	--	500 [6]	4	3	2	2	<1
Temperature (Field)	deg c	--	15	8.8	9.9	7.1	10.4	7.2
Total Dissolved Solids	mg/l	--	500	3160	3340	3160	3190	3360
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.003	0.012	0.003	0.003	0.003
Boron, dissolved	mg/l	5	--	1.31	0.914	1.47	1.15	0.846
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	29.2	40.5	60.6	47.1	41.7
Chromium, dissolved	mg/l	0.05	--	<0.001	0.04	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0006	0.0012	0.0007	0.0006
Copper, dissolved	mg/l	--	1	<0.0005	0.0034	0.0029	0.0026	0.0012
Iron, dissolved	mg/l	--	0.3	0.519	0.832	1.53	0.541	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0003	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	73.4	55.9	99.7	74.7	64.1
Manganese, dissolved	mg/l	--	0.05	0.067	0.07	0.119	0.089	0.076
Potassium, dissolved	mg/l	--	--	27.2	31.6	47.6	32.7	26.9
Sodium, dissolved	mg/l	--	200 [7]	1260	1180	1180	1030	874
Zinc, dissolved	mg/l	--	5	0.008	0.012	<0.005	0.009	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.010 [11]	<0.001	0.007	<0.004 [11]
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1C 30-Nov-2007	07-1C 28-Feb-2008	07-1C 22-May-2008	07-1C 13-Aug-2008	07-1C 10-Nov-2008	07-1C 19-May-2009 G-4	07-1C 26-Nov-2009 J-15	07-1C 25-May-2010 [4] M-6	07-1C 20-Oct-2010 [4] G-5
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	642	672	660	660	666	657	666	639	661
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	642	672	660	660	666	657	666	639	661
Ammonia Nitrogen	mg/l	--	--	1.41	0.73	0.66	0.79	0.75	0.30	0.53	0.49	0.28
Chemical Oxygen Demand	mg/l	--	--	360	13	40	102	29	18	30	25	40
Chloride	mg/l	--	250	562	471	507	505	605	425	454	422	468
Conductivity	uS/cm	--	--	--	--	--	--	--	2760	2820	2760	2820
Conductivity (Field)	uS/cm	--	--	2100	--	2850	2600	2350	2300	2420	2845	2945
Hardness, Calcium Carbonate	mg/l	--	--	252	245	260	245	235	243	158	186	191
Nitrate as N	mg/l	10.0	--	<0.1	0.1	0.1	0.2	0.2	0.42	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	5.52	2.23	1.93	1.88	1.73	0.66	0.70	0.62	0.60
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	7.78	8.06	8.10	7.79
pH (Field)	-	--	--	7.6	--	7.4	7.8	7.3	--	7.16	7.65	7.04
Phosphorus	mg/l	--	--	--	--	--	--	--	0.26	0.21	0.26	0.10
Sulphate	mg/l	--	500 [6]	197	176	163	158	119	119	115	108	98
Temperature (Field)	deg c	--	15	3.5	--	10.5	11	8	8	9.3	10.2	10.2
Total Dissolved Solids	mg/l	--	500	1900	1670	1710	1640	1740	1790	1830	1790	1830
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.0048	0.0068	0.0084	0.0026	0.012	0.004	0.005	<0.01	<0.01
Boron, dissolved	mg/l	5	--	0.474	0.45	0.429	0.432	0.474	0.48	0.52	0.43	0.44
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	37.5	33.8	36.2	33.9	33.2	33	22	25	27
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	<0.005	0.004	0.009
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0006	0.0007	0.0006	0.0005
Copper, dissolved	mg/l	--	1	<0.002	0.003	<0.002	<0.002	0.003	0.004	0.002	0.002	<0.001
Iron, dissolved	mg/l	--	0.3	0.149	0.122	1.44	0.005	0.01	<0.03	0.11	0.40	0.75
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	38.5	39	41.2	39	37.1	39	25	30	30
Manganese, dissolved	mg/l	--	0.05	0.479	0.403	0.469	0.461	0.466	0.40	0.38	0.32	0.38
Potassium, dissolved	mg/l	--	--	17.9	14.9	14.9	16.1	15.6	12	12	12	11
Sodium, dissolved	mg/l	--	200 [7]	662	535	551	495	526	471	537	531	510
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.01	0.01	<0.01	<0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1C 24-May-2011 [4] G-4	07-1C 29-Nov-2011 [4] 07-1C	07-1C 31-May-2012 07-1C	07-1C 28-Nov-2012 07-1C	07-1C 29-May-2013 07-1C	07-1C 26-Nov-2013 GW-20	07-1C 29-May-2014 07-1C	07-1C 19-Nov-2014 07-1C	07-1C 02-Jun-2015 07-1C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	671	674	650	670	680	680	660	660	693
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [3]	14	7.7	5.5	5.8	7.6	8.6	6.2	8
Alkalinity (Total as CaCO3)	mg/l	--	--	671	688	660	680	690	680	670	670	701
Ammonia Nitrogen	mg/l	--	--	0.59	0.40	0.56	0.41	0.49	0.25	0.60	0.25	0.60
Chemical Oxygen Demand	mg/l	--	--	30	30	34	28	29	26	26	23	40
Chloride	mg/l	--	250	452	460	420	400	310	410	440	510	528
Conductivity	uS/cm	--	--	2840	2870	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2576	2534	2433	2423	1976	2172	2366	2664	2555
Hardness, Calcium Carbonate	mg/l	--	--	199	136	150	150	230	180	200	160	161
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	0.11	0.16	0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	0.050	<0.010	0.057	0.021	0.060	0.049	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.81	0.50	1.4	1.6	0.93	0.85	1.2	0.94	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	0.11	<0.10	0.17	0.18	0.16	<0.10	--
pH	-	--	--	8.26	8.35	8.10	--	7.96	8.08	8.14	8.00	--
pH (Field)	-	--	--	7.57	7.47	7.40	7.62	6.99	7.23	7.65	7.69	7.46
Phosphorus	mg/l	--	--	0.40	0.29	0.34	0.36	0.21	0.25	0.49	0.33	0.38
Sulphate	mg/l	--	500 [6]	86	84	72	75	94	81	66	54	56
Temperature (Field)	deg c	--	15	13.6	7.9	9.2	8.5	8.7	7.7	9.8	6.0	9.5
Total Dissolved Solids	mg/l	--	500	1850	1870	1560	1590	1600	1560	1490	1460	1700
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	0.0043	0.004	0.0030	0.0029	0.0049	0.0038	0.003
Boron, dissolved	mg/l	5	--	0.44	0.50	0.5	0.59	0.56	0.48	0.52	0.53	0.314
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	27	18	21	20	31	25	27	23	22.9
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.0050	<0.005	<0.0050	0.0054	<0.0050	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.0003	<0.00050	<0.0005	<0.00050	<0.00050	0.00054	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.0010	<0.001	0.0014	0.0012	0.0025	<0.0020	<0.0005
Iron, dissolved	mg/l	--	0.3	0.88	<0.03	0.5	0.46	<0.1	<0.1	1.4	0.87	0.563
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	0.0004
Magnesium, dissolved	mg/l	--	--	32	22	24	24	38	28	31	24	25.2
Manganese, dissolved	mg/l	--	0.05	0.34	0.14	0.24	0.32	0.33	0.28	0.35	0.27	0.33
Potassium, dissolved	mg/l	--	--	13	11	12	13	14	12	13	12	10.7
Sodium, dissolved	mg/l	--	200 [7]	502	521	560	570	560	510	570	550	586
Zinc, dissolved	mg/l	--	5	0.01	<0.01	<0.0050	<0.005	<0.0050	0.0086	<0.0050	<0.0050	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0005	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0013	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1C 26-Nov-2015	07-1C 26-May-2016	07-1C 17-Nov-2016	07-1C 24-May-2017	07-1C 29-Nov-2017	07-1C 24-May-2018	07-1C 22-Nov-2018	07-1C 19-Jun-2019	07-1C 20-Nov-2019 [21]
				07-1C	07-1C	07-1C	07-1C	07-1C	07-1C	07-1C	07-1C	07-1C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	709	712	713	735	737	742	781	661	682
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6	5	5	<5	8	8	7	<5	9
Alkalinity (Total as CaCO3)	mg/l	--	--	716	718	718	740	745	750	788	665	690
Ammonia Nitrogen	mg/l	--	--	0.32	0.71	0.54	1.14	0.40	0.68	0.38	0.61	0.36
Chemical Oxygen Demand	mg/l	--	--	32	31	49	30	39	67	40	28	42
Chloride	mg/l	--	250	450	509	511	434	478	465	552	418	448
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2678	2628	2773	2528	2303	2701	2379	2442	2600
Hardness, Calcium Carbonate	mg/l	--	--	114	177	152	192	153	201	192	229	276
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	1.2	0.8	1.6	0.8	1.3	0.8	0.9	0.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.65	7.73	7.28	7.55	7.50	7.36	7.85	7.49	--
Phosphorus	mg/l	--	--	0.50	0.45	0.32	0.64	0.35	0.64	0.41	0.66	0.54
Sulphate	mg/l	--	500 [6]	73	63	65	105	108	93	81	117	115
Temperature (Field)	deg c	--	15	9.3	9.3	10.1	8.5	8.2	9.0	7.7	11.7	8.4
Total Dissolved Solids	mg/l	--	500	1460	1630	1570	1520	1560	1560	1730	1440	1470
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.004	0.003	0.007	0.005	0.003	0.003	0.003	0.003	0.004
Boron, dissolved	mg/l	5	--	0.535	0.482	0.619	0.456	0.522	0.542	0.55	0.452	0.421
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	17	24.7	21.4	27	22.1	30.1	29.1	34	39.6
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.006	0.01	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	0.0007	0.0006
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0006	0.0012	0.0011	0.0005	0.0038	0.0010	0.0016
Iron, dissolved	mg/l	--	0.3	0.724	0.351	0.273	<0.1	0.133	0.426	0.218	0.917	0.411
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0006	0.0002
Magnesium, dissolved	mg/l	--	--	17.4	27.9	23.9	30.2	23.7	30.5	28.9	35	43.1
Manganese, dissolved	mg/l	--	0.05	0.34	0.279	0.429	0.341	0.3	0.312	0.22	0.389	0.401
Potassium, dissolved	mg/l	--	--	10.8	14.2	12.5	13.1	13.6	13.4	16.2	14.1	19.5
Sodium, dissolved	mg/l	--	200 [7]	587	502	587	583	553	509	597	442	518
Zinc, dissolved	mg/l	--	5	0.009	<0.005	<0.005	0.006	<0.005	0.005	<0.005	0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.003	0.004	<0.002 [11]	<0.001	<0.001	0.006	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1C 21-May-2020 07-1C	07-1C 26-Nov-2020 07-1C	07-1C 26-May-2021 07-1C	07-1C 30-Nov-2021 07-1C
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	657	671	667	674
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	7	<5	10
Alkalinity (Total as CaCO3)	mg/l	--	--	660	679	670	684
Ammonia Nitrogen	mg/l	--	--	0.54	0.27	0.58	0.31
Chemical Oxygen Demand	mg/l	--	--	49	65	38	51
Chloride	mg/l	--	250	566	419	412	454
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2387	2316	2544	2500
Hardness, Calcium Carbonate	mg/l	--	--	238	193	241	165
Nitrate as N	mg/l	10.0	--	<0.1	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.4	0.8	0.9	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.25	7.64	7.36	7.49
Phosphorus	mg/l	--	--	1.01	0.72	0.58	0.56
Sulphate	mg/l	--	500 [6]	113	120	97	97
Temperature (Field)	deg c	--	15	8.1	8.1	9.3	7.1
Total Dissolved Solids	mg/l	--	500	1570	1490	1550	1650
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.003	0.002	0.003	0.003
Boron, dissolved	mg/l	5	--	0.389	0.411	0.409	0.398
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	34	27.2	31.4	25.1
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0007	0.0005	0.0008	0.0007
Copper, dissolved	mg/l	--	1	0.0034	0.0013	0.0009	0.0011
Iron, dissolved	mg/l	--	0.3	0.853	0.295	0.287	0.241
Lead, dissolved	mg/l	0.01	--	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	37.1	30.3	39.4	25
Manganese, dissolved	mg/l	--	0.05	0.396	0.371	0.348	0.488
Potassium, dissolved	mg/l	--	--	14.4	13.7	14.7	13.3
Sodium, dissolved	mg/l	--	200 [7]	537	521	501	457
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.006
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	0.004	<0.004 [11]	<0.004 [11]	<0.001
Semi-VOCs							
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1D 30-Nov-2007	07-1D 28-Feb-2008	07-1D 22-May-2008	07-1D 13-Aug-2008	07-1D 10-Nov-2008	07-1D 19-May-2009 G-6	07-1D 26-Nov-2009 J-14	07-1D 25-May-2010 [4] M-5	07-1D 20-Oct-2010 [4] G-3
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	730	690	654	681	717	618	697	635	709
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	730	690	654	681	717	618	697	635	709
Ammonia Nitrogen	mg/l	--	--	1.31	1.26	0.8	1.18	1.21	1.75	1.52	1.73	1.21
Chemical Oxygen Demand	mg/l	--	--	307	58	54	114	43	33	90	40	38
Chloride	mg/l	--	250	105	90.7	77.2	96.4	104	63	95	59	84
Conductivity	uS/cm	--	--	--	--	--	--	--	1460	1660	1440	1590
Conductivity (Field)	uS/cm	--	--	1300	--	1500	1450	1400	1100	1456	1423	1530
Hardness, Calcium Carbonate	mg/l	--	--	383	401	381	357	386	319	333	369	404
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.2	0.2	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	7.44	3.91	3.24	3.32	3.2	2.37	1.94	2.23	1.75
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	7.23	7.64	7.39	7.16
pH (Field)	-	--	--	6.8	--	6.8	7.2	6.7	--	6.51	6.99	6.73
Phosphorus	mg/l	--	--	--	--	--	--	--	1.15	1.12	0.92	1.39
Sulphate	mg/l	--	500 [6]	182	164	150	140	140	108	102	59	60
Temperature (Field)	deg c	--	15	5.5	--	10.5	15	8	8	9.1	13.2	9
Total Dissolved Solids	mg/l	--	500	1210	1050	1040	1020	1080	949	1080	936	1030
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.0086	0.0048	0.0044	0.0015	0.0045	<0.001	0.004	<0.01	<0.01
Boron, dissolved	mg/l	5	--	0.431	0.314	0.326	0.424	0.446	0.33	0.48	0.31	0.52
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	65.1	71.9	65.1	61.3	72.6	57	64	67	81
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	0.006	0.005	0.004	0.007
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	0.0005	0.0007	0.0006	0.0005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	<0.002	0.002	0.002	0.002	<0.001
Iron, dissolved	mg/l	--	0.3	8.46	12.8	14.1	2.95	8.04	2.19	9.01	14.2	19.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.00002	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	53.5	53.7	53.2	49.6	49.8	43	42	49	49
Manganese, dissolved	mg/l	--	0.05	2.14	2.67	2.13	2.14	2.71	2.78	2.01	2.79	3.55
Potassium, dissolved	mg/l	--	--	12	8	9.5	11.2	10.3	6	9	8	8
Sodium, dissolved	mg/l	--	200 [7]	347	234	270	248	259	187	237	211	207
Zinc, dissolved	mg/l	--	5	<0.005	0.013	0.008	<0.005	<0.005	0.03	0.01	<0.01	<0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1D 24-May-2011 [4] G-12	07-1D 29-Nov-2011 [4] 07-1D	07-1D 31-May-2012 07-1D	07-1D 28-Nov-2012 07-1D	07-1D 29-May-2013 7-1D	07-1D 26-Nov-2013 GW-12	07-1D 29-May-2014 [22] 07-1D	07-1D 19-Nov-2014 07-1D	07-1D 02-Jun-2015 07-1D
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	642	690	620	700	510	630	370	610	503
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	2.0	1.5	1.8	1.9	1.8	1.5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	642	690	630	700	510	630	370	610	504
Ammonia Nitrogen	mg/l	--	--	0.62	0.98	1.0	1.4	0.82	1.6	0.90	0.61	1.23
Chemical Oxygen Demand	mg/l	--	--	30	33	33	41	36	34	25	25	37
Chloride	mg/l	--	250	58	62	46	75	30	41	19	58	42
Conductivity	uS/cm	--	--	1440	1450	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1070	1468	1201	1447	977	1202	862	1161	1153
Hardness, Calcium Carbonate	mg/l	--	--	397	403	380	430	390	360	350	400	236
Nitrate as N	mg/l	10.0	--	0.12	0.10	<0.10	<0.10	0.69	<0.10	<0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	0.014	0.016	0.095	0.016	0.043	<0.010	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.09	1.96	1.7	2.1	1.3	2.4	1.5	1.1	1.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	<0.10	<0.10	0.78	<0.10	<0.10	<0.10	--
pH	-	--	--	7.86	7.73	7.54	--	7.57	7.51	7.70	7.43	--
pH (Field)	-	--	--	6.89	7.07	6.95	6.76	6.62	6.76	7.07	6.83	6.85
Phosphorus	mg/l	--	--	0.55	0.34	0.32	0.51	0.35	0.58	0.41	0.38	0.37
Sulphate	mg/l	--	500 [6]	80	52	66	50	65	50	34	44	61
Temperature (Field)	deg c	--	15	14.0	7.7	9.9	7.8	9.0	7.7	9.5	7.6	9.3
Total Dissolved Solids	mg/l	--	500	936	942	824	950	746	736	418	600	684
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.0010	0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	0.26	0.44	0.39	0.64	0.41	0.36	0.42	0.28	0.293
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	78	79	74	78	75	81	65	96	48.6
Chromium, dissolved	mg/l	0.05	--	0.002	0.006	<0.0050	<0.005	<0.0050	<0.0050	<0.0050	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	0.0009	0.0006	<0.00050	0.0008	<0.00050	0.00079	<0.00050	0.0011	0.0006
Copper, dissolved	mg/l	--	1	0.003	<0.001	0.0014	0.001	0.0015	0.0014	0.0016	0.0013	<0.0005
Iron, dissolved	mg/l	--	0.3	4.81	10.5	4.5	7	3.4	2.1	10	3.5	3.28
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	49	50	48	57	50	40	45	38	27.7
Manganese, dissolved	mg/l	--	0.05	1.63	3.22	1.7	4.1	2.2	1.7	2.1	3	1.57
Potassium, dissolved	mg/l	--	--	8	8	6.5	9.3	6.1	6.8	6.9	7.6	5.78
Sodium, dissolved	mg/l	--	200 [7]	174	208	170	230	160	130	160	100	121
Zinc, dissolved	mg/l	--	5	0.01	<0.01	<0.0050	<0.005	<0.0050	0.011	<0.0050	0.0056	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0005	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0013	<0.0013	<0.00050	<0.00050	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.00025	<0.00025	<0.00010	<0.00010	<0.00010	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.00050	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.00050	<0.00050	<0.00020	<0.00020	<0.00020	<0.00020	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1D 26-Nov-2015 07-1D	07-1D 26-May-2016 07-1D	07-1D 17-Nov-2016 07-1D	07-1D 24-May-2017 07-1D	07-1D 29-Nov-2017 07-1D	07-1D 24-May-2018 07-1D	07-1D 22-Nov-2018 07-1D	07-1D 19-Jun-2019 07-1D	07-1D 20-Nov-2019 07-1D
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	471	477	516	383	455	439	545	426	361
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	471	477	517	384	456	440	546	428	361
Ammonia Nitrogen	mg/l	--	--	1.48	1.00	0.48	0.45	0.26	0.28	0.04	0.26	0.10
Chemical Oxygen Demand	mg/l	--	--	32	38	27	61	51	55	30	68	52
Chloride	mg/l	--	250	33	54	71	23	34	24	35	17	28
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1138	1261	1571	1046	1175	1099	971	1025	1178
Hardness, Calcium Carbonate	mg/l	--	--	365	441	561	438	527	503	592	485	539
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.1	<0.1	0.5	1.4	0.6	0.8	1.7
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.9	1.3	1.0	1.8	1.7	2.1	0.9	2.2	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.95	7.19	7.25	7.09	7.04	6.92	7.17	7.05	6.8
Phosphorus	mg/l	--	--	0.58	0.40	0.34	0.60	1.07	1.08	0.73	1.42	0.61
Sulphate	mg/l	--	500 [6]	58	153	313	220	270	196	207	197	215
Temperature (Field)	deg c	--	15	9.0	9.3	10.3	9.3	7.1	9.5	7	12.6	7.8
Total Dissolved Solids	mg/l	--	500	596	760	986	698	796	748	822	686	752
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.33	0.359	0.386	0.172	0.267	0.245	0.877	0.247	0.286
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	68.9	84.8	142	127	143	136	122	119	134
Chromium, dissolved	mg/l	0.05	--	0.001	<0.001	0.006	0.003	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0005	0.0009	0.0019	0.0030	0.0025	0.0022	0.0042	0.0032	0.0031
Iron, dissolved	mg/l	--	0.3	4.66	4.71	2.05	0.497	1.1	0.57	2.61	<0.1	0.662
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	46.7	55.7	50.1	29.2	41.3	39.7	69.7	45.6	49.7
Manganese, dissolved	mg/l	--	0.05	1.31	2.03	0.824	0.27	0.487	0.334	1.03	0.67	0.344
Potassium, dissolved	mg/l	--	--	6.12	7.68	7.53	7.08	7.51	5.38	9.11	7.07	7.56
Sodium, dissolved	mg/l	--	200 [7]	137	152	105	42.3	62.9	48.6	139	63.8	63.3
Zinc, dissolved	mg/l	--	5	0.009	0.009	<0.005	<0.005	<0.005	<0.005	0.007	0.008	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.005	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	07-1D 21-May-2020 07-1D	07-1D 26-Nov-2020 07-1D	07-1D 26-May-2021 07-1D	07-1D 30-Nov-2021 07-1D
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	391	426	401	459
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	393	428	402	461
Ammonia Nitrogen	mg/l	--	--	0.23	0.20	0.38	0.07
Chemical Oxygen Demand	mg/l	--	--	142	93	251	51
Chloride	mg/l	--	250	21	26	18	11
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1019	1111	1092	1145
Hardness, Calcium Carbonate	mg/l	--	--	466	513	483	495
Nitrate as N	mg/l	10.0	--	1.8	0.2	0.7	0.6
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	4.2	1.9	5.7	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.06	7.05	6.94	6.81
Phosphorus	mg/l	--	--	2.89	0.91	3.23	0.71
Sulphate	mg/l	--	500 [6]	253	254	186	187
Temperature (Field)	deg c	--	15	7.86	6.8	9.9	6.9
Total Dissolved Solids	mg/l	--	500	716	764	670	720
Metals							
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.185	0.248	0.173	0.175
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	116	127	123	136
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0047	0.0031	0.0026	0.0027
Iron, dissolved	mg/l	--	0.3	0.195	<0.1	0.184	0.898
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	42.8	47.6	42.3	37.4
Manganese, dissolved	mg/l	--	0.05	0.392	0.07	0.144	0.369
Potassium, dissolved	mg/l	--	--	5.54	6.08	5.47	5.75
Sodium, dissolved	mg/l	--	200 [7]	55	62.9	43.8	39.8
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001
Semi-VOCs							
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-1 09-Jun-1992	92-1 01-Nov-1992	92-1 15-Jun-1994	92-1 02-Nov-1994	92-1 22-Nov-1995	92-1 12-Oct-1996	92-1 06-Nov-1997
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	996	1061	--	771	848	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	10	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	816	870	706	642	712	716	640
Ammonia Nitrogen	mg/l	--	--	--	--	--	1.09	0.77	1.12	0.7
Chemical Oxygen Demand	mg/l	--	--	--	--	323	363	27	20	17
Chloride	mg/l	--	250	307	404	390	266	235	186	196
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2486	2579	2210	2140	2180	1910	1900
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	4.14	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	73.89	66	63	49	40	36	36
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.1	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	3.1	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	2.33	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.21	8.12	8.52	8.82	9.13	8.31	8.01
Phosphate	mg/l	--	--	--	--	--	--	1.7	--	--
Phosphorus	mg/l	--	--	--	--	1.63	1.095	--	--	--
Sulphate	mg/l	--	500 [6]	70	87.5	5.3	6	5	3	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1120	1080	1090	960	950
Total Organic Carbon	mg/l	--	--	--	--	11.8	23.3	10.8	8.9	9.6
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	4560	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.1	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.199	--	--	--
Boron, dissolved	mg/l	5	--	--	--	0.98	0.868	0.89	0.8	0.91
Cadmium, dissolved	mg/l	0.005	--	--	--	--	0.01	0.001	--	--
Calcium, dissolved	mg/l	--	--	7	7.77	9	3.8	4.5	4.4	4.14
Chromium, dissolved	mg/l	0.05	--	--	--	0.012	0.01	0.03	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0154	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	2.993	1.19	2.11	2.4	1.29
Lead, dissolved	mg/l	0.01	--	--	--	0.0012	0.1	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	13.7	11.4	10	2.115	7.01	5.96	6.1
Manganese, dissolved	mg/l	--	0.05	--	--	0.062	0.032	0.04	0.04	0.03
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	22.49	18	22	8.481	13.3	12.9	13.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	555.9	728	423	414.9	461	386	384
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.01	0.01	0.01	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.072	0.001	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-1 05-Jun-1998	92-1 26-Aug-1998	92-1 29-Oct-1998	92-1 06-May-1999	92-1 24-Oct-2000	92-1 14-Jun-2001	92-1 06-Nov-2002	92-1 30-May-2003	92-1 19-Nov-2004
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	359	910	824	997	865	955	893	889
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	1	19	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	450	294	746	710	817	741	783	732	729
Ammonia Nitrogen	mg/l	--	--	0.63	0.21	6.05	1.34	0.06	1.26	0.74	0.62	1.03
Chemical Oxygen Demand	mg/l	--	--	35	49	392	310	--	27	39	27	41
Chloride	mg/l	--	250	450	20.9	275	285	275	219	334	236	248
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1893	1130	2040	1930	2130	1550	2020	1780	2180
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	552	559	54	36	28	25	30	29	27
Nitrate as N	mg/l	10.0	--	1	1.1	--	--	0.1	0.1	0.1	0.1	<1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	7.18	9.11	1.56	1.69	1.33	1.32	1.67
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.21	8.4	8.4	8.59	8.4	8.2	7.3	8.4
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	1.59	1.37	1.27	1.26	1.48
Sulphate	mg/l	--	500 [6]	39	314	2	1	1	1	1	1	10
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	946	563	1020	960	1170	966	1160	1150	1090
Total Organic Carbon	mg/l	--	--	7.4	22	11.7	16.5	--	10.4	11	12	10
Total Suspended Solids	mg/l	--	--	--	--	--	--	244	2490	102	80	114
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.001	0.002	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.04	0.47	1.08	1.03	0.96	0.94	0.99	0.94	1
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	165	136	6.61	2.32	2.39	2.26	3.08	3.44	2.22
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.06	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.002
Iron, dissolved	mg/l	--	0.3	19.6	2.6	0.45	0.06	0.07	0.07	0.02	0.07	0.041
Lead, dissolved	mg/l	0.01	--	0.0067	0.0002	0.0002	0.0015	0.022	0.0002	0.0013	0.0005	0.0007
Magnesium, dissolved	mg/l	--	--	33.4	52.6	9.01	6.69	5.3	4.6	5.48	4.85	5.14
Manganese, dissolved	mg/l	--	0.05	1.05	1.16	0.02	0.01	0.01	0.01	0.01	0.01	0.003
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.06	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	20.9	6.5	28.5	10.2	13.7	6.8	10.7	11.1	11.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	281	78.6	499	532	490	423	498	448	477
Zinc, dissolved	mg/l	--	5	0.14	0.52	0.01	0.01	0.01	0.01	0.01	0.01	0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.039	0.001	0.001	0.001
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-1 16-Nov-2005	92-1 15-May-2007	92-1 10-Nov-2008	92-1 26-Nov-2009 M-4	92-1 24-May-2011 [4] G-19	92-1 28-Nov-2012 92-1	92-1 29-May-2014 92-1	92-1 26-Nov-2015 92-1	92-1 24-May-2017 92-1
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	188	770	750	724	713	700	700	746	776
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	27	37	25	30	16	18
Alkalinity (Total as CaCO3)	mg/l	--	--	770	770	750	751	750	730	730	762	795
Ammonia Nitrogen	mg/l	--	--	0.95	0.67	0.9	1.01	0.96	1.2	1.2	1.22	1.21
Chemical Oxygen Demand	mg/l	--	--	35	84	<100	93	35	37	40	67	41
Chloride	mg/l	--	250	240	268	286	277	299	290	320	347	334
Conductivity	uS/cm	--	--	--	--	--	2250	2340	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1900	1500	1900	1995	2089	2191	2031	2262	2309
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	32	31	41	35	39	36	36	28.4	36
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	<0.10	<0.10	<0.010	0.014	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.56	2.05	7.62	1.32	1.37	2.7	6.2	1.8	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	8.60	8.74	--	8.66	--	--
pH (Field)	-	--	--	--	8.9	8.2	8.55	8.72	8.53	8.39	8.69	8.63
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.98	--	--	2.98	1.31	1.3	1.2	1.13	1.13
Sulphate	mg/l	--	500 [6]	<1	1	2	2	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	--	10.2	9	10	12.5	6.0	11.1	9.7	11.4
Total Dissolved Solids	mg/l	--	500	1260	1210	1280	1460	1520	1360	1350	1370	1360
Total Organic Carbon	mg/l	--	--	12	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	50	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0013	0.0025	0.002	<0.01	<0.001	<0.0010	<0.001	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.02	0.927	0.939	0.9	1.0	1.2	1.1	1.16	1.08
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	3.11	3.1	4.14	4	4	3.5	3.5	2.5	3.3
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	0.007	<0.005	<0.005	<0.0050	<0.001	0.01
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.0002	0.0003	<0.0005	<0.00050	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.001	0.002	<0.001	0.0020	<0.0005	0.0007
Iron, dissolved	mg/l	--	0.3	0.039	0.131	0.065	0.09	0.03	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0002	0.00006	<0.00002	<0.001	<0.001	<0.0005	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	5.8	5.74	7.35	6	7	6.6	6.7	5.39	6.69
Manganese, dissolved	mg/l	--	0.05	0.004	0.017	0.013	0.02	0.01	0.004	0.0036	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13.8	12.8	14.3	11	12	13	13	11.1	13.1
Selenium, dissolved	mg/l	0.05	--	<0.001	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	548	458	511	449	552	550	550	592	557
Zinc, dissolved	mg/l	--	5	0.006	<0.005	<0.005	<0.01	0.01	<0.005	<0.0050	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010	<0.0005	<0.0005
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-1 22-Nov-2018 92-1	92-1 21-May-2020 92-1	92-1 30-Nov-2021 92-1
General Chemistry						
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	830	729	763
Alkalinity, Carbonate as CaCO3	mg/l	--	--	11	31	16
Alkalinity (Total as CaCO3)	mg/l	--	--	841	760	780
Ammonia Nitrogen	mg/l	--	--	1.15	1.13	0.97
Chemical Oxygen Demand	mg/l	--	--	68	71	65
Chloride	mg/l	--	250	372	423	336
Conductivity	uS/cm	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2096	2186	2296
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	63	74.5	41.1
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.1	1.7	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--
pH	-	--	--	--	--	--
pH (Field)	-	--	--	8.47	8.06	8.70
Phosphate	mg/l	--	--	--	--	--
Phosphorus	mg/l	--	--	1.40	1.22	1.25
Sulphate	mg/l	--	500 [6]	<1	<1	<1
Temperature (Field)	deg c	--	15	9.1	13.0	8.2
Total Dissolved Solids	mg/l	--	500	1390	1410	1350
Total Organic Carbon	mg/l	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--
Metals						
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--
Boron, dissolved	mg/l	5	--	1.08	0.83	0.877
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	11.9	14.5	5.42
Chromium, dissolved	mg/l	0.05	--	<0.001	0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0020	0.0032	0.0040
Iron, dissolved	mg/l	--	0.3	0.111	0.825	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0003	0.0002
Magnesium, dissolved	mg/l	--	--	8.06	9.26	6.69
Manganese, dissolved	mg/l	--	0.05	0.016	0.055	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.9	14	12
Selenium, dissolved	mg/l	0.05	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	549	563	490
Zinc, dissolved	mg/l	--	5	<0.005	0.008	<0.005
Phenols						
Phenolics, Total Recoverable	mg/l	--	--	0.004	0.007	<0.001
VOCs						
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-5 09-Jun-1992	92-5 01-Nov-1992	92-5 08-Jun-1993	92-5 04-Nov-1993	92-5 15-Jun-1994	92-5 02-Nov-1994	92-5 28-Jun-1995
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	922	928	926	910	--	669	871
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	<1	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	756	761	759	746	752	724	714
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	1.73	2.3
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	138	242	188
Chloride	mg/l	--	250	928	1240	1315	1375	1480	1090	167
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4255	4404	3990	4380	4890	4880	4820
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	6.02	4.64
Hardness, Calcium Carbonate	mg/l	--	--	361.84	361	286	276	318	320	221
Nitrate as N	mg/l	10.0	--	--	--	0.3	8.17	0.1	0.4	0.1
Nitrite as N	mg/l	1.0	--	--	--	0.1	0.1	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	5.7
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.67	8.05	7.9	8.06	7.94	8.27	7.85
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	1.45	0.577	4.3
Sulphate	mg/l	--	500 [6]	29	25.5	4.8	7.1	1.9	1.9	6
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	2555	2520	2460	2440	2410
Total Organic Carbon	mg/l	--	--	--	--	--	--	22.2	26.6	24.6
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	0.139	0.068	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	**0.1**	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	0.088	--
Boron, dissolved	mg/l	5	--	--	--	--	--	1.19	1.068	0.83
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**	0.0001
Calcium, dissolved	mg/l	--	--	47.6	46	36.1	35	42.1	28.04	28.5
Chromium, dissolved	mg/l	0.05	--	--	--	**0.1**	<0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.017	0.01	0.0151	0.01	0.02
Iron, dissolved	mg/l	--	0.3	--	--	0.247	<0.1	0.436	0.159	0.06
Lead, dissolved	mg/l	0.01	--	--	--	**0.1**	**0.116**	0.0013	**0.1**	0.0002
Magnesium, dissolved	mg/l	--	--	59	59.8	47.6	45.7	51.6	23.816	36.1
Manganese, dissolved	mg/l	--	0.05	--	--	0.087	0.01	0.192	0.075	0.1
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.023	<0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	23	28.1	28.3	26.7	35	21.69	--
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	827.7	1050	909	945	791	848.8	693
Zinc, dissolved	mg/l	--	5	--	--	0.083	<0.01	0.01	0.01	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.007	0.063	0.001	0.001
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-5 23-Nov-1995	92-5 12-Oct-1996	92-5 06-Nov-1997	92-5 05-Jun-1998	92-5 06-May-1999	92-5 24-Oct-2000	92-5 14-Jun-2001	92-5 06-Nov-2002	92-5 30-May-2003
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	893	--	--	--	900	1050	936	977	911
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	732	764	808	672	738	861	768	801	747
Ammonia Nitrogen	mg/l	--	--	1.34	2.18	1.25	0.93	1.98	1.07	1.99	2.63	2.14
Chemical Oxygen Demand	mg/l	--	--	68	43	36	31	51	--	51	99	68
Chloride	mg/l	--	250	1100	1110	944	1120	1110	1230	1100	1120	1190
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5080	4550	4600	4550	4400	4660	4350	4530	4270
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	269	239	266	252	246	272	214	250	227
Nitrate as N	mg/l	10.0	--	0.6	0.1	0.1	2.8	--	0.1	0.2	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	4.5	--	--	--	5.84	2.77	3.14	4.89	3.63
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	3.16	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.75	7.76	7.48	--	7.8	8.06	7.8	7.8	7.1
Phosphate	mg/l	--	--	0.7	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	3.42	2.79	4.96	1.2
Sulphate	mg/l	--	500 [6]	1	4	1	39	2	3	1	2	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2540	2280	2310	2270	2200	2700	2300	2610	--
Total Organic Carbon	mg/l	--	--	19.9	17.5	18.4	18.8	22.4	--	18.7	19.1	17.9
Total Suspended Solids	mg/l	--	--	--	1730	--	--	--	4360	2070	2220	856
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	0.003	0.001	0.003	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.91	0.96	1.8	1.18	1.13	1.15	1.18	1.18	1.11
Cadmium, dissolved	mg/l	0.005	--	0.0001	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	32.1	28	32.7	30	31.2	28.7	26.9	29.5	29
Chromium, dissolved	mg/l	0.05	--	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.38	0.97	0.54	1.27	0.45	0.27	0.12	0.56	1.06
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0008	0.022	0.0002	0.0059	0.0006
Magnesium, dissolved	mg/l	--	--	45.2	40.5	44.2	42.5	40.3	48.6	35.6	42.8	37.5
Manganese, dissolved	mg/l	--	0.05	0.12	0.11	0.1	0.13	0.12	0.09	0.08	0.1	0.08
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	26.2	25.4	24.7	31	27.2	26.4	21	25.8	27.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	841	937	908	1140	951	937	923	984	812
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.01	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	0.003	0.08	0.001	0.001
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-5 19-Nov-2004	92-5 16-Nov-2005	92-5 15-May-2007	92-5 10-Nov-2008	92-5 26-Nov-2009 [23] M-2	92-5 24-May-2011 [4] G-23	92-5 28-Nov-2012 92-5	92-5 29-May-2014 92-5	92-5 26-Nov-2015 92-5
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	982	198	840	810	796	766	750	760	790
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<2 [8]	23	9.7	15	13
Alkalinity (Total as CaCO3)	mg/l	--	--	805	810	840	810	796	789	760	770	803
Ammonia Nitrogen	mg/l	--	--	2.38	1.7	1.16	1.64	2.01	1.92	1.9	1.7	0.05
Chemical Oxygen Demand	mg/l	--	--	67	74	107	61	60	65	68	53	105
Chloride	mg/l	--	250	1200	1120	1200	1230	1110	1100	1100	1200	1180
Conductivity	uS/cm	--	--	--	--	--	--	4850	4890	--	--	--
Conductivity (Field)	uS/cm	--	--	4710	3400	3500	4350	>3999	>3999	3871	3903	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	231	253	235	229	224	244	250	260	271
Nitrate as N	mg/l	10.0	--	1	1.4	0.2	0.2	<0.10	<0.10	<0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	<0.010	<0.010	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.3	3.3	2.76	3.25	2.99	3.05	2.7	2.5	1.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	<0.10	<0.10	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	8.19	8.50	--	8.33	--
pH (Field)	-	--	--	7.9	--	8.4	8	7.9	8.09	8.04	7.63	8.01
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1	1.62	--	--	0.95	1.52	1.5	0.98	0.96
Sulphate	mg/l	--	500 [6]	10	<1	2	1	4	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	--	--	10.2	8	10.8	12.5	8.5	11.6	9.8
Total Dissolved Solids	mg/l	--	500	2355	2700	2700	2680	3150	3180	2590	2590	2730
Total Organic Carbon	mg/l	--	--	16.3	20.6	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	710	28	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.002	0.0076	0.0064	0.009	<0.01	0.002	0.0037 [20]	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.14	1.21	1.1	1.11	0.96	1.3	1.4	1.3	1.35
Cadmium, dissolved	mg/l	0.005	--	--	0.0001	0.00004	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	29.4	32.2	30.3	29.2	27	30	31	32	29
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.005	<0.005	<0.005	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	0.0006	0.0008	0.0005	0.00059	0.0005
Copper, dissolved	mg/l	--	1	0.002	<0.002	0.006	0.003	0.007	0.006	0.003	0.0028	<0.0005
Iron, dissolved	mg/l	--	0.3	0.404	0.312	0.413	0.015	<0.03	<0.03	<0.1	0.18	<0.1
Lead, dissolved	mg/l	0.01	--	0.0013	0.0007	0.00016	<0.00002	<0.001	<0.001	<0.0005	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	38.3	41.9	38.7	37.9	38	41	42	44	48.2
Manganese, dissolved	mg/l	--	0.05	0.083	0.081	0.023	0.032	<0.01	0.02	<0.002	0.036	0.011
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	28.2	31.7	29.9	27.8	24	27	27	27	22.7
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	977	1010	887	864	884	833	930	830	1060
Zinc, dissolved	mg/l	--	5	0.005	0.006	<0.005	<0.005	0.01	0.02	<0.005	<0.0050	0.008
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0010	<0.004 [10]
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00025	<0.00010	<0.0005
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00025	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.0013	<0.00050	<0.0050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.00020	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-5 24-May-2017 92-5	92-5 29-Nov-2018 92-5	92-5 21-May-2020 92-5	92-5 30-Nov-2021 92-5
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	834	884	766	790
Alkalinity, Carbonate as CaCO3	mg/l	--	--	12	15	13	19
Alkalinity (Total as CaCO3)	mg/l	--	--	847	899	779	810
Ammonia Nitrogen	mg/l	--	--	0.01	0.20	1.44	2.19
Chemical Oxygen Demand	mg/l	--	--	111	147	127	303
Chloride	mg/l	--	250	1160	1120	1400	1100
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3999	>3999	>3999	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	94	327	290	260
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.25 [9]	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.7	2.1	2.6	7.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.00	8.1	8.14	8.17
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.92	1.43	1.50	13.9
Sulphate	mg/l	--	500 [6]	1	<1	<1	<1
Temperature (Field)	deg c	--	15	11.9	6.9	13.6	8.2
Total Dissolved Solids	mg/l	--	500	2620	2600	2680	2700
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Aluminum, dissolved	mg/l	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.008	0.003	0.003	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.981	1.26	0.92	0.954
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	31.1	41.8	35.5	31.6
Chromium, dissolved	mg/l	0.05	--	0.017	0.002	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.0012	0.0011	0.0007
Copper, dissolved	mg/l	--	1	0.0013	0.0046	0.0035	0.0035
Iron, dissolved	mg/l	--	0.3	<0.1	0.645	0.998	0.322
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0002	0.0003	0.0002
Magnesium, dissolved	mg/l	--	--	3.9	54	48.8	44
Manganese, dissolved	mg/l	--	0.05	0.12	0.024	0.122	0.08
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	27.9	33.6	28.9	25.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	981	1010	899	812
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.006	<0.005
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	<0.010 [10]	<0.001	0.005	<0.004 [11]
VOCs							
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 09-Jun-1992	92-7 01-Nov-1992	92-7 08-Jun-1993	92-7 04-Nov-1993	92-7 15-Jun-1994	92-7 02-Nov-1994	92-7 28-Jun-1995	92-7 23-Nov-1995	92-7 12-Jun-1996
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	561	529	515	538	--	503	524	597	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	<1	--	1	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	460	434	422	441	442	420	430	462	462
Ammonia Nitrogen	mg/l	--	--	--	--	--	--	--	0.89	0.8	0.39	0.7
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	143	115	125	48	45
Chloride	mg/l	--	250	298	407	465	568	720	410	300	342	377
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1822	1687	1780	1930	2060	2050	2030	2100	1970
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	8.72	6.07	--	--
Hardness, Calcium Carbonate	mg/l	--	--	219.79	161	145	147	167	169	155	158	159
Nitrate as N	mg/l	10.0	--	--	--	0.3	3.1	0.1	1.08	0.1	0.8	0.6
Nitrite as N	mg/l	1.0	--	--	--	0.1	0.1	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	6.8	1.8	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	6	1.41	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.76	8.02	7.3	7.7	7.53	7.94	7.49	8.16	7.69
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	0.3	--
Phosphorus	mg/l	--	--	--	--	--	--	3.85	0.356	4.1	--	--
Sulphate	mg/l	--	500 [6]	13	4.7	1.8	4.4	2.6	2.3	2	4	4
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1176	1000	1040	1030	1020	1050	990
Total Organic Carbon	mg/l	--	--	--	--	--	--	15.2	19	15.8	14.8	15.2
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	1960
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	2.91	0.344	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	**0.1**	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	0.04	--	--	--
Boron, dissolved	mg/l	5	--	--	--	--	--	0.4	0.442	0.37	0.36	0.387
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**	0.0001	0.0001	--
Calcium, dissolved	mg/l	--	--	34.9	24	21.1	22.5	25.5	20.64	24.4	23.8	22.6
Chromium, dissolved	mg/l	0.05	--	--	--	0.018	0.01	0.01	0.01	0.01	0.02	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.1	0.01	0.0116	0.029	0.02	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	1.587	0.1	1.891	0.742	0.05	0.82	1.27
Lead, dissolved	mg/l	0.01	--	--	--	**0.1**	**0.0356**	0.0012	**0.1**	0.0003	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	32.18	24.6	22.3	22	25.2	10.426	22.5	23.6	24.5
Manganese, dissolved	mg/l	--	0.05	--	--	0.238	0.261	0.405	0.213	0.38	0.4	0.361
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.024	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	11.06	13.1	15.7	13.4	35.3	8.746	--	14	16.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	313.3	369	349	388	320	331	339	371	38.1
Zinc, dissolved	mg/l	--	5	--	--	0.059	0.01	0.01	0.456	0.01	0.01	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.002	0.019	0.087	0.001	0.001	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 09-Jun-1992	92-7 01-Nov-1992	92-7 08-Jun-1993	92-7 04-Nov-1993	92-7 15-Jun-1994	92-7 02-Nov-1994	92-7 28-Jun-1995	92-7 23-Nov-1995	92-7 12-Jun-1996
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 12-Oct-1996	92-7 18-Jun-1997	92-7 06-Nov-1997	92-7 05-Jun-1998	92-7 30-Oct-1998	92-7 06-May-1999	92-7 19-Oct-1999	92-7 05-May-2000	92-7 24-Oct-2000
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	366	372	471	684	620
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	1	1	23	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	479	452	466	456	300	305	424	561	508
Ammonia Nitrogen	mg/l	--	--	0.99	0.49	0.68	0.5	0.93	0.27	0.9	0.03	0.41
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	30	34	34	43	28	21	21	33	--
Chloride	mg/l	--	250	320	404	396	386	250	226	368	375	410
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1800	1980	2020	2020	1562	1180	1740	1800	2100
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	2.77	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	149	176	176	173	142	165	176	166	168
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	1.6	--	--	0.1	0.2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	3.93	1.44	--	--	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.23	7.69	7.27	--	7.3	7.1	7.6	7.6	7.57
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	--	--	0.46
Sulphate	mg/l	--	500 [6]	9	1	2	47	29	31	13	9	8
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	900	990	1010	1000	783	590	870	900	1100
Total Organic Carbon	mg/l	--	--	15	13.5	14.7	13.7	9.4	9.2	10.6	11.8	--
Total Suspended Solids	mg/l	--	--	546	1340	--	--	--	--	1640	210	116
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.39	0.52	0.45	0.54	0.4	0.25	0.46	0.53	0.45
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	21.3	26.8	27.2	26.1	28.2	32.6	32.3	28.7	25.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.6	0.57	2.67	2.49	0.39	0.14	2.34	0.68	0.18
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0008	0.0002	0.0002	0.0003	0.0002	0.0002	0.0022
Magnesium, dissolved	mg/l	--	--	22.9	26.1	25.9	25.9	17.4	20	22.8	22.6	25.4
Manganese, dissolved	mg/l	--	0.05	0.39	0.33	0.45	0.37	0.27	0.24	0.19	0.03	0.37
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	11.4	12.9	15.9	14.4	12.5	11.3	12.7	6.2	11.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	321	325	331	443	244	226	334	382	459
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.22	0.01	0.01	0.13	0.1	0.02
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	--	--	0.001

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 12-Oct-1996	92-7 18-Jun-1997	92-7 06-Nov-1997	92-7 05-Jun-1998	92-7 30-Oct-1998	92-7 06-May-1999	92-7 19-Oct-1999	92-7 05-May-2000	92-7 24-Oct-2000
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 14-Jun-2001	92-7 23-Nov-2001	92-7 23-May-2002	92-7 06-Nov-2002	92-7 30-May-2003	92-7 09-Oct-2003	92-7 14-May-2004	92-7 19-Nov-2004	92-7 24-May-2005
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	561	583	542	597	575	--	597	634	605
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	18	1	1	--	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	460	478	474	489	471	480	489	520	496
Ammonia Nitrogen	mg/l	--	--	0.74	0.86	0.59	0.95	0.44	1.15	0.71	1.12	0.58
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	3	--	--	--
Chemical Oxygen Demand	mg/l	--	--	30	32	19	42	68	43	44	43	33
Chloride	mg/l	--	250	414	400	396	386	410	396	397	397	381
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1700	1750	1980	2000	1940	2000	2090	2290	2500
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	112	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	135	179	178	166	159	161	167	169	174
Nitrate as N	mg/l	10.0	--	0.2	0.1	0.1	0.2	0.2	0.1	0.2	1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.57	1.73	1.09	1.89	1.33	1.83	1.53	1.8	1.27
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.5	7.03	7.17	7.7	7	7.4	7.3	7.9	7.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.65	0.3	0.27	0.62	0.34	0.55	0.35	0.57	0.31
Sulphate	mg/l	--	500 [6]	5	12	7	8	6	4	10	20	9
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	10.6
Total Dissolved Solids	mg/l	--	500	1100	1040	1080	1180	970	1139	1045	1145	1130
Total Organic Carbon	mg/l	--	--	12.9	17	13	13.2	13.2	15	11.7	12.5	12.8
Total Suspended Solids	mg/l	--	--	167	82	45	202	76	100	43	910	31
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.47	0.56	0.47	0.44	0.44	0.445	0.451	0.478	0.451
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	20.9	28.6	29.5	25.3	24.9	23.8	25.8	26.3	25.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.006	0.001	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.003	0.002	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.16	0.15	0.05	0.05	0.2	2.19	0.052	0.747	0.039
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.001	0.0005	0.0009	0.0003	0.0006	0.0011
Magnesium, dissolved	mg/l	--	--	20	26.2	25.4	25	23.4	24.6	24.9	25.2	26.5
Manganese, dissolved	mg/l	--	0.05	0.01	0.36	0.31	0.57	0.27	0.296	0.163	0.349	0.098
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	<0.01
Potassium, dissolved	mg/l	--	--	9.5	13.7	15.3	12.8	13.2	13.9	14.3	14.1	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [7]	382	388	366	348	385	386	411	397	384
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.01	0.01	0.005	0.005	0.005	0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.054	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.003

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 14-Jun-2001	92-7 23-Nov-2001	92-7 23-May-2002	92-7 06-Nov-2002	92-7 30-May-2003	92-7 09-Oct-2003	92-7 14-May-2004	92-7 19-Nov-2004	92-7 24-May-2005
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0007
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0006
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0004
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	<0.0001
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0002
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	<0.0002
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.002
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	<0.0002
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	<0.0002
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0003
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	<0.0002
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 16-Nov-2005	92-7 25-May-2006	92-7 21-Nov-2006	92-7 15-May-2007	92-7 30-Nov-2007	92-7 22-May-2008	92-7 10-Nov-2008	92-7 19-May-2009 G-9	92-7 26-Nov-2009 M-6
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	303	515	528	531	540	531	543	517	534
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<2 [8]	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	496	515	528	531	540	531	543	517	534
Ammonia Nitrogen	mg/l	--	--	1.08	0.72	1.05	<0.01	0.94	0.46	1.08	0.36	1.07
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	35	38	55	72	26	34	30	40
Chloride	mg/l	--	250	387	413	387	437	432	413	413	402	421
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	2240	2280
Conductivity (Field)	uS/cm	--	--	2000	1700	2000	2190	1500	1900	1850	--	1998
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	178	160	175	168	170	166	174	165	163
Nitrate as N	mg/l	10.0	--	0.6	0.1	0.1	0.6	0.2	0.1	0.1	0.29	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	1.63	1.79	1.72	0.69	1.58	1.25	1.69	0.93	1.41
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	7.97	8.21
pH (Field)	-	--	--	--	7.7	6.7	8.1	7.9	7.7	7.5	--	7.66
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.44	--	--	--	--	--	--	0.36	0.45
Sulphate	mg/l	--	500 [6]	10	10	12	9	4	8	13	7	7
Temperature (Field)	deg c	--	15	--	5.5	11.5	10	8	12	8	--	11.6
Total Dissolved Solids	mg/l	--	500	1210	1180	1200	1250	1330	1230	1220	1460	1480
Total Organic Carbon	mg/l	--	--	14.6	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	110	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.0015	0.0019	0.0015	0.0021	0.0013	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.489	0.404	0.448	0.468	0.469	0.43	0.435	1.62	0.49
Cadmium, dissolved	mg/l	0.005	--	0.0002	<0.005	<0.0001	<0.00002	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	27.2	24	26.7	25.4	26	25.1	26.5	25	24
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	0.008
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0002	0.0003
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	0.003	0.001
Iron, dissolved	mg/l	--	0.3	0.667	0.053	1.19	0.019	0.728	0.025	0.009	<0.03	0.28
Lead, dissolved	mg/l	0.01	--	0.0009	0.0002	<0.0001	0.00004	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	26.8	24.4	26.2	25.4	25.5	25.1	26.3	25	25
Manganese, dissolved	mg/l	--	0.05	0.319	0.267	0.718	0.004	0.325	0.32	0.025	<0.01	0.29
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16.2	13.2	14.3	15	15.5	13.6	14.6	13	15
Selenium, dissolved	mg/l	0.05	--	<0.001	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	456	402	410	417	502	422	403	389	427
Zinc, dissolved	mg/l	--	5	0.009	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	0.01	0.01
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 16-Nov-2005	92-7 25-May-2006	92-7 21-Nov-2006	92-7 15-May-2007	92-7 30-Nov-2007	92-7 22-May-2008	92-7 10-Nov-2008	92-7 19-May-2009 G-9	92-7 26-Nov-2009 M-6
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 25-May-2010 [4] M-13	92-7 20-Oct-2010 [4] G-9	92-7 24-May-2011 [4] G-15	92-7 29-Nov-2011 [4] 92-7	92-7 31-May-2012 92-7	92-7 28-Nov-2012 92-7	92-7 29-May-2013 [5] 92-7	92-7 26-Nov-2013 [5] GW-21	92-7 29-May-2014 92-7
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	513	534	541	552	530	540	540	570	570
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [3]	<2 [3]	12	12	8.7	4.3	6.3	6.4	9.8
Alkalinity (Total as CaCO3)	mg/l	--	--	513	534	553	565	540	550	540	570	580
Ammonia Nitrogen	mg/l	--	--	0.34	0.95	0.56	0.74	0.10	1.1	1.0	1.2	0.59
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	38	55	35	38	45	50	45	41	45
Chloride	mg/l	--	250	387	393	403	399	370	380	400	380	390
Conductivity	uS/cm	--	--	2260	2210	2300	2350	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2306	2108	2099	2165	2011	1979	1818	1891	1939
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	179	197	176	186	170	190	190	190	210
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.028	<0.010	0.026	0.029	0.026
Nitrogen, Total Kjeldahl	mg/l	--	--	0.64	1.67	0.90	0.90	1.1	1.5	1.5	1.9	1.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10	0.11	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.25	7.94	8.38	8.38	8.24	--	8.09	8.08	8.27
pH (Field)	-	--	--	7.69	7.62	7.73	8.12	7.79	7.77	7.18	7.09	7.52
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.31	0.43	0.27	0.46	0.21	0.47	0.47	0.77	0.35
Sulphate	mg/l	--	500 [6]	10	7	6	14	9	7	3	4	<1
Temperature (Field)	deg c	--	15	17.6	11.3	12.2	9.2	11.0	9.8	10.6	10.5	10.9
Total Dissolved Solids	mg/l	--	500	1470	1440	1500	1530	1240	1250	1260	1240	1230
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.01	<0.01	<0.0010	<0.001	0.0017	<0.0010	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.49	0.47	0.48	0.46	0.52	0.58	0.48	0.47	0.56
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	27	31	26	30	26	28	28	29	32
Chromium, dissolved	mg/l	0.05	--	<0.005	0.009	<0.005	<0.005	<0.0050	<0.005	0.012	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0005	0.0004	0.0005	0.0003	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.002	0.001	0.003	0.001	0.0018	<0.001	0.0020	<0.0010	0.0024
Iron, dissolved	mg/l	--	0.3	0.49	0.90	0.18	0.58	<0.1	<0.1	<0.1	0.56	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	27	29	27	27	26	30	28	29	32
Manganese, dissolved	mg/l	--	0.05	0.54	0.41	0.41	0.10	0.042	0.003	0.02	0.42	0.33
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	14	14	13	14	15	14	14	15
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	387	388	384	378	420	440	440	410	460
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	<0.01	<0.0050	<0.005	0.0062	0.0096	<0.0050
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 25-May-2010 [4] M-13	92-7 20-Oct-2010 [4] G-9	92-7 24-May-2011 [4] G-15	92-7 29-Nov-2011 [4] 92-7	92-7 31-May-2012 92-7	92-7 28-Nov-2012 92-7	92-7 29-May-2013 [5] 92-7	92-7 26-Nov-2013 [5] GW-21	92-7 29-May-2014 92-7
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	0.0005	<0.0004	<0.00025	<0.00050	<0.00025	<0.00025	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050	<0.00025	<0.00025	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050	<0.00025	<0.00025	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025	<0.00050	<0.00025	<0.00025	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013	<0.0025	<0.0013	<0.0013	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00050	<0.00025	<0.00025	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.0010	<0.00050	<0.00050	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.0010	<0.00050	<0.00050	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 19-Nov-2014	92-7 02-Jun-2015	92-7 26-Nov-2015	92-7 26-May-2016	92-7 17-Nov-2016	92-7 24-May-2017	92-7 29-Nov-2017	92-7 24-May-2018	92-7 22-Nov-2018
				92-7	92-7	92-7	92-7	92-7	92-7	92-7	92-7	92-7
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	560	585	598	609	617	635	645	673	697
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6.0	6	<5	<5	<5	5	6	5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	570	591	602	612	620	640	651	678	702
Ammonia Nitrogen	mg/l	--	--	1.1	0.47	1.07	0.72	1.30	0.69	1.17	0.71	1.20
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	42	83	72	63	84	46	41	74	35
Chloride	mg/l	--	250	420	428	431	446	434	433	462	430	429
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2268	2185	2257	2242	2376	2262	2053	2308	2153
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	210	159	167	209	208	199	206	212	265
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.022	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.7	0.9	1.8	1.5	2.0	1.2	1.6	1.4	2.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.06	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.76	7.73	8.04	8.30	7.55	7.72	7.56	7.59	7.83
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.56	0.19	0.46	0.51	0.65	0.28	0.40	0.28	0.49
Sulphate	mg/l	--	500 [6]	1	4	2	4	2	3	5	4	4
Temperature (Field)	deg c	--	15	7.4	10.2	9.5	14.7	11.6	10.3	9.2	10.3	9.2
Total Dissolved Solids	mg/l	--	500	1270	1320	1320	1360	1270	1300	1330	1390	1320
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.001	<0.001	<0.001	0.001	0.002	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.53	0.334	0.522	0.555	0.711	0.46	0.535	0.527	0.57
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	33	26.2	26.5	31	31.2	31.3	30.1	33.3	38.4
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	0.002	<0.001	0.009	0.011	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0020	<0.0005	<0.0005	0.0020	0.0008	0.0013	0.0014	0.0011	0.0033
Iron, dissolved	mg/l	--	0.3	0.68	0.214	0.404	<0.1	<0.1	<0.1	<0.1	<0.1	0.574
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	32	22.8	24.4	31.9	31.7	29.3	31.7	31.3	41.2
Manganese, dissolved	mg/l	--	0.05	0.5	0.236	0.431	0.019	0.023	0.197	<0.005	0.13	0.411
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	12.5	12.4	16.6	14.6	14	15.1	14.4	18
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	450	466	491	436	464	469	441	426	529
Zinc, dissolved	mg/l	--	5	0.039	0.055	0.008	0.007	<0.005	<0.005	<0.005	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.001	<0.001	0.005	0.003	<0.002 [10]	<0.001	<0.001	<0.001

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 19-Nov-2014	92-7 02-Jun-2015	92-7 26-Nov-2015	92-7 26-May-2016	92-7 17-Nov-2016	92-7 24-May-2017	92-7 29-Nov-2017	92-7 24-May-2018	92-7 22-Nov-2018
				92-7	92-7	92-7	92-7	92-7	92-7	92-7	92-7	92-7
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	≤0.0005	≤0.0005	<0.0005	≤0.0005	<0.0005	<0.0005	≤0.0005	≤0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	≤0.0005	≤0.0005	<0.0005	≤0.0005	<0.0005	<0.0005	≤0.0005	≤0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	≤0.0005	≤0.0005	<0.0005	≤0.0005	<0.0005	<0.0005	≤0.0005	≤0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	≤0.0005	≤0.0005	<0.0005	≤0.0005	<0.0005	<0.0005	≤0.0005	≤0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	≤0.0050	≤0.0050	<0.0050	≤0.0050	<0.0050	<0.0050	≤0.0050	≤0.0050
o-Xylene	mg/l	--	--	<0.00010	≤0.0005	≤0.0005	<0.0005	≤0.0005	<0.0005	<0.0005	≤0.0005	≤0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	≤0.0005	≤0.0005	<0.0005	≤0.0005	<0.0005	<0.0005	≤0.0005	≤0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	≤0.0005	≤0.0005	<0.0005	≤0.0005	<0.0005	<0.0005	≤0.0005	≤0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 19-Jun-2019 92-7	92-7 20-Nov-2019 92-7	92-7 21-May-2020 92-7	92-7 26-Nov-2020 92-7	92-7 26-May-2021 92-7	92-7 30-Nov-2021 92-7
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	640	621	617	628	652	636
Alkalinity, Carbonate as CaCO3	mg/l	--	--	9	6	13	9	6	9
Alkalinity (Total as CaCO3)	mg/l	--	--	649	627	630	637	658	646
Ammonia Nitrogen	mg/l	--	--	0.38	1.03	0.17	0.27	0.21	0.84
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	41	51	79	25	46
Chloride	mg/l	--	250	428	457	564 [24]	450	423	420
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2202	2390	2247	2134	2338	2332
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	394	288	239	241	259	215
Nitrate as N	mg/l	10.0	--	<0.1	0.3	<0.1	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.7	1.3	0.7	0.9	0.6	1.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.71	7.74	8.68	8.07	7.74	7.93
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.20	0.38	0.25	0.35	0.23	0.43
Sulphate	mg/l	--	500 [6]	4	8	3	1	2	1
Temperature (Field)	deg c	--	15	13.3	8.8	12.0	8.1	12.1	8.3
Total Dissolved Solids	mg/l	--	500	1350	1290	1410	1310	1380	1330
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.765	0.453	0.41	0.43	0.442	0.412
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	58.8	42.5	35.6	34.6	35.2	31.3
Chromium, dissolved	mg/l	0.05	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0046	0.0015	0.0035	0.0043	0.0026	0.0010
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.182
Lead, dissolved	mg/l	0.01	--	0.0002	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	60	44.2	36.5	37.5	41.5	33.1
Manganese, dissolved	mg/l	--	0.05	<0.005	0.047	0.203	0.039	<0.005	0.124
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	26.7	20.3	16.3	15.9	16.4	14.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	444	448	459	465	454	419
Zinc, dissolved	mg/l	--	5	0.006	<0.005	0.005	0.007	<0.005	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.005	<0.001	<0.004 [11]	<0.004 [11]	<0.001

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-7 19-Jun-2019 92-7	92-7 20-Nov-2019 92-7	92-7 21-May-2020 92-7	92-7 26-Nov-2020 92-7	92-7 26-May-2021 92-7	92-7 30-Nov-2021 92-7
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 09-Jun-1992	92-8 01-Nov-1992	92-8 22-Jun-1994	92-8 02-Nov-1994	92-8 28-Jun-1995	92-8 23-Nov-1995	92-8 12-Jun-1996	92-8 12-Oct-1996	92-8 18-Jun-1997
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	503	1010	--	763	500	694	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	412	828	804	637	410	569	416	410	341
Ammonia Nitrogen	mg/l	--	--	--	--	--	4.62	3.1	0.15	6.2	1.96	0.18
Chemical Oxygen Demand	mg/l	--	--	--	--	214	194	138	85	72	45	44
Chloride	mg/l	--	250	173	213	310	156	102	148	68	29.3	72.8
Conductivity (Field)	uS/cm	--	--	1613	2300	2200	1650	1270	2200	1360	1250	1470
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	9.22	7.64	--	--	--	4.23
Hardness, Calcium Carbonate	mg/l	--	--	485.3	760	596	416	341	890	429	575	756
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.54	1.3	0.8	0.1	0.1	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	10.8	5.7	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	7.7	5.55	--	--	--
pH (Field)	-	--	--	7.07	7.04	6.5	7.06	6.74	7.06	6.81	6.53	7.1
Phosphate	mg/l	--	--	--	--	--	--	--	0.3	--	--	--
Phosphorus	mg/l	--	--	--	--	0.82	0.249	3.25	--	--	--	--
Sulphate	mg/l	--	500 [6]	159	223.5	67.3	55.1	492	352	214	299	365
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1110	830	640	1100	680	620	740
Total Organic Carbon	mg/l	--	--	--	--	55.6	32	35.7	26.4	29	18.9	7.9
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	379	146	435
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.1	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.058	--	--	--	--	--
Boron, dissolved	mg/l	5	--	--	--	2.1	1.635	1.84	2.4	1.19	0.78	0.33
Cadmium, dissolved	mg/l	0.005	--	--	--	--	0.01	0.0001	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	130.9	174	132	68.36	75.3	179	93.1	135	179
Chromium, dissolved	mg/l	0.05	--	--	--	0.01	0.01	0.01	0.03	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0198	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	1.433	0.491	0.07	10.4	27.2	12.2	5.19
Lead, dissolved	mg/l	0.01	--	--	--	0.0003	0.1	0.0012	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	38.44	78.9	64.6	25.716	36.8	106	47	57.1	74.2
Manganese, dissolved	mg/l	--	0.05	--	--	4.193	1.802	1.85	3.26	3.05	3.48	1.08
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.59	21.5	27.9	9.917	--	21.4	14.4	11.7	5.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	143.4	233	166	171.6	130	144	165	75.6	88.6
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.021	0.01	0.01	0.01	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 09-Jun-1992	92-8 01-Nov-1992	92-8 22-Jun-1994	92-8 02-Nov-1994	92-8 28-Jun-1995	92-8 23-Nov-1995	92-8 12-Jun-1996	92-8 12-Oct-1996	92-8 18-Jun-1997
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.142	0.001	0.001	--	--	--	--
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 06-Nov-1997	92-8 26-Aug-1998	92-8 29-Oct-1998	92-8 06-May-1999	92-8 19-Oct-1999	92-8 05-May-2000	92-8 24-Oct-2000	92-8 14-Jun-2001	92-8 23-Nov-2001
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	826	468	344	512	803	741	403	604
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	12	1	1	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	396	697	384	282	420	659	607	330	495
Ammonia Nitrogen	mg/l	--	--	4.66	1.01	1.24	0.01	0.47	0.01	1	1.52	1.94
Chemical Oxygen Demand	mg/l	--	--	82	56	7	39	19	372	--	47	45
Chloride	mg/l	--	250	26	387	39.4	18.7	12.9	30	50.7	18.8	45.8
Conductivity (Field)	uS/cm	--	--	1200	2370	1310	1230	1000	1500	1400	1050	1400
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	745	59	553	710	481	814	703	507	618
Nitrate as N	mg/l	10.0	--	0.1	0.1	--	--	0.1	0.1	0.1	0.1	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	1.43	1.24	--	--	3.35	2.08	2.6
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.74	8.4	6.5	6.9	6.9	6.7	6.57	6.7	6.31
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.67	0.38	0.28
Sulphate	mg/l	--	500 [6]	348	5	325	460	110	240	184	315	208
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	600	1200	660	615	500	750	870	830	868
Total Organic Carbon	mg/l	--	--	28.8	7	18	14	9.5	122	--	14.8	23
Total Suspended Solids	mg/l	--	--	--	--	--	--	128	428	1800	170	204
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.22	1.14	0.44	0.09	0.45	0.27	0.21	0.21	0.4
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	181	6.12	144	188	130	178	143	115	139
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	22.2	5.02	9.21	7.93	3.91	52.7	12.6	16	32.7
Lead, dissolved	mg/l	0.01	--	0.0002	0.0004	0.0002	0.0003	0.0002	0.0002	0.0012	0.0002	--
Magnesium, dissolved	mg/l	--	--	70.2	10.6	47.1	57.6	37.4	88.5	84.1	53.5	65.9
Manganese, dissolved	mg/l	--	0.05	0.66	0.11	3.83	0.83	0.85	4.48	4.53	1.88	2.35
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.2	16.2	8.4	1.1	4.2	0.4	6.5	1.5	2.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	56.7	621	93	27.1	53.6	60	74.9	50	94.7
Zinc, dissolved	mg/l	--	5	0.01	0.08	0.01	0.02	0.47	0.03	0.01	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 06-Nov-1997	92-8 26-Aug-1998	92-8 29-Oct-1998	92-8 06-May-1999	92-8 19-Oct-1999	92-8 05-May-2000	92-8 24-Oct-2000	92-8 14-Jun-2001	92-8 23-Nov-2001
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	0.006	0.073	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 23-May-2002	92-8 06-Nov-2002 [3]	92-8 30-May-2003	92-8 09-Oct-2003 [3]	92-8 14-May-2004	92-8 19-Nov-2004	92-8 24-May-2005	92-8 16-Nov-2005 [3]	92-8 25-May-2006
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	401	--	641	--	772	750	714	--	685
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	--	1	1	<5	--	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	329	--	525	--	633	615	585	--	685
Ammonia Nitrogen	mg/l	--	--	1.16	--	1.12	--	0.83	0.94	0.76	--	1.03
Chemical Oxygen Demand	mg/l	--	--	37	--	74	--	55	50	35	--	42
Chloride	mg/l	--	250	51.8	--	24.4	--	67.7	28	23.3	--	15.2
Conductivity (Field)	uS/cm	--	--	980	--	1150	--	1600	1750	1800	--	1200
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	486	--	468	--	781	778	757	--	696
Nitrate as N	mg/l	10.0	--	0.1	--	0.2	--	0.2	1	0.1	--	<0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	1.95	--	3.63	--	1.81	1.76	1.43	--	1.81
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.82	--	6.4	--	6.9	6.8	6.6	--	6.9
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.3	--	0.41	--	0.31	0.24	0.24	--	--
Sulphate	mg/l	--	500 [6]	208	--	197	--	269	290	260	--	208
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	9.4	--	5
Total Dissolved Solids	mg/l	--	500	736	--	--	--	800	875	980	--	964
Total Organic Carbon	mg/l	--	--	13	--	13.8	--	10.6	10.7	12	--	--
Total Suspended Solids	mg/l	--	--	184	--	200	--	112	100	80	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	--	0.001	--	0.001	0.001	0.001	--	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.21	--	0.25	--	0.484	0.446	0.382	--	0.284
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	--	<0.005
Calcium, dissolved	mg/l	--	--	119	--	117	--	178	189	177	--	166
Chromium, dissolved	mg/l	0.05	--	0.01	--	0.01	--	0.001	0.002	<0.002	--	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	--	0.01	--	0.002	0.002	<0.002	--	<0.002
Iron, dissolved	mg/l	--	0.3	8.87	--	3.92	--	9.73	6.9	18.2	--	35.1
Lead, dissolved	mg/l	0.01	--	0.0002	--	0.0002	--	0.0011	0.0002	0.0007	--	<0.0002
Magnesium, dissolved	mg/l	--	--	45.8	--	42.7	--	81.9	74.4	76.9	--	68
Manganese, dissolved	mg/l	--	0.05	1.5	--	1	--	2.2	2.76	2.16	--	2.28
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.02	--	0.02	--	0.01	0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	5.2	--	6	--	6.4	6.5	5.5	--	5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [7]	56.7	--	107	--	109	71.9	74.7	--	57.2
Zinc, dissolved	mg/l	--	5	0.02	--	0.01	--	0.005	0.005	0.006	--	0.011

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 23-May-2002	92-8 06-Nov-2002 [3]	92-8 30-May-2003	92-8 09-Oct-2003 [3]	92-8 14-May-2004	92-8 19-Nov-2004	92-8 24-May-2005	92-8 16-Nov-2005 [3]	92-8 25-May-2006
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	0.001	--	0.001	0.001	<0.001	--	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	<0.0007	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0004	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	<0.0001	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0002	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	<0.0002	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	<0.002	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	<0.0002	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	<0.0002	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	<0.0003	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	<0.0002	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 19-Dec-2008
General Chemistry				
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1540
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1540
Ammonia Nitrogen	mg/l	--	--	0.35
Chemical Oxygen Demand	mg/l	--	--	214
Chloride	mg/l	--	250	280
Conductivity (Field)	uS/cm	--	--	3100
Dissolved Oxygen (Field)	mg/l	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1310
Nitrate as N	mg/l	10.0	--	0.2
Nitrogen, Total Kjeldahl	mg/l	--	--	4.19
Nitrogen, Organic	mg/l	--	--	--
pH (Field)	-	--	--	6.6
Phosphate	mg/l	--	--	--
Phosphorus	mg/l	--	--	--
Sulphate	mg/l	--	500 [6]	34
Temperature (Field)	deg c	--	15	4
Total Dissolved Solids	mg/l	--	500	2050
Total Organic Carbon	mg/l	--	--	--
Total Suspended Solids	mg/l	--	--	--
Metals				
Arsenic, dissolved	mg/l	0.01	--	0.0048
Barium, dissolved	mg/l	1	--	--
Boron, dissolved	mg/l	5	--	9.88
Cadmium, dissolved	mg/l	0.005	--	<0.00002
Calcium, dissolved	mg/l	--	--	307
Chromium, dissolved	mg/l	0.05	--	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005
Copper, dissolved	mg/l	--	1	<0.002
Iron, dissolved	mg/l	--	0.3	0.873
Lead, dissolved	mg/l	0.01	--	<0.00002
Magnesium, dissolved	mg/l	--	--	133
Manganese, dissolved	mg/l	--	0.05	5.08
Mercury, dissolved	mg/l	0.001	--	--
Molybdenum, dissolved	mg/l	--	--	--
Nickel, dissolved	mg/l	--	--	--
Potassium, dissolved	mg/l	--	--	8
Selenium, dissolved	mg/l	0.05	--	--
Sodium, dissolved	mg/l	--	200 [7]	353
Zinc, dissolved	mg/l	--	5	0.007

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-8 19-Dec-2008
Phenols				
Phenolics, Total Recoverable	mg/l	--	--	<0.001
Semi-VOCs				
Naphthalene	mg/l	--	--	--
Styrene	mg/l	--	--	--
VOCs				
1,1,1,2-Tetrachloroethane	mg/l	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--
1,2-Dibromoethane	mg/l	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--
1,2-Dichloroethane	mg/l	0.005	--	--
1,2-Dichloropropane	mg/l	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--
Benzene	mg/l	0.001	--	0.001
Bromodichloromethane	mg/l	--	--	--
Bromoform	mg/l	--	--	--
Bromomethane	mg/l	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--
Chlorobenzene	mg/l	0.08	0.03	--
Chloroform	mg/l	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--
Dibromochloromethane	mg/l	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	<0.0003
o-Xylene	mg/l	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--
Toluene	mg/l	0.06	0.024	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--
Trichloroethene	mg/l	0.005	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)- Health [1]	ODWQS- AO [2]	92-9 09-Jun-1992	92-9 01-Nov-1992	92-9 08-Jun-1993	92-9 04-Nov-1993	92-9 15-Jun-1994	92-9 02-Nov-1994	92-9 28-Jun-1995	92-9 22-Nov-1995	92-9 12-Oct-1996	92-9 06-Nov-1997	92-9 05-Jun-1998
General Chemistry														
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	849	931	910	921	--	853	883	880	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	--	1	1	8	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	696	763	746	755	764	710	724	734	748	780	790
Ammonia Nitrogen	mg/l	--	--	1.57	2.34	--	--	--	--	0.97	0.51	1.41	1.04	1.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	4.6	8.3	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	219	97.8	--	--	79	90	65	60	5	56	37
Chloride	mg/l	--	250	820	1003	1005	1450	1290	882	875	838	858	840	1110
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3813	3938	3580	3890	4170	3990	4130	4260	--	3900	4220
Dissolved Inorganic Carbon	mg/l	--	--	153.6	175.2	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	5.59	5.86	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	258	238	213	224	280	269	220	194	225	228	222
Nitrate as N	mg/l	10.0	--	0.54	0.24	0.3	9.1	1.3	1.51	0.1	1.7	0.7	0.1	1.9
Nitrite as N	mg/l	1.0	--	0.1	0.17	0.1	0.12	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.64	8.12	--	--	--	--	5	2.45	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	2.07	5.78	--	--	--	--	4.03	1.94	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.18	8.1	7.65	8.07	7.73	7.99	7.63	8.12	--	6.95	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	0.3	--	--	--
Phosphorus	mg/l	--	--	0.57	0.71	--	--	1	0.626	0.99	--	--	--	--
Sulphate	mg/l	--	500 [6]	46	13	8.5	13	18	21.4	15	20	13	6	38
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2168	2164	2248	2290	2100	2000	2070	2140	--	1960	2100
Total Organic Carbon	mg/l	--	--	25.2	23.9	--	--	21.7	--	25.2	16.9	17.9	19.6	18.3
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	93	--	--
Metals														
Aluminum, dissolved	mg/l	--	--	--	0.25	0.423	0.01	--	0.148	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.004	--	--	--	**0.1**	--	--	--	--	--
Barium, dissolved	mg/l	1	--	0.05	0.11	--	--	--	0.037	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.99	1.05	--	--	0.97	0.92	0.83	1.23	0.86	0.98	1.05
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**	0.0005	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	30.15	26.3	23.6	25.9	35.1	23.15	26.2	24.3	25.7	20.1	24.4
Chromium, dissolved	mg/l	0.05	--	0.02	0.05	0.014	0.01	0.01	0.01	0.01	0.03	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.05	0.01	0.01	0.0186	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.4	0.13	0.249	0.1	0.243	0.223	0.05	0.18	0.94	0.69	0.4
Lead, dissolved	mg/l	0.01	--	**0.1**	**0.17**	**0.1**	**0.105**	0.0015	**0.1**	0.0006	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	44.39	41.8	37.5	38.7	46.7	20.626	37.2	31.8	38.5	42.6	38.6
Manganese, dissolved	mg/l	--	0.05	0.13	0.05	0.057	0.053	0.06	0.044	0.04	0.03	0.1	0.06	0.05
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.05	0.023	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	22.56	28.8	30.8	26.4	34.7	17.8	--	23.9	24.4	25.6	30.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	0.01	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	690.1	931	782	819	689	716.5	682	880	668	653	983
Zinc, dissolved	mg/l	--	5	0.02	0.05	0.042	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.13
Phenols														
Phenolics, Total Recoverable	mg/l	--	--	0.014	0.002	0.002	0.002	0.114	0.001	0.001	--	--	--	--
VOCs														
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
2-Hexanone	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-9 06-May-1999	92-9 24-Oct-2000	92-9 14-Jun-2001	92-9 06-Nov-2002	92-9 30-May-2003	92-9 19-Nov-2004	92-9 16-Nov-2005	92-9 15-May-2007	92-9 10-Nov-2008	92-9 26-Nov-2009 J-22	92-9 24-May-2011 [4] G-17
General Chemistry														
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	961	1050	781	910	886	1020	189	800	765	760	754
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	47	1	1	1	<5	<5	<5	<2 [8]	21
Alkalinity (Total as CaCO3)	mg/l	--	--	788	861	720	846	726	835	775	800	765	760	776
Ammonia Nitrogen	mg/l	--	--	1.24	1.33	1.59	1.86	0.62	1.74	1.82	1.78	2.01	1.59	1.78
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	70	--	52	70	57	66	50	82	72	60	58
Chloride	mg/l	--	250	980	950	883	844	904	929	857	923	1010	852	834
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	3960	4100
Conductivity (Field)	uS/cm	--	--	3970	3660	3500	3990	1150	4050	2900	2800	3300	3421	3488
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	230	229	214	219	197	208	215	195	196	159	200
Nitrate as N	mg/l	10.0	--	--	0.1	0.2	0.2	0.3	1	0.8	0.2	<0.1	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	3.07	2.22	2.85	3.02	1.99	2.76	2.95	3.16	3.24	2.41	3.26
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--	8.23	8.48
pH (Field)	-	--	--	7.9	8.03	7.9	7.7	6.4	7.9	--	8.2	7.8	7.79	7.92
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	1.04	0.68	0.71	0.81	0.85	0.97	--	--	0.94	1.01
Sulphate	mg/l	--	500 [6]	10	2	8	6	5	10	3	1	<1	4	<1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	12.8	9.8	7	10.5	14.4
Total Dissolved Solids	mg/l	--	500	1990	2400	2000	2220	575	2025	2230	2220	2270	2570	2660
Total Organic Carbon	mg/l	--	--	23.5	--	16.7	19	16.6	17.8	21.6	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	182	70	47	25	122	25	--	--	--	--
Metals														
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.003	0.001	0.002	0.003	0.002	0.001	0.0058	0.0063	0.008	<0.01
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.04	0.97	1.04	0.98	0.93	1.02	1.01	0.893	0.935	0.93	0.79
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	0.0003	0.00003	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	26.3	23.7	27.8	26.1	24.5	25.6	26.7	24.7	24.5	19	24
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002	<0.005	<0.005
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005	0.007	<0.005	0.0007	0.0007
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002	<0.001	<0.001
Iron, dissolved	mg/l	--	0.3	0.44	0.2	0.05	0.03	0.46	0.279	0.473	0.047	0.035	0.79	0.82
Lead, dissolved	mg/l	0.01	--	0.0004	0.022	0.0002	0.0028	0.0007	0.002	0.001	0.00005	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	39.4	41.3	35.2	37.3	32.9	35.1	36	32.3	32.8	27	34
Manganese, dissolved	mg/l	--	0.05	0.05	0.04	0.03	0.03	0.05	0.046	0.061	0.027	0.061	0.06	0.07
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	25.9	24.1	20.6	24.8	24	26	28	26.1	25.1	21	24
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.001	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	865	796	768	840	688	744	832	729	721	726	810
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.005	0.007	<0.005	<0.005	<0.01	<0.01
Phenols														
Phenolics, Total Recoverable	mg/l	--	--	--	0.003	0.102	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs														
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	<0.0001	<0.0001	<0.0004	<0.0004
2-Hexanone	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-9 28-Nov-2012 92-9	92-9 29-May-2014 92-9	92-9 26-Nov-2015 92-9	92-9 24-May-2017 92-9	92-9 22-Nov-2018 92-9	92-9 21-May-2020 92-9	92-9 30-Nov-2021 92-9
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	710	710	772	785	838	737	734
Alkalinity, Carbonate as CaCO3	mg/l	--	--	7.7	16	12	13	16	14	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	720	730	784	798	854	751	738
Ammonia Nitrogen	mg/l	--	--	2.0	1.8	2.25	0.02	2.37	2.18	1.12
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	63	54	221	96	74	82	86
Chloride	mg/l	--	250	790	850	855	813	853	1070	820
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3281	3349	3698	3695	3439	3566	3588
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	200	210	164	190	255	235	206
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.1	<0.1	<0.1	0.2	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	0.151	<0.05	<0.25 [9]	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.0	2.9	3.4	1.4	3.1	3.0	2.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	0.16	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.37	--	--	--	--	--
pH (Field)	-	--	--	8.08	7.63	8.03	8.06	7.85	7.41	8.17
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.0	0.79	0.99	0.85	0.99	0.96	1.01
Sulphate	mg/l	--	500 [6]	<1	<1	<1	1	<1	<1	1
Temperature (Field)	deg c	--	15	8.1	12.5	9.6	11.6	9.4	12.3	7.7
Total Dissolved Solids	mg/l	--	500	2120	2120	2100	2080	2120	2230	2130
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.0031	0.002	0.005	0.002	0.007	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.1	1	0.926	0.804	0.949	0.997	0.755
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	25	26	22.7	24	33.9	28.6	25.3
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	<0.001	0.029	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.00063	0.0005	0.0005	0.0009	0.0007	0.0006
Copper, dissolved	mg/l	--	1	<0.001	0.0021	<0.0005	0.0015	0.0027	0.0039	0.0012
Iron, dissolved	mg/l	--	0.3	<0.1	0.31	0.507	<0.1	0.499	0.421	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0005	<0.00050	<0.0001	<0.0001	0.0002	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	35	36	26	31.5	41.3	39.6	34.6
Manganese, dissolved	mg/l	--	0.05	0.13	0.033	0.069	0.035	0.079	0.081	0.068
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	23	23	19.4	24.4	27.1	25.3	21.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	780	670	835	795	855	728	669
Zinc, dissolved	mg/l	--	5	<0.005	<0.0050	0.007	<0.005	<0.005	<0.005	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]	<0.001	0.007	<0.004 [11]
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
2-Hexanone	mg/l	--	--	--	--	--	--	--	<0.0100	--
Benzene	mg/l	0.001	--	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0025	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00050	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 09-Jun-1992	92-10 01-Nov-1992	92-10 08-Jun-1993	92-10 04-Nov-1993	92-10 15-Jun-1994	92-10 02-Nov-1994	92-10 28-Jun-1995	92-10 22-Nov-1995	92-10 12-Jun-1996
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1078	980	937	939	--	907	915	969	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	--	1	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	884	803	768	770	760	756	750	794	783
Ammonia Nitrogen	mg/l	--	--	0.74	0.48	--	--	--	0.28	0.16	0.1	0.24
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	1.4	2.5	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	187	64.5	--	--	54	93	60	40	29
Chloride	mg/l	--	250	221	260	170	289	600	177	120	125	145
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2250	2100	1820	2100	2110	2070	1950	2040	1830
Dissolved Inorganic Carbon	mg/l	--	--	201.6	224.4	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	8.12	6.44	--	--
Hardness, Calcium Carbonate	mg/l	--	--	793.65	515	589	600	621	615	619	229	631
Nitrate as N	mg/l	10.0	--	0.24	0.24	0.3	2.39	0.1	0.42	1.7	0.5	0.6
Nitrite as N	mg/l	1.0	--	0.1	0.1	0.1	0.1	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.68	1.21	--	--	--	--	4	1.3	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	0.94	0.73	--	--	--	--	3.84	1.2	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.88	7.89	6.85	7.34	6.92	7.27	7	8.09	7.12
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	0.1	--
Phosphorus	mg/l	--	--	0.28	0.86	--	--	1.45	0.362	1.84	--	--
Sulphate	mg/l	--	500 [6]	95	95	103	116	98	110	15	101	128
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1492	1268	1220	1180	1070	1040	980	1020	920
Total Organic Carbon	mg/l	--	--	27.7	22.4	--	--	15.6	19	14.3	12.9	13.2
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	380
Metals												
Aluminum, dissolved	mg/l	--	--	--	0.21	0.152	0.044	--	0.069	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	--	--	--	**0.1**	--	--	--
Barium, dissolved	mg/l	1	--	0.07	0.14	--	--	--	0.052	--	--	--
Boron, dissolved	mg/l	5	--	1.1	1.31	--	--	1.18	1.517	1.49	0.76	1.47
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	**0.01**	0.0011	0.0001	--
Calcium, dissolved	mg/l	--	--	132.9	37.9	89.2	99.7	97	92.06	107	25.4	106
Chromium, dissolved	mg/l	0.05	--	0.02	0.05	0.01	0.01	0.01	0.01	0.02	0.03	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.05	0.03	0.01	0.0142	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.66	0.3	0.341	0.1	0.431	0.366	0.02	0.2	0.665
Lead, dissolved	mg/l	0.01	--	**0.1**	**0.05**	**0.1**	**0.0235**	0.0007	**0.1**	0.0017	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	112.1	102	88.9	85.1	91.9	71.786	84.4	39.6	87.7
Manganese, dissolved	mg/l	--	0.05	1.45	0.92	0.97	0.787	0.556	1.039	0.52	0.56	0.745
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.05	0.028	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	13.03	18.1	16.1	18.9	18.4	12.13	--	26	17.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	0.01	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	211.2	260	227	289	200	228.9	195	738	214
Zinc, dissolved	mg/l	--	5	0.02	0.05	0.101	0.01	0.01	0.01	0.01	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 09-Jun-1992	92-10 01-Nov-1992	92-10 08-Jun-1993	92-10 04-Nov-1993	92-10 15-Jun-1994	92-10 02-Nov-1994	92-10 28-Jun-1995	92-10 22-Nov-1995	92-10 12-Jun-1996
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.006	0.002	0.002	0.002	0.223	0.001	0.001	--	--
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 12-Oct-1996	92-10 18-Jun-1997	92-10 06-Nov-1997	92-10 05-Jun-1998	92-10 30-Oct-1998	92-10 06-May-1999	92-10 19-Oct-1999	92-10 06-May-2000	92-10 24-Oct-2000
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	810	773	732	833	732
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	752	749	630	656	664	634	600	683	600
Ammonia Nitrogen	mg/l	--	--	0.62	0.1	0.34	0.41	0.49	0.47	0.35	0.01	0.23
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	5	27	29	44	13	26	6	11	--
Chloride	mg/l	--	250	142	139	174	214	190	210	156	59.2	232
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1790	1850	1900	1970	1860	1780	1600	1500	1590
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	3.31	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	551	735	638	528	504	477	384	358	394
Nitrate as N	mg/l	10.0	--	0.6	0.1	0.1	1.3	--	--	0.8	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	1.3	1.39	--	--	1.17
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.86	7.24	6.28	--	7.1	7.3	7.6	7.4	7.36
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	--	--	0.73
Sulphate	mg/l	--	500 [6]	120	140	136	132	122	105	100	82	66
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	900	920	980	980	920	890	800	750	1030
Total Organic Carbon	mg/l	--	--	12.8	12	12.1	13.2	14.6	12.4	9.4	8.4	--
Total Suspended Solids	mg/l	--	--	1290	2170	--	--	--	--	1380	210	852
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.62	1.88	1.59	1.5	1.27	1.3	1.33	1.05	1.08
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	92.2	142	120	87.5	77.1	82.1	65.4	58.3	58.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.78	2.12	0.93	1.17	1.71	1.08	2.54	1.86	0.38
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0004	0.0002	0.0002	0.0022
Magnesium, dissolved	mg/l	--	--	76.9	91.1	81	74.3	75.8	65.1	52.8	51	60.3
Manganese, dissolved	mg/l	--	0.05	0.68	1.06	0.64	0.92	0.81	0.64	0.47	0.59	0.41
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	15.3	10.4	15.6	17.5	19.7	12.6	15.7	5.9	12.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	214	184	213	280	247	217	285	250	235
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.12	0.01	0.01	0.1	0.17	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 12-Oct-1996	92-10 18-Jun-1997	92-10 06-Nov-1997	92-10 05-Jun-1998	92-10 30-Oct-1998	92-10 06-May-1999	92-10 19-Oct-1999	92-10 06-May-2000	92-10 24-Oct-2000
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	--	--	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 14-Jun-2001	92-10 23-Nov-2001	92-10 23-May-2002	92-10 06-Nov-2002	92-10 30-May-2003	92-10 09-Oct-2003	92-10 14-May-2004	92-10 19-Nov-2004	92-10 24-May-2005
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	620	588	638	659	684	--	688	732	702
Alkalinity, Carbonate as CaCO3	mg/l	--	--	12	4	12	1	1	--	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	518	482	543	540	561	570	564	600	575
Ammonia Nitrogen	mg/l	--	--	0.34	0.33	0.25	0.26	0.26	0.54	0.25	0.32	0.58
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	2	--	--	--
Chemical Oxygen Demand	mg/l	--	--	10	21	12	19	16	68	26	23	19
Chloride	mg/l	--	250	128	194	141	116	158	195	186	147	168
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1200	1270	1590	1550	1560	1640	1650	1670	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	127	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	413	408	445	361	395	350	338	459	410
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.2	0.4	0.3	0.2	0.3	<1	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.85	1.57	0.46	0.77	0.88	1.07	0.96	0.74	1.16
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.3	6.4	6.92	7.2	6.7	7.3	7.4	7.3	6.6
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.49	1.36	0.21	0.34	0.5	0.53	0.47	0.2	0.65
Sulphate	mg/l	--	500 [6]	60	58	104	96	89	68	83	110	156
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	9.8
Total Dissolved Solids	mg/l	--	500	796	912	824	810	780	992	825	835	1080
Total Organic Carbon	mg/l	--	--	8.3	14	8	7.3	7.7	14	7.4	7	8
Total Suspended Solids	mg/l	--	--	360	832	190	460	256	280	136	526	3220
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.002	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.13	1.35	1.06	0.97	0.94	0.845	0.826	1.1	0.879
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	75.6	65.9	77.4	60	69.1	58.2	56.5	81.3	67.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.001	0.001	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	0.002	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.18	0.03	0.56	0.76	0.7	0.598	0.526	0.479	0.379
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0012	0.0002	0.0005	0.0003	0.0005	0.0006
Magnesium, dissolved	mg/l	--	--	54.4	59.2	61.2	51.4	53.9	49.7	48	62.2	58.7
Manganese, dissolved	mg/l	--	0.05	0.26	0.46	0.23	0.39	0.27	0.356	0.284	0.237	0.432
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	0.01	0.01	<0.01
Potassium, dissolved	mg/l	--	--	7.9	11.3	13.2	14.8	13.5	14.5	15.8	14.9	17.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	<0.001
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	164	206	167	221	196	264	294	185	286
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.02	0.01	0.005	0.005	0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 14-Jun-2001	92-10 23-Nov-2001	92-10 23-May-2002	92-10 06-Nov-2002	92-10 30-May-2003	92-10 09-Oct-2003	92-10 14-May-2004	92-10 19-Nov-2004	92-10 24-May-2005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.037	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.002
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0007
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0006
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0004
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	<0.0001
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0002
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	<0.0002
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.002
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	<0.0002
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	<0.0002
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0003
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	<0.0002
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	<0.0001
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	<0.0001
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 16-Nov-2005	92-10 25-May-2006	92-10 21-Nov-2006	92-10 15-May-2007	92-10 30-Nov-2007	92-10 22-May-2008	92-10 10-Nov-2008	92-10 19-May-2009 G-7	92-10 26-Nov-2009 J-18
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	148	590	624	612	595	550	720	949 [8]	784
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5	<2	<2 [8]
Alkalinity (Total as CaCO3)	mg/l	--	--	605	590	624	612	595	550	720	949	784
Ammonia Nitrogen	mg/l	--	--	0.05	0.06	0.25	0.15	0.54	0.18	0.55	0.43	0.49
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	15	7	11	42	59	19	38	65	53
Chloride	mg/l	--	250	172	160	126	171	190	191	192	150	229
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	2240	2180
Conductivity (Field)	uS/cm	--	--	1600	1400	1500	1300	1400	1500	1700	1700	1911
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	501	490	471	442	420	402	460	871	463
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.1	0.3	0.1	0.2	<0.1	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	0.49	0.55	0.64	0.66	1	0.87	1.22	1.49	0.94
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	7.16	7.86
pH (Field)	-	--	--	--	7.3	6.7	7.7	8	7.3	7.1	--	6.95
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.26	--	--	--	--	--	--	0.06	0.68
Sulphate	mg/l	--	500 [6]	124	176	178	155	122	131	124	139	92
Temperature (Field)	deg c	--	15	12.6	5	10.5	10.5	9	10.5	10	10	10.9
Total Dissolved Solids	mg/l	--	500	1030	1020	1060	1080	1090	1050	1160	1460	1420
Total Organic Carbon	mg/l	--	--	9.2	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	139	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	<0.001	0.0011	0.0011	0.002	0.0014	0.0016	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.08	0.873	0.986	0.869	0.85	0.778	0.949	3.96	1.3
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.005	<0.0001	0.00003	<0.00002	<0.00002	<0.00002	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	90.2	87.6	83.2	77.8	73.2	70.2	82.2	189	80
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005	0.006
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	0.0028	0.0004
Copper, dissolved	mg/l	--	1	0.004	0.009	0.002	<0.002	<0.002	<0.002	<0.002	0.003	0.001
Iron, dissolved	mg/l	--	0.3	0.057	0.029	0.531	0.201	1.38	0.479	0.466	1.91	4.74
Lead, dissolved	mg/l	0.01	--	<0.0002	0.0003	<0.0001	0.00004	<0.00002	<0.00002	<0.00002	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	67.1	65.9	64	60.3	57.7	55.2	61.9	97	64
Manganese, dissolved	mg/l	--	0.05	0.169	0.464	1.31	0.133	0.994	4.32	3	2.91	1.01
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17.2	13.6	15.7	15.7	15.8	14.2	16	9	16
Selenium, dissolved	mg/l	0.05	--	<0.001	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	214	175	215	236	276	257	245	151	272
Zinc, dissolved	mg/l	--	5	0.011	0.007	0.008	<0.005	<0.005	<0.005	<0.005	<0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 16-Nov-2005	92-10 25-May-2006	92-10 21-Nov-2006	92-10 15-May-2007	92-10 30-Nov-2007	92-10 22-May-2008	92-10 10-Nov-2008	92-10 19-May-2009 G-7	92-10 26-Nov-2009 J-18
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040	<0.0040
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 25-May-2010 [4] M-10	92-10 20-Oct-2010 [4] G-7	92-10 24-May-2011 G-22	92-10 29-Nov-2011 [4] 92-10	92-10 31-May-2012 92-10	92-10 28-Nov-2012 92-10	92-10 29-May-2013 [5] 92-10	92-10 26-Nov-2013 [5] GW-24	92-10 29-May-2014 92-10
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	728	720	688	688	660	650	620	650	640
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	5.7	5.8	4.7	4.7	7.8
Alkalinity (Total as CaCO3)	mg/l	--	--	728	720	688	688	660	660	630	650	640
Ammonia Nitrogen	mg/l	--	--	0.45	0.52	0.30	0.63	0.46	0.83	0.57	0.62	0.52
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	50	43	38	45	36	40	38	36	25
Chloride	mg/l	--	250	199	195	187	193	210	210	180	170	230
Conductivity	uS/cm	--	--	2080	2000	1940	2010	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2051	1991	1865	1529	1723	1807	1462	1543	1706
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	548	540	457	477	440	440	390	400	390
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	0.14	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	0.013	<0.010	0.037	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.75	1.64	0.74	0.78	1.3	1.5	1.1	1.5	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	7.97	7.63	8.20	8.14	7.97	--	7.90	7.89	8.11
pH (Field)	-	--	--	7.33	7.17	7.30	7.36	7.30	7.40	6.87	6.92	7.07
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.39	0.41	0.42	0.40	0.28	0.48	0.54	0.40	0.43
Sulphate	mg/l	--	500 [6]	96	98	103	78	69	58	74	77	55
Temperature (Field)	deg c	--	15	15.3	10.7	12.6	8.8	10.0	9.4	9.8	10.0	11.0
Total Dissolved Solids	mg/l	--	500	1350	1300	1260	1310	1140	1180	1110	1060	1090
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.01	<0.001	<0.01	<0.0010	<0.001	<0.0010	<0.0010	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.6	1.5	1.0	1.4	1	1.1	0.91	0.96	0.9
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	94	96	76	84	71	70	66	68	64
Chromium, dissolved	mg/l	0.05	--	0.006	0.006	<0.005	0.007	<0.0050	<0.005	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0006	0.0006	0.0005	0.0004	0.00054	<0.0005	<0.00050	<0.00050	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.001	0.005	0.002	0.0021	0.001	0.0014	0.0026	0.0033
Iron, dissolved	mg/l	--	0.3	0.38	5.89	<0.03	0.55	0.18	1.9	<0.1	<0.1	0.29
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	76	73	65	65	63	64	56	56	56
Manganese, dissolved	mg/l	--	0.05	0.82	1.77	0.62	1.98	0.84	0.99	0.74	0.33	0.48
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	17	15	16	16	16	16	16	15	16
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	231	251	247	243	300	280	310	220	310
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	0.01	<0.01	<0.0050	<0.005	<0.0050	0.0059	0.018

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 25-May-2010 [4] M-10	92-10 20-Oct-2010 [4] G-7	92-10 24-May-2011 G-22	92-10 29-Nov-2011 [4] 92-10	92-10 31-May-2012 92-10	92-10 28-Nov-2012 92-10	92-10 29-May-2013 [5] 92-10	92-10 26-Nov-2013 [5] GW-24	92-10 29-May-2014 92-10
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.00025	<0.00025	<0.00025	<0.00025	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00025	<0.00025	<0.00025	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00025	<0.00025	<0.00025	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0005	<0.00025	<0.00025	<0.00025	<0.00025	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0013	<0.0013	<0.0013	<0.0013	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00025	<0.00025	<0.00025	<0.00025	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00050	<0.00050	<0.00050	<0.00050	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 19-Nov-2014 92-10	92-10 02-Jun-2015 92-10	92-10 26-Nov-2015 92-10	92-10 26-May-2016 92-10	92-10 17-Nov-2016 92-10	92-10 24-May-2017 92-10	92-10 29-Nov-2017 92-10	92-10 24-May-2018 92-10	92-10 22-Nov-2018 92-10
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	630	660	589	660	662	678	661	725	808
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.3	<5	<5	<5	<5	<5	5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	640	664	591	664	665	682	666	729	811
Ammonia Nitrogen	mg/l	--	--	0.59	0.09	0.75	0.16	0.62	0.03	0.49	0.35	0.62
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	29	72	116	76	78	39	34	67	77
Chloride	mg/l	--	250	200	218	128	210	201	194	218	180	200
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1761	1803	1489	1732	1849	1760	1576	1827	1777
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	420	339	382	390	399	374	376	434	552
Nitrate as N	mg/l	10.0	--	<0.10	<0.1	0.2	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.1	0.6	2.2	0.8	1.0	0.5	0.9	1.4	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	7.86	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.34	7.54	7.31	7.42	7.09	7.45	7.29	7.23	7.18
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.42	0.14	2.10	0.60	0.57	0.14	0.45	0.87	0.93
Sulphate	mg/l	--	500 [6]	67	68	112	82	82	74	80	76	70
Temperature (Field)	deg c	--	15	8.9	9.1	10.4	12.5	11.0	11.0	8.7	11.1	10.4
Total Dissolved Solids	mg/l	--	500	1040	1140	914	1080	1020	1010	970	1080	1010
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.001	<0.001	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.95	0.694	0.772	0.881	1.14	0.805	0.856	0.888	1.03
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	72	39.9	49.5	66.1	69.1	68.4	63.8	77	93.5
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.001	<0.001	<0.001	0.007	0.006	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0005
Copper, dissolved	mg/l	--	1	0.0032	<0.0005	0.0012	0.0028	0.0027	0.0028	0.0018	0.0028	0.0044
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	0.362	<0.1	0.824
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	58	58	62.7	54.7	55	49.4	52.7	58.8	77.4
Manganese, dissolved	mg/l	--	0.05	0.26	<0.005	0.011	<0.005	1.28	<0.005	0.333	0.006	0.785
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	12.4	12.8	16.5	14.4	13.9	14.3	14.5	18.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	270	274	317	246	261	261	224	236	283
Zinc, dissolved	mg/l	--	5	<0.0050	0.008	0.007	0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 19-Nov-2014	92-10 02-Jun-2015	92-10 26-Nov-2015	92-10 26-May-2016	92-10 17-Nov-2016	92-10 24-May-2017	92-10 29-Nov-2017	92-10 24-May-2018	92-10 22-Nov-2018
				92-10	92-10	92-10	92-10	92-10	92-10	92-10	92-10	92-10
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.001	<0.001	0.002	<0.001	0.002	<0.001	<0.001	0.003
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 19-Jun-2019 92-10	92-10 20-Nov-2019 92-10	92-10 21-May-2020 92-10	92-10 26-Nov-2020 92-10	92-10 26-May-2021 92-1D	92-10 30-Nov-2021 92-10
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	827	774	798	804	803	801
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6	<5	11	5	<5	5
Alkalinity (Total as CaCO3)	mg/l	--	--	832	779	809	809	806	807
Ammonia Nitrogen	mg/l	--	--	0.24	0.58	0.52	0.60	0.60	0.34
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	84	86	71	91	79	159
Chloride	mg/l	--	250	227	226	278	232	223	229
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1925	2040	1936	1844	2046	2026
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	589	588	538	515	550	511
Nitrate as N	mg/l	10.0	--	<0.1	0.1	0.2	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.9	1.2	1.4	1.3	1.3	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.26	7.18	7.69	7.51	7.24	7.27
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.15	0.66	0.82	0.60	0.25	0.18
Sulphate	mg/l	--	500 [6]	60	57	63	45	39	39
Temperature (Field)	deg c	--	15	12.2	9.6	11.7	7.7	10.8	8.5
Total Dissolved Solids	mg/l	--	500	1240	1160	1220	1180	1210	1170
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.09	0.903	0.882	0.834	0.904	0.82
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	103	101	91.1	85.6	90.3	87.8
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.004	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0005	0.0017	<0.0005	<0.0005	0.0007
Copper, dissolved	mg/l	--	1	0.0053	0.0023	0.0065	0.0026	0.0029	0.0015
Iron, dissolved	mg/l	--	0.3	<0.1	0.66	5.69	1.44	<0.1	0.781
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0016	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	80.7	81.5	75.5	73.2	78.7	70.7
Manganese, dissolved	mg/l	--	0.05	0.876	1.2	1.34	0.911	1.33	1.65
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	19.6	21.6	17.7	17.1	16.9	17.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	272	290	291	292	281	277
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.014	<0.005	<0.005	0.006

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-10 19-Jun-2019 92-10	92-10 20-Nov-2019 92-10	92-10 21-May-2020 92-10	92-10 26-Nov-2020 92-10	92-10 26-May-2021 92-1D	92-10 30-Nov-2021 92-10
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	0.010	<0.004 [11]	<0.004 [11]	<0.004 [11]
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 09-Jun-1992	92-11 01-Nov-1992	92-11 15-Jun-1994	92-11 02-Nov-1994	92-11 28-Jun-1995	92-11 22-Nov-1995	92-11 12-Jun-1996	92-11 12-Oct-1996	92-11 18-Jun-1997
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	795	705	--	907	754	664	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	1	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	652	578	796	756	618	544	605	603	604
Ammonia Nitrogen	mg/l	--	--	--	--	--	3.65	4.3	0.46	2.5	1.07	0.16
Chemical Oxygen Demand	mg/l	--	--	--	--	87	128	113	65	45	33	41
Chloride	mg/l	--	250	145	93	79	35	139	55	34	43.3	88.5
Conductivity (Field)	uS/cm	--	--	2014	1937	1990	2020	1620	1890	1690	1640	1620
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	10.47	7	--	--	--	6.17
Hardness, Calcium Carbonate	mg/l	--	--	647.71	662	740	869	679	658	886	753	793
Nitrate as N	mg/l	10.0	--	--	--	1.56	5.92	0.1	1.7	1.5	1.1	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	20.3	2.5	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	16	2.04	--	--	--
pH (Field)	-	--	--	7.76	7.13	6.68	7.34	7.03	7.52	6.85	6.81	7.05
Phosphate	mg/l	--	--	--	--	--	--	--	0.5	--	--	--
Phosphorus	mg/l	--	--	--	--	0.54	0.376	14.4	--	--	--	--
Sulphate	mg/l	--	500 [6]	204	423.5	189	229	99	362	320	352	273
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	1000	1010	820	940	850	820	810
Total Organic Carbon	mg/l	--	--	--	--	22.4	25.5	37.7	15.8	18.5	16.8	16.1
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	481	323	3460
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.1	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	0.116	--	--	--	--	--
Boron, dissolved	mg/l	5	--	--	--	2.74	2.339	1.92	1.31	1.54	1.85	1.96
Cadmium, dissolved	mg/l	0.005	--	--	--	--	0.01	0.0001	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	179.4	188	202	234.6	194	225	236	204	199
Chromium, dissolved	mg/l	0.05	--	--	--	--	0.01	0.01	0.02	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	0.0212	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	--	--	0.702	0.526	0.04	0.14	2.89	0.88	0.94
Lead, dissolved	mg/l	0.01	--	--	--	0.0003	0.1	0.0003	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	48.4	46.7	57.2	42.426	46.5	50.8	71	58.3	70.9
Manganese, dissolved	mg/l	--	0.05	--	--	2.892	3.357	2.82	0.66	2.23	2.45	2.44
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	0.02	0.02	0.02	0.06	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	28.2	19	31.8	22.39	--	23.2	20.8	20.2	15.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	189.9	199	110	92.17	92.5	125	110	110	106
Zinc, dissolved	mg/l	--	5	--	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 09-Jun-1992	92-11 01-Nov-1992	92-11 15-Jun-1994	92-11 02-Nov-1994	92-11 28-Jun-1995	92-11 22-Nov-1995	92-11 12-Jun-1996	92-11 12-Oct-1996	92-11 18-Jun-1997
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.134	0.002	0.001	--	--	--	--
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 06-Nov-1997	92-11 05-Jun-1998	92-11 30-Oct-1998	92-11 06-May-1999	92-11 19-Oct-1999	92-11 05-May-2000	92-11 24-Oct-2000	92-11 14-Jun-2001	92-11 23-Nov-2001
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	420	380	427	388	549	421	277
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	390	512	344	312	350	318	450	345	227
Ammonia Nitrogen	mg/l	--	--	0.04	0.14	0.13	0.01	0.06	0.01	0.07	0.01	0.01
Chemical Oxygen Demand	mg/l	--	--	30	41	12	7	10	18	--	7	15
Chloride	mg/l	--	250	109	85.4	19.9	10.2	9.5	9	41.5	22.5	51.7
Conductivity (Field)	uS/cm	--	--	1770	1518	940	860	740	700	1320	900	1300
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	759	695	500	473	385	354	577	535	696
Nitrate as N	mg/l	10.0	--	1	1.6	--	--	0.2	0.1	0.2	0.6	0.2
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	0.73	0.36	--	--	0.68	0.5	0.51
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.27	--	6.7	7.1	7.4	6.9	6.91	6.9	6.41
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.3	0.28	0.29
Sulphate	mg/l	--	500 [6]	398	283	183	185	110	91	263	179	395
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	930	760	470	430	370	350	884	632	952
Total Organic Carbon	mg/l	--	--	12.9	12.6	12.7	6.2	4.8	4.3	--	6.6	11
Total Suspended Solids	mg/l	--	--	--	--	--	--	123	170	346	218	326
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.28	1.45	1.25	0.48	0.89	0.5	0.9	0.39	0.53
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	204	172	140	130	100	104	152	160	190
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.16	0.18	1.13	0.02	0.16	0.1	0.16	0.02	0.03
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0004	0.0002	0.0002	0.0022	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	59.8	63.7	36.4	35.6	32.4	22.7	47.9	32.9	53.8
Manganese, dissolved	mg/l	--	0.05	0.1	1.04	1.05	0.1	0.03	0.02	0.16	0.01	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02
Potassium, dissolved	mg/l	--	--	15.3	11.2	16.5	0.7	5.7	1.1	6.2	2.4	2.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	100	118	40	36.9	50	28	58.9	36.9	91.1
Zinc, dissolved	mg/l	--	5	0.01	0.36	0.01	0.01	0.27	0.22	0.03	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 06-Nov-1997	92-11 05-Jun-1998	92-11 30-Oct-1998	92-11 06-May-1999	92-11 19-Oct-1999	92-11 05-May-2000	92-11 24-Oct-2000	92-11 14-Jun-2001	92-11 23-Nov-2001
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	0.001	0.026	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 23-May-2002	92-11 06-Nov-2002	92-11 30-May-2003	92-11 09-Oct-2003 [3]	92-11 14-May-2004	92-11 19-Nov-2004	92-11 24-May-2005	92-11 16-Nov-2005	92-11 25-May-2006
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	410	659	780	--	651	802	799	176	595
Alkalinity, Carbonate as CaCO3	mg/l	--	--	10	1	1	--	1	1	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	352	540	639	--	534	657	655	720	595
Ammonia Nitrogen	mg/l	--	--	0.13	0.04	0.09	--	0.04	0.5	0.35	0.39	0.14
Chemical Oxygen Demand	mg/l	--	--	3	29	14	--	24	45	34	38	17
Chloride	mg/l	--	250	52	66	80	--	95.2	34	32.8	14.5	17.2
Conductivity (Field)	uS/cm	--	--	1150	1630	1300	--	1980	1900	2150	1600	1300
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	536	554	471	--	832	667	628	663	487
Nitrate as N	mg/l	10.0	--	3.1	0.2	0.4	--	0.3	1	0.1	0.1	0.3
Nitrogen, Total Kjeldahl	mg/l	--	--	0.62	0.54	0.65	--	0.5	1.47	1.31	1.4	0.61
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.96	6.6	6.5	--	7.2	6.9	6.5	--	7.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.24	0.05	0.21	--	0.14	0.15	0.23	0.2	--
Sulphate	mg/l	--	500 [6]	407	323	325	--	831	350	370	220	410
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	11.4	--	4
Total Dissolved Solids	mg/l	--	500	990	1100	650	--	990	950	1210	1090	1110
Total Organic Carbon	mg/l	--	--	6	8.3	6.9	--	6.7	10.2	6.6	9	--
Total Suspended Solids	mg/l	--	--	306	137	15	--	52	118	94	94	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	--	0.001	0.008	0.002	0.002	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.73	0.99	0.7	--	0.606	0.833	0.529	0.784	0.551
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	<0.0001	<0.005
Calcium, dissolved	mg/l	--	--	138	178	133	--	219	171	159	173	119
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	--	0.001	0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	--	0.003	0.002	<0.002	<0.002	0.01
Iron, dissolved	mg/l	--	0.3	0.02	0.02	0.21	--	0.015	21.4	10.3	8.74	0.828
Lead, dissolved	mg/l	0.01	--	0.0003	0.0007	0.0002	--	0.0002	0.0008	0.0006	0.0002	<0.0002
Magnesium, dissolved	mg/l	--	--	31.1	44.1	33.8	--	69.1	58.4	55.8	56.2	45.9
Manganese, dissolved	mg/l	--	0.05	0.01	0.02	0.01	--	0.002	8.21	3.08	2.92	1.62
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006	<0.00006	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01	<0.01	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	--	0.01	0.01	<0.01	<0.01	--
Potassium, dissolved	mg/l	--	--	5.5	11.8	7.9	--	10.4	10.6	9.1	11.6	6.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	0.001	<0.001	--
Sodium, dissolved	mg/l	--	200 [7]	150	164	191	--	232	185	181	186	157
Zinc, dissolved	mg/l	--	5	0.01	0.02	0.01	--	0.005	0.005	<0.005	0.008	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 23-May-2002	92-11 06-Nov-2002	92-11 30-May-2003	92-11 09-Oct-2003 [3]	92-11 14-May-2004	92-11 19-Nov-2004	92-11 24-May-2005	92-11 16-Nov-2005	92-11 25-May-2006
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	--	0.001	0.001	0.004	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	<0.0007	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0004	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	<0.0001	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0002	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	<0.0002	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	<0.002	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	<0.0002	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	<0.0002	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	<0.0003	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	<0.0002	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	<0.0001	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 19-Dec-2008
General Chemistry				
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1590
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1590
Ammonia Nitrogen	mg/l	--	--	0.5
Chemical Oxygen Demand	mg/l	--	--	314
Chloride	mg/l	--	250	300
Conductivity (Field)	uS/cm	--	--	2700
Dissolved Oxygen (Field)	mg/l	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1230
Nitrate as N	mg/l	10.0	--	0.1
Nitrogen, Total Kjeldahl	mg/l	--	--	5.76
Nitrogen, Organic	mg/l	--	--	--
pH (Field)	-	--	--	6.1
Phosphate	mg/l	--	--	--
Phosphorus	mg/l	--	--	--
Sulphate	mg/l	--	500 [6]	92
Temperature (Field)	deg c	--	15	6
Total Dissolved Solids	mg/l	--	500	2150
Total Organic Carbon	mg/l	--	--	--
Total Suspended Solids	mg/l	--	--	--
Metals				
Arsenic, dissolved	mg/l	0.01	--	0.0032
Barium, dissolved	mg/l	1	--	--
Boron, dissolved	mg/l	5	--	**10.4**
Cadmium, dissolved	mg/l	0.005	--	<0.00002
Calcium, dissolved	mg/l	--	--	298
Chromium, dissolved	mg/l	0.05	--	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005
Copper, dissolved	mg/l	--	1	<0.002
Iron, dissolved	mg/l	--	0.3	0.657
Lead, dissolved	mg/l	0.01	--	<0.00002
Magnesium, dissolved	mg/l	--	--	119
Manganese, dissolved	mg/l	--	0.05	3.39
Mercury, dissolved	mg/l	0.001	--	--
Molybdenum, dissolved	mg/l	--	--	--
Nickel, dissolved	mg/l	--	--	--
Potassium, dissolved	mg/l	--	--	11.6
Selenium, dissolved	mg/l	0.05	--	--
Sodium, dissolved	mg/l	--	200 [7]	373
Zinc, dissolved	mg/l	--	5	0.007

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	92-11 19-Dec-2008
Phenols				
Phenolics, Total Recoverable	mg/l	--	--	0.004
Semi-VOCs				
Naphthalene	mg/l	--	--	--
Styrene	mg/l	--	--	--
VOCs				
1,1,1,2-Tetrachloroethane	mg/l	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--
1,2-Dibromoethane	mg/l	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--
1,2-Dichloroethane	mg/l	0.005	--	--
1,2-Dichloropropane	mg/l	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--
Benzene	mg/l	0.001	--	0.0009
Bromodichloromethane	mg/l	--	--	--
Bromoform	mg/l	--	--	--
Bromomethane	mg/l	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--
Chlorobenzene	mg/l	0.08	0.03	--
Chloroform	mg/l	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--
Dibromochloromethane	mg/l	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	0.0011
m,p-Xylenes	mg/l	--	--	0.0032
Methylene Chloride	mg/l	0.05	--	<0.0003
o-Xylene	mg/l	--	--	0.0009
Tetrachloroethylene	mg/l	0.01	--	--
Toluene	mg/l	0.06	0.024	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--
Trichloroethene	mg/l	0.005	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)- Health [1]	ODWQS- AO [2]	94-1 09-Jan-1990	94-1 02-Mar-1990	94-1 28-Mar-1990	94-1 01-Aug-1990	94-1 06-Nov-1990	94-1 29-Nov-1991	94-1 09-Jun-1992	94-1 01-Nov-1992	94-1 08-Jun-1993	94-1 04-Nov-1993	94-1 15-Jun-1994
General Chemistry														
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1210	1220	--	--	--	1205	1561	1276	1300	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	--	--	--	14.4	1	1	<1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	--	2256	1000	950	1014	1060	1012	1280	1046	1063	1040
Ammonia Nitrogen	mg/l	--	--	0.64	--	--	2.2	1.8	0.5	2.28	1.86	--	--	--
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	3	20.8	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--	--	94	72.8	--	--	153
Chloride	mg/l	--	250	993	978	954	950	920	746	890	1018	1020	1250	1430
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2742	--	4352	4664	4368	7500	4685	4485	3760	4380	5340
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	**0.276**	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	213	250.3	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	260	265	278	229	180	186	202.56	198	200	237	293
Nitrate as N	mg/l	10.0	--	**18**	**69.6**	**19.5**	3.83	1.88	--	0.3	1.5	0.48	**10.8**	0.1
Nitrite as N	mg/l	1.0	--	**1.3**	--	--	0.21	0.001	**1.97**	0.1	0.18	0.1	0.14	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	3.36	4.01	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	1.08	2.15	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.67	8.25	8.11	8.26	8.2	8.1	8.37	7.99	7.82	8.18	7.96
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	2.36	1.1	--	--	2.63
Sulphate	mg/l	--	500 [6]	34	30.3	30	20	11	1	0.35	2	1.8	4.6	64
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	2256	2412	--	--	--	2737	2915	2692	2640	2680
Total Organic Carbon	mg/l	--	--	35.5	--	--	27	22.3	--	33.8	22.5	--	--	21.6
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Metals														
Aluminum, dissolved	mg/l	--	--	0.58	--	--	0.1	--	0.5	--	0.14	0.102	<0.01	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001	0.003	--	--	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	0.04	0.1	--	--	--
Boron, dissolved	mg/l	5	--	--	--	--	--	--	--	1.42	1.34	--	--	1.37
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	30.3	31	34	27	21	21.8	20.6	22.1	22	29.3	40.4
Chromium, dissolved	mg/l	0.05	--	**0.13**	--	--	0.05	--	0.001	0.02	0.05	0.01	<0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	--	--	0.05	--	0.02	0.02	0.05	0.01	<0.01	0.0225
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--	--	0.2	0.1	0.1	<0.1	0.299
Lead, dissolved	mg/l	0.01	--	**0.69**	--	--	**0.05**	--	0.001	**0.1**	**0.09**	**0.1**	**0.13**	0.0018
Magnesium, dissolved	mg/l	--	--	44.9	50	52	39	31	32	36.7	34.6	35.2	39.7	46.6
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--	--	0.03	0.05	0.062	0.057	0.129
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.04	--	--	0.05	--	0.07	0.02	0.05	0.02	<0.02	0.02
Potassium, dissolved	mg/l	--	--	62.5	31	31	23	23	21	16.5	25.4	24	25	37.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	0.01	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	790	1357	995	1063	1157	717	1049	1110	964	1020	897
Zinc, dissolved	mg/l	--	5	0.17	--	--	0.05	--	0.01	0.02	0.05	0.031	<0.01	0.01
Phenols														
Phenolics, Total Recoverable	mg/l	--	--	0.002	--	--	0.003	0.002	0.002	0.002	0.002	0.002	0.002	0.01
VOCs														
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)- Health [1]	ODWQS- AO [2]	94-1 02-Nov-1994	94-1 28-Jun-1995	94-1 23-Nov-1995	94-1 12-Oct-1996	94-1 06-Nov-1997	94-1 05-Jun-1998	94-1 06-May-1999	94-1 24-Oct-2000	94-1 14-Jun-2001	94-1 06-Nov-2002	94-1 30-May-2003
General Chemistry														
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1233	1268	1370	--	--	--	1430	1540	1100	1440	1310
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	--	--	--	1	1	97	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	1030	1040	1120	1140	1130	1020	1170	1260	1060	1180	1070
Ammonia Nitrogen	mg/l	--	--	1.35	1.47	0.6	2.31	1.34	1.03	1.34	0.72	1.26	2.01	0.27
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	221	100	65	43	36	55	35	--	41	94	60
Chloride	mg/l	--	250	1040	1095	1070	928	1060	1130	1190	1200	1100	1080	1100
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5070	5300	5520	5340	4980	5090	4950	5210	4800	4860	4410
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	6.06	6.13	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	278	191	212	215	211	208	226	219	204	196	178
Nitrate as N	mg/l	10.0	--	1.98	1.8	2.2	0.1	0.1	4.6	--	1.5	0.3	0.2	1.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	6.5	4.3	--	--	--	5.69	1.5	2.86	0.41	1.77
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	5.03	3.7	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.19	8.06	8.41	7.83	7.78	--	7.9	8.15	8	7.9	7.3
Phosphate	mg/l	--	--	--	--	0.5	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.1	2.41	--	--	--	--	--	1.02	3.15	0.58	2.17
Sulphate	mg/l	--	500 [6]	30.9	23	20	10	3	41	3	7	4	4	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2560	2570	2770	2680	2500	2550	2490	3200	2800	2810	2205
Total Organic Carbon	mg/l	--	--	25	20.3	17.9	16.4	17	16.2	23.5	--	15.1	15.3	14.6
Total Suspended Solids	mg/l	--	--	--	--	--	2310	--	--	--	1410	2700	4730	2370
Metals														
Aluminum, dissolved	mg/l	--	--	0.01	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	**0.1**	--	--	--	--	--	--	0.003	0.003	0.002	0.003
Barium, dissolved	mg/l	1	--	0.057	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.143	1.04	1.03	1.15	1.18	1.36	1.37	1.27	1.37	1.2	1.2
Cadmium, dissolved	mg/l	0.005	--	**0.01**	0.0001	0.0001	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	22.63	23	24	24.5	24.7	23.2	28.4	22.9	26.5	24.5	22
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.03	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.1	0.05	1.14	1.43	0.83	3.19	0.02	0.37	0.13	0.02	0.26
Lead, dissolved	mg/l	0.01	--	**0.1**	0.001	0.0003	0.0002	0.0002	0.0012	0.0005	**0.022**	0.0002	0.0094	0.0012
Magnesium, dissolved	mg/l	--	--	19.606	31.9	36.6	36.9	35.8	35.9	37.3	39.3	33.4	32.8	29.9
Manganese, dissolved	mg/l	--	0.05	0.093	0.06	0.02	0.1	0.08	0.11	0.08	0.08	0.06	0.06	0.06
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	15.33	--	28.9	28.1	25.4	30.8	26	26.7	21.4	24.6	25.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	95.5	864	949	1000	1010	1330	1150	1110	1060	1120	921
Zinc, dissolved	mg/l	--	5	0.011	0.01	0.01	0.01	0.01	0.13	0.01	0.01	0.01	0.02	0.01
Phenols														
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	--	--	--	--	--	0.001	0.001	0.001	0.001
VOCs														
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)- Health [1]	ODWQS- AO [2]	94-1 19-Nov-2004	94-1 16-Nov-2005	94-1 15-May-2007	94-1 10-Nov-2008	94-1 26-Nov-2009 [25] M-1	94-1 24-May-2011 [4] G-35	94-1 28-Nov-2012 94-1	94-1 29-May-2014 94-1	94-1 26-Nov-2015 94-1	94-1 24-May-2017 94-1	94-1 22-Nov-2018 94-1
General Chemistry														
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1400	279	1120	1090	1100	1080	1100	1100	1060	1030	1140
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	23	39	20	38	<25 [15]	<25 [3]	<25 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	1150	1150	1120	1090	1120	1120	1100	1100	1070	1050	1160
Ammonia Nitrogen	mg/l	--	--	1.83	1.81	0.76	0.58	2.49	2.50	2.6	2.6	1.04	0.02	0.36
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	60	64	151	72	110	65	65	59	542	69	231
Chloride	mg/l	--	250	1140	997	1050	1100	1090	1010	1000	1100	1110	1100	1110
Conductivity	uS/cm	--	--	--	--	--	--	5220	5250	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5320	1700	3600	4450	>3999	>3999	3972	>3999	>3999	3999	>3999
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	191	199	174	163	173	193	200	190	170	191	270
Nitrate as N	mg/l	10.0	--	1	0.2	0.2	0.8	0.49	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	0.020	0.080	<0.05	<0.25 [9]	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.11	3.22	1.2	2.33	3.43	3.27	4.9	5.1	3.1	1.2	2.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	<0.10	0.11	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	8.35	8.58	--	8.58	--	--	--
pH (Field)	-	--	--	7.9	--	8.5	7.9	7.69	8.17	8.12	7.89	8.08	8.14	8.25
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.99	1.17	--	--	3.85	2.30	4.1	2.2	3.20	1.05	2.78
Sulphate	mg/l	--	500 [6]	10	2	2	2	5	<1	1	2	<1	1	2
Temperature (Field)	deg c	--	15	--	--	9.4	10	10.3	15.4	8.8	11.7	7.3	11.6	8.6
Total Dissolved Solids	mg/l	--	500	2660	2900	2820	2820	3390	3410	2860	2850	2940	2870	2910
Total Organic Carbon	mg/l	--	--	15.6	19.4	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	99	32	--	--	--	--	--	--	--	--	--
Metals														
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.002	0.0096	0.0071	<0.01	<0.01	0.002	0.0025 [20]	0.003	0.008	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.28	1.34	1.13	1.12	1.8	1.3	1.5	1.4	1.44	1.12	1.47
Cadmium, dissolved	mg/l	0.005	--	--	0.0002	0.00005	<0.00002	<0.001	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	23.9	24.5	22.1	20.3	20	23	24	23	22.4	23.9	33.9
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.005	0.014	<0.005	<0.01	<0.001	0.02	<0.001
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.002	0.0007	0.0005	<0.00050	<0.0005	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	0.002	<0.002	0.005	0.003	<0.01	0.005	<0.001	0.0020	<0.0005	0.0016	0.0033
Iron, dissolved	mg/l	--	0.3	0.071	0.345	0.178	0.006	<0.3	<0.03	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0009	0.0006	0.00021	<0.00002	<0.01	<0.001	<0.0005	<0.00050	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	32	33.5	28.8	27.4	30	33	34	32	27.7	31.9	44.9
Manganese, dissolved	mg/l	--	0.05	0.059	0.084	0.017	0.049	<0.1	0.03	0.14	0.065	0.123	0.018	0.021
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	28.1	30	28.5	25.2	23	27	25	24	21.3	25.9	31
Selenium, dissolved	mg/l	0.05	--	--	<0.001	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1200	1150	1020	984	1001	1100	1100	990	1230	1130	1050
Zinc, dissolved	mg/l	--	5	0.005	0.006	0.013	<0.005	<0.1	0.02	<0.005	<0.0050	0.007	<0.005	<0.005
Phenols														
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.002 [10]	<0.010 [10]	<0.001
VOCs														
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-1 21-May-2020 94-1	94-1 30-Nov-2021 94-1
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1110	1140
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [16]	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1130	1150
Ammonia Nitrogen	mg/l	--	--	2.27	2.25
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	84	92
Chloride	mg/l	--	250	1360	1050
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	>3999
Cyanide	mg/l	0.2	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	265	214
Nitrate as N	mg/l	10.0	--	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.0	3.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	7.22	8.14
Phosphate	mg/l	--	--	--	--
Phosphorus	mg/l	--	--	1.29	1.74
Sulphate	mg/l	--	500 [6]	<1	<1
Temperature (Field)	deg c	--	15	13.7	3.8
Total Dissolved Solids	mg/l	--	500	3000	2940
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Aluminum, dissolved	mg/l	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.003
Barium, dissolved	mg/l	1	--	--	--
Boron, dissolved	mg/l	5	--	1.43	1.4
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	32.8	25
Chromium, dissolved	mg/l	0.05	--	0.004	<0.001
Cobalt, dissolved	mg/l	--	--	0.0025	<0.0005
Copper, dissolved	mg/l	--	1	0.0013	0.0008
Iron, dissolved	mg/l	--	0.3	4.61	0.128
Lead, dissolved	mg/l	0.01	--	0.0048	<0.0001
Magnesium, dissolved	mg/l	--	--	44.4	36.7
Manganese, dissolved	mg/l	--	0.05	0.272	0.104
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	27.4	23.2
Selenium, dissolved	mg/l	0.05	--	--	--
Silver, dissolved	mg/l	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1020	909
Zinc, dissolved	mg/l	--	5	0.016	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	0.011	<0.004 [11]
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 09-Jan-1990	94-2 02-Mar-1990	94-2 20-Mar-1990	94-2 01-Aug-1990	94-2 06-Nov-1990	94-2 29-Nov-1991	94-2 09-Jun-1992	94-2 01-Nov-1992	94-2 15-Jun-1994
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	995	1000	--	--	--	927	1058	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	14.4	1	--	--	--	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1196	840	820	782	858	857	760	868	756
Ammonia Nitrogen	mg/l	--	--	0.1	--	--	1.24	0.57	0.4	0.27	1.69	--
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	1.9	21.3	--
Chemical Oxygen Demand	mg/l	--	--	--	--	--	--	--	--	178	58.2	84
Chloride	mg/l	--	250	2070	539	549	553	513	532	505	667	530
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	5180	--	3076	3290	2891	2890	3077	3120	2970
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	165.1	213.2	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	710	294	302	244	212	204	209.78	203	409
Nitrate as N	mg/l	10.0	--	**68**	**38.9**	**11.5**	2.81	0.52	1.02	0.66	1.35	0.3
Nitrite as N	mg/l	1.0	--	0.1	--	--	0.1	0.01	--	0.1	0.16	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	--	--	--	--	1.4	2.24	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	1.13	0.55	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.92	8.39	8.18	8.32	8.2	8	8.27	8.1	7.07
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.47	1.3	0.85
Sulphate	mg/l	--	500 [6]	43	35.6	42	25	27	10	19	8	127
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	1548	1628	--	--	--	1660	1864	1490
Total Organic Carbon	mg/l	--	--	--	--	--	23	18.1	--	27.4	18.9	18.4
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	0.1	--	0.5	--	0.1	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001	0.003	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	0.04	0.1	--
Boron, dissolved	mg/l	5	--	--	--	--	--	--	--	0.88	0.96	1.12
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	77.3	35	35	30	27	27.6	22.45	24.3	64.6
Chromium, dissolved	mg/l	0.05	--	--	--	--	0.05	--	0.01	0.02	0.05	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	--	--	--	0.05	--	0.002	0.02	0.05	0.0194
Iron, dissolved	mg/l	--	0.3	--	--	--	--	--	--	0.2	0.07	0.421
Lead, dissolved	mg/l	0.01	--	--	--	--	**0.05**	--	0.001	**0.1**	**0.05**	0.0008
Magnesium, dissolved	mg/l	--	--	126	43	47	41	35	32.7	37.26	34.5	62
Manganese, dissolved	mg/l	--	0.05	--	--	--	--	--	--	0.02	0.13	0.725
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	0.05	--	0.05	0.02	0.05	0.02
Potassium, dissolved	mg/l	--	--	2070	539	549	553	17	14	12.56	17.3	17.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	0.01	--	--
Sodium, dissolved	mg/l	--	200 [7]	1919	800	686	693	66	532	513.4	768	415
Zinc, dissolved	mg/l	--	5	--	--	--	0.05	--	0.02	0.02	0.05	0.1

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 09-Jan-1990	94-2 02-Mar-1990	94-2 20-Mar-1990	94-2 01-Aug-1990	94-2 06-Nov-1990	94-2 29-Nov-1991	94-2 09-Jun-1992	94-2 01-Nov-1992	94-2 15-Jun-1994
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.13	0.002	0.002	0.002	0.002	0.011
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 02-Nov-1994	94-2 28-Jun-1995	94-2 23-Nov-1995	94-2 12-Jun-1996	94-2 18-Jun-1997	94-2 06-Nov-1997	94-2 05-Jun-1998	94-2 30-Oct-1998	94-2 06-May-1999
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	868	952	1030	--	--	--	--	986	1090
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	--	--	--	--	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	724	780	840	813	917	800	874	808	897
Ammonia Nitrogen	mg/l	--	--	0.15	0.17	0.04	0.12	0.37	0.32	0.23	0.11	0.23
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	115	65	50	38	26	38	48	9	42
Chloride	mg/l	--	250	392	430	400	455	456	520	509	470	552
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2930	2880	3060	2970	2760	2800	3020	2930	3010
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	9.09	8.7	--	--	3.88	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	323	270	268	265	261	243	241	197	244
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.3	0.1	0.1	0.1	1	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	8.8	1.11	--	--	--	--	0.94	1.19
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	8.63	1.07	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.68	7.65	8.32	8.03	7.76	7.56	--	7.6	7.6
Phosphate	mg/l	--	--	--	--	0.3	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.266	0.36	--	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	116	81	98	55	58	47	53	52	21
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1470	1460	1530	1490	1380	1410	1510	1480	1510
Total Organic Carbon	mg/l	--	--	19	16.1	15	15.5	13.9	13.9	14	16.4	16.6
Total Suspended Solids	mg/l	--	--	--	--	--	343	567	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	0.111	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	**0.1**	--	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	0.058	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.89	0.62	0.62	0.728	0.88	0.76	0.93	0.95	0.87
Cadmium, dissolved	mg/l	0.005	--	**0.01**	0.0015	0.0001	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	34.69	37.1	35.1	33.1	34.5	32.6	30.6	26.5	32.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.016	0.02	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.38	0.04	0.35	0.549	0.77	0.48	0.48	0.46	0.29
Lead, dissolved	mg/l	0.01	--	**0.1**	0.0051	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.0005
Magnesium, dissolved	mg/l	--	--	25.676	42.6	43.2	43.8	41.8	38.7	39.4	31.8	39.2
Manganese, dissolved	mg/l	--	0.05	0.359	0.4	0.32	0.339	0.25	0.22	0.32	0.27	0.24
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.8	--	14.6	19.7	12.5	16.3	15.1	16.4	5.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	514.6	492	542	586	496	495	709	599	625
Zinc, dissolved	mg/l	--	5	0.076	0.01	0.01	0.01	0.01	0.01	0.16	0.01	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 02-Nov-1994	94-2 28-Jun-1995	94-2 23-Nov-1995	94-2 12-Jun-1996	94-2 18-Jun-1997	94-2 06-Nov-1997	94-2 05-Jun-1998	94-2 30-Oct-1998	94-2 06-May-1999
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.005	0.001	--	--	--	--	--	--	--
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 19-Oct-1999	94-2 05-May-2000	94-2 24-Oct-2000	94-2 14-Jun-2001	94-2 23-Nov-2001	94-2 23-May-2002	94-2 06-Nov-2002	94-2 30-May-2003	94-2 09-Oct-2003
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	900	1161	1100	826	859	765	867	982	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	59	1	1	58	1	49	1	1	--
Alkalinity (Total as CaCO3)	mg/l	--	--	826	952	901	773	704	708	711	805	805
Ammonia Nitrogen	mg/l	--	--	0.22	0.05	0.03	0.06	0.02	0.06	0.06	0.07	0.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	1
Chemical Oxygen Demand	mg/l	--	--	33	38	--	30	25	15	32	39	35
Chloride	mg/l	--	250	532	370	453	371	362	347	383	420	421
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2800	2850	2910	2400	2360	2660	2670	2560	2700
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	185
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	240	237	248	242	240	224	221	204	201
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.3	0.1	0.2	0.3	0.2	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	0.64	0.95	0.66	0.54	0.6	0.78	0.68
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	7.6	7.41	7.7	6.97	7.23	7.6	7	7.5
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	0.41	0.33	0.29	0.36	0.32	0.45	0.43
Sulphate	mg/l	--	500 [6]	40	90	67	68	86	73	59	43	38
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1390	1425	1530	1440	1340	1330	1500	1280	1541
Total Organic Carbon	mg/l	--	--	13.6	13.2	--	11	10	11	10.7	10.7	14
Total Suspended Solids	mg/l	--	--	208	100	55	55	137	152	44	35	56
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	0.003	0.001	0.003	0.001	0.003	0.002	0.004
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.02	0.84	0.74	0.9	0.99	0.71	0.79	0.66	0.667
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	33.9	31.9	30	36.3	33.4	33.7	29.2	28.9	26.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.003
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.004
Iron, dissolved	mg/l	--	0.3	1.15	0.51	0.28	0.08	0.03	0.02	0.11	0.2	1.33
Lead, dissolved	mg/l	0.01	--	0.0003	0.0002	0.0022	0.0002	0.0002	0.0002	0.0021	0.0008	0.0009
Magnesium, dissolved	mg/l	--	--	37.2	37.8	42	36.7	38	33.9	35.9	32.1	32.7
Manganese, dissolved	mg/l	--	0.05	0.18	0.25	0.45	0.13	0.13	0.12	0.12	0.01	0.17
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.01
Potassium, dissolved	mg/l	--	--	15.9	9.4	17.7	7	7.8	13.9	12.8	12.8	13.8
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	700	623	645	487	509	452	468	505	524
Zinc, dissolved	mg/l	--	5	0.12	0.08	0.01	0.01	0.01	0.01	0.02	0.01	0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 19-Oct-1999	94-2 05-May-2000	94-2 24-Oct-2000	94-2 14-Jun-2001	94-2 23-Nov-2001	94-2 23-May-2002	94-2 06-Nov-2002	94-2 30-May-2003	94-2 09-Oct-2003
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	0.001	0.084	0.001	0.001	0.001	0.001	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 14-May-2004	94-2 19-Nov-2004	94-2 24-May-2005	94-2 16-Nov-2005	94-2 25-May-2006	94-2 21-Nov-2006	94-2 15-May-2007	94-2 30-Nov-2007	94-2 22-May-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	952	1090	1050	209	865	904	890	900	840
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	780	890	860	855	865	904	890	900	840
Ammonia Nitrogen	mg/l	--	--	0.03	0.01	0.12	0.17	0.01	0.01	<0.01	0.1	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	34	41	33	45	26	29	49	68	27
Chloride	mg/l	--	250	421	491	438	386	449	446	430	470	472
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2710	2900	3300	2400	2400	2600	1900	1300	2500
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	219	213	226	228	210	194	214	215	213
Nitrate as N	mg/l	10.0	--	0.2	1	0.2	0.4	0.1	0.1	<0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.7	0.63	0.9	0.73	0.98	0.62	0.68	0.81	0.76
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.8	7.8	7.2	--	7.7	7.1	8.1	7.8	7.8
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.31	0.38	0.4	0.46	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	46	30	34	43	32	30	23	23	21
Temperature (Field)	deg c	--	15	--	--	10.1	--	5	10	9.3	6.5	9.5
Total Dissolved Solids	mg/l	--	500	1355	1450	1620	1670	1660	1660	1610	1830	1640
Total Organic Carbon	mg/l	--	--	9.8	11.4	11	13	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	35	28	43	33	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.002	0.002	<0.001	0.0067	0.0068	0.0054	0.0047
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.678	0.763	0.717	0.726	0.595	0.579	0.621	0.714	0.602
Cadmium, dissolved	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00004	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	30	29.4	29	31.3	28.1	26.9	29.8	29.6	29.4
Chromium, dissolved	mg/l	0.05	--	0.001	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	0.002	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.049	0.137	0.061	0.276	0.055	0.761	0.453	0.378	0.302
Lead, dissolved	mg/l	0.01	--	0.0007	0.0005	0.0012	0.0002	0.0004	<0.0001	0.00004	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	35.1	33.9	37.3	36.5	33.9	30.9	34	34.3	33.9
Manganese, dissolved	mg/l	--	0.05	0.3	0.151	0.135	0.396	0.175	0.346	0.331	0.184	0.289
Mercury, dissolved	mg/l	0.001	--	--	--	<0.00006	<0.00006	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	<0.01	<0.01	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	0.01	<0.01	<0.01	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.7	15.1	16.2	16.5	13.6	14.1	15.1	17.5	13.7
Selenium, dissolved	mg/l	0.05	--	--	--	<0.001	<0.001	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	547	572	569	657	597	567	545	710	566
Zinc, dissolved	mg/l	--	5	0.005	0.005	<0.005	0.008	<0.005	0.008	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 14-May-2004	94-2 19-Nov-2004	94-2 24-May-2005	94-2 16-Nov-2005	94-2 25-May-2006	94-2 21-Nov-2006	94-2 15-May-2007	94-2 30-Nov-2007	94-2 22-May-2008
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	<0.0007	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	<0.0006	--	--	--	--	--	<0.0006
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	<0.0004	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	<0.0001	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	<0.0002	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	<0.0001	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	<0.0002	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	<0.002	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	<0.0002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	<0.0002	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	<0.0003	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	<0.0002	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	<0.0001	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	<0.0001	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 10-Nov-2008	94-2 19-May-2009 G-21	94-2 26-Nov-2009 M-5	94-2 25-May-2010 [4] M-18	94-2 20-Oct-2010 [4] G-15	94-2 24-May-2011 [4] G-28	94-2 29-Nov-2011 [4] 94-2	94-2 31-May-2012 94-2	94-2 28-Nov-2012 94-2
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	880	862	877	838	860	854	859	840	840
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<2 [8]	<2 [8]	<2 [8]	<2 [8]	27	19	12	14
Alkalinity (Total as CaCO3)	mg/l	--	--	880	862	877	838	860	881	878	850	850
Ammonia Nitrogen	mg/l	--	--	0.1	0.07	0.04	0.04	0.11	0.17	0.06	<0.050	0.18
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	31	35	35	38	45	33	35	33	43
Chloride	mg/l	--	250	500	455	478	432	471	476	458	440	420
Conductivity	uS/cm	--	--	--	2950	2990	2920	2960	3070	3000	--	--
Conductivity (Field)	uS/cm	--	--	2500	2500	2799	2876	2780	2735	2590	2530	2438
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	211	219	195	221	211	227	191	220	230
Nitrate as N	mg/l	10.0	--	<0.1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.69	0.49	0.40	0.55	0.47	0.62	0.48	1.2	0.87
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.10	8.07	8.28	8.09	8.52	8.38	8.20	--
pH (Field)	-	--	--	7.7	--	7.47	7.82	7.75	7.79	7.68	7.78	7.72
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	0.68	0.52	0.57	0.63	0.69	0.46	0.41	0.49
Sulphate	mg/l	--	500 [6]	14	14	15	17	12	10	11	<20	13
Temperature (Field)	deg c	--	15	9	10	10.5	22.3	14.9	15.6	9.7	11.1	9.7
Total Dissolved Solids	mg/l	--	500	1660	1920	1940	1900	1920	2000	1950	1610	1680
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0047	0.006	0.006	<0.01	<0.01	<0.01	<0.01	0.0026	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.606	0.74	0.90	0.68	0.58	0.7	0.59	0.63	0.7
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	29.3	30	27	29	30	30	27	30	31
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.005	0.006	<0.005	<0.005	<0.005	<0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	0.0004	0.0004	0.0005	0.0005	0.0005	0.0003	<0.00050	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	0.002	0.001	0.002	0.001	0.004	0.002	0.0025	0.002
Iron, dissolved	mg/l	--	0.3	<0.005	<0.03	0.95	0.34	0.73	<0.03	0.08	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005
Magnesium, dissolved	mg/l	--	--	33.4	35	31	36	33	37	30	35	37
Manganese, dissolved	mg/l	--	0.05	0.036	<0.01	0.25	0.20	0.25	0.03	0.02	0.0029	<0.002
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.2	13	12	14	12	15	12	13	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	543	542	569	536	592	564	543	550	590
Zinc, dissolved	mg/l	--	5	<0.005	<0.01	0.01	<0.01	<0.01	0.02	<0.01	<0.0050	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 10-Nov-2008	94-2 19-May-2009 G-21	94-2 26-Nov-2009 M-5	94-2 25-May-2010 [4] M-18	94-2 20-Oct-2010 [4] G-15	94-2 24-May-2011 [4] G-28	94-2 29-Nov-2011 [4] 94-2	94-2 31-May-2012 94-2	94-2 28-Nov-2012 94-2
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	<0.0006	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 29-May-2013 [5] 94-2	94-2 26-Nov-2013 GW-9	94-2 29-May-2014 94-2	94-2 19-Nov-2014 [5] 94-2	94-2 02-Jun-2015 94-2	94-2 26-Nov-2015 94-2	94-2 26-May-2016 94-2	94-2 17-Nov-2016 94-2	94-2 24-May-2017 94-2
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	840	860	830	870	902	885	922	925	949
Alkalinity, Carbonate as CaCO3	mg/l	--	--	12	13	15	12	13	9	9	9	11
Alkalinity (Total as CaCO3)	mg/l	--	--	850	880	850	880	915	894	931	934	960
Ammonia Nitrogen	mg/l	--	--	0.31	0.28	0.20	0.14	0.33	0.32	0.28	0.43	0.92
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	41	33	39	42	56	44	44	58
Chloride	mg/l	--	250	500	510	460	560	564	527	559	584	596
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2460	2399	2515	2674	2864	2895	2853	3019	3060
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	240	200	250	230	185	219	245	244	228
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05	<0.05	<0.25 [9]
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	1.0	1.1	0.75	0.9	1.1	0.9	0.9	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.17	8.22	8.29	8.16	--	--	--	--	--
pH (Field)	-	--	--	7.60	7.61	7.90	7.82	7.80	7.74	8.11	7.94	7.82
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.56	0.61	0.42	0.54	0.40	0.61	0.48	0.55	0.73
Sulphate	mg/l	--	500 [6]	<1	<1	<1	<1	6	7	6	4	4
Temperature (Field)	deg c	--	15	11.4	8.5	10.8	6.5	11.3	8.0	15.1	11.1	13.1
Total Dissolved Solids	mg/l	--	500	1810	1700	1670	1680	1760	1700	1870	1810	1840
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0017	0.0026	0.0019	0.0020	0.001	0.002	0.002	0.005	0.004
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.72	0.55	0.79	0.61	0.549	0.539	0.663	0.862	0.63
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	33	29	33	31	28.9	28.3	34.2	33.2	32.3
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001	0.012	0.011
Cobalt, dissolved	mg/l	--	--	<0.00050	0.00051	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0017	0.0014	0.0021	<0.0020	<0.0005	<0.0005	0.0009	0.0008	0.0016
Iron, dissolved	mg/l	--	0.3	<0.1	0.19	0.51	0.62	<0.1	0.5	0.135	0.382	<0.1
Lead, dissolved	mg/l	0.01	--	0.00057	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	38	32	40	36	27.4	36.1	38.8	39.1	35.9
Manganese, dissolved	mg/l	--	0.05	0.22	0.33	0.2	0.34	0.036	0.259	0.092	0.408	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14	13	15	14	12.3	11.4	15	13.6	13.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	550	550	580	600	611	632	542	639	629
Zinc, dissolved	mg/l	--	5	<0.0050	0.027	0.039	<0.0050	<0.005	0.008	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 29-May-2013 [5]	94-2 26-Nov-2013	94-2 29-May-2014	94-2 19-Nov-2014 [5]	94-2 02-Jun-2015	94-2 26-Nov-2015	94-2 26-May-2016	94-2 17-Nov-2016	94-2 24-May-2017
				94-2	GW-9	94-2	94-2	94-2	94-2	94-2	94-2	94-2
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]	0.008	0.004	<0.004 [10]
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00025	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.00050	<0.00050	<0.0010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00050	0.00043	<0.00020	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00020	<0.00020	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 29-Nov-2017	94-2 24-May-2018	94-2 22-Nov-2018	94-2 19-Jun-2019 [26]	94-2 20-Nov-2019	94-2 21-May-2020	94-2 26-Nov-2020	94-2 26-May-2021	94-2 30-Nov-2021
				94-2	94-2	94-2	94-2	94-2	94-2	94-2	94-2	94-2
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	941	959	981	--	873	871	878	900	866
Alkalinity, Carbonate as CaCO3	mg/l	--	--	13	12	12	--	16	22	20	11	13
Alkalinity (Total as CaCO3)	mg/l	--	--	954	971	993	--	889	893	898	912	879
Ammonia Nitrogen	mg/l	--	--	0.37	0.25	0.51	--	0.35	0.09	0.30	0.11	0.11
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	60	61	76	--	54	57	80	36	83
Chloride	mg/l	--	250	629	548	544	--	586	612	495	485	457
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2593	2981	2725	--	3010	2793	2576	2894	2818
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	210	245	280	--	295	266	269	292	224
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	--	<0.1	<0.1	<0.5 [11]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	1.0	1.8	--	0.8	0.9	1.1	0.6	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.68	7.58	8.09	--	7.94	8.11	8.07	7.64	7.68
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.60	0.51	1.52	--	0.68	0.60	0.83	0.46	0.70
Sulphate	mg/l	--	500 [6]	6	6	9	--	5	11	5	5	9
Temperature (Field)	deg c	--	15	8.6	14.9	5.9	--	8.5	12.1	7.1	14.5	7.0
Total Dissolved Solids	mg/l	--	500	1820	1850	1730	--	1780	1680	1680	1770	1670
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.003	0.002	0.003	--	0.003	0.001	0.002	0.002	0.003
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.6	0.655	0.604	--	0.433	0.491	0.445	0.494	0.36
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	29.9	35.2	38.5	--	40.7	37.1	36.6	37.1	33.6
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0008	--	0.0006	<0.0005	<0.0005	0.0006	0.0005
Copper, dissolved	mg/l	--	1	0.0007	0.0010	0.0037	--	0.0014	0.0053	0.0012	0.0011	0.0011
Iron, dissolved	mg/l	--	0.3	0.612	0.222	0.178	--	0.462	<0.1	0.536	0.113	0.397
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001	--	0.0001	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	33	38.1	44.6	--	47	42.1	43	48.4	34.1
Manganese, dissolved	mg/l	--	0.05	0.42	0.258	0.544	--	0.354	0.026	0.377	0.605	0.599
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	14	14.1	16.3	--	20.4	16	14.5	14.7	12.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Silver, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	598	565	641	--	636	599	587	515	555
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	--	0.005	<0.005	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-2 29-Nov-2017	94-2 24-May-2018	94-2 22-Nov-2018	94-2 19-Jun-2019 [26]	94-2 20-Nov-2019	94-2 21-May-2020	94-2 26-Nov-2020	94-2 26-May-2021	94-2 30-Nov-2021
				94-2	94-2	94-2	94-2	94-2	94-2	94-2	94-2	94-2
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	--	0.003	0.004	<0.004 [11]	<0.004 [11]	<0.004 [11]
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 15-Jun-1994	94-3 02-Nov-1994	94-3 28-Jun-1995	94-3 23-Nov-1995	94-3 12-Jun-1996	94-3 12-Oct-1996	94-3 18-Jun-1997	94-3 06-Nov-1997	94-3 05-Jun-1998
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	907	453	850	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	940	756	372	697	466	533	511	620	530
Ammonia Nitrogen	mg/l	--	--	--	2.23	1.2	1.38	0.94	1.39	0.73	0.82	0.29
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	260	158	85	78	33	30	16	46	39
Chloride	mg/l	--	250	360	132	223	274	132	138	86.6	212	145
Conductivity (Field)	uS/cm	--	--	3070	2270	1960	2650	1680	1960	1370	1900	1700
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	10.19	8.2	--	--	--	2.47	--	--
Hardness, Calcium Carbonate	mg/l	--	--	878	783	787	853	588	514	445	492	435
Nitrate as N	mg/l	10.0	--	0.1	4.38	1.7	2	0.6	0.1	0.1	0.1	1.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	6.4	4.6	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	5.2	3.22	--	--	--	--	--
pH (Field)	-	--	--	6.69	7.08	7.55	7.52	7.06	6.68	7.25	6.55	--
Phosphate	mg/l	--	--	--	--	--	0.4	--	--	--	--	--
Phosphorus	mg/l	--	--	2.25	0.392	1.08	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	369	359	355	272	279	234	190	137	234
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1550	1140	999	1330	840	980	680	1010	842
Total Organic Carbon	mg/l	--	--	42.2	--	29	23.7	16.1	16.4	8.9	17.8	14.5
Total Suspended Solids	mg/l	--	--	--	--	--	--	853	396	1590	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	0.097	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.1	--	--	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.104	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	5.41	3.981	0.68	0.76	1.06	1.36	1.43	1.63	1.71
Cadmium, dissolved	mg/l	0.005	--	--	0.001	0.0004	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	170	165.1	198	212	133	117	102	103	97
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.03	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0233	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02
Iron, dissolved	mg/l	--	0.3	0.691	0.435	0.46	6.46	5.73	4.67	2.44	4.05	3.24
Lead, dissolved	mg/l	0.01	--	0.0007	0.1	0.0007	0.0002	0.0002	0.0002	0.0002	0.0005	0.0002
Magnesium, dissolved	mg/l	--	--	110	61.336	70.2	77.6	61.6	53.3	45.7	56.3	46.1
Manganese, dissolved	mg/l	--	0.05	1.708	1.313	1.05	1.69	1.47	1.22	1.04	0.89	0.67
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.05	0.02	0.02	0.02	0.02	0.04
Potassium, dissolved	mg/l	--	--	48	22.77	--	20.4	15.9	15.9	9.5	16.4	16.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	285	172.1	107	219	217	214	173	251	268
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.71
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.048	--	0.001	--	--	--	--	--	--
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 29-Oct-1998	94-3 06-May-1999	94-3 19-Oct-1999	94-3 05-May-2000	94-3 24-Oct-2000	94-3 14-Jun-2001	94-3 23-Nov-2001	94-3 23-May-2002	94-3 06-Nov-2002
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	556	588	650	708	732	476	405	412	754
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	10	1	1	1	1	15	1
Alkalinity (Total as CaCO3)	mg/l	--	--	456	482	549	580	600	390	332	362	618
Ammonia Nitrogen	mg/l	--	--	0.19	0.12	0.18	0.01	0.02	0.03	0.02	0.17	0.02
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	3	10	92	11	--	10	12	13	18
Chloride	mg/l	--	250	62.9	71	226	39	127	51.1	45.9	43.6	56.5
Conductivity (Field)	uS/cm	--	--	1571	1450	1800	1400	1900	1130	1240	980	1380
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	363	527	456	570	404	408	531	374	515
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.2	0.4	0.1	0.2	0.2	1.9
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.75	0.94	--	--	0.75	0.45	0.68	0.52	0.5
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.6	6.7	7.6	6.8	6.81	6.9	6.19	6.77	6.6
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.24	0.26	0.29	0.21	0.17
Sulphate	mg/l	--	500 [6]	203	280	163	300	203	195	209	128	147
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	788	720	900	700	1000	782	770	564	868
Total Organic Carbon	mg/l	--	--	12.5	8.8	14.9	7.8	--	6.1	9	5	6.1
Total Suspended Solids	mg/l	--	--	--	--	2020	182	376	172	414	224	153
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.7	1.01	1.67	0.96	1.53	1.12	1.1	0.48	0.98
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	87.5	128	96.5	141	78.2	98.2	132	94.6	126
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	2.3	0.21	6.74	0.16	0.07	0.02	0.03	0.02	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0005	0.0002	0.0002	0.0022	0.0002	0.0002	0.0002	0.0007
Magnesium, dissolved	mg/l	--	--	35.2	49.6	51.6	52.1	50.7	39.5	48.9	33.4	48.6
Manganese, dissolved	mg/l	--	0.05	0.92	0.66	1	0.1	0.31	0.08	0.03	0.34	0.09
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	7.9	1.2	10.9	0.6	8.6	0.4	5.5	5	7.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	161	152	307	135	224	147	120	77.3	122
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.25	0.2	0.01	0.01	0.01	0.02	0.02
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.034	0.001	0.001	0.001
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-3 30-May-2003	94-3 09-Oct-2003	94-3 14-May-2004	94-3 19-Nov-2004	94-3 24-May-2005	94-3 16-Nov-2005	94-3 25-May-2006	94-3 19-Dec-2008	94-3 19-Jun-2019 94-3
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	671	--	776	824	781	179	660	770	930
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	--	1	1	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	550	579	636	675	640	735	660	770	934
Ammonia Nitrogen	mg/l	--	--	0.16	0.38	0.31	0.16	0.28	<0.01	0.2	0.08	0.31
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	2	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	17	21	23	28	20	15	24	<5	81
Chloride	mg/l	--	250	27.9	97.8	41.2	58	54.4	63.9	39.7	49.7	49
Conductivity (Field)	uS/cm	--	--	1240	1500	1490	1760	1950	1700	1325	1600	1556
Dissolved Inorganic Carbon	mg/l	--	--	--	129	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	529	434	553	530	589	659	662	756	708
Nitrate as N	mg/l	10.0	--	2.7	0.1	0.3	1	0.2	0.3	0.2	0.4	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.92	1.04	0.81	0.9	0.79	0.44	0.98	0.52	0.8
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.5	7	6.9	7	6.8	--	7.9	7.3	6.96
Phosphate	mg/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.23	0.64	0.21	0.57	0.14	0.16	--	--	0.11
Sulphate	mg/l	--	500 [6]	161	138	179	170	186	200	330	270	64
Temperature (Field)	deg c	--	15	--	--	--	--	9	--	5.5	4	13.1
Total Dissolved Solids	mg/l	--	500	620	958	745	880	989	1120	1150	1250	1020
Total Organic Carbon	mg/l	--	--	6.9	11	6.2	7.5	6.7	9.2	--	--	--
Total Suspended Solids	mg/l	--	--	188	519	108	17	99	90	--	--	--
Metals												
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	<0.001	0.002	<0.001	0.0006	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.64	1.24	0.797	1.16	0.95	1.51	0.773	1.1	0.59
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.0001	<0.005	<0.00002	0.0001
Calcium, dissolved	mg/l	--	--	139	98.9	137	131	140	159	156	176	145
Chromium, dissolved	mg/l	0.05	--	0.01	0.001	0.001	0.002	<0.002	<0.002	<0.002	<0.002	<0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005	<0.005	<0.005	0.0006
Copper, dissolved	mg/l	--	1	0.01	0.003	0.003	0.002	<0.002	0.006	<0.002	0.003	0.0020
Iron, dissolved	mg/l	--	0.3	0.27	0.126	0.03	0.05	0.533	0.013	0.014	0.024	0.424
Lead, dissolved	mg/l	0.01	--	0.0002	0.0003	0.0003	0.0002	0.0009	0.0003	<0.0002	<0.00002	<0.0001
Magnesium, dissolved	mg/l	--	--	44.1	45.4	51.3	49.2	58.3	63.8	66.1	77.1	83.8
Manganese, dissolved	mg/l	--	0.05	0.55	0.501	0.544	0.259	1.3	0.019	0.777	0.392	3.43
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	<0.00006	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	<0.01	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.01	0.01	0.01	<0.01	<0.01	--	--	--
Potassium, dissolved	mg/l	--	--	7.6	10.6	8.8	8.6	8.8	11.4	8.4	11	11
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	0.001	<0.001	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	104	219	159	172	164	200	157	200	116
Zinc, dissolved	mg/l	--	5	0.01	0.009	0.005	0.005	<0.005	0.009	<0.005	<0.005	<0.005
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
VOCs												
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0005
Benzene	mg/l	0.001	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	<0.001	--	<0.001	<0.001	<0.0005
Methylene Chloride	mg/l	0.05	--	--	--	--	--	<0.0003	--	<0.0003	<0.0003	<0.0050
o-Xylene	mg/l	--	--	--	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	<0.0002	--	<0.0002	<0.0002	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 05-May-2000	MW-C 24-Oct-2000	MW-C 14-Jun-2001	MW-C 23-Nov-2001	MW-C 23-May-2002	MW-C 06-Nov-2002	MW-C 30-May-2003	MW-C 09-Oct-2003	MW-C 14-May-2004
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	454	628	366	381	412	666	403	--	523
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	10	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	372	515	300	312	395	546	330	528	429
Ammonia Nitrogen	mg/l	--	--	0.12	0.37	0.33	0.01	0.35	0.65	0.14	0.59	0.13
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	3	--
Chemical Oxygen Demand	mg/l	--	--	--	--	8	77	56	120	70	59	89
Chloride	mg/l	--	250	103	212	122	206	117	279	201	171	123
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1150	1660	1100	1670	1410	1900	1500	1880	1790
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	122	--
Hardness, Calcium Carbonate	mg/l	--	--	212	182	224	331	344	147	372	125	402
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	0.1	0.3	1	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	15.5	2.66	3.43	2.26	3.26	4.9	2.79	3.77
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.9	7.5	7.1	6.94	6.94	7.8	6.8	7.4	7.5
Phosphorus	mg/l	--	--	--	7.27	5.4	5.15	2.81	8.71	3.01	2.15	2.87
Sulphate	mg/l	--	500 [6]	155	77	156	315	220	56	335	64	320
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	575	890	706	958	876	1100	750	950	895
Total Organic Carbon	mg/l	--	--	--	--	13.5	21	14	18.1	16.2	15	15.7
Total Suspended Solids	mg/l	--	--	22300	37000	5930	9420	3440	6550	5900	1130	4360
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	0.004	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.99	0.75	1.06	1.36	1.34	0.72	1.12	0.716	1.25
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	40.5	28.5	42.2	57	62.9	22.7	67.1	19.4	71.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.016	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.012	0.007
Iron, dissolved	mg/l	--	0.3	0.09	6.35	0.04	0.04	0.03	0.05	0.33	0.42	1.13
Lead, dissolved	mg/l	0.01	--	0.0002	0.0022	0.0002	0.0002	0.0002	0.0019	0.0002	0.0007	0.0003
Magnesium, dissolved	mg/l	--	--	26.5	27	28.8	45.8	45.4	21.9	49.7	18.7	54.1
Manganese, dissolved	mg/l	--	0.05	0.46	0.63	0.22	0.14	0.2	0.2	0.26	0.401	0.47
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.03	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	4.7	9.2	2.2	3.2	6.2	7.6	4.8	8.6	4.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	200	353	161	294	216	347	266	351	274
Zinc, dissolved	mg/l	--	5	0.03	0.04	0.01	0.01	0.02	0.04	0.01	0.027	0.006

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 05-May-2000	MW-C 24-Oct-2000	MW-C 14-Jun-2001	MW-C 23-Nov-2001	MW-C 23-May-2002	MW-C 06-Nov-2002	MW-C 30-May-2003	MW-C 09-Oct-2003	MW-C 14-May-2004
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	0.002	0.03	0.001	0.001	0.001	0.001	0.001	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 19-Nov-2004	MW-C 24-May-2005	MW-C 16-Nov-2005	MW-C 25-May-2006	MW-C 21-Nov-2006	MW-C 15-May-2007	MW-C 30-Nov-2007	MW-C 22-May-2008	MW-C 10-Nov-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	695	539	256	448	458	507	447	410	570
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	570	442	420	448	458	507	447	410	570
Ammonia Nitrogen	mg/l	--	--	0.08	<0.01	0.01	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	43	70	59	20	27	120	80	<5	31
Chloride	mg/l	--	250	153	67.2	235	159	76.9	62.9	197	99.8	157
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1820	1700	2000	1450	1200	800	1425	1350	1400
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	454	423	594	395	351	433	459	396	454
Nitrate as N	mg/l	10.0	--	1	<0.1	0.1	<0.1	<0.1	<0.1	0.1	0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.94	2.19	1.37	1.47	0.9	1.4	1.72	0.8	0.63
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.3	6.9	--	7.6	8.1	7.9	7.8	7.3	7.1
Phosphorus	mg/l	--	--	1.09	2.12	2.06	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	290	167	420	360	182	139	370	250	240
Temperature (Field)	deg c	--	15	--	10	--	6.5	6.5	9.2	6.5	14.5	6
Total Dissolved Solids	mg/l	--	500	910	804	1450	1220	864	772	1320	957	1150
Total Organic Carbon	mg/l	--	--	11.8	10.2	19.4	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	1010	233	1430	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	0.0016	0.0024	0.0016	0.0015	0.0008
Boron, dissolved	mg/l	5	--	1.38	1.18	1.24	1.15	1.1	0.778	0.932	1.06	1.22
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00003	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	86.2	74	116	69.5	61.4	81.4	82.4	71.6	83.9
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	<0.002	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.346	1.93	0.76	1.86	2.64	3.31	0.879	0.778	0.086
Lead, dissolved	mg/l	0.01	--	0.0007	0.0003	0.0002	<0.0002	<0.0001	0.00005	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	58.1	57.8	74.1	53.8	48.1	55.8	61.5	52.8	59.5
Manganese, dissolved	mg/l	--	0.05	1.1	0.591	0.329	0.254	0.373	0.517	0.434	0.188	0.078
Mercury, dissolved	mg/l	0.001	--	--	0.00014	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5.4	3.9	7	5.5	5	3.6	6.5	4.8	6.2
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	288	170	351	306	212	121	335	227	268
Zinc, dissolved	mg/l	--	5	0.005	0.008	0.008	0.018	0.007	<0.005	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 19-Nov-2004	MW-C 24-May-2005	MW-C 16-Nov-2005	MW-C 25-May-2006	MW-C 21-Nov-2006	MW-C 15-May-2007	MW-C 30-Nov-2007	MW-C 22-May-2008	MW-C 10-Nov-2008
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.003	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--	<0.0006	<0.0006
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 19-May-2009 G-16	MW-C 26-Nov-2009 J-8	MW-C 25-May-2010 M-20	MW-C 20-Oct-2010 G-19	MW-C 24-May-2011 G-27	MW-C 29-Nov-2011 [4] MW-C	MW-C 31-May-2012 MW-C	MW-C 28-Nov-2012 MW-C	MW-C 29-May-2013 [27] MW-C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	511	546	390	434	384	580	350	510	390
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	1.8	2.4	2.7
Alkalinity (Total as CaCO3)	mg/l	--	--	511	546	390	434	384	580	350	520	400
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.02	0.04	0.02	<0.02	0.52	<0.050	0.16	0.20
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	23	40	23	40	25	50	31	35	87
Chloride	mg/l	--	250	86	108	53	121	47	269	120	190	63
Conductivity	uS/cm	--	--	1420	1600	1080	1570	1060	2060	--	--	--
Conductivity (Field)	uS/cm	--	--	1150	1457	917	1527	1202	1863	1633	1949	1090
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	380	411	334	390	329	195	420	470	340
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.32	0.23	0.41	0.35	0.16	1.18	0.87	1.3	2.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10
pH	-	--	--	7.66	7.82	7.96	7.69	8.28	8.15	7.74	--	7.86
pH (Field)	-	--	--	--	6.29	7.18	7.1	7.11	7.65	7.39	7.23	7.36
Phosphorus	mg/l	--	--	0.71	0.90	0.85	0.87	0.35	2.17	0.40	0.83	4.8
Sulphate	mg/l	--	500 [6]	133	160	102	222	116	103	370	350	220
Temperature (Field)	deg c	--	15	7	8	20.2	11.8	12.4	8.5	10.6	6.3	10.7
Total Dissolved Solids	mg/l	--	500	923	1040	702	1020	689	1340	1130	1410	900
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	<0.001	<0.01	0.0011	<0.001	<0.0010
Boron, dissolved	mg/l	5	--	0.94	0.9	0.69	1.1	0.86	0.80	1.1	1.2	0.9
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	68	79	66	72	69	32	85	81	67
Chromium, dissolved	mg/l	0.05	--	0.004	0.004	0.004	0.005	0.004	0.009	<0.0050	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.0002	0.0003	0.0002	0.0003	0.0003	0.0003	<0.00050	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.002	0.002	0.001	0.002	<0.001	0.0019	<0.001	<0.0010
Iron, dissolved	mg/l	--	0.3	0.39	0.83	0.78	0.39	1.62	0.72	0.19	0.39	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	51	52	41	51	38	28	50	64	41
Manganese, dissolved	mg/l	--	0.05	0.06	0.29	0.09	0.58	0.11	0.42	0.44	0.97	0.19
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4	4	4	7	4	8	6.4	8.7	5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	160	193	105	223	114	355	220	330	180
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.0050	<0.005	<0.0050

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 19-May-2009 G-16	MW-C 26-Nov-2009 J-8	MW-C 25-May-2010 M-20	MW-C 20-Oct-2010 G-19	MW-C 24-May-2011 G-27	MW-C 29-Nov-2011 [4] MW-C	MW-C 31-May-2012 MW-C	MW-C 28-Nov-2012 MW-C	MW-C 29-May-2013 [27] MW-C
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0054	0.015
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010	<0.00025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010	<0.00025
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050	<0.0013
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00025
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.00050
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.00050

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 26-Nov-2013 [28] GW-2	MW-C 29-May-2014 MW-C	MW-C 19-Nov-2014 MW-C	MW-C 02-Jun-2015 MW-C	MW-C 26-Nov-2015 MW-C	MW-C 26-May-2016 MW-C	MW-C 17-Nov-2016 MW-C	MW-C 24-May-2017 MW-C	MW-C 29-Nov-2017 MW-C
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	540	350	510	431	580	303	574	332	472
Alkalinity, Carbonate as CaCO3	mg/l	--	--	6.7	3.0	3.0	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	550	350	510	433	583	304	577	333	475
Ammonia Nitrogen	mg/l	--	--	0.33	0.11	0.080	0.13	0.64	0.13	0.54	0.04	0.09
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	52	25	38	45	217	131	83	55	40
Chloride	mg/l	--	250	240	100	140	89	322	65	269	134	102
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1711	1420	1776	1464	1997	1203	2136	1829	1375
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	280	340	340	382	276	283	216	396	343
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.1	0.2	<0.1	0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.021	<0.010	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.2	2.2	1.2	0.6	3.0	1.2	1.7	0.8	1.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	--	--	--	--	--	--
pH	-	--	--	8.12	7.96	7.79	--	--	--	--	--	--
pH (Field)	-	--	--	7.54	7.61	7.39	7.18	7.74	7.89	8.07	7.75	7.98
Phosphorus	mg/l	--	--	1.6	1.3	1.6	0.55	3.70	1.41	1.41	0.64	1.64
Sulphate	mg/l	--	500 [6]	160	350	250	342	140	263	165	473	339
Temperature (Field)	deg c	--	15	6.7	11.6	6.4	10.4	7.2	11.5	10.3	10.8	5.7
Total Dissolved Solids	mg/l	--	500	1250	1040	1060	976	1220	802	1180	1270	958
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.78	0.92	0.9	0.728	0.833	0.429	0.94	0.482	0.665
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	47	63	61	60.8	32.3	62.3	36.9	83.6	60.8
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.001	0.001	<0.001	0.008	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	0.00052	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.0010	0.0035	<0.0020	<0.0005	<0.0005	0.0011	0.0015	0.0061	0.0016
Iron, dissolved	mg/l	--	0.3	0.2	0.17	<0.1	0.396	0.408	0.134	0.11	0.124	0.349
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	<0.0001
Magnesium, dissolved	mg/l	--	--	39	43	46	55.9	47.3	30.9	30.2	45.5	46.4
Manganese, dissolved	mg/l	--	0.05	0.62	0.14	0.42	0.158	0.814	0.066	0.202	0.119	0.607
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.2	5.5	7.4	4.55	7.9	4.72	7.87	5.25	6.53
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	400	210	310	195	509	101	414	172	235
Zinc, dissolved	mg/l	--	5	0.0052	<0.0050	0.034	<0.005	0.01	0.006	<0.005	0.006	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 26-Nov-2013 [28] GW-2	MW-C 29-May-2014 MW-C	MW-C 19-Nov-2014 MW-C	MW-C 02-Jun-2015 MW-C	MW-C 26-Nov-2015 MW-C	MW-C 26-May-2016 MW-C	MW-C 17-Nov-2016 MW-C	MW-C 24-May-2017 MW-C	MW-C 29-Nov-2017 MW-C
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.0012	<0.0010	<0.0010	<0.001	<0.001	0.003	<0.001	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	0.00073	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

WCC - Navan Waste Recycling and Disposal Facility

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 24-May-2018	MW-C 22-Nov-2018	MW-C 19-Jun-2019	MW-C 20-Nov-2019	MW-C 21-May-2020	MW-C 26-Nov-2020	MW-C 26-May-2021	MW-C 30-Nov-2021
				MW-C	MW-C	MW-C	MW-C	MW-C	MW-C	MW-C	MW-C
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	518	573	457	565	357	593	516	306
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	10	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	520	576	460	570	362	603	520	310
Ammonia Nitrogen	mg/l	--	--	0.07	0.06	0.16	0.31	0.04	0.52	0.16	0.06
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	107	105	140	127	63	91	61	163
Chloride	mg/l	--	250	57	201	68	283	151	282	217	71
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1248	1649	1351	2040	1616	1942	2072	1282
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	326	430	427	298	562	259	431	357
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	0.4	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.2	1.5	1.2	1.7	1.0	1.2	1.2	2.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.29	7.75	7.32	7.69	7.83	7.88	7.35	7.64
Phosphorus	mg/l	--	--	1.18	1.69	1.39	1.78	0.40	0.79	0.86	1.45
Sulphate	mg/l	--	500 [6]	186	197	317	165	146	154	315	266
Temperature (Field)	deg c	--	15	10.9	5.8	13	7.9	10.5	7.3	11.9	4.8
Total Dissolved Solids	mg/l	--	500	818	1090	986	1220	1250	1240	1310	770
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.002	0.001	0.001	0.002	0.002
Boron, dissolved	mg/l	5	--	0.407	0.781	0.392	0.633	0.403	0.582	0.363	0.251
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	68.9	85.3	86.8	48.7	114	41	91.4	86.5
Chromium, dissolved	mg/l	0.05	--	<0.001	0.004	0.004	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0015	0.0012	0.0005	<0.0005	0.0006	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0010	0.0087	0.0050	0.0028	0.0031	0.0016	0.0020	0.0058
Iron, dissolved	mg/l	--	0.3	0.312	1.77	1.56	0.223	0.734	0.622	0.455	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0009	0.0010	<0.0001	0.0001	<0.0001	<0.0001	0.0002
Magnesium, dissolved	mg/l	--	--	37.3	52.7	51.1	42.9	67.1	37.9	49.2	34.2
Manganese, dissolved	mg/l	--	0.05	0.054	0.076	0.168	0.426	0.165	0.545	0.107	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.5	9.27	6.44	10.5	7.38	9.26	6.17	4.95
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	94.5	298	141	376	196	402	165	112
Zinc, dissolved	mg/l	--	5	<0.005	0.008	0.009	<0.005	<0.005	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-C 24-May-2018	MW-C 22-Nov-2018	MW-C 19-Jun-2019	MW-C 20-Nov-2019	MW-C 21-May-2020	MW-C 26-Nov-2020	MW-C 26-May-2021	MW-C 30-Nov-2021
				MW-C	MW-C	MW-C	MW-C	MW-C	MW-C	MW-C	MW-C
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	<0.001	0.002	0.004	<0.001	0.002	<0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 05-May-2000	MW-E 24-Oct-2000	MW-E 14-Jun-2001	MW-E 23-Nov-2001	MW-E 23-May-2002	MW-E 06-Nov-2002	MW-E 30-May-2003	MW-E 09-Oct-2003 [3]	MW-E 14-May-2004
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	388	668	390	400	338	615	244	--	490
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	7	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	318	548	320	328	289	504	200	--	402
Ammonia Nitrogen	mg/l	--	--	0.16	0.29	0.36	0.02	0.37	0.09	0.08	--	0.17
Chemical Oxygen Demand	mg/l	--	--	--	--	61	84	184	87	38	--	62
Chloride	mg/l	--	250	32.8	154	130	59	53.9	143	22.7	--	47.4
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	850	1770	1500	1230	570	--	980	--	1510
Hardness, Calcium Carbonate	mg/l	--	--	295	607	483	628	304	667	264	--	602
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.2	0.1	0.1	0.2	0.1	--	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	3.12	2.94	3.27	4.31	1.99	1.27	--	2.13
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7	7.07	7	6.22	7.26	--	6.8	--	7.2
Phosphorus	mg/l	--	--	--	2.45	2.25	3.81	5.09	2.7	0.69	--	1.12
Sulphate	mg/l	--	500 [6]	102	320	354	340	163	420	95	--	273
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	1152	1070	942	636	1320	382	--	755
Total Organic Carbon	mg/l	--	--	--	--	22.5	31	27	19.1	13.6	--	14.5
Total Suspended Solids	mg/l	--	--	452	3890	2140	2740	4670	1910	628	--	700
Metals												
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	0.001	0.001	--	0.001
Boron, dissolved	mg/l	5	--	0.99	1.47	1.41	2.26	0.94	1.63	0.8	--	1.16
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	70.1	111	108	120	67.7	133	67.5	--	156
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01	--	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01	--	0.002
Iron, dissolved	mg/l	--	0.3	0.2	0.7	0.71	0.47	0.31	0.16	0.58	--	0.305
Lead, dissolved	mg/l	0.01	--	0.0002	0.0022	0.0002	0.0002	0.0002	0.0025	0.0003	--	0.0002
Magnesium, dissolved	mg/l	--	--	28.8	80	51.7	49.5	32.7	81.3	23.2	--	51.7
Manganese, dissolved	mg/l	--	0.05	0.54	2.23	1.51	0.61	0.01	0.13	0.26	--	0.52
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02	--	0.01
Potassium, dissolved	mg/l	--	--	4.8	11.8	4.7	4	4.7	12.5	3.1	--	4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	87.5	180	135	119	97.8	186	64.3	--	107
Zinc, dissolved	mg/l	--	5	0.04	0.01	0.01	0.01	0.02	0.02	0.01	--	0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 05-May-2000	MW-E 24-Oct-2000	MW-E 14-Jun-2001	MW-E 23-Nov-2001	MW-E 23-May-2002	MW-E 06-Nov-2002	MW-E 30-May-2003	MW-E 09-Oct-2003 [3]	MW-E 14-May-2004
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	--	0.002	0.016	0.001	0.001	0.001	0.001	--	0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 19-Nov-2004	MW-E 24-May-2005	MW-E 16-Nov-2005	MW-E 25-May-2006	MW-E 21-Nov-2006	MW-E 15-May-2007	MW-E 30-Nov-2007	MW-E 22-May-2008	MW-E 10-Nov-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	527	398	131	242	308	380	567	222	290
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	432	326	531	242	308	380	567	222	290
Ammonia Nitrogen	mg/l	--	--	0.08	<0.01	<0.01	0.06	<0.01	<0.01	0.02	<0.01	0.08
Chemical Oxygen Demand	mg/l	--	--	49	49	35	38	33	74	71	35	30
Chloride	mg/l	--	250	65	21.5	94.6	21.5	22	23.3	120	25.5	69
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1360	1650	1600	525	650	700	1200	450	1000
Hardness, Calcium Carbonate	mg/l	--	--	549	330	511	261	339	338	549	170	397
Nitrate as N	mg/l	10.0	--	1	0.1	0.1	<0.1	<0.1	0.1	0.2	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.38	1.46	0.98	0.85	0.92	0.81	0.91	0.84	0.74
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	6.9	--	7.6	8	7.9	7.8	7.1	7.2
Phosphorus	mg/l	--	--	0.85	0.66	0.31	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	300	98	250	75	127	71	270	66	167
Temperature (Field)	deg c	--	15	--	7.8	--	7	6	10.4	4.5	10.5	6
Total Dissolved Solids	mg/l	--	500	680	477	989	394	513	484	1130	332	661
Total Organic Carbon	mg/l	--	--	15.4	15.1	15.1	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	304	516	232	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	<0.001	0.0007	0.0005	0.0007	0.0006	0.0004
Boron, dissolved	mg/l	5	--	1.4	0.804	1.33	0.732	0.807	0.683	1.32	0.535	0.84
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00004	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	148	84.9	134	64.9	91.9	93.3	117	43	97.5
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	0.006	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.005	0.002	0.005	<0.002	0.003	<0.002	0.003	<0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.071	0.364	0.057	0.153	0.042	0.12	0.039	0.387	0.069
Lead, dissolved	mg/l	0.01	--	0.0003	0.0007	<0.0002	<0.0002	<0.0001	0.00006	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	43.5	28.6	42.6	24.1	26.7	25.5	62.3	15.3	37.2
Manganese, dissolved	mg/l	--	0.05	0.086	0.728	0.077	0.383	0.158	0.119	0.029	0.272	0.037
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	4.1	2.1	4.8	3.7	3.1	1.9	12.1	2.3	6.5
Selenium, dissolved	mg/l	0.05	--	--	<0.001	0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	119	47.6	149	62.9	57.6	39.7	213	45.2	110
Zinc, dissolved	mg/l	--	5	0.005	0.007	0.008	0.005	0.007	<0.005	<0.005	<0.005	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 19-Nov-2004	MW-E 24-May-2005	MW-E 16-Nov-2005	MW-E 25-May-2006	MW-E 21-Nov-2006	MW-E 15-May-2007	MW-E 30-Nov-2007	MW-E 22-May-2008	MW-E 10-Nov-2008
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--	<0.0006	<0.0006
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 19-May-2009 G-11	MW-E 26-Nov-2009 J-6	MW-E 25-May-2010 M-23	MW-E 20-Oct-2010 G-20	MW-E 24-May-2011 G-34	MW-E 29-Nov-2011 MW-E	MW-E 31-May-2012 [29] MW-E	MW-E 28-Nov-2012 MW-E	MW-E 29-May-2013 MW-E
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	336	361	464	316	243	485	310	270	280
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	<2 [8]	1.6	2.0	1.5
Alkalinity (Total as CaCO3)	mg/l	--	--	336	361	464	316	243	485	310	270	280
Ammonia Nitrogen	mg/l	--	--	0.05	0.08	0.21	<0.02	0.03	0.05	<0.050	0.092	0.11
Chemical Oxygen Demand	mg/l	--	--	43	88	43	50	20	50	30	30	58
Chloride	mg/l	--	250	61	50	84	66	30	126	46	48	32
Conductivity	uS/cm	--	--	1050	1040	1430	1050	629	1590	--	--	--
Conductivity (Field)	uS/cm	--	--	550	1140	1070	1012	470	1538	918	1194	630
Hardness, Calcium Carbonate	mg/l	--	--	327	379	426	436	252	443	260	420	300
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.59	0.49	0.71	0.47	0.23	0.83	0.74	0.88	2.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	<0.10	<0.10	<0.10
pH	-	--	--	7.64	7.99	7.89	7.76	8.10	8.12	7.73	--	7.76
pH (Field)	-	--	--	--	6.69	7.36	7.4	7.07	7.32	7.16	7.46	7.19
Phosphorus	mg/l	--	--	1.00	0.26	0.30	0.24	0.12	0.06	0.16	0.18	1.7
Sulphate	mg/l	--	500 [6]	125	125	163	152	44	205	150	260	99
Temperature (Field)	deg c	--	15	8	7.8	21.1	11.4	12.5	8.0	12.6	5.7	11.2
Total Dissolved Solids	mg/l	--	500	683	676	930	683	409	1030	760	832	554
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.001	<0.0010
Boron, dissolved	mg/l	5	--	0.55	0.9	0.73	0.61	0.31	0.97	0.37	0.53	0.38
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	78	99	88	122	68	95	68	110	82
Chromium, dissolved	mg/l	0.05	--	0.002	0.003	0.003	0.003	0.003	0.004	<0.0050	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0003	0.0006	0.0006	0.0003	0.0008	0.0003	<0.00050	<0.0005	0.00082
Copper, dissolved	mg/l	--	1	0.003	0.003	0.004	0.003	0.004	0.005	0.0033	0.003	0.0025
Iron, dissolved	mg/l	--	0.3	0.59	0.17	1.59	0.33	0.59	0.07	0.22	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	32	32	50	32	20	50	21	32	23
Manganese, dissolved	mg/l	--	0.05	0.14	0.36	0.27	0.09	0.37	0.02	0.14	0.023	0.36
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	5	8	9	3	3	9	2.7	3.2	1.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	86	77	137	74	36	167	63	86	47
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.0050	<0.005	<0.0050

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 19-May-2009 G-11	MW-E 26-Nov-2009 J-6	MW-E 25-May-2010 M-23	MW-E 20-Oct-2010 G-20	MW-E 24-May-2011 G-34	MW-E 29-Nov-2011 MW-E	MW-E 31-May-2012 [29] MW-E	MW-E 28-Nov-2012 MW-E	MW-E 29-May-2013 MW-E
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.0010
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020	<0.00020

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 26-Nov-2013 GW-14	MW-E 29-May-2014 [22] MW-E	MW-E 19-Nov-2014 [19] MW-E	MW-E 02-Jun-2015 MW-E	MW-E 26-Nov-2015 MW-E	MW-E 26-May-2016 MW-E	MW-E 17-Nov-2016 MW-E	MW-E 24-May-2017 MW-E	MW-E 29-Nov-2017 MW-E
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	460	240	460	509	621	529	374	393	469
Alkalinity, Carbonate as CaCO3	mg/l	--	--	2.9	1.3	2.5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	460	240	460	511	623	531	375	384	471
Ammonia Nitrogen	mg/l	--	--	0.12	0.13	0.073	0.21	0.09	0.29	0.07	0.09	0.10
Chemical Oxygen Demand	mg/l	--	--	120	60	72	14	105	73	49	50	47
Chloride	mg/l	--	250	120	54	41	114	124	120	111	82	88
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1455	601	1192	1293	1692	1472	1728	1080	1221
Hardness, Calcium Carbonate	mg/l	--	--	570	210	660	404	718	395	830	533	609
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	6.4	7.0	2.8	0.7	1.6	1.2	0.8	0.9	0.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	--	--	--	--	--	--
pH	-	--	--	7.83	7.77	7.76	--	--	--	--	--	--
pH (Field)	-	--	--	7.41	7.61	7.34	7.12	7.40	7.64	7.81	7.46	7.67
Phosphorus	mg/l	--	--	3.1	1.2	2.2	0.17	0.95	0.45	0.21	0.43	0.24
Sulphate	mg/l	--	500 [6]	320	120	240	227	225	241	436	272	393
Temperature (Field)	deg c	--	15	7.0	11.6	5.3	11.0	7.6	11.3	9.7	10.8	5.6
Total Dissolved Solids	mg/l	--	500	1110	588	850	922	1090	1070	1120	908	1090
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Arsenic, dissolved	mg/l	0.01	--	<0.0010	<0.0010	<0.0010	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	1	0.25	0.79	0.39	1.42	0.503	1.24	0.457	0.448
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	130	56	180	103	139	104	214	128	163
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001	0.006	0.002	<0.001
Cobalt, dissolved	mg/l	--	--	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0027	0.0048	0.0033	<0.0005	<0.0005	0.0017	0.0034	0.0024	0.0026
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	60	16	49	35.5	90	32.9	71.5	52.2	49.1
Manganese, dissolved	mg/l	--	0.05	0.023	<0.0020	0.02	<0.005	0.035	0.032	<0.005	0.031	0.012
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	1.5	3.4	3.43	10.6	3.55	8.2	3.35	4.21
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	200	31	100	71	218	65.5	173	122	87.7
Zinc, dissolved	mg/l	--	5	0.02	<0.0050	<0.0050	<0.005	0.009	0.005	<0.005	0.006	<0.005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 26-Nov-2013 GW-14	MW-E 29-May-2014 [22] MW-E	MW-E 19-Nov-2014 [19] MW-E	MW-E 02-Jun-2015 MW-E	MW-E 26-Nov-2015 MW-E	MW-E 26-May-2016 MW-E	MW-E 17-Nov-2016 MW-E	MW-E 24-May-2017 MW-E	MW-E 29-Nov-2017 MW-E
Phenols												
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	0.002	<0.001	0.004	0.002	<0.001	<0.001
Semi-VOCs												
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--
VOCs												
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.0010	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00040	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 24-May-2018	MW-E 22-Nov-2018	MW-E 19-Jun-2019	MW-E 20-Nov-2019	MW-E 21-May-2020	MW-E 26-Nov-2020	MW-E 26-May-2021	MW-E 30-Nov-2021
				MW-E	MW-E	MW-E	MW-E	MW-E	MW-E	MW-E	MW-E
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	492	416	366	472	244	521	375	239
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	10	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	494	418	368	476	245	531	377	241
Ammonia Nitrogen	mg/l	--	--	0.10	0.06	0.26	0.05	0.02	0.03	0.08	0.05
Chemical Oxygen Demand	mg/l	--	--	59	113	103	102	44	56	23	73
Chloride	mg/l	--	250	71	140	70	124	33	135	94	80
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1183	1298	935	1887	631	1783	1474	1044
Hardness, Calcium Carbonate	mg/l	--	--	371	798	388	627	267	739	284	370
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.9	2.2	1.6	1.5	0.8	0.8	0.7	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.19	7.72	7.12	7.78	7.79	7.98	7.07	7.40
Phosphorus	mg/l	--	--	0.36	1.39	0.93	1.32	0.25	0.19	0.19	0.31
Sulphate	mg/l	--	500 [6]	289	407	138	60	86	451	300	271
Temperature (Field)	deg c	--	15	10.9	4.9	13.9	7.4	11.6	6.7	11.9	4.7
Total Dissolved Solids	mg/l	--	500	1030	1160	662	1360	400	1300	868	772
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.255	1.12	0.235	0.854	0.217	0.871	0.245	0.343
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	104	187	100	150	73.3	168	77.7	100
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0017	0.0046	0.0034	0.0035	0.0070	0.0045	0.0024	0.0039
Iron, dissolved	mg/l	--	0.3	<0.1	0.157	<0.1	0.151	0.924	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	0.0006	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	27.2	80.1	33.5	61.2	20.3	77.6	21.9	29.1
Manganese, dissolved	mg/l	--	0.05	0.639	0.11	0.342	<0.005	0.142	0.046	0.006	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	1.59	13.2	4.77	10.4	1.59	12.4	1.6	1.74
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	37.9	198	76.4	152	35.5	191	47.7	75.9
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	0.008	<0.005	<0.005	0.01

Report of Monitoring Results - Groundwater Immediately Downgradient Groundwater Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	MW-E 24-May-2018	MW-E 22-Nov-2018	MW-E 19-Jun-2019	MW-E 20-Nov-2019	MW-E 21-May-2020	MW-E 26-Nov-2020	MW-E 26-May-2021	MW-E 30-Nov-2021
				MW-E	MW-E	MW-E	MW-E	MW-E	MW-E	MW-E	MW-E
Phenols											
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.002	<0.001
Semi-VOCs											
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--
VOCs											
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [12]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2020).
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised July 2017).
(3)	Monitoring location was dry during this sampling event. No sample was collected.
(4)	Arsenic MRL elevated due to matrix interference.
(5)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.
(6)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.
(7)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(8)	pH < 8.3. Calculations not available.
(9)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(10)	Elevated Reporting Limit due to matrix interference.
(11)	GEN02 Elevated Reporting Limit due to matrix interference.
(12)	REV 1 Revision 1 - This report now includes data for Xylenes
(13)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly. Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(14)	Field Parameters were not measured
(15)	Elevated detection limit due to dilution required because of high target analyte concentration.
(16)	GEN04 Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(17)	Nitrite/Nitrate: Due to the colour interferences, sample required dilution. Detection limits were adjusted accordingly.
(18)	Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(19)	VOC Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(20)	Detection Limit was raised due to matrix interferences.
(21)	pH Parameter was not measured.
(22)	Elevated ion balance was confirmed by re-analysis.
(23)	TKN results may be biased low due to elevated dissolved salt content.
(24)	REV 1 Revision 1 - Data updated with corrected dilution factor
(25)	Metals MRL elevated due to matrix interference.
(26)	Inadvertently, no sample was collected at this location.
(27)	VOC Analysis: Due to high concentrations of non-target analytes, sample required dilution. Detection limits were adjusted accordingly.
(28)	VOC Analysis: Due to high concentrations of non- target analytes, sample required dilution. Detection limits were adjusted accordingly.
(29)	Elevated ion balance result was confirmed by re-analysis.

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1A 12-Feb-2010 [3] A	09-1A 26-Jan-2011 [3] 09-1A	09-1A 18-Jan-2012 [3] 1A	09-1A 12-Feb-2013 [3] 09-1A	09-1A 27-Aug-2014 MW 09-1A	09-1A 25-Aug-2015 MW09-1A
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	–	--	--	–	820	853
Alkalinity, Carbonate as CaCO3	mg/l	–	--	–	--	--	–	22	26
Alkalinity (Total as CaCO3)	mg/l	–	--	–	--	--	–	840	880
Ammonia Nitrogen	mg/l	–	--	–	--	--	–	1.4	1.26
Chemical Oxygen Demand	mg/l	–	--	–	--	--	–	39	27
Chloride	mg/l	–	250	–	--	--	–	410	433
Conductivity (Field)	uS/cm	–	--	–	--	--	–	2658	2694
Hardness, Calcium Carbonate	mg/l	–	--	–	--	--	–	36	33.7
Nitrate as N	mg/l	10.0	--	–	--	--	–	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	–	--	--	–	<0.010	<0.05
Nitrogen, Total Kjeldahl	mg/l	–	--	–	--	--	–	4.7	1.8
Nitrogen, Nitrate-Nitrite	mg/l	–	--	–	--	--	–	<0.10	--
pH	-	–	--	–	--	--	–	8.45	--
pH (Field)	-	–	--	–	--	--	–	8.6	9.48
Phosphorus	mg/l	–	--	–	--	--	–	0.56	0.14
Sulphate	mg/l	–	500 [6]	–	--	--	–	2	<1
Temperature (Field)	deg c	–	15	–	--	--	–	10.0	10.3
Total Dissolved Solids	mg/l	–	500	–	--	--	–	1640	1710
Metals									
Arsenic, dissolved	mg/l	0.01	--	–	--	--	–	<0.0010	<0.001
Boron, dissolved	mg/l	5	--	–	--	--	–	1.1	1.01
Cadmium, dissolved	mg/l	0.005	--	–	--	--	–	<0.00010	<0.0001
Calcium, dissolved	mg/l	–	--	–	--	--	–	3.2	1.89
Chromium, dissolved	mg/l	0.05	--	–	--	--	–	<0.0050	<0.001
Cobalt, dissolved	mg/l	–	--	–	--	--	–	<0.00050	<0.0005
Copper, dissolved	mg/l	–	1	–	--	--	–	<0.0050	<0.0005
Iron, dissolved	mg/l	–	0.3	–	--	--	–	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	–	--	--	–	<0.00050	<0.0001
Magnesium, dissolved	mg/l	–	--	–	--	--	–	6.8	7.03
Manganese, dissolved	mg/l	–	0.05	–	--	--	–	0.0059	0.006
Potassium, dissolved	mg/l	–	--	–	--	--	–	9.9	11.4
Sodium, dissolved	mg/l	–	200 [7]	–	--	--	–	640	628
Zinc, dissolved	mg/l	–	5	–	--	--	–	0.0063	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	–	--	–	--	--	–	<0.0010	0.002
VOCs									
1,1-Dichloroethane	mg/l	–	--	–	--	--	–	<0.00010	<0.0005
Benzene	mg/l	0.001	--	–	--	--	–	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	–	--	--	–	<0.00010	<0.0005
m,p-Xylenes	mg/l	–	--	–	--	--	–	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	–	--	--	–	<0.00050	<0.0050
o-Xylene	mg/l	–	--	–	--	--	–	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	–	--	--	–	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	–	--	--	–	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1A 18-Aug-2016 09-1A	09-1A 28-Aug-2017 [4] 09-1A	09-1A 29-Nov-2017 [3] 09-1A	09-1A 30-Aug-2018 09-1A	09-1A 28-Aug-2019 [5] 1A	09-1A 24-Aug-2021 09-1A
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	865	--	--	911	--	838
Alkalinity, Carbonate as CaCO3	mg/l	–	--	17	--	--	19	--	28
Alkalinity (Total as CaCO3)	mg/l	–	--	882	--	--	930	--	867
Ammonia Nitrogen	mg/l	–	--	1.26	--	--	1.47	--	1.47
Chemical Oxygen Demand	mg/l	–	--	67	--	--	38	--	36
Chloride	mg/l	–	250	438	--	--	445	--	403
Conductivity (Field)	uS/cm	–	--	2649	--	--	2630	--	2674
Hardness, Calcium Carbonate	mg/l	–	--	34	--	--	47	--	44.8
Nitrate as N	mg/l	10.0	--	<0.1	--	--	<0.1	--	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	--	--	<0.05	--	<0.05
Nitrogen, Total Kjeldahl	mg/l	–	--	1.9	--	--	2.1	--	1.8
Nitrogen, Nitrate-Nitrite	mg/l	–	--	–	--	--	–	--	--
pH	-	–	--	–	--	--	–	--	--
pH (Field)	-	–	--	8.59	--	--	8.44	--	8.20
Phosphorus	mg/l	–	--	0.34	--	--	0.13	--	0.07
Sulphate	mg/l	–	500 [6]	<1	--	--	3	--	<1
Temperature (Field)	deg c	–	15	11.8	--	--	10.1	--	16.4
Total Dissolved Solids	mg/l	–	500	1630	--	--	1560	--	1590
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	--	--	<0.001	--	<0.001
Boron, dissolved	mg/l	5	--	1.08	--	--	0.942	--	0.79
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	--	<0.0001	--	<0.0001
Calcium, dissolved	mg/l	–	--	2.59	--	--	6.04	--	4.6
Chromium, dissolved	mg/l	0.05	--	<0.001	--	--	<0.001	--	<0.001
Cobalt, dissolved	mg/l	–	--	<0.0005	--	--	<0.0005	--	<0.0005
Copper, dissolved	mg/l	–	1	<0.0005	--	--	0.0008	--	<0.0005
Iron, dissolved	mg/l	–	0.3	<0.1	--	--	<0.1	--	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	--	--	<0.0001	--	<0.0001
Magnesium, dissolved	mg/l	–	--	6.67	--	--	7.8	--	8.08
Manganese, dissolved	mg/l	–	0.05	0.006	--	--	0.011	--	0.006
Potassium, dissolved	mg/l	–	--	11.6	--	--	11.5	--	11.3
Sodium, dissolved	mg/l	–	200 [7]	597	--	--	647	--	552
Zinc, dissolved	mg/l	–	5	<0.005	--	--	0.006	--	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	–	--	<0.001	--	--	<0.001	--	<0.001
VOCs									
1,1-Dichloroethane	mg/l	–	--	<0.0005	--	--	<0.0005	--	<0.0005
Benzene	mg/l	0.001	--	<0.0005	--	--	<0.0005	--	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	--	<0.0005	--	<0.0005
m,p-Xylenes	mg/l	–	--	<0.0005	--	--	<0.0005	--	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	--	--	<0.0050	--	<0.0050
o-Xylene	mg/l	–	--	<0.0005	--	--	<0.0005	--	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	--	--	<0.0005	--	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	--	<0.0005	--	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1B 12-Feb-2010 [8] 1B	09-1B 26-Jan-2011 [3] 09-1B	09-1B 18-Jan-2012 [3] 1B	09-1B 12-Feb-2013 [3] 091B	09-1B 27-Aug-2014 MW 09-1B	09-1B 25-Aug-2015 MW09-1B	09-1B 18-Aug-2016 09-1B
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1270	--	--	--	1200	1170	1100
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	--	--	--	19	<25	10
Alkalinity (Total as CaCO3)	mg/l	--	--	1270	--	--	--	1300	1180	1110
Ammonia Nitrogen	mg/l	--	--	4.01	--	--	--	4.2	3.94	4.47
Chemical Oxygen Demand	mg/l	--	--	110	--	--	--	81	136	152
Chloride	mg/l	--	250	1350	--	--	--	1500	1420	1540
Conductivity	uS/cm	--	--	6500	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>5000	--	--	--	>3999	>3999	>3999
Hardness, Calcium Carbonate	mg/l	--	--	296	--	--	--	290	276	283
Nitrate as N	mg/l	10.0	--	<0.10	--	--	--	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	--	--	--	0.041	<0.05	<0.50 [11]
Nitrogen, Total Kjeldahl	mg/l	--	--	4.85	--	--	--	8.9	6.2	7.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	--	--
pH	-	--	--	8.13	--	--	--	8.20	--	--
pH (Field)	-	--	--	8.29	--	--	--	7.95	9.66	9.06
Phosphorus	mg/l	--	--	2.72	--	--	--	3.3	4.00	6.45
Sulphate	mg/l	--	500 [6]	23	--	--	--	<1	6	5
Temperature (Field)	deg c	--	15	3.1	--	--	--	10.9	11.6	11.3
Total Dissolved Solids	mg/l	--	500	4220	--	--	--	3530	3580	3740
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.02	--	--	--	0.0064	0.007	0.005
Boron, dissolved	mg/l	5	--	1.7	--	--	--	1.8	1.82	1.82
Cadmium, dissolved	mg/l	0.005	--	<0.001	--	--	--	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	31	--	--	--	32	28.7	29.7
Chromium, dissolved	mg/l	0.05	--	<0.005	--	--	--	<0.0050	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.002	--	--	--	<0.00050	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.01	--	--	--	<0.0050	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	2.2	--	--	--	0.93	0.763	<0.1
Lead, dissolved	mg/l	0.01	--	<0.01	--	--	--	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	53	--	--	--	50	49.5	50.7
Manganese, dissolved	mg/l	--	0.05	0.2	--	--	--	0.076	0.079	0.063
Potassium, dissolved	mg/l	--	--	32	--	--	--	32	30.2	32.6
Sodium, dissolved	mg/l	--	200 [7]	1340	--	--	--	1400	1170	1280
Zinc, dissolved	mg/l	--	5	<0.1	--	--	--	0.0084	0.023	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	--	--	--	<0.0010	<0.020 [10]	0.004
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0004	--	--	--	<0.00010	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	--	--	--	0.00010	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	--	--	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	--	--	--	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	--	--	--	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	--	--	--	<0.00010	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	--	--	--	<0.00020	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	--	--	--	<0.00020	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1B 28-Aug-2017 [4] 09-1B	09-1B 29-Nov-2017 09-1B	09-1B 30-Aug-2018 09-1B	09-1B 28-Aug-2019 [5] 1B	09-1B 20-Nov-2019 09-1B	09-1B 26-Nov-2020 09-1B	09-1B 24-Aug-2021 09-1B
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1120	1070	--	1260	1300	1360
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	<25 [11]	<25 [11]	--	<25	25	26
Alkalinity (Total as CaCO3)	mg/l	--	--	--	1130	1090	--	1270	1320	1390
Ammonia Nitrogen	mg/l	--	--	--	4.58	4.46	--	3.97	4.52	4.43
Chemical Oxygen Demand	mg/l	--	--	--	101	122	--	88	88	108
Chloride	mg/l	--	250	--	1620	1500	--	1570	1470	1370
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	3999	>3999	--	6430	>3999	>3999
Hardness, Calcium Carbonate	mg/l	--	--	--	308	363	--	363	401	453
Nitrate as N	mg/l	10.0	--	--	<0.1	<0.1	--	<0.1	<0.5 [12]	<0.5 [12]
Nitrite as N	mg/l	1.0	--	--	<0.05	<0.05	--	<0.05	<1.00 [13]	<0.25 [13]
Nitrogen, Total Kjeldahl	mg/l	--	--	--	7.8	6.0	--	4.6	4.9	4.5
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	8.06	8.04	--	8.18	8.47	7.86
Phosphorus	mg/l	--	--	--	8.13	2.79	--	2.19	3.01	2.06
Sulphate	mg/l	--	500 [6]	--	1	6	--	2	<1	2
Temperature (Field)	deg c	--	15	--	6.3	9.5	--	6.6	6.2	13.4
Total Dissolved Solids	mg/l	--	500	--	3740	3550	--	3690	3610	3680
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	0.005	0.003	--	0.004	0.004	0.003
Boron, dissolved	mg/l	5	--	--	1.87	1.3	--	1.78	1.75	1.77
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	--	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	--	37.4	42	--	41	38.1	43.3
Chromium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	--	0.0013	<0.0005	--	0.0011	0.0010	0.0005
Copper, dissolved	mg/l	--	1	--	0.0029	0.0010	--	0.0011	0.0039	0.0017
Iron, dissolved	mg/l	--	0.3	--	<0.1	0.743	--	0.486	0.207	0.802
Lead, dissolved	mg/l	0.01	--	--	<0.0001	<0.0001	--	<0.0001	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	--	52.2	62.7	--	63.2	74.3	83.6
Manganese, dissolved	mg/l	--	0.05	--	0.066	0.082	--	0.09	0.07	0.096
Potassium, dissolved	mg/l	--	--	--	34.9	33.8	--	36.8	33.5	34.5
Sodium, dissolved	mg/l	--	200 [7]	--	1320	1340	--	1220	1270	1120
Zinc, dissolved	mg/l	--	5	--	<0.005	0.009	--	<0.005	<0.005	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	<0.002 [10]	<0.001	--	<0.004 [10]	<0.004 [12]	<0.001
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005 [14]	<0.0005
Methylene Chloride	mg/l	0.05	--	--	<0.0050	<0.0050	--	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005 [14]	<0.0005
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1C 12-Feb-2010 1C	09-1C 26-Jan-2011 [15] S-2	09-1C 18-Jan-2012 [3] 1C	09-1C 12-Feb-2013 [3] 09-1C	09-1C 27-Aug-2014 MW 09-1C	09-1C 25-Aug-2015 MW09-1C
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	804	914	--	--	880	892
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<2 [9]	--	--	9.8	9
Alkalinity (Total as CaCO3)	mg/l	--	--	804	914	--	--	890	901
Ammonia Nitrogen	mg/l	--	--	2.15	1.54	--	--	2.7	2.14
Chemical Oxygen Demand	mg/l	--	--	43	150	--	--	280	221
Chloride	mg/l	--	250	624	710	--	--	780	799
Conductivity	uS/cm	--	--	3570	3910	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3240	3000	--	--	3545	3931
Hardness, Calcium Carbonate	mg/l	--	--	271	275	--	--	260	232
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	--	--	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	--	--	0.044	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.59	2.47	--	--	27	6.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	--
pH	-	--	--	7.97	7.88	--	--	8.07	--
pH (Field)	-	--	--	7.99	6.28	--	--	7.66	9.42
Phosphorus	mg/l	--	--	18.6	14.2	--	--	19	8.92
Sulphate	mg/l	--	500 [6]	41	20	--	--	<1	8
Temperature (Field)	deg c	--	15	3.5	4.2	--	--	9.8	10.7
Total Dissolved Solids	mg/l	--	500	2320	2540	--	--	1960	1980
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.006	<0.01	--	--	0.0036	0.004
Boron, dissolved	mg/l	5	--	0.70	0.91	--	--	0.8	0.755
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	--	--	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	41	41	--	--	37	30
Chromium, dissolved	mg/l	0.05	--	<0.005	0.020	--	--	<0.0050	<0.001
Cobalt, dissolved	mg/l	--	--	0.0014	0.0014	--	--	0.00082	0.0008
Copper, dissolved	mg/l	--	1	0.002	0.002	--	--	<0.0050	<0.0005
Iron, dissolved	mg/l	--	0.3	0.70	1.52	--	--	0.23	0.181
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	--	--	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	41	42	--	--	40	38.2
Manganese, dissolved	mg/l	--	0.05	0.77	0.92	--	--	0.71	0.971
Potassium, dissolved	mg/l	--	--	15	13	--	--	13	11.5
Sodium, dissolved	mg/l	--	200 [7]	657	810	--	--	670	552
Zinc, dissolved	mg/l	--	5	0.02	0.02	--	--	0.0062	<0.005
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	--	--	<0.0010	0.005
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0008	--	--	<0.00010	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.001	--	--	<0.00010	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.001	--	--	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0020	--	--	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0080	--	--	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.001	--	--	<0.00010	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.001	--	--	<0.00020	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0004	--	--	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1C 18-Aug-2016	09-1C 28-Aug-2017 [4]	09-1C 29-Nov-2017	09-1C 30-Aug-2018	09-1C 28-Aug-2019 [5]	09-1C 20-Nov-2019	09-1C 26-Nov-2020 [16]
				09-1C	09-1C	09-1C	09-1C	1C	09-1C	09-1C
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	979	--	1010	1000	--	937	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	5	--	18	9	--	10	--
Alkalinity (Total as CaCO3)	mg/l	--	--	984	--	1030	1010	--	947	--
Ammonia Nitrogen	mg/l	--	--	2.47	--	2.15	1.55	--	1.49	--
Chemical Oxygen Demand	mg/l	--	--	414	--	103	277	--	80	--
Chloride	mg/l	--	250	875	--	900	830	--	788	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3268	--	3394	3639	--	3730	--
Hardness, Calcium Carbonate	mg/l	--	--	265	--	278	257	--	375	--
Nitrate as N	mg/l	10.0	--	<0.1	--	<0.1	<0.1	--	0.6	--
Nitrite as N	mg/l	1.0	--	<0.50 [11]	--	<0.05	<0.05	--	0.25	--
Nitrogen, Total Kjeldahl	mg/l	--	--	8.0	--	4.2	3.8	--	2.5	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.22	--	7.97	7.96	--	7.9	--
Phosphorus	mg/l	--	--	11.8	--	7.18	2.82	--	1.64	--
Sulphate	mg/l	--	500 [6]	6	--	5	5	--	2	--
Temperature (Field)	deg c	--	15	12.1	--	6.4	9.4	--	7.1	--
Total Dissolved Solids	mg/l	--	500	2330	--	2290	2230	--	2250	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	--	0.004	0.003	--	0.003	--
Boron, dissolved	mg/l	5	--	0.748	--	0.785	0.629	--	0.672	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	<0.0001	<0.0001	--	<0.0001	--
Calcium, dissolved	mg/l	--	--	36.4	--	39.7	38.1	--	52.3	--
Chromium, dissolved	mg/l	0.05	--	<0.001	--	<0.001	<0.001	--	<0.001	--
Cobalt, dissolved	mg/l	--	--	0.0007	--	0.0007	0.0008	--	0.0010	--
Copper, dissolved	mg/l	--	1	<0.0005	--	0.0018	0.0042	--	0.0061	--
Iron, dissolved	mg/l	--	0.3	0.262	--	0.118	0.115	--	<0.1	--
Lead, dissolved	mg/l	0.01	--	<0.0001	--	<0.0001	0.0002	--	0.0002	--
Magnesium, dissolved	mg/l	--	--	42.2	--	43.4	39.4	--	59.3	--
Manganese, dissolved	mg/l	--	0.05	0.746	--	0.437	0.828	--	0.837	--
Potassium, dissolved	mg/l	--	--	14.8	--	13.9	12.8	--	20.1	--
Sodium, dissolved	mg/l	--	200 [7]	623	--	654	577	--	717	--
Zinc, dissolved	mg/l	--	5	<0.005	--	<0.005	0.01	--	<0.005	--
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.002	--	<0.002 [10]	<0.001	--	0.004	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0050	--	<0.0050	<0.0050	--	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
Toluene	mg/l	0.06	0.024	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	<0.0005	<0.0005	--	<0.0005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1C 26-Nov-2020 09-1C	09-1C 24-Aug-2021 09-1C
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	901	873
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25	11
Alkalinity (Total as CaCO3)	mg/l	--	--	913	884
Ammonia Nitrogen	mg/l	--	--	1.80	2.22
Chemical Oxygen Demand	mg/l	--	--	105	125
Chloride	mg/l	--	250	736	677
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3035	3668
Hardness, Calcium Carbonate	mg/l	--	--	294	268
Nitrate as N	mg/l	10.0	--	<0.5 [12]	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.25 [13]
Nitrogen, Total Kjeldahl	mg/l	--	--	2.8	3.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	8.13	7.63
Phosphorus	mg/l	--	--	1.39	3.28
Sulphate	mg/l	--	500 [6]	3	3
Temperature (Field)	deg c	--	15	6.0	13.2
Total Dissolved Solids	mg/l	--	500	2050	2050
Metals					
Arsenic, dissolved	mg/l	0.01	--	0.002	0.003
Boron, dissolved	mg/l	5	--	0.609	0.53
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	40.7	37
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0009	0.0007
Copper, dissolved	mg/l	--	1	0.0037	0.0011
Iron, dissolved	mg/l	--	0.3	<0.1	0.351
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	46.8	42.7
Manganese, dissolved	mg/l	--	0.05	0.832	0.835
Potassium, dissolved	mg/l	--	--	12.8	12
Sodium, dissolved	mg/l	--	200 [7]	619	501
Zinc, dissolved	mg/l	--	5	<0.005	<0.005
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	<0.004 [12]	<0.001
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005 [14]	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005 [14]	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 15-Jun-1994	94-4 01-Nov-1994	94-4 28-Jun-1995	94-4 22-Nov-1995	94-4 12-Oct-1996	94-4 06-Nov-1997	94-4 05-Jun-1998
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	1347	1442	1030	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1092	1123	1182	840	1280	1270	1220
Ammonia Nitrogen	mg/l	--	--	--	2.77	4.6	3.75	3.47	4.84	3.84
Chemical Oxygen Demand	mg/l	--	--	437	283	188	100	70	62	64
Chloride	mg/l	--	250	1900	1530	1685	1610	1570	1730	1580
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	6150	6900	7000	7440	7120	6190	6720
Dissolved Oxygen (Field)	mg/l	--	--	--	6.64	3.08	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	570	598	436	461	421	476	431
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	1.2	0.1	0.1	1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	11.3	5.75	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	6.7	2	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.77	8.08	7.89	8.36	7.69	8.5	--
Phosphate	mg/l	--	--	--	--	--	1.6	--	--	--
Phosphorus	mg/l	--	--	39.6	0.797	6.5	--	--	--	--
Sulphate	mg/l	--	500 [6]	27.4	13.8	5	32	15	3	38
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	3090	3460	3510	3720	3570	3470	3350
Total Organic Carbon	mg/l	--	--	19	25.9	22.5	17.5	19.2	18.5	18.4
Total Suspended Solids	mg/l	--	--	--	--	--	--	4520	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	0.02	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	**0.1**	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.124	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.34	1.465	1.3	1.19	1.43	1.47	1.65
Cadmium, dissolved	mg/l	0.005	--	--	**0.01**	0.0001	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	69	39.34	45.3	45.9	41.3	50	42.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.04	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0201	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.409	0.1	0.03	1.31	1.07	0.92	2.15
Lead, dissolved	mg/l	0.01	--	0.002	**0.1**	0.0009	0.0002	0.0002	0.0002	0.0003
Magnesium, dissolved	mg/l	--	--	96.6	58.416	77.4	83.1	76.3	84.2	78.1
Manganese, dissolved	mg/l	--	0.05	0.116	0.153	0.18	0.2	0.17	0.18	0.19
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.025	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	54.9	25.61	--	37.7	33.2	37.7	39.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1040	1327	1045	1150	1330	1210	1660
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.12

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 15-Jun-1994	94-4 01-Nov-1994	94-4 28-Jun-1995	94-4 22-Nov-1995	94-4 12-Oct-1996	94-4 06-Nov-1997	94-4 05-Jun-1998
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.049	--	0.001	--	--	--	--
Semi-VOCs										
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 06-May-1999	94-4 24-Oct-2000	94-4 14-Jun-2001	94-4 06-Nov-2002	94-4 30-May-2003	94-4 19-Nov-2004	94-4 16-Nov-2005
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1600	1730	1300	1720	1480	1610	160
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	90	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1310	1420	1210	1410	1220	1320	1310
Ammonia Nitrogen	mg/l	--	--	3.92	3.47	4.48	4.05	3.62	3.66	3.94
Chemical Oxygen Demand	mg/l	--	--	64	--	61	76	66	69	99
Chloride	mg/l	--	250	1690	1760	1500	1680	1650	1700	1600
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	6540	6790	5000	6700	5400	7110	5500
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	456	474	449	439	397	412	430
Nitrate as N	mg/l	10.0	--	--	0.1	0.1	0.1	0.1	1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	5.4	5.32	5.28	5.8	5.84	4.97	6.08
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.8	8.22	8	7.8	6.9	8	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	2.03	2.21	2.59	2.42	1.25	3.18
Sulphate	mg/l	--	500 [6]	1	1	6	2	1	10	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	3280	3850	3860	4040	2700	3555	3990
Total Organic Carbon	mg/l	--	--	24	--	17.3	17.5	17.1	17.1	21.1
Total Suspended Solids	mg/l	--	--	--	932	1560	1110	720	184	43
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.004	0.003	0.001	0.003	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.67	1.61	1.75	1.58	1.48	1.58	1.61
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	46.1	41.4	49.6	43.4	42.4	42.8	45.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	1.03	0.66	0.41	0.32	1.05	0.266	0.57
Lead, dissolved	mg/l	0.01	--	0.0005	**0.022**	0.0002	0.004	0.0009	0.0016	0.0004
Magnesium, dissolved	mg/l	--	--	81.8	90.1	79	80.2	70.8	74.2	76.7
Manganese, dissolved	mg/l	--	0.05	0.17	0.14	0.11	0.14	0.12	0.117	0.125
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	34.3	29.2	33.2	34	35.2	37.3	40.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [7]	1400	1410	1350	1430	1150	1590	1470
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.02	0.01	0.005	0.006

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 06-May-1999	94-4 24-Oct-2000	94-4 14-Jun-2001	94-4 06-Nov-2002	94-4 30-May-2003	94-4 19-Nov-2004	94-4 16-Nov-2005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	0.003	0.054	0.001	0.001	0.001	<0.001
Semi-VOCs										
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 15-May-2007	94-4 10-Nov-2008	94-4 26-Nov-2009 [24] J-2	94-4 24-May-2011 [25] G-25	94-4 29-Nov-2012 [26] 94-4	94-4 29-May-2014 [27] 94-4	94-4 26-Nov-2015 94-4
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1320	1230	1320	1260	1300	1300	1240
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [9]	39	25	29	<25 [28]
Alkalinity (Total as CaCO3)	mg/l	--	--	1320	1230	1320	1300	1300	1300	1240
Ammonia Nitrogen	mg/l	--	--	3.56	4	3.93	3.60	4.2	4.1	4.03
Chemical Oxygen Demand	mg/l	--	--	114	76	68	60	65	70	99
Chloride	mg/l	--	250	1750	1690	1630	1620	1500	1700	1710
Conductivity	uS/cm	--	--	--	--	7080	7310	--	--	--
Conductivity (Field)	uS/cm	--	--	4100	>5000	799	>3999	>3999	>3999	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	393	342	405	414	400	410	378
Nitrate as N	mg/l	10.0	--	0.1	<0.1	<0.10	<0.10	<0.10	<0.10	<0.1
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	<0.010	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	5.51	5.22	4.59	5.60	5.3	5.3	5.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	8.21	8.52	8.32	8.39	--
pH (Field)	-	--	--	8.4	7.9	6.89	7.94	8.02	7.29	8.04
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	1.20	1.50	1.6	1.4	1.60
Sulphate	mg/l	--	500 [6]	1	<1	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	8.8	5	7.8	11.1	6.7	10.0	9.0
Total Dissolved Solids	mg/l	--	500	4200	3770	4600	4750	3860	3600	3860
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.009	0.0057	<0.01	<0.01	0.0062	<0.0050	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.37	1.39	1.6	1.8	1.6	1.6	1.47
Cadmium, dissolved	mg/l	0.005	--	0.00005	<0.00002	<0.001	<0.0001	<0.00050	<0.00050	<0.0001
Calcium, dissolved	mg/l	--	--	41.8	33.6	42	42	43	41	26.1
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.025	<0.025	<0.001
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.002	0.0008	<0.0025	<0.0025	<0.0005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.01	0.003	<0.0050	0.0058	<0.0005
Iron, dissolved	mg/l	--	0.3	0.465	0.265	<0.3	0.34	<0.5	<0.5	<0.1
Lead, dissolved	mg/l	0.01	--	0.00012	<0.00002	<0.01	<0.001	<0.0025	<0.0025	<0.0001
Magnesium, dissolved	mg/l	--	--	70.3	62.8	73	75	72	73	75.9
Manganese, dissolved	mg/l	--	0.05	0.105	0.06	0.1	0.11	0.12	0.12	0.089
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	38.1	34.2	32	37	31	31	27
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1500	1200	1390	1430	1400	1300	1350
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.1	0.01	<0.025	<0.025	0.009

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 15-May-2007	94-4 10-Nov-2008	94-4 26-Nov-2009 [24] J-2	94-4 24-May-2011 [25] G-25	94-4 29-Nov-2012 [26] 94-4	94-4 29-May-2014 [27] 94-4	94-4 26-Nov-2015 94-4
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010	<0.002 [10]
Semi-VOCs										
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.004	<0.00020	<0.00020	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.005	<0.00020	<0.00020	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.005	<0.00020	<0.00020	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.01	<0.00020	<0.00020	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.04	<0.0010	<0.0010	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.005	<0.00020	<0.00020	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.005	<0.00040	<0.00040	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.002	<0.00040	<0.00040	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 24-May-2017 94-4	94-4 22-Nov-2018 94-4	94-4 19-Jun-2019 94-4	94-4 21-May-2020 94-4	94-4 30-Nov-2021 94-4
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1320	1310	1070	1280	1330
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [11]	<25 [11]	<25 [11]	<25 [13]	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1330	1330	1080	1300	1340
Ammonia Nitrogen	mg/l	--	--	5.16 [29]	4.05	4.36	4.15	4.34
Chemical Oxygen Demand	mg/l	--	--	107	102	84	121	195
Chloride	mg/l	--	250	1690	1810	1640	1980	1630
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3999	>3999	>3999	>3999	>3999
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	373	589	443	537	451
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.50 [11]	<1.00 [11]	<0.50 [11]	<0.05	<1.00 [13]
Nitrogen, Total Kjeldahl	mg/l	--	--	4.9	5.9	5.0	4.4	7.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.00	8.03	7.98	7.45	8.2
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.11	1.95	1.41	1.47	5.57
Sulphate	mg/l	--	500 [6]	<1	1	<1	<1	<1
Temperature (Field)	deg c	--	15	10.6	5.7	11.2	10.4	6.3
Total Dissolved Solids	mg/l	--	500	4040	3960	3690	4020	3970
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.01	0.003	0.003	0.002	0.002
Barium, dissolved	mg/l	1	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.17	1.58	0.14	1.64	1.57
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	41.7	61.8	48.2	52.2	44.8
Chromium, dissolved	mg/l	0.05	--	0.021	<0.001	<0.001	0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0009	0.0006	0.0007	0.0005
Copper, dissolved	mg/l	--	1	0.0012	0.0033	0.0012	0.0028	0.0011
Iron, dissolved	mg/l	--	0.3	<0.1	0.208	0.21	1.21	0.101
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	65.3	105	78.4	98.7	82.3
Manganese, dissolved	mg/l	--	0.05	0.089	0.138	0.112	0.13	0.105
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	32.5	42.5	32.5	37	29.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1360	1290	1060	1300	1090
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.007	0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-4 24-May-2017 94-4	94-4 22-Nov-2018 94-4	94-4 19-Jun-2019 94-4	94-4 21-May-2020 94-4	94-4 30-Nov-2021 94-4
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.010 [10]	<0.001	<0.001	0.012	<0.004 [12]
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1D 12-Feb-2010 [17] 1D	09-1D 26-Jan-2011 [18] S-1	09-1D 18-Jan-2012 [19] 09-1B	09-1D 12-Feb-2013 [20] 09-1B	09-1D 27-Aug-2014 [21] 09-1D	09-1D 25-Aug-2015 MW09-1D	09-1D 18-Aug-2016 [21] 91D
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	155	86	105	90	--	64	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<2 [9]	<2 [9]	<1.0	--	<5	--
Alkalinity (Total as CaCO3)	mg/l	--	--	155	86	105	90	--	64	--
Ammonia Nitrogen	mg/l	--	--	1.15	0.97	1.26	1.4	--	1.46	--
Chemical Oxygen Demand	mg/l	--	--	1980	1020	85	140	--	232	--
Chloride	mg/l	--	250	99	83	97	84	--	70	--
Conductivity	uS/cm	--	--	619	437	517	--	--	--	--
Conductivity (Field)	uS/cm	--	--	325	-- [22]	745	586	--	519	--
Hardness, Calcium Carbonate	mg/l	--	--	96	42	46	27	--	24.8	--
Nitrate as N	mg/l	10.0	--	<1	<0.10	<1.0	<1.0	--	<0.1	--
Nitrite as N	mg/l	1.0	--	<1	<0.10	<1.0	<0.10	--	<0.05	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.81	4.80	2.55	4.6	--	7.8	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	<1.0	--	--	--
pH	-	--	--	7.32	7.06	6.89	7.12	--	--	--
pH (Field)	-	--	--	7.68	-- [22]	7.51	7.20	--	7.55	--
Phosphorus	mg/l	--	--	0.19	0.45	0.03	<0.40 [23]	--	0.86	--
Sulphate	mg/l	--	500 [6]	<1	<1	<1	<1	--	<1	--
Temperature (Field)	deg c	--	15	0.4	-- [22]	0.4	2.8	--	18.6	--
Total Dissolved Solids	mg/l	--	500	402	284	336	320	--	196	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	--	<0.001	--
Boron, dissolved	mg/l	5	--	0.07	0.06	0.06	0.027	--	0.037	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	--
Calcium, dissolved	mg/l	--	--	22	7	7	4.8	--	4.07	--
Chromium, dissolved	mg/l	0.05	--	0.004	0.004	0.002	<0.005	--	<0.001	--
Cobalt, dissolved	mg/l	--	--	0.0005	0.0004	0.0005	<0.0005	--	<0.0005	--
Copper, dissolved	mg/l	--	1	0.003	0.002	0.002	0.003	--	<0.0005	--
Iron, dissolved	mg/l	--	0.3	0.86	1.29	1.24	0.65	--	0.682	--
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.0005	--	<0.0001	--
Magnesium, dissolved	mg/l	--	--	10	6	7	3.7	--	3.55	--
Manganese, dissolved	mg/l	--	0.05	0.19	0.14	0.15	0.091	--	0.089	--
Potassium, dissolved	mg/l	--	--	4	2	2	1.5	--	1.6	--
Sodium, dissolved	mg/l	--	200 [7]	101	67	86	41	--	40.8	--
Zinc, dissolved	mg/l	--	5	0.02	<0.01	0.02	0.015	--	0.024	--
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	0.004	<0.001	<0.0010	--	0.005	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0008	<0.0004	<0.00010	--	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	<0.001	<0.0005	<0.00010	--	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.001	<0.0005	<0.00010	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0020	<0.0005	<0.00010	--	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0080	<0.0040	<0.00050	--	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	<0.001	<0.0005	<0.00010	--	<0.0005	--
Toluene	mg/l	0.06	0.024	0.0007	<0.001	<0.0005	<0.00020	--	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0004	<0.0002	<0.00020	--	<0.0005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	09-1D 28-Aug-2017 09-1D	09-1D 30-Aug-2018 [21] 09-1D	09-1D 28-Aug-2019 [5] 1D	09-1D 21-Nov-2019 09-1D	09-1D 26-Nov-2020 09-1D	09-1D 24-Aug-2021 [21] 09-1D
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	50	--	--	72	103	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	--	--	<5	<5	--
Alkalinity (Total as CaCO3)	mg/l	--	--	50	--	--	72	103	--
Ammonia Nitrogen	mg/l	--	--	0.94	--	--	1.19	1.35	--
Chemical Oxygen Demand	mg/l	--	--	441	--	--	1400	187	--
Chloride	mg/l	--	250	62	--	--	74	107	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	313	--	--	506	505	--
Hardness, Calcium Carbonate	mg/l	--	--	42	--	--	35.4	46.7	--
Nitrate as N	mg/l	10.0	--	<0.1	--	--	<0.1	<0.1	--
Nitrite as N	mg/l	1.0	--	<0.05	--	--	<0.05	<0.05	--
Nitrogen, Total Kjeldahl	mg/l	--	--	6.2	--	--	12.5	3.3	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.80	--	--	6.82	6.92	--
Phosphorus	mg/l	--	--	0.23	--	--	0.62	0.11	--
Sulphate	mg/l	--	500 [6]	<1	--	--	2	<1	--
Temperature (Field)	deg c	--	15	18.1	--	--	4.9	5.3	--
Total Dissolved Solids	mg/l	--	500	212	--	--	238	328	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	<0.001	--	--	<0.001	<0.001	--
Boron, dissolved	mg/l	5	--	0.064	--	--	0.044	0.058	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--	--	<0.0001	<0.0001	--
Calcium, dissolved	mg/l	--	--	6.48	--	--	5.97	7.29	--
Chromium, dissolved	mg/l	0.05	--	<0.001	--	--	<0.001	<0.001	--
Cobalt, dissolved	mg/l	--	--	<0.0005	--	--	<0.0005	<0.0005	--
Copper, dissolved	mg/l	--	1	<0.0005	--	--	0.0014	0.0030	--
Iron, dissolved	mg/l	--	0.3	0.984	--	--	0.679	1.32	--
Lead, dissolved	mg/l	0.01	--	0.0001	--	--	0.0002	0.0002	--
Magnesium, dissolved	mg/l	--	--	6.31	--	--	4.97	6.91	--
Manganese, dissolved	mg/l	--	0.05	0.14	--	--	0.098	0.187	--
Potassium, dissolved	mg/l	--	--	2.2	--	--	2.86	2.29	--
Sodium, dissolved	mg/l	--	200 [7]	71.4	--	--	63.2	76.3	--
Zinc, dissolved	mg/l	--	5	<0.005	--	--	<0.005	0.007	--
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	--	--	0.008	<0.002 [12]	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0005	--	--	<0.0005	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	--	--	<0.0005	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--	--	<0.0005	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0005	--	--	<0.0005	<0.0005 [14]	--
Methylene Chloride	mg/l	0.05	--	<0.0050	--	--	<0.0050	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	--	--	<0.0005	<0.0005 [14]	--
Toluene	mg/l	0.06	0.024	<0.0005	--	--	<0.0005	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	--	--	<0.0005	<0.0005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 15-Jun-1994	94-5 02-Nov-1994	94-5 28-Jun-1995	94-5 22-Nov-1995	94-5 12-Jun-1996	94-5 12-Oct-1996	94-5 18-Jun-1997
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	841	929	81	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	622	701	762	804	796	840	871
Ammonia Nitrogen	mg/l	--	--	--	0.66	0.86	0.5	0.85	1.14	0.85
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	171	150	275	63	33	26	13
Chloride	mg/l	--	250	1400	795	880	915	900	870	881
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3550	4050	4060	4480	3850	4450	3900
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	7.95	7.27	--	--	--	2.34
Hardness, Calcium Carbonate	mg/l	--	--	448	474	425	444	449	419	499
Nitrate as N	mg/l	10.0	--	0.1	--	0.1	1.1	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	15.5	3.25	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	14.64	2.75	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.17	7.66	7.4	8.22	8.03	7.25	7.54
Phosphate	mg/l	--	--	--	--	--	0.8	--	--	--
Phosphorus	mg/l	--	--	6.7	0.391	7.22	--	--	--	--
Sulphate	mg/l	--	500 [6]	32.5	17.1	5	4	5	4	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1790	2040	2060	2240	2070	2230	1830
Total Organic Carbon	mg/l	--	--	12	16.5	22	9.1	12.2	11	9.9
Total Suspended Solids	mg/l	--	--	--	--	--	--	2940	1070	1880
Metals										
Aluminum, dissolved	mg/l	--	--	--	0.062	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	**0.1**	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.061	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.44	0.601	0.45	0.4	0.48	0.61	0.69
Cadmium, dissolved	mg/l	0.005	--	--	**0.01**	0.0001	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	66.6	48.11	57.2	57	56.6	53	69
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.03	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0173	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.39	0.175	0.02	0.9	1.2	0.55	0.53
Lead, dissolved	mg/l	0.01	--	0.0011	**0.1**	0.0005	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	68.5	44.206	67.8	72.4	73.8	68.7	78.3
Manganese, dissolved	mg/l	--	0.05	0.78	0.933	1.29	1.37	1.47	1.22	1.56
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	11.9	8.244	--	15.2	17.7	13.2	14.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	508	651.7	630	711	694	658	608
Zinc, dissolved	mg/l	--	5	0.01	0.012	0.01	0.01	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 15-Jun-1994	94-5 02-Nov-1994	94-5 28-Jun-1995	94-5 22-Nov-1995	94-5 12-Jun-1996	94-5 12-Oct-1996	94-5 18-Jun-1997
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.12	0.005	0.001	--	--	--	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 06-Nov-1997	94-5 05-Jun-1998	94-5 30-Oct-1998	94-5 06-May-1999	94-5 19-Oct-1999	94-5 05-May-2000	94-5 24-Oct-2000
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	996	1040	983	1220	1140
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	26	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	276	869	816	852	850	1000	935
Ammonia Nitrogen	mg/l	--	--	0.68	0.56	0.79	0.36	0.97	0.01	0.27
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	35	42	24	30	12	40	--
Chloride	mg/l	--	250	812	1020	910	970	951	845	1010
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3930	4280	4350	4030	3800	4025	4250
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	468	440	361	457	443	463	475
Nitrate as N	mg/l	10.0	--	0.6	1.8	--	--	--	0.2	0.8
Nitrite as N	mg/l	1.0	--	--	--	--	--	0.1	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	2.14	2.08	--	--	1.02
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.88	--	7.2	7.2	7.4	7.5	7.67
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.68
Sulphate	mg/l	--	500 [6]	98	37	2	2	2	2	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1990	2150	2180	2020	1900	4910	2260
Total Organic Carbon	mg/l	--	--	11.6	11.5	11.4	12.2	11.2	12.1	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	1320	--	556
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.62	0.64	0.75	0.6	0.84	0.78	0.66
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	65	55.8	49.4	59.4	61.2	60.1	56.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.44	1.69	0.2	0.93	1.53	4.96	0.22
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002	0.022
Magnesium, dissolved	mg/l	--	--	73.4	72.1	57.6	74	69.5	75.1	81.1
Manganese, dissolved	mg/l	--	0.05	1.68	1.85	1.8	1.93	1.58	1.62	1.88
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	15.6	13.4	16.2	17.4	16	11.1	13.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	613	893	762	765	876	770	763
Zinc, dissolved	mg/l	--	5	0.01	0.14	0.01	0.01	0.11	0.21	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 06-Nov-1997	94-5 05-Jun-1998	94-5 30-Oct-1998	94-5 06-May-1999	94-5 19-Oct-1999	94-5 05-May-2000	94-5 24-Oct-2000
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 14-Jun-2001	94-5 23-Nov-2001	94-5 23-May-2002	94-5 06-Nov-2002	94-5 30-May-2003	94-5 09-Oct-2003	94-5 14-May-2004
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	826	991	888	1140	915	--	939
Alkalinity, Carbonate as CaCO3	mg/l	--	--	39	1	38	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	741	812	791	936	750	845	770
Ammonia Nitrogen	mg/l	--	--	0.98	0.84	0.91	0.26	0.92	1.01	0.85
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	5	--
Chemical Oxygen Demand	mg/l	--	--	28	37	15	34	25	25	38
Chloride	mg/l	--	250	910	898	925	855	840	798	950
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3750	3560	770	4000	3280	3980	3950
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	189	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	458	465	455	435	419	395	444
Nitrate as N	mg/l	10.0	--	0.3	0.2	0.1	0.9	0.2	0.4	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2	1.94	1.68	1.17	2.16	2.09	2.31
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.5	7.22	6.74	7.4	6.8	7.4	7.6
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.37	1.31	0.85	0.64	1.18	1.21	1.4
Sulphate	mg/l	--	500 [6]	2	3	3	5	3	3	4
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2160	2260	2000	2300	1640	2118	1975
Total Organic Carbon	mg/l	--	--	10.3	16	12	11.4	11.1	24	9.2
Total Suspended Solids	mg/l	--	--	1120	1130	792	454	708	580	648
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.002	0.003	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.64	0.8	0.61	0.7	0.5	0.617	0.548
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	65.8	59.6	61.5	64.1	57.6	53.4	59.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.002	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	0.002
Iron, dissolved	mg/l	--	0.3	0.85	0.11	0.87	0.33	3.09	0.541	0.898
Lead, dissolved	mg/l	0.01	--	0.0032	0.0002	0.0002	0.006	0.0015	0.001	0.0015
Magnesium, dissolved	mg/l	--	--	71.3	76.9	73.1	71.1	66.9	63.7	71.8
Manganese, dissolved	mg/l	--	0.05	2.03	1.95	2.17	1.7	1.99	1.53	2.07
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.03	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	5.2	7.3	13.8	13.3	12.3	13.3	13.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	714	811	657	731	626	677	686
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.02	0.02	0.005	0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 14-Jun-2001	94-5 23-Nov-2001	94-5 23-May-2002	94-5 06-Nov-2002	94-5 30-May-2003	94-5 09-Oct-2003	94-5 14-May-2004
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.113	0.001	0.001	0.001	0.001	0.001	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 19-Nov-2004	94-5 24-May-2005	94-5 16-Nov-2005	94-5 25-May-2006	94-5 21-Nov-2006	94-5 15-May-2007	94-5 30-Nov-2007
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1070	1040	220	860	892	880	895
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	875	850	900	860	892	880	895
Ammonia Nitrogen	mg/l	--	--	0.32	0.92	0.04	0.98	0.54	0.94	0.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	34	25	25	25	49	89	75
Chloride	mg/l	--	250	943	853	886	942	906	928	939
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4370	4200	3000	3300	3450	2600	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	415	437	417	425	396	404	408
Nitrate as N	mg/l	10.0	--	1	0.2	0.7	0.2	0.3	0.1	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.22	1.97	0.97	1.89	2.2	2	1.72
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	7.2	--	7.6	7.2	8.1	8.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.54	0.78	1.86	--	--	--	--
Sulphate	mg/l	--	500 [6]	10	5	4	5	4	5	4
Temperature (Field)	deg c	--	15	--	8.4	--	4.5	7.5	7.3	5
Total Dissolved Solids	mg/l	--	500	2185	2170	2340	2370	2290	2240	2490
Total Organic Carbon	mg/l	--	--	10	9.2	11.2	--	--	--	--
Total Suspended Solids	mg/l	--	--	1450	852	436	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	0.0035	0.0056	0.0038
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.651	0.534	0.671	0.586	0.629	0.487	0.619
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00004	<0.00002
Calcium, dissolved	mg/l	--	--	56.9	57.5	58.3	56.7	52.6	54.7	57
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	<0.002	<0.002	0.007	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.676	0.226	0.149	1.93	0.759	1.35	0.076
Lead, dissolved	mg/l	0.01	--	0.0017	0.0017	0.0004	<0.0002	<0.0001	0.00004	<0.00002
Magnesium, dissolved	mg/l	--	--	66.5	71.3	66.1	69	64.4	65.1	64.5
Manganese, dissolved	mg/l	--	0.05	1.86	2.04	1.9	1.56	1.41	1.88	1.66
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	14.7	14.1	15.4	15	14.6	13	16.8
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	712	672	779	775	709	646	870
Zinc, dissolved	mg/l	--	5	0.005	0.008	0.008	<0.005	0.008	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 19-Nov-2004	94-5 24-May-2005	94-5 16-Nov-2005	94-5 25-May-2006	94-5 21-Nov-2006	94-5 15-May-2007	94-5 30-Nov-2007
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 22-May-2008	94-5 10-Nov-2008	94-5 19-May-2009	94-5 26-Nov-2009	94-5 20-Oct-2010 [30]	94-5 24-May-2011 [30]	94-5 29-Nov-2011 [30]
						G-13	J-5	G-24	G-38	94-5
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	820	860	832	869	863	853	852
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [9]	<2 [9]	<2 [9]	20	<2 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	820	860	832	869	863	873	852
Ammonia Nitrogen	mg/l	--	--	0.57	0.78	0.82	0.66	0.76	0.90	0.61
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	7	33	38	55	50	60	45
Chloride	mg/l	--	250	866	879	822	868	872	798	823
Conductivity	uS/cm	--	--	--	--	4010	4170	4120	4080	4050
Conductivity (Field)	uS/cm	--	--	3950	3500	3400	3511	3808	2603	3657
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	407	379	385	363	411	352	398
Nitrate as N	mg/l	10.0	--	0.2	0.3	0.19	0.12	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	2.1	1.64	1.47	1.12	1.37	1.67	1.05
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	7.94	8.17	8.04	8.40	7.95
pH (Field)	-	--	--	7.6	7.4	--	7.12	7.67	7.41	7.57
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	7.56	1.44	2.58	1.65	1.09
Sulphate	mg/l	--	500 [6]	5	4	5	7	6	5	5
Temperature (Field)	deg c	--	15	12	7	10	3.0	10.8	19.1	7.6
Total Dissolved Solids	mg/l	--	500	2220	2190	2610	2710	2680	2650	2630
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0052	0.0033	0.003	0.005	<0.01	<0.01	<0.01
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.543	0.584	0.60	0.73	0.62	0.42	0.63
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	55.1	51	52	48	54	47	54
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	0.009	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.0009	0.0011	0.0009	0.0010	0.0009
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.002	0.002	0.001	0.003	0.002
Iron, dissolved	mg/l	--	0.3	1.55	0.022	<0.03	0.34	0.75	0.43	0.17
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	65.6	61.1	62	59	67	57	64
Manganese, dissolved	mg/l	--	0.05	1.63	1.42	1.74	1.60	1.67	1.53	1.87
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	13.7	13.3	11	13	12	10	12
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	718	664	680	780	720	698	684
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.01	0.01	<0.01	0.02	<0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 22-May-2008	94-5 10-Nov-2008	94-5 19-May-2009 G-13	94-5 26-Nov-2009 J-5	94-5 20-Oct-2010 [30] G-24	94-5 24-May-2011 [30] G-38	94-5 29-Nov-2011 [30] 94-5
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	<0.0006	<0.0006	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 31-May-2012 [31]	94-5 29-Nov-2012	94-5 29-May-2013 [32]	94-5 26-Nov-2013	94-5 29-May-2014	94-5 19-Nov-2014	94-5 02-Jun-2015
				94-5	94-5	94-5	GW-16	94-5	94-5	94-5
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	810	830	820	870	810	840	756
Alkalinity, Carbonate as CaCO3	mg/l	--	--	7.6	11	7.3	9.2	10	7.9	8
Alkalinity (Total as CaCO3)	mg/l	--	--	820	840	830	880	820	850	765
Ammonia Nitrogen	mg/l	--	--	0.97	0.78	1.5	0.81	1.3	1.0	1.28
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	35	40	70	47	38	76	122
Chloride	mg/l	--	250	750	770	890	860	840	860	754
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3337	3227	3096	3225	3227	3726	3707
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	310	390	430	410	370	410	305
Nitrate as N	mg/l	10.0	--	<0.10	0.14	0.68	0.22	<0.10	0.18	<0.1
Nitrite as N	mg/l	1.0	--	0.12	<0.010	0.10	0.023	0.095	0.059	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.8	2.6	4.5	5.6	4.9	4.3	2.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.13	0.14	0.78	0.24	0.12	0.24	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.00	8.16	7.98	8.05	8.13	8.00	--
pH (Field)	-	--	--	7.48	7.66	6.95	7.54	6.60	7.59	7.43
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.8	2.1	8.7	4.0	3.4	10	1.27
Sulphate	mg/l	--	500 [6]	<1	1	<1	<1	<1	<1	8
Temperature (Field)	deg c	--	15	10.5	6.2	9.8	6.3	9.5	7.8	7.7
Total Dissolved Solids	mg/l	--	500	2050	2190	2370	2220	2100	2170	1910
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0015	0.0028	<0.0010	<0.0010	0.0013	0.0014	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.46	0.67	0.6	0.64	0.52	0.72	0.223
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	44	51	60	54	49	58	40.9
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.01 [34]	<0.001
Cobalt, dissolved	mg/l	--	--	0.00080	0.00075	0.0011	0.0011	0.00085	0.0010	0.0006
Copper, dissolved	mg/l	--	1	0.0023	0.0012	0.0020	0.0019	0.0023	0.0011	<0.0005
Iron, dissolved	mg/l	--	0.3	0.7	0.27	<0.1	<0.1	0.48	0.48	<0.1
Lead, dissolved	mg/l	0.01	--	0.0018	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001
Magnesium, dissolved	mg/l	--	--	49	64	68	67	61	66	49.3
Manganese, dissolved	mg/l	--	0.05	1.6	2.1	2.2	1.5	1.7	1.9	1.78
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.1	12	12	13	10	13	6.72
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	520	720	650	660	580	740	507
Zinc, dissolved	mg/l	--	5	0.0061	<0.0050	<0.0050	0.0065	<0.0050	<0.0050	0.007

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 31-May-2012 [31] 94-5	94-5 29-Nov-2012 94-5	94-5 29-May-2013 [32] 94-5	94-5 26-Nov-2013 GW-16	94-5 29-May-2014 94-5	94-5 19-Nov-2014 94-5	94-5 02-Jun-2015 94-5
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.0013	<0.00050	<0.00050	<0.00050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 26-Nov-2015	94-5 26-May-2016	94-5 17-Nov-2016	94-5 24-May-2017	94-5 29-Nov-2017	94-5 24-May-2018	94-5 22-Nov-2018
				94-5	94-5	94-5	94-5	94-5	94-5	94-5
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	871	878	912	905	902	929	977
Alkalinity, Carbonate as CaCO3	mg/l	--	--	9	7	7	7	10	9	10
Alkalinity (Total as CaCO3)	mg/l	--	--	880	885	918	912	912	938	987
Ammonia Nitrogen	mg/l	--	--	0.64	1.38	1.14	0.68	0.74	1.43	0.71
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	233	114	88	205	98	391	89
Chloride	mg/l	--	250	874	871	909	882	892	855	886
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3815	3748	3999	3702	3308	3860	3411
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	381	324	377	459	368	334	497
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.25 [11]	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.7	2.1	2.8	2.3	1.6	4.8	2.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.58	7.39	7.89	7.48	7.08	7.44	7.64
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.56	1.32	4.88	3.83	3.42	6.74	2.34
Sulphate	mg/l	--	500 [6]	10	7	7	8	13	8	11
Temperature (Field)	deg c	--	15	8.5	9.8	9.7	11.7	7.5	9.5	6.3
Total Dissolved Solids	mg/l	--	500	2210	2260	2270	2180	2080	2250	1560
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.004	0.003	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.627	0.457	0.775	0.396	0.601	0.455	1.12
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	37.6	45.2	51.6	55	51	50.8	65
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	0.012	0.008	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0008	0.0007	0.0007	0.0006	0.0009	0.0007	0.0013
Copper, dissolved	mg/l	--	1	<0.0005	0.0007	0.0010	0.0024	0.0011	<0.0005	0.0040
Iron, dissolved	mg/l	--	0.3	0.221	0.293	0.23	0.246	0.214	0.741	0.155
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	69.6	51.3	60.3	78.2	58.4	50.3	81.4
Manganese, dissolved	mg/l	--	0.05	1.62	1.67	2.17	1.78	2	1.82	1.52
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.2	10.4	10.7	8.18	11.7	8.73	16.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	731	498	699	807	675	507	795
Zinc, dissolved	mg/l	--	5	0.008	0.008	<0.005	0.006	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 26-Nov-2015 94-5	94-5 26-May-2016 94-5	94-5 17-Nov-2016 94-5	94-5 24-May-2017 94-5	94-5 29-Nov-2017 94-5	94-5 24-May-2018 94-5	94-5 22-Nov-2018 94-5
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	0.004	<0.002 [10]	<0.002 [12]	<0.002 [10]	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 19-Jun-2019 [33] 94-5	94-5 20-Nov-2019 94-5	94-5 21-May-2020 94-5	94-5 26-Nov-2020 94-5	94-5 26-May-2021 94-5	94-5 30-Nov-2021 94-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	848	819	838	867	857
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	12	9	<25	8	13
Alkalinity (Total as CaCO3)	mg/l	--	--	--	860	828	848	875	870
Ammonia Nitrogen	mg/l	--	--	--	0.94	0.97	0.68	0.91	0.52
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	--	159	104	91	60	91
Chloride	mg/l	--	250	--	995	1000	776	721	779
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	3810	2660	3270	3668	3761
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	471	426	416	409	369
Nitrate as N	mg/l	10.0	--	--	0.8	<0.1	<0.5 [12]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	--	3.1	2.0	1.4	1.4	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.61	8.23	7.86	7.45	7.76
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	4.76	3.96	0.72	1.14	0.83
Sulphate	mg/l	--	500 [6]	--	10	18	13	13	15
Temperature (Field)	deg c	--	15	--	7.7	7.7	6.6	10.4	6.7
Total Dissolved Solids	mg/l	--	500	--	2220	2120	2080	2130	2120
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	0.001	0.001	0.001	0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	--	0.387	0.432	0.463	0.381	0.473
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	--	63.8	57.1	55.3	53.9	49.9
Chromium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	--	0.0008	0.0009	0.0009	0.0008	0.0009
Copper, dissolved	mg/l	--	1	--	0.0014	0.0031	0.0030	0.0011	0.0025
Iron, dissolved	mg/l	--	0.3	--	0.297	1.19	0.292	0.423	<0.1
Lead, dissolved	mg/l	0.01	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	--	75.6	68.7	67.5	66.6	59.2
Manganese, dissolved	mg/l	--	0.05	--	1.81	1.94	2.04	2.32	2.36
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	--	19	11.9	11.7	9.62	11.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	--	745	665	665	551	581
Zinc, dissolved	mg/l	--	5	--	<0.005	<0.005	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-5 19-Jun-2019 [33] 94-5	94-5 20-Nov-2019 94-5	94-5 21-May-2020 94-5	94-5 26-Nov-2020 94-5	94-5 26-May-2021 94-5	94-5 30-Nov-2021 94-5
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	--	0.002	0.005	<0.002 [12]	<0.010 [12]	<0.004 [12]
Semi-VOCs									
Naphthalene	mg/l	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 15-Jun-1994	94-6 02-Nov-1994	94-6 28-Jun-1995	94-6 22-Nov-1995	94-6 12-Jun-1996	94-6 12-Oct-1996	94-6 18-Jun-1997
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	322	529	610	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	1	1	1	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	276	268	434	500	412	420	430
Ammonia Nitrogen	mg/l	--	--	--	0.11	0.01	0.03	0.1	0.04	0.2
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	141	105	80	70	35	33	14
Chloride	mg/l	--	250	245	266	275	236	216	248	347
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1280	1710	1850	1840	1730	2030	1880
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	9.02	6.31	--	--	--	5.05
Hardness, Calcium Carbonate	mg/l	--	--	180	290	254	234	248	191	309
Nitrate as N	mg/l	10.0	--	1.6	0.1	2.7	0.1	0.1	0.3	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	3.3	2.45	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	3.29	2.42	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.2	7.17	6.78	7.29	7.03	6.82	7.02
Phosphate	mg/l	--	--	--	--	--	0.8	--	--	--
Phosphorus	mg/l	--	--	4.39	0.196	1.68	--	--	--	--
Sulphate	mg/l	--	500 [6]	87	105	88	81	76	91	74
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	660	860	930	910	870	1020	930
Total Organic Carbon	mg/l	--	--	15.8	15.9	13.7	13.9	15.8	13	9
Total Suspended Solids	mg/l	--	--	--	--	--	--	1780	1430	953
Metals										
Aluminum, dissolved	mg/l	--	--	--	0.056	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	**0.1**	--	--	--	--	--
Barium, dissolved	mg/l	1	--	--	0.042	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.15	0.169	0.14	0.02	0.158	0.18	0.22
Cadmium, dissolved	mg/l	0.005	--	--	**0.01**	0.0001	0.0001	--	--	--
Calcium, dissolved	mg/l	--	--	38.4	47.33	51.7	40.4	39.8	31.7	52.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.03	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.0095	0.01	0.02	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.291	0.14	0.03	0.54	0.811	0.4	0.47
Lead, dissolved	mg/l	0.01	--	0.0006	**0.1**	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	20.4	16.666	30	32	35.5	26.7	42.5
Manganese, dissolved	mg/l	--	0.05	0.108	0.176	0.32	0.24	1.41	0.7	1.57
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	6.5	0.864	--	6	6.15	6.5	5.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	171	236.1	284	294	353	312	315
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 15-Jun-1994	94-6 02-Nov-1994	94-6 28-Jun-1995	94-6 22-Nov-1995	94-6 12-Jun-1996	94-6 12-Oct-1996	94-6 18-Jun-1997
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.15	0.001	0.001	--	--	--	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 06-Nov-1997	94-6 05-Jun-1998	94-6 29-Oct-1998	94-6 06-May-1999	94-6 19-Oct-1999	94-6 05-May-2000	94-6 24-Oct-2000
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	454	506	366	536	617
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	1	1	1	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	534	336	372	415	300	439	506
Ammonia Nitrogen	mg/l	--	--	0.88	0.07	0.19	0.09	0.13	0.01	0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	47	37	4	29	92	39	--
Chloride	mg/l	--	250	176	307	260	326	193	315	427
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1870	1720	2080	1770	1240	1750	2520
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.05	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	142	160	161	215	204	304	433
Nitrate as N	mg/l	10.0	--	0.1	1.1	--	--	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	--	--	1.58	1.29	--	--	1.16
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.41	--	6.7	6.7	7.8	6.9	6.85
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.63
Sulphate	mg/l	--	500 [6]	2.1	95	80	71	93	131	300
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1030	859	1030	890	620	875	1490
Total Organic Carbon	mg/l	--	--	15.1	11.8	13.5	13.1	27.5	14	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	416	1090	508
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.14	0.21	0.24	0.15	0.27	0.27	0.37
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	25.8	26.7	32.6	37.8	42.1	55.1	61.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.66	0.52	0.31	1.72	1.82	1.43	1.88
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0002	0.0006	0.0002	0.0022
Magnesium, dissolved	mg/l	--	--	18.6	22.3	19.4	29	23.7	40	67.5
Manganese, dissolved	mg/l	--	0.05	0.22	0.21	0.93	0.69	0.55	1.43	0.83
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	2.9	6.4	5.1	1.7	4.5	0.4	5.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	260	337	287	312	220	371	510
Zinc, dissolved	mg/l	--	5	0.01	0.23	0.01	0.01	0.16	0.24	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 06-Nov-1997	94-6 05-Jun-1998	94-6 29-Oct-1998	94-6 06-May-1999	94-6 19-Oct-1999	94-6 05-May-2000	94-6 24-Oct-2000
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	--	--	0.002
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 14-Jun-2001	94-6 23-Nov-2001	94-6 23-May-2002	94-6 06-Nov-2002	94-6 30-May-2003	94-6 09-Oct-2003	94-6 14-May-2004
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	453	373	462	340	337	--	545
Alkalinity, Carbonate as CaCO3	mg/l	--	--	39	1	17	1	1	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	435	306	407	279	276	408	447
Ammonia Nitrogen	mg/l	--	--	0.11	0.08	0.08	0.06	0.06	0.3	0.14
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	7	--
Chemical Oxygen Demand	mg/l	--	--	40	60	46	56	58	92	64
Chloride	mg/l	--	250	268	182	95.8	330	205	357	167
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1850	1290	1060	2140	1440	2150	1560
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	109	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	308	224	205	233	206	259	258
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.1	0.2	0.2	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.61	1.62	1.47	1.33	1.79	2.37	1.83
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	6.91	6.87	7.6	7	7.1	7
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.94	0.59	0.68	0.45	0.39	1.93	0.81
Sulphate	mg/l	--	500 [6]	170	92	30	190	127	146	109
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1130	860	596	1110	720	1221	780
Total Organic Carbon	mg/l	--	--	17.3	28	20	19.4	19.6	18	18.8
Total Suspended Solids	mg/l	--	--	700	716	394	348	442	3610	656
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.001	0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.2	0.11	0.1	0.3	0.14	0.477	0.394
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	66.8	58.1	54.2	52.3	49.6	43.2	48
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.001	0.001
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.002	0.007
Iron, dissolved	mg/l	--	0.3	0.46	0.03	0.58	0.02	0.13	0.846	0.022
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0007	0.0013	0.0002	0.0007	0.0008
Magnesium, dissolved	mg/l	--	--	34.2	19.1	16.9	24.9	19.9	36.7	33.7
Manganese, dissolved	mg/l	--	0.05	1.52	0.13	0.57	0.02	0.02	1.41	0.117
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.01	0.01
Potassium, dissolved	mg/l	--	--	0.4	0.4	2.8	1.1	2.3	6.2	3.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	301	218	150	299	237	385	267
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.005	0.006

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 14-Jun-2001	94-6 23-Nov-2001	94-6 23-May-2002	94-6 06-Nov-2002	94-6 30-May-2003	94-6 09-Oct-2003	94-6 14-May-2004
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.077	0.001	0.001	0.001	0.001	0.001	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 19-Nov-2004	94-6 24-May-2005	94-6 16-Nov-2005	94-6 25-May-2006	94-6 21-Nov-2006	94-6 15-May-2007	94-6 30-Nov-2007 [21]
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	512	598	259	340	492	452	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	<5	<5	<5	<5	<5	--
Alkalinity (Total as CaCO3)	mg/l	--	--	420	490	420	340	492	452	--
Ammonia Nitrogen	mg/l	--	--	0.22	<0.01	<0.01	0.04	<0.01	<0.01	--
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	54	71	49	52	59	107	--
Chloride	mg/l	--	250	179	149	238	113	155	207	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1670	2200	620	800	1150	950	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	302	287	186	172	275	262	--
Nitrate as N	mg/l	10.0	--	1	0.2	0.1	<0.1	<0.1	0.1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.64	1.62	1.49	1.19	1.14	1.99	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	7	--	7.5	7.7	7.6	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.68	0.65	0.67	--	--	--	--
Sulphate	mg/l	--	500 [6]	150	75	77	62	53	83	--
Temperature (Field)	deg c	--	15	--	8	--	5	6	7.9	--
Total Dissolved Solids	mg/l	--	500	835	863	820	593	828	881	--
Total Organic Carbon	mg/l	--	--	15	23.8	10.6	--	--	--	--
Total Suspended Solids	mg/l	--	--	434	392	352	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	<0.001	<0.001	0.0012	0.0014	--
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.517	0.284	0.15	0.107	0.25	0.22	--
Cadmium, dissolved	mg/l	0.005	--	--	<0.0001	<0.0001	<0.005	<0.0001	0.00004	--
Calcium, dissolved	mg/l	--	--	55.6	49.2	41.2	39.4	57.4	50.3	--
Chromium, dissolved	mg/l	0.05	--	0.002	<0.002	<0.002	<0.002	<0.002	<0.002	--
Cobalt, dissolved	mg/l	--	--	--	<0.005	<0.005	<0.005	<0.005	0.013	--
Copper, dissolved	mg/l	--	1	0.006	0.002	0.005	0.004	0.004	<0.002	--
Iron, dissolved	mg/l	--	0.3	0.013	0.029	0.012	0.037	0.057	0.051	--
Lead, dissolved	mg/l	0.01	--	0.0003	0.0006	0.0003	0.0002	<0.0001	0.00006	--
Magnesium, dissolved	mg/l	--	--	39.6	39.9	20.2	17.8	31.9	33.1	--
Manganese, dissolved	mg/l	--	0.05	0.081	0.62	0.071	0.368	0.99	0.332	--
Mercury, dissolved	mg/l	0.001	--	--	<0.00006	<0.00006	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	<0.01	<0.01	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.01	<0.01	<0.01	--	--	--	--
Potassium, dissolved	mg/l	--	--	2.9	3.8	14.6	14.9	13.3	10.5	--
Selenium, dissolved	mg/l	0.05	--	--	<0.001	<0.001	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	242	255	190	156	222	225	--
Zinc, dissolved	mg/l	--	5	0.005	0.01	0.009	0.009	0.021	<0.005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 19-Nov-2004	94-6 24-May-2005	94-6 16-Nov-2005	94-6 25-May-2006	94-6 21-Nov-2006	94-6 15-May-2007	94-6 30-Nov-2007 [21]
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	<0.001	<0.001	<0.001	<0.001	<0.001	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	<0.0007	--	--	--	--	--
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	<0.0004	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	--	<0.0001	<0.0001	<0.0001	--
1,1-Dichloroethylene	mg/l	0.014	--	--	<0.0001	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	<0.0002	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	<0.0001	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	<0.0001	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	<0.0001	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	<0.0002	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
Bromoform	mg/l	--	--	--	<0.0001	--	--	--	--	--
Bromomethane	mg/l	--	--	--	<0.002	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	<0.0002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	<0.0002	--	--	--	--	--
Chloroform	mg/l	--	--	--	<0.0003	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	<0.0001	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	--	<0.0005	<0.0005	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	<0.001	--	<0.001	<0.001	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	<0.0003	--	<0.0003	<0.0003	<0.0003	--
o-Xylene	mg/l	--	--	--	<0.0005	--	<0.0005	<0.0005	<0.0005	--
Tetrachloroethylene	mg/l	0.01	--	--	<0.0002	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	--	<0.0005	0.0008	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	<0.0001	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	<0.0001	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	<0.0001	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	--	<0.0002	<0.0002	<0.0002	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 22-May-2008	94-6 10-Nov-2008	94-6 19-May-2009 G-17	94-6 26-Nov-2009 J-3	94-6 25-May-2010 [30] M-22	94-6 20-Oct-2010 [30] G-25	94-6 24-May-2011 [30] G-37
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	309	430	453	501	432	538	490
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<2 [9]	<2 [9]	<2 [9]	<2 [9]	<2 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	309	430	453	501	432	538	490
Ammonia Nitrogen	mg/l	--	--	0.02	<0.01	0.04	0.05	0.04	0.03	0.04
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	65	64	45	55	40	80	60
Chloride	mg/l	--	250	71.1	220	190	195	161	124	160
Conductivity	uS/cm	--	--	--	--	1590	1610	1470	1420	1500
Conductivity (Field)	uS/cm	--	--	625	1400	1200	1144	1400	1363	1319
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	105	246	271	282	271	336	332
Nitrate as N	mg/l	10.0	--	0.1	0.2	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	3.09	1.79	0.95	0.65	0.61	0.92	1.34
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	7.34	7.69	7.40	7.53	8.03
pH (Field)	-	--	--	7.4	6.6	--	4.87	6.61	7.67	6.46
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	2.00	0.55	0.58	0.97	0.59
Sulphate	mg/l	--	500 [6]	26	120	77	56	56	35	42
Temperature (Field)	deg c	--	15	13	5	7	6.7	27.1	11.8	15.0
Total Dissolved Solids	mg/l	--	500	458	960	1030	1050	956	923	975
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	0.0017	0.0016	0.001	0.001	<0.01	<0.001	<0.01
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.138	0.378	0.35	0.20	0.27	0.23	0.27
Cadmium, dissolved	mg/l	0.005	--	<0.00002	<0.00002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	25.2	44.6	54	62	49	77	57
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	0.006	0.004	0.006	0.008	0.009
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.0022	0.0010	0.0023	0.0005	0.0027
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.003	0.003	0.002	0.003	0.004
Iron, dissolved	mg/l	--	0.3	0.942	0.423	<0.03	0.06	0.62	0.03	1.12
Lead, dissolved	mg/l	0.01	--	<0.00002	<0.00002	<0.001	<0.001	<0.001	<0.001	<0.001
Magnesium, dissolved	mg/l	--	--	10.3	32.8	33	31	36	35	46
Manganese, dissolved	mg/l	--	0.05	1.64	0.245	1.17	0.75	1.73	0.09	1.88
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	28.2	11.3	10	15	9	14	7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	108	271	234	208	198	166	224
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.01	0.01	<0.01	0.01	0.02

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 22-May-2008	94-6 10-Nov-2008	94-6 19-May-2009 G-17	94-6 26-Nov-2009 J-3	94-6 25-May-2010 [30] M-22	94-6 20-Oct-2010 [30] G-25	94-6 24-May-2011 [30] G-37
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	<0.0006	<0.0006	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.0004	<0.0004	0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 29-Nov-2011 [30]	94-6 31-May-2012	94-6 29-Nov-2012 [31]	94-6 29-May-2013 [35]	94-6 26-Nov-2013	94-6 29-May-2014	94-6 19-Nov-2014 [36]
				94-6	94-6	94-6	94-6	GW-11	94-6	94-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	475	370	360	380	360	310	420
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<1.0	<1.0	1.3	<1.0	<1.0	<1.0
Alkalinity (Total as CaCO3)	mg/l	--	--	475	370	360	380	360	310	420
Ammonia Nitrogen	mg/l	--	--	<0.02	<0.050	0.14	0.25	<0.050	0.099	0.12
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	45	76	58	140	39	50	70
Chloride	mg/l	--	250	236	150	160	270	200	140	260
Conductivity	uS/cm	--	--	1740	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1373	1246	1258	1149	1303	960	1311
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	291	280	340	310	330	270	320
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	1.17	1.7	2.6	5.7	2.4	4.7	<2.0 [23]
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	7.63	7.42	7.44	7.56	7.31	7.36	7.33
pH (Field)	-	--	--	6.62	6.86	6.91	7.49	7.32	6.77	6.74
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.25	0.80	0.96	9.1	0.59	0.55	2.0
Sulphate	mg/l	--	500 [6]	89	120	130	130	150	55	62
Temperature (Field)	deg c	--	15	6.5	11.8	4.1	11.6	5.5	12.1	5.6
Total Dissolved Solids	mg/l	--	500	1130	896	936	934	902	624	1060
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.01	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.40	0.29	0.35	0.27	0.31	0.15	0.32
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010
Calcium, dissolved	mg/l	--	--	54	47	59	52	56	53	58
Chromium, dissolved	mg/l	0.05	--	0.006	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0009	0.00052	0.00073	0.0012	0.00063	0.00050	0.0014
Copper, dissolved	mg/l	--	1	0.002	0.0025	0.0020	0.0020	0.0015	0.0041	0.0010
Iron, dissolved	mg/l	--	0.3	0.90	<0.1	1	0.13	<0.1	<0.1	1.3
Lead, dissolved	mg/l	0.01	--	<0.001	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Magnesium, dissolved	mg/l	--	--	38	40	46	43	46	34	43
Manganese, dissolved	mg/l	--	0.05	2.25	0.64	2.3	0.67	1.2	0.61	2.9
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6	4.7	7.1	4.1	5.7	4.4	6.5
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	244	240	330	180	290	160	330
Zinc, dissolved	mg/l	--	5	<0.01	<0.0050	0.0055	<0.0050	0.011	0.0065	0.0054

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 29-Nov-2011 [30]	94-6 31-May-2012	94-6 29-Nov-2012 [31]	94-6 29-May-2013 [35]	94-6 26-Nov-2013	94-6 29-May-2014	94-6 19-Nov-2014 [36]
				94-6	94-6	94-6	94-6	GW-11	94-6	94-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.0010	<0.0010	0.0072	<0.0010	<0.0010	0.0011
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.00050	<0.00050	<0.0025	<0.00050	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.00020	<0.00020	<0.0010	<0.00020	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.00020	<0.00020	<0.0010	<0.00020	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 02-Jun-2015	94-6 26-Nov-2015	94-6 26-May-2016	94-6 17-Nov-2016	94-6 24-May-2017	94-6 29-Nov-2017	94-6 24-May-2018
				94-6	94-6	94-6	94-6	94-6	94-6	94-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	483	521	578	547	436	513	551
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	484	522	579	548	424	514	552
Ammonia Nitrogen	mg/l	--	--	0.52	0.58	0.37	0.27	0.38	0.15	0.43
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	73	156	101	63	58	91	100
Chloride	mg/l	--	250	332	372	459	428	306	396	382
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1405	1598	1517	1736	1574	1555	1737
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	218	276	317	261	364	255	323
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.3	5.3	1.3	0.9	2.3	1.1	1.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.70	6.91	7.19	7.74	7.03	7.39	6.72
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.35	6.20	0.56	0.35	0.38	0.46	0.43
Sulphate	mg/l	--	500 [6]	64	81	70	81	102	101	87
Temperature (Field)	deg c	--	15	10.0	7.2	12.6	9.2	11.6	5.7	11.7
Total Dissolved Solids	mg/l	--	500	1050	1210	1380	1280	1050	1160	1260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	0.001	0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.142	0.202	0.154	0.332	0.185	0.201	0.241
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	39.2	47.8	65.7	51.9	70.2	53.2	67
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	0.006	0.005	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0015	0.0009	0.0027	<0.0005	0.0007	<0.0005	0.0021
Copper, dissolved	mg/l	--	1	<0.0005	<0.0005	0.0018	0.0037	0.0040	0.0019	0.0010
Iron, dissolved	mg/l	--	0.3	0.214	0.131	0.168	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	29.1	38	37.3	31.9	45.7	29.6	37.7
Manganese, dissolved	mg/l	--	0.05	1.28	1.29	1.7	0.148	1.4	0.18	2.19
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	3.46	3.72	4.51	3.83	4.03	4.02	4.29
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	147	212	160	182	292	166	202
Zinc, dissolved	mg/l	--	5	0.006	0.012	0.008	0.006	0.006	<0.005	0.007

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 02-Jun-2015	94-6 26-Nov-2015	94-6 26-May-2016	94-6 17-Nov-2016	94-6 24-May-2017	94-6 29-Nov-2017	94-6 24-May-2018
				94-6	94-6	94-6	94-6	94-6	94-6	94-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.004 [10]	0.003	<0.001	<0.002 [10]	<0.002 [10]	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 29-Nov-2018	94-6 19-Jun-2019	94-6 20-Nov-2019	94-6 21-May-2020	94-6 26-Nov-2020	94-6 26-May-2021	94-6 30-Nov-2021
				94-6	94-6	94-6	94-6	94-6	94-6	94-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	448	461	516	338	364	344	315
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	449	463	518	339	364	345	316
Ammonia Nitrogen	mg/l	--	--	0.04	0.32	0.19	0.06	0.16	0.07	0.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	62	86	80	52	58	34	63
Chloride	mg/l	--	250	240	263	460	292	276	224	245
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1451	1427	1531	1616	1372	1696	1777
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	394	411	390	331	256	323	349
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.2	1.8	1.1	0.9	0.7	0.8	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.58	7.22	6.91	7.62	6.93	6.80	7.13
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.77	0.66	0.88	0.39	0.24	0.40	0.40
Sulphate	mg/l	--	500 [6]	150	149	112	271	231	226	325
Temperature (Field)	deg c	--	15	4.3	15.2	6.3	8.9	5.5	12.0	4.3
Total Dissolved Solids	mg/l	--	500	948	1070	1400	1010	1070	972	1170
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Aluminum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Barium, dissolved	mg/l	1	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.42	0.147	0.262	0.201	0.174	0.157	0.274
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	78.4	96.6	66.3	64.8	51.3	77.9	70.9
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0010	0.0008	0.0007	0.0011	<0.0005	0.0027	<0.0005
Copper, dissolved	mg/l	--	1	0.0018	0.0052	0.0076	0.0047	0.0035	0.0020	0.0022
Iron, dissolved	mg/l	--	0.3	0.918	<0.1	0.64	1.01	0.117	0.329	0.248
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	0.0015	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	48.1	41.2	54.4	41	31	31.2	41.7
Manganese, dissolved	mg/l	--	0.05	0.899	1.11	1.45	1.08	0.368	2.14	0.871
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.01	7.68	9.81	4.6	3.7	5.54	5.09
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	316	218	411	212	151	156	263
Zinc, dissolved	mg/l	--	5	<0.005	0.007	0.006	0.008	0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	94-6 29-Nov-2018 94-6	94-6 19-Jun-2019 94-6	94-6 20-Nov-2019 94-6	94-6 21-May-2020 94-6	94-6 26-Nov-2020 94-6	94-6 26-May-2021 94-6	94-6 30-Nov-2021 94-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.003	<0.001	<0.001	0.006	<0.001	0.002	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 28-Jun-1995	95-1 23-Nov-1995	95-1 12-Oct-1996	95-1 06-Nov-1997	95-1 05-Jun-1998	95-1 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1076	1260	--	--	--	1570
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	116	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	882	1220	1280	1060	1050	1290
Ammonia Nitrogen	mg/l	--	--	1.27	7.5	9.15	4.42	6.05	2.83
Chemical Oxygen Demand	mg/l	--	--	700	250	115	56	392	1740
Chloride	mg/l	--	250	615	853	836	784	998	925
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3660	4460	4000	4380	4250	4320
Dissolved Oxygen (Field)	mg/l	--	--	2.66	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	175	194	165	185	170	178
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.4	0.1	3.1	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	19.5	28.8	--	--	--	24.6
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	18.23	21.3	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.4	8.77	7.96	8.84	--	8.1
Phosphate	mg/l	--	--	--	54.2	--	--	--	--
Phosphorus	mg/l	--	--	2.86	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	10	19	6	1	162	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1830	2250	2000	2200	2110	2170
Total Organic Carbon	mg/l	--	--	31.8	24.5	20.1	23.9	28	26.5
Total Suspended Solids	mg/l	--	--	--	--	106	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	1.07	1.22	1.19	1.34	1.59	1.52
Cadmium, dissolved	mg/l	0.005	--	0.0009	0.0001	--	--	--	--
Calcium, dissolved	mg/l	--	--	26.4	24.3	20.2	22.8	20.5	22.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.04	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.05	4.05	4.96	5.67	3.58	1.39
Lead, dissolved	mg/l	0.01	--	0.0008	0.0013	0.0002	0.0003	0.0005	0.0002
Magnesium, dissolved	mg/l	--	--	26.2	31.8	27.4	30.8	28.5	28.8
Manganese, dissolved	mg/l	--	0.05	0.17	0.18	0.18	0.21	0.15	0.11
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	23.9	21.4	26.1	29.3	29.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	639	871	977	896	1200	1080
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.02	0.09	0.04
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 28-Jun-1995	95-1 23-Nov-1995	95-1 12-Oct-1996	95-1 06-Nov-1997	95-1 05-Jun-1998	95-1 06-May-1999
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 24-Oct-2000	95-1 14-Jun-2001	95-1 06-Nov-2002	95-1 30-May-2003	95-1 19-Nov-2004	95-1 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1690	1300	1780	1500	1560	277
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	102	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1390	1240	1460	1230	1280	1140
Ammonia Nitrogen	mg/l	--	--	1.33	3.15	2.4	2.53	2.33	2.14
Chemical Oxygen Demand	mg/l	--	--	--	56	72	71	81	65
Chloride	mg/l	--	250	890	880	820	879	864	731
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4660	4200	4430	4110	4540	3100
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	182	170	211	157	158	170
Nitrate as N	mg/l	10.0	--	0.3	0.1	0.2	1	1	0.7
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.49	3.75	4.17	4.3	3.7	3.88
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.26	8.3	8.1	7.2	8.1	--
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.81	2.29	0.79	2.43	2.78	1.96
Sulphate	mg/l	--	500 [6]	4.5	1	2	1	10	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2600	2520	2720	2055	2270	2540
Total Organic Carbon	mg/l	--	--	--	19.8	19.6	19.1	16.2	21.8
Total Suspended Solids	mg/l	--	--	1210	127	184	168	380	35
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.003	0.003	0.001	0.001
Boron, dissolved	mg/l	5	--	1.5	1.59	1.51	1.42	1.47	1.5
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	0.0002
Calcium, dissolved	mg/l	--	--	20.3	23.2	23.8	20.4	20.6	22.2
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.33	0.23	0.27	2	0.186	0.251
Lead, dissolved	mg/l	0.01	--	**0.022**	0.0002	0.0063	0.0004	0.0028	0.0007
Magnesium, dissolved	mg/l	--	--	31.9	27.2	28.5	25.7	26	27.9
Manganese, dissolved	mg/l	--	0.05	0.09	0.08	0.08	0.1	0.066	0.072
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	--	--	17.2	16.2	23	24.2	24.2	27.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	0.001
Sodium, dissolved	mg/l	--	200 [7]	1030	997	978	876	1130	1070
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.005	0.009
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	0.002	0.024	0.001	0.001	0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 24-Oct-2000	95-1 14-Jun-2001	95-1 06-Nov-2002	95-1 30-May-2003	95-1 19-Nov-2004	95-1 16-Nov-2005
Semi-VOCs									
Styrene	mg/l	--	--	--	--	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 15-May-2007	95-1 10-Nov-2008	95-1 26-Nov-2009 [37] M-10	95-1 24-May-2011 [30] G-13	95-1 28-Nov-2012 95-1	95-1 29-May-2014 [36] 95-1
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1370	1200	1260	1150	1200	1200
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	27	42	19	38
Alkalinity (Total as CaCO3)	mg/l	--	--	1370	1200	1290	1190	1300	1200
Ammonia Nitrogen	mg/l	--	--	2.15	1.07	2.35	1.35	2.7	2.6
Chemical Oxygen Demand	mg/l	--	--	108	47	70	43	73	67
Chloride	mg/l	--	250	782	650	827	626	810	770
Conductivity	uS/cm	--	--	--	--	4690	3970	--	--
Conductivity (Field)	uS/cm	--	--	2500	3300	3930	2624	3795	3830
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	161	205	142	227	160	130
Nitrate as N	mg/l	10.0	--	<0.1	0.2	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	--	--	<0.10	<0.10	<0.010	0.047
Nitrogen, Total Kjeldahl	mg/l	--	--	4	2.25	3.40	2.42	3.5	4.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	8.35	8.59	--	8.53
pH (Field)	-	--	--	8.5	8	7.8	8.10	8.29	8.03
Phosphate	mg/l	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	2.13	0.85	2.7	2.0
Sulphate	mg/l	--	500 [6]	1	1	4	1	<1	1
Temperature (Field)	deg c	--	15	8.4	6	8.9	13.3	6.5	9.3
Total Dissolved Solids	mg/l	--	500	2660	2200	3050	2580	2690	2650
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0074	0.0033	0.008	<0.01	0.002	0.0024
Boron, dissolved	mg/l	5	--	1.41	1.03	1.6	0.92	1.6	1.2
Cadmium, dissolved	mg/l	0.005	--	0.00004	<0.00002	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	21.4	25.3	19	30	20	16
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.01	<0.005	0.0004	0.0005	<0.0005	<0.00050
Copper, dissolved	mg/l	--	1	<0.002	<0.002	<0.001	0.003	0.001	0.0028
Iron, dissolved	mg/l	--	0.3	0.361	0.014	0.15	0.28	0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.00017	<0.00002	<0.001	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	--	--	26.3	34.4	23	37	26	20
Manganese, dissolved	mg/l	--	0.05	0.078	0.004	0.06	0.06	0.047	0.035
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	27.1	17.5	23	14	22	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	979	754	1140	873	1000	720
Zinc, dissolved	mg/l	--	5	0.006	<0.005	<0.01	0.02	<0.005	<0.0050
Phenols									
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 15-May-2007	95-1 10-Nov-2008	95-1 26-Nov-2009 [37] M-10	95-1 24-May-2011 [30] G-13	95-1 28-Nov-2012 95-1	95-1 29-May-2014 [36] 95-1
Semi-VOCs									
Styrene	mg/l	--	--	--	<0.0006	--	--	--	--
VOCs									
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00010
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00010
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00020
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 26-Nov-2015 95-1	95-1 24-May-2017 95-1	95-1 22-Nov-2018 95-1	95-1 21-May-2020 95-1	95-1 30-Nov-2021 [3] 95-1
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1210	1270	1150	1270	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [28]	<25 [11]	<25 [11]	27	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1230	1280	1170	1300	--
Ammonia Nitrogen	mg/l	--	--	3.78	3.13	3.58	2.46	--
Chemical Oxygen Demand	mg/l	--	--	284	97	306	94	--
Chloride	mg/l	--	250	863	873	760	1050	--
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	3179	>3999	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	139	163	215	195	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	0.1	<0.1	--
Nitrite as N	mg/l	1.0	--	<0.05	<0.25 [11]	<0.05	<0.05	--
Nitrogen, Total Kjeldahl	mg/l	--	--	9.9	4.5	7.7	3.3	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.25	8.21	8.58	7.96	--
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	12.3	4.02	9.90	1.94	--
Sulphate	mg/l	--	500 [6]	1	<1	1	<1	--
Temperature (Field)	deg c	--	15	6.7	11.6	4.8	15.0	--
Total Dissolved Solids	mg/l	--	500	2880	2700	2440	2790	--
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.002	0.005	0.002	0.002	--
Boron, dissolved	mg/l	5	--	1.55	0.994	1.53	1.58	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	--
Calcium, dissolved	mg/l	--	--	18.5	15.4	33.1	24.6	--
Chromium, dissolved	mg/l	0.05	--	<0.001	0.014	<0.001	<0.001	--
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	0.0006	<0.0005	--
Copper, dissolved	mg/l	--	1	<0.0005	0.0008	0.0011	0.0014	--
Iron, dissolved	mg/l	--	0.3	0.138	<0.1	0.2	0.223	--
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	--
Magnesium, dissolved	mg/l	--	--	22.6	30.2	32	32.4	--
Manganese, dissolved	mg/l	--	0.05	0.053	0.028	0.066	0.063	--
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	20	15.7	27	24.5	--
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	1050	1010	1010	963	--
Zinc, dissolved	mg/l	--	5	0.01	<0.005	<0.005	<0.005	--
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	<0.004 [10]	<0.001	0.004	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-1 26-Nov-2015 95-1	95-1 24-May-2017 95-1	95-1 22-Nov-2018 95-1	95-1 21-May-2020 95-1	95-1 30-Nov-2021 [3] 95-1
Semi-VOCs								
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 28-Jun-1995	95-2 23-Nov-1995	95-2 12-Jun-1996	95-2 12-Oct-1996	95-2 18-Jun-1997	95-2 06-Nov-1997	95-2 05-Jun-1998
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1139	1400	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	15	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	934	1180	1240	1200	1280	1190	1080
Ammonia Nitrogen	mg/l	--	--	0.88	0.63	1.18	1.49	0.01	0.77	0.68
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	70	50	18	30	19	62	50
Chloride	mg/l	--	250	528	628	636	656	629	632	615
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3480	4170	4000	4180	3850	3900	3720
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	6.2	--	--	--	2.36	--	--
Hardness, Calcium Carbonate	mg/l	--	--	214	244	247	231	264	265	239
Nitrate as N	mg/l	10.0	--	0.1	1.7	0.1	0.1	0.1	0.1	2.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	6.3	4	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	5.42	3.37	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8	8.48	8.08	7.8	8.22	8.5	--
Phosphate	mg/l	--	--	--	1	--	--	--	--	--
Phosphorus	mg/l	--	--	4.39	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	26	8	4	6	3	1	10
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1750	2090	1940	2100	1930	1960	1840
Total Organic Carbon	mg/l	--	--	12.1	14.8	15.5	14.5	16.5	16.7	16.6
Total Suspended Solids	mg/l	--	--	--	--	1480	780	1910	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.79	0.92	0.965	1.01	1.27	1.07	1.17
Cadmium, dissolved	mg/l	0.005	--	0.0009	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	32.4	30.2	30.1	29	34.4	34.1	28.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.02	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.09	0.2	0.545	0.62	0.62	0.41	0.96
Lead, dissolved	mg/l	0.01	--	0.0012	0.0002	0.0005	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	32	40.5	41.3	38	42.8	43.1	40.2
Manganese, dissolved	mg/l	--	0.05	0.13	0.09	0.138	0.14	0.16	0.11	0.12
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	19.4	23	19.3	18.5	19.3	18.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	608	754	777	867	662	789	1000
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.06
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 28-Jun-1995	95-2 23-Nov-1995	95-2 12-Jun-1996	95-2 12-Oct-1996	95-2 18-Jun-1997	95-2 06-Nov-1997	95-2 05-Jun-1998
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 29-Oct-1998	95-2 06-May-1999	95-2 19-Oct-1999	95-2 05-May-2000	95-2 24-Oct-2000	95-2 14-Jun-2001	95-2 23-Nov-2001
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1340	1430	1160	1577	1550	1230	1420
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	91	1	1	67	1
Alkalinity (Total as CaCO3)	mg/l	--	--	1100	1170	1100	1293	1273	1120	1160
Ammonia Nitrogen	mg/l	--	--	0.8	0.12	1.21	0.07	0.2	1.23	0.88
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	36	38	37	47	--	37	31
Chloride	mg/l	--	250	660	690	695	645	703	671	682
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3980	3720	3860	3750	3970	3600	3620
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	195	250	239	227	255	232	254
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.2	0.9	0.3	0.4
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.14	2.67	--	--	1.32	2.3	2.51
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.7	7.9	8.1	7.9	8.1	8.1	7.55
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	0.85	0.95	0.94
Sulphate	mg/l	--	500 [6]	3	1	6	3	4	3	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2000	1870	1130	1875	2230	2060	2200
Total Organic Carbon	mg/l	--	--	17.1	19.4	16.8	16.6	--	14.9	18
Total Suspended Solids	mg/l	--	--	--	--	492	180	90	51	43
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	1.25	1.18	1.29	1.19	1.15	1.11	1.38
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	24.3	32.2	32.6	30	28.6	32.6	30.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.45	0.45	1.1	2.3	0.17	0.08	0.11
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0005	0.0002	0.022	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	32.6	40.7	37.9	36.5	44.6	36.5	43.1
Manganese, dissolved	mg/l	--	0.05	0.12	0.11	0.11	0.13	0.11	0.09	0.1
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	20.8	13.6	18	11.2	19.8	9.1	12.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	842	902	926	798	831	782	898
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.1	0.06	0.01	0.01	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.054	0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 29-Oct-1998	95-2 06-May-1999	95-2 19-Oct-1999	95-2 05-May-2000	95-2 24-Oct-2000	95-2 14-Jun-2001	95-2 23-Nov-2001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 23-May-2002	95-2 06-Nov-2002	95-2 30-May-2003	95-2 09-Oct-2003	95-2 14-May-2004	95-2 19-Nov-2004	95-2 24-May-2005
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1240	1600	1400	--	1379	1410	1450
Alkalinity, Carbonate as CaCO3	mg/l	--	--	110	1	1	--	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1200	1310	1150	1160	1130	1160	1190
Ammonia Nitrogen	mg/l	--	--	1.2	1.33	1.34	1.45	1.23	1.04	1.38
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	5	--	--	--
Chemical Oxygen Demand	mg/l	--	--	43	55	50	52	56	75	51
Chloride	mg/l	--	250	675	646	657	639	687	658	619
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3100	3690	2630	3550	3503	3730	3800
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	280	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	242	233	215	214	220	216	228
Nitrate as N	mg/l	10.0	--	0.1	0.3	0.3	0.1	0.2	2	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.23	2.47	2.67	2.48	2.69	2.57	2.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.41	8	7.1	7.8	8.2	8	7.4
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.89	0.82	1.18	0.89	0.92	2.07	1.34
Sulphate	mg/l	--	500 [6]	2	2	2	--	3	10	2
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	10
Total Dissolved Solids	mg/l	--	500	2170	2160	1315	2203	1750	1865	2200
Total Organic Carbon	mg/l	--	--	18	16.1	1.2	20	14.1	12.9	15.3
Total Suspended Solids	mg/l	--	--	51	36	164	46	42	40	431
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	0.001	0.002	0.001	0.001	<0.001
Boron, dissolved	mg/l	5	--	1.18	1.18	1.03	1.05	1.06	1.11	1.1
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	32.3	28.9	28.7	27.4	29	28.9	28.9
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.001	0.001	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.002	0.002	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.31	0.31	0.49	0.552	0.3	0.391	0.633
Lead, dissolved	mg/l	0.01	--	0.0002	0.0035	0.0005	0.0012	0.0013	0.0005	0.0015
Magnesium, dissolved	mg/l	--	--	39.2	39.1	34.7	35.5	36	35.1	38
Manganese, dissolved	mg/l	--	0.05	0.12	0.1	0.09	0.076	0.097	0.099	0.089
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.01	0.01	0.01	<0.01
Potassium, dissolved	mg/l	--	--	18.4	17.2	16.9	17	17.9	18.7	19.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	0.001
Sodium, dissolved	mg/l	--	200 [7]	802	809	719	785	761	770	791
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.005	0.005	0.005	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 23-May-2002	95-2 06-Nov-2002	95-2 30-May-2003	95-2 09-Oct-2003	95-2 14-May-2004	95-2 19-Nov-2004	95-2 24-May-2005
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	<0.0007
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0004
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	<0.0001
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0002
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	<0.0001
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	<0.0002
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromoform	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromomethane	mg/l	--	--	--	--	--	--	--	--	<0.002
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	<0.0002
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	<0.0002
Chloroform	mg/l	--	--	--	--	--	--	--	--	<0.0003
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	<0.0002
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 16-Nov-2005	95-2 25-May-2006	95-2 21-Nov-2006	95-2 15-May-2007	95-2 30-Nov-2007	95-2 22-May-2008	95-2 10-Nov-2008
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	281	1220	1260	1290	1230	1180	1220
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	1150	1220	1260	1290	1230	1180	1215
Ammonia Nitrogen	mg/l	--	--	1.22	1.18	1.24	1.25	1.12	1.05	2.12
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	68	50	51	54	80	52	67
Chloride	mg/l	--	250	587	689	673	601	679	678	812
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3640	3300	3500	2000	3000	3350	4100
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	230	213	215	197	220	214	143
Nitrate as N	mg/l	10.0	--	1.4	0.2	0.1	0.1	0.2	0.1	0.3
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.6	2.34	2.42	2.53	2.27	2.52	3.77
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	8	7.4	8.5	8.3	8.1	8.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.26	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	3	1	1	1	1	<1	<1
Temperature (Field)	deg c	--	15	--	4.5	6.5	6.7	7	12	6
Total Dissolved Solids	mg/l	--	500	2220	2290	2310	2160	2460	2290	2480
Total Organic Carbon	mg/l	--	--	15.8	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	7	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	0.0035	0.0047	0.0043	0.0039	0.0047
Boron, dissolved	mg/l	5	--	1.14	0.984	1.07	0.962	1.07	1.03	1.18
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.005	<0.0001	0.00003	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	30.3	27.9	26.6	26.6	29.9	28.4	18.9
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.003	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.138	0.253	0.304	0.223	0.061	0.317	0.706
Lead, dissolved	mg/l	0.01	--	0.0011	0.0006	<0.0001	0.00009	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	37.4	35	36.1	31.8	35.4	34.8	23.3
Manganese, dissolved	mg/l	--	0.05	0.099	0.092	0.057	0.088	0.101	0.087	0.044
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	20.1	17.4	18.3	17.3	20.2	17.8	29.1
Selenium, dissolved	mg/l	0.05	--	0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	860	801	794	707	963	817	861
Zinc, dissolved	mg/l	--	5	0.01	0.006	0.007	0.006	<0.005	<0.005	<0.005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 16-Nov-2005	95-2 25-May-2006	95-2 21-Nov-2006	95-2 15-May-2007	95-2 30-Nov-2007	95-2 22-May-2008	95-2 10-Nov-2008
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 19-May-2009 G-22	95-2 26-Nov-2009 M-13	95-2 25-May-2010 M-17	95-2 20-Oct-2010 [30] G-16	95-2 24-May-2011 [30] G-20	95-2 29-Nov-2011 [30] 95-2	95-2 31-May-2012 95-2
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1130	1190	1040	1170	1260	1150	1100
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	29	22	<2 [9]	50	<2 [9]	24
Alkalinity (Total as CaCO3)	mg/l	--	--	1130	1220	1060	1170	1309	1150	1100
Ammonia Nitrogen	mg/l	--	--	1.25	0.61	1.40	1.14	2.18	1.27	1.4
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	73	45	48	50	50	50	50
Chloride	mg/l	--	250	598	652	529	607	797	602	550
Conductivity	uS/cm	--	--	3800	4080	3660	3890	4840	3800	--
Conductivity (Field)	uS/cm	--	--	3300	3370	3920	3857	1476	3506	3330
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	201	176	218	234	166	214	180
Nitrate as N	mg/l	10.0	--	0.19	0.30	<0.10	<0.10	<0.10	<0.10	0.22
Nitrite as N	mg/l	1.0	--	<0.10	0.14	<0.10	<0.10	<0.10	<0.10	0.41
Nitrogen, Total Kjeldahl	mg/l	--	--	2.26	1.47	1.91	2.35	3.32	1.59	2.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	0.63
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.25	8.41	8.36	8.28	8.63	8.25	8.36
pH (Field)	-	--	--	--	7.47	8.05	8.18	8.06	8.11	8.07
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.89	0.81	0.99	0.88	2.17	0.84	0.72
Sulphate	mg/l	--	500 [6]	3	4	5	1	<1	2	<1
Temperature (Field)	deg c	--	15	8	8.6	19.7	11.5	20.0	7.7	9.9
Total Dissolved Solids	mg/l	--	500	2470	2650	2380	2530	3150	2470	2230
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.004	0.005	<0.01	<0.01	<0.01	<0.01	0.0019
Boron, dissolved	mg/l	5	--	1.33	1.1	1.6	1.3	1.4	1.12	0.99
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	26	21	28	31	22	28	22
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0003	0.0004	0.0005	0.0004	0.0006	0.0004	<0.00050
Copper, dissolved	mg/l	--	1	0.003	0.002	0.002	<0.001	0.003	<0.001	<0.0010
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	0.23	0.27	0.16	0.09	0.27
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	33	30	36	38	27	35	29
Manganese, dissolved	mg/l	--	0.05	0.06	0.02	0.10	0.09	0.05	0.11	0.061
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15	16	18	17	23	16	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	791	801	750	842	1110	804	690
Zinc, dissolved	mg/l	--	5	<0.01	<0.01	<0.01	<0.01	0.02	<0.01	<0.0050
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 19-May-2009 G-22	95-2 26-Nov-2009 M-13	95-2 25-May-2010 M-17	95-2 20-Oct-2010 [30] G-16	95-2 24-May-2011 [30] G-20	95-2 29-Nov-2011 [30] 95-2	95-2 31-May-2012 95-2
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 28-Nov-2012 95-2	95-2 29-May-2013 [32] 95-2	95-2 26-Nov-2013 GW-8	95-2 29-May-2014 95-2	95-2 19-Nov-2014 95-2	95-2 02-Jun-2015 95-2	95-2 26-Nov-2015 95-2
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1200	1100	1200	1200	1200	934	1130
Alkalinity, Carbonate as CaCO3	mg/l	--	--	18	19	26	31	25	<50	<25 [28]
Alkalinity (Total as CaCO3)	mg/l	--	--	1200	1200	1200	1200	1200	947	1150
Ammonia Nitrogen	mg/l	--	--	1.3	1.6	1.3	1.7	1.7	1.66	1.52
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	54	56	58	53	93	104	99
Chloride	mg/l	--	250	600	650	660	670	640	627	676
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3229	3121	3074	3215	3648	3632	3679
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	230	230	220	220	250	148	166
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.043	0.57	0.33	0.176	0.055	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.4	2.6	5.1	3.3	4.9	2.9	2.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	0.66	0.40	0.23	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.25	8.37	8.46	8.37	--	--
pH (Field)	-	--	--	8.15	7.95	8.14	7.79	8.22	8.16	8.23
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.79	1.1	1.4	1.5	5.2	1.75	1.59
Sulphate	mg/l	--	500 [6]	<10 [38]	<1	<1	<1	<1	2	3
Temperature (Field)	deg c	--	15	6.5	8.9	7.1	8.8	7.3	9.6	7.2
Total Dissolved Solids	mg/l	--	500	2270	2300	2290	2180	2260	2220	2440
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.01	0.0012	0.0024	0.0018	0.0022	0.001	0.002
Boron, dissolved	mg/l	5	--	1.3	1.2	1	1.1	1.2	0.782	1.21
Cadmium, dissolved	mg/l	0.005	--	<0.001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	29	30	27	29	32	20.8	25.1
Chromium, dissolved	mg/l	0.05	--	<0.05	<0.0050	0.0051	0.0057	0.0055	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.005	0.00053	0.00053	<0.00050	<0.00050	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	<0.01	0.0017	0.0013	0.0035	0.0018	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	<1	<0.1	<0.1	<0.1	0.13	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.005	0.00056	<0.00050	<0.00050	<0.00050	0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	39	37	36	37	40	23.2	32.5
Manganese, dissolved	mg/l	--	0.05	0.094	0.092	0.031	0.015	0.11	0.048	0.083
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	18	17	16	17	19	11.9	14.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	900	760	750	740	830	716	83.2
Zinc, dissolved	mg/l	--	5	<0.05	0.0065	0.0063	<0.0050	0.0066	0.035	0.01
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	0.0018	0.0013	0.0022	0.0022	<0.004 [10]	<0.004 [10]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 28-Nov-2012 95-2	95-2 29-May-2013 [32] 95-2	95-2 26-Nov-2013 GW-8	95-2 29-May-2014 95-2	95-2 19-Nov-2014 95-2	95-2 02-Jun-2015 95-2	95-2 26-Nov-2015 95-2
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0013	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00050	0.00070	<0.00020	<0.00020	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 26-May-2016	95-2 17-Nov-2016	95-2 24-May-2017	95-2 29-Nov-2017	95-2 24-May-2018	95-2 22-Nov-2018	95-2 19-Jun-2019
				95-2	95-2	95-2	95-2	95-2	95-2	95-2
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1020	1090	1120	1040	1050	1220	1060
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25 [11]	<25 [11]	<25 [11]	<25 [11]	<25 [11]	<25 [11]	<25 [11]
Alkalinity (Total as CaCO3)	mg/l	--	--	1030	1100	1140	1050	1060	1240	1070
Ammonia Nitrogen	mg/l	--	--	2.10	1.68	2.61	1.48	1.81	1.39	2.07
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	108	89	119	78	97	119	97
Chloride	mg/l	--	250	685	672	644	719	658	699	587
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3727	3843	3661	3404	3905	3391	3560
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	184	204	190	215	203	281	245
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.25 [11]	0.33	0.05	<0.05	0.36
Nitrogen, Total Kjeldahl	mg/l	--	--	3.2	2.7	3.2	2.9	2.8	2.7	2.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.28	7.86	8.14	8.16	8.10	8.39	8.02
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.17	2.30	3.53	2.74	2.16	1.78	2.57
Sulphate	mg/l	--	500 [6]	3	4	5	4	6	4	3
Temperature (Field)	deg c	--	15	10.7	9.2	10.0	7.3	10.4	6.3	11.4
Total Dissolved Solids	mg/l	--	500	2430	2360	2200	2300	2290	2330	2090
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	0.004	0.005	0.002	0.002	0.002	0.001
Boron, dissolved	mg/l	5	--	0.962	1.35	0.919	1.06	1.03	1.16	0.842
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	24.5	26.1	25.7	27.4	28.2	36	32.5
Chromium, dissolved	mg/l	0.05	--	<0.001	0.014	0.012	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006	<0.0005
Copper, dissolved	mg/l	--	1	0.0008	0.0006	0.0008	0.0013	0.0013	0.0050	0.0025
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	0.106	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	29.8	33.8	30.5	35.5	32.3	46.5	39.7
Manganese, dissolved	mg/l	--	0.05	0.081	0.068	0.06	0.049	0.05	0.014	0.048
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	15.8	15.7	15.2	17.2	16.2	20.4	17.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	627	767	772	806	718	871	720
Zinc, dissolved	mg/l	--	5	0.007	<0.005	<0.005	<0.005	<0.005	<0.005	0.006
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.011	<0.002 [10]	<0.004 [10]	<0.002 [10]	<0.001	<0.001	<0.001

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 26-May-2016	95-2 17-Nov-2016	95-2 24-May-2017	95-2 29-Nov-2017	95-2 24-May-2018	95-2 22-Nov-2018	95-2 19-Jun-2019
				95-2	95-2	95-2	95-2	95-2	95-2	95-2
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 20-Nov-2019 95-2	95-2 21-May-2020 95-2	95-2 26-Nov-2020 95-2	95-2 26-May-2021 95-2	95-2 30-Nov-2021 95-2
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1130	1110	1110	1140	1190
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25	26	32	<25	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	1150	1140	1140	1160	1200
Ammonia Nitrogen	mg/l	--	--	1.59	1.35	1.34	1.67	1.20
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	132	76	101	70	82
Chloride	mg/l	--	250	720	748	627	574	631
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3810	3269	3288	3668	3545
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	290	269	266	259	227
Nitrate as N	mg/l	10.0	--	0.7	<0.1	<0.5 [12]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.07	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.0	2.3	2.2	2.1	2.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.31	7.97	8.54	8.03	8.07
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.86	0.95	1.17	1.05	0.92
Sulphate	mg/l	--	500 [6]	6	8	3	2	2
Temperature (Field)	deg c	--	15	7.6	12.6	6.6	10.9	5.3
Total Dissolved Solids	mg/l	--	500	2470	2210	2150	2240	2230
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.001	0.002	0.002	0.002	0.001
Boron, dissolved	mg/l	5	--	0.864	0.852	0.849	0.851	0.799
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	38.4	35.5	31.3	30.2	28.6
Chromium, dissolved	mg/l	0.05	--	<0.001	0.003	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0018	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0016	0.0008	0.0021	0.0016	0.0009
Iron, dissolved	mg/l	--	0.3	0.261	3.11	0.101	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	0.0018	0.0001	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	47.1	43.7	45.6	44.7	37.8
Manganese, dissolved	mg/l	--	0.05	0.062	0.183	0.066	0.089	0.041
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	25.2	18.3	17.1	17.2	15.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	851	748	813	731	641
Zinc, dissolved	mg/l	--	5	<0.005	0.012	0.006	<0.005	<0.005
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.004 [10]	0.007	<0.004 [12]	<0.010 [12]	<0.004 [12]

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-2 20-Nov-2019 95-2	95-2 21-May-2020 95-2	95-2 26-Nov-2020 95-2	95-2 26-May-2021 95-2	95-2 30-Nov-2021 95-2
Semi-VOCs								
Naphthalene	mg/l	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 28-Jun-1995	95-3 23-Nov-1995	95-3 12-Jun-1996	95-3 12-Oct-1996	95-3 18-Jun-1997	95-3 06-Nov-1997	95-3 05-Jun-1998
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	700	797	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	574	653	634	651	644	660	650
Ammonia Nitrogen	mg/l	--	--	0.14	0.09	0.19	0.57	0.79	0.07	0.18
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	90	25	23	15	9	17	30
Chloride	mg/l	--	250	269	261	294	272	266	262	248
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2170	2340	2150	4000	2200	2130	2080
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	7.36	--	--	--	2.36	--	--
Hardness, Calcium Carbonate	mg/l	--	--	220	264	221	202	262	239	225
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	0.1	0.1	1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	8.5	0.8	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	8.36	0.71	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.03	7.45	7.1	7.96	7.29	7.94	--
Phosphate	mg/l	--	--	--	0.4	--	--	--	--	--
Phosphorus	mg/l	--	--	5.86	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	55	128	119	114	100	52	118
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1090	1170	1080	1120	1110	1070	1019
Total Organic Carbon	mg/l	--	--	19.2	7	7.5	6.8	6.9	7	6.8
Total Suspended Solids	mg/l	--	--	--	--	5070	5530	5010	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.61	0.61	0.618	0.77	0.8	0.74	0.85
Cadmium, dissolved	mg/l	0.005	--	0.0002	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	35.6	36	30.2	28.6	35.5	34	29.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.05	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.05	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.03	19.9	0.132	0.25	0.16	0.14	1.46
Lead, dissolved	mg/l	0.01	--	0.0048	0.0059	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	31.5	41.7	34.8	31.4	38.1	37	36.2
Manganese, dissolved	mg/l	--	0.05	0.34	0.74	0.477	0.43	0.53	0.5	0.54
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.03	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	15.2	11.3	7.8	7.6	12.9	10.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	375	422	428	384	347	362	468
Zinc, dissolved	mg/l	--	5	0.01	0.05	0.01	0.01	0.01	0.01	0.32

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 28-Jun-1995	95-3 23-Nov-1995	95-3 12-Jun-1996	95-3 12-Oct-1996	95-3 18-Jun-1997	95-3 06-Nov-1997	95-3 05-Jun-1998
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 29-Oct-1998	95-3 06-May-1999	95-3 19-Oct-1999	95-3 05-May-2000	95-3 24-Oct-2000	95-3 14-Jun-2001	95-3 23-Nov-2001
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	756	810	813	953	927	753	828
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	1	25	1
Alkalinity (Total as CaCO3)	mg/l	--	--	620	664	666	781	760	659	679
Ammonia Nitrogen	mg/l	--	--	0.22	0.16	0.25	0.03	0.1	0.23	0.07
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	3	8	20	11	--	13	13
Chloride	mg/l	--	250	260	285	287	245	303	251	279
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2120	2050	2370	2000	2310	1900	2100
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	186	218	223	240	237	236	243
Nitrate as N	mg/l	10.0	--	--	--	0.1	0.2	0.3	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.06	1.19	--	--	1.22	0.62	0.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	6.8	7.8	7	7.01	7	6.68
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	3.39	0.46	0.67
Sulphate	mg/l	--	500 [6]	117	104	101	101	130	112	110
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1070	1040	1130	1000	1240	1180	1260
Total Organic Carbon	mg/l	--	--	9.6	7	6.5	6.1	--	5.8	7
Total Suspended Solids	mg/l	--	--	--	--	3000	1210	6230	1580	2100
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.001	0.001	0.001
Boron, dissolved	mg/l	5	--	0.95	0.68	1.02	0.77	0.84	0.76	1
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	26.7	29.1	33.8	34	30	36.1	33
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.38	0.28	1.2	2.45	0.08	0.02	0.02
Lead, dissolved	mg/l	0.01	--	0.0002	0.0021	0.0002	0.0002	0.0022	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	28.9	34.8	33.2	37.1	39.3	35.3	39
Manganese, dissolved	mg/l	--	0.05	0.56	0.52	0.35	0.54	0.4	0.57	0.19
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	10.8	2.2	11.1	4.3	12.6	4.3	7.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	414	437	439	432	550	402	448
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.17	0.26	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 29-Oct-1998	95-3 06-May-1999	95-3 19-Oct-1999	95-3 05-May-2000	95-3 24-Oct-2000	95-3 14-Jun-2001	95-3 23-Nov-2001
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.051	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 23-May-2002	95-3 06-Nov-2002	95-3 30-May-2003	95-3 09-Oct-2003	95-3 14-May-2004	95-3 19-Nov-2004	95-3 24-May-2005
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	837	1050	487	--	802	854	824
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	--	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	686	864	399	537	657	700	675
Ammonia Nitrogen	mg/l	--	--	0.27	0.16	0.45	0.12	0.15	0.17	0.06
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	2	--	--	--
Chemical Oxygen Demand	mg/l	--	--	10	22	25	42	57	32	26
Chloride	mg/l	--	250	281	262	256	180	242	215	204
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2030	2260	1740	1930	2010	2160	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	147	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	248	248	225	170	225	213	228
Nitrate as N	mg/l	10.0	--	0.1	0.3	0.3	0.2	0.2	1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.47	0.8	1.69	0.57	1.51	0.57	0.49
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.8	7	6.6	7.3	7.2	7.4	7.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.47	0.14	3.24	1.56	3.21	2.34	1.16
Sulphate	mg/l	--	500 [6]	111	114	97	131	115	130	126
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	13.5
Total Dissolved Solids	mg/l	--	500	1260	1290	870	1073	1005	1080	1180
Total Organic Carbon	mg/l	--	--	6	5.6	6	12	4.5	5.3	4.6
Total Suspended Solids	mg/l	--	--	1600	4150	9680	8180	5720	2200	2810
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	0.001	0.001	<0.001
Boron, dissolved	mg/l	5	--	0.72	0.87	0.62	0.9	0.681	0.867	0.66
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	35.8	36.5	32.1	26.3	32.5	32	32.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.008	0.001	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.002	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.02	0.02	0.21	0.35	0.016	0.005	0.027
Lead, dissolved	mg/l	0.01	--	0.001	0.0013	0.0005	0.0005	0.0008	0.0013	0.0012
Magnesium, dissolved	mg/l	--	--	38.4	38	35.2	25.4	34.9	32.4	35.7
Manganese, dissolved	mg/l	--	0.05	0.62	0.17	0.55	0.377	0.63	0.487	0.605
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.01	0.01	0.01	<0.01
Potassium, dissolved	mg/l	--	--	6.9	9.7	8.4	7.9	8.6	8.4	8.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [7]	395	441	406	379	412	410	376
Zinc, dissolved	mg/l	--	5	0.02	0.02	0.01	0.014	0.005	0.005	0.006

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 23-May-2002	95-3 06-Nov-2002	95-3 30-May-2003	95-3 09-Oct-2003	95-3 14-May-2004	95-3 19-Nov-2004	95-3 24-May-2005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	<0.0007
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0004
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	<0.0001
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0002
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	<0.0001
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	<0.0002
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromoform	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromomethane	mg/l	--	--	--	--	--	--	--	--	<0.002
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	<0.0002
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	<0.0002
Chloroform	mg/l	--	--	--	--	--	--	--	--	<0.0003
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	<0.0002
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 16-Nov-2005	95-3 25-May-2006	95-3 21-Nov-2006	95-3 15-May-2007	95-3 30-Nov-2007	95-3 22-May-2008	95-3 10-Nov-2008
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	172	725	738	687	750	680	725
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	705	725	738	687	750	680	725
Ammonia Nitrogen	mg/l	--	--	<0.01	0.18	<0.01	0.05	0.03	<0.01	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	32	15	12	63	67	18	<5
Chloride	mg/l	--	250	190	216	203	211	174	187	177
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1900	1700	1800	1400	1000	1750	1650
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	223	211	213	229	200	206	188
Nitrate as N	mg/l	10.0	--	0.2	0.1	0.2	0.1	1.1	0.2	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	0.28	1.76	0.28	0.58	0.67	0.61	0.48
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.3	7.7	8	7.7	7.1	7.1
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.09	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	136	132	134	122	125	122	123
Temperature (Field)	deg c	--	15	--	4	6	5.8	5	8	8
Total Dissolved Solids	mg/l	--	500	1290	1260	1280	1220	1300	1210	1210
Total Organic Carbon	mg/l	--	--	6	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	460	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	0.001	0.001	0.0008	0.0012	0.0005
Boron, dissolved	mg/l	5	--	0.933	0.711	0.881	0.679	0.942	0.736	0.967
Cadmium, dissolved	mg/l	0.005	--	0.0001	<0.005	0.0002	0.00024	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	33.9	30.3	31.6	34.7	30.9	31	28.4
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	0.009	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	<0.002	<0.002	0.002	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.046	<0.005	0.014	0.072	0.01	0.011	<0.005
Lead, dissolved	mg/l	0.01	--	0.0005	<0.0002	<0.0001	0.00012	<0.00002	<0.00002	<0.00002
Magnesium, dissolved	mg/l	--	--	33.7	32.9	32.5	34.7	29.8	31.2	28.5
Manganese, dissolved	mg/l	--	0.05	0.298	0.408	0.282	0.686	0.107	0.331	0.195
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10.1	8.1	9.2	8.3	8.8	8.3	8.8
Selenium, dissolved	mg/l	0.05	--	<0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	470	417	426	396	472	424	409
Zinc, dissolved	mg/l	--	5	0.012	<0.005	0.008	<0.005	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 16-Nov-2005	95-3 25-May-2006	95-3 21-Nov-2006	95-3 15-May-2007	95-3 30-Nov-2007	95-3 22-May-2008	95-3 10-Nov-2008
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 19-May-2009 G-23	95-3 26-Nov-2009 M-14	95-3 25-May-2010 M-27	95-3 20-Oct-2010 G-17	95-3 24-May-2011 [39] G-32	95-3 29-Nov-2011 [40] 95-3	95-3 31-May-2012 95-3
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	724	740	707	737	748	739	710
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<2 [9]	<2 [9]	<2 [9]	<2 [9]	<2 [9]	2.8
Alkalinity (Total as CaCO3)	mg/l	--	--	724	740	707	737	748	739	720
Ammonia Nitrogen	mg/l	--	--	0.07	0.02	0.11	0.08	0.08	<0.02	<0.050
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	15	27	20	25	20	15	30
Chloride	mg/l	--	250	173	174	155	158	169	159	140
Conductivity	uS/cm	--	--	2020	2040	1990	1990	2030	1940	--
Conductivity (Field)	uS/cm	--	--	1700	1777	1756	1972	1533	1798	1745
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	192	183	201	197	207	177	190
Nitrate as N	mg/l	10.0	--	0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.29	0.15	0.42	1.08	0.19	3.57	0.89
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	7.61	7.70	7.93	7.77	8.24	8.06	7.61
pH (Field)	-	--	--	--	6.85	6.98	7.22	7.03	7.12	7.32
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.51	0.26	0.87	1.20	0.68	0.23	0.61
Sulphate	mg/l	--	500 [6]	103	101	99	102	96	89	86
Temperature (Field)	deg c	--	15	7	8.3	26.1	11.3	19.5	7.9	9.1
Total Dissolved Solids	mg/l	--	500	1310	1330	1290	1290	1320	1260	1120
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Boron, dissolved	mg/l	5	--	1.21	1.0	0.93	1.3	0.79	1.2	0.87
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	29	27	31	31	27	28	29
Chromium, dissolved	mg/l	0.05	--	0.009	0.007	<0.005	0.005	0.008	0.006	<0.0050
Cobalt, dissolved	mg/l	--	--	<0.0002	<0.0002	0.0005	0.0003	0.0004	0.0004	<0.00050
Copper, dissolved	mg/l	--	1	0.004	0.003	0.003	0.003	0.003	0.002	0.0041
Iron, dissolved	mg/l	--	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	29	28	30	29	34	26	30
Manganese, dissolved	mg/l	--	0.05	0.02	0.03	1.16	0.30	0.49	0.51	0.17
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7	8	7	8	7	8	7.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	351	380	368	373	395	358	380
Zinc, dissolved	mg/l	--	5	<0.01	0.01	<0.01	<0.01	0.01	<0.01	0.0060

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 19-May-2009 G-23	95-3 26-Nov-2009 M-14	95-3 25-May-2010 M-27	95-3 20-Oct-2010 G-17	95-3 24-May-2011 [39] G-32	95-3 29-Nov-2011 [40] 95-3	95-3 31-May-2012 95-3
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.004	<0.0008	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.001	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.001	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.01	<0.001	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.04	<0.0080	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.001	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.005	<0.001	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.002	<0.0004	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 28-Nov-2012 95-3	95-3 29-May-2013 MW-W	95-3 26-Nov-2013 GW-7	95-3 29-May-2014 95-3	95-3 19-Nov-2014 [41] MW-W	95-3 02-Jun-2015 95-3	95-3 26-Nov-2015 95-3
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	720	710	720	720	740	743	747
Alkalinity, Carbonate as CaCO3	mg/l	--	--	5.4	3.7	4.4	5.4	4.4	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	730	710	730	720	740	747	750
Ammonia Nitrogen	mg/l	--	--	0.19	0.35	0.12	0.22	0.33	0.31	0.33
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	31	81	57	35	150	188	348
Chloride	mg/l	--	250	140	160	140	150	160	173	162
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1753	1617	1615	1686	1842	1824	1803
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	200	210	180	190	200	151	154
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	0.93	3.5	3.6	6.4	4.6	2.8	5.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	<0.10	<0.10	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	7.75	7.81	7.90	7.80	--	--
pH (Field)	-	--	--	7.10	7.62	7.79	7.43	7.19	7.25	7.35
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.4	8.0	3.0	3.0	13	4.47	9.07
Sulphate	mg/l	--	500 [6]	78	83	79	71	83	81	87
Temperature (Field)	deg c	--	15	6.5	9.5	6.5	9.6	6.8	7.9	6.2
Total Dissolved Solids	mg/l	--	500	1150	1160	1150	1140	1140	1010	1150
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001
Boron, dissolved	mg/l	5	--	1.2	0.85	1	1.1	1.1	0.616	1.19
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	29	31	28	28	30	22.6	24.1
Chromium, dissolved	mg/l	0.05	--	<0.005	0.0065	<0.0050	<0.0050	<0.0050	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.00066	0.00066	<0.00050	<0.00050	0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.002	0.0025	0.0023	0.0034	<0.0020	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	0.2	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	31	31	27	29	29	22.9	22.6
Manganese, dissolved	mg/l	--	0.05	0.27	0.88	0.45	0.55	0.59	0.637	0.536
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.5	7.1	7.6	7.2	8.1	5.43	6.83
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	410	380	370	370	410	325	426
Zinc, dissolved	mg/l	--	5	0.008	<0.0050	0.036	<0.0050	<0.0050	<0.005	0.013

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 28-Nov-2012 95-3	95-3 29-May-2013 MW-W	95-3 26-Nov-2013 GW-7	95-3 29-May-2014 95-3	95-3 19-Nov-2014 [41] MW-W	95-3 02-Jun-2015 95-3	95-3 26-Nov-2015 95-3
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0010	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.00020	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00020	0.00088	<0.00020	<0.00040	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00020	<0.00020	<0.00020	<0.00040	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 26-May-2016	95-3 17-Nov-2016	95-3 24-May-2017	95-3 29-Nov-2017	95-3 24-May-2018	95-3 22-Nov-2018	95-3 19-Jun-2019
				95-3	95-3	95-3	95-3	95-3	95-3	95-3
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	768	753	785	1030	805	807	750
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	7
Alkalinity (Total as CaCO3)	mg/l	--	--	770	756	789	1040	810	810	757
Ammonia Nitrogen	mg/l	--	--	0.51	0.35	0.31	0.26	0.27	0.10	0.29
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	184	59	289	25	312	183	105
Chloride	mg/l	--	250	187	162	181	65	191	172	189
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1892	1917	1962	1609	1988	1662	1763
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	160	185	178	634	140	232	232
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.8	2.1	3.4	0.8	1.8	3.1	1.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.87	7.94	7.45	6.84	7.42	7.74	7.55
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	6.33	4.88	7.14	0.44	3.13	5.58	2.92
Sulphate	mg/l	--	500 [6]	87	89	82	128	84	86	85
Temperature (Field)	deg c	--	15	10.6	9.4	9.2	8.1	8.6	6.1	10.8
Total Dissolved Solids	mg/l	--	500	1170	1080	1140	1140	1190	1050	1150
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.761	1.43	0.826	0.931	0.634	1.12	0.831
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	25.2	28.5	27	125	24.4	34.4	36.3
Chromium, dissolved	mg/l	0.05	--	<0.001	0.008	0.006	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0006
Copper, dissolved	mg/l	--	1	0.0011	0.0025	0.0014	0.0010	0.0037	0.0050	0.0014
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	1.3	0.171	0.123	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	23.7	27.7	26.8	78.2	19.1	35.4	34.3
Manganese, dissolved	mg/l	--	0.05	0.573	0.294	0.658	0.884	0.727	3.41	0.599
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	6.54	7.96	6.93	12.3	4.98	9.36	8.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	276	399	345	231	249	455	375
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 26-May-2016 95-3	95-3 17-Nov-2016 95-3	95-3 24-May-2017 95-3	95-3 29-Nov-2017 95-3	95-3 24-May-2018 95-3	95-3 22-Nov-2018 95-3	95-3 19-Jun-2019 95-3
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.001	<0.002 [10]	<0.001	<0.001	0.003	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 20-Nov-2019 95-3	95-3 21-May-2020 95-3	95-3 26-Nov-2020 95-3	95-3 26-May-2021 95-3	95-3 30-Nov-2021 95-3
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	698	659	691	696	604
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	6	9	<5	8
Alkalinity (Total as CaCO3)	mg/l	--	--	703	665	699	699	612
Ammonia Nitrogen	mg/l	--	--	0.11	0.11	0.04	0.17	0.21
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	111	37	89	137	96
Chloride	mg/l	--	250	164	184	163	158	150
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1815	1713	1601	1731	1642
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	237	225	179	176	159
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.6	0.7	0.8	1.5	5.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.21	8.26	7.49	6.97	7.14
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.97	0.66	0.67	1.70	16.1
Sulphate	mg/l	--	500 [6]	88	89	90	81	101
Temperature (Field)	deg c	--	15	7.1	10.3	6.2	11.3	4.5
Total Dissolved Solids	mg/l	--	500	1090	998	1000	1090	1000
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001
Boron, dissolved	mg/l	5	--	0.904	0.745	0.889	0.705	0.819
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	36.5	34.9	28.1	26.7	25.2
Chromium, dissolved	mg/l	0.05	--	<0.001	0.002	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0020	<0.0005	0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0016	0.0021	0.0034	0.0011	0.0014
Iron, dissolved	mg/l	--	0.3	<0.1	2.7	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	0.0040	0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	35.5	33.5	26.5	26.4	23.2
Manganese, dissolved	mg/l	--	0.05	0.444	0.921	0.069	0.639	0.195
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11.1	7.71	7.25	5.79	6.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	374	377	345	281	320
Zinc, dissolved	mg/l	--	5	<0.005	0.01	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-3 20-Nov-2019 95-3	95-3 21-May-2020 95-3	95-3 26-Nov-2020 95-3	95-3 26-May-2021 95-3	95-3 30-Nov-2021 95-3
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.002	0.003	<0.001	<0.004 [12]	<0.001
Semi-VOCs								
Naphthalene	mg/l	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 28-Jun-1995	95-5 22-Nov-1995	95-5 12-Oct-1996	95-5 06-Nov-1997	95-5 05-Jun-1998	95-5 06-May-1999
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	1181	1420	--	–	--	1610
Alkalinity, Carbonate as CaCO3	mg/l	–	--	1	1	--	–	--	1
Alkalinity (Total as CaCO3)	mg/l	–	--	968	1160	1250	1250	875	1320
Ammonia Nitrogen	mg/l	–	--	1.59	7.5	4.64	4.65	7.51	4.42
Chemical Oxygen Demand	mg/l	–	--	400	260	148	96	288	61
Chloride	mg/l	–	250	703	1430	1370	1340	1390	1510
Conductivity	uS/cm	–	--	–	--	--	–	--	--
Conductivity (Field)	uS/cm	–	--	5340	6120	2830	6020	5370	5220
Dissolved Oxygen (Field)	mg/l	–	--	3	--	--	–	--	--
Hardness, Calcium Carbonate	mg/l	–	--	315	467	337	424	347	369
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	1	--
Nitrite as N	mg/l	1.0	--	–	--	--	–	--	--
Nitrogen, Total Kjeldahl	mg/l	–	--	13.8	19.3	--	–	--	37.1
Nitrogen, Nitrate-Nitrite	mg/l	–	--	–	--	--	–	--	--
Nitrogen, Organic	mg/l	–	--	12.21	11.8	--	–	--	--
pH	-	–	--	–	--	--	–	--	--
pH (Field)	-	–	--	7.94	8.33	7.87	8.16	--	7.9
Phosphate	mg/l	–	--	–	41	--	–	--	--
Phosphorus	mg/l	–	--	21	--	--	–	--	--
Sulphate	mg/l	–	500 [6]	14	10	3	9	73	2
Temperature (Field)	deg c	–	15	–	--	--	–	--	--
Total Dissolved Solids	mg/l	–	500	268	320	2830	3020	2670	2710
Total Organic Carbon	mg/l	–	--	26.1	19.9	31.8	20.2	27.7	24.5
Total Suspended Solids	mg/l	–	--	–	--	58.8	–	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	–	--	--	–	--	--
Boron, dissolved	mg/l	5	--	1.02	1.13	1.28	1.41	1.52	1.62
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	–	--	--
Calcium, dissolved	mg/l	–	--	40.4	48.7	35	46.5	35.1	38.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.1	0.01	0.02	0.01	0.01
Cobalt, dissolved	mg/l	–	--	–	--	--	–	--	--
Copper, dissolved	mg/l	–	1	0.02	0.04	0.01	0.01	0.03	0.01
Iron, dissolved	mg/l	–	0.3	0.04	58.1	0.7	13.3	6.37	0.56
Lead, dissolved	mg/l	0.01	--	0.0008	0.007	0.0002	0.001	0.001	0.0002
Magnesium, dissolved	mg/l	–	--	51.2	82.8	59.8	73.8	62.1	65.3
Manganese, dissolved	mg/l	–	0.05	0.31	1.21	0.18	0.4	0.23	0.13
Mercury, dissolved	mg/l	0.001	--	–	--	--	–	--	--
Molybdenum, dissolved	mg/l	–	--	–	--	--	–	--	--
Nickel, dissolved	mg/l	–	--	0.02	0.07	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	–	--	–	41.4	32.1	39.3	36.4	41.1
Selenium, dissolved	mg/l	0.05	--	–	--	--	–	--	--
Sodium, dissolved	mg/l	–	200 [7]	832	1050	1230	1140	1370	1340
Zinc, dissolved	mg/l	–	5	0.01	0.11	0.01	0.04	0.22	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 28-Jun-1995	95-5 22-Nov-1995	95-5 12-Oct-1996	95-5 06-Nov-1997	95-5 05-Jun-1998	95-5 06-May-1999
Phenols									
Phenolics, Total Recoverable	mg/l	–	--	0.001	--	--	–	--	--
Semi-VOCs									
Styrene	mg/l	–	--	–	--	--	–	--	--
VOCs									
1,1-Dichloroethane	mg/l	–	--	–	--	--	–	--	--
Benzene	mg/l	0.001	--	–	--	--	–	--	--
Ethylbenzene	mg/l	0.14	0.0016	–	--	--	–	--	--
m,p-Xylenes	mg/l	–	--	–	--	--	–	--	--
Methylene Chloride	mg/l	0.05	--	–	--	--	–	--	--
o-Xylene	mg/l	–	--	–	--	--	–	--	--
Toluene	mg/l	0.06	0.024	–	--	--	–	--	--
Vinyl Chloride	mg/l	0.001	--	–	--	--	–	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 24-Oct-2000	95-5 14-Jun-2001	95-5 06-Nov-2002	95-5 30-May-2003	95-5 19-Nov-2004	95-5 16-Nov-2005
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	1620	1290	1680	1460	1550	292
Alkalinity, Carbonate as CaCO3	mg/l	–	--	1	85	1	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	–	--	1320	1200	1380	1200	1270	1200
Ammonia Nitrogen	mg/l	–	--	2.12	4.14	3.95	3.71	3.89	3.62
Chemical Oxygen Demand	mg/l	–	--	–	52	150	81	315	78
Chloride	mg/l	–	250	1520	1480	1430	1470	1500	1300
Conductivity	uS/cm	–	--	–	--	--	–	--	--
Conductivity (Field)	uS/cm	–	--	6090	5000	5890	5040	6200	4200
Dissolved Oxygen (Field)	mg/l	–	--	–	--	--	–	--	--
Hardness, Calcium Carbonate	mg/l	–	--	417	370	357	327	340	356
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	0.1	1	0.4
Nitrite as N	mg/l	1.0	--	–	--	--	–	--	--
Nitrogen, Total Kjeldahl	mg/l	–	--	4.76	5.13	7.66	5.94	4.82	5.18
Nitrogen, Nitrate-Nitrite	mg/l	–	--	–	--	--	–	--	--
Nitrogen, Organic	mg/l	–	--	–	--	--	–	--	--
pH	-	–	--	–	--	--	–	--	--
pH (Field)	-	–	--	8.26	8.1	8	7.2	7.9	--
Phosphate	mg/l	–	--	–	--	--	–	--	--
Phosphorus	mg/l	–	--	3.58	1.6	15.3	3.17	9.54	2.19
Sulphate	mg/l	–	500 [6]	1	1	2	1	10	1
Temperature (Field)	deg c	–	15	–	--	--	–	--	--
Total Dissolved Solids	mg/l	–	500	3450	3250	3390	3330	3100	3470
Total Organic Carbon	mg/l	–	--	–	17.7	18.1	18.9	16.9	19.7
Total Suspended Solids	mg/l	–	--	1830	323	7160	2590	2850	128
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.002	0.001	0.003	0.003	0.001	0.002
Boron, dissolved	mg/l	5	--	1.56	1.69	1.52	1.47	1.53	1.6
Cadmium, dissolved	mg/l	0.005	--	–	--	--	–	--	<0.0001
Calcium, dissolved	mg/l	–	--	38.4	43.2	37.1	36.4	37.3	39.8
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.002	<0.002
Cobalt, dissolved	mg/l	–	--	–	--	--	–	--	<0.005
Copper, dissolved	mg/l	–	1	0.01	0.01	0.01	0.01	0.002	<0.002
Iron, dissolved	mg/l	–	0.3	0.45	0.4	0.45	0.97	0.324	0.385
Lead, dissolved	mg/l	0.01	--	**0.022**	0.0002	**0.0121**	0.0007	0.0022	0.0017
Magnesium, dissolved	mg/l	–	--	77.9	63.6	64.3	57.3	60.1	62.5
Manganese, dissolved	mg/l	–	0.05	0.12	0.12	0.12	0.1	0.104	0.107
Mercury, dissolved	mg/l	0.001	--	–	--	--	–	--	<0.00006
Molybdenum, dissolved	mg/l	–	--	–	--	--	–	--	<0.01
Nickel, dissolved	mg/l	–	--	0.02	0.02	0.02	0.02	0.01	<0.01
Potassium, dissolved	mg/l	–	--	30.8	26.7	31.4	33	34.4	38.4
Selenium, dissolved	mg/l	0.05	--	–	--	--	–	--	<0.001
Sodium, dissolved	mg/l	–	200 [7]	1270	1240	1320	1060	1470	1350
Zinc, dissolved	mg/l	–	5	0.01	0.01	0.02	0.01	0.019	0.007

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 24-Oct-2000	95-5 14-Jun-2001	95-5 06-Nov-2002	95-5 30-May-2003	95-5 19-Nov-2004	95-5 16-Nov-2005
Phenols									
Phenolics, Total Recoverable	mg/l	–	--	0.004	0.029	0.001	0.001	0.001	<0.001
Semi-VOCs									
Styrene	mg/l	–	--	–	--	--	–	--	--
VOCs									
1,1-Dichloroethane	mg/l	–	--	–	--	--	–	--	--
Benzene	mg/l	0.001	--	–	--	--	–	--	--
Ethylbenzene	mg/l	0.14	0.0016	–	--	--	–	--	--
m,p-Xylenes	mg/l	–	--	–	--	--	–	--	--
Methylene Chloride	mg/l	0.05	--	–	--	--	–	--	--
o-Xylene	mg/l	–	--	–	--	--	–	--	--
Toluene	mg/l	0.06	0.024	–	--	--	–	--	--
Vinyl Chloride	mg/l	0.001	--	–	--	--	–	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 15-May-2007	95-5 10-Nov-2008	95-5 26-Nov-2009 [8] M-3	95-5 24-May-2011 [30] G-33	95-5 28-Nov-2012 95-5	95-5 29-May-2014 [32] 95-5
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	1270	1320	1280	1230	1200	1200
Alkalinity, Carbonate as CaCO3	mg/l	–	--	<5	<5	30	43	14	30
Alkalinity (Total as CaCO3)	mg/l	–	--	1270	1320	1310	1270	1200	1300
Ammonia Nitrogen	mg/l	–	--	3.55	3.52	3.72	3.60	3.9	3.9
Chemical Oxygen Demand	mg/l	–	--	181	84	93	70	77	70
Chloride	mg/l	–	250	1410	1510	1690	1390	1300	1500
Conductivity	uS/cm	–	--	–	--	6570	6570	--	--
Conductivity (Field)	uS/cm	–	--	4400	>5000	>3999	>3999	>3999	>3999
Dissolved Oxygen (Field)	mg/l	–	--	–	--	--	–	--	--
Hardness, Calcium Carbonate	mg/l	–	--	326	320	361	365	360	310
Nitrate as N	mg/l	10.0	--	0.1	0.2	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	–	--	<0.10	<0.10	<0.010	<0.010
Nitrogen, Total Kjeldahl	mg/l	–	--	5.99	5.37	4.84	4.32	90	9.9
Nitrogen, Nitrate-Nitrite	mg/l	–	--	–	--	--	–	<0.10	<0.10
Nitrogen, Organic	mg/l	–	--	–	--	--	–	--	--
pH	-	–	--	–	--	8.39	8.57	--	8.42
pH (Field)	-	–	--	8.5	8	7.42	8.05	8.12	7.51
Phosphate	mg/l	–	--	–	--	--	–	--	--
Phosphorus	mg/l	–	--	–	--	2.78	1.68	2.0	1.7
Sulphate	mg/l	–	500 [6]	2	1	4	<1	<1	<1
Temperature (Field)	deg c	–	15	10.8	7	9.1	19.2	6.8	9.5
Total Dissolved Solids	mg/l	–	500	3470	3590	4270	4270	3460	3460
Total Organic Carbon	mg/l	–	--	–	--	--	–	--	--
Total Suspended Solids	mg/l	–	--	–	--	--	–	--	--
Metals									
Arsenic, dissolved	mg/l	0.01	--	0.0089	0.0073	<0.01	<0.01	0.002	0.0023 [38]
Boron, dissolved	mg/l	5	--	1.42	1.47	2.1	1.9	1.8	1.5
Cadmium, dissolved	mg/l	0.005	--	0.00004	<0.00002	<0.001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	–	--	36.7	35.7	39	39	38	33
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.005	<0.005	<0.005	<0.01
Cobalt, dissolved	mg/l	–	--	<0.005	<0.005	<0.002	0.0008	0.0006	0.00054
Copper, dissolved	mg/l	–	1	<0.002	<0.002	<0.01	0.002	0.001	0.0014
Iron, dissolved	mg/l	–	0.3	0.893	0.225	<0.3	0.36	0.2	0.27
Lead, dissolved	mg/l	0.01	--	0.00019	<0.00002	<0.01	<0.001	<0.0005	<0.00050
Magnesium, dissolved	mg/l	–	--	57	56.2	64	65	64	55
Manganese, dissolved	mg/l	–	0.05	0.107	0.09	<0.1	0.09	0.087	0.085
Mercury, dissolved	mg/l	0.001	--	–	--	--	–	--	--
Molybdenum, dissolved	mg/l	–	--	–	--	--	–	--	--
Nickel, dissolved	mg/l	–	--	–	--	--	–	--	--
Potassium, dissolved	mg/l	–	--	37.1	34.4	33	36	33	29
Selenium, dissolved	mg/l	0.05	--	–	--	--	–	--	--
Sodium, dissolved	mg/l	–	200 [7]	1160	1160	1345	1160	1300	1200
Zinc, dissolved	mg/l	–	5	<0.005	<0.005	<0.1	0.02	<0.005	<0.0050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 15-May-2007	95-5 10-Nov-2008	95-5 26-Nov-2009 [8] M-3	95-5 24-May-2011 [30] G-33	95-5 28-Nov-2012 95-5	95-5 29-May-2014 [32] 95-5
Phenols									
Phenolics, Total Recoverable	mg/l	–	--	<0.001	<0.001	<0.001	<0.001	<0.0010	0.0011
Semi-VOCs									
Styrene	mg/l	–	--	–	<0.0006	--	–	--	--
VOCs									
1,1-Dichloroethane	mg/l	–	--	<0.0001	<0.0001	<0.0004	<0.0004	<0.00010	<0.00020
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	0.00011	<0.00020
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00020
m,p-Xylenes	mg/l	–	--	<0.001	<0.001	<0.0010	<0.0010	0.00018	<0.00020
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0040	<0.0040	<0.00050	<0.0010
o-Xylene	mg/l	–	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010	<0.00020
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020	<0.00040
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020	<0.00040

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 26-Nov-2015 95-5	95-5 24-May-2017 95-5	95-5 22-Nov-2018 [42] 95-5	95-5 21-May-2020 95-5	95-5 30-Nov-2021 95-5
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	1170	1210	1230	1250	1250
Alkalinity, Carbonate as CaCO3	mg/l	–	--	<25 [28]	<25 [11]	38	<25 [13]	<25
Alkalinity (Total as CaCO3)	mg/l	–	--	1190	1230	1270	1280	1250
Ammonia Nitrogen	mg/l	–	--	4.98	5.58	--	3.97	3.60
Chemical Oxygen Demand	mg/l	–	--	277	237	--	126	129
Chloride	mg/l	–	250	1490	1430	1430	1740	1420
Conductivity	uS/cm	–	--	–	--	--	–	--
Conductivity (Field)	uS/cm	–	--	>3999	3999	--	>3999	>3999
Dissolved Oxygen (Field)	mg/l	–	--	–	--	--	–	--
Hardness, Calcium Carbonate	mg/l	–	--	317	282	456	410	355
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.50 [11]	<0.05	<0.05	<1.00 [13]
Nitrogen, Total Kjeldahl	mg/l	–	--	9.1	11.0	--	4.4	5.0
Nitrogen, Nitrate-Nitrite	mg/l	–	--	–	--	--	–	--
Nitrogen, Organic	mg/l	–	--	–	--	--	–	--
pH	-	–	--	–	--	--	–	--
pH (Field)	-	–	--	8.14	8.05	--	8.10	8.18
Phosphate	mg/l	–	--	–	--	--	–	--
Phosphorus	mg/l	–	--	7.23	12.2	--	1.63	1.67
Sulphate	mg/l	–	500 [6]	<1	1	6	<1	2
Temperature (Field)	deg c	–	15	7.1	11.9	--	14.5	5.1
Total Dissolved Solids	mg/l	–	500	3420	3630	3600	3700	3580
Total Organic Carbon	mg/l	–	--	–	--	--	–	--
Total Suspended Solids	mg/l	–	--	–	--	--	–	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.002	0.008	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	1.46	1.18	1.59	1.59	1.62
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	–	--	31.3	33.2	52.4	42.4	37.5
Chromium, dissolved	mg/l	0.05	--	<0.001	0.021	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	–	--	<0.0005	<0.0005	0.0008	0.0007	0.0005
Copper, dissolved	mg/l	–	1	<0.0005	0.0010	0.0023	0.0023	0.0011
Iron, dissolved	mg/l	–	0.3	0.126	<0.1	0.195	0.263	0.151
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	–	--	58	48.4	79	73.9	63.4
Manganese, dissolved	mg/l	–	0.05	0.068	0.065	0.098	0.093	0.077
Mercury, dissolved	mg/l	0.001	--	–	--	--	–	--
Molybdenum, dissolved	mg/l	–	--	–	--	--	–	--
Nickel, dissolved	mg/l	–	--	–	--	--	–	--
Potassium, dissolved	mg/l	–	--	25.6	30	40.7	34.2	28.8
Selenium, dissolved	mg/l	0.05	--	–	--	--	–	--
Sodium, dissolved	mg/l	–	200 [7]	1110	1140	1140	1170	963
Zinc, dissolved	mg/l	–	5	0.014	<0.005	<0.005	0.009	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-5 26-Nov-2015 95-5	95-5 24-May-2017 95-5	95-5 22-Nov-2018 [42] 95-5	95-5 21-May-2020 95-5	95-5 30-Nov-2021 95-5
Phenols								
Phenolics, Total Recoverable	mg/l	–	--	<0.002 [10]	<0.010 [12]	--	0.010	<0.004 [12]
Semi-VOCs								
Styrene	mg/l	–	--	–	--	--	–	--
VOCs								
1,1-Dichloroethane	mg/l	–	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	–	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	–	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 28-Jun-1995	95-6 22-Nov-1995	95-6 12-Jun-1996	95-6 12-Oct-1996	95-6 18-Jun-1997	95-6 06-Nov-1997	95-6 05-Jun-1998
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	832	1070	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	8	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	682	886	901	905	914	966	840
Ammonia Nitrogen	mg/l	--	--	1.14	0.89	1.37	1.46	0.01	0.87	0.79
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	115	48	29	25	34	42	64
Chloride	mg/l	--	250	389	825	839	816	783	952	861
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3380	4350	4020	4380	3230	4040	4290
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.45	--	--	--	1.97	--	--
Hardness, Calcium Carbonate	mg/l	--	--	255	338	349	320	387	374	336
Nitrate as N	mg/l	10.0	--	0.1	0.8	0.1	0.1	0.1	0.1	2.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	6.3	3.5	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	5.16	2.61	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.89	8.09	7.95	7.56	8.02	7.98	--
Phosphate	mg/l	--	--	--	0.3	--	--	--	--	--
Phosphorus	mg/l	--	--	6.1	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	21	11	9	8	5	3	38
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1700	2190	2010	2190	1630	2030	2140
Total Organic Carbon	mg/l	--	--	14.1	13.5	14.4	14	15.1	14.6	14
Total Suspended Solids	mg/l	--	--	--	--	2910	1490	1320	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.53	0.59	0.678	0.71	0.91	0.79	0.84
Cadmium, dissolved	mg/l	0.005	--	0.0002	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	38.1	43.6	43.3	40.8	52.4	50.3	41.7
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.02	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	3.06	0.5	0.44	0.39	0.28	0.45
Lead, dissolved	mg/l	0.01	--	0.0008	0.0001	0.0002	0.0002	0.0002	0.0002	0.0018
Magnesium, dissolved	mg/l	--	--	38.4	54.8	57.7	52.2	61.4	59.6	55.7
Manganese, dissolved	mg/l	--	0.05	0.33	0.27	0.213	0.18	0.19	0.19	0.18
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.01	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	20.7	25.4	19.7	19.3	21.9	20.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	566	721	753	668	643	788	967
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.01	0.16

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 28-Jun-1995	95-6 22-Nov-1995	95-6 12-Jun-1996	95-6 12-Oct-1996	95-6 18-Jun-1997	95-6 06-Nov-1997	95-6 05-Jun-1998
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 30-Oct-1998	95-6 06-May-1999	95-6 19-Oct-1999	95-6 05-May-2000	95-6 24-Oct-2000	95-6 14-Jun-2001	95-6 23-Nov-2001
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	1090	1130	936	1369	1280	923	1050
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	55	1	1	62	1
Alkalinity (Total as CaCO3)	mg/l	--	--	892	930	859	1122	1050	861	860
Ammonia Nitrogen	mg/l	--	--	0.99	0.97	1.23	0.05	0.66	1.62	1.07
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	50	45	36	--	41	37
Chloride	mg/l	--	250	850	890	920	855	900	836	859
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4060	3800	3600	3775	4020	3800	3610
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	278	338	312	337	353	320	344
Nitrate as N	mg/l	10.0	--	--	--	0.1	--	0.4	0.2	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.82	2.06	--	0.2	1.83	2.57	2.54
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	7.6	7.8	8	8.01	8	7.55
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	2.01	0.8	0.34
Sulphate	mg/l	--	500 [6]	4	3	1	3	3	3	3
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2040	2040	1780	1888	2250	2060	2110
Total Organic Carbon	mg/l	--	--	16.8	18.2	17.7	16.2	--	14	20
Total Suspended Solids	mg/l	--	--	--	--	520	360	3200	186	174
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	0.001	0.001	0.002
Boron, dissolved	mg/l	5	--	0.94	0.84	0.92	0.93	0.82	0.8	0.99
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	38	41.7	43.8	44.2	41.4	46.5	43.3
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.22	0.21	0.68	1.14	0.06	0.26	0.19
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0003	0.0002	0.022	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	44.5	56.1	48.5	54.3	60.6	49.4	57.4
Manganese, dissolved	mg/l	--	0.05	0.2	0.19	0.17	0.19	0.21	0.2	0.23
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	21.9	22.1	19	13.8	19	12.6	14
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	803	835	926	810	790	750	850
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.06	0.09	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 30-Oct-1998	95-6 06-May-1999	95-6 19-Oct-1999	95-6 05-May-2000	95-6 24-Oct-2000	95-6 14-Jun-2001	95-6 23-Nov-2001
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	--	0.001	0.024	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 23-May-2002	95-6 06-Nov-2002	95-6 30-May-2003	95-6 09-Oct-2003	95-6 14-May-2004	95-6 19-Nov-2004	95-6 24-May-2005
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	983	1210	1110	--	1000	1060	1110
Alkalinity, Carbonate as CaCO3	mg/l	--	--	73	1	1	--	1	1	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	928	990	910	915	820	870	910
Ammonia Nitrogen	mg/l	--	--	1.24	1.37	2.13	1.91	1.38	1.5	1.58
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	3	--	--	--
Chemical Oxygen Demand	mg/l	--	--	58	54	79	53	52	51	48
Chloride	mg/l	--	250	870	801	895	876	831	826	793
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3520	3990	3600	3900	3750	4310	3400
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	205	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	337	320	302	311	289	270	325
Nitrate as N	mg/l	10.0	--	0.1	0.2	0.1	0.1	0.3	1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.43	2.57	4.34	2.76	2.53	2.26	2.54
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.35	7.8	7.2	7.6	8	7.9	7.3
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.51	0.56	2.95	0.57	0.67	0.48	0.33
Sulphate	mg/l	--	500 [6]	2	3	2	2	2	10	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	10.2
Total Dissolved Solids	mg/l	--	500	2190	2220	2200	2348	1875	2155	2180
Total Organic Carbon	mg/l	--	--	16	14	14.5	30	13.9	14.1	14
Total Suspended Solids	mg/l	--	--	50	228	2670	228	176	950	97
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	0.003	0.004	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.85	0.85	0.73	0.784	0.692	0.754	0.763
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Calcium, dissolved	mg/l	--	--	45.1	41.6	41.7	41.8	40	38	43.1
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.001	0.001	0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.002	0.002	0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.3	0.21	0.79	0.386	0.245	0.268	0.696
Lead, dissolved	mg/l	0.01	--	0.0002	0.0018	0.0009	0.0009	0.001	0.0008	0.0024
Magnesium, dissolved	mg/l	--	--	54.6	52.6	48	50.2	45.9	42.6	52.8
Manganese, dissolved	mg/l	--	0.05	0.22	0.2	0.19	0.146	0.22	0.22	0.207
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.01	0.01	0.01	<0.01
Potassium, dissolved	mg/l	--	--	18.4	18.6	17.9	19.6	17.9	18.5	20.2
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	<0.001
Sodium, dissolved	mg/l	--	200 [7]	728	760	688	809	689	690	738
Zinc, dissolved	mg/l	--	5	0.01	0.02	0.01	0.005	0.005	0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 23-May-2002	95-6 06-Nov-2002	95-6 30-May-2003	95-6 09-Oct-2003	95-6 14-May-2004	95-6 19-Nov-2004	95-6 24-May-2005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	<0.0007
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0004
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	<0.0001
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0002
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	<0.0001
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	<0.0001
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	<0.0002
Benzene	mg/l	0.001	--	--	--	--	--	--	--	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromoform	mg/l	--	--	--	--	--	--	--	--	<0.0001
Bromomethane	mg/l	--	--	--	--	--	--	--	--	<0.002
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	<0.0002
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	<0.0002
Chloroform	mg/l	--	--	--	--	--	--	--	--	<0.0003
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	<0.0001
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	--	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	<0.0002
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	<0.0001
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	<0.0001
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	<0.0001
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 16-Nov-2005	95-6 25-May-2006	95-6 21-Nov-2006	95-6 15-May-2007	95-6 30-Nov-2007	95-6 22-May-2008	95-6 10-Nov-2008
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	222	925	940	980	985	950	1010
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	910	925	940	980	985	950	1010
Ammonia Nitrogen	mg/l	--	--	1.3	1.43	1.63	1.52	1.6	1.22	1.54
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	52	36	69	64	81	50	53
Chloride	mg/l	--	250	808	874	896	804	855	919	927
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3200	3400	3600	2900	3200	3700	3600
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	309	293	288	303	315	292	302
Nitrate as N	mg/l	10.0	--	0.7	0.2	0.2	<0.1	<0.1	0.1	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.19	2.3	3.15	2.71	2.55	1.32	2.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	--	7.9	7	8.5	8.4	7.9	7.9
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.33	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	2	1	2	1	<1	1	<1
Temperature (Field)	deg c	--	15	--	6	7	8.9	7.5	9.5	8
Total Dissolved Solids	mg/l	--	500	2260	2260	2280	2210	2500	2360	2380
Total Organic Carbon	mg/l	--	--	38.6	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	244	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	<0.001	0.0049	0.0058	0.0049	0.0049	0.0043
Boron, dissolved	mg/l	5	--	0.829	0.673	0.72	0.707	0.794	0.747	0.739
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.005	<0.0001	0.00002	<0.00002	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	43.4	40.3	39.1	41.7	44.7	39.6	41.1
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	<0.005	0.012	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.002	<0.002	0.004	<0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.024	0.181	0.037	0.46	0.175	0.529	0.006
Lead, dissolved	mg/l	0.01	--	0.0012	0.0002	0.0001	0.00004	<0.00002	0.00012	<0.00002
Magnesium, dissolved	mg/l	--	--	48.8	46.9	46.2	48.4	49.4	47	48.4
Manganese, dissolved	mg/l	--	0.05	0.19	0.168	0.14	0.204	0.194	0.159	0.162
Mercury, dissolved	mg/l	0.001	--	<0.00006	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	<0.01	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	21.6	18.5	18.6	18.7	21.9	18.4	18.6
Selenium, dissolved	mg/l	0.05	--	0.001	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	810	745	715	704	934	761	732
Zinc, dissolved	mg/l	--	5	0.01	<0.005	0.012	<0.005	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 16-Nov-2005	95-6 25-May-2006	95-6 21-Nov-2006	95-6 15-May-2007	95-6 30-Nov-2007	95-6 22-May-2008	95-6 10-Nov-2008
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	<0.0006
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 19-May-2009 G-27	95-6 26-Nov-2009 [37] J-7	95-6 25-May-2010 [30] M-25	95-6 20-Oct-2010 [30] G-22	95-6 24-May-2011 [30] G-31	95-6 29-Nov-2011 [30] 95-6	95-6 31-May-2012 95-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	927	947	920	935	926	957	880
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<2 [9]	<2 [9]	<2 [9]	30	<2 [9]	14
Alkalinity (Total as CaCO3)	mg/l	--	--	927	947	920	935	956	957	900
Ammonia Nitrogen	mg/l	--	--	1.87	1.48	1.55	1.53	1.52	1.49	1.7
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	38	55	45	55	45	5	53
Chloride	mg/l	--	250	833	814	773	844	826	854	750
Conductivity	uS/cm	--	--	4190	4230	4210	4200	4300	4270	--
Conductivity (Field)	uS/cm	--	--	3600	3647	3944	7400	3216	3681	3499
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	298	353	331	300	326	304	290
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.16
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	0.31
Nitrogen, Total Kjeldahl	mg/l	--	--	2.33	2.11	2.17	2.35	2.26	1.86	2.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	0.47
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.17	8.18	8.27	8.23	8.54	8.16	8.23
pH (Field)	-	--	--	--	7.16	7.92	8.32	7.98	7.92	7.89
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.55	0.48	0.51	0.76	0.57	0.47	0.42
Sulphate	mg/l	--	500 [6]	2	4	<1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	9	9.0	21.9	9.5	15.4	8.6	12.2
Total Dissolved Solids	mg/l	--	500	2720	2750	2740	2730	2800	2780	2260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.005	0.007	<0.01	<0.01	<0.01	<0.01	0.0017
Boron, dissolved	mg/l	5	--	0.96	0.95	0.81	1.1	0.80	0.87	0.82
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010
Calcium, dissolved	mg/l	--	--	40	44	42	41	45	41	40
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	0.007	<0.005	<0.005	<0.005	<0.0050
Cobalt, dissolved	mg/l	--	--	0.0006	0.0008	0.0007	0.0007	0.0007	0.0007	<0.00050
Copper, dissolved	mg/l	--	1	0.001	0.001	<0.001	<0.001	0.002	0.003	<0.0010
Iron, dissolved	mg/l	--	0.3	0.52	0.38	0.36	0.40	0.22	0.26	0.52
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.00050
Magnesium, dissolved	mg/l	--	--	48	59	55	48	52	49	47
Manganese, dissolved	mg/l	--	0.05	0.16	0.17	0.16	0.19	0.16	0.18	0.14
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	16	23	21	17	16	18	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	819	702	800	781	882	746	720
Zinc, dissolved	mg/l	--	5	<0.01	0.01	<0.01	<0.01	<0.01	<0.01	<0.0050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 19-May-2009 G-27	95-6 26-Nov-2009 [37] J-7	95-6 25-May-2010 [30] M-25	95-6 20-Oct-2010 [30] G-22	95-6 24-May-2011 [30] G-31	95-6 29-Nov-2011 [30] 95-6	95-6 31-May-2012 95-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.0004	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.0005	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.0040	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 28-Nov-2012 95-6	95-6 29-May-2013 [32] 95-6	95-6 26-Nov-2013 GW-5	95-6 29-May-2014 [36] 95-6	95-6 19-Nov-2014 95-6	95-6 02-Jun-2015 95-6	95-6 26-Nov-2015 95-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	910	910	940	870	890	871	936
Alkalinity, Carbonate as CaCO3	mg/l	--	--	13	13	18	21	16	17	16
Alkalinity (Total as CaCO3)	mg/l	--	--	920	920	960	890	910	888	952
Ammonia Nitrogen	mg/l	--	--	1.6	2.0	1.9	2.2	1.9	2.15	2.13
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	57	65	80	68	77	108	126
Chloride	mg/l	--	250	810	850	860	830	870	790	875
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3493	3061	3154	3272	3749	3819	3954
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	350	340	270	300	320	276	309
Nitrate as N	mg/l	10.0	--	<0.10	0.25	<0.10	<0.10	<0.10	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.010	0.41	0.035	0.050	0.032	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	2.3	3.1	7.6	9.9	3.2	3.4	4.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.10	0.65	<0.10	<0.10	<0.10	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	8.19	8.31	8.41	8.27	--	--
pH (Field)	-	--	--	8.01	7.60	7.67	7.90	8.09	7.87	8.03
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.56	2.0	2.7	4.6	3.7	2.20	3.85
Sulphate	mg/l	--	500 [6]	<1	<1	<1	7	<1	2	1
Temperature (Field)	deg c	--	15	6.2	10.7	6.4	9.9	5.0	10.0	7.8
Total Dissolved Solids	mg/l	--	500	2400	2310	2340	2180	2200	2000	2260
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0016	0.0030	0.0018	0.0025	0.001	0.001
Boron, dissolved	mg/l	5	--	1	0.91	0.69	0.86	0.95	0.563	0.848
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	45	46	36	40	42	34.2	27.1
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.0050	0.0057	0.0065	<0.01 [34]	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0006	0.00068	0.00073	0.00054	0.00058	0.0005	0.0006
Copper, dissolved	mg/l	--	1	<0.001	<0.0010	0.0013	0.0024	0.0016	<0.0005	<0.0005
Iron, dissolved	mg/l	--	0.3	0.19	<0.1	<0.1	<0.1	0.16	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0005	0.00059	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	57	55	45	48	53	46.4	58.5
Manganese, dissolved	mg/l	--	0.05	0.16	0.2	0.14	0.15	0.22	0.125	0.152
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	20	19	17	18	19	13.8	16.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	840	780	750	630	810	686	865
Zinc, dissolved	mg/l	--	5	<0.005	<0.0050	0.0075	<0.0050	0.0070	<0.005	0.009

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 28-Nov-2012 95-6	95-6 29-May-2013 [32] 95-6	95-6 26-Nov-2013 GW-5	95-6 29-May-2014 [36] 95-6	95-6 19-Nov-2014 95-6	95-6 02-Jun-2015 95-6	95-6 26-Nov-2015 95-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.0010	<0.002 [10]	<0.002 [10]
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.00050	<0.0013	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00010	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00020	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 26-May-2016 95-6	95-6 17-Nov-2016 95-6	95-6 24-May-2017 95-6	95-6 29-Nov-2017 95-6	95-6 24-May-2018 95-6	95-6 22-Nov-2018 95-6	95-6 19-Jun-2019 95-6
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	940	983	932	1030	1060	1030	931
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	14	15	19	20	<25 [11]	11
Alkalinity (Total as CaCO3)	mg/l	--	--	944	997	948	1050	1070	1040	943
Ammonia Nitrogen	mg/l	--	--	2.80	2.08	2.30	1.99	2.53	2.09	1.48
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	131	89	106	69	86	154	75
Chloride	mg/l	--	250	846	902	860	974	899	968	902
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	>3999	3999	3836	3566	>3999	3677	3757
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	276	305	261	223	315	399	299
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.25 [11]	0.25	<0.05	<0.05	0.07
Nitrogen, Total Kjeldahl	mg/l	--	--	3.9	2.3	3.3	3.1	3.9	3.1	2.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.03	7.81	7.99	7.94	7.97	7.92	7.76
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	3.26	3.02	2.57	2.46	3.22	3.10	0.52
Sulphate	mg/l	--	500 [6]	2	1	1	1	2	1	1
Temperature (Field)	deg c	--	15	11.6	9.5	10.0	5.9	10.2	6.6	10.8
Total Dissolved Solids	mg/l	--	500	2260	2330	2200	2340	2450	2390	2370
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	0.005	0.005	0.001	0.001	0.002	0.001
Boron, dissolved	mg/l	5	--	0.754	1.06	0.657	0.634	0.843	0.844	0.686
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	38.5	41.3	38.3	29	45.4	51.5	40.6
Chromium, dissolved	mg/l	0.05	--	<0.001	0.015	0.012	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0005	0.0007	<0.0005	<0.0005	0.0005	0.0011	0.0006
Copper, dissolved	mg/l	--	1	0.0017	0.0007	0.0017	0.0010	0.0014	0.0054	0.0023
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	<0.1	<0.1	<0.1	0.176	0.108
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0002	<0.0001
Magnesium, dissolved	mg/l	--	--	43.8	49	40.2	36.4	49.1	65.7	47.9
Manganese, dissolved	mg/l	--	0.05	0.089	0.26	0.096	0.129	0.12	0.132	0.111
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	18.9	18.8	15.8	14.4	19	24	17
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	646	790	733	597	752	839	591
Zinc, dissolved	mg/l	--	5	<0.005	0.005	<0.005	<0.005	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 26-May-2016 95-6	95-6 17-Nov-2016 95-6	95-6 24-May-2017 95-6	95-6 29-Nov-2017 95-6	95-6 24-May-2018 95-6	95-6 22-Nov-2018 95-6	95-6 19-Jun-2019 95-6
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.007	<0.002 [10]	<0.002 [10]	<0.002 [10]	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 20-Nov-2019 95-6	95-6 21-May-2020 95-6	95-6 26-Nov-2020 95-6	95-6 26-May-2021 95-6	95-6 30-Nov-2021 95-6
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	924	880	941	942	950
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<25	15	<25	13	<25
Alkalinity (Total as CaCO3)	mg/l	--	--	932	894	963	955	955
Ammonia Nitrogen	mg/l	--	--	2.13	1.59	1.71	1.98	1.47
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	179	66	90	46	72
Chloride	mg/l	--	250	994	1020	862	763	846
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4170	3352	3416	3915	3915
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	409	356	358	405	326
Nitrate as N	mg/l	10.0	--	0.4	<0.1	<0.5 [12]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.25 [13]	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	3.9	2.3	2.3	2.2	2.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.22	8.00	8.47	7.96	8.16
Phosphate	mg/l	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	5.46	0.95	0.95	0.67	0.54
Sulphate	mg/l	--	500 [6]	2	<1	2	<1	<1
Temperature (Field)	deg c	--	15	6.0	14.9	6.4	11.9	6.0
Total Dissolved Solids	mg/l	--	500	2620	2190	2410	2190	2270
Total Organic Carbon	mg/l	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--
Metals								
Arsenic, dissolved	mg/l	0.01	--	0.002	0.002	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.614	0.608	0.599	0.684	0.65
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	54.5	47.1	45.1	48.3	43.6
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0007	0.0005	0.0006	0.0007	0.0006
Copper, dissolved	mg/l	--	1	0.0011	0.0030	0.0029	0.0013	0.0010
Iron, dissolved	mg/l	--	0.3	0.124	<0.1	<0.1	0.258	<0.1
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	0.0001	0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	66.2	57.9	59.6	69.1	52.7
Manganese, dissolved	mg/l	--	0.05	0.201	0.22	0.206	0.19	0.187
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	28.8	19.6	18.7	20.3	17.3
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	882	724	747	764	685
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-6 20-Nov-2019 95-6	95-6 21-May-2020 95-6	95-6 26-Nov-2020 95-6	95-6 26-May-2021 95-6	95-6 30-Nov-2021 95-6
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	<0.002 [10]	0.004	<0.002 [12]	<0.010 [12]	<0.004 [12]
Semi-VOCs								
Naphthalene	mg/l	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 28-Jun-1995	95-7 22-Nov-1995	95-7 13-Oct-1996	95-7 18-Jun-1997	95-7 06-Nov-1997	95-7 05-Jun-1998	95-7 29-Oct-1998
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	583	649	--	--	--	--	644
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	--	--	--	1
Alkalinity (Total as CaCO3)	mg/l	--	--	478	538	536	537	440	530	528
Ammonia Nitrogen	mg/l	--	--	0.58	0.38	0.55	0.52	0.35	0.43	0.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	100	55	39	23	29	40	15
Chloride	mg/l	--	250	402	413	420	407	384	399	420
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2210	2380	--	2330	1900	2160	2130
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	5.42	--	--	2.72	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	202	231	192	243	208	211	172
Nitrate as N	mg/l	10.0	--	0.1	0.7	0.1	0.1	0.1	1.4	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	16.8	5.95	--	--	--	--	1.12
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	16.22	5.57	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.34	7.65	--	7.75	7.81	--	7.1
Phosphate	mg/l	--	--	--	0.5	--	--	--	--	--
Phosphorus	mg/l	--	--	3.21	--	--	--	--	--	--
Sulphate	mg/l	--	500 [6]	4	3	7	5	12	41	9
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1110	1280	--	1170	950	1080	1070
Total Organic Carbon	mg/l	--	--	14	13.6	14.5	12.3	13.2	13	16.2
Total Suspended Solids	mg/l	--	--	--	--	656	993	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	--
Boron, dissolved	mg/l	5	--	0.34	0.31	0.42	0.44	0.42	0.44	0.57
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	31.3	33.6	28.7	37.2	31.6	29.8	26.5
Chromium, dissolved	mg/l	0.05	--	0.01	0.03	0.01	0.01	0.01	0.01	0.02
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.02	1.28	0.63	1.09	0.65	1.33	0.52
Lead, dissolved	mg/l	0.01	--	0.0007	0.0002	0.0002	0.0002	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	29.7	35.2	28.9	36	30.6	32.8	25.6
Manganese, dissolved	mg/l	--	0.05	1.86	2.21	1.82	2.14	1.98	2	2.12
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.03	0.02
Potassium, dissolved	mg/l	--	--	--	10.4	6.5	8.5	7.2	15.3	10.6
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	366	426	366	338	335	454	400
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.01	0.01	0.01	0.16	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 28-Jun-1995	95-7 22-Nov-1995	95-7 13-Oct-1996	95-7 18-Jun-1997	95-7 06-Nov-1997	95-7 05-Jun-1998	95-7 29-Oct-1998
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	--	--	--	--	--	--
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 06-May-1999	95-7 19-Oct-1999	95-7 05-May-2000	95-7 24-Oct-2000	95-7 14-Jun-2001	95-7 23-Nov-2001	95-7 23-May-2002
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	610	732	684	573	540	584	488
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	1	1	32	1	1
Alkalinity (Total as CaCO3)	mg/l	--	--	500	600	561	552	497	479	400
Ammonia Nitrogen	mg/l	--	--	0.12	0.52	0.01	0.14	0.63	0.27	0.6
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	26	25	26	--	27	37	20
Chloride	mg/l	--	250	432	314	365	440	420	398	382
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2040	2040	2000	2220	1900	1930	1940
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	222	204	240	199	206	202	207
Nitrate as N	mg/l	10.0	--	--	2.5	0.3	0.5	0.4	0.3	0.2
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.23	--	--	0.95	1.45	1.52	0.84
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7	7.5	7.4	7.44	7.3	7.02	6.97
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	0.87	0.67	1.94	0.4
Sulphate	mg/l	--	500 [6]	6	14	11	15	13	21	16
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1010	1020	1000	1120	1160	1190	1020
Total Organic Carbon	mg/l	--	--	14.2	15.1	12.7	--	12.8	19	13
Total Suspended Solids	mg/l	--	--	--	624	536	916	528	928	348
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	0.003	0.001	0.001	0.002
Boron, dissolved	mg/l	5	--	0.38	0.59	0.45	0.47	0.42	0.57	0.4
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	31.6	32.9	36.6	28.3	34.1	29.6	32.6
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	1.11	2.82	5.2	0.24	0.39	0.07	0.76
Lead, dissolved	mg/l	0.01	--	0.0002	0.0002	0.0002	0.0022	0.0002	0.0002	0.0002
Magnesium, dissolved	mg/l	--	--	34.3	29.3	35.6	31.2	29.3	31	30.6
Manganese, dissolved	mg/l	--	0.05	2.15	1.78	2	2.07	2.19	2.18	2.26
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium, dissolved	mg/l	--	--	4.1	11.1	6.1	9.7	5.2	5.6	8.7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	393	417	410	486	377	402	357
Zinc, dissolved	mg/l	--	5	0.01	0.11	0.17	0.01	0.01	0.01	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 06-May-1999	95-7 19-Oct-1999	95-7 05-May-2000	95-7 24-Oct-2000	95-7 14-Jun-2001	95-7 23-Nov-2001	95-7 23-May-2002
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	--	--	--	0.001	0.011	0.001	0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 06-Nov-2002	95-7 30-May-2003	95-7 09-Oct-2003	95-7 14-May-2004	95-7 19-Nov-2004	95-7 24-May-2005	95-7 16-Nov-2005
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	662	586	--	531	655	593	132
Alkalinity, Carbonate as CaCO3	mg/l	--	--	1	1	--	1	1	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	543	480	324	435	537	486	540
Ammonia Nitrogen	mg/l	--	--	0.66	0.47	0.33	0.57	0.65	0.46	<0.01
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	2	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	39	2	58	59	351	7	58
Chloride	mg/l	--	250	428	382	298	413	448	369	364
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2240	1970	1620	2090	2290	2500	2000
Dissolved Inorganic Carbon	mg/l	--	--	--	--	71	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	194	195	176	198	209	230	211
Nitrate as N	mg/l	10.0	--	0.2	0.2	0.2	0.3	1	0.3	0.5
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	1.43	1.06	1.49	2.02	1.44	1.63	1.26
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.6	6.9	7.2	7.3	7.8	7.3	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.66	0.36	0.51	0.91	4.95	0.5	1.86
Sulphate	mg/l	--	500 [6]	17	17	31	13	20	10	28
Temperature (Field)	deg c	--	15	--	--	--	--	--	9.9	--
Total Dissolved Solids	mg/l	--	500	1260	1150	859	1045	1145	1120	1220
Total Organic Carbon	mg/l	--	--	14	13.4	31	17.4	23.5	20.2	23.8
Total Suspended Solids	mg/l	--	--	460	188	417	276	1250	233	319
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	0.003	0.001	0.001	0.001	<0.001	0.001
Boron, dissolved	mg/l	5	--	0.51	0.36	0.512	0.362	0.449	0.363	0.478
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	--	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	33.1	30.2	29.9	31.5	32.9	34.9	33.4
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.016	0.002	0.002	<0.002	0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.011	0.006	0.005	<0.002	0.008
Iron, dissolved	mg/l	--	0.3	0.08	0.79	5.78	0.048	0.072	0.097	0.068
Lead, dissolved	mg/l	0.01	--	0.0012	0.0003	0.0007	0.0007	0.0006	0.0011	0.0007
Magnesium, dissolved	mg/l	--	--	29	29	24.6	29	30.8	34.8	31
Manganese, dissolved	mg/l	--	0.05	1.92	2.21	1.13	1.48	1.38	1.59	1.4
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	<0.00006	<0.00006
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	<0.01	<0.01
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.01	0.01	0.01	<0.01	<0.01
Potassium, dissolved	mg/l	--	--	7.6	7.8	9.2	7.4	8.2	8.4	9.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	<0.001	0.001
Sodium, dissolved	mg/l	--	200 [7]	425	368	265	379	405	379	441
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.016	0.005	0.005	0.007	0.008

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 06-Nov-2002	95-7 30-May-2003	95-7 09-Oct-2003	95-7 14-May-2004	95-7 19-Nov-2004	95-7 24-May-2005	95-7 16-Nov-2005
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	0.001	0.001	0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	<0.0007	--
Styrene	mg/l	--	--	--	--	--	--	--	<0.0006	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	<0.0004	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	<0.0001	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	<0.0002	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	<0.0001	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	<0.0001	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	<0.0001	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	<0.0002	--
Benzene	mg/l	0.001	--	--	--	--	--	--	<0.0005	--
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
Bromoform	mg/l	--	--	--	--	--	--	--	<0.0001	--
Bromomethane	mg/l	--	--	--	--	--	--	--	<0.002	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	<0.0002	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	<0.0002	--
Chloroform	mg/l	--	--	--	--	--	--	--	<0.0003	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	<0.0001	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	<0.0001	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	<0.0001	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	<0.0005	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	<0.001	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	<0.0003	--
o-Xylene	mg/l	--	--	--	--	--	--	--	<0.0005	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	<0.0002	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	<0.0005	--
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	<0.0001	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	<0.0001	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	<0.0001	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	<0.0002	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 25-May-2006	95-7 21-Nov-2006	95-7 15-May-2007	95-7 30-Nov-2007	95-7 22-May-2008	95-7 10-Nov-2008	95-7 19-May-2009 G-19
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	545	615	573	603	540	615	560
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	<5	<5	<5	<5	<2 [9]
Alkalinity (Total as CaCO3)	mg/l	--	--	545	615	573	603	540	615	560
Ammonia Nitrogen	mg/l	--	--	0.52	<0.01	0.15	<0.01	0.23	<0.01	0.21
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	42	54	91	127	59	45	45
Chloride	mg/l	--	250	430	456	362	439	413	483	397
Conductivity	uS/cm	--	--	--	--	--	--	--	--	2320
Conductivity (Field)	uS/cm	--	--	1800	2150	1600	1750	1300	2100	1900
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	211	233	230	221	214	225	221
Nitrate as N	mg/l	10.0	--	0.3	0.5	0.2	0.5	0.1	0.5	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	2.12	0.93	1.28	2.24	1.93	0.85	0.81
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	7.89
pH (Field)	-	--	--	7.9	7.6	8.2	7.9	7.5	7.6	--
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	--	--	--	--	--	--	0.87
Sulphate	mg/l	--	500 [6]	21	9	11	19	21	10	15
Temperature (Field)	deg c	--	15	12.5	7	9.7	4.5	9.5	6	9
Total Dissolved Solids	mg/l	--	500	1250	1370	1190	1420	1250	1400	1510
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	<0.001	0.0027	0.0033	0.0069	0.0038	0.0044	0.003
Boron, dissolved	mg/l	5	--	0.352	0.466	0.352	0.46	0.37	0.476	0.49
Cadmium, dissolved	mg/l	0.005	--	<0.005	<0.0001	0.00006	<0.00002	<0.00002	<0.00002	<0.0001
Calcium, dissolved	mg/l	--	--	32.3	36.2	35.6	35.3	33.6	35.8	34
Chromium, dissolved	mg/l	0.05	--	<0.002	<0.002	<0.002	<0.002	<0.002	<0.002	<0.005
Cobalt, dissolved	mg/l	--	--	<0.005	<0.005	0.008	<0.005	<0.005	<0.005	0.0005
Copper, dissolved	mg/l	--	1	0.003	0.005	0.003	0.004	<0.002	0.003	0.006
Iron, dissolved	mg/l	--	0.3	0.089	0.067	0.18	0.084	0.717	0.205	0.11
Lead, dissolved	mg/l	0.01	--	0.0004	<0.0001	0.00011	<0.00002	<0.00002	<0.00002	<0.001
Magnesium, dissolved	mg/l	--	--	31.6	34.7	34.2	32.4	31.8	33	33
Manganese, dissolved	mg/l	--	0.05	1.72	1.56	2	1.6	2.25	0.938	0.63
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.8	9.5	8	10	7.8	9.6	7
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	401	452	388	519	417	460	373
Zinc, dissolved	mg/l	--	5	0.012	0.009	<0.005	<0.005	0.008	<0.005	<0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 25-May-2006	95-7 21-Nov-2006	95-7 15-May-2007	95-7 30-Nov-2007	95-7 22-May-2008	95-7 10-Nov-2008	95-7 19-May-2009 G-19
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	<0.0006	<0.0006	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010
Methylene Chloride	mg/l	0.05	--	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0003	<0.0040
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 26-Nov-2009 J-12	95-7 25-May-2010 [30] M-19	95-7 20-Oct-2010 [30] G-21	95-7 24-May-2011 [30] G-29	95-7 29-Nov-2011 [43] 95-7	95-7 31-May-2012 [31] 95-7	95-7 28-Nov-2012 95-7
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	599	552	593	575	579	570	580
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<2 [9]	<2 [9]	<2 [9]	14	11	4.9	7.0
Alkalinity (Total as CaCO3)	mg/l	--	--	599	552	593	589	590	570	590
Ammonia Nitrogen	mg/l	--	--	0.07	0.52	<0.02	0.28	<0.02	0.33	0.10
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	70	55	55	50	60	50	59
Chloride	mg/l	--	250	447	383	450	400	430	390	410
Conductivity	uS/cm	--	--	2490	2350	2460	2420	2430	--	--
Conductivity (Field)	uS/cm	--	--	2149	2310	2405	2191	2272	2020	2146
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	214	234	235	258	219	180	240
Nitrate as N	mg/l	10.0	--	0.37	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.10	<0.10	<0.10	0.036	<0.010
Nitrogen, Total Kjeldahl	mg/l	--	--	0.64	1.14	0.96	0.76	0.82	1.4	1.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	<0.10	<0.10
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.20	8.12	8.07	8.42	8.31	7.96	--
pH (Field)	-	--	--	7.21	7.51	7.66	7.40	7.68	7.62	7.71
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.71	3.58	1.19	0.67	1.06	0.66	0.88
Sulphate	mg/l	--	500 [6]	16	15	8	10	9	<1	<1
Temperature (Field)	deg c	--	15	8.5	15.7	12.3	13.5	7.9	12.0	6.2
Total Dissolved Solids	mg/l	--	500	1620	1530	1600	1570	1580	1280	1360
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.004	<0.01	<0.001	<0.01	<0.01	0.0028	0.001
Boron, dissolved	mg/l	5	--	0.49	0.46	0.56	0.48	0.52	0.36	0.58
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001
Calcium, dissolved	mg/l	--	--	33	36	38	39	35	28	36
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	0.009	<0.005	<0.005	<0.0050	<0.005
Cobalt, dissolved	mg/l	--	--	0.0006	0.0008	0.0009	0.0010	0.0006	0.0012	0.0011
Copper, dissolved	mg/l	--	1	0.004	0.003	0.002	0.003	0.003	0.0026	0.002
Iron, dissolved	mg/l	--	0.3	<0.03	0.52	0.12	0.38	<0.03	0.86	0.15
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.001	<0.001	<0.001	0.00090	<0.0005
Magnesium, dissolved	mg/l	--	--	32	35	34	39	32	26	35
Manganese, dissolved	mg/l	--	0.05	0.31	2.16	1.89	2.15	0.83	5.2	2.8
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	10	9	9	9	8	6.3	9.4
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	420	368	445	361	392	320	470
Zinc, dissolved	mg/l	--	5	0.01	<0.01	<0.01	0.01	<0.01	<0.0050	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 26-Nov-2009 J-12	95-7 25-May-2010 [30] M-19	95-7 20-Oct-2010 [30] G-21	95-7 24-May-2011 [30] G-29	95-7 29-Nov-2011 [43] 95-7	95-7 31-May-2012 [31] 95-7	95-7 28-Nov-2012 95-7
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.001	<0.001	<0.001	<0.0010	<0.0010
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.0004	<0.0004	<0.0008	<0.00010	<0.00010
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.00010	<0.00010
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.00010	<0.00010
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.00010	<0.00010
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.0040	<0.0040	<0.0080	0.00070	<0.00050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.00010	<0.00010
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.001	<0.00020	<0.00020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.0002	<0.0002	<0.0004	<0.00020	<0.00020

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 29-May-2013 [32]	95-7 26-Nov-2013	95-7 29-May-2014	95-7 19-Nov-2014	95-7 02-Jun-2015	95-7 26-Nov-2015	95-7 26-May-2016
				95-7	GW-3	95-7	95-7	95-7	95-7	95-7
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	560	570	560	570	609	593	614
Alkalinity, Carbonate as CaCO3	mg/l	--	--	4.3	8.1	6.8	6.4	5	5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	560	580	570	580	614	598	617
Ammonia Nitrogen	mg/l	--	--	0.59	<0.050	0.53	0.084	0.46	0.02	0.75
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	64	55	66	57	93	83	94
Chloride	mg/l	--	250	420	430	420	460	463	433	463
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1975	2066	2046	2362	2292	2362	2385
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	240	230	200	240	158	210	160
Nitrate as N	mg/l	10.0	--	0.12	<0.10	<0.10	0.22	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	0.092	<0.010	0.019	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.9	1.3	1.7	1.4	1.4	0.9	1.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	0.21	<0.10	<0.10	0.22	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	7.92	8.18	8.11	8.08	--	--	--
pH (Field)	-	--	--	7.75	7.77	7.29	7.67	7.61	7.75	7.86
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	2.8	2.0	1.5	2.2	1.08	0.73	1.17
Sulphate	mg/l	--	500 [6]	1	2	1	1	10	10	11
Temperature (Field)	deg c	--	15	11.0	6.6	10.2	6.7	10.4	7.4	11.1
Total Dissolved Solids	mg/l	--	500	1340	1370	1300	1310	1330	1350	1400
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.0011	0.0018	0.0013	0.0018	0.002	0.001	0.001
Boron, dissolved	mg/l	5	--	0.45	0.49	0.4	0.52	0.172	0.504	0.305
Cadmium, dissolved	mg/l	0.005	--	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	37	35	31	36	24.8	24.7	25
Chromium, dissolved	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.00088	0.00096	<0.00050	0.00074	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	0.0041	0.0040	0.0051	0.0036	0.0005	0.0016	0.0020
Iron, dissolved	mg/l	--	0.3	<0.1	<0.1	0.2	<0.1	0.509	<0.1	0.376
Lead, dissolved	mg/l	0.01	--	<0.00050	<0.00050	<0.00050	<0.00050	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	35	34	30	36	23.4	36	23.8
Manganese, dissolved	mg/l	--	0.05	2.2	1.8	1.3	1.6	1.05	0.117	0.951
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	7.9	9	6.7	9.1	4.81	7.45	5.96
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	410	450	360	470	322	500	266
Zinc, dissolved	mg/l	--	5	<0.0050	0.039	0.015	<0.0050	<0.005	0.008	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 29-May-2013 [32] 95-7	95-7 26-Nov-2013 GW-3	95-7 29-May-2014 95-7	95-7 19-Nov-2014 95-7	95-7 02-Jun-2015 95-7	95-7 26-Nov-2015 95-7	95-7 26-May-2016 95-7
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.0010	<0.0010	<0.0010	<0.0010	<0.001	<0.001	0.005
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0013	<0.00050	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.00025	<0.00010	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.00050	0.00078	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.00050	<0.00020	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 17-Nov-2016 95-7	95-7 24-May-2017 95-7	95-7 29-Nov-2017 95-7	95-7 24-May-2018 95-7	95-7 22-Nov-2018 95-7	95-7 19-Jun-2019 95-7	95-7 20-Nov-2019 95-7
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	618	643	626	657	667	610	588
Alkalinity, Carbonate as CaCO3	mg/l	--	--	<5	<5	7	5	6	8	9
Alkalinity (Total as CaCO3)	mg/l	--	--	622	646	633	662	673	618	597
Ammonia Nitrogen	mg/l	--	--	0.11	0.60	0.07	0.63	0.10	0.75	0.05
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	72	61	82	96	105	73	85
Chloride	mg/l	--	250	463	480	498	462	460	458	483
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	1257	2322	2145	2436	2112	2213	2390
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	228	255	192	167	287	268	292
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.3	0.1	0.5
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05	<0.05	0.07	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	1.4	1.0	1.7	1.8	1.3	1.0
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.05	7.48	8.03	7.64	8.2	7.34	7.82
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.07	0.88	1.12	1.30	1.44	0.86	1.59
Sulphate	mg/l	--	500 [6]	8	9	11	10	8	10	13
Temperature (Field)	deg c	--	15	9.6	12.4	6.7	10.1	5.4	13.2	7.1
Total Dissolved Solids	mg/l	--	500	1340	1400	1330	1410	1340	1410	1340
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.004	0.003	0.002	0.002	0.002	0.002	0.002
Boron, dissolved	mg/l	5	--	0.644	0.361	0.459	0.316	0.558	0.303	0.432
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	35.7	33.9	29.6	28	42.9	41.5	44.7
Chromium, dissolved	mg/l	0.05	--	0.008	0.006	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0005	0.0006	0.0006	<0.0005	0.0007	0.0008	0.0006
Copper, dissolved	mg/l	--	1	0.0021	0.0018	0.0026	0.0030	0.0106	0.0023	0.0075
Iron, dissolved	mg/l	--	0.3	<0.1	0.442	<0.1	0.555	<0.1	0.321	0.383
Lead, dissolved	mg/l	0.01	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	33.7	41.3	28.8	23.6	43.8	39.9	43.8
Manganese, dissolved	mg/l	--	0.05	1.75	2.23	2.1	1.65	0.567	4.25	0.626
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	9.24	6.42	7.89	5.98	11.6	9.46	13
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	473	464	387	304	536	457	455
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	<0.005	0.015	<0.005	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 17-Nov-2016 95-7	95-7 24-May-2017 95-7	95-7 29-Nov-2017 95-7	95-7 24-May-2018 95-7	95-7 22-Nov-2018 95-7	95-7 19-Jun-2019 95-7	95-7 20-Nov-2019 95-7
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.002	<0.002 [10]	<0.001	<0.001	0.007	<0.001	0.002
Semi-VOCs										
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 21-May-2020 95-7	95-7 26-Nov-2020 95-7	95-7 26-May-2021 95-7	95-7 30-Nov-2021 95-7
General Chemistry							
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	527	619	623	612
Alkalinity, Carbonate as CaCO3	mg/l	--	--	5	<25	6	10
Alkalinity (Total as CaCO3)	mg/l	--	--	532	627	629	622
Ammonia Nitrogen	mg/l	--	--	0.35	0.08	0.42	0.03
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	--	--	--
Chemical Oxygen Demand	mg/l	--	--	66	79	43	80
Chloride	mg/l	--	250	505	459	416	452
Conductivity	uS/cm	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2018	2170	2246	2425
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	246	255	234	231
Nitrate as N	mg/l	10.0	--	<0.1	<0.5 [12]	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.05	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.0	0.9	1.0	0.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--
pH	-	--	--	--	--	--	--
pH (Field)	-	--	--	8.53	8.13	7.56	7.98
Phosphate	mg/l	--	--	--	--	--	--
Phosphorus	mg/l	--	--	0.30	0.50	0.24	0.40
Sulphate	mg/l	--	500 [6]	22	11	13	8
Temperature (Field)	deg c	--	15	10.4	6.8	12.6	6.1
Total Dissolved Solids	mg/l	--	500	1200	1290	1350	1440
Total Organic Carbon	mg/l	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--
Metals							
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.002	0.001
Boron, dissolved	mg/l	5	--	0.357	0.427	0.353	0.401
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	38.1	38.4	34.1	36.2
Chromium, dissolved	mg/l	0.05	--	<0.001	<0.001	<0.001	<0.001
Cobalt, dissolved	mg/l	--	--	0.0008	<0.0005	0.0007	<0.0005
Copper, dissolved	mg/l	--	1	0.0060	0.0055	0.0022	0.0033
Iron, dissolved	mg/l	--	0.3	0.18	<0.1	0.46	<0.1
Lead, dissolved	mg/l	0.01	--	0.0001	<0.0001	<0.0001	<0.0001
Magnesium, dissolved	mg/l	--	--	36.6	38.7	36.2	34.1
Manganese, dissolved	mg/l	--	0.05	2.54	1.05	1.89	0.808
Mercury, dissolved	mg/l	0.001	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	8.31	10	7.71	9.28
Selenium, dissolved	mg/l	0.05	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	421	466	372	408
Zinc, dissolved	mg/l	--	5	<0.005	<0.005	0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-7 21-May-2020 95-7	95-7 26-Nov-2020 95-7	95-7 26-May-2021 95-7	95-7 30-Nov-2021 95-7
Phenols							
Phenolics, Total Recoverable	mg/l	--	--	0.003	<0.002 [12]	<0.004 [12]	<0.001
Semi-VOCs							
Naphthalene	mg/l	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--
VOCs							
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005 [14]	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 28-Jun-1995	95-9 22-Nov-1995	95-9 12-Oct-1996	95-9 06-Nov-1997	95-9 05-Jun-1998	95-9 06-May-1999	95-9 24-Oct-2000
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	834	912	--	--	--	862	1080
Alkalinity, Carbonate as CaCO3	mg/l	--	--	19	23	--	--	--	54	1
Alkalinity (Total as CaCO3)	mg/l	--	--	716	785	--	770	663	796	887
Ammonia Nitrogen	mg/l	--	--	1.6	5	--	0.86	0.9	2	1.16
Chemical Oxygen Demand	mg/l	--	--	850	850	--	23	42	15	--
Chloride	mg/l	--	250	380	405	--	358	366	382	442
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2440	2600	2650	2540	2430	2600	2550
Dissolved Oxygen (Field)	mg/l	--	--	1.26	1.26	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	59	71	--	55	57	47	48
Nitrate as N	mg/l	10.0	--	0.1	0.1	--	0.1	1	--	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	30.3	50	--	--	--	13.8	1.12
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	28.7	45	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.51	8.81	8.38	8.9	--	8.4	8.66
Phosphate	mg/l	--	--	--	2.4	--	--	--	--	--
Phosphorus	mg/l	--	--	1.63	--	--	--	--	--	5.86
Sulphate	mg/l	--	500 [6]	5	10	--	1	44	1	1
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	1230	1230	1330	1270	1192	1360	1440
Total Organic Carbon	mg/l	--	--	37.1	37.1	--	10.5	8.9	11.6	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	4940
Metals										
Arsenic, dissolved	mg/l	0.01	--	--	--	--	--	--	--	0.001
Boron, dissolved	mg/l	5	--	0.91	0.91	--	1.02	1.1	1.13	1.16
Cadmium, dissolved	mg/l	0.005	--	0.0001	0.0001	--	--	--	--	--
Calcium, dissolved	mg/l	--	--	7.97	7.7	--	5.73	7.38	4.65	4.28
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	--	0.01	0.01	0.01	--
Cobalt, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Copper, dissolved	mg/l	--	1	0.03	0.03	--	0.01	0.01	0.01	0.01
Iron, dissolved	mg/l	--	0.3	0.06	0.06	--	3.05	3.25	1	0.16
Lead, dissolved	mg/l	0.01	--	0.0009	0.0009	--	0.0002	0.0002	0.0017	0.022
Magnesium, dissolved	mg/l	--	--	9.3	12.4	--	9.66	9.24	8.46	9.05
Manganese, dissolved	mg/l	--	0.05	0.03	0.03	--	0.06	0.06	0.03	0.01
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	--	0.02	0.03	0.02	0.02
Potassium, dissolved	mg/l	--	--	--	18.6	--	14.4	22.4	20.1	18.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	484	556	--	478	644	573	634
Zinc, dissolved	mg/l	--	5	0.01	0.01	--	0.01	0.04	0.02	0.01

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 28-Jun-1995	95-9 22-Nov-1995	95-9 12-Oct-1996	95-9 06-Nov-1997	95-9 05-Jun-1998	95-9 06-May-1999	95-9 24-Oct-2000
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.001	0.001	--	--	--	--	0.001
Semi-VOCs										
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--
o-Xylene	mg/l	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 14-Jun-2001	95-9 06-Nov-2002	95-9 30-May-2003	95-9 19-Nov-2004	95-9 16-Nov-2005	95-9 15-May-2007	95-9 10-Nov-2008
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	837	1040	897	1030	200	815	820
Alkalinity, Carbonate as CaCO3	mg/l	--	--	40	1	1	1	<5	<5	<5
Alkalinity (Total as CaCO3)	mg/l	--	--	753	855	735	845	820	815	820
Ammonia Nitrogen	mg/l	--	--	1.94	1.7	1.5	1.59	1.61	1.78	1.6
Chemical Oxygen Demand	mg/l	--	--	23	49	41	30	43	94	28
Chloride	mg/l	--	250	373	355	305	410	320	355	397
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2250	2280	2000	2870	2100	1800	2100
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	36	39	130	44	48	39	40
Nitrate as N	mg/l	10.0	--	0.1	0.1	0.1	<1	<0.1	<0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	3.65	2.33	2.57	2.03	2.43	2.78	2.47
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.7	8.6	7.6	8.4	--	8.8	8.6
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	7.94	2.11	3.05	0.98	2.84	--	--
Sulphate	mg/l	--	500 [6]	1	2	1	10	<1	<1	<1
Temperature (Field)	deg c	--	15	--	--	--	--	--	11.4	7
Total Dissolved Solids	mg/l	--	500	1420	1410	1310	1435	1500	1390	1470
Total Organic Carbon	mg/l	--	--	9.3	8.6	10.4	9.3	9.3	--	--
Total Suspended Solids	mg/l	--	--	5210	1900	2990	4200	1460	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.001	0.001	0.001	0.001	<0.001	0.0015	0.0012
Boron, dissolved	mg/l	5	--	1.05	1.02	0.98	1.13	1.12	0.988	1.01
Cadmium, dissolved	mg/l	0.005	--	--	--	--	--	<0.0001	<0.00002	<0.00002
Calcium, dissolved	mg/l	--	--	2.76	4.77	31.2	3.62	4.4	2.92	3.25
Chromium, dissolved	mg/l	0.05	--	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002
Cobalt, dissolved	mg/l	--	--	--	--	--	--	<0.005	<0.005	<0.005
Copper, dissolved	mg/l	--	1	0.01	0.01	0.01	0.002	<0.002	<0.002	<0.002
Iron, dissolved	mg/l	--	0.3	0.06	0.06	5.07	0.144	0.1	0.173	0.044
Lead, dissolved	mg/l	0.01	--	0.0002	0.0021	0.0029	0.0006	0.0017	0.00013	0.00012
Magnesium, dissolved	mg/l	--	--	7.13	7.67	12.6	8.45	9.08	7.61	7.82
Manganese, dissolved	mg/l	--	0.05	0.01	0.01	0.18	0.006	0.005	0.005	0.003
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	<0.00006	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	<0.01	--	--
Nickel, dissolved	mg/l	--	--	0.02	0.02	0.02	0.01	<0.01	--	--
Potassium, dissolved	mg/l	--	--	7.5	13.3	13.8	14.8	16.6	14.3	14.1
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	<0.001	--	--
Sodium, dissolved	mg/l	--	200 [7]	535	577	494	567	672	519	548
Zinc, dissolved	mg/l	--	5	0.01	0.01	0.02	0.005	0.007	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 14-Jun-2001	95-9 06-Nov-2002	95-9 30-May-2003	95-9 19-Nov-2004	95-9 16-Nov-2005	95-9 15-May-2007	95-9 10-Nov-2008
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	0.063	0.001	0.001	0.001	<0.001	<0.001	<0.001
Semi-VOCs										
Styrene	mg/l	--	--	--	--	--	--	--	--	<0.0006
VOCs										
1,1-Dichloroethane	mg/l	--	--	--	--	--	--	--	<0.0001	<0.0001
Benzene	mg/l	0.001	--	--	--	--	--	--	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	--	--	--	--	--	<0.001	<0.001
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	<0.0003	<0.0003
o-Xylene	mg/l	--	--	--	--	--	--	--	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	--	--	--	--	--	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	<0.0002	<0.0002

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 26-Nov-2009 J-9	95-9 24-May-2011 [30] G-30	95-9 28-Nov-2012 95-9	95-9 29-May-2014 [36] 95-9	95-9 26-Nov-2015 95-9	95-9 24-May-2017 95-9	95-9 22-Nov-2018 95-9
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	760	756	760	770	798	802	824
Alkalinity, Carbonate as CaCO3	mg/l	--	--	29	46	22	36	23	21	25
Alkalinity (Total as CaCO3)	mg/l	--	--	789	802	780	800	821	823	849
Ammonia Nitrogen	mg/l	--	--	1.52	1.59	2.0	2.1	2.03	1.85	1.51
Chemical Oxygen Demand	mg/l	--	--	38	30	35	39	53	78	39
Chloride	mg/l	--	250	337	344	410	490	502	406	429
Conductivity	uS/cm	--	--	2490	2620	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2294	2266	2245	2276	2670	2770	2238
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	34	43	52	44	37.3	43	66
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<0.010	<0.010	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	1.78	1.98	2.9	3.4	2.5	2.9	2.2
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	<0.10	<0.10	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--
pH	-	--	--	8.61	8.81	--	8.70	--	--	--
pH (Field)	-	--	--	8.25	8.67	8.74	8.47	8.78	8.62	8.81
Phosphate	mg/l	--	--	--	--	--	--	--	--	--
Phosphorus	mg/l	--	--	1.36	1.54	1.6	1.6	0.72	1.21	0.71
Sulphate	mg/l	--	500 [6]	<1	<1	1	<1	<1	<1	<1
Temperature (Field)	deg c	--	15	8.8	19.3	6.7	10.4	7.4	11.9	6.4
Total Dissolved Solids	mg/l	--	500	1620	1700	1720	1560	1670	1490	1560
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic, dissolved	mg/l	0.01	--	0.002	<0.01	<0.001	<0.0010	<0.001	0.002	<0.001
Boron, dissolved	mg/l	5	--	0.99	1.3	1.2	1.2	1.09	1.15	1.19
Cadmium, dissolved	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.00010	<0.0001	<0.0001	<0.0001
Calcium, dissolved	mg/l	--	--	2	4	5	3.8	3.32	3.39	10.6
Chromium, dissolved	mg/l	0.05	--	<0.005	<0.005	<0.005	<0.0050	<0.001	0.011	<0.001
Cobalt, dissolved	mg/l	--	--	<0.0002	0.0003	<0.0005	<0.00050	<0.0005	<0.0005	<0.0005
Copper, dissolved	mg/l	--	1	<0.001	0.002	<0.001	0.0020	<0.0005	<0.0005	0.0021
Iron, dissolved	mg/l	--	0.3	0.04	0.04	<0.1	<0.1	<0.1	<0.1	<0.1
Lead, dissolved	mg/l	0.01	--	<0.001	<0.001	<0.0005	<0.00050	<0.0001	<0.0001	0.0001
Magnesium, dissolved	mg/l	--	--	7	8	9.6	8.5	7.04	8.42	9.58
Manganese, dissolved	mg/l	--	0.05	<0.01	<0.01	0.005	0.0033	<0.005	<0.005	<0.005
Mercury, dissolved	mg/l	0.001	--	--	--	--	--	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--	--	--	--	--	--
Potassium, dissolved	mg/l	--	--	11	14	15	14	12.3	14.4	15.9
Selenium, dissolved	mg/l	0.05	--	--	--	--	--	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	501	596	700	490	637	584	614
Zinc, dissolved	mg/l	--	5	0.01	0.01	<0.005	<0.0050	0.009	<0.005	<0.005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 26-Nov-2009 J-9	95-9 24-May-2011 [30] G-30	95-9 28-Nov-2012 95-9	95-9 29-May-2014 [36] 95-9	95-9 26-Nov-2015 95-9	95-9 24-May-2017 95-9	95-9 22-Nov-2018 95-9
Phenols										
Phenolics, Total Recoverable	mg/l	--	--	<0.001	<0.001	<0.0010	<0.0010	0.002	<0.002 [10]	<0.001
Semi-VOCs										
Styrene	mg/l	--	--	--	--	--	--	--	--	--
VOCs										
1,1-Dichloroethane	mg/l	--	--	<0.0004	<0.0004	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0010	<0.0010	0.00015	<0.00010	<0.0005	<0.0005	<0.0005
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.0040	<0.00050	<0.00050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.00010	<0.00010	<0.0005	<0.0005	<0.0005
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	0.00031	<0.00020	<0.0005	<0.0005	<0.0005
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.0002	<0.00020	<0.00020	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 21-May-2020 95-9	95-9 30-Nov-2021 [3] 95-9
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	723	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	32	--
Alkalinity (Total as CaCO3)	mg/l	--	--	755	--
Ammonia Nitrogen	mg/l	--	--	1.84	--
Chemical Oxygen Demand	mg/l	--	--	35	--
Chloride	mg/l	--	250	523	--
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	--	2480	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	102	--
Nitrate as N	mg/l	10.0	--	<0.1	--
Nitrite as N	mg/l	1.0	--	<0.05	--
Nitrogen, Total Kjeldahl	mg/l	--	--	2.0	--
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--
pH	-	--	--	--	--
pH (Field)	-	--	--	7.71	--
Phosphate	mg/l	--	--	--	--
Phosphorus	mg/l	--	--	0.79	--
Sulphate	mg/l	--	500 [6]	<1	--
Temperature (Field)	deg c	--	15	12.7	--
Total Dissolved Solids	mg/l	--	500	1520	--
Total Organic Carbon	mg/l	--	--	--	--
Total Suspended Solids	mg/l	--	--	--	--
Metals					
Arsenic, dissolved	mg/l	0.01	--	<0.001	--
Boron, dissolved	mg/l	5	--	0.857	--
Cadmium, dissolved	mg/l	0.005	--	<0.0001	--
Calcium, dissolved	mg/l	--	--	18.4	--
Chromium, dissolved	mg/l	0.05	--	<0.001	--
Cobalt, dissolved	mg/l	--	--	0.0008	--
Copper, dissolved	mg/l	--	1	0.0015	--
Iron, dissolved	mg/l	--	0.3	1.88	--
Lead, dissolved	mg/l	0.01	--	0.0023	--
Magnesium, dissolved	mg/l	--	--	13.7	--
Manganese, dissolved	mg/l	--	0.05	0.072	--
Mercury, dissolved	mg/l	0.001	--	--	--
Molybdenum, dissolved	mg/l	--	--	--	--
Nickel, dissolved	mg/l	--	--	--	--
Potassium, dissolved	mg/l	--	--	16.4	--
Selenium, dissolved	mg/l	0.05	--	--	--
Sodium, dissolved	mg/l	--	200 [7]	627	--
Zinc, dissolved	mg/l	--	5	0.009	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	95-9 21-May-2020 95-9	95-9 30-Nov-2021 [3] 95-9
Phenols					
Phenolics, Total Recoverable	mg/l	--	--	0.002	--
Semi-VOCs					
Styrene	mg/l	--	--	--	--
VOCs					
1,1-Dichloroethane	mg/l	--	--	<0.0005	--
Benzene	mg/l	0.001	--	<0.0005	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	--
m,p-Xylenes	mg/l	--	--	<0.0005	--
Methylene Chloride	mg/l	0.05	--	<0.0050	--
o-Xylene	mg/l	--	--	<0.0005	--
Toluene	mg/l	0.06	0.024	<0.0005	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	--

Report of Monitoring Results - Groundwater Downgradient/Mer Bleue Bog Monitoring Wells

Footnotes:

	Tables should be read in conjunction with the accompanying document
<	Indicates parameter not detected above laboratory method detection limit
>	Indicates parameter detected above equipment analytical range
--	Chemical not analyzed or criteria not defined
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2020)
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised July 2017).
(3)	Monitoring location was frozen during this sampling event. No sample was collected
(4)	Monitoring location could not be located during this sampling event
(5)	Monitoring location was not monitored due to dry conditions observed in the area
(6)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L
(7)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(8)	Metals MRL elevated due to matrix interference.
(9)	pH < 8.3. Calculations not available.
(10)	Elevated Reporting Limit due to matrix interference.
(11)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes
(12)	GEN02 Elevated Reporting Limit due to matrix interference
(13)	GEN04 Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes
(14)	REV 1 Revision 1 - This report now includes data for Xylenes
(15)	Due to matrix interference 2 X dilution factor required for VOCs. Arsenic MRL elevated due to matrix interference
(16)	Waterra tubing could not be extracted from well. No sample was collected
(17)	N-NO2,N-NO3 MRL elevated due to matrix interference.
(18)	Due to matrix interference 2 X dilution factor required for VOCs. TP MRL elevated due to insufficient sample volume
(19)	N-NO2,N-NO3 MRL elevated due to matrix interference. Sediment was not included in Metals Analysis
(20)	Nitrite/Nitrate: Due to colour interferences, sample required dilution. Detection limits were adjusted accordingly
(21)	Monitoring location was dry during this sampling event. No sample was collected
(22)	Insufficient sample volume was collected for analysis
(23)	Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly
(24)	TKN MRL elevated due to matrix interference. Metals MRL elevated due to matrix interference
(25)	Arsenic MRL elevated due to matrix interference. Due to matrix interference 10x dilution factor required for VOCs
(26)	Metal Analysis: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly
(27)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly. Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(28)	Elevated detection limit due to dilution required because of high target analyte concentration
(29)	INOG6 Note that Ammonia (as N) results are greater than TKN results due to the error associated to higher than normal sample dilutions
(30)	Arsenic MRL elevated due to matrix interference.
(31)	Elevated ion balance result was confirmed by re-analysis
(32)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly
(33)	Inadvertently, no sample was collected at this location
(34)	Metal Analysis: Detection Limit was raised due to matrix interferences
(35)	VOC Analysis: Due to high concentrations of non-target analytes, sample required dilution. Detection limits were adjusted accordingly
(36)	Elevated ion balance was confirmed by re-analysis
(37)	TKN results may be biased low due to elevated dissolved salt content
(38)	Detection Limit was raised due to matrix interferences
(39)	Due to matrix interference 10x dilution factor required for VOCs
(40)	Due to matrix interference 2x dilution factor required for VOCs.
(41)	VOC Analysis: Due to high sediment in vials resulting in smaller amounts of sample available for analysis, the sample required dilution. The detection limits were adjusted accordingly
(42)	Insufficient sample volume was collected for analysis. Field Parameters were not measured
(43)	Due to matrix interference 2x dilution factor required for VOCs. Arsenic MRL elevated due to matrix interference

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 18-Sep-1992	L5 19-Oct-1992	L5 11-Nov-1992	L5 08-Jun-1993	L5 15-Nov-1993	L5 15-Jun-1994	L5 02-Nov-1994	L5 28-Jun-1995	L5 24-Nov-1995	L5 12-Jun-1996
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	--	--	185	1696	1677	1140	1565	1680	1650	2000
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	0.1	--	0.83	22.6	26.51	19.1	12.38	20	25	31
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	9.6	10.3	3.8	70	81	1.6	31.7	16	15	173
Chemical Oxygen Demand	mg/l	--	--	220	--	69.2	370	331	158	321	202	270	600
Chloride	mg/l	--	250	410	379	76.5	342	533	370	378	312	342	393
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	669	3520	3970	3830	4350	3850	4540	4650
Cyanide	mg/l	0.2	--	0.078	0.012	0.014	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	--	--	455	--	--	376	--	16	233
Dissolved Organic Carbon	mg/l	--	5	--	--	17.5	--	107	76	107	74.1	114	131
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	--	--	--	1.6	0.1	2.07	5.77	9.47	--	0.29
Fluoride	mg/l	1.5	--	**1.56**	**1.66**	0.84	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	--	--	227	1320	1340	858	1256	1167	1640	2090
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	--	--	6.9	0.1	7.18	0.1	0.1	0.1	0.1	--
Nitrite as N	mg/l	1.0	--	--	--	0.15	0.1	0.1	--	0.1	0.1	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	37.7	28.7	2.1	32	31.92	23.5	28	25.5	30	38.8
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	37.6	--	1.27	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.79	7.51	7.65	6.74	7.52	6.99	--	7.25	7.66	6.26
Phosphorus	mg/l	--	--	0.28	0.17	0.26	0.3	0.37	0.11	0.45	0.44	0.43	0.66
Sulphate	mg/l	--	500 [16]	207.3	164	60.7	42.2	83	109	61	247	199	--
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	--	--	--	2572	2344	1920	2120	1930	2270	2330
Total Organic Carbon	mg/l	--	--	--	--	17.5	--	107	76	107	74.1	114	131
Total Suspended Solids	mg/l	--	--	79	25	130	--	--	30	12	39	85	59
Metals													
Aluminum	mg/l	--	--	4.61	0.1	1.79	--	0.293	--	0.37	--	--	--
Antimony	mg/l	0.006	--	0.001	0.001	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.001	0.001	0.001	--	--	--	--	--	--	--
Barium	mg/l	1	--	**1.78**	--	0.1	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	0.31	0.1	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**11.9**	--	0.37	**11.4**	**10.4**	**8.454**	**6.797**	**9**	**12**	**14.3**
Cadmium	mg/l	0.005	--	**0.051**	**0.008**	0.005	--	--	0.0001	0.0001	0.0001	0.0001	--
Calcium	mg/l	--	--	--	--	63	344	345	177	295	290.6	370	415
Chromium	mg/l	0.05	--	**0.31**	0.05	0.05	**0.064**	0.023	0.01	0.01	0.03	0.02	--
Cobalt	mg/l	--	--	0.05	0.05	--	--	--	--	--	--	--	--
Copper	mg/l	--	1	0.05	0.05	0.05	0.004	0.01	0.0131	0.0036	--	0.0016	0.005
Iron	mg/l	--	0.3	1.92	7.16	1.55	0.003	8.086	1.918	2.44	2.25	2.67	1.66
Lead	mg/l	0.01	--	**0.05**	**0.05**	**0.05**	**0.0104**	**0.1**	0.0021	**0.0127**	0.0008	0.0012	0.0024
Magnesium	mg/l	--	--	--	--	17	112	116	101	126	105.8	171	252
Manganese	mg/l	--	0.05	8.56	1.71	0.13	1.813	1.637	0.688	1.011	1.06	1.08	0.845
Mercury	mg/l	0.001	--	**0.21**	**0.1**	**0.16**	--	--	--	0.0001	--	--	--
Molybdenum	mg/l	--	--	0.05	0.05	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	0.17	0.06	0.05	0.029	0.02	0.02	0.02	0.03	0.02	0.02
Potassium	mg/l	--	--	--	--	11.8	76	68	62	80	67.2	80.4	97.5
Selenium	mg/l	0.05	--	0.001	0.001	--	--	--	--	0.005	--	--	--
Silver	mg/l	--	--	0.05	0.05	--	--	--	--	0.0073	--	--	--
Sodium	mg/l	--	200 [17]	--	--	53.9	367	394	343	372	324.7	476	481
Sulfur	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	0.2	0.7	0.1	--	--	--	--	--	--	--
Titanium	mg/l	--	--	0.1	0.07	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	0.1	0.1	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 18-Sep-1992	L5 19-Oct-1992	L5 11-Nov-1992	L5 08-Jun-1993	L5 15-Nov-1993	L5 15-Jun-1994	L5 02-Nov-1994	L5 28-Jun-1995	L5 24-Nov-1995	L5 12-Jun-1996
Zinc	mg/l	–	5	0.13	0.05	0.05	0.032	0.022	0.031	0.01	0.02	0.01	0.011
Phenols													
Phenolics, Total Recoverable	mg/l	–	--	0.012	0.005	0.003	0.06	0.098	0.055	0.03	0.001	–	0.296
Semi-VOCs													
Naphthalene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	–	–	–	–	–	–	–	–	–	–
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Methyl tert-Butyl Ether	mg/l	–	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 12-Oct-1996	L5 17-Jun-1997	L5 05-Nov-1997	L5 05-Jun-1998	L5 26-Aug-1998	L5 29-Oct-1998	L5 27-Nov-1998	L5 30-Jun-1999	L5 18-Oct-1999	L5 03-May-2000
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1970	2210	1610	1960	1330	1820	1980	1610	1800	1850
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	0.05	0.01	--	--	--
Ammonia Nitrogen	mg/l	--	--	27	5.14	31.4	32.5	18.6	25.8	1.26	30.3	19	28.5
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	27	95	37	40	13	15	14	24	23	38
Chemical Oxygen Demand	mg/l	--	--	350	495	388	328	212	316	270	324	170	240
Chloride	mg/l	--	250	492	525	540	471	281	440	470	528	473	360
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4750	4890	4680	4610	3360	4210	--	4390	3970	4070
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	433	132	407	392	197	308	611	95	469	340
Dissolved Organic Carbon	mg/l	--	5	125	140	111	82	72	90.6	97.2	101	87.2	85.2
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	0.36	1.71	2.85	3.39	2.98	5.49	--	3.59	4.98	2.2
Fluoride	mg/l	1.5	--	--	0.5	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1890	1790	1580	1560	1030	1590	1460	1310	1430	1340
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	0.37	0.06	--	0.34	0.02	--	--
Nitrate as N	mg/l	10.0	--	--	--	--	--	--	--	--	--	--	--
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	39.4	34.7	38	33.9	20.7	28.6	17.2	37.8	19.8	28.4
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.6	6.93	6.75	--	7.39	6.9	--	7.1	6.9	6.67
Phosphorus	mg/l	--	--	0.45	0.8	0.35	0.34	0.3	0.34	0.34	0.31	0.39	0.31
Sulphate	mg/l	--	500 [16]	--	340	--	84	--	--	--	--	--	--
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2390	2460	--	2310	1690	2100	--	2200	2050	--
Total Organic Carbon	mg/l	--	--	125	--	111	82	72	90.6	97.2	101	87.2	85.2
Total Suspended Solids	mg/l	--	--	2	13	44	23	73	28	19	48	42	54
Metals													
Aluminum	mg/l	--	--	--	0.17	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	0.003	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	--	**0.017**	--	--	--	--	--	--	--	--
Barium	mg/l	1	--	--	0.396	--	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	14.9	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**16.9**	**14.9**	**14.3**	**14.3**	**9.6**	**14**	**14.9**	**13.3**	**14.5**	**11.6**
Cadmium	mg/l	0.005	--	--	0.0001	--	--	--	--	--	--	--	--
Calcium	mg/l	--	--	383	399	295	290	240	304	297	270	298	267
Chromium	mg/l	0.05	--	--	0.01	--	--	--	--	--	--	--	--
Cobalt	mg/l	--	--	--	0.01	--	--	--	--	--	--	--	--
Copper	mg/l	--	1	0.004	0.02	0.0071	0.0281	0.0051	0.008	0.0005	0.003	0.0042	0.0085
Iron	mg/l	--	0.3	1.21	0.31	2.07	2.07	9.31	9.83	5.57	7.05	7.47	8.27
Lead	mg/l	0.01	--	0.0002	0.0002	0.0019	0.0002	0.0002	0.0002	0.0002	0.0006	0.0002	0.0002
Magnesium	mg/l	--	--	224	189	203	200	104	199	171	153	165	161
Manganese	mg/l	--	0.05	0.84	0.85	1.11	1.39	1.24	1.74	1.33	1.37	1.54	1.56
Mercury	mg/l	0.001	--	--	0.0003	--	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	0.11	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	0.02	0.02	0.03	0.02	0.02	0.02	0.02	0.02	0.02	0.02
Potassium	mg/l	--	--	99.2	91.4	96.8	89.4	66.7	79.3	85.6	88.6	83.4	77.9
Selenium	mg/l	0.05	--	--	0.015	--	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	0.02	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	514	493	486	452	312	532	543	578	520	471
Sulfur	mg/l	--	--	--	--	--	--	0.08	0.02	--	--	0.02	--
Tin	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	0.02	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	0.013	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 12-Oct-1996	L5 17-Jun-1997	L5 05-Nov-1997	L5 05-Jun-1998	L5 26-Aug-1998	L5 29-Oct-1998	L5 27-Nov-1998	L5 30-Jun-1999	L5 18-Oct-1999	L5 03-May-2000
Zinc	mg/l	–	5	0.01	0.08	0.01	0.01	0.05	0.01	0.01	0.01	0.01	0.07
Phenols													
Phenolics, Total Recoverable	mg/l	–	--	--	0.94	0.016	0.049	0.001	0.001	0.035	0.001	0.001	0.039
Semi-VOCs													
Naphthalene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Methyl tert-Butyl Ether	mg/l	–	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 25-Oct-2000	L5 13-Jun-2001	L5 20-Sep-2001	L5 21-Nov-2001	L5 22-May-2002	L5 08-Nov-2002	L5 31-May-2003	L5 23-Jul-2003	L5 21-Oct-2003	L5 17-May-2004
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	2180	1900	--	1890	1820	2190	1890	1820	2120	2080
Ammonia, unionized	mg/l	--	--	--	0.07	--	<0.02	--	--	--	--	--	0.26
Ammonia Nitrogen	mg/l	--	--	29.6	33.6	--	38.3	1.53	35	31.5	37.4	39.4	30.2
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	--	319	207	15	49	507	84	58	53	346
Chemical Oxygen Demand	mg/l	--	--	--	728	490	292	335	986	390	371	416	669
Chloride	mg/l	--	250	516	530	515	500	404	458	419	470	477	439
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	4430	4300	4080	4710	3500	4900	--	3570	4630	--
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	--	312	--	265	344	550	440	566	525	137
Dissolved Organic Carbon	mg/l	--	5	--	--	--	139	66	524	141	231	188	203
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	3.14	--	--	3.6	3.16	4.1	--	2.73	--	--
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1392	1716	--	1461	1470	1744	1309	1350	1380	1460
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	0.44	24.9	11.7	5.7	4.94	5.6
Nitrate as N	mg/l	10.0	--	0.1	0.1	--	0.1	0.1	0.1	0.2	0.1	0.1	0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	36.3	40	40.2	48.2	31.5	41.1	43.3	41.2	48.9	40.3
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.97	6.7	7.18	6.53	6.68	--	--	6.83	7	--
Phosphorus	mg/l	--	--	--	0.58	0.41	0.21	0.35	0.68	0.42	0.55	0.47	0.42
Sulphate	mg/l	--	500 [16]	22	357	58	25	107	55	43	30	12	71
Temperature (Field)	deg c	--	15	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	mg/l	--	500	2820	3080	--	2730	10300	--	2260	3130	2864	--
Total Organic Carbon	mg/l	--	--	--	249	--	139	66	524	141	231	--	--
Total Suspended Solids	mg/l	--	--	60	80	124	76	58	46	30	11	33	30
Metals													
Aluminum	mg/l	--	--	--	--	1.24	--	--	--	--	--	--	0.241
Antimony	mg/l	0.006	--	--	--	0.006	--	--	--	--	--	--	0.001
Arsenic	mg/l	0.01	--	0.001	0.001	--	0.001	0.001	0.003	0.003	0.004	0.007	0.002
Barium	mg/l	1	--	--	--	0.615	--	--	--	--	--	--	0.832
Bismuth	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**18.2**	**13.5**	**14.6**	**17.1**	**13.9**	**13.2**	**12.4**	**15.3**	**15.5**	**12.9**
Cadmium	mg/l	0.005	--	0.0001	0.0001	**0.01**	0.0001	**0.01**	0.0001	0.0001	0.0003	0.0001	<0.005
Calcium	mg/l	--	--	292	387	--	275	300	413	285	285	293	323
Chromium	mg/l	0.05	--	0.02	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.006	0.01
Cobalt	mg/l	--	--	0.0352	0.147	0.01	0.0267	0.01	0.0384	0.002	0.0018	0.005	<0.005
Copper	mg/l	--	1	0.0077	0.009	0.01	0.114	0.01	0.0161	0.004	0.254	0.002	0.002
Iron	mg/l	--	0.3	15.2	18.2	8.22	8.61	7.76	11.6	0.02	6.46	0.64	9.84
Lead	mg/l	0.01	--	0.0002	0.0024	**0.1**	0.0041	**0.1**	0.0047	0.0005	0.0031	0.0006	**0.02**
Magnesium	mg/l	--	--	161	182	--	188	175	173	145	154	158	158
Manganese	mg/l	--	0.05	2.38	1.9	1.54	1.43	1.59	1.94	1.24	1.14	1.01	1.22
Mercury	mg/l	0.001	--	0.0001	0.0001	--	0.0001	0.0001	0.0001	0.0001	0.0001	0.0001	--
Molybdenum	mg/l	--	--	0.002	0.041	0.02	0.005	0.02	0.042	0.0006	0.0002	0.01	--
Nickel	mg/l	--	--	0.07	0.02	0.02	0.02	0.03	0.02	0.02	0.01	0.01	0.02
Potassium	mg/l	--	--	77.6	116	--	95.6	82.3	88.2	86.6	95.2	104	93.6
Selenium	mg/l	0.05	--	0.001	0.001	--	0.001	0.001	0.005	0.001	0.006	0.006	0.001
Silver	mg/l	--	--	--	--	0.01	--	--	--	--	--	--	<0.005
Sodium	mg/l	--	200 [17]	590	525	--	542	469	494	463	507	546	505
Sulfur	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	0.2	--	--	--	--	--	--	<0.005
Titanium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	0.005	--	--	--	--	--	--	0.01

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Zinc	mg/l	–	5	0.01	0.2	0.06	0.19	0.17	0.34	0.02	0.369	0.23	0.48
Phenols													
Phenolics, Total Recoverable	mg/l	–	--	0.045	0.283	0.197	0.012	0.033	0.638	0.162	0.009	0.066	0.419
Semi-VOCs													
Naphthalene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Bromodichloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	--	--	--	--	--	--	--	--
m,p-Xylenes	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Methyl tert-Butyl Ether	mg/l	–	0.015	--	--	--	--	--	--	--	--	--	0.002
Methylene Chloride	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
o-Xylene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	--	--	--	--	--	--	--	--
trans-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 23-Aug-2004	L5 18-Nov-2004	L5 25-May-2005	L5 09-Sep-2005	L5 28-Nov-2005	L5 25-May-2006	L5 15-Aug-2006	L5 16-Nov-2006	L5 17-May-2007	L5 29-Aug-2007
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	2560	2710	2500	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	<1	<5	<5	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	2190	2330	2100	2220	2050	1940	2150	1820	2180	2210
Ammonia, unionized	mg/l	--	--	--	0.49	0.15	0.16	0.14	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	29.4	37.5	34.3	37.7	32.4	31.3	34.6	26	37.2	36.4
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	198	237	32	24	45	132	86	40	41	182
Chemical Oxygen Demand	mg/l	--	--	631	698	377	382	342	1170	442	239	309	560
Chloride	mg/l	--	250	386	499	360	454	380	329	348	262	380	546
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3530	2000	4400	3750	--	3690	3600	2800	3400	2200
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	701.2	369	651	710	595	640	538	395	632	553
Dissolved Organic Carbon	mg/l	--	5	29.8	401.1	108.8	202.5	91.8	122	201	135	95.7	165.1
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	4	--	--	2.8	--	--	1.1	2.97	--	1.19
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1550	1690	1630	1370	1370	1390	1340	1130	1320	1500
Hydrogen Sulfide	mg/l	--	0.05	--	8.3	1	1	4	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	0.3	<1	0.3	<0.1	0.1	0.1	0.1	<0.1	<0.1	<0.1
Nitrite as N	mg/l	1.0	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	mg/l	--	--	37.3	45.5	41	51.4	38.9	35.2	43.3	35.6	45.2	46.1
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	6.7	7.2	6.6	6.9	--	--	6.9	--	7.1	6.7
Phosphorus	mg/l	--	--	0.57	0.46	0.42	0.36	0.38	0.83	0.34	0.33	0.31	0.27
Sulphate	mg/l	--	500 [16]	96	40	30	19	74	97	28	40	47	98
Temperature (Field)	deg c	--	15	--	--	17.8	17	--	--	15.5	13.1	13.5	15.2
Total Dissolved Solids	mg/l	--	500	2940	--	2790	2930	2760	2550	2660	2290	2820	3140
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	45	67	54	16	17	1190	21	66	20	35
Metals													
Aluminum	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.001	0.001	0.001	0.003	0.003	0.002	0.005	0.003	0.0053	0.005
Barium	mg/l	1	--	--	--	--	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**11.5**	**14.9**	**16.3**	**15.1**	**13.2**	**10.8**	**13.3**	**11**	**13.8**	**11.6**
Cadmium	mg/l	0.005	--	<0.0006	<0.001	0.0001	0.0001	0.0003	0.0002	<0.001	<0.001	0.00014	<0.0002
Calcium	mg/l	--	--	369	379	349	288	282	325	296	241	280	311
Chromium	mg/l	0.05	--	0.008	0.012	0.012	0.008	0.005	0.014	0.006	0.008	0.006	0.009
Cobalt	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Copper	mg/l	--	1	<0.002	0.042	0.008	<0.002	<0.002	0.042	<0.002	0.002	<0.002	<0.002
Iron	mg/l	--	0.3	13.4	11.2	11.9	7.62	0.793	27.5	5.54	10.5	6.38	10.2
Lead	mg/l	0.01	--	0.0021	0.0029	0.0065	0.001	<0.001	0.0097	<0.001	<0.001	<0.00002	<0.0002
Magnesium	mg/l	--	--	152	181	185	159	163	139	145	129	151	175
Manganese	mg/l	--	0.05	1.55	1.38	1.62	1.27	0.649	1.52	0.964	1.4	0.957	0.654
Mercury	mg/l	0.001	--	<0.0001	<0.0001	<0.00006	<0.00005	0.00006	--	--	--	--	--
Molybdenum	mg/l	--	--	<0.01	<0.01	<0.01	<0.01	0.02	--	--	--	--	--
Nickel	mg/l	--	--	0.01	0.02	0.01	<0.01	<0.01	--	--	--	--	--
Potassium	mg/l	--	--	88.9	109	106	102	98.6	77.2	89.2	76.1	91.5	90.1
Selenium	mg/l	0.05	--	0.001	<0.001	<0.001	0.001	<0.001	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	<0.005	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	566	589	549	624	592	428	499	408	505	579
Sulfur	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 23-Aug-2004	L5 18-Nov-2004	L5 25-May-2005	L5 09-Sep-2005	L5 28-Nov-2005	L5 25-May-2006	L5 15-Aug-2006	L5 16-Nov-2006	L5 17-May-2007	L5 29-Aug-2007
Zinc	mg/l	–	5	0.12	0.149	0.045	<0.005	<0.005	--	--	--	0.007	0.008
Phenols													
Phenolics, Total Recoverable	mg/l	–	--	0.237	0.31	0.03	0.021	0.08	0.028	0.11	0.007	0.015	0.16
Semi-VOCs													
Naphthalene	mg/l	–	--	--	--	0.001	<0.0007	0.007	--	--	--	--	--
Styrene	mg/l	–	--	--	--	<0.0006	<0.0006	<0.006	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	--	--	--	<0.0004	<0.0004	<0.004	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	--	--	--	0.0001	0.0004	<0.001	<0.005	0.0003	--	--	--
1,1-Dichloroethylene	mg/l	0.014	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	--	--	--	<0.0002	<0.0002	<0.002	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	0.0001	0.0002	<0.001	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	0.0015	0.0016	<0.002	--	--	--	--	--
Benzene	mg/l	0.001	--	--	--	**0.0013**	**0.004**	<0.005	<0.03	**0.0021**	--	--	--
Bromodichloromethane	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Bromoform	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Bromomethane	mg/l	–	--	--	--	<0.002	<0.002	<0.02	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	<0.0002	<0.0002	<0.002	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	0.0039	0.0049	<0.002	--	--	--	--	--
Chloroform	mg/l	–	--	--	--	<0.0003	<0.0003	<0.003	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Dibromochloromethane	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	--	0.001	0.0115	0.008	<0.03	0.0075	--	--	--
m,p-Xylenes	mg/l	–	--	--	--	0.0015	0.0175	<0.01	<0.05	0.0108	--	--	--
Methyl tert-Butyl Ether	mg/l	–	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	--	0.0007	0.0027	<0.003	<0.02	0.0021	--	--	--
o-Xylene	mg/l	–	--	--	--	0.0006	0.0082	<0.005	<0.03	0.0037	--	--	--
Tetrachloroethylene	mg/l	0.01	--	--	--	<0.0002	<0.0002	<0.002	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	--	0.0027	0.0115	0.014	<0.03	0.0143	--	--	--
trans-1,2-Dichloroethene	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	<0.0001	<0.0001	<0.001	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	--	<0.0002	<0.0002	<0.002	<0.01	**0.0014**	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 20-Nov-2007	L5 23-May-2008	L5 13-Aug-2008	L5 10-Nov-2008	L5 19-May-2009 [3]	L5 25-Aug-2009 [4]	L5 23-Sep-2009	L5 30-Nov-2009 [4]	L5 25-May-2010 [4]	L5 18-Aug-2010 [5]
				--	--	--	--	L-1	L-1	L-1	L-1	L-1	L-1
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	2150	1900	2280	1990	1867	2063	--	1960	1906	2079
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	37.9	39.7	44	44.7	56.4	50.1	--	41.8	47.6	40.7
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	<20	447	484	154	662	320	--	10	13	22
Chemical Oxygen Demand	mg/l	--	--	332	863	1120	595	1010	782	--	275	300	250
Chloride	mg/l	--	250	437	448	538	562	569	538	--	397	366	351
Conductivity	uS/cm	--	--	--	--	--	--	5050	5210	--	4410	4190	4080
Conductivity (Field)	uS/cm	--	--	1600	4500	5000	4400	--	>4000	--	>2999	>3999	3366
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	602	494	499	498	445	462	--	460	352	417
Dissolved Organic Carbon	mg/l	--	5	83.4	226	354	147.2	273	247	--	106	91.6	85.6
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	2.46	--	--	--	--	--	--	--	--	7.34
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1260	1300	1790	1410	1070	1290	--	1310	1230	1080
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.1	<0.1	<0.1	<0.1	0.20	<0.10	--	<0.10	0.11	<0.10
Nitrite as N	mg/l	1.0	--	--	--	--	--	<0.10	<0.10	--	<0.10	<0.10	<0.10
Nitrogen, Total Kjeldahl	mg/l	--	--	47.9	51.5	58.2	50.5	68.5	59.2	--	43.1	48.4	43.7
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.9	7.8	8.3	7.7	--	7.29	--	8.5	7.28	7.65
Phosphorus	mg/l	--	--	0.36	0.43	0.54	0.32	0.10	0.34	--	0.24	0.34	0.25
Sulphate	mg/l	--	500 [16]	135	260	72	61	99	108	--	45	16	59
Temperature (Field)	deg c	--	15	6.9	16.5	18	10	--	18.4	--	9	18.2	18.3
Total Dissolved Solids	mg/l	--	500	2930	2930	3310	3040	3260	3390	--	2670	2720	2650
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	124	308	254	152	496	332	--	222	367	366
Metals													
Aluminum	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.004	0.0079	0.0065	0.0042	0.02	<0.05	--	<0.05	<0.05	<0.01
Barium	mg/l	1	--	--	--	--	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	14	12.2	14.5	14.9	14	15	--	14	18	17
Cadmium	mg/l	0.005	--	<0.0002	<0.005	<0.005	<0.0001	<0.001	<0.01	--	<0.01	<0.01	<0.0001
Calcium	mg/l	--	--	261	252	438	316	184	228	--	269	242	192
Chromium	mg/l	0.05	--	0.007	0.011	0.012	0.01	0.015	<0.05	--	<0.02	<0.05	<0.005
Cobalt	mg/l	--	--	<0.005	<0.005	<0.005	<0.005	0.003	<0.01	--	0.005	<0.01	0.0053
Copper	mg/l	--	1	<0.002	0.002	<0.002	0.015	<0.01	0.01	--	<0.01	<0.01	0.002
Iron	mg/l	--	0.3	14.2	8.71	5.43	7.48	7.5	32.4	--	32.7	20.1	25.8
Lead	mg/l	0.01	--	<0.0002	<0.02	<0.02	<0.0001	<0.01	<0.01	--	<0.01	<0.01	<0.001
Magnesium	mg/l	--	--	148	163	168	150	148	175	--	155	152	147
Manganese	mg/l	--	0.05	0.924	1.38	1.07	0.592	0.5	0.91	--	1.65	1.80	1.53
Mercury	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	94.7	94.8	105	102	87	99	--	87	86	80
Selenium	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	500	529	555	591	555	601	--	533	474	486
Sulfur	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 20-Nov-2007	L5 23-May-2008	L5 13-Aug-2008	L5 10-Nov-2008	L5 19-May-2009 [3]	L5 25-Aug-2009 [4]	L5 23-Sep-2009	L5 30-Nov-2009 [4]	L5 25-May-2010 [4]	L5 18-Aug-2010 [5]
								L-1	L-1	L-1	L-1	L-1	L-1
Zinc	mg/l	–	5	0.037	0.12	0.105	0.023	<0.1	0.09	--	<0.05	<0.05	<0.01
Phenols													
Phenolics, Total Recoverable	mg/l	–	--	0.006	0.33	0.438	0.24	0.688	0.469	--	<0.001	<0.001	0.002
Semi-VOCs													
Naphthalene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	–	--	--	--	--	<0.0006	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	--	--	<0.0001	0.0004	<0.0001	<0.0004	--	<0.0004	<0.0004	<0.0004	<0.0004
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	--	**0.0012**	**0.0017**	**0.0017**	**0.0080**	--	**0.0013**	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	--	0.0021	0.0038	0.0034	0.0009	--	0.0011	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	–	--	--	0.0053	0.0086	0.0069	0.0024	--	0.0034	<0.0010	<0.0010	<0.0010
Methyl tert-Butyl Ether	mg/l	–	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	--	0.0052	0.0051	0.0009	<0.0040	--	0.0049	<0.0040	<0.0040	<0.0040
o-Xylene	mg/l	–	--	--	0.0023	0.0033	0.0028	0.0019	--	0.0016	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	--	0.0127	0.0188	0.0103	0.0047	--	0.0067	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	--	<0.0002	<0.0002	<0.0002	<0.0002	--	<0.0002	<0.0002	<0.0002	<0.0002

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 14-Oct-2010 L-1	L5 24-May-2011 [6] L-1	L5 16-Aug-2011 [7] L-1	L5 30-Nov-2011 L5	L5 04-Jun-2012 [8] L5	L5 22-Aug-2012 [8] L - 5	L5 29-Nov-2012 [9] L5	L5 29-May-2013 [10] L5	L5 15-Aug-2013 [10] L-1	L5 26-Nov-2013 [10] LEACHATE
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	–	--	1914	1940	2052	2200	1700	1800	2300	1800	1900	1500
Ammonia, unionized	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	–	--	39.6	45.5	63.2	53.7	57	58	73	72 [20]	70	45
Biochemical Oxygen Demand, 5 Day	mg/l	–	--	18	60	64	45	32	43	45	25	29	13
Chemical Oxygen Demand	mg/l	–	--	275	450	475	275	370	420	480	410	420	230
Chloride	mg/l	–	250	320	421	543	553	470	520	620	510	580	380
Conductivity	uS/cm	–	--	4000	4180	4910	4920	--	--	--	--	--	--
Conductivity (Field)	uS/cm	–	--	2256	>3999	>4000	>3999	3787	3655	>3999	3659	>3999	2974
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	–	--	458	453	2.2	79.8	440	450	460	390	420	360
Dissolved Organic Carbon	mg/l	–	5	80.2	112	1.5	103	130	130	150	120	130	74
Dissolved Oxygen	mg/l	–	--	--	--	--	--	--	--	--	--	--	10.4
Dissolved Oxygen (Field)	mg/l	–	--	--	--	1.21	4.45	_ [18]	5.98	1.24	--	8.71	--
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	–	--	1250	1080	1010	1180	980	920	1100	940	840	830
Hydrogen Sulfide	mg/l	–	0.05	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.10	<0.10	<1.0	<0.10	<0.10	<0.10	<0.10	<0.10	0.20	0.30
Nitrite as N	mg/l	1.0	--	<0.10	<0.10	<1.0	<0.10	0.021	<0.010	<0.010	0.014	0.018	0.037
Nitrogen, Total Kjeldahl	mg/l	–	--	43.3	47.5	69.4	59.9	64	62	81	71 [20]	76	47
Nitrogen, Nitrate-Nitrite	mg/l	–	--	--	--	--	--	<0.10	<0.10	<0.10	<0.10	0.21	0.34
Nitrogen, Organic	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	–	--	7.64	7.75	8.31	7.64	8.08	8.25	6.93	8.11	7.26	8.37
Phosphorus	mg/l	–	--	0.30	0.27	0.28	0.28	<0.10 [19]	0.28	0.33	0.28	<0.20 [19]	0.17
Sulphate	mg/l	–	500 [16]	25	102	57	42	99	<1	<1	3	<1	21
Temperature (Field)	deg c	–	15	14.6	16.6	28.5	11.9	16.3	19.4	14.2	17.5	19.7	8.9
Total Dissolved Solids	mg/l	–	500	2600	2720	3190	3200	2670	2940	3400	2810	3030	2220
Total Organic Carbon	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	–	--	204	310	188	60	96	84	18	100	<2	45
Metals													
Aluminum	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	<0.05	<0.05	<0.05	<0.01	0.0079	0.0090	**0.013**	0.0096	0.0080	0.0021
Barium	mg/l	1	--	--	--	--	--	--	--	--	--	--	--
Bismuth	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**14**	**15**	**16**	**16**	**18**	**23**	**23**	**21**	**25**	**17**
Cadmium	mg/l	0.005	--	<0.01	<0.01	<0.01	<0.001	<0.00010	<0.00010	<0.00020	<0.00010	<0.00010	<0.00010
Calcium	mg/l	–	--	263	142	152	229	140	120	220	170	140	100
Chromium	mg/l	0.05	--	<0.05	<0.05	<0.05	0.008	0.0089	0.011	0.016	0.01	0.012	<0.0050
Cobalt	mg/l	–	--	<0.01	<0.01	<0.01	0.003	0.0028	0.0029	0.0034	0.0033	0.0038	0.0025
Copper	mg/l	–	1	<0.01	<0.01	<0.01	<0.01	0.0017	0.0012	<0.0020	<0.0010	<0.0010	<0.0010
Iron	mg/l	–	0.3	12.1	14.3	7.5	9.5	0.5	6.3	6.7	8.3	5.4	3.8
Lead	mg/l	0.01	--	<0.01	<0.01	<0.01	<0.01	<0.00050	<0.00050	<0.0010	<0.00050	<0.00050	<0.00050
Magnesium	mg/l	–	--	143	177	152	148	180	200	200	170	180	150
Manganese	mg/l	–	0.05	1.18	1.00	0.62	1.1	0.29	0.25	0.87	0.52	0.38	0.27
Mercury	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Molybdenum	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Nickel	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Potassium	mg/l	–	--	75	85	94	90	100	110	120	100	120	84
Selenium	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
Silver	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Sodium	mg/l	–	200 [17]	435	542	790	673	650	760	850	610	760	530
Sulfur	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	–	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 14-Oct-2010 L-1	L5 24-May-2011 [6] L-1	L5 16-Aug-2011 [7] L-1	L5 30-Nov-2011 L5	L5 04-Jun-2012 [8] L5	L5 22-Aug-2012 [8] L - 5	L5 29-Nov-2012 [9] L5	L5 29-May-2013 [10] L5	L5 15-Aug-2013 [10] L-1	L5 26-Nov-2013 [10] LEACHATE
Zinc	mg/l	–	5	<0.05	<0.05	<0.05	<0.1	0.0088	0.0053	<0.01	0.013	0.0055	0.01
Phenols													
Phenolics, Total Recoverable	mg/l	–	--	0.001	0.082	0.049	0.003	0.034	0.094	0.11	0.016	0.0037	0.0069
Semi-VOCs													
Naphthalene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	--	<0.0004	<0.002	<0.0008	<0.0004	<0.0020	<0.0010	<0.00050	<0.0025	<0.0010	<0.0025
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.002	<0.001	0.0010	<0.0020	<0.0010	0.0065	<0.0025	<0.0010	<0.0025
Bromodichloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.002	0.001	0.0019	<0.0020	<0.0010	0.011	<0.0025	<0.0010	<0.0025
m,p-Xylenes	mg/l	–	--	<0.0010	<0.0050	<0.0020	0.0040	<0.0020	<0.0010	0.014	<0.0025	<0.0010	<0.0025
Methyl tert-Butyl Ether	mg/l	–	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.0040	<0.02	<0.0080	<0.0040	<0.01	<0.0050	<0.0025	<0.013	<0.0050	<0.013
o-Xylene	mg/l	–	--	<0.0005	<0.002	0.001	0.0015	<0.0020	<0.0010	0.0033	<0.0025	<0.0010	<0.0025
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.002	0.002	<0.0005	<0.0040	<0.0020	0.0055	<0.0050	<0.0020	<0.0050
trans-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0002	<0.001	<0.0004	<0.0002	<0.0040	<0.0020	<0.0010	<0.0050	<0.0020	<0.0050

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 28-May-2014 [11]	L5 27-Aug-2014 [12]	L5 13-Nov-2014 [13]	L5 27-May-2015	L5 25-Aug-2015	L5 25-Nov-2015	L5 24-May-2016	L5 18-Aug-2016	L5 16-Nov-2016	L5 18-May-2017
				L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1800	1900	2000	1710	1850	1250	1500	1520	1870	1850
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	66	82 [20]	70	66.3	52.3	37.4	73.2	64.9	87.1	101
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	23	29	15	<60 [22]	134	25	210	42	58	495
Chemical Oxygen Demand	mg/l	--	--	360	430	370	378	384	242	647	368	427	1240
Chloride	mg/l	--	250	500	630	550	553	1000	393	654	523	614	689
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3765	>3999	3616	>3999	>3999	3742	>3999	>3999	>3999	3999
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	380	460	430	372	317	253	262	110	285	158
Dissolved Organic Carbon	mg/l	--	5	120	130	120	134	111	73.1	194	356	125	335
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	8.25	--	7.44	7.56	7.09	5.10	9.70	8.46	9.02	6.85
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	890	970	990	172	980	1250	1220	929	1030	1220
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.50	<0.50	0.26	<0.1	<0.1	0.7	<0.1	1.3	<0.1	<0.5 [23]
Nitrite as N	mg/l	1.0	--	<0.050	<0.050	0.042	<0.05	<0.05	<0.05	<0.05	<0.25 [24]	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	71	81 [20]	77	69.5	53.9	45.7	139	83.8	94.3	127
Nitrogen, Nitrate-Nitrite	mg/l	--	--	<0.50	<0.50	0.30	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	8.00	8.03	7.55	7.58	8.60	7.87	8.36	8.26	8.00	7.88
Phosphorus	mg/l	--	--	<0.10 [21]	0.33	0.31	0.39	0.25	0.16	0.41	0.33	0.34	0.48
Sulphate	mg/l	--	500 [16]	2	2	<1	41	34	403	124	43	24	76
Temperature (Field)	deg c	--	15	15.7	19.0	12.2	20.4	17.3	7.8	19.5	20	14.5	21.0
Total Dissolved Solids	mg/l	--	500	2960	3230	2930	2850	2820	2310	3290	2620	3130	3930
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	110	63	70	88	130	41	279	13	57	162
Metals													
Aluminum	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	<0.01	<0.02	**0.011**	0.001	0.007	0.003	0.009	0.005	0.004	**0.017**
Barium	mg/l	1	--	--	--	--	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**20**	**26**	**22**	4.27	**22.1**	**13.2**	**26.5**	**20.2**	**29.3**	**24.7**
Cadmium	mg/l	0.005	--	<0.0010	<0.0020	<0.0010	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	mg/l	--	--	170	180	160	25.3	154	254	196	139	145	229
Chromium	mg/l	0.05	--	<0.05	<0.1	<0.05	0.002	0.009	0.006	0.012	0.009	0.011	0.024
Cobalt	mg/l	--	--	<0.0050	<0.01	<0.0050	0.0006	0.0032	0.0073	0.0147	0.0034	0.0043	0.0040
Copper	mg/l	--	1	<0.01	<0.02	<0.01	<0.0005	<0.0005	<0.0005	0.0020	<0.0005	<0.0005	0.0060
Iron	mg/l	--	0.3	7.1	7.8	5.4	0.852	7.81	3.47	5.57	7.9	5.9	2.52
Lead	mg/l	0.01	--	<0.0050	<0.01	<0.0050	<0.0001	<0.0001	0.0003	0.0013	<0.0001	<0.0001	0.0005
Magnesium	mg/l	--	--	160	180	160	26.4	145	148	179	141	161	158
Manganese	mg/l	--	0.05	0.61	0.64	0.51	0.084	0.606	0.491	0.948	0.541	0.397	1.21
Mercury	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	100	110	110	17.9	94.7	62.9	108	76.2	123	109
Selenium	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	640	750	700	110	571	577	812	576	717	866
Sulfur	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 28-May-2014 [11]	L5 27-Aug-2014 [12]	L5 13-Nov-2014 [13]	L5 27-May-2015	L5 25-Aug-2015	L5 25-Nov-2015	L5 24-May-2016	L5 18-Aug-2016	L5 16-Nov-2016	L5 18-May-2017
				L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5	L-5
Zinc	mg/l	--	5	<0.05	<0.1	<0.05	<0.005	0.015	0.012	0.01	<0.005	0.009	0.029
Phenols													
Phenolics, Total Recoverable	mg/l	--	--	0.012	0.0058	0.072	0.011	0.032	<0.004 [23]	0.142	0.052	0.025	0.360
Semi-VOCs													
Naphthalene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	**0.0019**
Bromodichloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0008
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.025	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0050	<0.0010	<0.0010	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.01	<0.0020	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0020
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.01	<0.0020	<0.0020	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 28-Aug-2017	L5 28-Nov-2017	L5 23-May-2018	L5 30-Aug-2018	L5 11-Nov-2018 [14]	L5 19-Dec-2018 [15]	L5 20-Jun-2019	L5 28-Aug-2019	L5 21-Nov-2019	L5 14-May-2020
				L-5	L-5	L-5	L-5	L5	L-5	L-5	L-5	L-5	L-5
				--	--	--	--	--	--	--	--	--	--
General Chemistry													
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	--	--	1660	2050	1430	975	--	2040	2250	2080	1940	1580
Ammonia, unionized	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	--	--	45.6 [25]	80.1	81.7	74.2	--	90.0	112	69.1 [25]	89.4	45.3 [25]
Biochemical Oxygen Demand, 5 Day	mg/l	--	--	<60 [26]	652	43	27	--	22	178	86	35	24
Chemical Oxygen Demand	mg/l	--	--	269	1210	448	330	--	441	497	414	428	253
Chloride	mg/l	--	250	374	640	572	504	--	662	619	536	658	423
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	3234	3999	>3999	>3999	--	>3999	>3999	>3999	5640	3883
Cyanide	mg/l	0.2	--	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	--	--	299	130	302	158	--	368	2.80	818	10.1	310
Dissolved Organic Carbon	mg/l	--	5	82.4	407	123	99.8	--	131	125	129	122	113
Dissolved Oxygen	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	--	--	7.47	7.69	10.12	8.71	--	7.31	7.86	7.74	7.7	6.67
Fluoride	mg/l	1.5	--	--	--	--	--	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	--	--	1300	1750	1200	976	--	1150	1200	1420	1510	1180
Hydrogen Sulfide	mg/l	--	0.05	--	--	--	--	--	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	<0.5 [23]	<0.5 [23]	1.1	0.3	--	<0.5 [23]	<0.1	0.2	<0.1	0.6
Nitrite as N	mg/l	1.0	--	<0.25 [24]	<0.05	<0.05	0.12	--	<0.25 [23]	<0.05	0.09	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	--	--	34.4	94.4	93.7	81.6	--	118	115	68.0	92.6	43.9
Nitrogen, Nitrate-Nitrite	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	--	--	7.79	7.70	7.91	8.45	--	8.26	7.82	7.26	8.24	7.83
Phosphorus	mg/l	--	--	0.14	0.36	0.29	0.18	--	0.58	0.36	0.34	0.25	0.22
Sulphate	mg/l	--	500 [16]	19	41	374	312	--	58	87	135	143	123
Temperature (Field)	deg c	--	15	16.1	10.5	17.6	18.5	--	10.9	17.8	17.2	11.4	16.6
Total Dissolved Solids	mg/l	--	500	2590	3090	3030	2620	--	3040	3120	3020	3320	2240
Total Organic Carbon	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	mg/l	--	--	140	96	32	40	--	95	5	48	47	87
Metals													
Aluminum	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.001	**0.014**	**0.012**	**0.011**	--	0.004	0.007	**0.019**	0.006	0.001
Barium	mg/l	1	--	--	--	--	--	--	--	--	--	--	--
Bismuth	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Boron	mg/l	5	--	**14.2**	**13.4**	**16.2**	**10.3**	--	**20.9**	**25.6**	**13.2**	**24.6**	**15.8**
Cadmium	mg/l	0.005	--	<0.0001	<0.0001	<0.0001	<0.0001	--	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	mg/l	--	--	254	382	240	129	--	196	208	287	320	205
Chromium	mg/l	0.05	--	0.006	0.019	0.014	0.011	--	0.011	0.015	0.021	0.019	0.005
Cobalt	mg/l	--	--	0.0028	0.0030	0.0091	0.0051	--	0.0043	0.0055	0.0033	0.0063	0.0020
Copper	mg/l	--	1	<0.0005	0.0018	0.0082	0.0025	--	<0.0005	0.0006	0.0013	0.0005	<0.0005
Iron	mg/l	--	0.3	8.56	2.44	3.44	9.53	--	2.39	1.33	11.2	5.73	10.8
Lead	mg/l	0.01	--	<0.0001	0.0017	0.0019	0.0014	--	0.0001	<0.0001	0.0005	0.0003	0.0002
Magnesium	mg/l	--	--	161	193	147	159	--	161	166	171	172	163
Manganese	mg/l	--	0.05	0.704	1.6	0.541	0.066	--	0.308	0.315	13.2	0.776	0.592
Mercury	mg/l	0.001	--	--	--	--	--	--	--	--	--	--	--
Molybdenum	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Potassium	mg/l	--	--	94.7	118	104	96.3	--	123	123	102	132	88.2
Selenium	mg/l	0.05	--	--	--	--	--	--	--	--	--	--	--
Silver	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Sodium	mg/l	--	200 [17]	490	622	542	512	--	589	668	503	714	497
Sulfur	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Tin	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Titanium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--
Vanadium	mg/l	--	--	--	--	--	--	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 28-Aug-2017 L-5	L5 28-Nov-2017 L-5	L5 23-May-2018 L-5	L5 30-Aug-2018 L-5	L5 11-Nov-2018 [14] L5	L5 19-Dec-2018 [15] L-5	L5 20-Jun-2019 L-5	L5 28-Aug-2019 L-5	L5 21-Nov-2019 L-5	L5 14-May-2020 L-5
Zinc	mg/l	–	5	0.01	0.031	0.016	<0.005	--	<0.005	0.015	0.01	0.006	0.014
Phenols													
Phenolics, Total Recoverable	mg/l	–	--	<0.004 [23]	0.629	0.016	0.009	--	<0.010 [23]	0.008	0.033	0.008	0.006
Semi-VOCs													
Naphthalene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Styrene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
VOCs													
1,1,1,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	–	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0006	0.0009	<0.0005
Bromodichloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromoform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Bromomethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--	--	--	--	--	--
Chloroform	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	–	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0014	<0.0005	<0.0005
Methyl tert-Butyl Ether	mg/l	–	0.015	--	--	--	--	--	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	–	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0008	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	0.0268	<0.0005	<0.0005	--	<0.0005	<0.0005	0.0032	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	–	--	--	--	--	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 27-Aug-2020	L5 25-Nov-2020	L5 27-May-2021	L5 24-Aug-2021	L5 24-Nov-2021
				L-5	L-5	L-5	L-5	L-5
				--	--	--	--	--
General Chemistry								
Alkalinity, Bicarbonate (HCO3) as CaCO3	mg/l	–	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	mg/l	–	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	mg/l	–	--	916	2440	2220	1980	1750
Ammonia, unionized	mg/l	–	--	--	--	--	--	--
Ammonia Nitrogen	mg/l	–	--	33.6	76.9 [25]	90.8 [25]	91.6 [25]	74.4 [25]
Biochemical Oxygen Demand, 5 Day	mg/l	–	--	23	27	37	<60 [26]	30
Chemical Oxygen Demand	mg/l	–	--	236	405	416	392	330
Chloride	mg/l	–	250	648	544	561	542	441
Conductivity	uS/cm	–	--	--	--	--	--	--
Conductivity (Field)	uS/cm	–	--	>3999	>3999	>3999	>3999	>3999
Cyanide	mg/l	0.2	--	--	--	--	--	--
Dissolved Inorganic Carbon	mg/l	–	--	180	359	484	468	402
Dissolved Organic Carbon	mg/l	–	5	54.0	119	122	103	94.2
Dissolved Oxygen	mg/l	–	--	--	--	--	--	--
Dissolved Oxygen (Field)	mg/l	–	--	9.44	9.95	6.32	7.74	10.01
Fluoride	mg/l	1.5	--	--	--	--	--	--
Hardness, Calcium Carbonate	mg/l	–	--	1530	404	1280	1110	1260
Hydrogen Sulfide	mg/l	–	0.05	--	--	--	--	--
Nitrate as N	mg/l	10.0	--	1.2	<1.0 [27]	<0.5 [27]	<0.5 [27]	<0.1
Nitrite as N	mg/l	1.0	--	0.27	<0.50	<0.05	<0.05	<0.05
Nitrogen, Total Kjeldahl	mg/l	–	--	38.0	72.6	85.5	86.7	73.4
Nitrogen, Nitrate-Nitrite	mg/l	–	--	--	--	--	--	--
Nitrogen, Organic	mg/l	–	--	--	--	--	--	--
pH (Field)	-	–	--	7.97	8.37	7.91	7.90	8.53
Phosphorus	mg/l	–	--	0.38	0.19	0.33	0.23	0.35
Sulphate	mg/l	–	500 [16]	128	47	35	28	74
Temperature (Field)	deg c	–	15	17.5	10.1	18.1	22.1	9.9
Total Dissolved Solids	mg/l	–	500	2320	2770	2950	2880	2580
Total Organic Carbon	mg/l	–	--	--	--	--	--	--
Total Suspended Solids	mg/l	–	--	185	59	106	75	219
Metals								
Aluminum	mg/l	–	--	--	--	--	--	--
Antimony	mg/l	0.006	--	--	--	--	--	--
Arsenic	mg/l	0.01	--	0.001	0.004	0.003	0.002	0.003
Barium	mg/l	1	--	--	--	--	--	--
Bismuth	mg/l	–	--	--	--	--	--	--
Boron	mg/l	5	--	**8.42**	**17.3**	**25.6**	**16.4**	**17.5**
Cadmium	mg/l	0.005	--	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Calcium	mg/l	–	--	384	162	221	161	261
Chromium	mg/l	0.05	--	**0.075**	0.011	0.016	0.012	0.009
Cobalt	mg/l	–	--	0.0085	0.0044	0.0057	0.0048	0.0031
Copper	mg/l	–	1	0.0124	<0.0005	0.0010	<0.0005	0.0014
Iron	mg/l	–	0.3	17.2	3.89	9.37	3.82	1.38
Lead	mg/l	0.01	--	0.0033	<0.0001	0.0002	<0.0001	0.0004
Magnesium	mg/l	–	--	138	171	176	172	149
Manganese	mg/l	–	0.05	2.27	0.296	0.732	0.278	0.538
Mercury	mg/l	0.001	--	--	--	--	--	--
Molybdenum	mg/l	–	--	--	--	--	--	--
Nickel	mg/l	–	--	--	--	--	--	--
Potassium	mg/l	–	--	81.4	106	119	115	106
Selenium	mg/l	0.05	--	--	--	--	--	--
Silver	mg/l	–	--	--	--	--	--	--
Sodium	mg/l	–	200 [17]	410	643	687	645	559
Sulfur	mg/l	–	--	--	--	--	--	--
Tin	mg/l	–	--	--	--	--	--	--
Titanium	mg/l	–	--	--	--	--	--	--
Vanadium	mg/l	–	--	--	--	--	--	--

Parameter	Unit	ODWQS(169/03)-Health [1]	ODWQS-AO [2]	L5 27-Aug-2020	L5 25-Nov-2020	L5 27-May-2021	L5 24-Aug-2021	L5 24-Nov-2021
				L-5	L-5	L-5	L-5	L-5
Zinc	mg/l	--	5	4.54	<0.005	0.009	<0.005	0.015
Phenols								
Phenolics, Total Recoverable	mg/l	--	--	0.018	0.082	0.009	<0.010 [27]	0.050
Semi-VOCs								
Naphthalene	mg/l	--	--	--	--	--	--	--
Styrene	mg/l	--	--	--	--	--	--	--
VOCs								
1,1,1,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,1-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1,2,2-Tetrachloroethane	mg/l	--	--	--	--	--	--	--
1,1,2-Trichloroethane	mg/l	--	--	--	--	--	--	--
1,1-Dichloroethane	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
1,1-Dichloroethylene	mg/l	0.014	--	--	--	--	--	--
1,2,4-Trichlorobenzene	mg/l	--	--	--	--	--	--	--
1,2-Dibromoethane	mg/l	--	--	--	--	--	--	--
1,2-Dichlorobenzene	mg/l	0.2	0.003	--	--	--	--	--
1,2-Dichloroethane	mg/l	0.005	--	--	--	--	--	--
1,2-Dichloropropane	mg/l	--	--	--	--	--	--	--
1,3-Dichlorobenzene	mg/l	--	--	--	--	--	--	--
1,4-Dichlorobenzene	mg/l	0.005	0.001	--	--	--	--	--
Benzene	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Bromodichloromethane	mg/l	--	--	--	--	--	--	--
Bromoform	mg/l	--	--	--	--	--	--	--
Bromomethane	mg/l	--	--	--	--	--	--	--
Carbon Tetrachloride	mg/l	0.002	--	--	--	--	--	--
Chlorobenzene	mg/l	0.08	0.03	--	--	--	--	--
Chloroform	mg/l	--	--	--	--	--	--	--
cis-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
cis-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Dibromochloromethane	mg/l	--	--	--	--	--	--	--
Ethylbenzene	mg/l	0.14	0.0016	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
m,p-Xylenes	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Methyl tert-Butyl Ether	mg/l	--	0.015	--	--	--	--	--
Methylene Chloride	mg/l	0.05	--	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
o-Xylene	mg/l	--	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Tetrachloroethylene	mg/l	0.01	--	--	--	--	--	--
Toluene	mg/l	0.06	0.024	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
trans-1,2-Dichloroethene	mg/l	--	--	--	--	--	--	--
trans-1,3-Dichloropropene	mg/l	--	--	--	--	--	--	--
Trichloroethene	mg/l	0.005	--	--	--	--	--	--
Vinyl Chloride	mg/l	0.001	--	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than ODWQS(169/03)-Health
Value	Parameter is greater than ODWQS-AO
(1)	Ontario Drinking Water Quality Standards - Health Based Standards (June 2003, revised January 2020).
(2)	Ontario Drinking Water Quality Standards - Aesthetic Objectives. Aesthetic Objectives are established for parameters that may impair the taste, odour or colour of water or which may interfere with good water quality control practices. For certain parameters, both aesthetic objectives and health-related MACs have been derived (June 2003, revised July 2017).
(3)	Metals and TP MRL elevated due to matrix interference.
(4)	Metals analysis performed on aqua-regia digest of sample material.
(5)	Arsenic MRL elevated due to matrix interference.
(6)	Metals analysis performed on aqua-regia digest of sample material due to solids present in sample, except for Boron. MRLs may be elevated. TP MRL elevated due to matrix interference. Due to matrix interference 5x dilution factor required for VOCs. TKN and N-NH3 were analysed at SGS Lakefield.
(7)	N-NO2,N-NO3 and TP MRL elevated due to matrix interference. VOC MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated.
(8)	VOC Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly
(9)	Metal analysis: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly
(10)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly.
(11)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly. Metal Analysis: Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly. Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(12)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly. Nitrite/Nitrate: Due to the colour interferences, some sample required dilution. Detection limits were adjusted accordingly. Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(13)	VOC Water Analysis: Due to foaming, sample required dilution. The detection limits were adjusted accordingly. Nitrite/Nitrate: Due to the sample matrix, some sample required dilution. Detection limits were adjusted accordingly. Metals Analysis: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.
(14)	Leachate pump was not working. No sample could be collected.
(15)	Clarity: slight turbidity, sediments: none, colour: light greyish brownish tint, odour: leachate-like odou
(16)	There may be a laxative effect in some individuals when sulphate levels exceed 500 mg/L.
(17)	The aesthetic objective for sodium in drinking water is 200 mg/L. The local Medical Officer of Health should be notified when the sodium concentration exceeds 20 mg/L so that this information may be communicated to local physicians for their use with patients on sodium restricted diets.
(18)	The dissolved oxygen reading was missed during this monitoring session.
(19)	Due to the sample matrix, sample required dilution. Detection limit was adjusted accordingly
(20)	TKN < NH4: Both values fall within acceptable RPD limits for duplicates and are likely equivalent.
(21)	Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly
(22)	Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.
(23)	Elevated Reporting Limit due to matrix interference.
(24)	Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(25)	INOG6 Note that Ammonia (as N) results are greater than TKN results due to the error associated to higher than normal sample dilutions
(26)	BOD01 Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.
(27)	GEN02 Elevated Reporting Limit due to matrix interference.

Parameter	Unit	PWQO [1]	S1 01-Apr-1984	S1 01-May-1987	S1 01-Oct-1987	S1 19-Jun-1990	S1 27-Jun-1990	S1 04-Oct-1990	S1 06-Nov-1990	S1 27-Nov-1990	S1 24-Apr-1991
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	192000	194000	184000	134000	114000	132000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	--	80	220	150	100	750	180	750	240
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	--	2000	5000	1000	1000	3000	3000
Chemical Oxygen Demand	ug/l	--	--	--	--	39000	135000	135000	73000	95000	116000
Chloride	ug/l	--	--	173800	158500	57000	326000	113000	45000	46000	114000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	300	996	895	590	1152	849	431	663	622
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	--	980	74000	74000	33000	27000	31000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	--	6850	6850	9400	12300	9300
Hardness, Calcium Carbonate	ug/l	--	--	--	--	231000	335000	282000	157000	156000	169000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	1140	940	770	6800
Nitrite as N	ug/l	--	--	--	--	--	--	100	20	1	160
Nitrogen, Total Kjeldahl	ug/l	--	--	--	--	980	4000	1460	740	1560	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	330	330	710	560	810	1360
pH (Field)	-	6.5 - 8.5	--	7.34	7.59	7.96	8.06	8.16	8.11	7.9	8.03
Phosphate	ug/l	--	--	--	--	100	430	170	100	100	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	67900	59300	1600	52000	62000	36000	30000	72000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	150000	500000	450000	295000	575000	425000	216000	332000	311000
Total Organic Carbon	ug/l	--	--	--	--	1100	19000	19000	18000	9000	19000
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	100	20	20	50	50	50	50	60
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	--	84700	77900	71000	105000	93000	48000	51000	48000
Chromium	ug/l	-- [13]	--	**100**	**10**	--	--	**50**	**50**	**50**	**50**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	--	**1800**	**500**	**430**	**2390**	**210**	**630**	**2550**	**800**
Iron	ug/l	300	--	40	30	30	70	50	50	50	50
Lead	ug/l	-- [14]	--	200	130	**100**	**320**	**90**	**180**	**290**	**180**
Magnesium	ug/l	--	--	19200	16100	13000	17000	12000	9000	7000	12000
Manganese	ug/l	--	--	100	20	--	--	50	50	50	50
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	**50**	**70**	**40**	**50**	**80**	**50**	**80**	**50**
Potassium	ug/l	--	--	--	--	5000	13000	23000	7000	6000	5000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	--	--	31000	157000	102000	32000	78000	55000
Zinc	ug/l	30 [11]	--	--	--	--	--	--	--	--	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	--	--	**2**	**2**	**18**	**5**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S1 06-Sep-1992	S1 08-Jun-1993	S1 04-Nov-1993	S1 15-Jun-1994	S1 02-Nov-1994	S1 28-Jun-1995	S1 14-Nov-1995	S1 12-Jun-1996	S1 12-Oct-1996
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	134000	115000	134000	202000	51000	280000	144000	195000	193000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	<100	100	100	100	130	50	110	40	70
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	2000	2100	1800	4000	1000	2000	4000	1000
Chemical Oxygen Demand	ug/l	--	265000	17000	62200	35000	69000	496000	38000	18000	30000
Chloride	ug/l	--	107000	102000	85000	128000	40000	195000	71500	139000	89000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	744	350	651	908	423	1118	690	850	750
Cyanide	ug/l	5 [6]	<5	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	27300	32200	37400	--	12000	100000	33100	39800	38200
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	15900	--	10100	8030	12010	8080	13340	6790	10880
Hardness, Calcium Carbonate	ug/l	--	231650	179000	207000	242000	117000	749000	205000	241000	255000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	600	2900	7840	960	4500	100	1600	--	--
Nitrite as N	ug/l	--	<100	100	<100	--	100	100	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	840	560	1490	5320	6160	670	1660	650	990
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	740	460	1390	5220	6030	620	1550	610	--
pH (Field)	-	6.5 - 8.5	7.51	8.38	7.67	7.67	7.8	6.88	7.7	7.18	7.36
Phosphate	ug/l	--	260	80	260	10	440	200	110	100	120
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	55000	52900	57000	48000	52000	74000	60000	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	440000	425000	356000	456000	212000	714000	350000	430000	370000
Total Organic Carbon	ug/l	--	10300	8800	13700	16200	15300	11800	14700	9000	12400
Total Suspended Solids	ug/l	--	--	--	--	--	64000	38000	37000	35000	3000
Metals											
Arsenic	ug/l	100 [11]	<1	--	--	--	--	100	--	--	--
Barium	ug/l	--	5	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	**380**	53	30	32	30
Cadmium	ug/l	0.2 [11]	--	--	--	--	0.1	0.1	0.1	--	--
Calcium	ug/l	--	67800	49000	60000	73900	32000	102000	58800	68700	73600
Chromium	ug/l	-- [13]	**<20**	**74**	**<10**	**15**	**10**	**12**	**10**	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**<10**	**12**	3	**6.8**	4.1	**7**	2.6	**50.8**	1.7
Iron	ug/l	300	**1000**	**4906**	**793**	**835**	**1402**	**400**	**1220**	**1220**	**700**
Lead	ug/l	-- [14]	**10**	4.7	**6.6**	1	1.2	2	0.4	0.4	0.2
Magnesium	ug/l	--	15100	14000	14000	14000	8900	23800	14000	16600	16900
Manganese	ug/l	--	50	114	89	124	75	446	90	100	110
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	<20	20	<20	20	20	20	20	20	20
Potassium	ug/l	--	4300	11000	8100	6300	9900	13000	12200	9930	13900
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	66300	51000	45000	78000	23000	78900	61800	93600	58300
Zinc	ug/l	30 [11]	30	30	**36**	**37**	18	16	20	10	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**5**	**2**	**3**	**5**	1	1	--	1	--

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S1 17-Jun-1997	S1 05-Nov-1997	S1 05-Jun-1998	S1 26-Aug-1998	S1 30-Oct-1998	S1 30-Jun-1999	S1 19-Oct-1999	S1 03-May-2000	S1 25-Oct-2000
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	179000	216000	208000	100000	168000	208000	324000	195000	267000
Ammonia, unionized	ug/l	20	--	--	--	--	10	--	--	10	--
Ammonia Nitrogen	ug/l	--	10	60	20	50	50	10	170	70	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	1000	3000	2000	1000	6000	1000	1000	--
Chemical Oxygen Demand	ug/l	--	28000	17000	10000	36000	42000	81000	23000	30000	--
Chloride	ug/l	--	137000	242000	138000	38100	82200	201000	143000	240000	295000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	815	1200	900	360	643	1080	1300	1250	1540
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	33700	40600	39100	17400	39200	27100	84900	31400	--
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	6010	9830	10430	7560	9560	13110	7650	11330	7560
Hardness, Calcium Carbonate	ug/l	--	279000	294000	249000	147000	229000	271000	581000	309000	407000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--	--	--	10
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	1900
Nitrogen, Total Kjeldahl	ug/l	--	900	1050	3120	1240	940	800	570	890	660
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.07	7.8	--	7.69	7.3	8.3	7.2	7.22	7.22
Phosphate	ug/l	--	90	90	40	320	80	60	50	20	130
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	--	--	--	103000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	409000	600000	451000	180000	323000	540000	640000	625000	858000
Total Organic Carbon	ug/l	--	11100	10000	5900	11000	14000	13600	8900	9200	--
Total Suspended Solids	ug/l	--	17000	45000	21000	55000	9000	24000	22000	24000	113000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	70	60	30	60	50	30	110	40	**730**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	89500	92600	75700	47500	64600	89200	174000	94600	116000
Chromium	ug/l	-- [13]	--	--	--	--	--	--	--	--	**20**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	0.5	**12.4**	3.2	3.3	2.6	2.5	2	**8.4**	**13.2**
Iron	ug/l	300	**1320**	**1310**	**590**	**1810**	**800**	**390**	**3010**	**350**	**5620**
Lead	ug/l	-- [14]	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	13200	15100	14500	6870	16300	11400	35100	17400	28500
Manganese	ug/l	--	330	220	80	70	80	50	1100	330	440
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20	20	**40**
Potassium	ug/l	--	3800	5600	1200	5200	9100	2800	8700	4900	5700
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	73900	97200	89700	26400	55400	114000	91800	131000	149000
Zinc	ug/l	30 [11]	10	30	20	**250**	10	20	**340**	**240**	**330**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**4**	**2**	1	**19**	1	1	1	**5**	**2**

Parameter	Unit	PWQO [1]	S1 13-Jun-2001	S1 27-Sep-2001	S1 21-Nov-2001	S1 22-May-2002	S1 08-Nov-2002	S1 31-May-2003	S1 03-Jul-2003	S1 22-Oct-2003	S1 17-May-2004
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	196000	239000	169000	130000	234000	152000	158000	143000	228000
Ammonia, unionized	ug/l	20	<20	<20	<20	--	--	--	--	--	<10
Ammonia Nitrogen	ug/l	--	50	30	30	50	10	150	70	50	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	1000	1000	1000	1000	2000	2000	3000
Chemical Oxygen Demand	ug/l	--	31000	14000	30000	40000	32000	49000	56000	68000	42000
Chloride	ug/l	--	347000	280000	116000	144000	361000	105000	308000	97300	312000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1250	1290	670	780	1400	740	1310	760	1370
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	30200	52900	23700	26000	64000	39000	58000	34000	38300
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	10900	9180	11380	9450	11600	7160	5030	10500	9000
Hardness, Calcium Carbonate	ug/l	--	318000	403000	241000	273000	384000	209000	324000	--	340000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	600	700	1000	700	1200	900	22700	1300	400
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	770	520	690	670	620	1040	1460	5650	2680
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.5	7.94	6.63	6.75	7	7.6	7.37	7.73	7.4
Phosphate	ug/l	--	70	50	40	50	60	40	430	500	80
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	76000	126000	76000	49000	102000	43000	70000	74000	63000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	846000	868000	496000	492000	700000	397000	1000000	412000	685000
Total Organic Carbon	ug/l	--	11800	8300	15000	9000	10000	22000	13000	16000	9700
Total Suspended Solids	ug/l	--	37000	18000	10000	6000	18000	3000	218000	60000	24000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1	1	2
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	110	50	40	50	60	30	54	47	48
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	92900	124000	72100	59000	123000	63100	103000	69500	107000
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	**10**	3	**12**	2
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**5.5**	3.6	2.3	<1	3.1	3	2	**20**	**16**
Iron	ug/l	300	**1780**	**1280**	**460**	**670**	**1360**	**460**	**4020**	**3460**	**1760**
Lead	ug/l	-- [14]	1.2	0.2	0.2	<1	1.3	0.5	3.7	5.4	0.5
Magnesium	ug/l	--	20900	22600	14900	15300	18700	12400	16300	12100	17400
Manganese	ug/l	--	470	130	60	150	190	50	251	152	358
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	10	10	20
Potassium	ug/l	--	4500	7100	7600	8700	11000	5000	7500	8700	7000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	187000	149000	68700	88700	194000	67400	184000	64000	190000
Zinc	ug/l	30 [11]	**130**	**100**	30	**70**	**150**	20	**270**	**122**	**129**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**15**	1	1	1	1	1	1	1	1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S1 21-Aug-2004	S1 18-Nov-2004	S1 25-May-2005	S1 09-Sep-2005	S1 09-Nov-2005	S1 24-May-2006	S1 15-Aug-2006	S1 16-Nov-2006	S1 08-May-2007
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	268000	334000	273000	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	<5000	<5000	<5000	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	282000	230000	220000	274000	224000	153000	219000	110000	208000
Ammonia, unionized	ug/l	20	<10	<10	<10	<10	<10	<10	<10	--	<10
Ammonia Nitrogen	ug/l	--	60	110	30	40	30	10	<10	80	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	<3000	<3000	6000	<3000	<3000	<3000	<3000
Chemical Oxygen Demand	ug/l	--	32000	29000	35000	27000	23000	40000	38000	45000	35000
Chloride	ug/l	--	281000	195000	167000	273000	195000	121000	284000	28700	228000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1270	1180	1200	1500	730	485	1370	260	900
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	36200	25300	57200	68500	48600	40200	52600	28600	52000
Dissolved Organic Carbon	ug/l	--	--	--	10800	79400	9800	17800	12100	14600	9200
Dissolved Oxygen (Field)	ug/l	-- [7]	7000	6800	6380	6400	10900	9660	1200	8280	10340
Hardness, Calcium Carbonate	ug/l	--	351000	306000	298000	390000	342000	207000	295000	86000	273000
Hydrogen Sulfide	ug/l	2 [8]	--	--	<10	<10	<10	--	--	--	--
Nitrate as N	ug/l	--	300	1200	600	200	1800	900	200	1000	600
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	570	720	750	490	820	850	470	1140	570
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.6	6.9	7.3	7.6	7.7	7.8	7.7	--	8.1
Phosphate	ug/l	--	30	30	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	**40**	20	**70**	**40**	**60**	**210**	**40**
Sulphate	ug/l	--	83000	80000	62000	93000	97000	47000	82000	33000	67000
Temperature (Field)	deg c	-- [10]	--	--	16.8	17.2	1	9	20	8.2	17.2
Total Dissolved Solids	ug/l	--	635000	590000	580000	863000	696000	413000	790000	201000	683000
Total Organic Carbon	ug/l	--	9400	8700	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	3000	5000	<3000	3000	25000	3000	21000	57000	5000
Metals											
Arsenic	ug/l	100 [11]	1	1	<1	1	<1	<1	1.2	1	1.2
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	84	45	61	85	56	31	64	39	55
Cadmium	ug/l	0.2 [11]	--	--	<0.3	<0.1	<0.5	<0.1	<0.1	**<0.5**	<0.1
Calcium	ug/l	--	111000	95000	90400	126000	107000	63100	90600	23900	83300
Chromium	ug/l	-- [13]	1	2	<2	2	4	<2	2	**12**	<2
Cobalt	ug/l	0.9	--	--	**30**	**1.1**	0.6	0.3	0.6	0.9	<0.5
Copper	ug/l	5	2	2	<2	<2	4	<2	4	**40**	**22**
Iron	ug/l	300	**455**	**375**	**543**	**1360**	**1650**	**384**	**978**	**613**	**646**
Lead	ug/l	-- [14]	3.5	0.6	<0.6	<0.5	1	0.6	0.8	3	0.3
Magnesium	ug/l	--	17500	16600	17600	17900	18400	11800	16600	6420	15600
Manganese	ug/l	--	162	135	137	191	129	69	79	102	143
Mercury, dissolved	ug/l	0.2 [15]	--	--	<0.05	<0.06	<0.06	--	--	--	--
Molybdenum	ug/l	40	--	--	5.1	1.4	<5	--	--	--	--
Nickel	ug/l	25	10	10	<10	<10	<10	--	--	--	--
Potassium	ug/l	--	6900	7500	6200	8200	9000	4800	6500	4800	6600
Selenium	ug/l	100	--	--	<1	<1	<1	--	--	--	--
Sodium	ug/l	--	196000	124000	109000	186000	137000	73700	183000	32700	154000
Zinc	ug/l	30 [11]	**70**	**40**	**39**	**82**	**79**	17	28	**36**	29
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	<1	<1	<1	<1	<1	<1	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S1 22-Aug-2007	S1 20-Nov-2007	S1 23-May-2008	S1 12-Aug-2008	S1 06-Nov-2008	S1 13-May-2009 S-3	S1 25-Aug-2009 A-8	S1 27-Nov-2009 S-11	S1 18-May-2010 S-8
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	234000	190000	160000	220000	218000	172000	197000	306000	303000
Ammonia, unionized	ug/l	20	<10	<10	<20	<20	<20	2	4.06	7.67	<0.37
Ammonia Nitrogen	ug/l	--	<10	90	<10	<10	10	50	200	130	<20
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	4000	<3000	<3000	<3000	<1000	1000	2000	<1000
Chemical Oxygen Demand	ug/l	--	45000	42000	48000	29000	19000	48000	48000	38000	30000
Chloride	ug/l	--	340000	203000	127000	335000	163000	130000	258000	234000	254000
Conductivity	uS/cm	--	--	--	--	--	--	900	2010	1980	1860
Conductivity (Field)	uS/cm	--	1250	750	650	1500	900	750	1596	958	1948
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	58700	51300	39500	55200	52400	41400	47100	74400	66800
Dissolved Organic Carbon	ug/l	--	9400	12000	12500	9600	6600	17600	11200	13600	12600
Dissolved Oxygen (Field)	ug/l	-- [7]	6140	9690	11500	7320	9880	9940	9350	12430	**4210**
Hardness, Calcium Carbonate	ug/l	--	283000	277000	178000	265000	294000	230000	525000	598000	559000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	1400	500	200	1200	650	140	1260	<100
Nitrite as N	ug/l	--	--	--	--	--	--	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	1060	880	950	520	610	1050	700	840	440
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.4	8.2	8	**8.7**	8	8	7.69	**8.67**	7.74
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**200**	**100**	**50**	20	**40**	**140**	**50**	**90**	20
Sulphate	ug/l	--	70000	87000	33000	73000	98000	63000	420000	397000	296000
Temperature (Field)	deg c	-- [10]	16.4	1.6	13.8	21.3	9.8	20.7	20.9	5.9	18.2
Total Dissolved Solids	ug/l	--	878000	649000	408000	935000	619000	585000	1410000	1390000	1210000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	99000	34000	<3000	3000	4000	32000	15000	18000	5000
Metals											
Arsenic	ug/l	100 [11]	2.5	1.3	2.1	1.6	<0.5	1	2	1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	63	43	24	50	39	40	190	160	120
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	84900	89300	54100	83100	92400	69000	174000	180000	171000
Chromium	ug/l	-- [13]	3	4	<2	<2	<2	5	6	6	6
Cobalt	ug/l	0.9	**1**	**1.2**	<0.5	<0.5	<0.5	0.5	**1.1**	**1.5**	**1.0**
Copper	ug/l	5	5	4	<2	**7**	3	3	2	5	2
Iron	ug/l	300	**1720**	**1840**	**499**	274	**374**	**710**	**1050**	**560**	**420**
Lead	ug/l	-- [14]	1.7	2.8	<0.1	1.2	<0.1	2	<1	<1	<1
Magnesium	ug/l	--	17100	13200	10500	14000	15300	14000	22000	36000	32000
Manganese	ug/l	--	145	140	64	423	87	110	460	320	320
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	8200	8400	4300	9700	7900	6000	28000	23000	14000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	214000	123000	80300	285000	106000	96000	208000	199000	182000
Zinc	ug/l	30 [11]	**76**	**75**	8	30	**31**	**60**	20	20	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1	<1	<1	**2**

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S1 18-Aug-2010 [2] S-9	S1 14-Oct-2010 S-9	S1 19-May-2011 [2] W-11	S1 16-Aug-2011 [2] N-9	S1 30-Nov-2011 [3] S1	S1 30-May-2012 S 1	S1 22-Aug-2012 S-1	S1 29-Nov-2012 [4] S-1	S1 28-May-2013 S1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	316000	331000	270000	372000	198000	310000	360000	360000	320000
Ammonia, unionized	ug/l	20	<0.08	0.37	1.16	1.13	1.38	<1.38	<2.2	0.96	0.69
Ammonia Nitrogen	ug/l	--	<20	30	50	30	130	<50	<50	110	92
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	1000	2000	<1000	6000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	30000	35000	55000	35000	65000	53000	47000	39000	38000
Chloride	ug/l	--	202000	174000	231000	270000	106000	280000	240000	250000	260000
Conductivity	uS/cm	--	1860	1660	1670	1860	1160	--	--	--	--
Conductivity (Field)	uS/cm	--	1680	1357	1562	1482	1062	1699	1526	1769	1732
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	66400	74700	63400	88300	25900	76000	60000	82000	71000
Dissolved Organic Carbon	ug/l	--	14100	14300	12300	14000	7100	17000	86000	14000	14000
Dissolved Oxygen (Field)	ug/l	-- [7]	7560	14300	7270	5960	10950	7310	8160	13250	**3060**
Hardness, Calcium Carbonate	ug/l	--	620000	516000	547000	477000	385000	520000	520000	550000	670000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	830	<100	<100	170	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<10	<10	<10	<10
Nitrogen, Total Kjeldahl	ug/l	--	570	430	1180	550	1010	1100	1000	1200	810
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	<100	<100	170	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.96	7.73	7.89	7.92	7.93	7.71	7.93	8.02	7.29
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	30	**40**	**120**	30	**470**	**85**	**120**	**50**	**53**
Sulphate	ug/l	--	370000	275000	243000	197000	201000	220000	220000	270000	310000
Temperature (Field)	deg c	-- [10]	20.6	12.8	16.5	22.4	5.1	24.6	24.3	0.2	19.8
Total Dissolved Solids	ug/l	--	1300000	1080000	1090000	1210000	754000	1170000	1170000	1250000	1350000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	5000	6000	76000	8000	372000	19000	14000	23000	8000
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<10	<10	<50	1.4	1.0	<1.0	1.0
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**230**	140	150	130	100	190	200	150	160
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	0.1	<0.1	**<10**	**0.21**	<0.10	<0.10	<0.10
Calcium	ug/l	--	197000	157000	163000	148000	103000	170000	160000	200000	210000
Chromium	ug/l	-- [13]	7	7	**9**	**9**	**<50**	<5.0	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	0.8	0.8	**1.5**	0.5	<10	**1.3**	0.63	<0.50	0.59
Copper	ug/l	5	3	2	**8**	2	**30**	**6.6**	3.0	2.7	2.6
Iron	ug/l	300	**380**	**660**	**1480**	**380**	**13200**	**1500**	**1000**	<100	**450**
Lead	ug/l	-- [14]	<1	<1	5	<1	**30**	0.89	0.61	<0.50	<0.50
Magnesium	ug/l	--	31000	30000	34000	26000	31000	36000	31000	37000	40000
Manganese	ug/l	--	280	430	370	200	570	670	320	120	200
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	17000	14000	14000	14000	10000	15000	18000	18000	19000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	175000	146000	160000	184000	90000	210000	220000	230000	210000
Zinc	ug/l	30 [11]	<10	<10	**40**	<10	**140**	21	16	14	9.6
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	**1.2**	<1.0	<1.0	<1.0

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S1 15-Aug-2013 S-1	S1 21-Nov-2013 SA-1	S1 28-May-2014 S1	S1 26-Aug-2014 S1	S1 13-Nov-2014 S-1	S1 27-May-2015 S-1	S1 25-Aug-2015 S-1	S1 25-Nov-2015 S-1	S1 24-May-2016 S-1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	350000	370000	340000	390000	370000	373000	364000	418000	364000
Ammonia, unionized	ug/l	20	1.84	<0.32	<0.75	2.68	0.26	0.99	4.29	0.73	1.32
Ammonia Nitrogen	ug/l	--	50	<50	<50	120	95	190	30	100	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	2000	<2000	<2000	<2000	5000	15000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	38000	36000	36000	46000	38000	61000	29000	41000	37000
Chloride	ug/l	--	250000	200000	310000	270000	210000	266000	254000	260000	344000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1739	1581	1785	1992	1407	1752	1630	1824	1784
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	83000	92000	78000	98000	88000	76000	79900	83800	76000
Dissolved Organic Carbon	ug/l	--	16000	13000	14000	14000	13000	16400	14800	12600	13200
Dissolved Oxygen (Field)	ug/l	-- [7]	**150**	10580	14290	**360**	9660	7740	**4380**	11330	5570
Hardness, Calcium Carbonate	ug/l	--	550000	580000	650000	590000	560000	579000	408000	838000	582000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	190	<100	<100	100	<100	<100	100	<100
Nitrite as N	ug/l	--	<10	<10	<10	<10	12	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1000	690	860	950	1900	9800	500	900	700
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	190	<100	<100	110	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.93	7.78	7.68	7.72	7.35	7.10	**8.66**	7.93	7.88
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**48**	28	24	**57**	**88**	**1690**	**50**	**80**	30
Sulphate	ug/l	--	230000	270000	270000	250000	220000	224000	211000	221000	200000
Temperature (Field)	deg c	-- [10]	21.7	3.1	17.1	21.3	4.9	20.7	18.9	0.6	18.6
Total Dissolved Solids	ug/l	--	1280000	1210000	1440000	1320000	1070000	1110000	1060000	1080000	1240000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<1000	7000	12000	7000	88000	266000	9000	38000	30000
Metals											
Arsenic	ug/l	100 [11]	<1.0	<1.0	<1.0	<1.0	<1.0	2	<1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**210**	160	180	200	160	**201**	199	149	146
Cadmium	ug/l	0.2 [11]	<0.10	**1.8**	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	180000	180000	200000	180000	170000	174000	120000	253000	168000
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<5.0	<5.0	2	<1	3	1
Cobalt	ug/l	0.9	<0.50	<0.50	0.50	<0.50	0.69	**1.4**	0.5	0.7	<0.5
Copper	ug/l	5	2.6	2.5	1.9	1.7	2.9	3.1	<0.5	0.9	2.4
Iron	ug/l	300	**380**	230	**320**	210	**460**	**3480**	234	**965**	200
Lead	ug/l	-- [14]	0.64	0.52	0.51	<0.50	1.6	**9.0**	<0.1	1.1	0.3
Magnesium	ug/l	--	30000	40000	42000	32000	34000	35100	26500	50000	39200
Manganese	ug/l	--	83	93	120	210	140	638	206	153	42
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	16000	15000	17000	16000	13000	13800	12500	12200	12500
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	200000	170000	210000	220000	160000	154000	148000	228000	198000
Zinc	ug/l	30 [11]	6.5	15	16	9.6	30	**33**	13	23	9
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	**1.4**	<1.0	<1.0	**1.7**	<1	**2**	<1	**8**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S1 18-Aug-2016 S-1	S1 16-Nov-2016 S-1	S1 18-May-2017 S-1	S1 28-Aug-2017 S-1	S1 28-Nov-2017 S-1	S1 23-May-2018 S-1	S1 30-Aug-2018 S-1	S1 28-Nov-2018 S-1	S1 20-Jun-2019 S-1
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	332000	360000	384000	450000	464000	395000	466000	429000	398000
Ammonia, unionized	ug/l	20	0.69	0.37	1.63	0.36	1.18	0.88	1.18	0.8	1.18
Ammonia Nitrogen	ug/l	--	50	60	60	30	140	30	70	170	120
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	3000	<2000	3000	<2000	<2000	4000	2000	<2000
Chemical Oxygen Demand	ug/l	--	34000	33000	32000	36000	29000	35000	49000	56000	36000
Chloride	ug/l	--	213000	224000	342000	443000	275000	328000	442000	269000	338000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1604	1660	1921	1811	1702	1875	2095	1549	1819
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	65200	63000	49000	85400	76000	80900	87700	80400	79300
Dissolved Organic Carbon	ug/l	--	27400	11600	25500	14200	9600	11600	17400	13100	10200
Dissolved Oxygen (Field)	ug/l	-- [7]	**4540**	9380	8480	**3010**	11590	11180	**3680**	13120	7020
Hardness, Calcium Carbonate	ug/l	--	520000	539000	561000	652000	539000	466000	599000	563000	556000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	100	<100	<100	100	<100	<100	400	200
Nitrite as N	ug/l	--	<50	<50	<50	<250 [18]	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	600	800	600	600	700	700	2400	1300	800
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.46	7.6	7.77	7.54	8.00	7.88	7.71	7.72	7.51
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**60**	20	<10	30	10	20	**310**	**140**	10
Sulphate	ug/l	--	305000	211000	215000	200000	202000	166000	133000	157000	168000
Temperature (Field)	deg c	-- [10]	22.9	7.9	22.5	18.2	0.4	20.1	17.7	1.1	16.5
Total Dissolved Solids	ug/l	--	1100000	988000	1330000	1520000	1110000	1150000	1280000	1050000	1140000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	29000	9000	2000	30000	21000	4000	91000	43000	<2000
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<5 [17]	<1	<1	<1	1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**250**	161	174	196	171	189	166	118	172
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	148000	164000	158000	204000	154000	141000	186000	152000	160000
Chromium	ug/l	-- [13]	<1	<1	<5 [17]	1	<1	<1	4	**12**	<1
Cobalt	ug/l	0.9	<0.5	0.8	<2.5 [17]	0.5	0.5	<0.5	**1.4**	**2.8**	<0.5
Copper	ug/l	5	2.4	3.5	**5.7**	<0.5	2.0	2.0	**5.2**	**10.7**	2.6
Iron	ug/l	300	282	199	<500 [17]	**495**	**313**	101	**1960**	**3540**	201
Lead	ug/l	-- [14]	0.3	2.5	<0.5 [17]	0.6	0.5	0.3	**5.4**	4.6	0.2
Magnesium	ug/l	--	36300	31700	40600	34800	37400	27700	32800	44700	37800
Manganese	ug/l	--	160	106	170	518	308	49	676	340	222
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	17000	14400	14000	14900	10300	10700	16200	14100	13300
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	155000	149000	176000	266000	157000	180000	255000	195000	197000
Zinc	ug/l	30 [11]	7	**35**	<25 [17]	7	14	6	18	**31**	11
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**3**	**6**	<1	<1	<1	<1	**5**	<1	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S1 28-Aug-2019 S-1	S1 21-Nov-2019 S-1	S1 14-May-2020 S-1	S1 26-Aug-2020 S-1	S1 25-Nov-2020 S-1	S1 27-May-2021 S-1	S1 24-Aug-2021 S-1	S1 24-Nov-2021 S-1
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	167000	409000	342000	406000	404000	399000	404000	462000
Ammonia, unionized	ug/l	20	0.5	1.2	2.8	3.16	2.31	4.04	4.83	1.55
Ammonia Nitrogen	ug/l	--	40	130	80	110	120	140	180	210
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<2000	<2000	<2000	<2000	<2000	<2000	7000
Chemical Oxygen Demand	ug/l	--	53000	34000	29000	52000	30000	34000	38000	31000
Chloride	ug/l	--	251000	383000	445000	320000	279000	387000	376000	169000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1232	2350	2038	1976	1880	2151	2168	1953
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	52800	<500	72000	79400	83700	82500	82800	96100
Dissolved Organic Carbon	ug/l	--	14800	10100	26000	11900	10400	12800	13600	9000
Dissolved Oxygen (Field)	ug/l	-- [7]	6270	13560	11370	9660	14170	**5670**	6800	11850
Hardness, Calcium Carbonate	ug/l	--	325000	660000	611000	646000	586000	631000	630000	651000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	200	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	700	700	400	600	500	600	800	700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.53	8.03	8.12	7.76	8.29	8.07	7.83	7.73
Phosphate	ug/l	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**110**	30	<10	10	10	<10	20	10
Sulphate	ug/l	--	151000	220000	235000	210000	215000	194000	188000	222000
Temperature (Field)	deg c	-- [10]	19.2	0.6	15.1	23.6	2.4	14	20.4	6.3
Total Dissolved Solids	ug/l	--	794000	1180000	1200000	1160000	1190000	1380000	1320000	1050000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	68000	<2000	4000	4000	4000	2000	6000	44000
Metals										
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<1	<1	1
Barium	ug/l	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	130	124	112	**216**	117	121	145	119
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	104000	189000	183000	192000	175000	184000	189000	183000
Chromium	ug/l	-- [13]	8	1	<1	<1	<1	2	<1	6
Cobalt	ug/l	0.9	**1.8**	0.6	**1.1**	0.9	<0.5	0.8	0.6	**3.0**
Copper	ug/l	5	**6.8**	4.0	1.6	1.9	1.2	1.3	1.6	**7.6**
Iron	ug/l	300	**2690**	295	**440**	**897**	**845**	**1640**	**2160**	**6440**
Lead	ug/l	-- [14]	3.2	0.3	0.1	0.1	<0.1	0.5	0.3	3.1
Magnesium	ug/l	--	16200	45600	37100	40200	36300	41600	38300	47100
Manganese	ug/l	--	202	409	418	171	300	390	540	1140
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--
Potassium	ug/l	--	10100	14100	12200	15900	11400	13800	16300	11400
Selenium	ug/l	100	--	--	--	--	--	--	--	--
Sodium	ug/l	--	142000	261000	194000	216000	172000	218000	251000	106000
Zinc	ug/l	30 [11]	25	11	8	<5	<5	5	<5	28
Phenols										
Phenolics, Total Recoverable	ug/l	1 [16]	**5**	<1	<1	**4**	<4 [19]	**3**	<1	**2**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S3 01-May-1981	S3 01-Apr-1984	S3 01-May-1987	S3 01-Oct-1987	S3 06-Sep-1992	S3 08-Jun-1993	S3 15-Nov-1993	S3 15-Jun-1994	S3 02-Nov-1994
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	--	122000	217000	184000	326000	114000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	--	80	30	610	100	100	100	--	140
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	--	--	2000	3000	1800	1900	2000
Chemical Oxygen Demand	ug/l	--	24000	1600	162000	93000	129000	45000	53900	25000	45000
Chloride	ug/l	--	22000	42000	123000	255300	43000	123000	301000	196000	101000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	330	600	761	1794	488	1004	1204	1261	739
Cyanide	ug/l	5 [6]	--	--	--	--	15	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	--	--	24900	59100	50100	--	27000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	--	12800	--	10300	8970	11460
Hardness, Calcium Carbonate	ug/l	--	96000	--	910000	534000	207670	328000	329000	285000	197000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	840	900	6060	100	2500
Nitrite as N	ug/l	--	--	--	--	--	100	100	100	100	100
Nitrogen, Total Kjeldahl	ug/l	--	--	--	--	--	3920	930	1770	3920	5320
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	3820	830	1670	1670	5180
pH (Field)	-	6.5 - 8.5	7.9	--	8.15	7.82	6.4	8.32	7.84	8.15	7.95
Phosphate	ug/l	--	--	--	--	--	420	100	100	190	240
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	53000	--	39900	305400	41000	112000	93000	56000	70000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	170000	300000	380000	900000	328000	728000	724000	632000	371000
Total Organic Carbon	ug/l	--	--	--	--	--	10100	23700	8400	18100	10600
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	1	--	--	--	--
Barium	ug/l	--	--	--	--	--	80	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	10	--	--	58	48
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	0.1
Calcium	ug/l	--	--	--	252700	100000	50800	81000	102000	76000	61000
Chromium	ug/l	-- [13]	2	--	100	30	20	51	10	10	10
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	--	--	100	10	10	6	4	3	3.9
Iron	ug/l	300	200	--	700	400	21330	1334	2204	776	1002
Lead	ug/l	-- [14]	3	--	10	10	50	7.4	9.3	0.5	1.7
Magnesium	ug/l	--	--	--	56900	56800	19600	31000	18100	23000	11100
Manganese	ug/l	--	--	--	40	140	5600	36	294	70	129
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	1	--	10	40	20	20	20	20	20
Potassium	ug/l	--	--	--	--	--	2900	23000	10100	9100	11100
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	--	--	--	20600	54000	119000	121000	51000
Zinc	ug/l	30 [11]	3	--	10	210	60	10	39	28	27
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	--	17	2	2	2	10

Parameter	Unit	PWQO [1]	S3 28-Jun-1995	S3 14-Nov-1995	S3 12-Jun-1996	S3 12-Oct-1996	S3 17-Jun-1997	S3 05-Nov-1997	S3 05-Jun-1998	S3 28-Aug-1998	S3 30-Oct-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	226000	210000	235000	239000	193000	220000	285000	240000	256000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	10
Ammonia Nitrogen	ug/l	--	10	120	90	60	10	30	30	30	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	2000	2000	1000	1000	2000	3000	1000	3000
Chemical Oxygen Demand	ug/l	--	58000	28000	24000	18000	24000	14000	40000	29000	35000
Chloride	ug/l	--	195000	172000	177000	188000	136000	226000	183000	229000	112000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	792	1240	1060	1250	854	1375	1343	1290	1480
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	68200	49200	46700	46300	36100	42600	57900	49900	61200
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	10660	11870	7300	8630	6970	12100	9580	8050	9390
Hardness, Calcium Carbonate	ug/l	--	402000	320000	299000	347000	276000	336000	524000	513000	402000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	2200	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	630	2100	560	850	860	830	1630	1600	610
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	620	1980	470	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.56	7.68	7.44	7.11	7.24	7.9	--	8.04	7.4
Phosphate	ug/l	--	200	90	0.1	100	110	50	120	90	30
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	166000	106000	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	824000	620000	528000	630	428000	689000	673000	650000	740000
Total Organic Carbon	ug/l	--	14900	9200	10300	9500	11900	9800	10700	11000	10300
Total Suspended Solids	ug/l	--	9000	5000	8000	5000	1000	22000	64000	9000	1000
Metals											
Arsenic	ug/l	100 [11]	100	--	--	--	--	--	--	--	--
Barium	ug/l	--	87	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	200	10	35	50	100	80	80	100	80
Cadmium	ug/l	0.2 [11]	0.1	0.1	--	--	--	--	--	--	--
Calcium	ug/l	--	131000	94300	90200	108000	87000	105000	160000	172000	122000
Chromium	ug/l	-- [13]	**10**	**10**	--	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	4	2	4.4	1.8	4	**10.9**	**5.3**	2.8	2.7
Iron	ug/l	300	240	210	**326**	**380**	**340**	260	**1700**	**340**	290
Lead	ug/l	-- [14]	1.1	0.4	0.3	3	0.2	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	32100	20100	17700	18500	14000	17700	30100	20000	23200
Manganese	ug/l	--	62	130	305	210	180	100	1070	120	100
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20	20	20
Potassium	ug/l	--	27700	12400	11700	12300	8400	11000	8800	10500	6800
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	65400	126000	109000	112000	82200	108000	102000	127000	168000
Zinc	ug/l	30 [11]	10	**50**	10	20	10	10	30	**960**	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	**2**	--	**24**	1	1	**4**	1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S3 19-Oct-1999	S3 03-May-2000	S3 25-Oct-2000	S3 13-Jun-2001	S3 27-Sep-2001	S3 21-Nov-2001	S3 22-May-2002	S3 08-Nov-2002	S3 31-May-2003
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	238000	244000	300000	272000	215000	212000	238000	216000	209000
Ammonia, unionized	ug/l	20	--	10	--	<20	<20	<20	--	--	--
Ammonia Nitrogen	ug/l	--	30	20	--	10	20	10	20	120	90
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	2000	--	1000	1000	1000	1000	2000	1000
Chemical Oxygen Demand	ug/l	--	30000	21000	--	27000	9000	18000	26000	44000	26000
Chloride	ug/l	--	323000	215000	244000	212000	342000	290000	220000	261000	205000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1520	1290	1400	1050	1520	1200	1110	1300	1220
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	62700	38200	--	46400	40900	29700	29000	60000	55000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	9510	11660	8730	11200	8260	11130	10030	12800	9660
Hardness, Calcium Carbonate	ug/l	--	419000	360000	525000	366000	463000	359000	345000	408000	293000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	10	100	100	600	900	1400	900
Nitrite as N	ug/l	--	--	--	200	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	680	510	6180	530	520	420	400	1500	580
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.6	7.46	6.81	7.8	7.99	7.13	7.16	7	7.8
Phosphate	ug/l	--	40	20	2210	30	50	30	20	400	30
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	89000	53000	199000	85000	77000	126000	74000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	760000	650000	772000	708000	1030000	791000	696000	650000	657000
Total Organic Carbon	ug/l	--	10100	8800	--	12600	9900	11000	8000	11000	10000
Total Suspended Solids	ug/l	--	14000	32000	570000	63000	1000	9000	7000	244000	6000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	1	1	1	1	1	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	90	50	**600**	120	90	70	70	100	50
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	133000	111000	143000	108000	147000	114000	109000	126000	93600
Chromium	ug/l	-- [13]	--	--	**120**	**10**	**10**	**10**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	3.2	**7.3**	**62.7**	2	2.9	4.8	<1	**25.9**	4
Iron	ug/l	300	**530**	**320**	**6240**	**320**	200	80	100	**5210**	290
Lead	ug/l	-- [14]	0.2	0.2	**39.6**	0.5	0.2	0.2	<1	**11.9**	0.5
Magnesium	ug/l	--	20700	19900	40900	23300	23400	18000	17800	22600	14500
Manganese	ug/l	--	260	150	5460	150	110	30	90	420	220
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	**80**	20	20	20	20	20	20
Potassium	ug/l	--	15400	8600	12000	4800	5500	8400	8300	13100	8000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	174000	126000	122000	113000	169000	154000	136000	154000	132000
Zinc	ug/l	30 [11]	10	10	**410**	**70**	**50**	10	20	**60**	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	**2**	**4**	**90**	1	1	1	1	1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S3 03-Jul-2003	S3 22-Oct-2003	S3 17-May-2004	S3 21-Aug-2004	S3 18-Nov-2004	S3 25-May-2005	S3 09-Sep-2005 [20]	S3 09-Nov-2005	S3 24-May-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	285000	--	325000	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	<5000	--	<5000	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	240000	194000	201000	264000	250000	234000	--	266000	233000
Ammonia, unionized	ug/l	20	--	--	<10	<10	<10	<10	--	<10	<10
Ammonia Nitrogen	ug/l	--	10	180	20	10	10	<10	--	20	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	2000	1000	1000	<3000	--	<3000	<3000
Chemical Oxygen Demand	ug/l	--	24000	29000	38000	29000	26000	21000	--	24000	23000
Chloride	ug/l	--	283000	244000	249000	280000	344000	267000	--	326000	212000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1400	1300	1270	1320	1300	1650	--	980	725
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	61000	48000	37200	29200	36000	58500	--	56500	59600
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	9200	--	9100	12000
Dissolved Oxygen (Field)	ug/l	-- [7]	6040	10400	8600	7400	9760	9540	--	8900	9330
Hardness, Calcium Carbonate	ug/l	--	393000	--	329000	400000	374000	367000	--	405000	311000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	<10	--	<10	--
Nitrate as N	ug/l	--	100	600	300	100	600	200	--	500	500
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	600	710	900	420	360	550	--	460	430
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.94	8.08	7.9	7.6	6.9	7.6	--	7.2	7.9
Phosphate	ug/l	--	70	60	70	20	30	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	20	--	20	20
Sulphate	ug/l	--	99000	86000	76000	83000	95000	75000	--	106000	70000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	18.8	--	1	9.5
Total Dissolved Solids	ug/l	--	913000	710000	635000	660000	650000	799000	--	945000	686000
Total Organic Carbon	ug/l	--	16000	19000	8200	9000	7200	--	--	--	--
Total Suspended Solids	ug/l	--	90000	11000	29000	40000	14000	5000	--	2000000	3000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	<1	--	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	91	52	70	82	53	76	--	70	54
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	<0.5	--	<0.5	<0.1
Calcium	ug/l	--	120000	96900	101000	119000	114000	113000	--	126000	99300
Chromium	ug/l	-- [13]	2	6	1	2	2	<2	--	<2	<2
Cobalt	ug/l	0.9	--	--	--	--	--	**69**	--	**1**	0.5
Copper	ug/l	5	2	**27**	3	3	2	<2	--	<2	<2
Iron	ug/l	300	**488**	231	**894**	128	**828**	239	--	**341**	161
Lead	ug/l	-- [14]	1.4	2	0.8	1.3	0.7	1	--	1.5	0.9
Magnesium	ug/l	--	22600	14200	18400	25000	21700	20600	--	21900	15200
Manganese	ug/l	--	139	80	368	210	250	233	--	153	99
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	<0.05	--	<0.06	--
Molybdenum	ug/l	40	--	--	--	--	--	4	--	<5	--
Nickel	ug/l	25	10	10	10	10	10	<10	--	<10	--
Potassium	ug/l	--	11500	9400	10200	10200	9600	10500	--	10200	7500
Selenium	ug/l	100	--	--	--	--	--	<1	--	<1	--
Sodium	ug/l	--	158000	149000	143000	182000	183000	181000	--	203000	148000
Zinc	ug/l	30 [11]	18	16	21	**64**	15	**35**	--	9	8
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	<1	--	<1	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S3 15-Aug-2006	S3 16-Nov-2006	S3 08-May-2007	S3 22-Aug-2007 [20]	S3 20-Nov-2007	S3 23-May-2008	S3 12-Aug-2008 [20]	S3 06-Nov-2008	S3 13-May-2009 S-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	302000	171000	232000	--	170000	244000	--	276000	262000
Ammonia, unionized	ug/l	20	<10	--	0.346508	--	<10	<20	--	<20	1.2
Ammonia Nitrogen	ug/l	--	<10	80	<10	--	<10	<10	--	<10	90
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	<3000	--	<3000	<3000	--	<3000	<1000
Chemical Oxygen Demand	ug/l	--	30000	19000	31000	--	29000	26000	--	14000	25000
Chloride	ug/l	--	295000	88600	207000	--	194000	199000	--	259000	174000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	1170
Conductivity (Field)	uS/cm	--	1470	490	900	--	750	1050	--	1200	1000
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	72500	42800	58000	--	44200	57300	--	66800	64900
Dissolved Organic Carbon	ug/l	--	16200	8800	7600	--	10400	5000	--	3700	10200
Dissolved Oxygen (Field)	ug/l	-- [7]	**1600**	8270	8010	--	10890	10590	--	8540	9390
Hardness, Calcium Carbonate	ug/l	--	403000	232000	297000	--	264000	269000	--	346000	313000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	700	200	--	500	200	--	200	300
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	<100
Nitrogen, Total Kjeldahl	ug/l	--	460	820	330	--	580	550	--	470	560
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.8	--	8.1	--	8.1	8	--	7.5	7.6
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	20	**140**	<10	--	**150**	30	--	30	**60**
Sulphate	ug/l	--	93000	48000	65000	--	74000	54000	--	75000	53000
Temperature (Field)	deg c	-- [10]	16	8.3	15.5	--	2.1	13.3	--	10.5	17.9
Total Dissolved Solids	ug/l	--	895000	407000	663000	--	594000	642000	--	800000	761000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<3000	58000	<3000	--	46000	<3000	--	3000	16000
Metals											
Arsenic	ug/l	100 [11]	1.1	<1	0.7	--	1.2	1.8	--	0.8	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	102	41	66	--	45	40	--	63	70
Cadmium	ug/l	0.2 [11]	<0.1	<0.5	<0.1	--	<0.1	<0.1	--	<0.1	<0.1
Calcium	ug/l	--	125000	72800	92000	--	83900	87000	--	110000	99000
Chromium	ug/l	-- [13]	<2	8	<2	--	4	<2	--	<2	5
Cobalt	ug/l	0.9	0.4	**1**	<0.5	--	**1.5**	<0.5	--	0.7	0.8
Copper	ug/l	5	2	**38**	**16**	--	5	<2	--	<2	2
Iron	ug/l	300	191	**2130**	252	--	**2120**	**355**	--	**1150**	**1310**
Lead	ug/l	-- [14]	0.5	**6**	0.2	--	**10**	<0.1	--	<0.1	<1
Magnesium	ug/l	--	22000	12100	16300	--	13200	12400	--	17100	16000
Manganese	ug/l	--	170	238	273	--	267	258	--	420	440
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	10300	8800	8100	--	8000	6100	--	8000	7000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	177000	68800	134000	--	111000	135000	--	163000	127000
Zinc	ug/l	30 [11]	10	**42**	19	--	**36**	6	--	<5	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	--	<1	<1	--	<1	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S3 25-Aug-2009 A-7	S3 27-Nov-2009 [28] S-10	S3 18-May-2010 S-1	S3 18-Aug-2010 S-8	S3 14-Oct-2010 S-12	S3 19-May-2011 W-2	S3 16-Aug-2011 [2] N-8	S3 30-Nov-2011 [22] S3	S3 30-May-2012 S 3
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	417000	250000	343000	363000	320000	232000	407000	228000	360000
Ammonia, unionized	ug/l	20	1.51	0.14	0.76	0.64	0.89	0.48	1.85	0.23	0.79
Ammonia Nitrogen	ug/l	--	190	80	140	150	70	50	280	30	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	2000	2000	1000	<1000	<1000	1000	2000	<2000
Chemical Oxygen Demand	ug/l	--	58000	25000	30000	35000	30000	25000	40000	20000	41000
Chloride	ug/l	--	211000	162000	186000	170000	197000	112000	186000	128000	170000
Conductivity	uS/cm	--	1590	1160	1350	1580	1500	914	1630	1080	--
Conductivity (Field)	uS/cm	--	1234	1014	1452	1429	610	879	1313	985	1356
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	107000	61200	73500	79500	89000	55100	90700	28800	91000
Dissolved Organic Carbon	ug/l	--	13300	8900	11800	12400	11400	9500	14500	7800	15000
Dissolved Oxygen (Field)	ug/l	-- [7]	9160	12410	11000	9000	13000	6210	6150	7780	5410
Hardness, Calcium Carbonate	ug/l	--	422000	326000	357000	541000	438000	275000	518000	315000	460000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	600	<100	<100	<100	300	<100	600	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	<100	<10
Nitrogen, Total Kjeldahl	ug/l	--	670	380	590	360	580	840	880	880	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.37	7.13	7.37	7.14	7.81	7.61	7.28	7.76	7.20
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	30	**90**	20	20	20	**40**	20	**40**	**59**
Sulphate	ug/l	--	82000	78000	81000	214000	155000	71000	158000	111000	130000
Temperature (Field)	deg c	-- [10]	18	5.5	12.9	16.8	10.9	13.1	18.3	6.1	22.0
Total Dissolved Solids	ug/l	--	1030000	754000	878000	1030000	975000	594000	1060000	702000	854000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	7000	24000	8000	4000	5000	4000	13000	6000	38000
Metals											
Arsenic	ug/l	100 [11]	1	<1	<1	<1	<1	<1	<10	<50	<1.0
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	90	60	90	110	70	60	100	200	100
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**<10**	<0.10
Calcium	ug/l	--	131000	104000	110000	172000	139000	87000	158000	93000	150000
Chromium	ug/l	-- [13]	6	4	5	4	5	4	6	**<50**	<5.0
Cobalt	ug/l	0.9	**1.4**	0.7	**1.2**	0.8	0.6	0.4	0.8	<10	**1.1**
Copper	ug/l	5	2	2	2	3	3	2	2	**<10**	3.8
Iron	ug/l	300	**3050**	**1190**	**3840**	**3320**	**1510**	**740**	**4660**	**1300**	**8600**
Lead	ug/l	-- [14]	<1	<1	<1	<1	<1	<1	<1	**<10**	0.57
Magnesium	ug/l	--	23000	16000	20000	27000	22000	14000	30000	20000	27000
Manganese	ug/l	--	1210	490	1290	1020	520	280	1440	370	1500
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	8000	8000	7000	10000	9000	6000	10000	8000	9600
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	150000	119000	143000	153000	141000	81000	142000	89000	150000
Zinc	ug/l	30 [11]	<10	<10	<10	<10	<10	<10	<10	<50	20
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1	<1	<1	<1.0

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S3 22-Aug-2012 S-3	S3 29-Nov-2012 S3	S3 28-May-2013 S15	S3 15-Aug-2013 S3	S3 21-Nov-2013 SA-11	S3 28-May-2014 S3	S3 26-Aug-2014 S3	S3 13-Nov-2014 S-3	S3 27-May-2015 S-3
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	450000	340000	320000	510000	330000	340000	440000	330000	327000
Ammonia, unionized	ug/l	20	2.1	0.83	0.86	3.3	0.31	1.47	2.3	0.35	5.8
Ammonia Nitrogen	ug/l	--	350	330	290	1300	63	230	750	140	320
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000	2000	<2000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	50000	29000	27000	64000	24000	29000	47000	25000	29000
Chloride	ug/l	--	200000	210000	190000	180000	210000	200000	230000	230000	265000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1613	1520	1322	1695	1396	1299	1694	1237	1501
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	93000	76000	73000	130000	84000	77000	120000	79000	70500
Dissolved Organic Carbon	ug/l	--	<200	10000	12000	20000	10000	11000	14000	9500	14400
Dissolved Oxygen (Field)	ug/l	-- [7]	5500	**1990**	9370	**210**	**2090**	**5630**	**1400**	**2930**	5670
Hardness, Calcium Carbonate	ug/l	--	670000	480000	470000	580000	460000	440000	530000	430000	398000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	420	400	100	840	360	130	480	200
Nitrite as N	ug/l	--	<10	<10	<10	<10	<10	<10	<10	18	<50
Nitrogen, Total Kjeldahl	ug/l	--	1400	1500	1100	2100	780	1300	1600	620	900
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	420	400	100	840	360	130	500	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.26	7.48	7.04	6.97	7.71	7.40	6.96	7.31	7.71
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**69**	**42**	**35**	**100**	19	**97**	**32**	21	**60**
Sulphate	ug/l	--	270000	160000	120000	140000	140000	100000	100000	88000	97000
Temperature (Field)	deg c	-- [10]	17.6	0.2	14.9	15.0	1.8	14.2	17.8	4.9	18.7
Total Dissolved Solids	ug/l	--	1290000	994000	832000	1130000	996000	926000	1040000	860000	856000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	31000	8000	8000	<5000	7000	9000	22000	8000	2000
Metals											
Arsenic	ug/l	100 [11]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	160	80	77	110	97	76	96	76	96
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1
Calcium	ug/l	--	220000	170000	140000	210000	150000	140000	160000	140000	120000
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1
Cobalt	ug/l	0.9	**0.94**	0.53	0.61	**1.7**	<0.50	0.71	**1.2**	0.57	0.6
Copper	ug/l	5	3.9	2.4	2.0	1.4	2.1	1.8	1.4	1.6	<0.5
Iron	ug/l	300	**7200**	**3300**	**3000**	**22000**	**1300**	**4000**	**11000**	**2000**	**2990**
Lead	ug/l	-- [14]	0.54	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.1
Magnesium	ug/l	--	43000	32000	26000	47000	31000	26000	35000	24000	23600
Manganese	ug/l	--	1500	1300	900	4800	550	1100	2800	760	1050
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	16000	9300	9300	11000	9300	9100	10000	9200	9020
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	180000	180000	150000	150000	170000	140000	160000	150000	147000
Zinc	ug/l	30 [11]	<5.0	<5.0	<5.0	9.7	<5.0	5.1	13	<5.0	<5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.2**	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S3 25-Aug-2015 S-3	S3 25-Nov-2015 S-3	S3 24-May-2016 S-3	S3 18-Aug-2016 S-3	S3 16-Nov-2016 S-3	S3 18-May-2017 S-3	S3 28-Aug-2017 S-3	S3 28-Nov-2017 S-3	S3 23-May-2018 S-3
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	547000	352000	367000	595000	351000	302000	425000	317000	330000
Ammonia, unionized	ug/l	20	**36.7**	0.67	2.91	13.86	0.82	3.02	2.81	2.4	0.81
Ammonia Nitrogen	ug/l	--	900	130	410	1830	160	170	410	170	220
Biochemical Oxygen Demand, 5 Day	ug/l	--	13000	<2000	2000	<2000	3000	<2000	4000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	48000	34000	37000	59000	25000	31000	30000	23000	27000
Chloride	ug/l	--	240000	328000	227000	198000	339000	198000	227000	223000	194000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1737	1682	1375	1743	1914	1201	1196	1241	1265
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	134000	70500	74700	111000	64900	40300	77600	51300	69100
Dissolved Organic Carbon	ug/l	--	15500	9800	12600	37900	9000	21900	14600	8400	10100
Dissolved Oxygen (Field)	ug/l	-- [7]	**570**	**550**	5890	**240**	**1140**	5960	**5350**	**4740**	**4480**
Hardness, Calcium Carbonate	ug/l	--	474000	610000	592000	523000	475000	331000	445000	362000	347000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	500	<100	100	<100	200	<100	600	100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1800	700	1000	2800	600	700	600	700	700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8.14	7.77	7.34	7.32	7.53	7.71	7.41	8.20	7.07
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**80**	20	10	**110**	30	30	20	10	20
Sulphate	ug/l	--	117000	127000	106000	212000	140000	81000	98000	75000	60000
Temperature (Field)	deg c	-- [10]	16.6	0.7	17.4	18.9	7.5	18.4	14.8	1.1	16.9
Total Dissolved Solids	ug/l	--	1060000	961000	872000	1250000	1130000	742000	950000	758000	704000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	47000	8000	13000	70000	6000	9000	12000	<2000	4000
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<5 [17]	<1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	102	85	109	147	101	**444**	95	90	105
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1
Calcium	ug/l	--	132000	204000	173000	145000	147000	99700	139000	110000	107000
Chromium	ug/l	-- [13]	1	<1	2	<1	<1	<5 [17]	<1	<1	<1
Cobalt	ug/l	0.9	**1.1**	<0.5	**1.6**	**1.3**	0.6	<2.5 [17]	0.7	0.6	0.5
Copper	ug/l	5	<0.5	<0.5	1.6	2.7	1.0	4.2	<0.5	1.5	0.7
Iron	ug/l	300	**12700**	**1500**	**19200**	**13200**	**1350**	**4320**	**4860**	**1150**	**1650**
Lead	ug/l	-- [14]	0.2	<0.1	0.4	<0.1	<0.1	<0.5 [17]	0.1	0.1	<0.1
Magnesium	ug/l	--	34600	24300	38800	39300	26300	19800	23900	21200	19200
Manganese	ug/l	--	2780	565	2970	2220	616	520	1210	653	831
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	10800	8450	10300	14700	10800	7920	7790	8030	7440
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	150000	199000	149000	147000	187000	106000	138000	137000	119000
Zinc	ug/l	30 [11]	10	5	9	8	6	<25 [17]	<5	7	6
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**2**	<1	**4**	**5**	**2**	<1	<1	<1	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S3 30-Aug-2018 S-3	S3 28-Nov-2018 S-3	S3 20-Jun-2019 S-3	S3 28-Aug-2019 S-3	S3 21-Nov-2019 S-3	S3 14-May-2020 S-3	S3 26-Aug-2020 S-3	S3 25-Nov-2020 S-3
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	784000	358000	318000	208000	311000	281000	385000	321000
Ammonia, unionized	ug/l	20	5.39	0.31	2.03	2.27	0.79	1.38	2.21	2.59
Ammonia Nitrogen	ug/l	--	3490	80	170	250	170	240	390	240
Biochemical Oxygen Demand, 5 Day	ug/l	--	6000	<2000	<2000	<2000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	68000	26000	28000	52000	24000	27000	20000	33000
Chloride	ug/l	--	203000	370000	160000	234000	322000	303000	336000	340000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1831	1617	1213	1132	1828	1457	1835	41
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	134000	54600	67200	70900	655	59100	77200	67400
Dissolved Organic Carbon	ug/l	--	29400	24900	7400	18600	8400	24400	11700	8600
Dissolved Oxygen (Field)	ug/l	-- [7]	**1400**	11190	**2070**	**1330**	**4540**	**5940**	7240	11430
Hardness, Calcium Carbonate	ug/l	--	733000	445000	315000	322000	528000	361000	493000	468000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	900	800	200	500	500	600	600
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	5400	900	700	1000	600	600	900	600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.73	7.56	7.61	7.46	7.71	7.38	7.32	8.10
Phosphate	ug/l	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	30	**50**	30	**70**	20	<10	20	**70**
Sulphate	ug/l	--	31000	97000	146000	117000	120000	103000	114000	108000
Temperature (Field)	deg c	-- [10]	15.7	3.1	16.1	17	1.2	13.4	15	0.6
Total Dissolved Solids	ug/l	--	1100000	978000	764000	762000	926000	780000	972000	1020000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	116000	2000	4000	10000	2000	3000	7000	34000
Metals										
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	54	92	100	76	74	49	79	51
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	197000	128000	85500	98300	155000	111000	148000	141000
Chromium	ug/l	-- [13]	2	1	2	1	<1	<1	<1	1
Cobalt	ug/l	0.9	**2.6**	0.5	0.6	0.6	0.7	<0.5	0.8	0.8
Copper	ug/l	5	0.9	4.3	3.0	3.5	1.9	1.7	1.4	1.8
Iron	ug/l	300	**44700**	**935**	**1870**	**2020**	**2270**	**2160**	**2980**	**3820**
Lead	ug/l	-- [14]	<0.1	0.2	0.2	0.3	0.1	0.1	<0.1	0.5
Magnesium	ug/l	--	58800	30300	24700	18600	34300	20000	29800	28400
Manganese	ug/l	--	6550	269	438	738	885	647	1170	964
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--
Potassium	ug/l	--	14100	11300	9230	9830	12400	7520	11100	9700
Selenium	ug/l	100	--	--	--	--	--	--	--	--
Sodium	ug/l	--	125000	251000	128000	126000	171000	129000	187000	168000
Zinc	ug/l	30 [11]	6	11	<5	10	8	<5	5	<5
Phenols										
Phenolics, Total Recoverable	ug/l	1 [16]	**5**	<1	<1	**5**	<1	<1	**6**	<4 [19]

Parameter	Unit	PWQO [1]	S3 27-May-2021 S-3	S3 24-Aug-2021 S-3	S3 24-Nov-2021 S-3
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	392000	457000	429000
Ammonia, unionized	ug/l	20	2.67	2.58	0.68
Ammonia Nitrogen	ug/l	--	490	1040	760
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	3000	<2000
Chemical Oxygen Demand	ug/l	--	51000	54000	60000
Chloride	ug/l	--	289000	282000	331000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	1715	1839	2032
Cyanide	ug/l	5 [6]	--	--	--
Dissolved Inorganic Carbon	ug/l	--	86600	91400	40300
Dissolved Organic Carbon	ug/l	--	13700	14400	14500
Dissolved Oxygen (Field)	ug/l	-- [7]	**240**	**470**	**3400**
Hardness, Calcium Carbonate	ug/l	--	470000	540000	569000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	500	300	900
Nitrite as N	ug/l	--	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1300	2100	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.26	6.75	6.81
Phosphate	ug/l	--	--	--	--
Phosphorus	ug/l	-- [9]	**50**	**140**	**40**
Sulphate	ug/l	--	116000	112000	187000
Temperature (Field)	deg c	-- [10]	16.3	21.5	6.4
Total Dissolved Solids	ug/l	--	1000000	1110000	1160000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	24000	52000	22000
Metals					
Arsenic	ug/l	100 [11]	<1	1	<1
Barium	ug/l	--	--	--	--
Boron	ug/l	200 [12]	65	79	174
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1
Calcium	ug/l	--	142000	160000	182000
Chromium	ug/l	-- [13]	2	4	1
Cobalt	ug/l	0.9	**1.3**	**1.8**	**1.8**
Copper	ug/l	5	1.8	2.5	1.8
Iron	ug/l	300	**6480**	**13300**	**9860**
Lead	ug/l	-- [14]	0.5	2.0	0.7
Magnesium	ug/l	--	28100	34000	27500
Manganese	ug/l	--	1530	1810	2970
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	9290	12300	11000
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	178000	171000	205000
Zinc	ug/l	30 [11]	28	**90**	**77**
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	**7**	<1	**12**

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S5 19-Jun-1989	S5 24-Jul-1989	S5 17-Nov-1989	S5 27-Mar-1990	S5 16-Apr-1990	S5 18-May-1990	S5 27-Jun-1990	S5 04-Oct-1990	S5 06-Nov-1990
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	892000	1029000	980000	1330000	1254000	1048000	955000	973000	1008000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	4500	1830	3460	10000	530	660	6100	4100	4000
Biochemical Oxygen Demand, 5 Day	ug/l	--	7000	6000	5000	27000	14000	6000	35000	2000	8000
Chemical Oxygen Demand	ug/l	--	82000	65000	105000	287000	209000	202000	332000	218000	235000
Chloride	ug/l	--	136000	148000	177000	245000	239000	202000	234000	199000	193000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2199	2203	2200	3207	2614	2570	2213	2323	2196
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	4760	193000	211000	395000	302000	323000	331000	238000	291000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	<1000	500	6600	450	3440	4650
Hardness, Calcium Carbonate	ug/l	--	860000	414000	816000	1669000	1521000	1078000	958000	1045000	1027000
Nitrate as N	ug/l	--	<100	<100	6580	4000	7300	2900	<100	<100	<100
Nitrite as N	ug/l	--	<100	<100	250	<1000	<100	800	<100	<100	30
Nitrogen, Total Kjeldahl	ug/l	--	4760	1870	6470	12690	14000	12000	13000	6050	5590
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	260	40	3010	2690	13470	11340	6900	1950	1590
pH (Field)	-	6.5 - 8.5	7.64	7.63	7.2	7.9	7.28	7.81	8.18	8.01	8.08
Phosphate	ug/l	--	<100	<100	250	100	930	160	470	130	240
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	30000	25000	96000	156000	166000	47000	51000	70000	45000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1100000	1100000	1100000	1600000	1300000	1280000	1100000	1160000	1100000
Total Organic Carbon	ug/l	--	800	--	33900	65000	63000	44000	73000	41000	39000
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	277000	83000	238000	526000	453000	309000	243000	281000	284000
Chromium	ug/l	-- [13]	**20**	**240**	**<10**	**<50**	**<50**	**<50**	**<50**	**<50**	**<50**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**<100**	**<100**	**30**	**<50**	**<50**	**<50**	**<50**	**<50**	**<50**
Iron	ug/l	300	**14900**	**8990**	**9900**	**16970**	**7600**	**10000**	**30010**	**510**	**8430**
Lead	ug/l	-- [14]	**30**	**80**	**70**	**170**	**<50**	**<50**	**90**	**<50**	**<50**
Magnesium	ug/l	--	41000	56000	53600	86000	84000	74000	85000	83000	77000
Manganese	ug/l	--	2370	2030	2460	3120	2300	1700	1800	1930	2480
Nickel	ug/l	25	<100	<100	**30**	<50	<50	<50	<50	<50	<50
Potassium	ug/l	--	19000	31000	24900	51000	43000	14500	32000	46000	26000
Sodium	ug/l	--	127000	176000	173000	217000	235000	192000	215000	291000	224000
Zinc	ug/l	30 [11]	**260**	**120**	**40**	**270**	<50	**70**	**130**	<50	<50
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<2	**8**	**10**	**75**	**17**	**8**	<2	<2	<2

Parameter	Unit	PWQO [1]	S5 27-Nov-1990	S5 02-Nov-1991	S5 24-Nov-1991	S5 09-Jun-1992	S5 15-Nov-1993	S5 15-Jun-1994	S5 02-Nov-1994	S5 12-Jun-1996	S5 26-Aug-1998
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	718000	1296000	1256000	712000	320000	468000	113000	616000	88000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	4600	29000	9290	2630	100	1430	100	500	260
Biochemical Oxygen Demand, 5 Day	ug/l	--	7000	16000	6000	1700	4000	1600	4200	7000	2000
Chemical Oxygen Demand	ug/l	--	141000	278000	300000	148000	106000	47000	62000	51000	19000
Chloride	ug/l	--	80000	389000	244000	182000	241000	83000	36000	72000	15500
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2384	6500	2792	2274	2030	1711	756	1640	306
Cyanide	ug/l	5 [6]	--	--	--	**107**	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	270000	--	351000	165700	97200	--	27000	101000	17000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	4890	4800	6900	2500	4900	5910	12050	5880	6290
Hardness, Calcium Carbonate	ug/l	--	915000	1068000	1194000	774150	938000	603000	247000	718000	175000
Nitrate as N	ug/l	--	<100	--	7700	600	3350	240	100	--	--
Nitrite as N	ug/l	--	<10	--	140	<100	100	--	100	--	--
Nitrogen, Total Kjeldahl	ug/l	--	6610	31500	13900	7650	3580	5040	4760	1750	820
Nitrogen, Nitrate-Nitrite	ug/l	--	--	1530	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	2010	2500	4610	5020	3480	3610	4660	1250	--
pH (Field)	-	6.5 - 8.5	7.8	7.2	7.62	7.46	7.09	7.19	8.18	**5.92**	7.68
Phosphate	ug/l	--	<100	700	400	<100	200	10	460	1340	960
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	36000	12000	121000	240000	796000	184000	194000	--	80
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1200000	3250000	1400000	1384000	1692000	857000	349000	820000	154000
Total Organic Carbon	ug/l	--	42000	--	50000	28200	17200	20000	9100	16300	6000
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	67000	244000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	<1	--	--	--	--	--
Barium	ug/l	--	--	--	--	160	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	**3860**	--	**2372**	**1081**	**1630**	**350**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	**0.3**	--	--
Calcium	ug/l	--	244000	269300	341000	179100	244000	150000	67000	167000	37200
Chromium	ug/l	-- [13]	**<50**	**<10**	**<50**	**<20**	**10**	**11**	**10**	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**<50**	**20**	**<50**	**10**	**6**	3.1	**13.6**	**5.7**	**13.2**
Iron	ug/l	300	**14210**	**450**	**8900**	**22000**	**19170**	**7648**	**15040**	**2740**	**18600**
Lead	ug/l	-- [14]	**<50**	<1	**<50**	**100**	**20.9**	0.5	3.6	1	0.6
Magnesium	ug/l	--	74000	96000	83000	79300	79900	55300	19200	72300	19600
Manganese	ug/l	--	2720	1400	3300	2620	3347	1348	352	2480	240
Nickel	ug/l	25	<50	**50**	<50	<20	**37**	20	20	20	**50**
Potassium	ug/l	--	25000	76000	49000	17100	20700	14900	11800	7420	3500
Sodium	ug/l	--	241000	270000	259000	195800	194000	134000	44000	128000	19000
Zinc	ug/l	30 [11]	<50	20	<50	**230**	**2334**	**53**	**150**	19	**70**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**15**	**9**	**16**	<2	**2**	**12**	1	**163**	**5**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S5 25-May-2005 [20]	S5 09-Sep-2005 [20]	S5 09-Nov-2005 [20]	S5 24-May-2006 [20]	S5 15-Aug-2006 [20]	S5 16-Nov-2006	S5 08-May-2007 [20]	S5 22-Aug-2007 [20]	S5 20-Nov-2007 [20]
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	--	--	458000	--	--	--
Ammonia, unionized	ug/l	20	--	--	--	--	--	<10	--	--	--
Ammonia Nitrogen	ug/l	--	--	--	--	--	--	200	--	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	--	--	--	6000	--	--	--
Chemical Oxygen Demand	ug/l	--	--	--	--	--	--	105000	--	--	--
Chloride	ug/l	--	--	--	--	--	--	49700	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	--	--	--	--	750	--	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	--	--	--	119000	--	--	--
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	31700	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	--	--	**4990**	--	--	--
Hardness, Calcium Carbonate	ug/l	--	--	--	--	--	--	491000	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	200	--	--	--
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	--	--	--	--	--	3760	--	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	--	--	--	--	6.7	--	--	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	**590**	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	101000	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	7.3	--	--	--
Total Dissolved Solids	ug/l	--	--	--	--	--	--	706000	--	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	--	--	--	--	114000	--	--	--
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	<1	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	**526**	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	<0.5	--	--	--
Calcium	ug/l	--	--	--	--	--	--	129000	--	--	--
Chromium	ug/l	-- [13]	--	--	--	--	--	**14**	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	**3**	--	--	--
Copper	ug/l	5	--	--	--	--	--	**52**	--	--	--
Iron	ug/l	300	--	--	--	--	--	**3960**	--	--	--
Lead	ug/l	-- [14]	--	--	--	--	--	**10**	--	--	--
Magnesium	ug/l	--	--	--	--	--	--	40900	--	--	--
Manganese	ug/l	--	--	--	--	--	--	237	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	--	--	--	--	43000	--	--	--
Sodium	ug/l	--	--	--	--	--	--	62600	--	--	--
Zinc	ug/l	30 [11]	--	--	--	--	--	**60**	--	--	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	--	--	<1	--	--	--

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S5 23-May-2008 [20]	S5 12-Aug-2008 [20]	S5 06-Nov-2008 [20]	S5 13-May-2009	S5 25-Aug-2009 [20]	S5 27-Nov-2009	S5 18-May-2010 [37]	S5 18-Aug-2010 [2]	S5 14-Oct-2010 [2]
						S-4	S5	S-3	S5	S-2	S-10
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	--	--	610000	--	417000	--	220000	566000
Ammonia, unionized	ug/l	20	--	--	--	0.32	--	0.02	--	0.08	0.32
Ammonia Nitrogen	ug/l	--	--	--	--	120	--	80	--	130	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	--	--	<1000	--	4000	--	3000	2000
Chemical Oxygen Demand	ug/l	--	--	--	--	33000	--	75000	--	30000	35000
Chloride	ug/l	--	--	--	--	37000	--	53000	--	64000	40000
Conductivity	uS/cm	--	--	--	--	1290	--	1120	--	919	1280
Conductivity (Field)	uS/cm	--	--	--	--	1025	--	992	--	855	1070
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	--	--	133000	--	129000	--	50600	141000
Dissolved Organic Carbon	ug/l	--	--	--	--	11400	--	10100	--	15500	11300
Dissolved Oxygen (Field)	ug/l	-- [7]	--	--	--	**2140**	--	**4160**	--	**2920**	**5480**
Hardness, Calcium Carbonate	ug/l	--	--	--	--	573000	--	408000	--	305000	632000
Nitrate as N	ug/l	--	--	--	--	<100	--	300	--	180	<100
Nitrite as N	ug/l	--	--	--	--	<100	--	<100	--	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	--	--	--	1050	--	650	--	1280	760
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	--	--	7.2	--	**6.33**	--	**6.27**	7.19
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	**130**	--	**340**	--	**260**	**200**
Sulphate	ug/l	--	--	--	--	78000	--	123000	--	159000	107000
Temperature (Field)	deg c	-- [10]	--	--	--	8.8	--	4.8	--	16.8	10.1
Total Dissolved Solids	ug/l	--	--	--	--	839000	--	728000	--	597000	832000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	--	--	6000	--	36000	--	21000	27000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	1	--	<50	--	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	**880**	--	**700**	--	**300**	**560**
Cadmium	ug/l	0.2 [11]	--	--	--	<0.1	--	**<10**	--	<0.1	<0.1
Calcium	ug/l	--	--	--	--	142000	--	104000	--	86000	179000
Chromium	ug/l	-- [13]	--	--	--	6	--	**<20**	--	4	4
Cobalt	ug/l	0.9	--	--	--	**1.0**	--	<5	--	0.4	**1.5**
Copper	ug/l	5	--	--	--	2	--	**20**	--	5	2
Iron	ug/l	300	--	--	--	**770**	--	**2400**	--	260	**1300**
Lead	ug/l	-- [14]	--	--	--	<1	--	**<10**	--	<1	<1
Magnesium	ug/l	--	--	--	--	53000	--	36000	--	22000	45000
Manganese	ug/l	--	--	--	--	420	--	190	--	70	760
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	--	--	11000	--	16000	--	17000	15000
Sodium	ug/l	--	--	--	--	78000	--	68000	--	73000	64000
Zinc	ug/l	30 [11]	--	--	--	<10	--	<50	--	<10	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	--	--	<1	--	<1	--	<1	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S5 19-May-2011 [2] W-14	S5 16-Aug-2011 [20] S-5	S5 30-Nov-2011 [20] S5	S5 30-May-2012 [20] S5	S5 22-Aug-2012 [20] S-5	S5 29-Nov-2012 [20] S5	S5 28-May-2013 S5	S5 15-Aug-2013 [20] S5	S5 21-Nov-2013 [20] S-5
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	669000	--	--	--	--	--	540000	--	--
Ammonia, unionized	ug/l	20	0.41	--	--	--	--	--	0.15	--	--
Ammonia Nitrogen	ug/l	--	170	--	--	--	--	--	330	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	--	--	--	--	--	3000	--	--
Chemical Oxygen Demand	ug/l	--	35000	--	--	--	--	--	48000	--	--
Chloride	ug/l	--	24000	--	--	--	--	--	49000	--	--
Conductivity	uS/cm	--	1260	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1181	--	--	--	--	--	1107	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	166000	--	--	--	--	--	110000	--	--
Dissolved Organic Carbon	ug/l	--	12200	--	--	--	--	--	17000	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	**2050**	--	--	--	--	--	**1740**	--	--
Hardness, Calcium Carbonate	ug/l	--	615000	--	--	--	--	--	600000	--	--
Nitrate as N	ug/l	--	<100	--	--	--	--	--	<100	--	--
Nitrite as N	ug/l	--	<100	--	--	--	--	--	<10	--	--
Nitrogen, Total Kjeldahl	ug/l	--	810	--	--	--	--	--	2100	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	<100	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.12	--	--	--	--	--	**6.37**	--	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**140**	--	--	--	--	--	**530**	--	--
Sulphate	ug/l	--	41000	--	--	--	--	--	75000	--	--
Temperature (Field)	deg c	-- [10]	9.7	--	--	--	--	--	10.9	--	--
Total Dissolved Solids	ug/l	--	819000	--	--	--	--	--	748000	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	23000	--	--	--	--	--	12000	--	--
Metals											
Arsenic	ug/l	100 [11]	<10	--	--	--	--	--	1.7	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**520**	--	--	--	--	--	**790**	--	--
Cadmium	ug/l	0.2 [11]	<0.1	--	--	--	--	--	<0.10	--	--
Calcium	ug/l	--	149000	--	--	--	--	--	170000	--	--
Chromium	ug/l	-- [13]	4	--	--	--	--	--	<5.0	--	--
Cobalt	ug/l	0.9	**1.1**	--	--	--	--	--	**1.7**	--	--
Copper	ug/l	5	1	--	--	--	--	--	3.9	--	--
Iron	ug/l	300	**1280**	--	--	--	--	--	**2300**	--	--
Lead	ug/l	-- [14]	<1	--	--	--	--	--	1.2	--	--
Magnesium	ug/l	--	59000	--	--	--	--	--	56000	--	--
Manganese	ug/l	--	510	--	--	--	--	--	900	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	10000	--	--	--	--	--	15000	--	--
Sodium	ug/l	--	60000	--	--	--	--	--	77000	--	--
Zinc	ug/l	30 [11]	<10	--	--	--	--	--	21	--	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	--	--	--	--	<1.0	--	--

Parameter	Unit	PWQO [1]	S5 28-May-2014 S5	S5 26-Aug-2014 [20] S5	S5 13-Nov-2014 S-5	S5 27-May-2015 [20] S-5	S5 25-Aug-2015 [20] S-5	S5 25-Nov-2015 [20] S5	S5 24-May-2016 [20] S-5	S5 18-Aug-2016 [20] S5	S5 16-Nov-2016 [20] S5
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	470000	--	600000	--	--	--	--	--	--
Ammonia, unionized	ug/l	20	0.45	--	0.02	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	290	--	78	--	--	--	--	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	<2000	--	--	--	--	--	--
Chemical Oxygen Demand	ug/l	--	42000	--	26000	--	--	--	--	--	--
Chloride	ug/l	--	32000	--	35000	--	--	--	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	994	--	1150	--	--	--	--	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	100000	--	140000	--	--	--	--	--	--
Dissolved Organic Carbon	ug/l	--	15000	--	9500	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	**1160**	--	**3540**	--	--	--	--	--	--
Hardness, Calcium Carbonate	ug/l	--	510000	--	640000	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	--	--	--	--	--	--
Nitrite as N	ug/l	--	17	--	13	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1700	--	910	--	--	--	--	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	--	<100	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.81	--	**6.29**	--	--	--	--	--	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**230**	--	**130**	--	--	--	--	--	--
Sulphate	ug/l	--	110000	--	160000	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	13.3	--	5.7	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	718000	--	836000	--	--	--	--	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	5000	--	5000	--	--	--	--	--	--
Metals											
Arsenic	ug/l	100 [11]	1.9	--	<1.0	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**710**	--	**870**	--	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	<0.10	--	<0.10	--	--	--	--	--	--
Calcium	ug/l	--	140000	--	190000	--	--	--	--	--	--
Chromium	ug/l	-- [13]	<5.0	--	<5.0	--	--	--	--	--	--
Cobalt	ug/l	0.9	**1.0**	--	**1.6**	--	--	--	--	--	--
Copper	ug/l	5	1.5	--	1.7	--	--	--	--	--	--
Iron	ug/l	300	**710**	--	**1000**	--	--	--	--	--	--
Lead	ug/l	-- [14]	<0.50	--	<0.50	--	--	--	--	--	--
Magnesium	ug/l	--	43000	--	59000	--	--	--	--	--	--
Manganese	ug/l	--	860	--	640	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	17000	--	17000	--	--	--	--	--	--
Sodium	ug/l	--	69000	--	79000	--	--	--	--	--	--
Zinc	ug/l	30 [11]	<5.0	--	6.1	--	--	--	--	--	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	--	**3.0**	--	--	--	--	--	--

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S5 18-May-2017 S-5	S5 28-Aug-2017 [20] S5	S5 28-Nov-2017 S-5	S5 23-May-2018 S-5	S5 30-Aug-2018 [20] S-5	S5 28-Nov-2018 S-5	S5 20-Jun-2019 [20] S-5	S5 28-Aug-2019 [20] S-5	S5 21-Nov-2019 [20] S-5
General Chemistry											
Alkalinity (Total as CaCO3)	ug/l	-- [5]	557000	--	724000	823000	--	320000	--	--	--
Ammonia, unionized	ug/l	20	0.38	--	0.02	0.25	--	0.03	--	--	--
Ammonia Nitrogen	ug/l	--	60	--	50	80	--	40	--	--	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	--	<2000	<2000	--	4000	--	--	--
Chemical Oxygen Demand	ug/l	--	41000	--	28000	33000	--	42000	--	--	--
Chloride	ug/l	--	24000	--	34000	23000	--	58000	--	--	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1139	--	1036	1373	--	842	--	--	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	73000	--	76000	157000	--	60500	--	--	--
Dissolved Organic Carbon	ug/l	--	28400	--	66100	11400	--	15400	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	**3070**	--	**3620**	**2450**	--	8240	--	--	--
Hardness, Calcium Carbonate	ug/l	--	609000	--	730000	579000	--	423000	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	<100	--	500	--	--	--
Nitrite as N	ug/l	--	<50	--	<50	<50	--	<50	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	900	--	600	800	--	1500	--	--	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.32	--	6.66	7.16	--	7.01	--	--	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**70**	--	**60**	**90**	--	**190**	--	--	--
Sulphate	ug/l	--	111000	--	163000	40000	--	153000	--	--	--
Temperature (Field)	deg c	-- [10]	16.4	--	0.2	12.2	--	0.4	--	--	--
Total Dissolved Solids	ug/l	--	740000	--	888000	818000	--	558000	--	--	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	235000	--	32000	4000	--	11000	--	--	--
Metals											
Arsenic	ug/l	100 [11]	<5 [17]	--	<1	<1	--	1	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**774**	--	**519**	**706**	--	**399**	--	--	--
Cadmium	ug/l	0.2 [11]	<0.5 [17]	--	<0.1	**0.3**	--	<0.1	--	--	--
Calcium	ug/l	--	149000	--	183000	146000	--	118000	--	--	--
Chromium	ug/l	-- [13]	<5 [17]	--	6	<1	--	2	--	--	--
Cobalt	ug/l	0.9	<2.5 [17]	--	**1.2**	0.6	--	0.5	--	--	--
Copper	ug/l	5	4.2	--	2.6	<0.5	--	**8.8**	--	--	--
Iron	ug/l	300	<500 [17]	--	**1070**	**337**	--	284	--	--	--
Lead	ug/l	-- [14]	<0.5 [17]	--	0.8	0.1	--	0.5	--	--	--
Magnesium	ug/l	--	57600	--	66600	51900	--	31400	--	--	--
Manganese	ug/l	--	370	--	377	308	--	16	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	11800	--	12000	8670	--	17800	--	--	--
Sodium	ug/l	--	58300	--	66600	54600	--	59200	--	--	--
Zinc	ug/l	30 [11]	<25 [17]	--	11	7	--	13	--	--	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1	--	<1	--	--	--

Parameter	Unit	PWQO [1]	S5 14-May-2020 S-5	S5 26-Aug-2020 [20] S-5	S5 25-Nov-2020 [20] S-5	S5 27-May-2021 [20] S-5	S5 24-Aug-2021 [20] S5	S5 24-Nov-2021 S-5
General Chemistry								
Alkalinity (Total as CaCO3)	ug/l	-- [5]	518000	--	--	--	--	312000
Ammonia, unionized	ug/l	20	0.87	--	--	--	--	0.08
Ammonia Nitrogen	ug/l	--	90	--	--	--	--	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	6000	--	--	--	--	3000
Chemical Oxygen Demand	ug/l	--	122000	--	--	--	--	34000
Chloride	ug/l	--	34000	--	--	--	--	36000
Conductivity	uS/cm	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1154	--	--	--	--	1063
Cyanide	ug/l	5 [6]	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	98100	--	--	--	--	62800
Dissolved Organic Carbon	ug/l	--	39700	--	--	--	--	11900
Dissolved Oxygen (Field)	ug/l	-- [7]	6600	--	--	--	--	332000
Hardness, Calcium Carbonate	ug/l	--	378000	--	--	--	--	457000
Nitrate as N	ug/l	--	<100	--	--	--	--	<100
Nitrite as N	ug/l	--	<50	--	--	--	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	4200	--	--	--	--	1100
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.75	--	--	--	--	7.58
Phosphate	ug/l	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**540**	--	--	--	--	**110**
Sulphate	ug/l	--	131000	--	--	--	--	216000
Temperature (Field)	deg c	-- [10]	9.1	--	--	--	--	2.6
Total Dissolved Solids	ug/l	--	712000	--	--	--	--	650000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	15000	--	--	--	--	33000
Metals								
Arsenic	ug/l	100 [11]	<1	--	--	--	--	<1
Barium	ug/l	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**298**	--	--	--	--	**258**
Cadmium	ug/l	0.2 [11]	<0.1	--	--	--	--	<0.1
Calcium	ug/l	--	98700	--	--	--	--	128000
Chromium	ug/l	-- [13]	2	--	--	--	--	**41**
Cobalt	ug/l	0.9	0.6	--	--	--	--	0.6
Copper	ug/l	5	2.9	--	--	--	--	**6.7**
Iron	ug/l	300	**667**	--	--	--	--	**602**
Lead	ug/l	-- [14]	0.8	--	--	--	--	0.9
Magnesium	ug/l	--	32000	--	--	--	--	33100
Manganese	ug/l	--	92	--	--	--	--	41
Nickel	ug/l	25	--	--	--	--	--	--
Potassium	ug/l	--	6990	--	--	--	--	13900
Sodium	ug/l	--	39200	--	--	--	--	52200
Zinc	ug/l	30 [11]	17	--	--	--	--	10
Phenols								
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	--	--	--	**6**

Parameter	Unit	PWQO [1]	S8 18-May-1990	S8 27-Jun-1990	S8 04-Oct-1990	S8 06-Nov-1990	S8 27-Nov-1990	S8 25-Apr-1991	S8 08-Jun-1992	S8 15-Nov-1993	S8 15-Jun-1994	S8 02-Nov-1994
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	442000	720000	304000	235000	328000	360000	760000	202000	326000	226000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	<100	<100	680	440	2000	2110	950	100	100	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	6000	1000	1000	2000	6000	1900	1800	1900	2100
Chemical Oxygen Demand	ug/l	--	107000	336000	137000	116000	92000	164000	230000	60100	38000	51000
Chloride	ug/l	--	200000	299000	161000	92000	50000	170000	268000	288000	129000	56000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1888	1980	1302	687	1199	1482	2941	890	1117	973
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	**143**	--	--	--
Dissolved Inorganic Carbon	ug/l	--	103000	255000	74000	43000	84000	95000	168200	56000	–	54000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	12000	9950	500	8900	10080	10000	6900	10700	7780	12800
Hardness, Calcium Carbonate	ug/l	--	565000	731000	374000	224000	344000	510000	797630	285000	285000	240000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	11000	960	1970	2730	2740	8500	240	3980	100	1600
Nitrite as N	ug/l	--	<100	1000	<100	50	<10	20	<100	20	--	10
Nitrogen, Total Kjeldahl	ug/l	--	6700	6900	1950	1210	3820	4800	5180	1030	3920	5320
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	6600	6800	1270	770	1820	2690	4230	930	3820	5220
pH (Field)	-	6.5 - 8.5	8.24	8.19	8.45	8.04	8.1	8.06	7.93	7.04	7.67	7.93
Phosphate	ug/l	--	410	300	190	160	<100	<100	100	180	190	320
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	167000	133000	119000	48000	98000	173000	398000	96000	56000	156000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	--	--	650000	340000	600000	740000	1936000	584000	559000	488000
Total Organic Carbon	ug/l	--	40000	80000	22000	17000	21000	29000	28200	10200	18100	8900
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--	--	--
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	2450
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	<1	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	80	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	--	**5300**	--	58	142
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--	0.1
Calcium	ug/l	--	127000	139000	95000	60000	85000	130000	144700	80000	76000	55000
Chromium	ug/l	-- [13]	**<50**	**<50**	**<50**	**<50**	**<50**	**<50**	**<20**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**<50**	**<50**	**<50**	**<50**	**<50**	**<50**	**<10**	3	3	**13.7**
Iron	ug/l	300	**670**	**13640**	190	**910**	**2410**	**630**	**1500**	**1688**	**776**	**3717**
Lead	ug/l	-- [14]	**<50**	**<50**	**<50**	**<50**	**<50**	**<50**	**70**	**8.2**	0.5	2.5
Magnesium	ug/l	--	60000	93000	33000	18000	32000	46000	105900	21000	23000	24700
Manganese	ug/l	--	300	980	80	170	580	290	920	93	70	216
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	<50	<50	<50	<50	<50	<50	<20	20	20	20
Potassium	ug/l	--	35500	52000	35000	15000	18000	1161000	35300	10100	9100	10000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	**3.4**
Sodium	ug/l	--	202000	335000	188000	76000	132000	161000	329800	103000	121000	97000
Zinc	ug/l	30 [11]	<50	**90**	<50	<50	<50	<50	<20	21	28	10
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	<2	<2	<2	<2	**2**	**8**	<2	**2**	**2**	1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S8 12-Jun-1996	S8 12-Oct-1996	S8 17-Jun-1997	S8 05-Nov-1997	S8 30-Oct-1998	S8 30-Jun-1999	S8 19-Oct-1999	S8 03-May-2000	S8 25-Oct-2000	S8 13-Jun-2001
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	260000	235000	229000	278000	358000	662000	208000	537000	1090000	705000
Ammonia, unionized	ug/l	20	--	--	--	--	10	--	--	10	--	<20
Ammonia Nitrogen	ug/l	--	30	190	50	10	20	340	30	190	120	160
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	5000	1000	1000	7000	1000	5000	--	1000
Chemical Oxygen Demand	ug/l	--	31000	49000	63000	34000	40000	97000	38000	38000	--	38000
Chloride	ug/l	--	114000	147000	174000	210000	165000	109000	171000	158000	326000	200000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	930	960	1415	2750	1390	499	1280	1590	2600	1650
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	52300	46600	46600	43500	87400	101000	83200	74500	--	69100
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	2000	7530	6090	7100	8340	8150	7480	7250	3040	2600
Hardness, Calcium Carbonate	ug/l	--	269000	295000	348000	967000	410000	387000	308000	438000	774000	480000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	--	--	--	--	120	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	100	--
Nitrogen, Total Kjeldahl	ug/l	--	960	750	2060	1210	840	2030	830	1100	1520	1210
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	930	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.46	7.11	7.26	7.04	7.1	8.2	7.5	7.28	7.51	7.4
Phosphate	ug/l	--	120	140	220	110	100	100	70	100	180	140
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	--	--	--	--	--	65000	87000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	470000	480000	710000	1400000	693000	251000	640000	800000	1480000	1110000
Total Organic Carbon	ug/l	--	15300	11800	23400	14700	12600	33500	18800	11000	--	17900
Total Suspended Solids	ug/l	--	3000	4000	42000	26000	29000	19000	10000	56000	128000	53000
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	136	90	**1360**	**2800**	**1010**	**2200**	**400**	**450**	**2500**	**1010**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	70800	81700	85100	234000	99500	71400	79600	102000	152000	99300
Chromium	ug/l	-- [13]	--	--	--	--	--	--	--	--	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	4	3.9	0.5	**19**	3.4	3.3	0.5	**6.2**	**7.7**	2.5
Iron	ug/l	300	**360**	**460**	**1690**	**410**	**2390**	**1110**	**340**	**2860**	**3870**	**2090**
Lead	ug/l	-- [14]	0.2	0.5	0.2	0.8	0.2	0.2	0.2	0.6	0.2	1.3
Magnesium	ug/l	--	22100	21900	32400	91700	38800	50000	26100	43900	95700	56400
Manganese	ug/l	--	610	30	160	100	320	760	100	450	4940	1230
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	**40**	20	20	20	20	20	20
Potassium	ug/l	--	10100	13500	10200	20300	11700	15700	12900	10000	14200	7600
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	100000	97100	163000	306000	184000	284000	177000	187000	367000	259000
Zinc	ug/l	30 [11]	10	10	10	**40**	10	10	10	10	10	10
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	**43**	1	1	**3**	1	**5**	**6**	**19**

Parameter	Unit	PWQO [1]	S8 27-Sep-2001	S8 21-Nov-2001	S8 22-May-2002	S8 12-Nov-2002	S8 31-May-2003	S8 03-Jul-2003	S8 22-Oct-2003	S8 17-May-2004	S8 21-Aug-2004	S8 18-Nov-2004
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	375000	342000	396000	228000	411000	612000	387000	470000	726000	462000
Ammonia, unionized	ug/l	20	<20	<20	--	--	--	--	--	<10	<10	<10
Ammonia Nitrogen	ug/l	--	400	10	30	150	100	10	20	10	20	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	1000	1000	1000	1000	12000	2000	2000
Chemical Oxygen Demand	ug/l	--	33000	23000	23000	42000	53000	67000	46000	86000	54000	31000
Chloride	ug/l	--	259000	179000	110000	169000	122000	145000	131000	157000	166000	207000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	2400	1090	970	--	1250	1410	1310	1360	1430	1260
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	91000	47900	46000	57000	112000	157000	98000	114000	127800	32300
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	4190	7200	10770	--	3610	940	7600	8200	3200	--
Hardness, Calcium Carbonate	ug/l	--	852000	327000	331000	292000	323000	350000	--	388000	432000	375000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	100	100	100	100	200	100	100	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1100	490	440	750	960	1220	830	2800	950	590
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.39	6.84	7.04	--	7.7	7.55	7.99	7.4	7.4	7.1
Phosphate	ug/l	--	90	30	20	60	30	100	100	340	90	90
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	895000	140000	77000	197000	90000	71000	143000	78000	21000	61000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1930000	772000	642000	750000	750000	1020000	790000	680000	715000	630000
Total Organic Carbon	ug/l	--	14000	12000	8000	18000	22000	34000	22000	13000	17200	9700
Total Suspended Solids	ug/l	--	18000	14000	4000	4000	10000	3000	16000	112000	19000	68000
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1	1	2	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**1400**	**320**	**370**	**290**	**340**	**422**	**421**	**298**	**388**	155
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	194000	76800	81900	71200	75900	79800	68600	91800	101000	87600
Chromium	ug/l	-- [13]	**20**	**10**	**10**	**10**	**10**	2	**10**	1	4	7
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**19**	2.5	<1	**5.6**	5	2	**30**	5	**81**	**57**
Iron	ug/l	300	**490**	230	90	150	**320**	132	**1520**	278	**1030**	**3010**
Lead	ug/l	-- [14]	0.2	0.2	**<1000**	0.7	0.5	0.5	1.7	0.4	3.2	0.8
Magnesium	ug/l	--	89300	32900	30600	27700	32400	36700	34800	38500	43600	38100
Manganese	ug/l	--	310	10	20	10	30	147	161	293	62	430
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	10	10	10	**60**	10
Potassium	ug/l	--	14300	8300	9600	10100	10300	8500	13500	13100	11300	10400
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	360000	200000	152000	169000	166000	246000	178000	184000	286000	203000
Zinc	ug/l	30 [11]	10	10	10	10	10	5	13	5	**195**	**31**
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	1	1	1	1	1

Parameter	Unit	PWQO [1]	S8 25-May-2005	S8 09-Sep-2005 [20]	S8 09-Nov-2005	S8 24-May-2006	S8 15-Aug-2006 [20]	S8 16-Nov-2006	S8 08-May-2007	S8 22-Aug-2007 [20]	S8 20-Nov-2007	S8 23-May-2008
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	573000	--	500000	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	<5000	--	<5000	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	470000	--	410000	436000	--	338000	486000	--	310000	260000
Ammonia, unionized	ug/l	20	<10	--	<10	<10	--	<10	0.242165	--	<10	<20
Ammonia Nitrogen	ug/l	--	<10	--	30	50	--	<10	20	--	<10	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	--	<3000	<3000	--	<3000	<3000	--	3000	<3000
Chemical Oxygen Demand	ug/l	--	36000	--	25000	38000	--	32000	80000	--	31000	40000
Chloride	ug/l	--	161000	--	283000	102000	--	39600	95900	--	206000	109000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1700	--	2700	625	--	600	800	--	900	800
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	122000	--	84800	93400	--	84500	122000	--	80600	61500
Dissolved Organic Carbon	ug/l	--	13600	--	12000	19200	--	12700	11100	--	13900	8900
Dissolved Oxygen (Field)	ug/l	-- [7]	6430	--	10100	11300	--	8300	**5760**	--	11090	8410
Hardness, Calcium Carbonate	ug/l	--	354000	--	470000	371000	--	307000	361000	--	329000	232000
Hydrogen Sulfide	ug/l	2 [8]	<10	--	**20**	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	--	400	100	--	500	200	--	100	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	880	--	630	1070	--	910	840	--	600	1140
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.3	--	7.6	7.2	--	6.9	7.8	--	8.3	7.8
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**90**	--	**90**	**210**	--	**140**	**810**	--	**130**	**140**
Sulphate	ug/l	--	28000	--	119000	69000	--	98000	37000	--	119000	46000
Temperature (Field)	deg c	-- [10]	12.9	--	0	5.5	--	7.1	10.5	--	0.4	10.5
Total Dissolved Solids	ug/l	--	771000	--	1060000	712000	--	554000	734000	--	802000	501000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	11000	--	98000	122000	--	47000	236000	--	8000	<3000
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<1	--	<1	<1	--	<1	2	--	1.3	1.7
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**225**	--	181	**284**	--	**319**	**218**	--	121	97
Cadmium	ug/l	0.2 [11]	<0.1	--	<0.5	<0.1	--	<0.5	0.1	--	<0.1	<0.1
Calcium	ug/l	--	86200	--	123000	89500	--	80000	85300	--	82800	63500
Chromium	ug/l	-- [13]	6	--	**17**	**30**	--	**12**	**22**	--	<2	<2
Cobalt	ug/l	0.9	**14**	--	**5**	**4.9**	--	**1**	**6.1**	--	0.9	<0.5
Copper	ug/l	5	5	--	**12**	**25**	--	**47**	**37**	--	**10**	4
Iron	ug/l	300	**2330**	--	**7270**	**14300**	--	**2240**	**14400**	--	**1020**	**390**
Lead	ug/l	-- [14]	0.3	--	3.5	**5.7**	--	2	**5.8**	--	1.8	<0.1
Magnesium	ug/l	--	33800	--	39900	35800	--	26000	35900	--	29800	17800
Manganese	ug/l	--	335	--	458	782	--	170	2320	--	54	21
Mercury, dissolved	ug/l	0.2 [15]	<0.05	--	<0.06	--	--	--	--	--	--	--
Molybdenum	ug/l	40	1.1	--	<5	--	--	--	--	--	--	--
Nickel	ug/l	25	<10	--	<10	--	--	--	--	--	--	--
Potassium	ug/l	--	15100	--	18800	17900	--	13700	14900	--	13100	7000
Selenium	ug/l	100	<1	--	<1	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	178000	--	252000	138000	--	89300	156000	--	164000	100000
Zinc	ug/l	30 [11]	7	--	23	**52**	--	27	**58**	--	19	<5
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1	--	<1	<1	--	<1	<1

Parameter	Unit	PWQO [1]	S8 12-Aug-2008 [20]	S8 06-Nov-2008	S8 13-May-2009	S8 25-Aug-2009 [20]	S8 27-Nov-2009	S8 18-May-2010 [20]	S8 18-Aug-2010 [20]	S8 14-Oct-2010	S8 19-May-2011	S8 16-Aug-2011 [20]
					S-1	S8	S-1	S8	-	S-1	W-3	S-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	320000	290000	--	333000	--	--	455000	422000	--
Ammonia, unionized	ug/l	20	--	<20	<0.12	--	0.2	--	--	0.03	<0.24	--
Ammonia Nitrogen	ug/l	--	--	<10	<20	--	20	--	--	30	<20	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	<3000	2000	--	<1000	--	--	1000	<1000	--
Chemical Oxygen Demand	ug/l	--	--	27000	33000	--	28000	--	--	30000	35000	--
Chloride	ug/l	--	--	172000	101000	--	54000	--	--	121000	62000	--
Conductivity	uS/cm	--	--	--	943	--	1040	--	--	1380	1020	--
Conductivity (Field)	uS/cm	--	--	925	750	--	912	--	--	1342	982	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	73700	70100	--	102000	--	--	109000	95800	--
Dissolved Organic Carbon	ug/l	--	--	6300	12700	--	11800	--	--	13100	15000	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	8660	8130	--	10100	--	--	12590	**3000**	--
Hardness, Calcium Carbonate	ug/l	--	--	321000	266000	--	235000	--	--	367000	323000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	200	<100	--	<100	--	--	<100	<100	--
Nitrite as N	ug/l	--	--	--	<100	--	<100	--	--	<100	<100	--
Nitrogen, Total Kjeldahl	ug/l	--	--	550	570	--	530	--	--	530	1100	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	8.1	7.5	--	7.9	--	--	6.73	7.72	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**70**	30	--	**50**	--	--	**90**	**60**	--
Sulphate	ug/l	--	--	84000	48000	--	64000	--	--	114000	47000	--
Temperature (Field)	deg c	-- [10]	--	5.4	10	--	5.1	--	--	8.1	12.8	--
Total Dissolved Solids	ug/l	--	--	713000	613000	--	676000	--	--	897000	663000	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	10000	4000	--	11000	--	--	8000	25000	--
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	--	1.2	<1	--	<1	--	--	<1	<1	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	120	110	--	150	--	--	**220**	**210**	--
Cadmium	ug/l	0.2 [11]	--	<0.1	<0.1	--	<0.1	--	--	<0.1	<0.1	--
Calcium	ug/l	--	--	87400	72000	--	61000	--	--	96000	80000	--
Chromium	ug/l	-- [13]	--	4	4	--	6	--	--	7	4	--
Cobalt	ug/l	0.9	--	**2.2**	0.3	--	0.5	--	--	0.4	0.5	--
Copper	ug/l	5	--	5	3	--	4	--	--	4	4	--
Iron	ug/l	300	--	**1350**	220	--	**530**	--	--	**330**	**440**	--
Lead	ug/l	-- [14]	--	0.7	<1	--	<1	--	--	<1	<1	--
Magnesium	ug/l	--	--	25000	21000	--	20000	--	--	31000	30000	--
Manganese	ug/l	--	--	39	10	--	80	--	--	40	30	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	9500	8000	--	8000	--	--	10000	10000	--
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	140000	107000	--	109000	--	--	139000	107000	--
Zinc	ug/l	30 [11]	--	<5	<10	--	<10	--	--	<10	<10	--
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	<1	--	<1	--	--	<1	<1	--

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S8 30-Nov-2011 [22] S8	S8 30-May-2012 S 8	S8 22-Aug-2012 [20] S-8	S8 29-Nov-2012 [38] S8	S8 28-May-2013 S8	S8 15-Aug-2013 [20] S8	S8 21-Nov-2013 SA-7	S8 28-May-2014 S8	S8 26-Aug-2014 [20] S8	S8 13-Nov-2014 S-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	134000	460000	--	--	360000	--	280000	410000	--	400000
Ammonia, unionized	ug/l	20	<0.1	<0.19	--	--	0.04	--	<0.01	<0.01	--	<0.01
Ammonia Nitrogen	ug/l	--	<20	<50	--	--	110	--	<50	<50	--	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	3000	--	--	<2000	--	2000	<2000	--	<2000
Chemical Oxygen Demand	ug/l	--	25000	61000	--	--	52000	--	66000	42000	--	31000
Chloride	ug/l	--	58000	83000	--	--	120000	--	140000	130000	--	130000
Conductivity	uS/cm	--	737	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	722	1080	--	--	1015	--	1254	1143	--	1222
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	27600	110000	--	--	81000	--	70000	95000	--	93000
Dissolved Organic Carbon	ug/l	--	7800	17000	--	--	13000	--	10000	13000	--	10000
Dissolved Oxygen (Field)	ug/l	-- [7]	8990	**2220**	--	--	**5500**	--	11100	**2570**	--	10220
Hardness, Calcium Carbonate	ug/l	--	210000	320000	--	--	290000	--	340000	320000	--	330000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	890	<100	--	--	<100	--	<100	<100	--	<100
Nitrite as N	ug/l	--	<100	<10	--	--	<10	--	<10	<10	--	<10
Nitrogen, Total Kjeldahl	ug/l	--	480	1800	--	--	1600	--	2200	1700	--	720
Nitrogen, Nitrate-Nitrite	ug/l	--	--	<100	--	--	<100	--	<100	<100	--	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.59	7.10	--	--	**6.26**	--	**6.48**	**6.06**	--	**6.36**
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**80**	**300**	--	--	**210**	--	**290**	**210**	--	**93**
Sulphate	ug/l	--	124000	54000	--	--	38000	--	180000	49000	--	68000
Temperature (Field)	deg c	-- [10]	5.5	16.2	--	--	9.3	--	0.2	13.2	--	2.7
Total Dissolved Solids	ug/l	--	479000	664000	--	--	632000	--	818000	720000	--	698000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	24000	78000	--	--	500000	--	130000	9000	--	4000
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<50	1.2	--	--	1.3	--	<1.0	<1.0	--	<1.0
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	100	**280**	--	--	140	--	150	**210**	--	140
Cadmium	ug/l	0.2 [11]	**<10**	<0.10	--	--	<0.10	--	<0.10	<0.10	--	<0.10
Calcium	ug/l	--	56000	87000	--	--	81000	--	94000	86000	--	87000
Chromium	ug/l	-- [13]	**<50**	8.1	--	--	**11**	--	<5.0	<5.0	--	<5.0
Cobalt	ug/l	0.9	<10	**2.3**	--	--	**3.6**	--	<0.50	<0.50	--	<0.50
Copper	ug/l	5	**<10**	**9.5**	--	--	**25**	--	**5.1**	3.7	--	3.6
Iron	ug/l	300	**2000**	**3300**	--	--	**5800**	--	**670**	**410**	--	**590**
Lead	ug/l	-- [14]	**<10**	1.3	--	--	3.1	--	<0.50	<0.50	--	<0.50
Magnesium	ug/l	--	17000	31000	--	--	29000	--	34000	30000	--	34000
Manganese	ug/l	--	30	1800	--	--	1700	--	110	120	--	46
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	10000	11000	--	--	10000	--	9600	10000	--	9600
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	69000	150000	--	--	140000	--	150000	160000	--	150000
Zinc	ug/l	30 [11]	<50	16	--	--	**33**	--	5.2	<5.0	--	6.3
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1.0	--	--	<1.0	--	<1.0	<1.0	--	**1.8**

Parameter	Unit	PWQO [1]	S8 27-May-2015 S-8	S8 25-Aug-2015 [20] S-8	S8 25-Nov-2015 [20] S8	S8 24-May-2016 S-8	S8 18-Aug-2016 [20] S8	S8 16-Nov-2016 S-8	S8 18-May-2017 S-8	S8 28-Aug-2017 [20] S8	S8 28-Nov-2017 [39] S-8	S8 23-May-2018 S-8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	455000	--	--	457000	--	304000	408000	--	--	482000
Ammonia, unionized	ug/l	20	2.77	--	--	0.52	--	0.54	0.33	--	--	0.29
Ammonia Nitrogen	ug/l	--	100	--	--	160	--	80	80	--	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	--	64000	--	7000	15000	--	--	<2000
Chemical Oxygen Demand	ug/l	--	28000	--	--	321000	--	39000	105000	--	--	67000
Chloride	ug/l	--	129000	--	--	120000	--	133000	94000	--	--	85000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1244	--	--	1180	--	1283	1076	--	--	1048
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	110000	--	--	88200	--	55000	53600	--	--	98000
Dissolved Organic Carbon	ug/l	--	16700	--	--	23400	--	15600	29000	--	--	12700
Dissolved Oxygen (Field)	ug/l	-- [7]	**2950**	--	--	**2170**	--	8240	**2090**	--	--	**2650**
Hardness, Calcium Carbonate	ug/l	--	263000	--	--	369000	--	278000	319000	--	--	286000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	--	<100	--	<100	<100	--	--	<100
Nitrite as N	ug/l	--	<50	--	--	<50	--	<50	<50	--	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	900	--	--	8100	--	800	1600	--	--	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.98	--	--	7.16	--	7.75	7.10	--	--	7.53
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**90**	--	--	**1190**	--	**270**	**180**	--	--	**100**
Sulphate	ug/l	--	47000	--	--	62000	--	149000	63000	--	--	25000
Temperature (Field)	deg c	-- [10]	16.2	--	--	12.5	--	4.6	17.6	--	--	11.8
Total Dissolved Solids	ug/l	--	698000	--	--	754000	--	716000	626000	--	--	598000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	9000	--	--	674000	--	112000	159000	--	--	27000
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	<1	--	--	2	--	<1	<5 [17]	--	--	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**235**	--	--	**316**	--	**208**	**357**	--	--	**261**
Cadmium	ug/l	0.2 [11]	<0.1	--	--	0.2	--	<0.1	<0.5 [17]	--	--	<0.1
Calcium	ug/l	--	61800	--	--	87200	--	68700	76400	--	--	71200
Chromium	ug/l	-- [13]	<1	--	--	**26**	--	2	<5 [17]	--	--	<1
Cobalt	ug/l	0.9	<0.5	--	--	**6.2**	--	<0.5	<2.5 [17]	--	--	<0.5
Copper	ug/l	5	<0.5	--	--	**24.9**	--	**5.6**	**6.4**	--	--	1.4
Iron	ug/l	300	<100	--	--	**10900**	--	**308**	**686**	--	--	109
Lead	ug/l	-- [14]	<0.1	--	--	**5.2**	--	0.2	<0.5 [17]	--	--	0.1
Magnesium	ug/l	--	26400	--	--	36700	--	25900	31300	--	--	26300
Manganese	ug/l	--	40	--	--	3160	--	66	168	--	--	387
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	9220	--	--	11900	--	11000	10900	--	--	7670
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	149000	--	--	168000	--	149000	102000	--	--	115000
Zinc	ug/l	30 [11]	<5	--	--	**84**	--	10	<25 [17]	--	--	5
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	--	**13**	--	**12**	<1	--	--	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S8 30-Aug-2018 [20] S-8	S8 28-Nov-2018 S-8	S8 20-Jun-2019 S-8	S8 28-Aug-2019 [20] S-8	S8 21-Nov-2019 S-8	S8 14-May-2020 S-8	S8 26-Aug-2020 [20] S-8	S8 25-Nov-2020 S-8	S8 27-May-2021 S-8	S8 24-Aug-2021 [20] S8
General Chemistry												
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	377000	395000	--	229000	345000	--	295000	441000	--
Ammonia, unionized	ug/l	20	--	0.04	0.03	--	0.17	0.37	--	0.08	2.9	--
Ammonia Nitrogen	ug/l	--	--	50	60	--	50	70	--	30	300	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	2000	5000	--	<30000 [26]	5000	--	<2000	12000	--
Chemical Oxygen Demand	ug/l	--	--	31000	78000	--	122000	154000	--	34000	112000	--
Chloride	ug/l	--	--	91000	105000	--	176000	124000	--	154000	100000	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	955	1003	--	1271	1077	--	77	1383	--
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	72700	78600	--	<500	74200	--	62500	92100	--
Dissolved Organic Carbon	ug/l	--	--	12100	11200	--	10500	26300	--	10000	19000	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	14740	**1510**	--	7540	**5690**	--	8380	**1600**	--
Hardness, Calcium Carbonate	ug/l	--	--	327000	347000	--	351000	294000	--	305000	528000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	400	<100	--	<100	<100	--	<100	<100	--
Nitrite as N	ug/l	--	--	<50	<50	--	<50	<50	--	<50	<50	--
Nitrogen, Total Kjeldahl	ug/l	--	--	700	1600	--	1400	1600	--	500	2500	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	6.91	**6.14**	--	7.33	7.6	--	7.53	7.60	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**140**	**230**	--	**240**	**160**	--	**40**	**460**	--
Sulphate	ug/l	--	--	99000	24000	--	139000	76000	--	92000	222000	--
Temperature (Field)	deg c	-- [10]	--	2.9	17.4	--	8.3	5.8	--	0	13.6	--
Total Dissolved Solids	ug/l	--	--	596000	560000	--	650000	552000	--	646000	994000	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	4000	9000	--	245000	23000	--	15000	64000	--
Metals												
Aluminum, dissolved	ug/l	-- [40]	--	--	--	--	--	--	--	--	--	--
Arsenic	ug/l	100 [11]	--	<1	<1	--	<1	<1	--	<1	1	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	136	143	--	93	114	--	74	92	--
Cadmium	ug/l	0.2 [11]	--	<0.1	<0.1	--	<0.1	<0.1	--	<0.1	<0.1	--
Calcium	ug/l	--	--	73700	88100	--	83800	72200	--	75900	138000	--
Chromium	ug/l	-- [13]	--	1	<1	--	**10**	1	--	<1	3	--
Cobalt	ug/l	0.9	--	<0.5	0.8	--	**4.0**	**1.1**	--	<0.5	**3.1**	--
Copper	ug/l	5	--	**5.3**	2.4	--	**10.5**	4.1	--	2.1	3.2	--
Iron	ug/l	300	--	248	108	--	**3790**	**530**	--	<100	**1050**	--
Lead	ug/l	-- [14]	--	0.1	<0.1	--	1.9	0.5	--	<0.1	0.5	--
Magnesium	ug/l	--	--	34800	30700	--	34400	27700	--	28100	44600	--
Manganese	ug/l	--	--	13	3890	--	3180	1390	--	88	12800	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	11200	9440	--	9730	7270	--	7110	12800	--
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--	--
Silver	ug/l	0.1	--	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	122000	122000	--	120000	108000	--	116000	125000	--
Zinc	ug/l	30 [11]	--	10	<5	--	25	14	--	<5	9	--
Phenols												
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	<1	--	<1	<1	--	<1	**10**	--

Parameter	Unit	PWQO [1]	S8 24-Nov-2021 S-8
General Chemistry			
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	525000
Ammonia, unionized	ug/l	20	0.08
Ammonia Nitrogen	ug/l	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000
Chemical Oxygen Demand	ug/l	--	80000
Chloride	ug/l	--	128000
Conductivity	uS/cm	--	--
Conductivity (Field)	uS/cm	--	1548
Cyanide	ug/l	5 [6]	--
Dissolved Inorganic Carbon	ug/l	--	98300
Dissolved Organic Carbon	ug/l	--	25200
Dissolved Oxygen (Field)	ug/l	-- [7]	8400
Hardness, Calcium Carbonate	ug/l	--	470000
Hydrogen Sulfide	ug/l	2 [8]	--
Nitrate as N	ug/l	--	<100
Nitrite as N	ug/l	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	1800
Nitrogen, Nitrate-Nitrite	ug/l	--	--
Nitrogen, Organic	ug/l	--	--
pH (Field)	-	6.5 - 8.5	7.39
Phosphate	ug/l	--	--
Phosphorus	ug/l	-- [9]	**190**
Sulphate	ug/l	--	127000
Temperature (Field)	deg c	-- [10]	0.4
Total Dissolved Solids	ug/l	--	880000
Total Organic Carbon	ug/l	--	--
Total Suspended Solids	ug/l	--	131000
Metals			
Aluminum, dissolved	ug/l	-- [40]	--
Arsenic	ug/l	100 [11]	<1
Barium	ug/l	--	--
Boron	ug/l	200 [12]	132
Cadmium	ug/l	0.2 [11]	<0.1
Calcium	ug/l	--	122000
Chromium	ug/l	-- [13]	4
Cobalt	ug/l	0.9	**1.2**
Copper	ug/l	5	**5.4**
Iron	ug/l	300	**1360**
Lead	ug/l	-- [14]	0.9
Magnesium	ug/l	--	40300
Manganese	ug/l	--	713
Mercury, dissolved	ug/l	0.2 [15]	--
Molybdenum	ug/l	40	--
Nickel	ug/l	25	--
Potassium	ug/l	--	9560
Selenium	ug/l	100	--
Silver	ug/l	0.1	--
Sodium	ug/l	--	140000
Zinc	ug/l	30 [11]	12
Phenols			
Phenolics, Total Recoverable	ug/l	1 [16]	**3**

Parameter	Unit	PWQO [1]	S9 27-Mar-1990	S9 16-Apr-1990	S9 27-Jun-1990	S9 31-Jul-1990	S9 27-Aug-1990	S9 04-Oct-1990	S9 06-Nov-1990	S9 17-Nov-1990
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	608000	294000	532000	561000	594000	215000	154000	1134000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	4090	2200	100	4550	3130	800	320	1380
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	3000	4000	3000	4000	2000	2000	9000
Chemical Oxygen Demand	ug/l	--	112000	62000	287000	95000	160000	67000	137000	76000
Chloride	ug/l	--	123000	83000	163000	204000	216000	81000	43000	186000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1528	951	858	1877	1699	814	457	48.2
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	137000	421000	199000	185000	132000	53000	56000	194000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	3000	7400	5050	6150	6160	8840	10300	--
Hardness, Calcium Carbonate	ug/l	--	774000	424000	626000	625000	505000	293000	168000	7940
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	4160	11000	2000	1650	5160	3000	3620	16340
Nitrite as N	ug/l	--	330	100	2900	100	100	100	50	100
Nitrogen, Total Kjeldahl	ug/l	--	5030	5700	270	4720	4970	2340	2420	7080
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	940	3500	170	170	1840	1540	2100	5700
pH (Field)	-	6.5 - 8.5	7.9	7.47	7.92	7.93	8.05	8.2	7.82	7.48
Phosphate	ug/l	--	390	280	180	120	400	160	200	260
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	160000	86000	70000	97000	63000	72000	42000	115000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	--	--	--	--	850000	400000	250000	--
Total Organic Carbon	ug/l	--	28000	20000	39000	35000	31000	18000	17000	51100
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--
Metals										
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	--	--	--	--	--	--	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--
Calcium	ug/l	--	247000	135000	181000	176000	128000	86000	44000	234000
Chromium	ug/l	-- [13]	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--
Copper	ug/l	5	**50**	**50**	**50**	**50**	**50**	**50**	**50**	**140**
Iron	ug/l	300	**1720**	**1300**	**1280**	**1340**	**3860**	**720**	**4380**	**3900**
Lead	ug/l	-- [14]	**170**	**50**	**50**	**70**	**50**	**50**	**50**	**9**
Magnesium	ug/l	--	38000	21000	42000	45000	45000	19000	14000	50800
Manganese	ug/l	--	920	400	660	740	530	50	170	1450
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--
Nickel	ug/l	25	**50**	**50**	**50**	**50**	**50**	**50**	**50**	7
Potassium	ug/l	--	23000	13000	23000	24000	24000	23000	12000	35500
Selenium	ug/l	100	--	--	--	--	--	--	--	--
Sodium	ug/l	--	101000	60000	136000	168000	155000	97000	32000	179000
Zinc	ug/l	30 [11]	**130**	**50**	**50**	**50**	**50**	**50**	**50**	**110**
Phenols										
Phenolics, Total Recoverable	ug/l	1 [16]	**20**	**2**	**2**	**14**	**2**	**2**	**2**	**9**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S9 27-Nov-1990	S9 24-Apr-1991	S9 29-Nov-1991	S9 08-Jun-1992	S9 08-Jun-1993	S9 04-Nov-1993	S9 15-Jun-1994	S9 02-Nov-1994	S9 28-Jun-1995
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	234000	420000	266000	1124000	151000	485000	861000	84000	1380000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	1300	3440	300	13940	100	3200	--	290	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	5000	6000	4800	2000	3700	10200	4100	2000
Chemical Oxygen Demand	ug/l	--	56000	94000	30000	180000	26000	108000	131000	64000	172000
Chloride	ug/l	--	69000	196000	224000	243000	220000	221000	107000	43000	94500
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1090	1304	1145	2850	929	1378	2440	478	792
Cyanide	ug/l	5 [6]	--	--	--	123	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	62000	118000	--	259700	41000	126000	--	20000	321000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	9300	7000	6600	10000	9500	11280	12150	10660
Hardness, Calcium Carbonate	ug/l	--	278000	450000	349000	853220	198000	474000	628000	141000	1070000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	2200	26100	--	240	660	7690	340	4000	100
Nitrite as N	ug/l	--	10	1700	--	100	100	100	--	100	100
Nitrogen, Total Kjeldahl	ug/l	--	1960	6500	1400	19710	750	5690	12900	4480	17000
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	2090	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	660	3060	1100	5770	650	2490	12900	4190	16990
pH (Field)	-	6.5 - 8.5	8.1	7.86	7.8	7.72	8.57	7.74	8.09	7.96	7.56
Phosphate	ug/l	--	100	100	200	100	120	180	120	500	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	47000	213000	128000	130000	55900	86000	100000	56000	64000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	550000	650000	--	1853000	560000	816000	1230000	240000	474000
Total Organic Carbon	ug/l	--	16000	25000	--	48100	11800	26200	43800	15000	70000
Total Suspended Solids	ug/l	--	--	--	--	--	--	--	--	--	--
Metals											
Arsenic	ug/l	100 [11]	--	--	--	1	--	--	--	--	100
Barium	ug/l	--	--	--	--	210	--	--	--	--	43
Boron	ug/l	200 [12]	--	--	--	7450	--	--	4509	213	11
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	0.1	0.1
Calcium	ug/l	--	80000	147000	100400	210400	51000	124000	145000	37000	70000
Chromium	ug/l	-- [13]	50	50	10	20	59	10	10	10	14
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	50	50	30	10	5	6	16.6	4.8	4.2
Iron	ug/l	300	3930	1200	310	3900	2111	2734	1815	1211	659
Lead	ug/l	-- [14]	50	50	2	70	19	10.8	1.6	1.2	0.8
Magnesium	ug/l	--	19000	20000	23800	79500	17000	39800	64500	11500	20400
Manganese	ug/l	--	320	410	170	1790	76	429	242	74	36
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	50	50	50	20	20	20	20	20	20
Potassium	ug/l	--	12000	108000	9400	42800	10000	18900	39800	9500	10800
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	129000	108000	114000	263800	106000	128000	240000	29000	46000
Zinc	ug/l	30 [11]	50	50	10	40	18	49	44	14	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	2	33	2	17	2	3	2	10	1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S9 14-Nov-1995	S9 12-Jun-1996	S9 12-Oct-1996	S9 17-Jun-1997	S9 05-Nov-1997	S9 05-Jun-1998	S9 28-Aug-1998	S9 30-Oct-1998	S9 30-Jun-1999
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	229000	464000	395000	187000	254000	688000	114000	254000	370000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	10	--
Ammonia Nitrogen	ug/l	--	1010	40	940	10	10	70	60	10	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	2000	11000	3000	1000	3000	3000	1000	1000
Chemical Oxygen Demand	ug/l	--	50000	26000	63000	28000	19000	142000	36000	39000	71000
Chloride	ug/l	--	157000	99000	140000	115000	172000	362000	37300	114000	219000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	910	780	1270	7.76	1310	2350	390	890	1410
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	6400	44000	87800	35100	51000	137000	23900	46900	47700
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	--	10390	9410	8920	12360	12460	8520	13440	11360
Hardness, Calcium Carbonate	ug/l	--	277000	230000	441000	236000	302000	618000	132000	325000	354000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1500	--	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	5500	710	3980	1170	770	3950	1180	860	1150
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	4490	670	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.92	7.25	7.63	7.71	8.03	--	7.88	7.8	8.1
Phosphate	ug/l	--	200	120	170	260	50	120	380	60	70
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	77600	--	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	460000	390000	640000	389000	650000	1166000	200000	450000	710000
Total Organic Carbon	ug/l	--	66200	12400	24200	14300	11400	39200	10000	14700	22300
Total Suspended Solids	ug/l	--	116000	36000	20000	126000	24000	15000	180000	5000	6000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**770**	200	**2360**	**320**	**400**	**5210**	**390**	**760**	**2370**
Cadmium	ug/l	0.2 [11]	0.1	--	--	--	--	--	--	--	--
Calcium	ug/l	--	73200	63600	108000	53800	80400	114000	36700	70000	77300
Chromium	ug/l	-- [13]	**10**	--	--	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	5	**6.1**	2.8	0.5	**12.4**	**5.9**	4.2	3.1	2.4
Iron	ug/l	300	**2650**	**1080**	**1030**	**3970**	**450**	**380**	**2450**	**790**	220
Lead	ug/l	-- [14]	0.8	0.2	0.3	0.2	0.2	0.2	0.5	0.2	0.2
Magnesium	ug/l	--	22500	17100	41200	18400	24300	80800	9670	36100	38700
Manganese	ug/l	--	210	54	140	150	40	40	50	20	40
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	**30**	20	**30**	20	20	20	10
Potassium	ug/l	--	15700	11000	16000	5400	8900	19600	4900	6500	14500
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	82200	78000	130000	83700	124000	305000	37800	97400	198000
Zinc	ug/l	30 [11]	20	10	10	20	10	**80**	**80**	10	**60**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	1	--	**4**	**3**	1	1	1	1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S9 19-Oct-1999	S9 03-May-2000	S9 25-Oct-2000	S9 13-Jun-2001	S9 27-Sep-2001	S9 21-Nov-2001	S9 22-May-2002	S9 08-Nov-2002	S9 31-May-2003
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	256000	293000	370000	245000	126000	179000	183000	243000	162000
Ammonia, unionized	ug/l	20	--	10	--	<20	<20	<20	--	--	--
Ammonia Nitrogen	ug/l	--	10	20	10	10	40	10	40	10	200
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	3000	--	1000	1000	1000	1000	1000	1000
Chemical Oxygen Demand	ug/l	--	32000	32000	--	32000	11000	29000	34000	26000	43000
Chloride	ug/l	--	198000	162000	248000	239000	82500	104000	110000	305000	77000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1310	1100	1550	1300	1160	610	620	1450	660
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	68900	31300	--	31900	30200	25100	24000	64000	37000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	11620	19920	10300	13200	9930	13350	10230	9200	8220
Hardness, Calcium Carbonate	ug/l	--	350000	286000	417000	334000	439000	248000	261000	402000	195000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	10	100	1600	700	200	300	300
Nitrite as N	ug/l	--	--	--	500	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	580	780	740	760	640	670	640	640	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8.2	7.98	7.81	8.4	8.1	7.53	7.39	--	7.7
Phosphate	ug/l	--	40	30	70	30	90	40	20	90	40
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	116000	173000	435000	85000	51000	116000	64000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	650000	650000	858000	798000	910000	492000	416000	725000	389000
Total Organic Carbon	ug/l	--	10300	10000	--	13100	7800	14000	9000	10000	17000
Total Suspended Solids	ug/l	--	16000	22000	49000	5000	29000	17000	4000	56000	3000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	1	1	1	1	1	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**570**	**380**	**1430**	**760**	**940**	80	90	80	70
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	92500	73300	95700	77700	112000	71800	76500	119000	53200
Chromium	ug/l	-- [13]	--	--	**10**	**10**	**10**	**10**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	0.5	**8.2**	**11**	3	**7**	2.9	<1	**5.7**	3
Iron	ug/l	300	**640**	**310**	**2340**	120	20	**530**	200	**1910**	290
Lead	ug/l	-- [14]	0.2	0.2	0.2	0.8	0.2	0.2	<1	3.1	0.5
Magnesium	ug/l	--	28500	24600	43300	34100	38700	16600	17100	25500	13800
Manganese	ug/l	--	30	130	120	20	970	10	30	60	10
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20	20	20
Potassium	ug/l	--	13300	7800	8900	6200	10000	5200	3300	9000	5400
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	162000	124000	159000	180000	123000	65900	75300	173000	61700
Zinc	ug/l	30 [11]	20	10	10	10	10	10	10	20	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	**4**	**2**	**15**	1	1	1	1	1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S9 03-Jul-2003	S9 22-Oct-2003	S9 17-May-2004	S9 21-Aug-2004	S9 18-Nov-2004	S9 25-May-2005	S9 09-Sep-2005	S9 09-Nov-2005	S9 24-May-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	276000	343000	339000	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	<5000	<5000	<5000	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	237000	142000	241000	291000	240000	226000	281000	278000	168000
Ammonia, unionized	ug/l	20	--	--	<10	<10	<10	<10	<10	<10	<10
Ammonia Nitrogen	ug/l	--	10	30	10	10	10	<10	<10	20	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	1000	1000	1000	<3000	<3000	<3000	<3000
Chemical Oxygen Demand	ug/l	--	22000	31000	42000	30000	21000	35000	33000	35000	41000
Chloride	ug/l	--	124000	84600	176000	198000	152000	128000	191000	140000	101000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1600	820	1030	1070	820	1200	860	500	480
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	56000	34000	55500	30500	22300	54200	67400	56500	35800
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	11700	79400	9500	16200
Dissolved Oxygen (Field)	ug/l	-- [7]	6880	9100	8800	10800	7200	11800	8400	9100	11340
Hardness, Calcium Carbonate	ug/l	--	809000	--	299000	330000	261000	264000	354000	448000	216000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	<10	<10	**30**	--
Nitrate as N	ug/l	--	100	800	100	100	300	600	<100	200	500
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	650	1720	640	540	350	690	570	1210	830
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.6	8.1	7.7	8.3	7.5	7.7	8.1	7.3	8.3
Phosphate	ug/l	--	40	110	30	40	30	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	**40**	20	**360**	**60**
Sulphate	ug/l	--	840000	173000	49000	50000	95000	53000	53000	147000	58000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	21.9	20	1	12
Total Dissolved Solids	ug/l	--	1630000	503000	515000	535000	410000	509000	656000	717000	406000
Total Organic Carbon	ug/l	--	14000	15000	10500	9700	6800	--	--	--	--
Total Suspended Solids	ug/l	--	8000	21000	7000	6000	4000	6000	<3000	208000	10000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	<1	2	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**292**	67	84	166	127	94	113	200	51
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	<0.3	<0.1	<0.5	<0.1
Calcium	ug/l	--	229000	77200	86100	97800	73100	74600	104000	109000	63100
Chromium	ug/l	-- [13]	2	8	2	2	2	<2	<2	**90**	2
Cobalt	ug/l	0.9	--	--	--	--	--	**30**	0.5	**10**	0.4
Copper	ug/l	5	2	**35**	3	3	3	2	3	**38**	3
Iron	ug/l	300	**378**	**1190**	291	**543**	**630**	**337**	128	**35700**	**869**
Lead	ug/l	-- [14]	0.5	1.9	0.3	0.3	0.6	<0.6	<0.5	**5.5**	0.5
Magnesium	ug/l	--	57500	18700	20400	20900	19000	18800	22900	42700	14100
Manganese	ug/l	--	22	28	63	22	48	17	4	710	69
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	<0.05	<0.06	<0.06	--
Molybdenum	ug/l	40	--	--	--	--	--	20	2	<5	--
Nickel	ug/l	25	10	10	10	10	10	<10	<10	**50**	--
Potassium	ug/l	--	17600	9300	5600	6700	6500	6400	8900	20600	5500
Selenium	ug/l	100	--	--	--	--	--	<1	1	<1	--
Sodium	ug/l	--	182000	59100	115000	154000	117000	95800	117000	110000	66500
Zinc	ug/l	30 [11]	5	9	5	5	5	**33**	15	**121**	11
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	<1	<1	<1	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S9 15-Aug-2006	S9 16-Nov-2006	S9 08-May-2007	S9 22-Aug-2007	S9 20-Nov-2007	S9 23-May-2008	S9 12-Aug-2008	S9 06-Nov-2008	S9 13-May-2009
											S-5
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	274000	130000	226000	366000	250000	180000	200000	226000	197000
Ammonia, unionized	ug/l	20	<10	<10	0.933832	<10	<10	<20	<20	<20	<0.05
Ammonia Nitrogen	ug/l	--	<10	90	<10	730	80	<10	<10	<10	<20
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	<3000	<3000	5000	9000	<3000	<3000	<3000	1000
Chemical Oxygen Demand	ug/l	--	34000	23000	29000	51000	25000	44000	26000	15000	38000
Chloride	ug/l	--	233000	25000	140000	200000	173000	100000	156000	139000	99000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	847
Conductivity (Field)	uS/cm	--	1270	310	800	1250	800	650	900	800	700
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	65800	32500	54200	87600	168000	40100	50800	54800	46700
Dissolved Organic Carbon	ug/l	--	16500	12200	9000	19400	10300	11700	8800	6100	15300
Dissolved Oxygen (Field)	ug/l	-- [7]	**1800**	9270	12680	**990**	9650	13980	5310	**6210**	17710
Hardness, Calcium Carbonate	ug/l	--	332000	101000	273000	310000	304000	209000	226000	279000	242000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	1100	<100	100	500	<100	200	1400	<100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	<100
Nitrogen, Total Kjeldahl	ug/l	--	610	1260	600	2240	850	890	470	710	810
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.2	7.2	8.4	7.3	8	8.5	8.1	7.9	6.8
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**60**	**600**	30	**280**	**110**	**80**	**90**	**80**	**60**
Sulphate	ug/l	--	56000	52000	85000	40000	76000	59000	54000	82000	76000
Temperature (Field)	deg c	-- [10]	20.5	7.6	20.4	14.1	0.3	14.1	19.9	8.2	20
Total Dissolved Solids	ug/l	--	734000	246000	571000	743000	636000	420000	527000	571000	551000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	14000	332000	10000	75000	19000	7000	16000	42000	8000
Metals											
Arsenic	ug/l	100 [11]	2.1	<1	0.9	3.2	1	2	1	0.5	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	80	63	88	181	85	82	61	54	70
Cadmium	ug/l	0.2 [11]	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	99400	24900	73100	78400	88500	59700	64900	82200	69000
Chromium	ug/l	-- [13]	<2	**30**	<2	7	3	<2	4	5	4
Cobalt	ug/l	0.9	**1**	**6.6**	<0.5	**1.9**	0.7	<0.5	0.8	**1.2**	0.5
Copper	ug/l	5	**45**	**56**	**17**	3	2	3	3	5	4
Iron	ug/l	300	**718**	**2710**	**350**	**2880**	**1060**	**1060**	**1930**	**2230**	**550**
Lead	ug/l	-- [14]	0.8	**6**	0.2	1	<0.1	<0.1	0.8	0.7	<1
Magnesium	ug/l	--	20300	9330	21900	27600	20200	14500	15600	17800	17000
Manganese	ug/l	--	113	243	74	213	152	123	57	46	50
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	7500	8200	7200	17700	9500	5900	5400	7600	7000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	160000	41100	108000	156000	115000	72800	109000	97600	84000
Zinc	ug/l	30 [11]	26	**65**	**49**	22	16	7	7	10	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	**3**	<1	<1	<1	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S9 25-Aug-2009 A-3	S9 27-Nov-2009 S-4	S9 18-May-2010 S-3	S9 18-Aug-2010 [29] S-4	S9 14-Oct-2010 S-3	S9 19-May-2011 [41] W-7	S9 16-Aug-2011 [2] N-3	S9 30-Nov-2011 [42] S9	S9 30-May-2012 S 9
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	256000	211000	306000	183000	265000	203000	204000	132000	260000
Ammonia, unionized	ug/l	20	0.11	0.1	0.17	0.15	<0.02	<0.84	0.32	0.6	<0.71
Ammonia Nitrogen	ug/l	--	30	40	30	110	<20	<20	30	50	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	2000	2000	4000	2000	2000	2000	3000	<2000
Chemical Oxygen Demand	ug/l	--	63000	33000	35000	35000	35000	45000	35000	28000	46000
Chloride	ug/l	--	141000	57000	142000	43000	94000	47000	93000	33000	130000
Conductivity	uS/cm	--	1270	786	1240	896	1030	665	907	594	--
Conductivity (Field)	uS/cm	--	1088	709	1337	826	856	634	758	557	969
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	62800	51600	63800	40000	61100	49800	46500	26900	63000
Dissolved Organic Carbon	ug/l	--	15200	11500	14900	16800	13600	13700	11500	7300	17000
Dissolved Oxygen (Field)	ug/l	-- [7]	5900	9730	**5080**	**610**	7970	6250	**4060**	9040	**2880**
Hardness, Calcium Carbonate	ug/l	--	344000	231000	375000	256000	327000	219000	263000	177000	320000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	1040	<100	1030	480	200	<100	1950	<100
Nitrite as N	ug/l	--	<100	<100	<100	330	<100	<100	<100	<100	<10
Nitrogen, Total Kjeldahl	ug/l	--	1060	760	1070	1290	600	400	570	790	1100
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.97	7.31	7.40	6.58	6.82	8.20	7.41	7.95	7.54
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**70**	**200**	**110**	**310**	**120**	**120**	**170**	**440**	**92**
Sulphate	ug/l	--	163000	100000	119000	199000	118000	69000	106000	101000	84000
Temperature (Field)	deg c	-- [10]	19.9	5.0	12.2	18.8	9.5	15.2	20.7	6.2	20.7
Total Dissolved Solids	ug/l	--	825000	511000	806000	582000	670000	432000	590000	386000	618000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	15000	47000	24000	46000	14000	86000	78000	80000	31000
Metals											
Arsenic	ug/l	100 [11]	2	<50	2	<1	<1	<50	<10	<50	1.7
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	140	<100	150	**250**	90	<100	110	100	130
Cadmium	ug/l	0.2 [11]	<0.1	**<10**	<0.1	<0.1	<0.1	**<10**	<0.1	**<10**	<0.10
Calcium	ug/l	--	103000	61000	104000	71000	98000	58000	79000	46000	92000
Chromium	ug/l	-- [13]	4	**<20**	7	6	6	**<50**	6	**<50**	5.4
Cobalt	ug/l	0.9	0.5	<5	**1.4**	**1.3**	0.9	<10	**1.1**	<10	**1.2**
Copper	ug/l	5	3	**20**	4	**6**	4	**<10**	5	**10**	**6.4**
Iron	ug/l	300	**440**	**4800**	**1690**	**1420**	**770**	**4900**	**1250**	**7000**	**1800**
Lead	ug/l	-- [14]	<1	**<10**	<1	1	<1	**<10**	1	**<10**	0.75
Magnesium	ug/l	--	21000	19000	28000	19000	20000	18000	16000	15000	24000
Manganese	ug/l	--	110	110	980	210	90	160	110	140	220
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	17000	8000	12000	30000	10000	8000	9000	12000	9400
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	119000	67000	118000	81000	80000	58000	65000	49000	100000
Zinc	ug/l	30 [11]	10	**100**	10	<10	10	<50	<10	<50	15
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	1	1	<1	<1	<1	<1.0

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S9 22-Aug-2012 S-9	S9 29-Nov-2012 S9	S9 28-May-2013 S9	S9 15-Aug-2013 S9	S9 21-Nov-2013 SA-4	S9 28-May-2014 S9	S9 26-Aug-2014 S9	S9 13-Nov-2014 S-9	S9 27-May-2015 S-9
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	290000	330000	200000	220000	220000	240000	220000	240000	295000
Ammonia, unionized	ug/l	20	<0.25	0.26	0.37	0.52	<0.06	<0.14	1.08	<0.04	12.62
Ammonia Nitrogen	ug/l	--	<50	120	130	62	<50	<50	90	<50	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	6000	<2000	3000	<2000	2000	2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	41000	46000	42000	47000	32000	38000	41000	28000	27000
Chloride	ug/l	--	150000	90000	83000	120000	90000	140000	120000	81000	189000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1218	1030	670	993	808	885	915	803	1443
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	66000	74000	45000	52000	54000	55000	57000	60000	70800
Dissolved Organic Carbon	ug/l	--	16000	14000	17000	17000	11000	15000	12000	11000	11600
Dissolved Oxygen (Field)	ug/l	-- [7]	**4920**	**6460**	**3400**	**5050**	12960	7060	**2950**	**5630**	**270**
Hardness, Calcium Carbonate	ug/l	--	460000	360000	250000	300000	290000	300000	250000	300000	316000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	270	<100	<100	440	<100	<100	<100	300
Nitrite as N	ug/l	--	<10	<10	<10	<10	10	<10	<10	<10	<50
Nitrogen, Total Kjeldahl	ug/l	--	960	1800	1400	1200	740	1400	1100	650	500
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	270	<100	<100	450	<100	<100	<100	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.13	7.41	6.99	7.35	7.13	7.00	7.40	6.84	**8.55**
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**110**	**160**	**72**	**150**	**72**	**74**	**79**	**52**	**80**
Sulphate	ug/l	--	220000	120000	55000	130000	110000	64000	79000	110000	206000
Temperature (Field)	deg c	-- [10]	19.4	0.1	15.8	19.4	1.1	15.2	22.8	4.2	18.9
Total Dissolved Solids	ug/l	--	942000	660000	426000	646000	562000	614000	544000	548000	858000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	39000	83000	8000	<1000	14000	13000	11000	12000	3000
Metals											
Arsenic	ug/l	100 [11]	1.4	<1.0	1.2	<1.0	<1.0	1.2	1.1	<1.0	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**240**	120	58	180	85	82	130	110	**255**
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	**0.33**	<0.10	<0.10	<0.10	<0.10	<0.1
Calcium	ug/l	--	130000	110000	74000	87000	84000	79000	69000	88000	67400
Chromium	ug/l	-- [13]	<5.0	**11**	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	1
Cobalt	ug/l	0.9	**1.4**	**2.3**	0.69	<0.50	0.60	0.66	<0.50	<0.50	<0.5
Copper	ug/l	5	**7.9**	**7.0**	**6.0**	**14**	3.4	3.5	2.5	2.5	<0.5
Iron	ug/l	300	**1800**	**4500**	**1100**	**570**	**1000**	**1200**	**580**	**600**	**598**
Lead	ug/l	-- [14]	1.1	1.5	<0.50	<0.50	0.58	<0.50	<0.50	<0.50	0.3
Magnesium	ug/l	--	37000	37000	20000	29000	23000	22000	19000	27000	35800
Manganese	ug/l	--	95	310	110	120	63	130	98	110	234
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	16000	14000	6800	15000	11000	7900	8500	10000	12300
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	150000	110000	74000	110000	75000	110000	100000	82000	190000
Zinc	ug/l	30 [11]	12	17	8.0	<5.0	9.7	9.1	8.3	9.9	14
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	**24**	<1.0	<1.0	<1.0	<1.0	<1.0	**11**	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S9 25-Aug-2015 S-9	S9 25-Nov-2015 S-9	S9 24-May-2016 S-9	S9 18-Aug-2016 S-9	S9 16-Nov-2016 S-9	S9 18-May-2017 S-9	S9 28-Aug-2017 S-9	S9 28-Nov-2017 S-9	S9 23-May-2018 S-9
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	258000	250000	308000	179000	236000	210000	337000	253000	320000
Ammonia, unionized	ug/l	20	0.73	0.21	0.86	0.1	0.26	1.48	0.43	0.34	**42.92**
Ammonia Nitrogen	ug/l	--	40	60	70	50	80	50	90	270	3700
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	2000	3000	<2000	<2000	<2000	2000	<2000
Chemical Oxygen Demand	ug/l	--	63000	45000	42000	37000	20000	42000	30000	41000	67000
Chloride	ug/l	--	131000	164000	137000	135000	162000	140000	114000	101000	230000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1179	250	1062	974	1148	837	872	140	1285
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	53300	54800	64400	13900	47500	24500	66800	17400	72500
Dissolved Organic Carbon	ug/l	--	14300	11900	14100	42000	6600	24600	11500	44600	17900
Dissolved Oxygen (Field)	ug/l	-- [7]	**3570**	**7740**	**2420**	**4580**	9810	**2400**	**4510**	14070	9540
Hardness, Calcium Carbonate	ug/l	--	278000	368000	335000	247000	292000	238000	331000	340000	373000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	100	<100	<100	1200	<100	<100	700	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1000	800	800	900	500	800	900	1100	4500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.72	7.63	7.56	6.64	7.40	7.83	7.29	7.19	7.63
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**120**	**80**	**80**	**130**	30	**50**	**110**	**40**	**50**
Sulphate	ug/l	--	220000	102000	115000	151000	106000	57000	126000	74000	55000
Temperature (Field)	deg c	-- [10]	18.4	0	18.0	21.9	5.7	21.8	13.5	0	15.1
Total Dissolved Solids	ug/l	--	772000	648000	680000	620000	638000	516000	712000	514000	756000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	7000	31000	7000	8000	7000	14000	43000	16000	<2000
Metals											
Arsenic	ug/l	100 [11]	1	<1	1	3	<1	<5 [17]	<1	<1	1
Barium	ug/l	--	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**423**	92	144	185	109	**220**	127	**231**	13
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1
Calcium	ug/l	--	64800	114000	84700	63600	86700	66100	93300	93600	102000
Chromium	ug/l	-- [13]	1	4	2	2	<1	<5 [17]	2	3	2
Cobalt	ug/l	0.9	<0.5	0.8	0.6	<0.5	<0.5	<2.5 [17]	<0.5	**1.2**	**1.2**
Copper	ug/l	5	<0.5	0.8	2.3	1.2	0.8	4.8	0.7	3.3	1.4
Iron	ug/l	300	**670**	**1510**	**879**	**677**	298	**861**	**732**	**1070**	**909**
Lead	ug/l	-- [14]	<0.1	0.6	0.4	0.4	0.1	<0.5 [17]	0.4	0.5	0.2
Magnesium	ug/l	--	28300	20400	30000	21400	18300	17800	23800	25700	29000
Manganese	ug/l	--	341	88	791	164	59	177	189	155	292
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	11700	8970	8170	9180	5270	6190	7710	8390	11600
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	111000	135000	135000	110000	114000	98800	94900	84300	155000
Zinc	ug/l	30 [11]	7	16	7	8	6	<25 [17]	6	12	5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**3**	<1	**9**	**4**	**4**	<1	<1	<1	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S9 30-Aug-2018 [20] S-9	S9 28-Nov-2018 S-9	S9 20-Jun-2019 S-9	S9 28-Aug-2019 [39] S-9	S9 21-Nov-2019 S-9	S9 14-May-2020 S-9	S9 26-Aug-2020 S-9	S9 25-Nov-2020 S-9
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	209000	259000	--	252000	225000	250000	283000
Ammonia, unionized	ug/l	20	--	0.09	0.32	--	0.17	0.28	0.72	0.17
Ammonia Nitrogen	ug/l	--	--	120	110	--	40	20	50	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	3000	<2000	--	4000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	--	34000	32000	--	41000	41000	37000	31000
Chloride	ug/l	--	--	141000	208000	--	185000	171000	199000	192000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	--	462	1150	--	1405	1011	1253	13
Cyanide	ug/l	5 [6]	--	--	--	--	--	--	--	--
Dissolved Inorganic Carbon	ug/l	--	--	37500	53900	--	<500	47500	51800	65300
Dissolved Organic Carbon	ug/l	--	--	12800	12000	--	9100	22100	12600	11700
Dissolved Oxygen (Field)	ug/l	-- [7]	--	**4570**	**4750**	--	14560	11710	8110	13440
Hardness, Calcium Carbonate	ug/l	--	--	279000	306000	--	386000	270000	362000	355000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	900	200	--	<100	<100	<100	100
Nitrite as N	ug/l	--	--	<50	<50	--	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	--	1100	1000	--	800	500	700	500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	6.93	6.93	--	7.71	7.90	7.74	7.83
Phosphate	ug/l	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**130**	**80**	--	**60**	20	**50**	**40**
Sulphate	ug/l	--	--	105000	86000	--	159000	97000	164000	134000
Temperature (Field)	deg c	-- [10]	--	0.2	18.2	--	0	9.4	14.7	0
Total Dissolved Solids	ug/l	--	--	544000	692000	--	690000	542000	670000	732000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	8000	2000	--	12000	<2000	3000	6000
Metals										
Arsenic	ug/l	100 [11]	--	<1	1	--	<1	<1	<1	<1
Barium	ug/l	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	--	118	**391**	--	200	54	**220**	88
Cadmium	ug/l	0.2 [11]	--	<0.1	<0.1	--	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	--	76700	82100	--	103000	75600	87800	97800
Chromium	ug/l	-- [13]	--	4	2	--	2	<1	1	1
Cobalt	ug/l	0.9	--	0.9	0.7	--	0.5	<0.5	<0.5	<0.5
Copper	ug/l	5	--	**6.3**	3.2	--	3.3	2.0	2.0	1.9
Iron	ug/l	300	--	**1020**	**781**	--	**511**	187	**305**	**315**
Lead	ug/l	-- [14]	--	0.6	0.3	--	0.2	0.1	0.1	0.2
Magnesium	ug/l	--	--	21400	24400	--	31100	19600	34600	26900
Manganese	ug/l	--	--	91	294	--	88	86	73	44
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	10700	8520	--	10900	4820	11100	8050
Selenium	ug/l	100	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	116000	133000	--	129000	87500	149000	122000
Zinc	ug/l	30 [11]	--	15	7	--	8	<5	7	<5
Phenols										
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	<1	--	<1	**4**	**3**	<1

Parameter	Unit	PWQO [1]	S9 27-May-2021 S-9	S9 24-Aug-2021 S-9	S9 24-Nov-2021 S-9
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	337000	324000	274000
Ammonia, unionized	ug/l	20	1.88	0.78	0.15
Ammonia Nitrogen	ug/l	--	90	40	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	65000	41000	29000
Chloride	ug/l	--	127000	53000	75000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	1203	1246	1244
Cyanide	ug/l	5 [6]	--	--	--
Dissolved Inorganic Carbon	ug/l	--	69900	55300	57200
Dissolved Organic Carbon	ug/l	--	13900	12800	11700
Dissolved Oxygen (Field)	ug/l	-- [7]	**200**	**4350**	12810
Hardness, Calcium Carbonate	ug/l	--	423000	627000	592000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	<100	<100	400
Nitrite as N	ug/l	--	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	900	700	500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.98	7.68	7.66
Phosphate	ug/l	--	--	--	--
Phosphorus	ug/l	-- [9]	**100**	**70**	20
Sulphate	ug/l	--	150000	332000	302000
Temperature (Field)	deg c	-- [10]	12.4	20.7	0
Total Dissolved Solids	ug/l	--	744000	876000	804000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	35000	30000	3000
Metals					
Arsenic	ug/l	100 [11]	<1	<1	<1
Barium	ug/l	--	--	--	--
Boron	ug/l	200 [12]	112	126	83
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1
Calcium	ug/l	--	112000	185000	187000
Chromium	ug/l	-- [13]	4	3	<1
Cobalt	ug/l	0.9	**1.0**	0.7	<0.5
Copper	ug/l	5	3.4	2.5	1.6
Iron	ug/l	300	**1470**	**883**	174
Lead	ug/l	-- [14]	0.5	0.4	0.1
Magnesium	ug/l	--	34900	39700	30600
Manganese	ug/l	--	145	69	34
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	8920	13300	10900
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	115000	55600	60400
Zinc	ug/l	30 [11]	8	5	<5
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	**4**	<1	**2**

Parameter	Unit	PWQO [1]	S10 28-Jun-1995	S10 14-Nov-1995	S10 13-Jun-1996	S10 12-Oct-1996	S10 17-Jun-1997	S10 05-Nov-1997	S10 05-Jun-1998	S10 26-Aug-1998	S10 30-Oct-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	237000	312000	212000	193000	145000	8000	100000	67000	202000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	10
Ammonia Nitrogen	ug/l	--	10	60	20	130	10	10	70	60	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	7000	2000	1000	10000	1000	14000	4000	1000
Chemical Oxygen Demand	ug/l	--	291000	120000	75000	67000	51000	43000	232000	106000	100000
Chloride	ug/l	--	121000	118000	43000	68000	19400	58000	25400	33800	87900
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1026	1230	520	640	431	950	360	371	659
Dissolved Inorganic Carbon	ug/l	--	87700	18200	46300	39400	31000	1000	32600	16700	52000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	3950	--	4780	3840	2800	6390	6220	6250	8070
Hardness, Calcium Carbonate	ug/l	--	200000	257000	148000	178000	112000	287000	87000	157000	193000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1250	12000	980	830	2050	1280	4370	1600	1320
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	1240	11940	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.79	7.08	7.55	6.56	6.85	6.89	--	7.33	7.2
Phosphate	ug/l	--	900	540	380	150	180	90	590	180	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	13000	91200	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	636000	620000	260000	320000	216000	480000	183000	191000	331000
Total Organic Carbon	ug/l	--	31500	92400	24100	21200	37800	16600	41600	20000	31400
Total Suspended Solids	ug/l	--	39000	165000	11000	4000	18000	14000	234000	30000	16000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**2000**	**1630**	**1060**	**1300**	**1360**	**1120**	**790**	**1120**	**800**
Cadmium	ug/l	0.2 [11]	0.1	0.1	--	--	--	--	--	--	--
Calcium	ug/l	--	66800	50900	35200	37500	27400	76800	22300	46800	46000
Chromium	ug/l	-- [13]	**11**	**10**	--	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	1.7	3.2	1.9	1.5	0.5	**10.6**	4.2	1.5	0.6
Iron	ug/l	300	**570**	**5840**	**503**	**2890**	**660**	**600**	**5330**	**2160**	**1050**
Lead	ug/l	-- [14]	1.3	1.8	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	28100	31100	14300	20100	10500	22700	7710	9590	18700
Manganese	ug/l	--	740	680	217	580	310	780	850	120	110
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20	**30**	20
Potassium	ug/l	--	15200	16600	7730	1300	800	10800	400	1500	14500
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	87100	182000	64800	94000	53300	47700	36100	43400	78400
Zinc	ug/l	30 [11]	10	20	10	10	10	**120**	30	**460**	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	1	--	**2**	**2**	1	**19**	1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S10 30-Jun-1999	S10 19-Oct-1999	S10 03-May-2000	S10 25-Oct-2000	S10 13-Jun-2001	S10 27-Sep-2001	S10 21-Nov-2001	S10 22-May-2002	S10 12-Nov-2002
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	94000	38000	98000	151000	166000	54000	78000	181000	29000
Ammonia, unionized	ug/l	20	--	--	10	--	<20	<20	<20	--	--
Ammonia Nitrogen	ug/l	--	410	40	20	1	20	40	10	40	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	24000	5000	3000	--	5000	1000	1000	1000	7000
Chemical Oxygen Demand	ug/l	--	280000	80000	43000	--	84000	71000	84000	55000	190000
Chloride	ug/l	--	86000	57500	24100	112000	59000	87300	93400	29300	26700
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	199.1	650	383	667	500	680	650	370	--
Dissolved Inorganic Carbon	ug/l	--	23100	61000	18100	--	28900	10100	10900	2000	4000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	4910	6880	6600	2100	3400	5060	2030	6370	--
Hardness, Calcium Carbonate	ug/l	--	105000	200000	99000	179000	142000	160000	155000	149000	180000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	100	100	100	100	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	10500	1510	250	17700	1720	2020	1550	2470	5960
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	**6.1**	7.2	6.62	7.4	7	6.66	**5.94**	7.02	--
Phosphate	ug/l	--	1440	110	30	--	270	260	260	300	720
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	--	42000	12000	188000	188000	60000	180000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	98900	320000	190000	414000	326000	540000	538000	276000	360000
Total Organic Carbon	ug/l	--	50100	19200	16300	--	28100	25500	27000	13000	23000
Total Suspended Solids	ug/l	--	22000	14000	22000	352000	198000	7000	90000	14000	251000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	1	1	1	1	1
Boron	ug/l	200 [12]	**750**	**1240**	**460**	**1230**	**590**	**1330**	**1450**	**620**	**510**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	30100	51600	25000	45800	35900	42000	34000	36400	49400
Chromium	ug/l	-- [13]	--	--	--	**10**	**10**	**10**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**13.4**	3.1	0.5	**11**	1.5	4.4	3.8	<1	5
Iron	ug/l	300	**13600**	**4790**	300	**26200**	**3330**	**3060**	**12100**	**390**	**3560**
Lead	ug/l	-- [14]	**6.6**	0.2	0.2	2.2	1.1	0.2	0.6	<1	4.3
Magnesium	ug/l	--	7130	17100	8700	15600	12600	13500	17000	14000	13700
Manganese	ug/l	--	740	450	40	2700	420	670	240	40	500
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	20	20	20
Potassium	ug/l	--	800	3400	4600	9700	4700	4500	5500	7500	4900
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	18300	69000	39700	69800	61100	93400	120000	54200	35500
Zinc	ug/l	30 [11]	30	10	10	30	10	10	10	10	**60**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	**9**	**15**	**35**	1	1	1	1

Parameter	Unit	PWQO [1]	S10 31-May-2003	S10 03-Jul-2003	S10 22-Oct-2003	S10 17-May-2004	S10 21-Aug-2004	S10 18-Nov-2004	S10 25-May-2005	S10 09-Sep-2005 [20]	S10 09-Nov-2005
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	168000	--	77000
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	<5000	--	<5000
Alkalinity (Total as CaCO3)	ug/l	-- [5]	104000	136000	47000	175000	156000	180000	140000	--	63000
Ammonia, unionized	ug/l	20	--	--	--	<10	<10	<10	<10	--	<10
Ammonia Nitrogen	ug/l	--	240	110	40	20	30	10	<10	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	9000	7000	7000	8000	20000	<3000	--	9000
Chemical Oxygen Demand	ug/l	--	75000	138000	245000	132000	230000	891000	77000	--	227000
Chloride	ug/l	--	97000	25500	56000	48100	40400	69000	41900	--	52600
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	500	400	820	470	380	550	400	--	380
Dissolved Inorganic Carbon	ug/l	--	24000	35000	12000	39300	37200	36500	43400	--	20600
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	23200	--	26000
Dissolved Oxygen (Field)	ug/l	-- [7]	7400	1930	9100	2400	1800	--	**4200**	--	**3950**
Hardness, Calcium Carbonate	ug/l	--	125000	85000	--	148000	133000	166000	121000	--	142000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	**20**	--	**400**
Nitrate as N	ug/l	--	100	100	200	100	100	100	300	--	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1700	5880	6040	3930	4970	7090	1200	--	5500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.5	6.69	8.1	7.2	6.7	7	7.2	--	6.9
Phosphate	ug/l	--	160	1320	880	770	900	1440	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	**100**	--	**810**
Sulphate	ug/l	--	92000	28000	106000	31000	15000	54000	13000	--	152000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	10	--	1
Total Dissolved Solids	ug/l	--	297000	315000	289000	235000	190000	275000	225000	--	371000
Total Organic Carbon	ug/l	--	27000	46000	25000	21100	24800	17300	--	--	--
Total Suspended Solids	ug/l	--	25000	224000	294000	84000	156000	1630000	13000	--	320000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	3	<1	--	1
Boron	ug/l	200 [12]	**580**	**645**	**631**	**248**	**413**	**374**	**237**	--	**513**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	<0.1	--	<0.5
Calcium	ug/l	--	29800	19600	33800	39500	33900	41700	31200	--	35200
Chromium	ug/l	-- [13]	**10**	5	**9**	1	3	**48**	<2	--	**11**
Cobalt	ug/l	0.9	--	--	--	--	--	--	**4**	--	**3**
Copper	ug/l	5	3	2	**20**	**17**	**58**	**103**	<2	--	**17**
Iron	ug/l	300	**1280**	**6170**	270	**2050**	**502**	**593**	**816**	--	**2610**
Lead	ug/l	-- [14]	0.5	3.7	0.5	0.6	3	2.6	0.2	--	**6**
Magnesium	ug/l	--	12200	8860	10800	12000	11700	15000	10500	--	13100
Manganese	ug/l	--	70	1030	4	258	1750	4710	39	--	1080
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	<0.05	--	<0.06
Molybdenum	ug/l	40	--	--	--	--	--	--	<0.5	--	<5
Nickel	ug/l	25	20	10	10	20	**50**	**40**	<10	--	<10
Potassium	ug/l	--	5600	1100	8000	7800	3200	4800	7400	--	4100
Selenium	ug/l	100	--	--	--	--	--	--	<1	--	<1
Sodium	ug/l	--	54300	55300	53100	62300	50200	76500	43900	--	79200
Zinc	ug/l	30 [11]	10	12	**45**	**46**	**153**	**154**	<5	--	**64**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	**3**	<1	--	<1

Parameter	Unit	PWQO [1]	S10 24-May-2006	S10 15-Aug-2006	S10 16-Nov-2006	S10 08-May-2007	S10 22-Aug-2007	S10 20-Nov-2007	S10 23-May-2008	S10 12-Aug-2008	S10 06-Nov-2008
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	123000	127000	158000	107000	56000	103000	174000	160000	140000
Ammonia, unionized	ug/l	20	<10	<10	<10	0.251849	<10	<10	<20	<20	<20
Ammonia Nitrogen	ug/l	--	<10	30	<10	<10	90	60	<10	<10	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	3000	21000	<3000	<3000	13000	13000	4000	3000	<3000
Chemical Oxygen Demand	ug/l	--	52000	361000	52000	66000	342000	308000	88000	71000	98000
Chloride	ug/l	--	28200	22000	29400	20000	8200	60200	45700	64800	80600
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	280	520	320	300	425	390	480	500	500
Dissolved Inorganic Carbon	ug/l	--	23900	39400	41100	26800	15100	26800	38400	42200	35600
Dissolved Organic Carbon	ug/l	--	20700	35800	20700	14300	28100	19400	20300	21700	13000
Dissolved Oxygen (Field)	ug/l	-- [7]	11450	**2200**	**6290**	--	**2340**	**2950**	**3840**	**960**	**6240**
Hardness, Calcium Carbonate	ug/l	--	129000	106000	168000	96000	33000	156000	150000	167000	169000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	100	<100	100	<100	200	<100	200	<100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	960	7980	1450	1650	11200	6620	1620	1610	1280
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.8	**5.9**	6.6	8.3	7.3	8.1	7.3	7	7.5
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**80**	**1470**	**100**	**180**	**310**	**1120**	**150**	**320**	**130**
Sulphate	ug/l	--	42000	17000	37000	8000	9000	72000	20000	12000	69000
Temperature (Field)	deg c	-- [10]	4.5	16	6.5	5.4	11.3	0.2	9.1	15.6	5
Total Dissolved Solids	ug/l	--	225000	189000	279000	161000	84600	316000	277000	308000	367000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	34000	345000	11000	32000	476000	320000	20000	45000	9000
Metals											
Arsenic	ug/l	100 [11]	<1	0.9	<1	0.6	2.7	1.6	1.2	0.7	0.5
Boron	ug/l	200 [12]	192	**232**	**223**	105	76	162	200	124	113
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.5	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	35300	21600	45100	25400	8370	40800	40500	48500	45600
Chromium	ug/l	-- [13]	<2	**21**	8	<2	**26**	8	<2	<2	<2
Cobalt	ug/l	0.9	0.4	**3.3**	<0.5	0.6	**6.5**	**2.5**	<0.5	<0.5	<0.5
Copper	ug/l	5	2	**46**	**44**	**11**	**17**	**8**	<2	**6**	<2
Iron	ug/l	300	**1360**	**1190**	**793**	**1630**	**2310**	**7560**	**658**	**4390**	192
Lead	ug/l	-- [14]	0.8	4.5	0.9	1.4	**8**	3.4	<0.1	1	<0.1
Magnesium	ug/l	--	9930	12600	13400	7980	2820	13100	11900	11200	13400
Manganese	ug/l	--	392	1470	27	141	725	704	184	441	22
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5000	4800	16300	5200	1000	7200	5900	4100	8800
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	33500	36700	42200	28000	18700	51900	47200	64600	65000
Zinc	ug/l	30 [11]	7	**76**	26	23	**103**	**36**	8	**38**	<5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S10 13-May-2009 S-6	S10 25-Aug-2009 A-1	S10 27-Nov-2009 S-2	S10 18-May-2010 S-7	S10 18-Aug-2010 [2] S-1	S10 14-Oct-2010 S-2	S10 19-May-2011 W-1	S10 16-Aug-2011 [21] N-2	S10 30-Nov-2011 [22] S10
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	176000	230000	158000	266000	135000	178000	167000	145000	90000
Ammonia, unionized	ug/l	20	<0.12	0.03	0.02	0.03	<0.01	<0.02	0.18	0.05	<0.09
Ammonia Nitrogen	ug/l	--	<20	30	20	20	<20	<20	30	30	<20
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	3000	1000	3000	2000	1000	<1000	3000	2000
Chemical Oxygen Demand	ug/l	--	48000	99000	53000	60000	70000	40000	50000	95000	40000
Chloride	ug/l	--	54000	61000	57000	41000	36000	42000	30000	19000	39000
Conductivity	uS/cm	--	587	635	610	622	568	605	477	354	432
Conductivity (Field)	uS/cm	--	500	510	550	702	528	530	464	349	428
Dissolved Inorganic Carbon	ug/l	--	44600	60400	39800	57000	29100	43900	41600	37900	17800
Dissolved Organic Carbon	ug/l	--	18800	26900	13800	25900	27500	14900	18500	33600	14700
Dissolved Oxygen (Field)	ug/l	-- [7]	**3480**	**5770**	**5820**	**5420**	**1610**	9070	**2260**	**4250**	**5740**
Hardness, Calcium Carbonate	ug/l	--	173000	191000	158000	193000	175000	183000	165000	127000	116000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	110	<100	<100	<100	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	1050	1370	160	2620	1310	1020	1060	1820	590
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.5	6.59	6.84	6.93	**6.26**	6.86	7.37	6.66	7.54
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**40**	**970**	30	**750**	**80**	**170**	**70**	**80**	<10
Sulphate	ug/l	--	36000	2000	63000	<1000	90000	61000	31000	12000	56000
Temperature (Field)	deg c	-- [10]	10	15.6	4.3	11.0	15.5	7.2	14.0	18.3	5.3
Total Dissolved Solids	ug/l	--	382000	413000	397000	404000	369000	393000	310000	230000	281000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	3000	38000	4000	43000	8000	12000	52000	18000	<2000
Metals											
Arsenic	ug/l	100 [11]	<1	2	<1	2	<1	<1	<1	<50	<50
Boron	ug/l	200 [12]	130	90	110	170	**330**	110	100	100	200
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	**<10**	**<10**
Calcium	ug/l	--	46000	55000	42000	51000	47000	50000	43000	36000	30000
Chromium	ug/l	-- [13]	2	3	3	3	3	3	2	**<50**	**<50**
Cobalt	ug/l	0.9	<0.2	0.7	<0.2	**1.1**	0.4	0.5	<0.2	<10	<10
Copper	ug/l	5	<1	<1	1	1	1	1	<1	**<10**	**<10**
Iron	ug/l	300	170	**4660**	220	**8840**	**930**	**1610**	200	**1600**	100
Lead	ug/l	-- [14]	<1	<1	<1	<1	<1	<1	<1	**<10**	**<10**
Magnesium	ug/l	--	14000	13000	13000	16000	14000	14000	14000	9000	10000
Manganese	ug/l	--	40	780	50	2080	470	580	40	320	30
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	6000	9000	8000	8000	7000	10000	5000	<1000	5000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	57000	53000	50000	59000	50000	45000	39000	26000	38000
Zinc	ug/l	30 [11]	<10	<10	<10	<10	<10	<10	<10	<50	<50
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	**2**	<1	<1	<1	<1	<1

Parameter	Unit	PWQO [1]	S10 30-May-2012 S 10	S10 22-Aug-2012 S-10	S10 29-Nov-2012 S10	S10 28-May-2013 S10	S10 15-Aug-2013 S10	S10 21-Nov-2013 SA-6	S10 28-May-2014 [23] S10 (SW-W)	S10 26-Aug-2014 [24] S10	S10 13-Nov-2014 S-10
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	230000	44000	250000	150000	200000	160000	210000	200000	180000
Ammonia, unionized	ug/l	20	<0.12	<0.01	0.07	0.04	0.09	<0.03	<0.09	0.2	<0.02
Ammonia Nitrogen	ug/l	--	<50	<50	180	97	210	<50	<50	160	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	7000	<2000	4000	<2000	5000	<2000	2000	4000	6000
Chemical Oxygen Demand	ug/l	--	130000	160000	600000	79000	690000	150000	190000	410000	180000
Chloride	ug/l	--	33000	43000	83000	48000	42000	78000	55000	58000	62000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	518	759	894	524	548	725	571	603	558
Dissolved Inorganic Carbon	ug/l	--	56000	9200	52000	33000	57000	43000	48000	52000	43000
Dissolved Organic Carbon	ug/l	--	35000	27000	22000	23000	31000	18000	22000	23000	21000
Dissolved Oxygen (Field)	ug/l	-- [7]	**2250**	**560**	**1410**	**2770**	**1050**	**7580**	**680**	**600**	**3660**
Hardness, Calcium Carbonate	ug/l	--	200000	280000	280000	160000	170000	200000	200000	180000	160000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<500	<500	<100
Nitrite as N	ug/l	--	<10	<10	<10	<10	<10	<10	<50	<50	<10
Nitrogen, Total Kjeldahl	ug/l	--	2400	4000	16000	2300	16000	2400	11000	12000	7400
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	<100	<100	<100	<100	<100	<500	<500	<100
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.91	**5.87**	6.66	**6.41**	**6.23**	6.86	6.87	6.57	6.61
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**330**	**390**	**1900**	**270**	**4200**	**240**	**1100**	**1200**	**680**
Sulphate	ug/l	--	<1000	280000	100000	41000	<1000	100000	29000	31000	21000
Temperature (Field)	deg c	-- [10]	16.4	15.2	0	9.0	14	0.2	13.1	17.9	2.1
Total Dissolved Solids	ug/l	--	328000	628000	560000	352000	378000	476000	408000	440000	334000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	62000	57000	380000	160000	380000	120000	120000	280000	93000
Metals											
Arsenic	ug/l	100 [11]	2.0	2.3	5.2	<1.0	5.9	<1.0	2.6	3.0	1.3
Boron	ug/l	200 [12]	130	**340**	160	170	190	190	160	170	160
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	0.12	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Calcium	ug/l	--	58000	82000	87000	44000	63000	60000	60000	56000	47000
Chromium	ug/l	-- [13]	<5.0	<5.0	**17**	<5.0	<5.0	<5.0	<5.0	8.0	<5.0
Cobalt	ug/l	0.9	**1.1**	**2.0**	**4.5**	<0.50	**2.3**	0.55	**1.2**	**2.6**	**1.3**
Copper	ug/l	5	2.6	2.9	**17**	<1.0	**7.2**	3.3	3.0	**7.3**	2.8
Iron	ug/l	300	**5100**	**12000**	**43000**	**1900**	**59000**	**4400**	**10000**	**23000**	**7500**
Lead	ug/l	-- [14]	<0.50	0.66	**6.6**	<0.50	**6.3**	2.2	2.4	4.8	1.3
Magnesium	ug/l	--	15000	23000	29000	14000	17000	20000	16000	16000	15000
Manganese	ug/l	--	1900	730	1500	280	1100	220	1100	1300	1100
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5300	4100	7400	6600	2900	8700	11000	4300	9000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	46000	73000	87000	62000	59000	76000	59000	57000	60000
Zinc	ug/l	30 [11]	7.9	12	**51**	<5.0	**42**	11	25	30	19
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**3.0**	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	**1.6**	**11**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S10 27-May-2015 S-10	S10 25-Aug-2015 S-10	S10 25-Nov-2015 S-10	S10 24-May-2016 S-10	S10 18-Aug-2016 S-10	S10 16-Nov-2016 S-10	S10 18-May-2017 S-10	S10 28-Aug-2017 S-10	S10 28-Nov-2017 S-10
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	204000	199000	183000	163000	21000	147000	192000	179000	189000
Ammonia, unionized	ug/l	20	1.34	0.11	0.01	0.71	0.07	0.4	0.3	0.06	0.02
Ammonia Nitrogen	ug/l	--	100	30	30	150	80	70	30	40	90
Biochemical Oxygen Demand, 5 Day	ug/l	--	<20000 [25]	<30000 [25]	6000	74000	12000	4000	4000	35000	<100000 [26]
Chemical Oxygen Demand	ug/l	--	115000	171000	126000	671000	100000	52000	64000	153000	526000
Chloride	ug/l	--	77000	75000	108000	43000	33000	117000	75000	63000	64000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	619	602	39	458	864	942	673	520	656
Dissolved Inorganic Carbon	ug/l	--	45900	38300	43300	20200	900	29800	11000	36300	8800
Dissolved Organic Carbon	ug/l	--	38100	38900	19900	50500	25400	12800	42000	21400	43800
Dissolved Oxygen (Field)	ug/l	-- [7]	**930**	**1380**	**1940**	**1700**	**1310**	9270	**1660**	**2850**	**5580**
Hardness, Calcium Carbonate	ug/l	--	43000	137000	232000	193000	332000	229000	208000	202000	237000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2400	2300	2900	17400	4100	900	2300	4500	1700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.63	7.13	6.56	7.38	**6.43**	7.71	7.52	6.83	6.51
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**390**	**420**	**420**	**2500**	**650**	**120**	**260**	**540**	**480**
Sulphate	ug/l	--	12000	3000	87000	10000	398000	130000	51000	37000	67000
Temperature (Field)	deg c	-- [10]	17.0	15.5	0	10.8	17.9	3.7	16.3	12.3	0.4
Total Dissolved Solids	ug/l	--	358000	397000	488000	324000	668000	518000	408000	360000	390000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	97000	46000	129000	1160000	96000	36000	49000	410000	1000000
Metals											
Arsenic	ug/l	100 [11]	<1	1	<1	6	4	<1	<5 [17]	<1	2
Boron	ug/l	200 [12]	32	199	174	182	**489**	124	**255**	161	162
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	0.2	<0.1	<0.1	<0.5 [17]	<0.1	**0.3**
Calcium	ug/l	--	13000	34300	71000	56300	91300	61900	55400	57600	66300
Chromium	ug/l	-- [13]	<1	1	2	**9**	2	<1	<5 [17]	2	**11**
Cobalt	ug/l	0.9	<0.5	0.6	<0.5	**6.3**	**3.4**	<0.5	<2.5 [17]	0.6	**3.6**
Copper	ug/l	5	<0.5	<0.5	<0.5	**8.7**	3.3	<0.5	<2.5 [17]	0.7	**13.1**
Iron	ug/l	300	**801**	**9020**	**3000**	**43300**	**4450**	**2580**	**1880**	**4090**	**17900**
Lead	ug/l	-- [14]	0.2	0.1	0.8	**11.7**	1.9	0.2	0.5	1.0	4.9
Magnesium	ug/l	--	2560	12500	18900	12800	25200	18000	16900	14200	17500
Manganese	ug/l	--	179	683	179	7530	1080	52	984	400	648
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	1180	3050	4830	8370	9080	5850	8190	3670	6080
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	13000	61700	106000	52200	57000	88700	66000	57500	52400
Zinc	ug/l	30 [11]	<5	10	13	**86**	**82**	18	<25 [17]	14	**70**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**5**	<1	**29**	**10**	**7**	<1	<1	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S10 23-May-2018 S-10	S10 30-Aug-2018 S-10	S10 28-Nov-2018 S-10	S10 20-Jun-2019 S-10	S10 28-Aug-2019 [20] S-10	S10 21-Nov-2019 S-10	S10 14-May-2020 S-10	S10 26-Aug-2020 [20] S-10	S10 25-Nov-2020 S-10
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	243000	267000	175000	218000	--	89000	138000	--	191000
Ammonia, unionized	ug/l	20	0.11	0.05	0.02	0.05	--	0.01	0.02	--	0.05
Ammonia Nitrogen	ug/l	--	30	40	30	30	--	30	20	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	18000	4000	<12000 [26]	--	<20000 [26]	8000	--	<60000 [26]
Chemical Oxygen Demand	ug/l	--	106000	280000	66000	91000	--	178000	89000	--	361000
Chloride	ug/l	--	32000	118000	89000	62000	--	113000	59000	--	91000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	510	799	649	560	--	1091	505	--	23
Dissolved Inorganic Carbon	ug/l	--	50800	43000	32000	47100	--	<500	31100	--	45900
Dissolved Organic Carbon	ug/l	--	21500	37600	22400	23100	--	21800	31500	--	27600
Dissolved Oxygen (Field)	ug/l	-- [7]	**1920**	**1170**	13250	**1010**	--	**2980**	**5970**	--	**3000**
Hardness, Calcium Carbonate	ug/l	--	177000	230000	212000	217000	--	328000	120000	--	201000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	--	<100	<100	--	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	--	<50	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	2300	9900	900	1600	--	3200	1500	--	6600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.20	6.60	6.9	6.69	--	6.51	6.95	--	7.22
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**1190**	**1220**	**90**	**110**	--	**430**	**210**	--	**1470**
Sulphate	ug/l	--	4000	3000	73000	1000	--	243000	28000	--	40000
Temperature (Field)	deg c	-- [10]	12.3	17.3	0.9	17.6	--	0.2	6.0	--	0
Total Dissolved Solids	ug/l	--	314000	484000	424000	352000	--	612000	278000	--	442000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	47000	346000	13000	16000	--	106000	25000	--	428000
Metals											
Arsenic	ug/l	100 [11]	1	2	<1	1	--	1	<1	--	<1
Boron	ug/l	200 [12]	141	**222**	124	197	--	**246**	83	--	99
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	--	<0.1	<0.1	--	<0.1
Calcium	ug/l	--	47200	64700	55300	59400	--	85000	31500	--	53000
Chromium	ug/l	-- [13]	<1	3	<1	1	--	2	<1	--	<1
Cobalt	ug/l	0.9	0.8	**1.2**	<0.5	**2.3**	--	**2.1**	<0.5	--	<0.5
Copper	ug/l	5	<0.5	3.8	1.1	1.4	--	2.9	0.6	--	1.0
Iron	ug/l	300	**11200**	**15500**	**2070**	**13500**	--	**8400**	**1080**	--	**1050**
Lead	ug/l	-- [14]	0.6	2.0	0.3	2.3	--	1.3	0.1	--	<0.1
Magnesium	ug/l	--	14400	16600	17800	16600	--	28200	9940	--	16600
Manganese	ug/l	--	1400	773	476	2990	--	1600	215	--	324
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5600	3290	6910	4480	--	10700	4450	--	10800
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	42500	86700	79100	65900	--	90200	43800	--	67700
Zinc	ug/l	30 [11]	9	19	11	18	--	20	9	--	<5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**6**	<1	<1	--	**5**	<1	--	**10**

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S10 27-May-2021 S-10	S10 24-Aug-2021 S-10	S10 24-Nov-2021 S-10
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	215000	156000	185000
Ammonia, unionized	ug/l	20	0.17	0.03	0.02
Ammonia Nitrogen	ug/l	--	90	90	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	<150000 [26]	<150000 [26]	<100000 [26]
Chemical Oxygen Demand	ug/l	--	766000	834000	518000
Chloride	ug/l	--	71000	54000	82000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	660	501	799
Dissolved Inorganic Carbon	ug/l	--	52500	42500	42100
Dissolved Organic Carbon	ug/l	--	30700	41200	24300
Dissolved Oxygen (Field)	ug/l	-- [7]	**1090**	**1450**	**3660**
Hardness, Calcium Carbonate	ug/l	--	279000	169000	235000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	11100	12600	7700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.93	**5.88**	6.86
Phosphate	ug/l	--	--	--	--
Phosphorus	ug/l	-- [9]	**2920**	**1500**	**1430**
Sulphate	ug/l	--	2000	4000	96000
Temperature (Field)	deg c	-- [10]	12.5	19.7	0
Total Dissolved Solids	ug/l	--	416000	358000	486000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	221000	330000	404000
Metals					
Arsenic	ug/l	100 [11]	6	2	2
Boron	ug/l	200 [12]	143	112	143
Cadmium	ug/l	0.2 [11]	**0.3**	<0.1	<0.1
Calcium	ug/l	--	76700	48000	65400
Chromium	ug/l	-- [13]	**33**	6	3
Cobalt	ug/l	0.9	**9.1**	**1.5**	**2.7**
Copper	ug/l	5	**23.7**	**8.7**	5.0
Iron	ug/l	300	**54200**	**15400**	**20000**
Lead	ug/l	-- [14]	**13.6**	**6.9**	3.3
Magnesium	ug/l	--	21300	11900	17400
Manganese	ug/l	--	1970	819	2140
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	11300	2430	7480
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	71800	45300	70400
Zinc	ug/l	30 [11]	**108**	27	**32**
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	**12**	**2**	**8**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S11 28-Jun-1995	S11 14-Nov-1995	S11 13-Jun-1996	S11 12-Oct-1996	S11 17-Jun-1997	S11 05-Nov-1997	S11 05-Jun-1998	S11 26-Aug-1998	S11 30-Oct-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	300000	57000	78000	82000	71000	32000	72000	88000	218000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	10
Ammonia Nitrogen	ug/l	--	18000	330	50	190	10	10	730	90	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	15000	15000	5000	1000	3000	2000	5000	16000	1000
Chemical Oxygen Demand	ug/l	--	620000	130000	94000	50000	82000	51000	69000	116000	96000
Chloride	ug/l	--	75000	56500	42000	61000	68300	51000	120000	63400	120000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	790	500	320	710	706	770	1347	522	830
Dissolved Inorganic Carbon	ug/l	--	96800	7300	19100	16100	37000	6000	11400	23300	65700
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	4800	--	7700	4850	4700	4500	10520	5580	7860
Hardness, Calcium Carbonate	ug/l	--	234000	113000	70000	224000	190000	182000	397000	135000	223000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	100	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	19500	25800	1720	1660	2120	1080	1840	1640	1320
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	1500	25470	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.73	6.93	**5.05**	**6.25**	**6.44**	7.27	--	7.6	**6.4**
Phosphate	ug/l	--	5920	1070	200	210	150	80	170	360	100
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	7000	46000	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	400000	250000	160000	350	354000	380000	673000	261000	410000
Total Organic Carbon	ug/l	--	56100	36700	29700	16500	36800	19800	22800	23000	32700
Total Suspended Solids	ug/l	--	--	625000	26000	16000	8000	12000	40000	28000	5000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**1450**	**570**	**652**	**1270**	**2350**	**1340**	**3350**	**1100**	**810**
Cadmium	ug/l	0.2 [11]	**1.3**	**0.4**	--	--	--	--	--	--	--
Calcium	ug/l	--	57590	27600	18600	56500	52000	47300	102000	34400	52100
Chromium	ug/l	-- [13]	**90**	**20**	--	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**14**	**11.1**	3.5	4.2	0.5	**10.8**	2	3.2	0.7
Iron	ug/l	300	**24210**	**14500**	**1860**	**2060**	**1650**	150	**3040**	**1210**	**740**
Lead	ug/l	-- [14]	**37.6**	**16.5**	0.6	0.2	0.2	0.2	0.2	0.2	0.2
Magnesium	ug/l	--	21200	10600	5520	19800	14300	15400	34600	11700	22300
Manganese	ug/l	--	650	270	111	280	100	70	450	90	80
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	**30**	20	22	20	20	20	20	20	20
Potassium	ug/l	--	10430	7500	792	2900	400	1700	400	7600	17000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	74380	63200	45400	72800	81800	46400	153000	57800	103000
Zinc	ug/l	30 [11]	**120**	**80**	10	20	10	20	30	10	10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	1	--	**2**	**6**	1	1	1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S11 19-Oct-1999	S11 03-May-2000	S11 25-Oct-2000	S11 13-Jun-2001	S11 21-Nov-2001	S11 22-May-2002	S11 12-Nov-2002	S11 31-May-2003	S11 22-Oct-2003
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	46000	67000	210000	198000	80000	135000	44000	89000	42000
Ammonia, unionized	ug/l	20	--	10	--	<20	<20	--	--	--	--
Ammonia Nitrogen	ug/l	--	70	50	--	30	20	30	40	120	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	4000	--	3000	2000	1000	13000	9000	3000
Chemical Oxygen Demand	ug/l	--	118000	72000	--	66000	60000	49000	355000	150000	84000
Chloride	ug/l	--	70600	30400	149000	90400	79600	70700	89200	43200	80800
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	520	339	861	650	420	410	--	600	600
Dissolved Inorganic Carbon	ug/l	--	21300	13800	--	38300	11200	21000	9000	19000	10000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	6400	8740	2270	2000	6110	6380	--	5000	5000
Hardness, Calcium Carbonate	ug/l	--	133000	67000	291000	192000	166000	186000	295000	98000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	100	100	100	200	100	500
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1460	1140	20800	1520	1200	740	8700	3460	1360
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.7	6.76	7.19	6.9	**6.15**	7.02	--	8.15	8.15
Phosphate	ug/l	--	200	140	--	410	140	40	970	530	170
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	--	--	61000	53000	107000	36000	300000	44000	110000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	260000	170000	258000	438000	380000	340000	672000	196000	333000
Total Organic Carbon	ug/l	--	24700	20100	--	22700	15000	11000	28000	35000	23000
Total Suspended Solids	ug/l	--	29000	30000	1340000	43000	106000	4000	427000	232000	28000
Metals											
Arsenic	ug/l	100 [11]	--	--	5	1	1	1	1	1	1
Boron	ug/l	200 [12]	**880**	**280**	**1430**	**550**	**690**	110	**1260**	**260**	**455**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	34800	17700	70400	49100	43700	48800	77400	25900	34600
Chromium	ug/l	-- [13]	--	--	**80**	**10**	**10**	**10**	**10**	**10**	8
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	0.5	0.5	**53**	0.5	3.5	<1	**10.9**	5	**21**
Iron	ug/l	300	**2620**	**1260**	**37200**	**1990**	**5340**	220	**4940**	**2860**	**922**
Lead	ug/l	-- [14]	0.3	0.2	**51**	5	0.3	<1	**8.3**	1.3	1.9
Magnesium	ug/l	--	11100	5370	28000	16900	13700	12800	24800	8010	11600
Manganese	ug/l	--	290	390	2420	540	430	20	530	790	153
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	**50**	20	20	20	20	20	10
Potassium	ug/l	--	8000	8500	9600	2200	5700	4800	7800	4400	10600
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	60600	30800	95900	85600	62300	51300	95400	44100	67700
Zinc	ug/l	30 [11]	20	10	**320**	20	10	10	**110**	**40**	18
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**31**	**17**	**7**	**43**	1	1	1	1	1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S11 17-May-2004	S11 21-Aug-2004	S11 18-Nov-2004	S11 25-May-2005	S11 09-Sep-2005 [20]	S11 09-Nov-2005	S11 24-May-2006	S11 15-Aug-2006	S11 16-Nov-2006
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	149000	--	110000	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	<5000	--	<5000	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	155000	183000	250000	120000	--	90000	82000	191000	63000
Ammonia, unionized	ug/l	20	<10	<10	<10	<10	--	<10	<10	<10	<10
Ammonia Nitrogen	ug/l	--	10	40	80	<10	--	50	<10	20	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	7000	84000	10000	--	15000	13000	6000	<3000
Chemical Oxygen Demand	ug/l	--	76000	187000	2850000	64000	--	372000	264000	95000	48000
Chloride	ug/l	--	86500	72300	109000	62700	--	61200	39700	99300	19200
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	550	500	740	480	--	220	220	750	190
Dissolved Inorganic Carbon	ug/l	--	42300	38800	54100	38400	--	36800	29100	47800	17000
Dissolved Organic Carbon	ug/l	--	--	--	--	20100	--	22800	56800	29200	18900
Dissolved Oxygen (Field)	ug/l	-- [7]	3900	5800	--	**4800**	--	**7300**	10510	**1200**	**4340**
Hardness, Calcium Carbonate	ug/l	--	189000	164000	273000	121000	--	203000	40000	194000	32000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	**20**	--	**700**	--	--	--
Nitrate as N	ug/l	--	100	200	200	200	--	100	<100	100	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	2040	4330	48400	1180	--	7720	5460	2480	990
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.2	7	7	7.2	--	7.2	7.3	6.9	7.6
Phosphate	ug/l	--	260	640	11800	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	--	**120**	--	**1440**	**900**	**1180**	**130**
Sulphate	ug/l	--	30000	28000	79000	20000	--	174000	17000	20000	28000
Temperature (Field)	deg c	-- [10]	--	--	--	12.5	--	0.5	5	16	7.2
Total Dissolved Solids	ug/l	--	275000	250000	370000	252000	--	439000	175000	375000	139000
Total Organic Carbon	ug/l	--	17700	19200	17200	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	40000	172000	10400000	14000	--	1790000	253000	248000	67000
Metals											
Arsenic	ug/l	100 [11]	1	1	9	<1	--	1	<1	1.1	<1
Boron	ug/l	200 [12]	109	**223**	**410**	181	--	**758**	164	107	104
Cadmium	ug/l	0.2 [11]	--	--	--	<0.1	--	<0.5	**0.2**	<0.1	**<0.5**
Calcium	ug/l	--	53600	44200	74500	32000	--	52600	7280	45400	7250
Chromium	ug/l	-- [13]	2	7	**462**	<2	--	**45**	7	**33**	**13**
Cobalt	ug/l	0.9	--	--	--	**2**	--	**15**	**1.6**	**4.6**	0.9
Copper	ug/l	5	**17**	**96**	**370**	<2	--	**42**	**41**	**50**	**38**
Iron	ug/l	300	**922**	297	**1260**	**724**	--	**1390**	**1670**	**1110**	**1730**
Lead	ug/l	-- [14]	1.8	4.9	**22.5**	<0.2	--	**28**	**4.7**	**5.8**	1
Magnesium	ug/l	--	13400	12900	21200	10100	--	17400	5200	19600	3490
Manganese	ug/l	--	196	799	5760	69	--	1720	652	736	88
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	<0.05	--	<0.06	--	--	--
Molybdenum	ug/l	40	--	--	--	<0.5	--	<5	--	--	--
Nickel	ug/l	25	20	**80**	**300**	<10	--	**40**	--	--	--
Potassium	ug/l	--	6400	7700	9400	6200	--	5600	2000	7600	3600
Selenium	ug/l	100	--	--	--	<1	--	<1	--	--	--
Sodium	ug/l	--	73600	81100	100000	52500	--	77400	54900	73500	36900
Zinc	ug/l	30 [11]	**42**	**244**	**1080**	9	--	**145**	**46**	**78**	**31**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	**7**	<1	--	<1	<1	<1	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S11 08-May-2007	S11 22-Aug-2007 [20]	S11 20-Nov-2007	S11 23-May-2008	S11 12-Aug-2008	S11 06-Nov-2008	S11 13-May-2009 S-7	S11 25-Aug-2009 [27] A-2	S11 27-Nov-2009 [28] S-5
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	138000	--	182000	80000	170000	150000	181000	202000	157000
Ammonia, unionized	ug/l	20	0.120151	--	<10	<20	<20	<20	<0.16	0.3	3.35
Ammonia Nitrogen	ug/l	--	<10	--	60	<10	200	20	<20	190	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000	--	14000	<3000	10000	<3000	<1000	14000	16000
Chemical Oxygen Demand	ug/l	--	55000	--	366000	115000	222000	42000	45000	95000	60000
Chloride	ug/l	--	53200	--	131000	56800	69200	104000	77000	79000	66000
Conductivity	uS/cm	--	--	--	--	--	--	--	710	734	654
Conductivity (Field)	uS/cm	--	400	--	600	370	500	600	600	640	--
Dissolved Inorganic Carbon	ug/l	--	34500	--	49100	20000	42600	38700	44500	53400	38600
Dissolved Organic Carbon	ug/l	--	13100	--	18100	8700	26200	13400	17200	26100	20100
Dissolved Oxygen (Field)	ug/l	-- [7]	**5150**	--	**2750**	**2330**	**460**	**2430**	6570	**4160**	**700**
Hardness, Calcium Carbonate	ug/l	--	155000	--	215000	70000	116000	181000	192000	188000	187000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	--	100	100	100	<100	<100	<100	220
Nitrite as N	ug/l	--	--	--	--	--	--	--	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	1500	--	7620	2150	7340	1020	860	2910	1070
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.8	--	7.8	7.2	7.1	7.6	7.4	6.70	**8.68**
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**180**	--	**2330**	**210**	**2510**	**140**	**60**	**1210**	**250**
Sulphate	ug/l	--	25000	--	118000	16000	2000	71000	55000	44000	68000
Temperature (Field)	deg c	-- [10]	10.4	--	0.3	11.3	16.5	7.8	17.5	17.1	4.9
Total Dissolved Solids	ug/l	--	271000	--	575000	201000	283000	417000	462000	477000	425000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	30000	--	2020000	11000	93000	3000	5000	398000	112000
Metals											
Arsenic	ug/l	100 [11]	0.9	--	4.1	1.7	1.4	0.9	<1	<50	<50
Boron	ug/l	200 [12]	53	--	**205**	167	125	81	60	<100	<100
Cadmium	ug/l	0.2 [11]	<0.1	--	<0.1	<0.1	<0.1	<0.1	<0.1	**<10**	**<10**
Calcium	ug/l	--	41900	--	53100	18200	25800	46900	54000	52000	50000
Chromium	ug/l	-- [13]	<2	--	**86**	<2	5	<2	3	**<50**	**<20**
Cobalt	ug/l	0.9	0.8	--	**21.7**	<0.5	**1.8**	0.9	0.3	<10	<5
Copper	ug/l	5	**21**	--	**42**	<2	**8**	<2	3	**20**	**10**
Iron	ug/l	300	**1300**	--	**40600**	**1020**	**979**	**676**	**470**	**18900**	**3800**
Lead	ug/l	-- [14]	0.8	--	**14.8**	<0.1	2.1	<0.1	<1	**<10**	**<10**
Magnesium	ug/l	--	12300	--	19900	5950	12500	15400	14000	14000	15000
Manganese	ug/l	--	136	--	1040	156	1110	191	40	560	110
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5200	--	8000	3300	5000	9100	6000	11000	12000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	48100	--	92800	51100	64500	78200	65000	64000	56000
Zinc	ug/l	30 [11]	21	--	**161**	6	**44**	<5	<10	**60**	<50
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	<1	<1	<1	<1	<1	**2**	**4**

Parameter	Unit	PWQO [1]	S11 18-May-2010 S-6	S11 18-Aug-2010 [29] S-3	S11 14-Oct-2010 S-6	S11 19-May-2011 [30] W-5	S11 16-Aug-2011 [2] N-6	S11 30-Nov-2011 [22] S11	S11 30-May-2012 S 11	S11 22-Aug-2012 S-11	S11 29-Nov-2012 S11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	234000	139000	134000	140000	197000	110000	190000	1400000	250000
Ammonia, unionized	ug/l	20	0.12	0.18	0.03	<0.1	0.32	<0.07	0.53	<0.02	0.05
Ammonia Nitrogen	ug/l	--	30	170	30	<20	50	<20	120	<50	150
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	8000	5000	3000	68000	3000	6000	<2000	4000
Chemical Oxygen Demand	ug/l	--	58000	53000	83000	60000	175000	40000	160000	47000	180000
Chloride	ug/l	--	66000	46000	37000	34000	45000	44000	46000	62000	99000
Conductivity	uS/cm	--	708	754	461	452	637	562	--	--	--
Conductivity (Field)	uS/cm	--	767	709	205	447	543	537	498	1111	998
Dissolved Inorganic Carbon	ug/l	--	48900	31000	33900	34900	47700	22300	44000	10000	56000
Dissolved Organic Carbon	ug/l	--	23800	21500	28000	18900	25300	10300	32000	13000	24000
Dissolved Oxygen (Field)	ug/l	-- [7]	**3630**	**5780**	**3780**	**1990**	**1760**	6740	**300**	**2280**	**1550**
Hardness, Calcium Carbonate	ug/l	--	212000	201000	140000	138000	198000	146000	150000	530000	340000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	100	<100	<100	1290	<100	<100	160
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100	<10	<10	<10
Nitrogen, Total Kjeldahl	ug/l	--	1450	1870	920	1760	3300	660	3200	1300	6200
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	<100	<100	160
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.25	6.55	6.83	7.26	7.23	7.40	7.13	**6.15**	6.62
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**120**	**250**	**160**	**110**	**290**	**90**	**340**	**140**	**1600**
Sulphate	ug/l	--	27000	163000	37000	34000	57000	91000	<1000	480000	170000
Temperature (Field)	deg c	-- [10]	12.9	15.88	9	15.4	19.3	6.3	17.4	15.5	0
Total Dissolved Solids	ug/l	--	460000	490000	300000	294000	414000	365000	320000	990000	678000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	14000	69000	17000	33000	517000	65000	60000	10000	460000
Metals											
Arsenic	ug/l	100 [11]	1	<1	<1	<50	<10	<50	1.3	<1.0	4.5
Boron	ug/l	200 [12]	100	**270**	60	<100	190	100	150	**650**	150
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	**<10**	<0.1	**<10**	<0.10	<0.10	**0.24**
Calcium	ug/l	--	57000	54000	38000	37000	53000	37000	42000	150000	96000
Chromium	ug/l	-- [13]	3	5	7	**<50**	4	**<50**	<5.0	<5.0	**29**
Cobalt	ug/l	0.9	0.5	0.7	**1.4**	<10	0.6	<10	0.53	<0.50	**12**
Copper	ug/l	5	1	3	5	**<10**	1	**<10**	2.6	1.8	**14**
Iron	ug/l	300	**990**	**1660**	**2540**	**2000**	**1860**	**4400**	**2200**	**640**	**34000**
Lead	ug/l	-- [14]	<1	1	<1	**<10**	<1	**<10**	0.79	<0.50	**9.3**
Magnesium	ug/l	--	17000	16000	11000	11000	16000	13000	13000	41000	35000
Manganese	ug/l	--	170	250	80	100	370	130	230	110	3400
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	8000	13000	7000	5000	6000	10000	6800	8800	10000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	67000	67000	33000	36000	56000	55000	52000	88000	99000
Zinc	ug/l	30 [11]	<10	<10	<10	<50	<10	<50	<5.0	9.8	**53**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<5	<1	<1	1.0	<1.0	**2.6**

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S11 28-May-2013 S11	S11 15-Aug-2013 S11	S11 21-Nov-2013 SA-5	S11 28-May-2014 [23] S11 (SW-C)	S11 26-Aug-2014 [24] S11	S11 13-Nov-2014 S-11	S11 27-May-2015 S-11	S11 25-Aug-2015 S-11	S11 25-Nov-2015 S-11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	160000	190000	180000	120000	150000	140000	120000	136000	186000
Ammonia, unionized	ug/l	20	0.2	0.22	<0.04	<0.35	0.51	<0.06	1.88	0.12	0.2
Ammonia Nitrogen	ug/l	--	98	130	<50	<50	96	<50	120	30	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	2000	5000	3000	3000	<2000	<6000 [25]	<6000 [25]	<10000 [25]
Chemical Oxygen Demand	ug/l	--	50000	140000	73000	79000	81000	50000	79000	64000	107000
Chloride	ug/l	--	66000	56000	82000	59000	57000	60000	78000	100000	134000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	590	563	770	439	508	478	498	750	62
Dissolved Inorganic Carbon	ug/l	--	35000	50000	46000	28000	40000	34000	30700	29900	42800
Dissolved Organic Carbon	ug/l	--	20000	23000	15000	22000	21000	19000	27300	22300	20400
Dissolved Oxygen (Field)	ug/l	-- [7]	**3680**	**1260**	**4510**	**2430**	**300**	**3130**	**560**	**1560**	**3080**
Hardness, Calcium Carbonate	ug/l	--	190000	170000	220000	120000	130000	130000	22900	176000	270000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<500	<500	<100	<100	<100	<100
Nitrite as N	ug/l	--	<10	<10	<10	<50	<50	11	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1100	2700	1500	2200	2000	880	2100	1000	1300
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	<100	<100	<500	<500	<100	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.94	6.77	6.90	7.44	7.13	7.00	7.61	7.12	7.49
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**58**	**900**	**270**	**310**	**300**	**55**	**240**	**100**	**160**
Sulphate	ug/l	--	58000	23000	110000	23000	16000	20000	17000	117000	75000
Temperature (Field)	deg c	-- [10]	13.1	15.6	1.1	14.0	19.9	3.7	19.8	17.0	0
Total Dissolved Solids	ug/l	--	390000	368000	544000	320000	330000	282000	178000	461000	510000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<1000	120000	40000	90000	38000	3000	4000	8000	31000
Metals											
Arsenic	ug/l	100 [11]	<1.0	2.0	<1.0	1.4	1.7	<1.0	<1	<1	<1
Boron	ug/l	200 [12]	88	**220**	120	81	97	74	23	134	85
Cadmium	ug/l	0.2 [11]	<0.10	0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1
Calcium	ug/l	--	49000	54000	63000	27000	35000	32000	5910	42600	79300
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<5.0	<5.0	<5.0	<1	1	3
Cobalt	ug/l	0.9	<0.50	**2.4**	<0.50	0.72	0.77	<0.50	<0.5	<0.5	<0.5
Copper	ug/l	5	1.6	5.0	2.0	1.7	2.0	1.0	<0.5	<0.5	<0.5
Iron	ug/l	300	**550**	**12000**	**1200**	**2500**	**4300**	**990**	216	**772**	**1210**
Lead	ug/l	-- [14]	<0.50	1.8	0.65	1.7	1.7	<0.50	0.1	<0.1	0.7
Magnesium	ug/l	--	16000	17000	23000	9700	12000	12000	1970	16800	17500
Manganese	ug/l	--	42	3400	210	130	260	87	44	157	90
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5900	9200	10000	4600	6700	5200	859	5860	7960
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	65000	57000	88000	54000	55000	55000	12900	76600	121000
Zinc	ug/l	30 [11]	<5.0	20	5.8	<5.0	7.3	6.6	<5	6	9
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	**1.8**	<1.0	<1.0	**7.3**	<1	**2**	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S11 24-May-2016 S-11	S11 18-Aug-2016 S-11	S11 16-Nov-2016 S-11	S11 18-May-2017 S-11	S11 28-Aug-2017 S-11	S11 28-Nov-2017 S-11	S11 23-May-2018 S-11	S11 30-Aug-2018 S-11	S11 28-Nov-2018 S-11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	136000	32000	136000	150000	159000	110000	121000	249000	65000
Ammonia, unionized	ug/l	20	0.76	0.02	0.27	0.56	0.35	0.07	0.2	0.52	0.04
Ammonia Nitrogen	ug/l	--	100	50	70	40	160	100	30	140	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	10000	3000	3000	2000	34000	4000	3000	<40000 [26]	7000
Chemical Oxygen Demand	ug/l	--	122000	45000	38000	69000	128000	49000	76000	355000	83000
Chloride	ug/l	--	99000	95000	125000	97000	62000	51000	81000	112000	62000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	579	1354	974	648	414	228	530	771	462
Dissolved Inorganic Carbon	ug/l	--	31300	6600	27900	8400	28400	8400	32100	41000	7100
Dissolved Organic Carbon	ug/l	--	20600	15400	11000	34700	48700	32300	21200	37600	26200
Dissolved Oxygen (Field)	ug/l	-- [7]	**3520**	**1650**	**2950**	**930**	**640**	**3090**	**1800**	**1630**	**4570**
Hardness, Calcium Carbonate	ug/l	--	137000	510000	229000	167000	180000	89000	88000	212000	116000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2500	1100	600	900	3200	2500	1600	12600	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.47	**6.05**	7.47	7.55	7.00	6.94	7.42	7.08	6.93
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**490**	**170**	**80**	**80**	**330**	**480**	**140**	**1570**	**160**
Sulphate	ug/l	--	31000	630000	147000	51000	15000	37000	24000	38000	84000
Temperature (Field)	deg c	-- [10]	14.3	19.3	5.6	20.1	12.0	0.3	13.9	16.6	0.2
Total Dissolved Solids	ug/l	--	382000	1090000	540000	394000	348000	268000	298000	500000	308000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	159000	23000	5000	11000	208000	466000	22000	138000	41000
Metals											
Arsenic	ug/l	100 [11]	2	2	<1	<5 [17]	1	<1	<1	3	<1
Boron	ug/l	200 [12]	**207**	**542**	109	**201**	**230**	92	109	**435**	115
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1	**0.6**	<0.1
Calcium	ug/l	--	36100	139000	60100	43400	52400	22200	21400	59900	27000
Chromium	ug/l	-- [13]	**10**	2	<1	<5 [17]	5	6	1	8	2
Cobalt	ug/l	0.9	**1.5**	**1.5**	<0.5	<2.5 [17]	**1.7**	**1.1**	<0.5	**2.9**	0.9
Copper	ug/l	5	3.2	1.3	<0.5	<2.5 [17]	**7.7**	2.8	<0.5	4.7	2.3
Iron	ug/l	300	**5170**	**821**	**778**	**1310**	**3450**	**2650**	**1040**	**5120**	**1360**
Lead	ug/l	-- [14]	4.4	2.0	0.3	0.5	1.4	1.8	0.2	2.8	0.7
Magnesium	ug/l	--	11500	39800	19200	14200	12000	8250	8300	15100	11900
Manganese	ug/l	--	342	1000	121	194	525	304	250	2850	213
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5020	9180	6630	5510	4650	3290	2500	13500	5200
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	85600	106000	92400	78500	67500	50400	60300	70700	57200
Zinc	ug/l	30 [11]	**33**	**33**	<5	<25 [17]	18	13	7	17	13
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**13**	**8**	**5**	<1	<1	<1	<1	**6**	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S11 20-Jun-2019 S-11	S11 28-Aug-2019 [20] S-11	S11 21-Nov-2019 S-11	S11 14-May-2020 S-11	S11 26-Aug-2020 [20] S-11	S11 25-Nov-2020 S-11	S11 27-May-2021 S-11	S11 24-Aug-2021 S-11	S11 24-Nov-2021 S-11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	117000	--	66000	96000	--	80000	204000	240000	207000
Ammonia, unionized	ug/l	20	0.13	--	0.05	0.08	--	0.06	0.39	2.54	0.04
Ammonia Nitrogen	ug/l	--	50	--	180	20	--	40	90	1590	70
Biochemical Oxygen Demand, 5 Day	ug/l	--	12000	--	<60000 [26]	<2000	--	2000	11000	<40000 [26]	<40000 [26]
Chemical Oxygen Demand	ug/l	--	78000	--	137000	64000	--	76000	103000	317000	231000
Chloride	ug/l	--	75000	--	121000	92000	--	113000	104000	91000	101000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	502	--	1317	594	--	15	731	760	961
Dissolved Inorganic Carbon	ug/l	--	24700	--	<500	19400	--	20000	50000	48100	49400
Dissolved Organic Carbon	ug/l	--	19600	--	22500	26600	--	20700	29900	32200	23100
Dissolved Oxygen (Field)	ug/l	-- [7]	**1310**	--	**2040**	**4800**	--	**4260**	**1220**	**570**	**1970**
Hardness, Calcium Carbonate	ug/l	--	111000	--	404000	127000	--	194000	204000	226000	262000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	<100	--	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	--	<50	<50	--	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1800	--	6500	900	--	1500	1500	20500	1300
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.87	--	**6.49**	7.31	--	7.25	7.28	6.59	6.85
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**130**	--	**1270**	**40**	--	**210**	**170**	**5270**	**80**
Sulphate	ug/l	--	19000	--	371000	84000	--	162000	16000	5000	127000
Temperature (Field)	deg c	-- [10]	18.1	--	0.2	10.0	--	-0.1	12.7	20.5	0.7
Total Dissolved Solids	ug/l	--	282000	--	720000	306000	--	514000	436000	448000	546000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	38000	--	394000	4000	--	16000	4000	17000	48000
Metals											
Arsenic	ug/l	100 [11]	<1	--	2	<1	--	<1	1	4	<1
Boron	ug/l	200 [12]	111	--	**238**	97	--	137	117	143	94
Cadmium	ug/l	0.2 [11]	<0.1	--	0.1	<0.1	--	<0.1	<0.1	**0.5**	0.1
Calcium	ug/l	--	28400	--	108000	31600	--	50200	53600	59100	71600
Chromium	ug/l	-- [13]	1	--	**13**	5	--	1	2	**43**	8
Cobalt	ug/l	0.9	<0.5	--	**7.7**	<0.5	--	**1.4**	**1.1**	**7.6**	**1.4**
Copper	ug/l	5	0.8	--	**6.4**	1.2	--	1.2	0.7	**19.3**	4.0
Iron	ug/l	300	**706**	--	**11800**	**621**	--	**1660**	**1180**	**18300**	**2810**
Lead	ug/l	-- [14]	0.1	--	4.5	0.3	--	0.6	0.3	**15.9**	3.0
Magnesium	ug/l	--	9840	--	32600	11700	--	16600	16900	19100	20300
Manganese	ug/l	--	195	--	2650	68	--	594	1130	1110	206
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	2650	--	10900	3100	--	6860	8230	10300	7540
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	61700	--	89900	64200	--	75700	79200	70900	82100
Zinc	ug/l	30 [11]	6	--	**37**	<5	--	6	6	**69**	14
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	**5**	<1	--	**9**	**3**	<1	**7**

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S12 28-Jun-1995	S12 14-Nov-1995	S12 13-Jun-1996	S12 12-Oct-1996	S12 17-Jun-1997	S12 05-Nov-1997	S12 05-Jun-1998	S12 30-Jun-1998	S12 26-Aug-1998
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	735000	186000	67000	288000	231000	232000	576000	436000	102000
Ammonia, unionized	ug/l	20	--	--	--	--	--	--	--	--	--
Ammonia Nitrogen	ug/l	--	840	810	40	570	10	100	30	70	470
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	4000	3000	7000	23000	2000	5000	7000	6000
Chemical Oxygen Demand	ug/l	--	167000	70000	65000	75000	90000	41000	122000	170000	10000
Chloride	ug/l	--	157000	60000	37000	113000	127000	181000	317000	242000	28900
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1276	890	530	920	793	1350	1920	1530	341
Dissolved Inorganic Carbon	ug/l	--	166000	6600	15700	66800	43600	46300	118000	61400	23800
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	5750	--	9750	9580	10590	7850	17570	9570	6520
Hardness, Calcium Carbonate	ug/l	--	449000	203000	133000	328000	235000	326000	507000	295000	150000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	100	400	--	--	--	--	--	--	--
Nitrite as N	ug/l	--	100	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	3000	10000	1910	2650	6160	1420	4140	2280	1220
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	2160	9190	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.07	7.63	7.09	7.34	7.74	7.52	--	7.9	7.88
Phosphorus	ug/l	-- [9]	**300**	**140**	**320**	**180**	**970**	**130**	**150**	**250**	**450**
Sulphate	ug/l	--	45000	51000	--	--	--	--	--	--	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	736000	450000	270000	460000	398000	680000	950000	770000	171000
Total Organic Carbon	ug/l	--	50300	64200	20100	28000	30200	17100	42900	38600	8000
Total Suspended Solids	ug/l	--	38000	79000	7000	26000	116000	48000	22000	21000	103000
Metals											
Arsenic	ug/l	100 [11]	100	--	--	--	--	--	--	--	--
Boron	ug/l	200 [12]	**2600**	**710**	**678**	**1600**	**1870**	**1180**	**4480**	**3900**	**390**
Cadmium	ug/l	0.2 [11]	0.1	0.1	--	--	--	--	--	--	--
Calcium	ug/l	--	78200	53000	32900	81100	53400	82100	93800	44800	44900
Chromium	ug/l	-- [13]	**24**	**10**	--	--	--	--	--	--	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	3.6	2.4	**4300**	2.6	0.5	**10.4**	4.6	1.8	**5.8**
Iron	ug/l	300	**1300**	**1550**	**1240**	**1510**	**6090**	**910**	**390**	**550**	**3680**
Lead	ug/l	-- [14]	1	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.6
Magnesium	ug/l	--	35100	17000	12300	29900	24200	28900	66100	43800	8960
Manganese	ug/l	--	425	150	114	110	480	160	20	640	70
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	**34**	20	20	20	**30**	20	20
Potassium	ug/l	--	26800	17600	10100	16800	11800	12900	21100	23900	5300
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	103000	66000	51900	92700	107000	131000	268000	238000	33000
Zinc	ug/l	30 [11]	10	20	10	10	20	**80**	20	10	**330**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	--	1	--	**14**	1	1	1	1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S12 30-Oct-1998	S12 19-Oct-1999	S12 03-May-2000	S12 25-Oct-2000	S12 13-Jun-2001	S12 27-Sep-2001	S12 21-Nov-2001	S12 22-May-2002	S12 12-Nov-2002
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	62000	24000	98000	145000	137000	38000	112000	131000	52000
Ammonia, unionized	ug/l	20	10	--	10	--	<20	<20	<20	--	--
Ammonia Nitrogen	ug/l	--	40	130	60	--	20	50	10	20	20
Biochemical Oxygen Demand, 5 Day	ug/l	--	6000	5000	3000	--	8000	1000	1000	1000	3000
Chemical Oxygen Demand	ug/l	--	202000	120000	84000	--	66000	46000	38000	45000	71000
Chloride	ug/l	--	45800	55000	45500	82000	61600	119000	89200	34200	78200
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	342	410	319	487	500	960	500	250	--
Dissolved Inorganic Carbon	ug/l	--	43200	20500	16600	--	21500	5200	16000	16000	11000
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	5080	7710	5830	1720	4500	3570	7540	7330	--
Hardness, Calcium Carbonate	ug/l	--	84000	89000	53000	192000	141000	373000	176000	109000	281000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	--	--	--	100	100	100	100	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	3690	2210	620	20800	1300	1060	770	760	1700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.5	7.2	6.9	7.15	7.3	6.9	6.56	7.03	--
Phosphorus	ug/l	-- [9]	**2850**	**770**	**50**	--	**370**	**160**	**100**	**50**	**330**
Sulphate	ug/l	--	--	--	--	20000	33000	355000	105000	19000	225000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	172000	200000	160000	318000	314000	830000	391000	212000	528000
Total Organic Carbon	ug/l	--	41600	31100	23600	--	25500	17000	19000	13000	22000
Total Suspended Solids	ug/l	--	19000	13000	34000	1580000	67000	5000	58000	4000	62000
Metals											
Arsenic	ug/l	100 [11]	--	--	--	7	1	1	1	1	1
Boron	ug/l	200 [12]	120	**260**	40	**920**	**300**	**790**	**280**	110	**450**
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	18600	22500	11900	49000	36400	101000	46400	30900	77400
Chromium	ug/l	-- [13]	--	--	--	**50**	**10**	**10**	**10**	**10**	**10**
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	2.3	0.5	**5.5**	**39**	1	3.5	2.1	<1	4.3
Iron	ug/l	300	**6860**	**1990**	**440**	**97300**	**1520**	**740**	**2470**	**380**	**1890**
Lead	ug/l	-- [14]	0.2	0.8	0.2	**19**	0.9	0.2	0.2	<1	1.7
Magnesium	ug/l	--	8990	7960	5590	16900	12200	29300	14600	7650	21200
Manganese	ug/l	--	430	810	20	2790	150	230	90	10	120
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	**30**	20	20	20	20	20	20	20	20
Potassium	ug/l	--	12000	14100	4000	5600	1900	13400	5300	4800	8500
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	41000	45800	48000	48400	59000	95800	65200	29700	59900
Zinc	ug/l	30 [11]	**50**	30	10	**250**	10	10	10	10	**40**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**7**	1	**17**	**13**	**37**	1	1	1	1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S12 31-May-2003	S12 03-Jul-2003	S12 22-Oct-2003	S12 17-May-2004	S12 21-Aug-2004	S12 18-Nov-2004	S12 25-May-2005	S12 09-Sep-2005 [20]	S12 09-Nov-2005
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	134000	--	116000
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	<5000	--	<5000
Alkalinity (Total as CaCO3)	ug/l	-- [5]	122000	176000	78000	137000	153000	111000	110000	--	95000
Ammonia, unionized	ug/l	20	--	--	--	<10	<10	<10	<10	--	<10
Ammonia Nitrogen	ug/l	--	160	20	20	10	40	10	<10	--	40
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	2000	3000	2000	13000	16000	8000	--	10000
Chemical Oxygen Demand	ug/l	--	52000	87000	56000	66000	253000	517000	74000	--	245000
Chloride	ug/l	--	53600	29100	70200	44500	41600	56600	51300	--	63700
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	540	450	520	350	360	330	440	--	100
Dissolved Inorganic Carbon	ug/l	--	26000	43000	18000	33800	48000	23300	34100	--	26500
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	17500	--	37400
Dissolved Oxygen (Field)	ug/l	-- [7]	6200	2660	5800	9400	3400	--	6500	--	11200
Hardness, Calcium Carbonate	ug/l	--	169000	138000	--	118000	121000	102000	131000	--	101000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	**80**	--	<300
Nitrate as N	ug/l	--	100	100	200	100	100	200	200	--	100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1020	1660	820	1150	5420	9630	1530	--	3520
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.4	6.79	6.8	7.4	7.5	7.1	7.3	--	7
Phosphorus	ug/l	-- [9]	**70**	**210**	**110**	**90**	**4700**	**4720**	**250**	--	**1280**
Sulphate	ug/l	--	88000	15000	58000	12000	3000	17000	24000	--	51000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	10	--	0
Total Dissolved Solids	ug/l	--	338000	340000	275000	175000	180000	165000	234000	--	270000
Total Organic Carbon	ug/l	--	21000	38000	22000	18200	22000	16800	--	--	--
Total Suspended Solids	ug/l	--	5000	12000	84000	10000	346000	1660000	121000	--	400000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	10	10	<1	--	1
Boron	ug/l	200 [12]	130	**319**	195	121	**241**	**240**	106	--	158
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	<0.1	--	<0.5
Calcium	ug/l	--	46600	36600	33700	32100	31900	26100	35300	--	25800
Chromium	ug/l	-- [13]	**10**	4	8	2	**9**	**100**	4	--	**9**
Cobalt	ug/l	0.9	--	--	--	--	--	--	**2**	--	**5**
Copper	ug/l	5	2	2	**15**	**15**	**86**	**111**	<2	--	**18**
Iron	ug/l	300	**540**	**2270**	**617**	**1110**	**2700**	**2480**	**3660**	--	**1390**
Lead	ug/l	-- [14]	0.5	1.2	1.3	0.2	**9.6**	**6.7**	0.7	--	5
Magnesium	ug/l	--	12800	11400	10700	9210	10100	8850	10500	--	8790
Manganese	ug/l	--	50	394	41	137	9	15800	151	--	894
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	<0.05	--	<0.06
Molybdenum	ug/l	40	--	--	--	--	--	--	<0.5	--	<5
Nickel	ug/l	25	20	10	10	20	**50**	**50**	<10	--	<10
Potassium	ug/l	--	5700	1600	13200	5600	3800	6600	4500	--	5400
Selenium	ug/l	100	--	--	--	--	--	--	<1	--	<1
Sodium	ug/l	--	49600	49600	54000	50200	51000	40700	42000	--	62000
Zinc	ug/l	30 [11]	10	5	11	26	**190**	**278**	16	--	**128**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	**3**	<1	--	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S12 24-May-2006	S12 15-Aug-2006	S12 16-Nov-2006	S12 08-May-2007	S12 22-Aug-2007 [20]	S12 20-Nov-2007	S12 23-May-2008	S12 12-Aug-2008	S12 06-Nov-2008
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	114000	172000	65000	89000	--	89000	97000	110000	84000
Ammonia, unionized	ug/l	20	<10	<10	<10	0.0901869	--	<10	<20	<20	<20
Ammonia Nitrogen	ug/l	--	<10	20	30	<10	--	20	<10	<10	30
Biochemical Oxygen Demand, 5 Day	ug/l	--	6000	17000	<3000	<3000	--	5000	<3000	4000	<3000
Chemical Oxygen Demand	ug/l	--	72000	367000	42000	49000	--	234000	44000	108000	67000
Chloride	ug/l	--	34300	35300	18000	34900	--	48900	38600	27900	47500
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	407	670	170	300	--	290	335	315	385
Dissolved Inorganic Carbon	ug/l	--	27100	43000	17600	22300	--	24000	24300	33300	22500
Dissolved Organic Carbon	ug/l	--	18100	29400	14600	14200	--	32900	17900	32900	21700
Dissolved Oxygen (Field)	ug/l	-- [7]	9400	**1600**	7360	**5330**	--	**7620**	6990	**110**	**2490**
Hardness, Calcium Carbonate	ug/l	--	103000	116000	35000	103000	--	91000	94000	73000	103000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	100	<100	<100	--	1000	<100	100	<100
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	2040	7190	980	640	--	5400	800	1870	1740
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.9	6.7	6.9	7.6	--	7.8	7.3	7.1	6.8
Phosphorus	ug/l	-- [9]	**470**	**8350**	**170**	**50**	--	**1160**	**70**	**1750**	**380**
Sulphate	ug/l	--	41000	2000	19000	18000	--	28000	16000	1000	28000
Temperature (Field)	deg c	-- [10]	5	15.5	7	12.6	--	0	10.9	17	7
Total Dissolved Solids	ug/l	--	218000	229000	122000	185000	--	216000	183000	170000	207000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	390000	645000	81000	4000	--	196000	<3000	55000	23000
Metals											
Arsenic	ug/l	100 [11]	<1	6.9	1	0.6	--	3.4	1.3	2.7	1.2
Boron	ug/l	200 [12]	72	139	47	48	--	77	42	89	157
Cadmium	ug/l	0.2 [11]	0.2	<0.1	**<0.5**	<0.1	--	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	18200	27500	8550	28500	--	17600	26400	16800	25800
Chromium	ug/l	-- [13]	**22**	**10**	6	<2	--	**18**	<2	<2	2
Cobalt	ug/l	0.9	**6.7**	**5.5**	<0.5	<0.5	--	**5.2**	<0.5	**1.8**	**2**
Copper	ug/l	5	**225**	**35**	**38**	**19**	--	**17**	<2	**6**	<2
Iron	ug/l	300	228	**2620**	**860**	**800**	--	**812**	**497**	**2690**	**2500**
Lead	ug/l	-- [14]	**10.5**	2.8	0.6	0.3	--	**5.9**	<0.1	0.7	<0.1
Magnesium	ug/l	--	13900	11600	3320	7700	--	11400	6720	7530	9280
Manganese	ug/l	--	3550	4150	45	26	--	803	13	1200	871
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	7000	4000	3600	3600	--	7800	3700	2800	2400
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	38400	42100	28900	37500	--	42900	33400	42700	40300
Zinc	ug/l	30 [11]	**146**	**50**	20	16	--	**65**	<5	**32**	6
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	--	<1	<1	<1	**3**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S12 13-May-2009 S-9	S12 25-Aug-2009 [27] A-5	S12 27-Nov-2009 S-12	S12 18-May-2010 S-4	S12 18-Aug-2010 [31] S-6	S12 14-Oct-2010 S-5	S12 19-May-2011 [32] W-9	S12 16-Aug-2011 [20] S-12	S12 30-Nov-2011 [22] S12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	108000	146000	81000	117000	107000	94000	105000	--	81000
Ammonia, unionized	ug/l	20	<0.68	0.24	0.01	0.11	0.07	0.07	<0.11	--	<0.07
Ammonia Nitrogen	ug/l	--	<20	150	20	30	30	30	<20	--	<20
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	12000	2000	3000	4000	6000	2000	--	2000
Chemical Oxygen Demand	ug/l	--	50000	133000	118000	58000	88000	450000	50000	--	63000
Chloride	ug/l	--	41000	28000	37000	28000	28000	24000	21000	--	33000
Conductivity	uS/cm	--	373	373	324	316	336	274	269	--	330
Conductivity (Field)	uS/cm	--	340	405	246	355	318	530	285	--	325
Dissolved Inorganic Carbon	ug/l	--	27300	43300	20900	26600	24000	19600	26300	--	14500
Dissolved Organic Carbon	ug/l	--	19800	35900	17900	21400	38000	21100	21900	--	17400
Dissolved Oxygen (Field)	ug/l	-- [7]	**4870**	**330**	**4660**	**4330**	**2680**	8740	**2990**	--	**6790**
Hardness, Calcium Carbonate	ug/l	--	100000	105000	72000	91000	96000	80000	86000	--	86000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	--	<100
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	--	<100
Nitrogen, Total Kjeldahl	ug/l	--	870	2740	1700	2710	2700	5620	1180	--	710
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8.1	6.64	6.76	7.27	6.92	7.13	7.33	--	7.40
Phosphorus	ug/l	-- [9]	**160**	**1720**	**690**	**840**	**600**	**4210**	**60**	--	**40**
Sulphate	ug/l	--	12000	1000	16000	1000	16000	4000	2000	--	26000
Temperature (Field)	deg c	-- [10]	15.3	18.9	4.7	11.1	16.1	8.5	14.8	--	6.0
Total Dissolved Solids	ug/l	--	242000	242000	211000	205000	218000	178000	175000	--	214000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	50000	69000	111000	62000	54000	408000	<2000	--	72000
Metals											
Arsenic	ug/l	100 [11]	1	<50	<50	<1	<50	<50	<1	--	<50
Boron	ug/l	200 [12]	50	100	<100	70	200	100	50	--	<100
Cadmium	ug/l	0.2 [11]	<0.1	**<10**	**<10**	<0.1	**<10**	**<10**	<0.1	--	**<10**
Calcium	ug/l	--	27000	29000	19000	25000	27000	22000	23000	--	23000
Chromium	ug/l	-- [13]	2	**<50**	**20**	2	**<50**	**<50**	2	--	**<50**
Cobalt	ug/l	0.9	0.7	<10	<5	0.6	<10	<10	<0.2	--	<10
Copper	ug/l	5	3	**<10**	**20**	1	**<10**	**<10**	<1	--	**<10**
Iron	ug/l	300	**1260**	**22000**	**9300**	**3380**	**15200**	**30900**	**530**	--	**2600**
Lead	ug/l	-- [14]	4	**<10**	**<10**	<1	**<10**	**<10**	<1	--	**<10**
Magnesium	ug/l	--	8000	8000	6000	7000	7000	6000	7000	--	7000
Manganese	ug/l	--	80	890	220	240	400	1090	30	--	80
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5000	6000	5000	5000	4000	4000	4000	--	4000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	38000	31000	29000	29000	31000	21000	23000	--	29000
Zinc	ug/l	30 [11]	**40**	<50	**60**	<10	**800**	<50	<10	--	<50
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	1	<5	--	<1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S12 30-May-2012 S12	S12 22-Aug-2012 [20] S-12	S12 29-Nov-2012 [20] S12	S12 28-May-2013 S12	S12 15-Aug-2013 [20] S12	S12 21-Nov-2013 SA-9	S12 28-May-2014 [23] S12 (SW-E)	S12 26-Aug-2014 [24] S12	S12 13-Nov-2014 [24] S-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	140000	--	--	90000	--	73000	120000	140000	61000
Ammonia, unionized	ug/l	20	<0.16	--	--	0.43	--	<0.12	0.28	0.53	<0.13
Ammonia Nitrogen	ug/l	--	<50	--	--	100	--	<50	62	150	<50
Biochemical Oxygen Demand, 5 Day	ug/l	--	10000	--	--	<2000	--	2000	2000	6000	<2000
Chemical Oxygen Demand	ug/l	--	270000	--	--	74000	--	210000	130000	200000	91000
Chloride	ug/l	--	22000	--	--	29000	--	31000	46000	32000	27000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	328	--	--	274	--	295	393	396	240
Dissolved Inorganic Carbon	ug/l	--	30000	--	--	20000	--	21000	29000	39000	14000
Dissolved Organic Carbon	ug/l	--	42000	--	--	22000	--	31000	20000	29000	30000
Dissolved Oxygen (Field)	ug/l	-- [7]	**3910**	--	--	**3510**	--	**5240**	**4180**	**1080**	9290
Hardness, Calcium Carbonate	ug/l	--	120000	--	--	87000	--	80000	110000	120000	63000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	--	<100	--	<100	<500	<500	<500
Nitrite as N	ug/l	--	<10	--	--	<10	--	<10	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	5000	--	--	2000	--	5200	13000	3800	920
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	--	--	<100	--	<100	<500	<500	<500
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.92	--	--	7.27	--	7.45	7.29	7.02	7.39
Phosphorus	ug/l	-- [9]	**1500**	--	--	**360**	--	**480**	**780**	**2400**	**520**
Sulphate	ug/l	--	<1000	--	--	<1000	--	13000	<1000	<1000	<1000
Temperature (Field)	deg c	-- [10]	19.3	--	--	12.9	--	0.3	13.0	18.0	2.9
Total Dissolved Solids	ug/l	--	272000	--	--	166000	--	244000	284000	262000	148000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	120000	--	--	44000	--	150000	23000	250000	33000
Metals											
Arsenic	ug/l	100 [11]	3.7	--	--	1.3	--	1.4	1.2	3.0	<1.0
Boron	ug/l	200 [12]	96	--	--	62	--	56	52	65	46
Cadmium	ug/l	0.2 [11]	<0.10	--	--	<0.10	--	<0.10	<0.10	<0.10	<0.10
Calcium	ug/l	--	36000	--	--	23000	--	25000	32000	35000	18000
Chromium	ug/l	-- [13]	5.6	--	--	<5.0	--	<5.0	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	**5.3**	--	--	**1.3**	--	**1.7**	**1.3**	**5.1**	0.77
Copper	ug/l	5	4.1	--	--	1.4	--	2.9	1.5	1.9	1.1
Iron	ug/l	300	**22000**	--	--	**4500**	--	**6000**	**3800**	**19000**	**4300**
Lead	ug/l	-- [14]	1.7	--	--	<0.50	--	1.4	0.56	0.97	<0.50
Magnesium	ug/l	--	9300	--	--	7100	--	8400	9400	10000	6100
Manganese	ug/l	--	2200	--	--	500	--	320	460	2600	260
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	3500	--	--	4100	--	4600	5000	1700	2900
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	29000	--	--	30000	--	29000	43000	36000	23000
Zinc	ug/l	30 [11]	15	--	--	7.4	--	12	11	13	5.6
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**1.6**	--	--	<1.0	--	**2.2**	<1.0	<1.0	**9.5**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S12 27-May-2015 S-12	S12 25-Aug-2015 S-12	S12 25-Nov-2015 S-12	S12 24-May-2016 S-12	S12 18-Aug-2016 S-12	S12 16-Nov-2016 S-12	S12 18-May-2017 S-12	S12 28-Aug-2017 S-12	S12 28-Nov-2017 S-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	104000	116000	103000	123000	65000	158000	139000	115000	139000
Ammonia, unionized	ug/l	20	1.69	0.85	0.04	0.59	0.24	0.39	0.61	0.04	0.08
Ammonia Nitrogen	ug/l	--	110	20	30	90	90	80	40	20	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	<20000 [25]	<75000 [25]	2000	13000	18000	4000	20000	<200000 [26]	3000
Chemical Oxygen Demand	ug/l	--	143000	321000	83000	192000	120000	59000	76000	1120000	53000
Chloride	ug/l	--	54000	52000	58000	66000	74000	100000	48000	35000	57000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	362	399	191	439	686	811	434	264	62
Dissolved Inorganic Carbon	ug/l	--	18500	4500	27100	9600	12800	31300	2300	<500	12000
Dissolved Organic Carbon	ug/l	--	37500	59500	27800	46500	30400	16200	40300	94900	35700
Dissolved Oxygen (Field)	ug/l	-- [7]	**2680**	**1060**	**4250**	**710**	**3500**	**3610**	**810**	**1710**	**2330**
Hardness, Calcium Carbonate	ug/l	--	17600	116000	289000	144000	161000	214000	138000	163000	139000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	2800	6200	1100	4400	3000	800	900	7100	2100
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.65	8.18	7.26	7.50	6.86	7.57	7.67	6.90	7.23
Phosphorus	ug/l	-- [9]	**960**	**3130**	**90**	**2000**	**1110**	**130**	**130**	**7620**	**750**
Sulphate	ug/l	--	4000	<1000	19000	5000	168000	72000	20000	2000	38000
Temperature (Field)	deg c	-- [10]	18.3	15.9	0	11.5	19	5.6	17.5	13.1	0
Total Dissolved Solids	ug/l	--	222000	275000	266000	306000	482000	458000	268000	212000	306000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	114000	220000	39000	272000	49000	15000	62000	2020000	508000
Metals											
Arsenic	ug/l	100 [11]	<1	6	<1	3	3	<1	<5 [17]	3	2
Boron	ug/l	200 [12]	16	95	54	63	**354**	117	154	83	69
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.5 [17]	<0.1	<0.1
Calcium	ug/l	--	4760	30400	18500	41900	42700	58300	38800	49400	37800
Chromium	ug/l	-- [13]	<1	8	2	5	4	2	<5 [17]	3	4
Cobalt	ug/l	0.9	0.7	**4.4**	<0.5	**2.5**	**1.3**	<0.5	<2.5 [17]	**4.3**	**1.9**
Copper	ug/l	5	<0.5	<0.5	<0.5	3.2	3.4	0.7	3.2	1.8	1.9
Iron	ug/l	300	**1610**	**59200**	**845**	**47000**	**7760**	**1050**	**2810**	**52400**	**12000**
Lead	ug/l	-- [14]	0.5	4.3	0.2	2.7	1.2	1.0	0.6	1.2	1.1
Magnesium	ug/l	--	1400	9720	8850	9620	13100	16600	10000	9560	10900
Manganese	ug/l	--	278	1330	39	824	404	111	371	1860	706
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	643	2070	4380	4480	8380	6040	4600	1240	4400
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	8050	41300	49400	49400	64300	86400	42800	39000	43000
Zinc	ug/l	30 [11]	5	28	6	24	**34**	27	<25 [17]	19	9
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	**6**	<1	**23**	**9**	**9**	<1	<10 [33]	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S12 23-May-2018 S-12	S12 30-Aug-2018 [20] S-12	S12 28-Nov-2018 S-12	S12 20-Jun-2019 S-12	S12 28-Aug-2019 S-12	S12 21-Nov-2019 S-12	S12 14-May-2020 S-12	S12 26-Aug-2020 S-12	S12 25-Nov-2020 S-12
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	118000	--	51000	164000	10000	85000	72000	83000	118000
Ammonia, unionized	ug/l	20	0.15	--	0.27	0.34	0.02	0.01	0.07	0.24	1.97
Ammonia Nitrogen	ug/l	--	30	--	100	130	30	30	30	200	160
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	--	4000	203000	6000	<20000 [26]	4000	16000	<400000 [26]
Chemical Oxygen Demand	ug/l	--	52000	--	107000	807000	73000	101000	82000	697000	1400000
Chloride	ug/l	--	67000	--	40000	54000	3000	92000	54000	109000	69000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	446	--	161	482	84	767	326	723	8
Dissolved Inorganic Carbon	ug/l	--	28700	--	5500	34400	<500	<500	17300	<500	27200
Dissolved Organic Carbon	ug/l	--	17400	--	15700	24800	9300	15400	21300	20200	19500
Dissolved Oxygen (Field)	ug/l	-- [7]	**4900**	--	**6430**	**4610**	5570	9800	**5330**	**2030**	**1420**
Hardness, Calcium Carbonate	ug/l	--	92000	--	75000	124000	30600	215000	76000	230000	298000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	--	<100	<100	<100	<100	<100	<100	<100
Nitrite as N	ug/l	--	<50	--	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1200	--	2200	10900	1100	1500	1100	14300	61700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.37	--	7.51	6.96	**6.22**	6.63	7.00	6.64	8.18
Phosphorus	ug/l	-- [9]	**140**	--	**530**	**8390**	**300**	**370**	**190**	**3360**	**19100**
Sulphate	ug/l	--	9000	--	13000	2000	17000	127000	19000	130000	44000
Temperature (Field)	deg c	-- [10]	11.8	--	0	15.7	18.7	0.1	13.0	15.1	0
Total Dissolved Solids	ug/l	--	258000	--	144000	328000	50000	384000	154000	436000	330000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	18000	--	198000	1110000	113000	189000	59000	986000	7970000
Metals											
Arsenic	ug/l	100 [11]	<1	--	1	9	<1	1	<1	5	5
Boron	ug/l	200 [12]	86	--	46	109	63	127	48	145	115
Cadmium	ug/l	0.2 [11]	<0.1	--	**0.2**	0.2	<0.1	<0.1	<0.1	**0.3**	**0.6**
Calcium	ug/l	--	25900	--	21300	34200	8860	56600	20300	58700	89800
Chromium	ug/l	-- [13]	<1	--	**20**	6	**12**	3	6	**64**	**18**
Cobalt	ug/l	0.9	<0.5	--	**2.1**	**9.3**	**1.2**	0.8	0.7	**10.5**	**39.8**
Copper	ug/l	5	<0.5	--	**6.4**	**17.8**	4.4	2.4	2.7	**25.9**	**31.9**
Iron	ug/l	300	**604**	--	**6530**	**132000**	**3630**	**5020**	**2840**	**26400**	**83300**
Lead	ug/l	-- [14]	<0.1	--	**6.6**	**5.6**	**4.0**	0.8	**3.1**	**15.5**	**14.3**
Magnesium	ug/l	--	6750	--	5160	9310	2070	17900	6170	20400	17800
Manganese	ug/l	--	30	--	165	3240	55	313	121	428	11200
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	3580	--	3290	2240	1620	5410	3170	16000	8500
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	43400	--	30600	51500	8130	75500	34100	78500	52300
Zinc	ug/l	30 [11]	7	--	23	**40**	22	13	8	**92**	**145**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	--	**2**	<1	**3**	**4**	**31**	**15**	**25**

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S12 27-May-2021 S-12	S12 24-Aug-2021 S-12	S12 24-Nov-2021 S-12
General Chemistry					
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	166000	180000	98000
Ammonia, unionized	ug/l	20	0.16	0.14	0.03
Ammonia Nitrogen	ug/l	--	60	40	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	6000	3000
Chemical Oxygen Demand	ug/l	--	149000	114000	112000
Chloride	ug/l	--	47000	56000	42000
Conductivity	uS/cm	--	--	--	--
Conductivity (Field)	uS/cm	--	468	549	417
Dissolved Inorganic Carbon	ug/l	--	44400	37800	24400
Dissolved Organic Carbon	ug/l	--	29600	25400	34000
Dissolved Oxygen (Field)	ug/l	-- [7]	**4260**	**320**	**2470**
Hardness, Calcium Carbonate	ug/l	--	146000	150000	96300
Hydrogen Sulfide	ug/l	2 [8]	--	--	--
Nitrate as N	ug/l	--	100	<100	<100
Nitrite as N	ug/l	--	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	3800	2600	1500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--
Nitrogen, Organic	ug/l	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.06	6.87	6.82
Phosphorus	ug/l	-- [9]	**1800**	**390**	**230**
Sulphate	ug/l	--	<1000	15000	28000
Temperature (Field)	deg c	-- [10]	12.8	22.0	0.8
Total Dissolved Solids	ug/l	--	284000	346000	256000
Total Organic Carbon	ug/l	--	--	--	--
Total Suspended Solids	ug/l	--	59000	68000	33000
Metals					
Arsenic	ug/l	100 [11]	2	1	<1
Boron	ug/l	200 [12]	63	92	42
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1
Calcium	ug/l	--	40100	40900	25900
Chromium	ug/l	-- [13]	3	7	5
Cobalt	ug/l	0.9	**2.3**	0.8	0.5
Copper	ug/l	5	1.3	2.0	1.8
Iron	ug/l	300	**9170**	**3710**	**1920**
Lead	ug/l	-- [14]	0.6	2.2	1.5
Magnesium	ug/l	--	11100	11700	7720
Manganese	ug/l	--	684	371	102
Mercury, dissolved	ug/l	0.2 [15]	--	--	--
Molybdenum	ug/l	40	--	--	--
Nickel	ug/l	25	--	--	--
Potassium	ug/l	--	5860	5190	4890
Selenium	ug/l	100	--	--	--
Sodium	ug/l	--	43500	46000	31200
Zinc	ug/l	30 [11]	9	9	6
Phenols					
Phenolics, Total Recoverable	ug/l	1 [16]	**7**	**5**	**11**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S15 13-Jun-2001	S15 27-Sep-2001	S15 21-Nov-2001	S15 22-May-2002	S15 08-Nov-2002	S15 31-May-2003	S15 03-Jul-2003	S15 22-Oct-2003	S15 17-May-2004
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	241000	189000	177000	199000	225000	168000	253000	189000	214000
Ammonia, unionized	ug/l	20	<20	<20	<20	--	--	--	--	--	<10
Ammonia Nitrogen	ug/l	--	30	30	20	20	30	240	10	250	10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	1000	1000	1000	2000	1000	2000
Chemical Oxygen Demand	ug/l	--	30000	27000	26000	28000	35000	48000	27000	58000	37000
Chloride	ug/l	--	200000	282000	191000	173000	275000	146000	232000	221000	203000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1000	1340	910	860	1400	880	1240	1280	1140
Dissolved Inorganic Carbon	ug/l	--	37800	45900	24800	7000	63000	18000	63000	45000	33700
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	12800	9600	12190	11110	9700	9160	6630	10400	9800
Hardness, Calcium Carbonate	ug/l	--	312000	428000	263000	298000	427000	228000	362000	--	308000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	300	200	1300	600	1000	700	200	1300	300
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	810	760	610	560	1170	1090	620	1740	700
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8	7.96	7.23	7.22	7.1	7.9	7.92	7.98	7.9
Phosphate	ug/l	--	90	80	30	40	160	70	30	220	30
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	40000	157000	80000	56000	140000	58000	68000	75000	56000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	594000	904000	600000	558000	700000	495000	810000	672000	570000
Total Organic Carbon	ug/l	--	12200	11800	15000	9000	12000	42000	18000	24000	10100
Total Suspended Solids	ug/l	--	40000	7000	13000	9000	75000	8000	3000	40000	18000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1	1	1
Boron	ug/l	200 [12]	100	90	60	60	90	40	71	54	53
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	90500	131000	81200	91800	130000	70200	108000	92500	92300
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	**10**	2	**10**	1
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	3.5	3.5	2	<1	**6.4**	4	2	**15**	3
Iron	ug/l	300	**1600**	250	200	**380**	**1690**	**400**	147	**1810**	**344**
Lead	ug/l	-- [14]	1.2	0.2	0.2	<1	3.9	0.5	0.5	2.3	0.3
Magnesium	ug/l	--	21000	24400	14700	16700	24800	12900	22500	15900	18800
Manganese	ug/l	--	160	160	90	140	380	100	161	194	199
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	20	10	10	10
Potassium	ug/l	--	8400	19700	9500	12000	18300	11200	14400	24200	11200
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	107000	145000	96000	107000	152000	85300	138000	146000	125000
Zinc	ug/l	30 [11]	10	10	10	20	30	10	5	25	5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**50**	1	1	1	1	1	1	1	1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S15 21-Aug-2004	S15 18-Nov-2004	S15 25-May-2005	S15 09-Sep-2005	S15 09-Nov-2005	S15 24-May-2006	S15 15-Aug-2006	S15 16-Nov-2006	S15 08-May-2007
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	332000	913000	366000	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	<5000	<5000	<5000	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	336000	250000	272000	748000	300000	95000	354000	121000	236000
Ammonia, unionized	ug/l	20	<10	<10	20	**340**	10	<10	<10	--	0.6242
Ammonia Nitrogen	ug/l	--	60	60	2160	8300	150	30	<10	80	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	21000	9000	<3000	<3000	<3000	<3000	<3000
Chemical Oxygen Demand	ug/l	--	32000	32000	94000	212000	25000	44000	29000	41000	30000
Chloride	ug/l	--	207000	252000	194000	171000	341000	61000	281000	48300	181000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1160	1070	1550	1800	970	290	1550	320	800
Dissolved Inorganic Carbon	ug/l	--	28500	25400	73400	180000	61400	25400	85000	30300	56600
Dissolved Organic Carbon	ug/l	--	--	--	19800	99200	10600	21800	18600	15100	10100
Dissolved Oxygen (Field)	ug/l	-- [7]	8700	8270	**4690**	**2700**	10100	8900	**1800**	9600	9990
Hardness, Calcium Carbonate	ug/l	--	410000	337000	363000	604000	453000	129000	410000	93000	290000
Hydrogen Sulfide	ug/l	2 [8]	--	--	<10	<300	**10**	--	--	--	--
Nitrate as N	ug/l	--	200	700	100	3400	800	300	300	500	400
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	830	730	5380	15600	760	870	580	1020	560
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8	7.2	7.5	7.9	7	7.8	7.5	--	8.3
Phosphate	ug/l	--	20	40	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	--	**710**	**1130**	30	**60**	30	**180**	10
Sulphate	ug/l	--	67000	80000	45000	45000	101000	31000	80000	34000	57000
Temperature (Field)	deg c	-- [10]	--	--	19.1	18.2	0	11	17	8	17.6
Total Dissolved Solids	ug/l	--	580000	535000	665000	1050000	1020000	234000	904000	244000	614000
Total Organic Carbon	ug/l	--	10000	9800	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	5000	13000	10000	12000	16000	3000	9000	58000	3000
Metals											
Arsenic	ug/l	100 [11]	1	1	<1	2	<1	<1	1.1	1	0.9
Boron	ug/l	200 [12]	78	48	65	109	65	27	73	32	52
Cadmium	ug/l	0.2 [11]	--	--	<0.1	0.2	<0.5	0.2	<0.1	**<0.5**	<0.1
Calcium	ug/l	--	119000	99800	110000	154000	136000	38800	120000	26800	84700
Chromium	ug/l	-- [13]	1	3	<2	3	<2	<2	<2	8	<2
Cobalt	ug/l	0.9	--	--	**24**	**4.3**	**1**	0.5	0.4	**1**	0.5
Copper	ug/l	5	3	3	<2	**13**	<2	<2	2	**40**	**20**
Iron	ug/l	300	283	**1070**	**1730**	**5190**	**525**	**790**	200	**1270**	**362**
Lead	ug/l	-- [14]	1.6	0.6	0.3	1.8	0.5	0.8	0.5	5	0.2
Magnesium	ug/l	--	27200	21200	21300	53300	27400	7770	26800	6390	19000
Manganese	ug/l	--	402	271	734	2120	517	102	246	185	336
Mercury, dissolved	ug/l	0.2 [15]	--	--	<0.05	<0.06	<0.06	--	--	--	--
Molybdenum	ug/l	40	--	--	5.1	0.9	<5	--	--	--	--
Nickel	ug/l	25	10	10	<10	<10	<10	--	--	--	--
Potassium	ug/l	--	11100	14000	28200	151000	15800	4100	11600	7000	8900
Selenium	ug/l	100	--	--	<1	<1	<1	--	--	--	--
Sodium	ug/l	--	146000	144000	125000	143000	231000	36800	183000	44900	120000
Zinc	ug/l	30 [11]	12	8	**127**	**49**	<5	8	<5	**48**	13
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	**14**	<1	<1	<1	<1	<1	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S15 22-Aug-2007 [20]	S15 20-Nov-2007	S15 23-May-2008	S15 12-Aug-2008	S15 06-Nov-2008	S15 13-May-2009 S-2	S15 25-Aug-2009 A-6	S15 27-Nov-2009 S-8	S15 18-May-2010 S-2
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	--	202000	180000	339000	252000	212000	437000	177000	378000
Ammonia, unionized	ug/l	20	--	<10	<20	<20	<20	1.43	1.2	1.43	1
Ammonia Nitrogen	ug/l	--	--	50	<10	<10	70	50	50	80	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	--	3000	<3000	<3000	<3000	2000	<1000	2000	<1000
Chemical Oxygen Demand	ug/l	--	--	21000	38000	42000	23000	40000	60000	38000	30000
Chloride	ug/l	--	--	201000	111000	262000	193000	139000	199000	85000	209000
Conductivity	uS/cm	--	--	--	--	--	--	930	1520	719	1430
Conductivity (Field)	uS/cm	--	--	750	625	1500	1000	800	1226	697	1515
Dissolved Inorganic Carbon	ug/l	--	--	56600	42500	82000	60900	51300	108000	42800	77900
Dissolved Organic Carbon	ug/l	--	--	12400	11300	14000	6400	14500	15600	12600	13700
Dissolved Oxygen (Field)	ug/l	-- [7]	--	10820	11190	8730	6920	11130	9150	13530	12740
Hardness, Calcium Carbonate	ug/l	--	--	281000	193000	346000	306000	257000	417000	192000	393000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	--	600	200	200	400	480	290	290	240
Nitrite as N	ug/l	--	--	--	--	--	--	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	--	710	800	710	740	720	580	680	680
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	--	7.8	8.1	8.5	8.1	7.9	7.83	8.16	7.60
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**150**	**40**	10	20	**40**	30	**130**	<10
Sulphate	ug/l	--	--	75000	33000	49000	66000	40000	58000	49000	52000
Temperature (Field)	deg c	-- [10]	--	1.5	14.2	22.6	9.7	19.1	18.8	5.1	14.1
Total Dissolved Solids	ug/l	--	--	635000	396000	819000	660000	605000	988000	467000	930000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	--	58000	<3000	9000	4000	2000	5000	31000	9000
Metals											
Arsenic	ug/l	100 [11]	--	1.3	1.3	0.8	<0.5	<1	<1	<1	<1
Boron	ug/l	200 [12]	--	44	29	66	61	50	80	50	80
Cadmium	ug/l	0.2 [11]	--	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	--	85100	58500	96300	94300	78000	124000	57000	116000
Chromium	ug/l	-- [13]	--	8	<2	<2	<2	4	6	6	5
Cobalt	ug/l	0.9	--	**2.1**	<0.5	<0.5	0.9	0.5	0.9	0.7	**1.0**
Copper	ug/l	5	--	**6**	<2	<2	2	2	2	2	2
Iron	ug/l	300	--	**3420**	**664**	263	**381**	**690**	**420**	**1730**	**410**
Lead	ug/l	**7.8**	--	<0.1	<0.1	<0.1	<0.1	<1	<1	<1	<1
Magnesium	ug/l	--	--	16500	11400	25500	17100	15000	26000	12000	25000
Manganese	ug/l	--	--	506	234	73	476	330	1490	510	1460
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	--	9500	6100	9800	8500	7000	10000	7000	9000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	--	120000	68900	172000	127000	96000	145000	57000	152000
Zinc	ug/l	30 [11]	--	28	<5	<5	<5	<10	<10	<10	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	--	<1	<1	<1	**2**	<1	<1	<1	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S15 18-Aug-2010 S-7	S15 14-Oct-2010 S-11	S15 19-May-2011 W-13	S15 16-Aug-2011 [2] N-7	S15 30-Nov-2011 [22] S15	S15 30-May-2012 S 15	S15 22-Aug-2012 S-15	S15 29-Nov-2012 S15	S15 28-May-2013 S3
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	422000	332000	189000	413000	213000	370000	520000	420000	330000
Ammonia, unionized	ug/l	20	0.11	0.57	0.82	1.5	0.75	<1.44	<0.74	1.38	0.63
Ammonia Nitrogen	ug/l	--	40	70	70	60	80	<50	<50	360	200
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<1000	2000	1000	3000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	40000	33000	55000	50000	28000	54000	55000	33000	36000
Chloride	ug/l	--	169000	186000	80000	158000	114000	190000	190000	200000	220000
Conductivity	uS/cm	--	1560	1430	700	1370	968	--	--	--	--
Conductivity (Field)	uS/cm	--	1401	1174	672	1114	890	1358	1515	1506	1294
Dissolved Inorganic Carbon	ug/l	--	93200	78200	45200	95200	37400	94000	110000	95000	74000
Dissolved Organic Carbon	ug/l	--	16100	12500	16000	18000	9400	18000	21000	13000	14000
Dissolved Oxygen (Field)	ug/l	-- [7]	8830	14430	7180	6970	11190	10160	**4640**	11760	**530**
Hardness, Calcium Carbonate	ug/l	--	527000	417000	223000	438000	283000	440000	650000	500000	440000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	260	290	220	230	630	150	270	660	430
Nitrite as N	ug/l	--	<100	<100	<100	<100	<100	16	12	<10	15
Nitrogen, Total Kjeldahl	ug/l	--	520	630	760	1030	870	1200	900	1600	1600
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	160	280	660	450
pH (Field)	-	6.5 - 8.5	6.93	7.62	7.68	7.85	7.86	7.82	7.62	7.67	7.07
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	20	20	**60**	30	**80**	**64**	19	25	**42**
Sulphate	ug/l	--	157000	124000	40000	91000	88000	89000	160000	120000	81000
Temperature (Field)	deg c	-- [10]	16.9	10.7	13.7	18.8	5.6	21.7	18.8	0	14.9
Total Dissolved Solids	ug/l	--	1010000	930000	455000	890000	629000	872000	1130000	986000	820000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<2000	3000	7000	26000	23000	5000	21000	6000	2000
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<1	<10	<50	<1.0	<1.0	<1.0	<1.0
Boron	ug/l	200 [12]	100	60	40	70	100	84	110	73	55
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	**<10**	<0.10	<0.10	<0.10	<0.10
Calcium	ug/l	--	160000	129000	68000	126000	82000	140000	180000	170000	130000
Chromium	ug/l	-- [13]	5	6	3	7	**<50**	<5.0	<5.0	<5.0	<5.0
Cobalt	ug/l	0.9	0.8	0.6	0.5	0.7	<10	0.53	0.79	0.68	0.55
Copper	ug/l	5	3	2	2	2	**<10**	3.1	2.4	2.6	2.4
Iron	ug/l	300	210	**310**	**740**	**600**	**2300**	**790**	**630**	**550**	**650**
Lead	ug/l	-- [14]	<1	<1	<1	<1	**<10**	<0.50	<0.50	<0.50	<0.50
Magnesium	ug/l	--	31000	23000	13000	30000	19000	30000	48000	39000	28000
Manganese	ug/l	--	1340	710	280	710	570	800	1500	1800	850
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	12000	10000	9000	11000	11000	15000	17000	11000	12000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	143000	135000	62000	122000	81000	170000	160000	170000	160000
Zinc	ug/l	30 [11]	<10	<10	<10	<10	<50	<5.0	<5.0	<5.0	<5.0
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1.0	<1.0	<1.0	<1.0

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S15 15-Aug-2013 S15	S15 21-Nov-2013 SA-12	S15 28-May-2014 S15	S15 26-Aug-2014 S15	S15 13-Nov-2014 S-15	S15 27-May-2015 S-15	S15 25-Aug-2015 S-15	S15 25-Nov-2015 S-15	S15 24-May-2016 S-15
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	540000	360000	360000	480000	270000	353000	538000	411000	408000
Ammonia, unionized	ug/l	20	1.34	0.31	<0.31	2.43	0.28	1.06	4.22	1.55	2.74
Ammonia Nitrogen	ug/l	--	67	77	<50	100	110	120	30	290	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000	<2000	<2000	<2000	18000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	54000	34000	38000	52000	32000	33000	45000	40000	38000
Chloride	ug/l	--	200000	190000	260000	220000	150000	325000	335000	280000	207000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1648	1370	1419	1674	945	1704	1888	1769	1364
Dissolved Inorganic Carbon	ug/l	--	130000	89000	78000	120000	64000	83600	115000	81900	82100
Dissolved Organic Carbon	ug/l	--	22000	12000	14000	18000	14000	16600	19700	13100	15300
Dissolved Oxygen (Field)	ug/l	-- [7]	**5150**	**3130**	11320	6830	11400	10240	**4570**	13590	10400
Hardness, Calcium Carbonate	ug/l	--	570000	480000	440000	540000	320000	416000	504000	620000	490000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	320	720	410	200	300	200	<100	200	200
Nitrite as N	ug/l	--	<10	<10	<10	<10	23	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1000	840	860	1000	730	700	900	1100	900
Nitrogen, Nitrate-Nitrite	ug/l	--	320	720	410	200	320	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.75	7.65	7.36	7.76	7.34	7.34	**8.69**	7.81	7.87
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	14	**33**	20	21	**32**	<10	20	30	<10
Sulphate	ug/l	--	58000	120000	74000	79000	57000	71000	77000	106000	101000
Temperature (Field)	deg c	-- [10]	18.8	1.1	15.0	21.2	4.3	20.4	17.7	0.1	22.6
Total Dissolved Solids	ug/l	--	1030000	908000	1010000	978000	636000	994000	1160000	987000	868000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<1000	31000	2000	6000	4000	<2000	3000	21000	2000
Metals											
Arsenic	ug/l	100 [11]	<1.0	<1.0	<1.0	<1.0	<1.0	<1	<1	<1	<1
Boron	ug/l	200 [12]	82	91	80	100	57	84	91	80	110
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	<0.10	<0.10	<0.10	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	170000	140000	130000	150000	99000	117000	133000	191000	129000
Chromium	ug/l	-- [13]	<5.0	<5.0	<5.0	<5.0	<5.0	<1	<1	1	<1
Cobalt	ug/l	0.9	<0.50	<0.50	<0.50	<0.50	<0.50	<0.5	0.5	0.6	<0.5
Copper	ug/l	5	1.4	2.2	2.1	1.4	1.6	<0.5	<0.5	<0.5	1.5
Iron	ug/l	300	<100	**650**	290	180	**860**	262	197	**527**	254
Lead	ug/l	-- [14]	<0.50	1.1	<0.50	<0.50	<0.50	<0.1	<0.1	0.1	<0.1
Magnesium	ug/l	--	45000	35000	30000	38000	23000	29800	41100	34900	40500
Manganese	ug/l	--	360	470	790	370	560	520	1370	1220	614
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	14000	12000	13000	13000	10000	11400	12900	10900	12300
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	160000	150000	180000	170000	110000	169000	176000	205000	161000
Zinc	ug/l	30 [11]	<5.0	<5.0	<5.0	5.5	<5.0	<5	5	8	<5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1.0	<1.0	<1.0	<1.0	**3.8**	<1	**2**	<1	**6**

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S15 18-Aug-2016 S-15	S15 16-Nov-2016 S-15	S15 18-May-2017 S-15	S15 28-Aug-2017 S-15	S15 28-Nov-2017 S-15	S15 23-May-2018 S-15	S15 30-Aug-2018 S-15	S15 28-Nov-2018 S-15	S15 20-Jun-2019 S-15
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	508000	417000	331000	520000	324000	343000	664000	323000	344000
Ammonia, unionized	ug/l	20	4.73	0.92	4.01	1.23	5.37	2.79	2.05	0.41	3.21
Ammonia Nitrogen	ug/l	--	190	180	100	60	280	160	70	120	210
Biochemical Oxygen Demand, 5 Day	ug/l	--	5000	3000	<2000	6000	<2000	<2000	2000	3000	<2000
Chemical Oxygen Demand	ug/l	--	67000	32000	39000	44000	24000	37000	75000	35000	43000
Chloride	ug/l	--	258000	346000	159000	250000	171000	162000	253000	214000	154000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1792	1981	1140	1288	1141	1124	1724	1213	1177
Dissolved Inorganic Carbon	ug/l	--	84600	75500	42500	97400	15300	70400	115000	62000	72300
Dissolved Organic Carbon	ug/l	--	45500	12100	25100	17000	53000	13400	29300	11800	10400
Dissolved Oxygen (Field)	ug/l	-- [7]	6340	11590	9890	7240	13660	10480	**2020**	14410	8880
Hardness, Calcium Carbonate	ug/l	--	580000	518000	324000	683000	341000	312000	647000	385000	345000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	100	200	200	500	200	400	1000	400
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1600	700	800	900	900	800	2400	1200	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.79	7.53	7.96	7.85	8.35	7.70	7.94	7.55	7.69
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**90**	20	30	20	10	20	**40**	**90**	**50**
Sulphate	ug/l	--	204000	120000	80000	63000	70000	45000	13000	117000	113000
Temperature (Field)	deg c	-- [10]	20.6	7.5	22.0	16.0	0.7	18.5	18.2	2	17
Total Dissolved Solids	ug/l	--	1210000	1140000	708000	1010000	670000	666000	1040000	764000	712000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	5000	7000	7000	3000	7000	4000	17000	6000	21000
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<5 [17]	<1	<1	<1	<1	<1	<1
Boron	ug/l	200 [12]	134	94	**252**	87	76	76	61	83	100
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.5 [17]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	147000	150000	87600	211000	96600	92500	168000	102000	90700
Chromium	ug/l	-- [13]	<1	<1	<5 [17]	1	<1	<1	2	4	1
Cobalt	ug/l	0.9	<0.5	0.6	<2.5 [17]	0.6	0.6	<0.5	**1.1**	**1.0**	0.7
Copper	ug/l	5	0.7	0.8	**5.5**	<0.5	1.7	<0.5	1.4	**5.1**	2.2
Iron	ug/l	300	223	**328**	**647**	**325**	**894**	**634**	**1170**	**938**	**1730**
Lead	ug/l	-- [14]	<0.1	<0.1	<0.5 [17]	0.1	0.2	<0.1	0.4	0.4	0.5
Magnesium	ug/l	--	51600	34600	25600	38100	24100	19700	55200	31400	28700
Manganese	ug/l	--	488	1250	554	1100	956	503	1800	388	830
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	24200	14400	10300	15300	9660	8070	21800	14400	11000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	185000	186000	115000	171000	110000	94200	152000	161000	119000
Zinc	ug/l	30 [11]	<5	<5	<25 [17]	12	5	<5	6	8	<5
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**5**	**5**	<1	<1	<1	<1	**5**	<1	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S15 28-Aug-2019 S-15	S15 21-Nov-2019 S-15	S15 14-May-2020 S-15	S15 26-Aug-2020 S-15	S15 25-Nov-2020 S-15	S15 27-May-2021 S-15	S15 24-Aug-2021 S-15	S15 24-Nov-2021 S-15
General Chemistry										
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	371000	377000	323000	526000	387000	298000	513000	446000
Ammonia, unionized	ug/l	20	1.77	3.01	2.54	2.95	2.05	1.93	1.04	1.73
Ammonia Nitrogen	ug/l	--	150	350	130	120	260	80	70	340
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	4000	<2000	<2000	<2000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	54000	32000	45000	57000	30000	34000	54000	39000
Chloride	ug/l	--	168000	308000	271000	259000	246000	86000	291000	224000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1149	1883	1382	1715	54	1297	1854	1651
Dissolved Inorganic Carbon	ug/l	--	125000	<500	65800	102000	80600	67400	103000	87900
Dissolved Organic Carbon	ug/l	--	27400	11000	29900	21000	11800	10600	17400	13600
Dissolved Oxygen (Field)	ug/l	-- [7]	7230	14600	10890	7640	12760	9220	**2690**	11680
Hardness, Calcium Carbonate	ug/l	--	385000	544000	374000	537000	454000	601000	543000	471000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	300	400	700	300	400	<100	400
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	1000	900	600	1100	700	600	900	1000
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.55	8.00	7.86	7.92	7.98	7.96	7.49	7.68
Phosphate	ug/l	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**60**	20	10	20	20	<10	30	<10
Sulphate	ug/l	--	59000	92000	84000	47000	91000	317000	61000	129000
Temperature (Field)	deg c	-- [10]	17.8	0.6	15.1	16.4	-0.1	14.9	22.9	3.1
Total Dissolved Solids	ug/l	--	724000	976000	780000	948000	942000	892000	1110000	918000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	4000	5000	2000	2000	5000	3000	4000	<2000
Metals										
Arsenic	ug/l	100 [11]	<1	<1	<1	<1	<1	<1	<1	<1
Boron	ug/l	200 [12]	64	69	45	59	62	66	76	106
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	101000	150000	110000	145000	125000	179000	158000	132000
Chromium	ug/l	-- [13]	1	1	<1	1	<1	<1	1	<1
Cobalt	ug/l	0.9	0.8	**1.0**	0.5	0.8	<0.5	<0.5	0.7	0.6
Copper	ug/l	5	2.1	1.5	1.6	1.0	0.8	1.0	1.3	0.9
Iron	ug/l	300	**1070**	**1260**	**882**	**373**	**502**	**415**	**683**	**567**
Lead	ug/l	-- [14]	0.3	0.1	0.1	0.2	<0.1	0.2	0.2	<0.1
Magnesium	ug/l	--	31900	41000	24400	42600	34500	37100	36000	34500
Manganese	ug/l	--	1240	1670	775	1090	895	509	1480	1500
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--
Potassium	ug/l	--	12900	15800	10700	21800	12600	12200	11600	15100
Selenium	ug/l	100	--	--	--	--	--	--	--	--
Sodium	ug/l	--	96300	164000	127000	148000	144000	66000	177000	152000
Zinc	ug/l	30 [11]	5	5	<5	<5	<5	6	<5	9
Phenols										
Phenolics, Total Recoverable	ug/l	1 [16]	**6**	**10**	<1	**9**	<4 [19]	**2**	<1	**4**

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S16 27-Sep-2001	S16 21-Nov-2001	S16 22-May-2002	S16 08-Nov-2002	S16 31-May-2003	S16 03-Jul-2003	S16 22-Oct-2003	S16 17-May-2004	S16 21-Aug-2004 [20]
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	153000	86000	176000	156000	103000	210000	93000	194000	--
Ammonia, unionized	ug/l	20	<20	<20	--	--	--	--	--	<10	--
Ammonia Nitrogen	ug/l	--	670	30	30	1070	180	240	30	50	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	4000	1000	2000	2000	7000	--
Chemical Oxygen Demand	ug/l	--	70000	29000	36000	31000	63000	44000	40000	55000	--
Chloride	ug/l	--	394000	63300	83000	300000	56000	340000	92500	158000	--
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1580	450	490	1400	480	1490	680	910	--
Dissolved Inorganic Carbon	ug/l	--	39700	12000	20000	39000	25000	57000	24000	37200	--
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	2920	7410	8200	3000	3860	2000	8400	7000	--
Hardness, Calcium Carbonate	ug/l	--	386000	191000	211000	303000	161000	292000	--	250000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	200	2600	600	200	600	200	1600	300	--
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	2460	920	640	1980	1220	1500	850	1310	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.37	**6.4**	**6.15**	7.4	7.5	7.03	7.5	7.1	--
Phosphate	ug/l	--	280	70	40	130	60	150	130	160	--
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	154000	76000	37000	134000	42000	37000	75000	24000	--
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	1050000	328000	340000	700000	266000	937000	347000	455000	--
Total Organic Carbon	ug/l	--	9600	15000	11000	10000	23000	15000	13000	12800	--
Total Suspended Solids	ug/l	--	186000	22000	2000	34000	3000	77000	6000	31000	--
Metals											
Arsenic	ug/l	100 [11]	2	1	1	1	1	2	1	1	--
Boron	ug/l	200 [12]	50	30	40	70	20	46	34	25	--
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	131000	57000	64700	104000	48300	96700	56300	76000	--
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	3	7	1	--
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	**8.2**	2.1	<1	2.9	3	2	**11**	5	--
Iron	ug/l	300	**2400**	**410**	**650**	**1150**	**870**	**2970**	**437**	**4610**	--
Lead	ug/l	-- [14]	**8**	0.2	<1	3.9	0.5	3.6	1.8	1.1	--
Magnesium	ug/l	--	14400	11700	11800	10600	9740	12300	10300	14600	--
Manganese	ug/l	--	390	40	240	860	160	1060	60	1270	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	10	10	10	--
Potassium	ug/l	--	7100	9000	7000	9100	5500	5600	11300	4800	--
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	208000	30300	50900	176000	38800	209000	49500	101000	--
Zinc	ug/l	30 [11]	30	**500**	20	20	10	13	16	15	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	1	1	1	--

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S16 18-Nov-2004	S16 25-May-2005	S16 09-Sep-2005 [20]	S16 09-Nov-2005	S16 24-May-2006	S16 15-Aug-2006 [20]	S16 16-Nov-2006	S16 08-May-2007 [20]	S16 22-Aug-2007
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	215000	--	327000	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	<5000	--	<5000	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	150000	180000	--	268000	183000	--	72000	--	452000
Ammonia, unionized	ug/l	20	<10	<10	--	20	<10	--	--	--	<10
Ammonia Nitrogen	ug/l	--	10	<10	--	570	60	--	20	--	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<3000	--	<3000	3000	--	<3000	--	9000
Chemical Oxygen Demand	ug/l	--	36000	52000	--	45000	48000	--	38000	--	200000
Chloride	ug/l	--	68500	73000	--	666000	147000	--	12800	--	1140000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	480	595	--	1600	550	--	160	--	3300
Dissolved Inorganic Carbon	ug/l	--	19700	50400	--	60000	40200	--	20200	--	108000
Dissolved Organic Carbon	ug/l	--	--	17700	--	11700	19200	--	18800	--	11900
Dissolved Oxygen (Field)	ug/l	-- [7]	6600	**4600**	--	**6700**	11050	--	7550	--	**4480**
Hardness, Calcium Carbonate	ug/l	--	196000	212000	--	395000	230000	--	49000	--	645000
Hydrogen Sulfide	ug/l	2 [8]	--	<10	--	<10	--	--	--	--	--
Nitrate as N	ug/l	--	300	200	--	400	600	--	300	--	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	680	1040	--	1200	970	--	900	--	7360
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.8	7.2	--	7.5	7.5	--	--	--	7.3
Phosphate	ug/l	--	60	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**70**	--	**50**	**60**	--	**160**	--	**3130**
Sulphate	ug/l	--	56000	23000	--	133000	52000	--	23000	--	158000
Temperature (Field)	deg c	-- [10]	--	16.8	--	3	9	--	8.1	--	14.7
Total Dissolved Solids	ug/l	--	240000	327000	--	1550000	489000	--	123000	--	2540000
Total Organic Carbon	ug/l	--	9500	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	13000	5000	--	13000	6000	--	94000	--	1160000
Metals											
Arsenic	ug/l	100 [11]	1	<1	--	<1	<1	--	1	--	6
Boron	ug/l	200 [12]	23	38	--	39	39	--	22	--	49
Cadmium	ug/l	0.2 [11]	--	<0.3	--	<0.5	<0.1	--	**<0.5**	--	<0.1
Calcium	ug/l	--	57900	60800	--	125000	70300	--	13900	--	195000
Chromium	ug/l	-- [13]	2	<2	--	<2	<2	--	6	--	**12**
Cobalt	ug/l	0.9	--	<3	--	0.7	0.7	--	0.6	--	**3.9**
Copper	ug/l	5	2	<2	--	<2	3	--	**28**	--	**11**
Iron	ug/l	300	**1400**	**1610**	--	**5060**	**748**	--	**894**	--	**10200**
Lead	ug/l	-- [14]	1.2	<0.6	--	1	0.8	--	2	--	**17.7**
Magnesium	ug/l	--	12400	14500	--	19800	13300	--	3580	--	38100
Manganese	ug/l	--	167	268	--	1710	212	--	68	--	1730
Mercury, dissolved	ug/l	0.2 [15]	--	<0.05	--	<0.06	--	--	--	--	--
Molybdenum	ug/l	40	--	4.5	--	<5	--	--	--	--	--
Nickel	ug/l	25	10	<10	--	<10	--	--	--	--	--
Potassium	ug/l	--	5900	6100	--	5000	8400	--	4600	--	6600
Selenium	ug/l	100	--	<1	--	<1	--	--	--	--	--
Sodium	ug/l	--	40000	47900	--	442000	92600	--	19800	--	726000
Zinc	ug/l	30 [11]	9	21	--	<5	7	--	**37**	--	**237**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	<1	--	<1	<1	--	<1	--	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S16 20-Nov-2007	S16 23-May-2008	S16 12-Aug-2008	S16 06-Nov-2008	S16 13-May-2009 S-10	S16 25-Aug-2009 [34] A-10	S16 27-Nov-2009 S-7	S16 18-May-2010 S-9	S16 18-Aug-2010 [2] S-11
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	200000	99000	435000	120000	128000	458000	93000	338000	415000
Ammonia, unionized	ug/l	20	<10	<20	<20	<20	0.44	2.15	<0.07	0.85	0.71
Ammonia Nitrogen	ug/l	--	60	<10	180	<10	50	340	<20	180	90
Biochemical Oxygen Demand, 5 Day	ug/l	--	8000	<3000	<3000	<3000	<1000	3000	2000	4000	2000
Chemical Oxygen Demand	ug/l	--	173000	55000	40000	33000	43000	73000	45000	28000	33000
Chloride	ug/l	--	222000	38600	790000	93900	79000	486000	25000	570000	593000
Conductivity	uS/cm	--	--	--	--	--	566	2520	342	2540	2780
Conductivity (Field)	uS/cm	--	875	320	3500	525	470	2018	335	2555	2485
Dissolved Inorganic Carbon	ug/l	--	54000	22300	107000	30100	31600	115000	23600	153000	90400
Dissolved Organic Carbon	ug/l	--	13200	18200	9400	13000	18400	16400	16100	11600	13200
Dissolved Oxygen (Field)	ug/l	-- [7]	8520	8220	**1070**	7230	**2780**	**180**	9730	**1800**	**1420**
Hardness, Calcium Carbonate	ug/l	--	271000	112000	432000	160000	164000	358000	114000	428000	437000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1000	200	100	600	250	<100	<100	<100	<100
Nitrite as N	ug/l	--	--	--	--	--	<100	<100	<100	<100	<100
Nitrogen, Total Kjeldahl	ug/l	--	5120	1040	980	750	780	1940	540	1650	990
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8	7.4	7.7	7.6	7.4	7.19	7.47	7.16	7.34
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**2450**	**80**	**40**	**40**	**90**	**400**	20	**110**	**130**
Sulphate	ug/l	--	97000	18000	84000	57000	25000	51000	31000	44000	79000
Temperature (Field)	deg c	-- [10]	2.8	15	22.2	8.7	18.3	20.5	5.0	17.5	18.9
Total Dissolved Solids	ug/l	--	713000	188000	1780000	357000	368000	1640000	222000	1650000	1810000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	432000	<3000	25000	5000	4000	43000	4000	49000	33000
Metals											
Arsenic	ug/l	100 [11]	1.6	1.5	2.2	<0.5	<1	<50	<1	1	<1
Boron	ug/l	200 [12]	56	20	48	34	30	<100	20	30	70
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	**<10**	<0.1	<0.1	<0.1
Calcium	ug/l	--	86500	32700	134000	49900	49000	112000	34000	135000	142000
Chromium	ug/l	-- [13]	5	<2	<2	<2	3	**<50**	3	8	<5
Cobalt	ug/l	0.9	**1.5**	<0.5	<0.5	<0.5	0.6	<10	0.3	**1.9**	0.8
Copper	ug/l	5	**10**	<2	<2	3	1	**<10**	2	2	2
Iron	ug/l	300	**3430**	**866**	**1760**	**491**	**1480**	**16200**	**680**	**4040**	**1690**
Lead	ug/l	-- [14]	4.6	<0.1	<0.1	<0.1	<1	**<10**	<1	<1	<1
Magnesium	ug/l	--	13300	7440	23900	8610	10000	19000	7000	22000	20000
Manganese	ug/l	--	438	78	1840	187	220	3240	60	2540	1240
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	7100	4300	4400	4900	4000	6000	6000	4000	6000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	159000	25800	477000	66800	52000	365000	22000	295000	408000
Zinc	ug/l	30 [11]	**138**	<5	<5	5	<10	<50	10	20	<10
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	**3**	<1	<1	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S16 14-Oct-2010 S-14	S16 19-May-2011 [2] W-12	S16 16-Aug-2011 [2] N-10	S16 30-Nov-2011 [22] S16	S16 30-May-2012 S 16	S16 22-Aug-2012 [20] S-16	S16 29-Nov-2012 S16	S16 28-May-2013 S16	S16 15-Aug-2013 [20] S16
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	234000	151000	411000	97000	340000	--	370000	240000	--
Ammonia, unionized	ug/l	20	0.77	0.39	1.19	<0.16	4.56	--	0.77	1.09	--
Ammonia Nitrogen	ug/l	--	70	30	130	<20	230	--	530	160	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	1000	1000	2000	4000	--	3000	<2000	--
Chemical Oxygen Demand	ug/l	--	38000	50000	45000	25000	58000	--	86000	140000	--
Chloride	ug/l	--	225000	48000	551000	58000	620000	--	480000	400000	--
Conductivity	uS/cm	--	1350	506	2650	477	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1038	496	1423	482	2451	--	1903	1607	--
Dissolved Inorganic Carbon	ug/l	--	55000	35900	33500	18600	85000	--	86000	53000	--
Dissolved Organic Carbon	ug/l	--	13500	18900	10800	7900	17000	--	9400	14000	--
Dissolved Oxygen (Field)	ug/l	-- [7]	7240	6720	**3500**	9120	**1780**	--	**1200**	5330	--
Hardness, Calcium Carbonate	ug/l	--	261000	174000	468000	141000	480000	--	410000	360000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	260	640	<100	440	380	--	<100	<100	--
Nitrite as N	ug/l	--	<100	<100	<100	<100	56	--	<10	<10	--
Nitrogen, Total Kjeldahl	ug/l	--	780	1290	750	540	1300	--	1700	5600	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	430	--	<100	<100	--
pH (Field)	-	6.5 - 8.5	7.72	7.64	7.24	7.81	7.58	--	7.18	7.25	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**120**	**50**	30	**210**	**130**	--	**57**	**350**	--
Sulphate	ug/l	--	75000	28000	62000	42000	56000	--	70000	38000	--
Temperature (Field)	deg c	-- [10]	11.7	16.2	24.1	5.0	24.1	--	1.9	19.7	--
Total Dissolved Solids	ug/l	--	878000	329000	1720000	310000	1580000	--	1440000	942000	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	25000	8000	11000	26000	73000	--	14000	120000	--
Metals											
Arsenic	ug/l	100 [11]	<1	<10	<10	<50	1.8	--	<1.0	2.6	--
Boron	ug/l	200 [12]	30	20	40	<100	50	--	32	17	--
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	**<10**	<0.10	--	<0.10	<0.10	--
Calcium	ug/l	--	83000	50000	146000	45000	170000	--	160000	110000	--
Chromium	ug/l	-- [13]	6	3	<5	**<50**	<5.0	--	<5.0	7.0	--
Cobalt	ug/l	0.9	0.7	0.4	0.6	<10	**1.9**	--	0.65	**2.8**	--
Copper	ug/l	5	2	2	1	**<10**	4.3	--	1.2	5.0	--
Iron	ug/l	300	**1370**	**600**	**580**	**6100**	**5000**	--	**8100**	**14000**	--
Lead	ug/l	-- [14]	<1	<1	<1	**<10**	3.0	--	<0.50	**5.2**	--
Magnesium	ug/l	--	13000	12000	25000	7000	24000	--	29000	19000	--
Manganese	ug/l	--	350	70	550	160	1700	--	2700	1300	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5000	4000	14000	6000	5300	--	4100	5000	--
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	170000	40000	183000	38000	440000	--	440000	250000	--
Zinc	ug/l	30 [11]	<10	10	<10	<50	26	--	10	**39**	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1.0	--	<1.0	<1.0	--

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S16 21-Nov-2013 SA-3	S16 28-May-2014 S16	S16 26-Aug-2014 S16	S16 13-Nov-2014 S-16	S16 27-May-2015 S-16	S16 25-Aug-2015 S-16	S16 25-Nov-2015 S-16	S16 24-May-2016 S-16	S16 18-Aug-2016 S-16
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	330000	280000	390000	140000	255000	446000	392000	357000	430000
Ammonia, unionized	ug/l	20	0.56	1.2	14.2	0.29	0.35	**30.59**	0.5	2.1	5.22
Ammonia Nitrogen	ug/l	--	90	130	1500	62	120	440	180	120	350
Biochemical Oxygen Demand, 5 Day	ug/l	--	<2000	<2000	<2000	<2000	9000	17000	3000	24000	18000
Chemical Oxygen Demand	ug/l	--	150000	48000	2000000	160000	86000	74000	80000	95000	90000
Chloride	ug/l	--	350000	560000	800000	88000	402000	1100000	288000	1010000	791000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1653	2054	3177	502	1782	3767	3549	3437	3144
Dissolved Inorganic Carbon	ug/l	--	85000	64000	100000	34000	62400	77800	76200	54900	22700
Dissolved Organic Carbon	ug/l	--	10000	13000	11000	18000	16600	19100	10000	32100	78500
Dissolved Oxygen (Field)	ug/l	-- [7]	10510	**4300**	**300**	9690	**110**	**60**	**1780**	**4630**	**2610**
Hardness, Calcium Carbonate	ug/l	--	330000	430000	470000	160000	67700	512000	733000	616000	651000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	250	<100	<100	<100	<100	<100	<100	300
Nitrite as N	ug/l	--	<10	21	21	<10	<50	<50	<50	<50	<250 [18]
Nitrogen, Total Kjeldahl	ug/l	--	3200	1600	65000	4400	2800	3100	3100	4400	1900
Nitrogen, Nitrate-Nitrite	ug/l	--	<100	270	<100	<100	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.80	7.48	7.31	7.61	6.74	8.33	7.51	7.40	7.51
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**1300**	**200**	**4800**	**2200**	**810**	**920**	**1400**	**1550**	**450**
Sulphate	ug/l	--	81000	41000	52000	25000	45000	55000	96000	58000	252000
Temperature (Field)	deg c	-- [10]	2.2	16.6	22.3	4.1	24.1	18.3	0.6	28.2	22.3
Total Dissolved Solids	ug/l	--	1130000	1360000	1770000	346000	982000	2220000	1840000	2130000	2150000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	1100000	410000	11000000	130000	363000	170000	203000	382000	99000
Metals											
Arsenic	ug/l	100 [11]	7.8	1.5	52	2.7	<1	7	3	2	6
Boron	ug/l	200 [12]	36	110	110	26	12	56	34	150	132
Cadmium	ug/l	0.2 [11]	**0.25**	0.13	**3.1**	0.18	<0.1	**0.4**	0.2	0.1	0.1
Calcium	ug/l	--	130000	150000	290000	54000	21800	160000	243000	196000	216000
Chromium	ug/l	-- [13]	**27**	<5.0	**250**	**11**	1	**23**	**12**	7	7
Cobalt	ug/l	0.9	**7.6**	**2.8**	**78**	**2.7**	<0.5	**6.5**	**2.8**	**2.4**	**2.7**
Copper	ug/l	5	**17**	3.5	**180**	**9.4**	<0.5	**12.6**	**7.7**	**5.7**	**5.3**
Iron	ug/l	300	**60000**	**6700**	**430000**	**14000**	**1560**	**42500**	**20100**	**10300**	**8310**
Lead	ug/l	-- [14]	**19**	3.9	**190**	**9.8**	1.0	**18.3**	**9.7**	**6.4**	**5.6**
Magnesium	ug/l	--	23000	22000	63000	12000	3230	27600	30700	30600	27200
Manganese	ug/l	--	1900	2200	11000	280	137	2020	1430	3490	3500
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	6200	5200	22000	7600	917	7060	5260	5940	6760
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	290000	310000	530000	55000	52900	584000	663000	670000	503000
Zinc	ug/l	30 [11]	**130**	26	**1200**	**57**	7	**121**	**66**	**59**	**46**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**2.3**	<1.0	**4.8**	**11**	<1	**3**	<1	**16**	<2 [19]

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S16 16-Nov-2016 S-16	S16 18-May-2017 S-16	S16 28-Aug-2017 S-16	S16 28-Nov-2017 S-16	S16 23-May-2018 S-16	S16 30-Aug-2018 S-16	S16 28-Nov-2018 S-16	S16 20-Jun-2019 S-16	S16 28-Aug-2019 S-16
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	369000	186000	468000	155000	164000	429000	246000	222000	227000
Ammonia, unionized	ug/l	20	2.3	0.76	3.34	0.47	0.76	6.16	0.35	1	2.27
Ammonia Nitrogen	ug/l	--	190	60	340	80	70	600	160	130	300
Biochemical Oxygen Demand, 5 Day	ug/l	--	16000	3000	16000	4000	<2000	<30000 [26]	<2000	<12000 [26]	4000
Chemical Oxygen Demand	ug/l	--	94000	51000	98000	48000	52000	169000	56000	67000	46000
Chloride	ug/l	--	815000	184000	802000	<1000	109000	995000	1410000	335000	505000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	3185	880	2483	609	717	3400	>3999	1322	1893
Dissolved Inorganic Carbon	ug/l	--	66100	15100	85100	10200	37300	67400	45900	45000	75700
Dissolved Organic Carbon	ug/l	--	10800	35600	14800	34900	18200	25800	8700	10700	14800
Dissolved Oxygen (Field)	ug/l	-- [7]	**4330**	**2860**	**990**	**7660**	**730**	**630**	7770	**430**	**280**
Hardness, Calcium Carbonate	ug/l	--	461000	205000	577000	145000	158000	605000	555000	310000	284000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	<100	<100	<100	<100	200	200	<100
Nitrite as N	ug/l	--	<50	<50	<250 [18]	<50	<50	<250 [18]	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	3400	900	2900	1000	1100	2400	700	1300	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.84	7.42	7.46	7.83	7.49	7.45	7.35	7.41	7.31
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**1470**	**50**	**970**	**150**	**60**	**290**	**80**	**210**	**140**
Sulphate	ug/l	--	89000	27000	58000	36000	12000	31000	113000	43000	36000
Temperature (Field)	deg c	-- [10]	9.4	22.9	18.1	0.6	18.5	19.0	2.2	16.3	19.2
Total Dissolved Solids	ug/l	--	1790000	550000	1780000	340000	366000	2060000	2720000	832000	1130000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	44000	12000	970000	49000	11000	268000	11000	41000	62000
Metals											
Arsenic	ug/l	100 [11]	2	<5 [17]	2	<1	<1	3	<1	<1	<1
Boron	ug/l	200 [12]	93	166	49	24	34	34	27	36	24
Cadmium	ug/l	0.2 [11]	0.1	<0.5 [17]	0.1	<0.1	<0.1	**0.3**	<0.1	<0.1	<0.1
Calcium	ug/l	--	148000	61900	188000	43300	47700	189000	176000	99100	92900
Chromium	ug/l	-- [13]	7	<5 [17]	6	1	<1	**27**	**9**	3	5
Cobalt	ug/l	0.9	**1.9**	<2.5 [17]	**1.9**	<0.5	<0.5	**7.0**	**2.2**	**2.0**	**1.4**
Copper	ug/l	5	**5.9**	2.9	3.8	1.9	<0.5	**17.0**	**6.0**	**6.1**	4.8
Iron	ug/l	300	**10300**	**924**	**11100**	**1260**	**943**	**28800**	**3180**	**2670**	**3640**
Lead	ug/l	-- [14]	**7.3**	<0.5 [17]	**6.6**	0.6	0.3	**20.1**	1.7	4.3	2.9
Magnesium	ug/l	--	22300	12200	26300	9010	9460	32200	27900	15200	12700
Manganese	ug/l	--	1750	413	2030	190	233	2930	626	1020	843
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	5630	4530	5560	4530	3980	8500	9200	3390	3750
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	504000	101000	497000	38400	58700	440000	883000	147000	268000
Zinc	ug/l	30 [11]	**58**	<25 [17]	**42**	12	11	**103**	24	22	22
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**11**	<1	**2**	<1	<1	**4**	<1	<1	**5**

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S16 21-Nov-2019 S-16	S16 14-May-2020 S-16	S16 26-Aug-2020 S-16	S16 25-Nov-2020 S-16	S16 27-May-2021 S-16	S16 24-Aug-2021 [35] S16	S16 24-Nov-2021 S-16
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	352000	182000	350000	354000	256000	--	366000
Ammonia, unionized	ug/l	20	0.52	0.13	2.41	0.41	1.08	--	0.26
Ammonia Nitrogen	ug/l	--	300	40	550	130	60	--	180
Biochemical Oxygen Demand, 5 Day	ug/l	--	<30000 [26]	5000	9000	<40000 [26]	<2000	--	16000
Chemical Oxygen Demand	ug/l	--	70000	67000	213000	44000	28000	--	67000
Chloride	ug/l	--	1030000	260000	758000	1070000	35000	--	598000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	4110	1104	2924	2	1147	--	2670
Dissolved Inorganic Carbon	ug/l	--	<500	39400	69300	73600	56200	--	74300
Dissolved Organic Carbon	ug/l	--	11300	22300	10900	10100	9700	--	10500
Dissolved Oxygen (Field)	ug/l	-- [7]	**4420**	**1060**	**120**	**4200**	6710	--	**7000**
Hardness, Calcium Carbonate	ug/l	--	673000	271000	521000	556000	615000	--	733000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	<100	<100	100	<100	400	--	<100
Nitrite as N	ug/l	--	<50	<50	<50	<250 [18]	<50	--	<50
Nitrogen, Total Kjeldahl	ug/l	--	6600	2000	4200	1200	600	--	2800
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.31	7.03	7.10	7.58	7.85	--	7.20
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**3660**	**640**	**1620**	**440**	30	--	**1750**
Sulphate	ug/l	--	114000	41000	23000	116000	370000	--	127000
Temperature (Field)	deg c	-- [10]	0.3	16.2	18.3	0	14.3	--	1.3
Total Dissolved Solids	ug/l	--	2080000	588000	828000	2380000	834000	--	1570000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	208000	171000	454000	292000	24000	--	896000
Metals									
Arsenic	ug/l	100 [11]	4	1	2	<1	<1	--	7
Boron	ug/l	200 [12]	30	16	31	18	69	--	25
Cadmium	ug/l	0.2 [11]	0.2	<0.1	<0.1	<0.1	<0.1	--	**0.3**
Calcium	ug/l	--	198000	82100	169000	167000	188000	--	234000
Chromium	ug/l	-- [13]	**28**	5	7	2	2	--	**46**
Cobalt	ug/l	0.9	**6.2**	**1.5**	**2.5**	**1.1**	**1.0**	--	**11.5**
Copper	ug/l	5	**18.3**	5.0	**5.2**	2.8	1.7	--	**38.3**
Iron	ug/l	300	**31700**	**3770**	**14400**	**3190**	**1260**	--	<100
Lead	ug/l	-- [14]	**12.8**	4.0	4.7	2.6	0.7	--	**44.4**
Magnesium	ug/l	--	43200	16100	24000	33500	35500	--	36300
Manganese	ug/l	--	2450	418	2430	1440	216	--	3240
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	10300	4480	6340	5980	10400	--	9330
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	544000	121000	479000	601000	30300	--	394000
Zinc	ug/l	30 [11]	**82**	23	26	15	6	--	**147**
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**12**	**6**	**9**	<10 [19]	**2**	--	**6**

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S17 27-Sep-2001	S17 21-Nov-2001	S17 22-May-2002	S17 08-Nov-2002	S17 31-May-2003	S17 03-Jul-2003	S17 22-Oct-2003	S17 17-May-2004	S17 21-Aug-2004
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	240000	151000	158000	186000	151000	234000	106000	196000	264000
Ammonia, unionized	ug/l	20	<20	<20	--	--	--	--	--	<10	<10
Ammonia Nitrogen	ug/l	--	150	30	60	450	170	100	90	120	360
Biochemical Oxygen Demand, 5 Day	ug/l	--	1000	1000	1000	2000	1000	2000	3000	5000	6000
Chemical Oxygen Demand	ug/l	--	29000	25000	44000	23000	59000	45000	58000	59000	92000
Chloride	ug/l	--	83600	83300	90000	406000	75500	371000	66900	192000	337000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1230	510	580	1600	425	1320	640	1050	1410
Dissolved Inorganic Carbon	ug/l	--	59400	21100	17000	46000	39000	59000	26000	47200	42300
Dissolved Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Dissolved Oxygen (Field)	ug/l	-- [7]	3550	10270	8350	9300	6020	3390	11800	4000	2700
Hardness, Calcium Carbonate	ug/l	--	367000	226000	221000	277000	187000	304000	--	260000	297000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1600	900	600	1600	900	1100	1100	1200	900
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	1720	630	890	1070	1260	1210	1400	1450	3120
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.18	6.81	7.1	7.9	7.7	6.8	7.32	7.3	7.2
Phosphate	ug/l	--	190	40	50	60	50	190	350	100	740
Phosphorus	ug/l	-- [9]	--	--	--	--	--	--	--	--	--
Sulphate	ug/l	--	430000	70000	37000	69000	38000	57000	56000	42000	63000
Temperature (Field)	deg c	-- [10]	--	--	--	--	--	--	--	--	--
Total Dissolved Solids	ug/l	--	842000	394000	362000	800000	334000	997000	294000	525000	705000
Total Organic Carbon	ug/l	--	10600	15000	12000	11000	22000	15000	16000	12300	9200
Total Suspended Solids	ug/l	--	11000	7000	14000	31000	3000	82000	20000	32000	148000
Metals											
Arsenic	ug/l	100 [11]	1	1	1	1	1	1	1	1	3
Boron	ug/l	200 [12]	100	40	30	160	30	61	36	51	78
Cadmium	ug/l	0.2 [11]	--	--	--	--	--	--	--	--	--
Calcium	ug/l	--	124000	65200	65600	92300	54700	100000	47100	81800	98000
Chromium	ug/l	-- [13]	**10**	**10**	**10**	**10**	**10**	3	**9**	2	6
Cobalt	ug/l	0.9	--	--	--	--	--	--	--	--	--
Copper	ug/l	5	3.2	1.9	<1	**39.7**	2	4	**25**	**16**	**84**
Iron	ug/l	300	**500**	220	**380**	**1370**	**460**	**1360**	**1540**	**1110**	129
Lead	ug/l	-- [14]	0.2	0.2	<1	**34.1**	0.5	3.2	3.4	0.8	**5.8**
Magnesium	ug/l	--	13900	15300	14000	11400	12300	13200	9500	13600	12600
Manganese	ug/l	--	140	20	90	290	40	344	70	341	528
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	20	20	20	20	20	10	10	10	**90**
Potassium	ug/l	--	9300	5900	4800	9200	4800	7700	7600	6400	6800
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	162000	56300	37200	240000	49700	230000	44500	146000	254000
Zinc	ug/l	30 [11]	20	10	20	**50**	20	26	29	**34**	**164**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	1	1	1	1	0.1	1	1	1

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S17 18-Nov-2004	S17 25-May-2005	S17 09-Sep-2005 [20]	S17 09-Nov-2005	S17 24-May-2006	S17 15-Aug-2006	S17 16-Nov-2006	S17 08-May-2007	S17 22-Aug-2007
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	264000	--	237000	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	<5000	--	<5000	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	200000	216000	--	190000	150000	260000	90000	212000	302000
Ammonia, unionized	ug/l	20	<10	<10	--	<10	<10	<10	--	<10	<10
Ammonia Nitrogen	ug/l	--	170	40	--	50	20	40	100	<10	100
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	6000	--	<3000	<3000	<3000	<3000	<3000	3000
Chemical Oxygen Demand	ug/l	--	35000	50000	--	60000	63000	28000	38000	38000	37000
Chloride	ug/l	--	122000	139000	--	174000	102000	434000	21200	252000	494000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	790	845	--	610	430	1700	210	1000	1450
Dissolved Inorganic Carbon	ug/l	--	25300	56100	--	40800	39700	62400	24300	50900	72300
Dissolved Organic Carbon	ug/l	--	--	14000	--	10500	20900	13800	15700	10100	10000
Dissolved Oxygen (Field)	ug/l	-- [7]	7200	7110	--	12500	8620	**800**	7880	8020	**1890**
Hardness, Calcium Carbonate	ug/l	--	245000	259000	--	290000	196000	314000	69000	279000	351000
Hydrogen Sulfide	ug/l	2 [8]	--	<10	--	<10	--	--	--	--	--
Nitrate as N	ug/l	--	1600	400	--	1800	900	1000	1100	1200	200
Nitrite as N	ug/l	--	--	--	--	--	--	--	--	--	--
Nitrogen, Total Kjeldahl	ug/l	--	880	1160	--	730	860	640	1190	2110	1790
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	6.7	7.3	--	7.5	7.8	7.6	--	7.9	7.4
Phosphate	ug/l	--	60	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	--	**80**	--	**120**	**40**	**50**	**230**	**70**	**310**
Sulphate	ug/l	--	68000	31000	--	79000	40000	63000	24000	47000	46000
Temperature (Field)	deg c	-- [10]	--	18.8	--	2	11	18	8.1	18	14
Total Dissolved Solids	ug/l	--	395000	485000	--	598000	370000	1030000	158000	700000	1190000
Total Organic Carbon	ug/l	--	9800	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	6000	4000	--	16000	3000	<3000	45000	4000	30000
Metals											
Arsenic	ug/l	100 [11]	1	<1	--	<1	<1	1.6	2	1.4	3.3
Boron	ug/l	200 [12]	39	39	--	34	23	47	24	41	41
Cadmium	ug/l	0.2 [11]	--	<0.5	--	<0.5	<0.1	<0.1	**<0.5**	**0.7**	<0.1
Calcium	ug/l	--	73700	75200	--	89800	59200	103000	18400	88400	115000
Chromium	ug/l	-- [13]	2	<2	--	<2	<2	<2	8	<2	<2
Cobalt	ug/l	0.9	--	**83**	--	0.6	0.2	0.4	0.5	0.5	**1.1**
Copper	ug/l	5	2	<2	--	<2	<2	<2	**39**	**20**	4
Iron	ug/l	300	**519**	**436**	--	**453**	**303**	**355**	**399**	**858**	**1740**
Lead	ug/l	-- [14]	1.2	<1	--	2.5	<0.5	0.5	2	0.7	1
Magnesium	ug/l	--	14900	17200	--	15900	11800	13800	5570	14000	15200
Manganese	ug/l	--	95	85	--	56	40	342	80	204	772
Mercury, dissolved	ug/l	0.2 [15]	--	<0.05	--	<0.06	--	--	--	--	--
Molybdenum	ug/l	40	--	8	--	<5	--	--	--	--	--
Nickel	ug/l	25	10	<10	--	<10	--	--	--	--	--
Potassium	ug/l	--	7100	5300	--	8400	4700	6900	4300	6600	8700
Selenium	ug/l	100	--	<1	--	<1	--	--	--	--	--
Sodium	ug/l	--	80600	90800	--	115000	62700	256000	25000	158000	323000
Zinc	ug/l	30 [11]	14	14	--	**56**	14	25	28	19	**49**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	1	<1	--	<1	<1	<1	<1	<1	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S17 20-Nov-2007	S17 23-May-2008	S17 12-Aug-2008	S17 06-Nov-2008	S17 13-May-2009 S-11	S17 25-Aug-2009 A-9	S17 27-Nov-2009 S-9	S17 18-May-2010 S-10	S17 18-Aug-2010 S-10
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	180000	142000	280000	190000	165000	285000	152000	223000	283000
Ammonia, unionized	ug/l	20	<10	<20	<20	<20	1.72	3.39	1.08	1.17	1.06
Ammonia Nitrogen	ug/l	--	380	<10	110	20	60	500	100	60	110
Biochemical Oxygen Demand, 5 Day	ug/l	--	4000	<3000	<3000	<3000	<1000	<1000	2000	10000	4000
Chemical Oxygen Demand	ug/l	--	30000	19000	42000	22000	50000	50000	45000	53000	40000
Chloride	ug/l	--	193000	108000	455000	123000	113000	296000	80000	262000	277000
Conductivity	uS/cm	--	--	--	--	--	757	1620	660	1400	1630
Conductivity (Field)	uS/cm	--	750	550	1800	750	600	1291	795	1475	1487
Dissolved Inorganic Carbon	ug/l	--	48600	34900	70400	46500	40900	69600	37400	53700	63200
Dissolved Organic Carbon	ug/l	--	13200	15400	9800	8300	20000	12100	13900	18500	15600
Dissolved Oxygen (Field)	ug/l	-- [7]	9250	10540	**1780**	8710	8490	**2190**	10560	8840	**4010**
Hardness, Calcium Carbonate	ug/l	--	248000	148000	290000	252000	194000	260000	189000	267000	298000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1500	300	900	1100	750	880	950	1860	3710
Nitrite as N	ug/l	--	--	--	--	--	<100	130	<100	<100	170
Nitrogen, Total Kjeldahl	ug/l	--	1310	1130	1100	650	1300	1180	880	2600	1050
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8	7.8	7.9	7.9	7.8	7.22	7.93	7.80	7.38
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**100**	**100**	**130**	**40**	**50**	**50**	**90**	**110**	**60**
Sulphate	ug/l	--	80000	21000	57000	74000	27000	45000	51000	51000	75000
Temperature (Field)	deg c	-- [10]	1.9	14.6	18.7	9.4	22.3	20.5	5.3	16.9	20.3
Total Dissolved Solids	ug/l	--	620000	341000	1070000	494000	492000	1050000	429000	910000	1060000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	9000	40000	45000	4000	3000	11000	17000	67000	15000
Metals											
Arsenic	ug/l	100 [11]	1.6	1.9	1.1	0.9	1	1	<1	1	<1
Boron	ug/l	200 [12]	34	17	55	29	30	50	30	140	180
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	83300	42900	90600	76200	58000	86000	61000	87000	103000
Chromium	ug/l	-- [13]	3	<2	<2	<2	3	7	4	7	**9**
Cobalt	ug/l	0.9	**1.6**	<0.5	<0.5	0.8	0.4	0.6	0.8	0.7	0.6
Copper	ug/l	5	5	<2	<2	2	3	1	3	5	4
Iron	ug/l	300	**1260**	**726**	145	279	**430**	**1140**	**780**	**830**	**770**
Lead	ug/l	-- [14]	3.2	<0.1	<0.1	<0.1	<1	<1	2	1	<1
Magnesium	ug/l	--	9720	9900	15400	14900	12000	11000	9000	12000	10000
Manganese	ug/l	--	179	72	107	70	90	640	130	340	70
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	8800	3200	7600	6900	4000	8000	6000	8000	10000
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	126000	68900	277000	80400	81000	211000	69000	195000	212000
Zinc	ug/l	30 [11]	**50**	5	15	<5	10	<10	**40**	**60**	**70**
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	<1	<1	<1	**2**	<1

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S17 14-Oct-2010 S-13	S17 19-May-2011 W-10	S17 16-Aug-2011 [2] N-11	S17 30-Nov-2011 [22] S17	S17 30-May-2012 S 17	S17 22-Aug-2012 S-17	S17 29-Nov-2012 S17	S17 28-May-2013 S17	S17 15-Aug-2013 [20] S17
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	208000	107000	148000	97000	190000	250000	250000	180000	--
Ammonia, unionized	ug/l	20	0.42	<0.1	8.79	0.5	<5.18	2.31	0.52	2.57	--
Ammonia Nitrogen	ug/l	--	30	<20	420	60	<50	93	180	140	--
Biochemical Oxygen Demand, 5 Day	ug/l	--	<1000	<1000	6000	3000	2000	3000	6000	4000	--
Chemical Oxygen Demand	ug/l	--	35000	55000	48000	30000	64000	40000	43000	44000	--
Chloride	ug/l	--	102000	36000	97000	41000	160000	290000	240000	140000	--
Conductivity	uS/cm	--	864	362	716	442	--	--	--	--	--
Conductivity (Field)	uS/cm	--	650	363	617	439	927	1357	1272	771	--
Dissolved Inorganic Carbon	ug/l	--	52000	25800	35400	18700	45000	55000	54000	40000	--
Dissolved Organic Carbon	ug/l	--	13000	20800	11500	8500	18000	12000	9500	17000	--
Dissolved Oxygen (Field)	ug/l	-- [7]	11690	**3070**	**3610**	**4550**	6030	**3520**	**6940**	11360	--
Hardness, Calcium Carbonate	ug/l	--	228000	128000	174000	138000	230000	310000	300000	250000	--
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	2210	<100	1010	1210	980	480	4400	900	--
Nitrite as N	ug/l	--	<100	<100	<100	<100	28	80	48	<10	--
Nitrogen, Total Kjeldahl	ug/l	--	820	1270	1800	1190	2400	1500	2700	1000	--
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	1000	560	4500	900	--
pH (Field)	-	6.5 - 8.5	7.84	7.26	7.61	7.83	8.26	7.72	7.51	7.77	--
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**80**	**80**	**190**	**200**	**320**	**160**	**280**	**56**	--
Sulphate	ug/l	--	52000	15000	50000	50000	43000	59000	65000	36000	--
Temperature (Field)	deg c	-- [10]	11.3	14.7	23.9	5.0	26.6	22.8	0.9	17.0	--
Total Dissolved Solids	ug/l	--	562000	235000	465000	287000	556000	852000	722000	462000	--
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	9000	3000	31000	13000	4000	12000	24000	<1000	--
Metals											
Arsenic	ug/l	100 [11]	<1	<1	<10	<50	1.6	1.3	<1.0	<1.0	--
Boron	ug/l	200 [12]	30	20	60	<100	50	71	45	19	--
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	**<10**	<0.10	<0.10	<0.10	<0.10	--
Calcium	ug/l	--	70000	38000	58000	42000	78000	110000	110000	74000	--
Chromium	ug/l	-- [13]	4	2	7	**<50**	<5.0	<5.0	<5.0	<5.0	--
Cobalt	ug/l	0.9	0.4	0.5	0.8	<10	0.68	0.65	0.51	<0.50	--
Copper	ug/l	5	2	1	4	**<10**	4.4	3.1	4.4	1.8	--
Iron	ug/l	300	260	**1280**	**1370**	**900**	**920**	**990**	**620**	**410**	--
Lead	ug/l	-- [14]	<1	<1	4	**<10**	1.1	1.2	0.83	<0.50	--
Magnesium	ug/l	--	13000	8000	7000	8000	13000	12000	16000	13000	--
Manganese	ug/l	--	70	110	470	40	170	150	220	150	--
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	7000	4000	11000	8000	6400	9700	8400	4900	--
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	63000	25000	70000	29000	120000	230000	190000	85000	--
Zinc	ug/l	30 [11]	20	<10	20	<50	30	15	**73**	21	--
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	<1	<1	<1	<1	**2.2**	<1.0	<1.0	<1.0	--

Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S17 21-Nov-2013 SA-2	S17 28-May-2014 S17	S17 26-Aug-2014 [20] S17	S17 13-Nov-2014 S-17	S17 27-May-2015 S-17	S17 25-Aug-2015 S-17	S17 25-Nov-2015 S-17	S17 24-May-2016 S-17	S17 18-Aug-2016 S-17
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	230000	210000	--	190000	244000	257000	245000	201000	119000
Ammonia, unionized	ug/l	20	<0.47	1.45	--	<0.31	0.3	19.16	0.51	4.47	1.86
Ammonia Nitrogen	ug/l	--	<50	69	--	<50	170	440	80	280	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<2000	--	<2000	3000	14000	16000	3000	4000
Chemical Oxygen Demand	ug/l	--	32000	45000	--	42000	60000	88000	63000	45000	47000
Chloride	ug/l	--	100000	240000	--	75000	654000	347000	246000	317000	154000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	862	1122	--	584	2387	1513	1272	1286	933
Dissolved Inorganic Carbon	ug/l	--	57000	48000	--	44000	58700	62000	52600	43600	4700
Dissolved Organic Carbon	ug/l	--	10000	16000	--	16000	22500	16000	15900	15500	36800
Dissolved Oxygen (Field)	ug/l	-- [7]	10550	8150	--	**6620**	**4980**	**730**	**6900**	**110**	7180
Hardness, Calcium Carbonate	ug/l	--	300000	290000	--	230000	375000	224000	363000	297000	191000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	1800	580	--	770	<100	200	600	<100	200
Nitrite as N	ug/l	--	16	34	--	13	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	940	1000	--	960	1600	3000	1200	1300	1100
Nitrogen, Nitrate-Nitrite	ug/l	--	1800	620	--	780	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.98	7.85	--	7.74	6.62	8.07	7.83	7.38	7.75
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**140**	**66**	--	**86**	**150**	**650**	**150**	**60**	**150**
Sulphate	ug/l	--	78000	37000	--	56000	20000	43000	55000	28000	144000
Temperature (Field)	deg c	-- [10]	2.2	16.4	--	3.8	20.9	19.7	1.8	27.5	25
Total Dissolved Solids	ug/l	--	554000	744000	--	394000	1410000	872000	667000	776000	592000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	10000	12000	--	230000	8000	61000	6000	11000	18000
Metals											
Arsenic	ug/l	100 [11]	1.4	1.1	--	<1.0	2	2	<1	1	3
Boron	ug/l	200 [12]	40	32	--	25	33	53	33	34	43
Cadmium	ug/l	0.2 [11]	<0.10	<0.10	--	<0.10	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	100000	97000	--	68000	108000	72300	119000	98700	61700
Chromium	ug/l	-- [13]	<5.0	<5.0	--	<5.0	2	6	3	1	1
Cobalt	ug/l	0.9	0.80	<0.50	--	<0.50	0.7	**1.6**	0.7	0.6	<0.5
Copper	ug/l	5	4.7	1.5	--	2.3	<0.5	0.7	0.8	1.7	1.6
Iron	ug/l	300	**1700**	**620**	--	**880**	**1110**	**4140**	**1330**	**970**	**864**
Lead	ug/l	-- [14]	3.2	<0.50	--	0.85	0.5	**5.4**	2.6	0.5	1.4
Magnesium	ug/l	--	20000	16000	--	18000	25800	10600	16100	12300	8850
Manganese	ug/l	--	74	320	--	110	753	542	137	641	109
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	7300	5700	--	5400	7530	8850	6440	6310	5840
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	70000	160000	--	52000	306000	183000	159000	199000	87000
Zinc	ug/l	30 [11]	**47**	19	--	24	8	**48**	**39**	9	13
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**1.2**	<1.0	--	**5.7**	<1	**2**	<1	**9**	**7**

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S17 16-Nov-2016 S-17	S17 18-May-2017 S-17	S17 28-Aug-2017 S-17	S17 28-Nov-2017 S-17	S17 23-May-2018 S-17	S17 30-Aug-2018 S-17	S17 28-Nov-2018 S-17	S17 20-Jun-2019 S-17	S17 28-Aug-2019 S-17
General Chemistry											
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	200000	163000	246000	185000	183000	334000	133000	211000	86000
Ammonia, unionized	ug/l	20	2.93	3.96	3.73	0.73	1.89	11.14	0.06	2.28	0.97
Ammonia Nitrogen	ug/l	--	80	60	370	100	60	930	50	160	80
Biochemical Oxygen Demand, 5 Day	ug/l	--	2000	<2000	25000	20000	<2000	3000	2000	<2000	4000
Chemical Oxygen Demand	ug/l	--	28000	49000	38000	79000	53000	56000	34000	65000	44000
Chloride	ug/l	--	183000	199000	273000	106000	274000	488000	151000	300000	192000
Conductivity	uS/cm	--	--	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1104	907	1000	705	1225	1931	351	1256	884
Dissolved Inorganic Carbon	ug/l	--	39200	16000	50700	14800	41400	63000	23800	44800	27300
Dissolved Organic Carbon	ug/l	--	9300	30300	12200	43100	18600	13900	11900	13000	12900
Dissolved Oxygen (Field)	ug/l	-- [7]	8560	10440	**1690**	8240	11540	**1360**	12320	9810	**2950**
Hardness, Calcium Carbonate	ug/l	--	275000	193000	294000	216000	216000	400000	192000	285000	153000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	900	<100	400	1100	100	<100	1200	300	500
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<250 [18]	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	600	900	2400	1300	1100	2800	1000	1400	900
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	8.38	8.08	7.42	7.93	7.86	7.55	7.13	7.64	7.49
Phosphate	ug/l	--	--	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**90**	**50**	**490**	**220**	**60**	**510**	**150**	**70**	**150**
Sulphate	ug/l	--	68000	30000	43000	48000	19000	24000	54000	31000	101000
Temperature (Field)	deg c	-- [10]	8.0	25.5	19.7	0.6	21.7	18.0	1.0	17.6	20.1
Total Dissolved Solids	ug/l	--	598000	552000	738000	428000	710000	1090000	438000	770000	548000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	51000	10000	76000	63000	<2000	85000	3000	<2000	43000
Metals											
Arsenic	ug/l	100 [11]	<1	<5 [17]	1	<1	1	2	<1	1	<1
Boron	ug/l	200 [12]	125	141	158	29	33	32	26	32	34
Cadmium	ug/l	0.2 [11]	<0.1	<0.5 [17]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	88900	58600	97200	64200	66100	131000	57100	86600	51700
Chromium	ug/l	-- [13]	2	<5 [17]	2	3	<1	5	2	<1	4
Cobalt	ug/l	0.9	0.6	<2.5 [17]	0.6	0.7	<0.5	**1.3**	0.6	0.7	**1.0**
Copper	ug/l	5	3.0	4.5	0.6	3.2	0.9	3.8	3.4	2.1	**6.8**
Iron	ug/l	300	**1130**	**811**	**2200**	**1330**	**738**	**5700**	**489**	**821**	**1550**
Lead	ug/l	-- [14]	1.5	<0.5 [17]	1.3	2.0	0.3	3.8	0.5	0.2	2.5
Magnesium	ug/l	--	13000	11300	12400	13600	12500	17500	11900	16600	5720
Manganese	ug/l	--	149	160	751	120	208	1380	125	484	140
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--	--	--
Potassium	ug/l	--	8600	4450	7590	4760	4340	11500	6310	5900	6120
Selenium	ug/l	100	--	--	--	--	--	--	--	--	--
Sodium	ug/l	--	121000	113000	181000	57600	145000	241000	86500	165000	101000
Zinc	ug/l	30 [11]	**42**	<25 [17]	18	24	10	27	21	13	27
Phenols											
Phenolics, Total Recoverable	ug/l	1 [16]	**6**	<1	<1	<1	<1	<1	<1	<1	**4**

WCC - Navan Waste Recycling and Disposal Facility
Report of Monitoring Results - Surface Water

Parameter	Unit	PWQO [1]	S17 21-Nov-2019 S-17	S17 14-May-2020 S-17	S17 26-Aug-2020 S-17	S17 25-Nov-2020 S-17	S17 27-May-2021 S-17	S17 24-Aug-2021 S-17	S17 24-Nov-2021 S-17
General Chemistry									
Alkalinity, Bicarbonate (HCO3) as CaCO3	ug/l	--	--	--	--	--	--	--	--
Alkalinity, Carbonate as CaCO3	ug/l	-- [5]	--	--	--	--	--	--	--
Alkalinity (Total as CaCO3)	ug/l	-- [5]	200000	143000	224000	246000	247000	360000	258000
Ammonia, unionized	ug/l	20	0.21	2.35	1.62	0.31	2.47	0.6	0.21
Ammonia Nitrogen	ug/l	--	50	30	130	70	210	40	50
Biochemical Oxygen Demand, 5 Day	ug/l	--	28000	<2000	4000	<2000	9000	<2000	<2000
Chemical Oxygen Demand	ug/l	--	76000	33000	39000	38000	45000	38000	37000
Chloride	ug/l	--	275000	183000	339000	208000	533000	33000	60000
Conductivity	uS/cm	--	--	--	--	--	--	--	--
Conductivity (Field)	uS/cm	--	1499	836	1557	10	2199	1308	1244
Dissolved Inorganic Carbon	ug/l	--	1380	33100	46400	56300	56600	56600	58300
Dissolved Organic Carbon	ug/l	--	17600	16800	10600	12500	13700	13300	10900
Dissolved Oxygen (Field)	ug/l	-- [7]	10230	14450	**0** [36]	10070	6590	286000	9410
Hardness, Calcium Carbonate	ug/l	--	352000	194000	280000	293000	416000	704000	659000
Hydrogen Sulfide	ug/l	2 [8]	--	--	--	--	--	--	--
Nitrate as N	ug/l	--	600	<100	<100	600	<100	<100	600
Nitrite as N	ug/l	--	<50	<50	<50	<50	<50	<50	<50
Nitrogen, Total Kjeldahl	ug/l	--	800	500	1300	600	1100	600	500
Nitrogen, Nitrate-Nitrite	ug/l	--	--	--	--	--	--	--	--
pH (Field)	-	6.5 - 8.5	7.67	8.35	7.56	7.72	7.59	7.54	7.56
Phosphate	ug/l	--	--	--	--	--	--	--	--
Phosphorus	ug/l	-- [9]	**40**	30	**300**	**70**	**90**	20	<10
Sulphate	ug/l	--	104000	48000	106000	69000	99000	376000	357000
Temperature (Field)	deg c	-- [10]	0.9	19.4	18.2	0.3	16.5	21.4	4.4
Total Dissolved Solids	ug/l	--	772000	426000	866000	688000	1300000	962000	826000
Total Organic Carbon	ug/l	--	--	--	--	--	--	--	--
Total Suspended Solids	ug/l	--	<2000	3000	47000	11000	5000	59000	<2000
Metals									
Arsenic	ug/l	100 [11]	<1	<1	1	<1	<1	<1	<1
Boron	ug/l	200 [12]	37	17	73	24	47	103	73
Cadmium	ug/l	0.2 [11]	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Calcium	ug/l	--	104000	59800	89100	88600	127000	221000	214000
Chromium	ug/l	-- [13]	1	1	2	1	1	1	<1
Cobalt	ug/l	0.9	0.6	<0.5	**1.0**	<0.5	0.6	0.6	0.7
Copper	ug/l	5	2.9	1.7	2.3	2.0	1.3	2.6	1.5
Iron	ug/l	300	**391**	**515**	**1660**	**575**	**844**	**841**	227
Lead	ug/l	-- [14]	0.3	0.3	1.3	0.7	0.3	0.5	0.1
Magnesium	ug/l	--	22400	10900	14000	17400	24100	37300	30100
Manganese	ug/l	--	169	158	292	88	438	154	108
Mercury, dissolved	ug/l	0.2 [15]	--	--	--	--	--	--	--
Molybdenum	ug/l	40	--	--	--	--	--	--	--
Nickel	ug/l	25	--	--	--	--	--	--	--
Potassium	ug/l	--	8110	3620	9020	6720	9390	13700	11400
Selenium	ug/l	100	--	--	--	--	--	--	--
Sodium	ug/l	--	152000	88000	201000	119000	300000	33600	45200
Zinc	ug/l	30 [11]	29	8	13	7	<5	13	11
Phenols									
Phenolics, Total Recoverable	ug/l	1 [16]	**9**	<1	**6**	<4 [19]	**5**	<1	**3**

Parameter	Unit	PWQO [1]	S18 16-Nov-2006
General Chemistry			
Alkalinity (Total as CaCO3)	ug/l	-- [5]	145000
Ammonia, unionized	ug/l	20	<10
Ammonia Nitrogen	ug/l	--	<10
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000
Chemical Oxygen Demand	ug/l	--	28000
Chloride	ug/l	--	33400
Conductivity (Field)	uS/cm	--	300
Dissolved Inorganic Carbon	ug/l	--	37700
Dissolved Organic Carbon	ug/l	--	14000
Dissolved Oxygen (Field)	ug/l	-- [7]	6800
Hardness, Calcium Carbonate	ug/l	--	147000
Nitrate as N	ug/l	--	<100
Nitrogen, Total Kjeldahl	ug/l	--	780
pH (Field)	-	6.5 - 8.5	6.9
Phosphorus	ug/l	-- [9]	**40**
Sulphate	ug/l	--	35000
Temperature (Field)	deg c	-- [10]	6.2
Total Dissolved Solids	ug/l	--	262000
Total Suspended Solids	ug/l	--	13000
Metals			
Arsenic	ug/l	100 [11]	<1
Boron	ug/l	200 [12]	177
Cadmium	ug/l	0.2 [11]	<0.5
Calcium	ug/l	--	39000
Chromium	ug/l	-- [13]	**10**
Cobalt	ug/l	0.9	<0.5
Copper	ug/l	5	**37**
Iron	ug/l	300	**880**
Lead	ug/l	-- [14]	0.6
Magnesium	ug/l	--	12000
Manganese	ug/l	--	38
Potassium	ug/l	--	5300
Sodium	ug/l	--	49700
Zinc	ug/l	30 [11]	26
Phenols			
Phenolics, Total Recoverable	ug/l	1 [16]	<1

Parameter	Unit	PWQO [1]	S19 16-Nov-2006
General Chemistry			
Alkalinity (Total as CaCO3)	ug/l	-- [5]	170000
Ammonia, unionized	ug/l	20	<10
Ammonia Nitrogen	ug/l	--	60
Biochemical Oxygen Demand, 5 Day	ug/l	--	<3000
Chemical Oxygen Demand	ug/l	--	34000
Chloride	ug/l	--	82600
Conductivity (Field)	uS/cm	--	450
Dissolved Inorganic Carbon	ug/l	--	42500
Dissolved Organic Carbon	ug/l	--	10100
Dissolved Oxygen (Field)	ug/l	-- [7]	7930
Hardness, Calcium Carbonate	ug/l	--	197000
Nitrate as N	ug/l	--	1200
Nitrogen, Total Kjeldahl	ug/l	--	960
Phosphorus	ug/l	-- [9]	**200**
Sulphate	ug/l	--	38000
Temperature (Field)	deg c	-- [10]	8.6
Total Dissolved Solids	ug/l	--	379000
Total Suspended Solids	ug/l	--	82000
Metals			
Arsenic	ug/l	100 [11]	<1
Boron	ug/l	200 [12]	38
Cadmium	ug/l	0.2 [11]	<0.5
Calcium	ug/l	--	57100
Chromium	ug/l	-- [13]	8
Cobalt	ug/l	0.9	**1**
Copper	ug/l	5	**42**
Iron	ug/l	300	**1850**
Lead	ug/l	-- [14]	4
Magnesium	ug/l	--	13300
Manganese	ug/l	--	88
Potassium	ug/l	--	4900
Sodium	ug/l	--	73900
Zinc	ug/l	30 [11]	**40**
Phenols			
Phenolics, Total Recoverable	ug/l	1 [16]	<1

Footnotes:

	Tables should be read in conjunction with the accompanying document.
<	Indicates parameter not detected above laboratory method detection limit.
>	Indicates parameter detected above equipment analytical range.
--	Chemical not analyzed or criteria not defined.
Value	Parameter is greater than PWQO
(1)	Provincial Water Quality Objectives (July 1994, reprinted February 1999)
(2)	Arsenic MRL elevated due to matrix interference.
(3)	TP MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated
(4)	Sampling location was slightly moved due to ditch alterations.
(5)	Alkalinity should not be decreased by more than 25% of the natural concentration.
(6)	PWQO is for free cyanide in an unfiltered water sample.
(7)	Objective depends on water temperature and biota. Dissolved oxygen concentrations should not be less than the values specified in the PWQO document for cold water biota (e.g. salmonid fish communities) and warm water biota (e.g. centrarchid fish communities).
(8)	Undissociated hydrogen sulphide.
(9)	guidelines which should be supplemented by site-specific studies: To avoid nuisance concentrations of algae in lakes, average total phosphorus concentrations for the ice-free period should not exceed 20 ug/L; A high level of protection against aesthetic deterioration will be provided by a total phosphorus concentration for the ice-free period of 10 ug/L or less. This should apply to all lakes naturally below this value; Excessive plant growth in rivers and streams should be eliminated at a total phosphorus concentration below 30 ug/L.
(10)	(1) General: The natural thermal regime of any body of water shall not be altered so as to impair the quality of the natural environment. In particular, the diversity, distribution and abundance of plant and animal life shall not be significantly changed. (2) Waste Heat Discharge: (a) Ambient Temperature Changes: The temperature at the edge of a mixing zone shall not exceed the natural ambient water temperature at a representative control location by more than 10°C (18°F). However, in special circumstances, local conditions may require a significantly lower temperature difference than 10°C (18°F). Potential dischargers are to apply to the MOEE for guidance as to the allowable temperature rise for each thermal discharge. This ministry will also specify the nature of the mixing zone and the procedure for the establishment of a representative control location for temperature recording on a case-by-case basis. (b) Discharge Temperature Permitted: The maximum temperature of the receiving body of water, at any point in the thermal plume outside a mixing zone, shall not exceed 30°C (86°F) or the temperature of a representative control location plus 10°C (18°F) or the allowed temperature difference, which ever is the lesser temperature. These maximum temperatures are to be measured on a mean daily basis from continuous records. (c) Taking and Discharging of Cooling Water: Users of cooling water shall meet both the Objectives for temperature outlined above and the "Procedures for the Taking and Discharge of Cooling Water" as outlined in the MOEE publication Deriving Receiving-Water Based, Point-Source Effluent Requirements for Ontario Waters(1994).
(11)	An Interim PWQO also exists for this parameter. See Section 1.10 of the PWQO - Where both a PWQO and an Interim PWQO exist.
(12)	See Section 1.2.3. of PWQO. This Interim PWQO was set for emergency purposes based on the best information readily available. Employ due caution when applying this value.
(13)	PWQO values exist for Cr(III) and Cr(VI)
(14)	If alkalinity as CaCO3 < 20 mg/L, PWQO = 5 µg/L; if alkalinity as CaCO3 from 20 to 40 mg/L, PWQO = 10 µg/L; if alkalinity as CaCO3 from 40 to 80 mg/L, PWQO = 20 µg/L; if alkalinity as CaCO3 > 80 mg/L, PWQO = 25 ug/L. An Interim PWQO also exists for this parameter. See Section 1.10 of the PWQO - Where both a PWQO and an Interim PWQO exist.
(15)	In a filtered water sample.
(16)	Determined by the total reactive phenols test - the 4-AAP (4-amino-antipyrine) test. This objective should be used primarily as a screening tool. The isomer specific PWQOs for various phenolics should be employed where possible.
(17)	INOG12 Water sample required digestion for Total metals analysis, which resulted in elevated detection limits.
(18)	GEN04 Elevated detection limit because of dilution required due to the presence of high levels of non-target analytes.
(19)	GEN02 Elevated Reporting Limit due to matrix interference.
(20)	Monitoring location was dry during this sampling event. No sample was collected.
(21)	Metals analysis performed on aqua-regia digest of sample material except for Boron.
(22)	Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated.
(23)	Nitrite/Nitrate: Due to the sample matrix, sample required dilution. Detection limits were adjusted accordingly.

(24) Nitrite/Nitrate: Due to the colour interferences, some sample required dilution. Detection limits were adjusted accordingly.
(25) Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.
(26) BOD01 Raised Reporting Limits for BOD due to dilutions based on preliminary COD screening results.
(27) Metals analysis performed on aqua-regia digest of sample material.
(28) TP MRL elevated due to matrix interference.
(29) Arsenic and TP MRL elevated due to matrix interference.
(30) Metals analysis performed on aqua-regia digest of sample material, except for Boron. Phenols MRL elevated due to matrix interference
(31) Metals analysis performed on aqua-regia digest of sample material except for Boron.
(32) Phenols MRL elevated due to matrix interference.
(33) GEN09 Elevated detection limits due to the nature of the sample matrix.
(34) TP MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material.
(35) Insufficient water at monitoring location to sample. No sample was collected.
(36) Parameter was not measured.
(37) Monitoring location was stagnant during sampling event. No sample was collected.
(38) Monitoring location was frozen during this sampling event. No sample was collected.
(39) Insufficient sample volume was collected for analysis.
(40) At pH 4.5 to 5.5 the Interim PWQO is 15 µg/L based on inorganic monomeric aluminum measure in clay-free samples; At pH > 5.5 to 6.5, no condition should be permitted which would increase the acid soluble inorganic aluminum concentration in clay-free samples to more than 10% above natural background concentrations for waters representative of that geological area of the Province that are unaffected by man-made inputs. At pH > 6.5 to 9.0, the Interim PWQO is 75 µg/L based on total aluminum measured in clay-free samples. If natural background aluminum concentrations in water bodies unaffected by man-made inputs are greater than the numerical Interim PWQO (above), no condition is permitted that would increase the aluminum concentration in clay-free samples by more than 10% of the natural background level. Note: pH values of < 6.5 and > 8.5 are outside the range considered acceptable by the PWQO for pH. See the Scientific Criteria Document for Development of Provincial Water Quality Objectives and Guidelines - Aluminum for a discussion of analytical procedures.
(41) Metals analysis performed on aqua-regia digest of sample material, except for Boron.
(42) TP MRL elevated due to matrix interference. Metals analysis performed on aqua-regia digest of sample material due to solids present in sample. MRLs may be elevated

Appendix '2'

Golder 2021 Landfill Gas Monitoring Report

WSP GOLDER

REPORT

2021 Landfill Gas Monitoring Report

Waste Connections of Canada
Navan Waste Recycling and Disposal Facility
Ottawa, Ontario

Submitted to:

Waste Connections of Canada
3354 Navan Road
Ottawa, Ontario
K4B 1H9

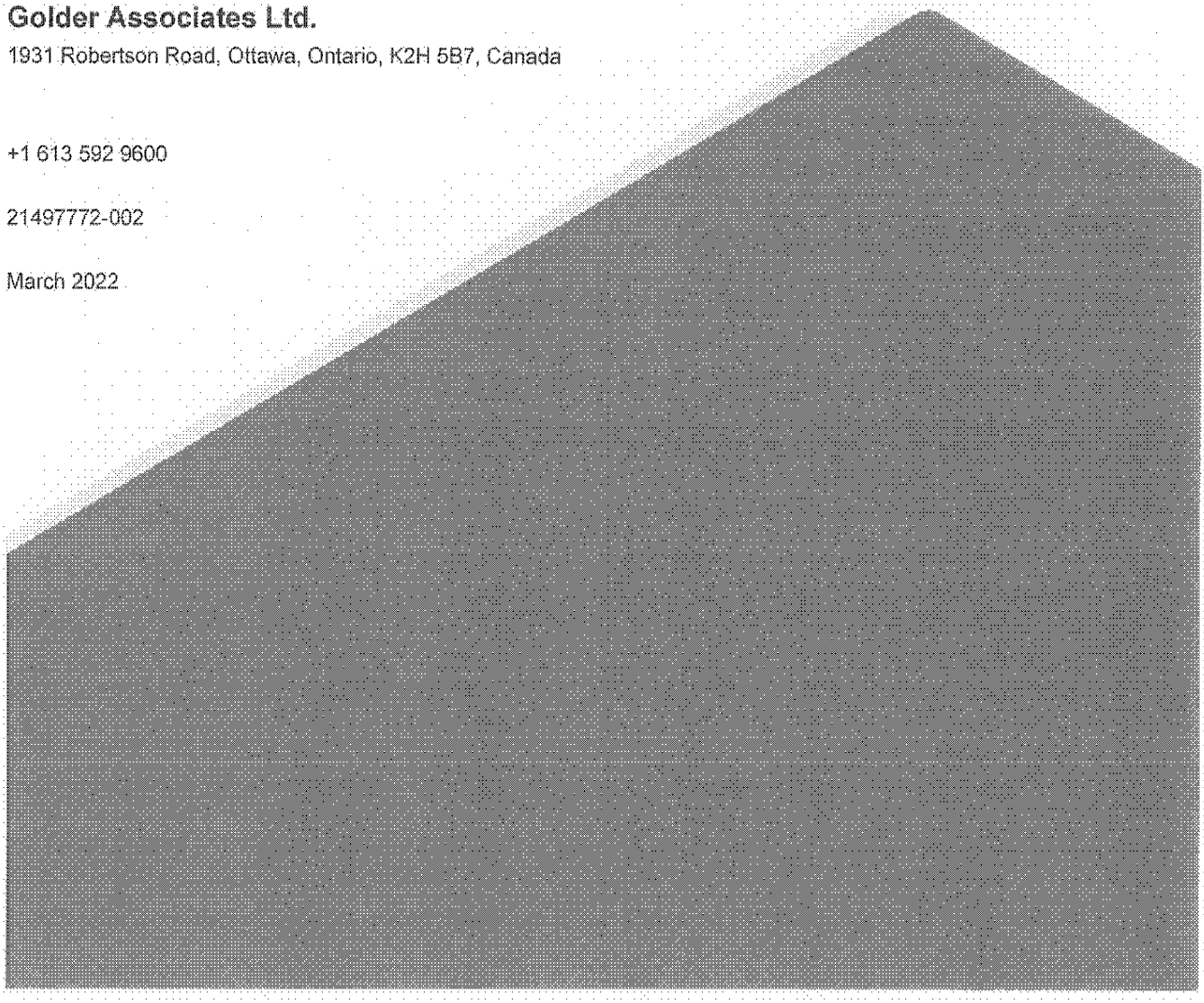
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21497772-002

March 2022



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Executive Summary

This report serves as the landfill gas (LFG) monitoring portion of the 2021 site operations and monitoring report and presents the results of LFG monitoring activities carried out during 2021 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility). This report has been prepared to fulfill the reporting requirements outlined in Condition 110 of Environmental Compliance Approval No. A460702 dated April 16, 2009.

The following executive summary highlights key points only; for complete information and findings it is necessary for the reader to examine the complete report.

LFG monitoring was undertaken in May, August and December 2021. At most locations monitored, methane gas was detected at concentrations lower than 1.25% by volume. Non-methane organic compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system, with methane concentrations measured in excess of 1.25% by volume at the following locations:

- MH-2 (G18a), MH-3 (G13a), MH-4 (G12a), and MH-5 (G11a) in August 2021
- MH-7 (G5a), MH-9 (G3a), and MH-10 (G2a) in December 2021

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met by the WCC Navan Facility based on the 2021 monitoring results. Although no monitoring locations are available below surface at the property boundary, it is anticipated that the WCC Navan Facility met the property boundary requirements in 2021.

Hydrogen sulfide was not detected at any location during the 2021 monitoring events, with the exception of the following location, which reported a relatively low detection (1 part per million or ppm):

MH-6 (G6a), OW-94-2 (G8), OW-92-8 (G15), and Primary Tank #1 (G26d), all in May 2021.It is noted that an interim LFG odour control system (refer to Section 3.4) was installed in 2011 and commissioned in April 2012. The system was extended in 2016, 2017, 2019, and 2020. The purpose of this system is to control potential odorous emissions from the site until the full-scale LFG collection system is installed at the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells.

Construction of the permanent LFG collection and treatment system continued in 2021 and the new flare and extraction plant are expected to be commissioned in 2022.

Table of Contents

EXECUTIVE SUMMARY i

1.0 INTRODUCTION 1

2.0 CHARACTERISTICS OF LANDFILL GAS AT THE WCC NAVAN FACILITY 1

3.0 ENGINEERING SYSTEMS 2

3.1 Buffer Area and Natural Barrier System 2

3.2 Constructed Barrier System 2

3.3 Passive Ventilation System 3

3.4 Interim Landfill Gas Odour Control System 3

4.0 LANDFILL GAS ASSESSMENTS 3

4.1 Olfactive Assessment 3

4.2 Visual Assessment 4

4.3 Ongoing Gas Monitoring in On-Site Buildings 4

4.4 Field Monitoring 4

5.0 LANDFILL GAS FIELD MONITORING RESULTS 5

6.0 ODOUR CONTROL 6

6.1 Odour Monitoring 6

6.2 Prevention 7

6.3 Masking the Odour 8

6.4 Isolating an Odour Source 8

6.5 Complaints Response 8

7.0 LIMITATIONS AND USE OF REPORT 9

TABLES

Table 1: Composition of Landfill Gas at WCC Navan Facility

Table 2: Field Monitoring Results – May 2021

Table 3: Field Monitoring Results – August 2021

Table 4: Field Monitoring Results – December 2021

FIGURES

Figure 1: Key Plan

Figure 2: Landfill Gas Monitoring Locations

APPENDICES

APPENDIX A
2009 Landfill Gas Characterization

1.0 INTRODUCTION

This report serves as the landfill gas (LFG) monitoring portion of the 2021 site operations and monitoring report and presents the results of LFG monitoring activities carried out by Golder Associates Ltd. (Golder) during 2021 at the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (the WCC Navan Facility).

The WCC Navan Facility is located at 3354 Navan Road on part of Lots 2, 3, and 4, Concession IV, Ottawa Front, in the City of Ottawa as shown in Figure 1. This site is operated under Environmental Compliance Approval (ECA) No. A460702 (dated April 16, 2009) and ECA (air) No. 6141-59XKF9 (dated May 10, 2002, authorizing the use of a mobile wood grinder to process wood waste), No. 6733-7BYS9A (dated April 16, 2009, authorizing the permanent LFG Collection and Treatment System) and No. 3536-8APNZD (dated November 24, 2010, authorizing the Interim Landfill Gas Odour Control System).

This report has been prepared to fulfill the reporting requirements outlined in Condition 110 of ECA No. A460702.

2.0 CHARACTERISTICS OF LANDFILL GAS AT THE WCC NAVAN FACILITY

The presence of typical LFG is indicated by a reduction in nitrogen (N_2) and oxygen (O_2) and elevated concentrations of carbon dioxide (CO_2), methane (CH_4) and hydrogen sulfide (H_2S) when compared to atmospheric air as described in the table below. The main constituents of typical LFG are CO_2, CH_4 and H_2S. Other parameters such as mercaptans and volatile organic compounds can be present in LFG but at lower concentrations. LFG at the WCC Navan Facility was characterized in 1994, in 2002 and in 2009. The average composition of WCC LFG at the monitored locations is provided in the table below. It is noted that the LFG composition presented herein is not representative of the composition in the LFG collection and flaring system. The raw data from the 1994 and 2002 characterizations is provided in Table 1 and the data from the 2009 characterization is provided in Appendix A.

Select Gases	Sea-Level Composition of Air[1] (15°C and 101 kPa) (% by Volume)	Average WCC LFG Composition November 1994 (% by Volume)	Average WCC LFG Composition June 2002 (% by Volume)	Average WCC LFG Composition 2009* (% by Volume)
Nitrogen, N_2	78.1	77.5	78.4	NM
Oxygen, O_2	20.9	19	20.6	14.6
Carbon Dioxide, CO_2	0.03	2.7	0.5	12.6
Methane, CH_4	0.0002	1.3	0.2	14.1
Trace Elements	<0.01	NM	NM	NM

Notes:
[1] Source: CRC Handbook of Chemistry and Physics by David R. Lide, Editor-in-Chief, 1997 Edition.
* The averages were calculated using data from all Maintenance Holes and cleanouts (both measured with tubing) over the six monitoring sessions.
NM – not monitored

002643

3.0 ENGINEERING SYSTEMS

From a hydrogeological perspective, the WCC Navan Facility is favourably situated on a thick deposit of low permeability, Champlain Sea clay (Leda Clay). The site is characterized by a shallow groundwater table. This is overlain by a thin sand cover, through which gas migration can occur. The west and south perimeter drainage system put in place by WCC has been excavated through the sand deposit into the underlying clay and extends to the water table. This drainage system, combined with the natural subsoil conditions, a perimeter buffer area and constructed low permeability barrier systems are considered to have significantly reduced the potential for off-site migration of LFG. The engineering systems in place at the WCC Navan Facility to safeguard against off-site migration of methane gas are discussed below.

3.1 Buffer Area and Natural Barrier System

The WCC Navan Facility is designed with a buffer area and natural barriers. The site has a favourable hydrogeological setting whereby the site is underlain and surrounded by a thick clay deposit of low permeability. The depth below grade to the water table at the perimeter of the site is shallow. The depth of the landfill between the ground surface and the water table is less than 2.5 metres. The Ministry of the Environment, Conservation and Parks (MECP) *Guideline for Assessing Methane Hazards from Landfill Sites* (Ministry of Environment, 1987) considers that methane gas migration of any significance may extend for a distance of ten times the depth of the landfill between the ground surface and the water table. Based on site conditions, this 10:1 general rule would suggest that methane migration could extend for a distance of 25 metres. The north, west, south and east sides of the landfill footprint are surrounded by buffer zones of 30 to 70 metres, 100 metres, 10 metres and 140 metres, respectively. Note that on the south side of the landfill a 10-metre buffer zone exists between the south limits of the waste mound and the VIA Rail right-of-way (ROW) and an additional buffer strip with a width of 100 metres exists to the south of the VIA Rail ROW. These buffers would therefore provide adequate natural venting. The natural barriers and the provision of adequate buffer area present at the WCC Navan Facility are the preferred method of dealing with potential LFG migration.

3.2 Constructed Barrier System

In addition to natural barriers and buffer area, WCC has constructed low permeability clay cut-off walls, clay berms and intervening drainage trenches at the perimeter of the waste footprint. At the edge of the fill area, native sand and other pervious materials have been removed and replaced with less permeable compacted clay. These clay barriers, designed to minimize and contain the flow of leachate, also act as a barrier against the lateral migration of LFG. Presently, the constructed clay barriers exist along the northeast, northwest, west, southwest and southeast perimeters of the fill area. As development of the landfill progresses, clay barriers will be constructed along the east perimeters. In 2020, WCC continued to construct the east buffer adjacent to the waste limit and WCC constructed the north clay buffer wall. An intervening trench or excavated drainage ditch with its base at an elevation lower than the base of the waste pile and/or water table is also present at the perimeter of the waste footprint and will intercept and force any methane to the atmosphere. Construction of the leachate drainage layer on the north and northeast slope in Phase 6 was completed in 2020 (refer to Section 3.3) and landfilling operations were generally located in the northeast corner of the approved waste footprint in 2021.

3.3 Passive Ventilation System

The leachate collection system constructed along the west, south and east limits of the existing waste area, also serves as a passive ventilation system. A passive ventilation system is a system that prevents the subsurface migration of LFGs beyond the landfill property by altering the path of flow without the use of mechanical components.

It can be used as a general barrier to gas movement or as a protective measure for structures and/or vegetation. Maintenance Holes (MHs), installed at intervals of approximately 100 metres are effective in venting LFG as indicated by the results of the field monitoring (as discussed in Sections 4.4 and 5.0).

3.4 Interim Landfill Gas Odour Control System

As part of their commitment to control potential odorous emissions from the site, WCC has installed an interim LFG odour control system which will operate until the full-scale LFG collection system is installed at the site in the near future.

The interim LFG odour control system, which has been constructed within the existing landfill footprint, includes connections to the existing leachate collection system cleanouts and to existing vertical LFG extraction wells, as well as the installation of lateral and header piping, condensate management facilities, an outdoor skid-mounted abstraction plant, and a candlestick flare. During construction, some 15 leachate collection system cleanouts were excavated and the perforated pipe replaced with solid pipe and air tight connections. Tees were installed in the header pipe to allow for expansion of the interim odour control system, if required.

The interim LFG odour control system was installed in 2011 and has been operating since April 2012. Extensions to the LFG odour control system were installed in 2016, 2017, 2019 and 2020. The additional vertical wells installed in 2017 and 2019 are intended to be part of the future permanent LFG collection system. In 2020, one horizontal well was added at the north-west corner of Phase 1.

To date, these systems have performed satisfactorily and have assisted in minimizing potential LFG problems related to the landfill operations. A permanent LFG collection system is being installed as part of the expansion of the WCC Navan Facility as the landfill cells are completed to their final elevation.

4.0 LANDFILL GAS ASSESSMENTS

4.1 Olfactive Assessment

The WCC Navan Facility is a dry waste facility and wet organic waste is not permitted for processing or disposal. Consequently, few odours are emitted from the waste pile at this site. Odours from the waste pile, when detected, are in isolated locations occurring generally from fugitive emissions at ground surface in areas of recent landfilling activity, i.e. three to ten months following waste placement. Clay cover material is regularly placed over areas where the final fill heights have been reached. The waste and daily/interim cover materials in areas where no clay cover has been placed are sufficiently pervious to provide good ventilation at the surface thereby preventing the accumulation of LFG. The leachate collection system constructed at the south and west perimeters of the waste footprint behave as a passive gas ventilation system. Odours resulting from LFG are, on occasion, noticeable at some of the MH openings located along the leachate collection system. These odours dissipate rapidly and are barely noticeable only a short distance from the source of the odours.

002645

It is important to note that in compliance with the amended ECA dated April 16, 2009, the WCC Navan Facility is no longer receiving materials for composting.

Evaluation of odour is based on the subjective interpretations of WCC's on-site personnel and observations by Golder and WCC staff during site visits as well as documentation of odour complaints received from the public nearby. The site practice, when odour complaints are received at the time of the occurrence, is to carry out an investigation of the source of odour regardless of the source of origin and to follow up with the caller with the corrective measures taken or to notify them of the potential source of odour if it is deemed to be originating from an off-site source.

4.2 Visual Assessment

There are no discernible impacts on vegetation at the surface of the landfill resulting from LFG. WCC has undertaken a landscaping program at the site including seeding berms and planting trees and significant efforts have been made at the site to preserve and relocate existing vegetation. The top surface of the waste pile has not been seeded.

In the past, venting of LFG could be observed at ground surface along the west side of the landfill between MHs. The LFG venting was only noticeable once the ground surface was covered with snow. In 2021, venting of LFG at ground surface was not noticeable to Golder technicians.

4.3 Ongoing Gas Monitoring in On-Site Buildings

Gas monitors have been installed in three on-site buildings. The monitors, that are calibrated annually, measure carbon monoxide (CO), nitrogen dioxide (NO_2) and CH_4 in the main site building, H_2S and CH_4 in the scale house, and H_2S and CH_4 in the pump station building. To date, the monitors have not detected any of these gases in the buildings.

4.4 Field Monitoring

Field monitoring with the use of portable field instruments was carried out on May 20, 2021, on August 25, 2021 and on December 16, 2021. The locations where monitoring of LFG and air quality was conducted during the last monitoring session are indicated on Figure 2. Shallow monitoring wells located along the south and north boundaries of the site were included in the monitoring program. Monitoring was also carried out at site facilities such as the leachate pump station, the maintenance garage, the weigh scale station and the leachate collection system. Other on-site locations were selected based on an olfactive and visual inspection of the site, and active landfilling operations. Some locations were selected at random. MHs that are part of the leachate collection system were included.

Monitoring for LFG was also carried out in buildings within close proximity to the landfill. These buildings are the following:

- The on-site maintenance garage
- The on-site pump station
- The on-site scale house
- WCC office at 3354 Navan Road

The ambient air at six addresses along Navan Road and two other off-site locations near the new subdivision adjacent to the site was also included in the LFG monitoring program.

002646

Weather data was obtained from the Ottawa Airport (OTTAWA INTL A, climate ID 6106001) in Ottawa, Ontario located 17 kilometres southwest of the WCC Navan Facility for the monitoring periods of May 20, 2021; August 22, 2021 and December 16, 2021. This weather data is summarized in the table below:

Date	Temperature (°C)			Relative Humidity (%)		Precipitation* (mm)			Station Pressure (kPa)			Wind During Working Hours	
	Max.	Min.	Mean	Max.	Min.	Rain	Snow	Total Precip.	Max.	Min.	Variability During Working Hours	Max Speed (km/h)	Prevail. Direct.
May 20, 2021	29.1	15.8	22.3	76	34	0.0	0.0	0.0	101.51	101.27	↓	17	NW
Aug. 25, 2021	32.6	18.3	25.3	97	42	0.0	0.0	0.0	100.46	100.2	↓	19	SW
Dec.16, 2021	15.2	-0.3	7.7	99	48	2.1	0.0	2.1	100.16	98.4	↓	41	S/SW

Notes: * Precipitation data obtained from the Experimental Farm in Ottawa (CDA RCS, climate ID 6105978)

Entered by: ETB
Checked by: RPM/YJM

Field observations from the Golder technician are provided in Tables 2 to 4 for hours while he was on-site.

The instrument used to detect and measure LFG concentrations during the various sampling events was a LANDTEC GEM-5000 Infrared Gas Analyzer.

The LANDTEC GEM-5000 is designed for analyzing LFG composition and calculating flow. It is a handheld device which can measure percentages of CH_4, CO_2, CO, H_2S and O_2, relative and atmospheric pressure. Methane and carbon dioxide concentrations are measured by infrared gas analyzer and oxygen is measured by the galvanic cell principle. The LANDTEC GEM-2000 Plus, which has historically been used at the site to measure LFG composition, can measure combustible methane Lower Explosive Limit (LEL, equivalent to 5 percent (%) by volume in air for methane gas). Since the LANDTEC GEM-2000 Plus is being phased out and replaced with the LANDTEC GEM-5000, the LEL for all locations were not reported during this monitoring year (see Tables 2 through 4). Interpretation related to LEL is therefore not possible for the 2021 results. Concentrations of CH_4 greater than 1.25% by volume are instead discussed in the next Section.

5.0 LANDFILL GAS FIELD MONITORING RESULTS

Results of the monitoring program undertaken in 2021 are presented in Table 2 for May, Table 3 for August and Table 4 for December. Non-Methane Organic Compounds (NMOCs) do not present an emissions problem at this site. As expected, LFG is present within the leachate collection system, with methane concentrations measured in excess of 1.25% at the following locations:

- MH-3 (G13a), MH-2 (G18a), MH-4 (G12a), and MH-5 (G11a)in August 2021
- MH-7 (G5a), MH-9 (G3a), and MH-10 (G2a) in December 2021.

Monitoring of ambient air conditions in close proximity to point sources of LFG indicate normal atmospheric conditions with trace or non-detectable levels of LFG. According to *Ontario Regulation 232/98*, the Landfill Standards, the design of a landfill must ensure that the subsurface migration of LFG meets several conditions including:

- The concentration of methane gas below the surface of the land at the boundary of the site must be less than 2.5% by volume.
- The concentration of methane gas must be less than 1.0% by volume in any on-site building or enclosed structure.

The on-site building requirements were met at the WCC Navan Facility based on the 2021 monitoring results. Although no monitoring locations are available below surface at the property boundary, based on the discussion in Section 3.1 of this report it is anticipated that the WCC Navan Facility met the property boundary requirements in 2021.

Hydrogen sulfide was not detected at any location during the 2021 monitoring events, with the exception of the following locations, which reported a relatively low concentration (at the detection limit of 1 part per million or ppm):

MH-6 (G6a), OW-94-2 (G8), OW-92-8 (G15), and Primary Tank #1 (G26d), all in May 2021. During the May 2021 monitoring session, faint odours were noted at the site, while no odours were noted during the August and December monitoring sessions by the Golder field technician. As previously mentioned, gas monitors installed in three on-site buildings including the scale house have not been triggered to date. The site maintains a log to record the date and time of any odour complaints. This log describes activities related to the investigation of the complaint, and the mitigative measures implemented, if required, to address concerns. In 2021, WCC personnel responded to one odour related complaint (received on October 14, 2021 from a resident west of the landfill).

6.0 ODOUR CONTROL

To ensure the WCC Navan Facility is operated in a manner that minimizes the impact from odour on the public and the natural environment, the following program is in place at the WCC Navan Facility to deal with odour issues.

6.1 Odour Monitoring

WCC has a comprehensive program for monitoring odours and for taking remedial action in the event that odours become at all problematic in the operation of the WCC Navan Facility. Any unusual odour events and any measures taken to deal with odour at the site are recorded and filed on-site.

There are no Ontario Government standards for odour. There are no agreed-upon, empirical measurement protocols or odour thresholds that may be used in the operation of a landfill or processing facility. Consequently, the ultimate test of an effective odour-control strategy for any facility can only be that it produces no odour complaints from the surrounding community over an extended period of operation. The operators of the facility need to take preventative and other control measures to ensure that odours never reach a threshold where they can generate complaints. The best odour monitoring program available is to give responsibility to all staff working at the site to use their own senses to constantly monitor for excessive levels of odour on-site. While some level of on-site odour is normal and acceptable, it can become a problem when these same odours register off the property. As well, the character of the odour is significant. Many 'aerobic' odours may be very inoffensive, even at a significant concentration, while even very low levels of the types of odour associated with anaerobic activity may be deeply offensive.

It is normal practice at the site to monitor odours in the following way. Every morning, when staff first arrives on the site, a general inspection is undertaken of the facility. While the site manager is looking for anything untoward, the presence of any odours likely to extend beyond the perimeter of the site will be of special concern. In addition, whenever any material at the site is being disturbed by the equipment used at the facility, staff on-site periodically stand downwind of the work that is being done and assure themselves that any odours being created are mild, indicative of fully aerobic activity, and are not likely to be carried off the property.

In the event that staff on-site believe any odours may have some potential for off-site impact, they will drive to a location off-site and downwind from the work at the facility to determine at that moment if any off-site impact can be detected. If there is a detectable off-site impact, work on the site will be stopped immediately and remedial measures will be taken (see below). If no off-site impacts are detectable, work at the site will proceed with caution, with further periodic inspections off-site. Remedial measures will again be taken as appropriate.

The key to this approach is that all staff are constantly vigilant for even mild odours produced on-site and will take actions to deal with those odours well before they become evident off-site.

A windsock and flag are installed on the site. This provides a strong visual reminder to site staff of existing wind conditions, such that they can make judgments as to the potential for off-site odours, given that day's planned activities.

No odour monitoring program is of much value unless there is a companion program to control those same odours, once they are detected. What follows is a stepped program, capable of dealing effectively with everything from the mildest odours to the most offensive. It should be noted that all of the measures described below can and are just as likely to be applied to only sections of a site, rather than to the entire site. The source of odour problems can commonly be quite localized.

6.2 Prevention

The best odour control strategy is odour prevention. If experienced staff early in the process makes the correct, preventative decisions, odour will not be an issue. Although mild odours are experienced on-site from time to time, they are mild in nature and should not be noticeable off-site.

A perimeter drainage system put in place by WCC has been excavated through the sand deposit into the underlying clay and extends below the water table. This drainage system has significantly reduced, if not eliminated, the potential for off-site migration of LFG.

Monitoring of methane gas at the landfill site is performed on three occasions per year generally during the spring, summer and late fall or winter. Results of the monitoring programs and interpretation of the data are presented in the annual Operations & Monitoring report.

A leachate pumping station has been constructed in the southeast corner of the landfill site and a forcemain connection to the municipal sewage treatment plant commenced in 2007. Presently, the disposal method of choice for leachate generated by the WCC Navan Facility is treatment at the Robert O. Pickard Environmental Centre, a wastewater treatment plant. The use of leachate retention ponds has been discontinued. This eliminates the possibility of odours emanating from on-site treatment and leachate retention ponds.

As discussed in Section 3.4, an interim LFG odour control system was installed in 2011 and commissioned in April 2012. The purpose of the interim LFG odour control system is to control potential odorous emissions from the site until the full-scale LFG collection system is installed at the site. The interim LFG odour control system includes connections to the existing leachate collection system cleanouts and to existing vertical

LFG extraction wells. The system was extended in 2016, 2017, and 2019. In 2020, one horizontal well was added at the north-west corner of Phase 1. In 2021, a portion of the header pipe for the permanent landfill gas collection and treatment system was installed and construction of the structural pad and compound area for the new flare and extraction plant were completed. Commissioning of the new flare and extraction plant is expected in 2022.

6.3 Masking the Odour

Principally, these additional measures will consist of using physical, biological and/or chemical methods to mask the odours on the surface of the odour source, so that none of the odours contained within are released to the environment. A number of proven masking techniques are available and can be used at the discretion of the site manager:

- Physically covering the surface of the odour source with a 15 centimetre layer of bulking material is often enough to block the release of most odours for a period of a day or more while remedial work is done;
- A number of biological inoculants are available commercially. These substances, when applied to the surface in a water solution, are felt to effectively reinforce aggressive aerobic activity on the surface by out-competing any anaerobic colonies that may be present in the near surface area. In effect, this creates a bio-filter, and biologically processes anaerobic gases as they are released; and/or,
- A number of chemical/nutrient mixtures are also available commercially. These substances, when applied to the odour source in much the same manner used with the biological inoculants, can have a very similar or even stronger effect. Manufacturers of these products claim that their compounds rapidly stimulate the growth of one desirable family of microorganisms or another, again to create a bio-filter effect.

Whatever the actual mechanism, these products have been proven effective in the field. In all cases, odour control strategies used at this level can be applied within minutes of the decision to use them, and the effects will be largely felt within 10-15 minutes of that application, if not sooner.

6.4 Isolating an Odour Source

The last strategy will consist of using additional measures to isolate and neutralize the offending odour source material. The offensive material may be removed from the problem area, landfilled and covered immediately. This isolation strategy will be used at the discretion of the site manager.

6.5 Complaints Response

In the event that an odour complaint is received, either by the City of Ottawa or the MECP, it is expected that those parties will immediately contact WCC site staff and notify them of the problem. WCC staff will take immediate steps to determine the extent of the problem and whether or not it is caused by the facility. If the source of the odour is deemed to be originating from the WCC Navan Facility, appropriate measures as described above will be taken to mitigate the odour problem and to stop the detection of odours off-site. Again, all such measures taken will be documented and a record kept on-site. If the identity of the complainant is made known to WCC staff, staff will contact the complainant that day, listen to their description of the problem, advise them in detail of the measures taken to rectify the problem, and invite them to visit the facility at some point to see for themselves how the site is operated. WCC will also call them back in a week's time to determine whether or not they have been aware of any other odours at their location.

WCC staff has found in the past that this kind of immediate and personal attention goes a long way to building community support for a facility and builds community confidence in the management of the site.

7.0 LIMITATIONS AND USE OF REPORT

This report was prepared for the exclusive use of Waste Connections of Canada. The report, which specifically includes all tables and figures, is based on data and information collected by Golder Associates Ltd. and is based solely on the conditions of the properties at the time of the work, supplemented by historical information and data obtained by Golder Associates Ltd. as described in this report.

Golder Associates Ltd. has relied in good faith on all information provided and does not accept responsibility for any deficiency, misstatements, or inaccuracies contained in the report as a result of omissions, misinterpretation, or fraudulent acts of the persons contacted or errors or omissions in the reviewed documentation.

The assessment of environmental conditions and possible hazards at this site has been made using the results of physical measurements from a number of locations. The site conditions between sampling locations have been inferred based on conditions observed. Air quality conditions may vary from these sampled locations.

The services performed, as described in this report, were conducted in a manner consistent with that level of care and skill normally exercised by other members of the engineering and science professions currently practicing under similar conditions, subject to the time limits and financial and physical constraints applicable to the services.

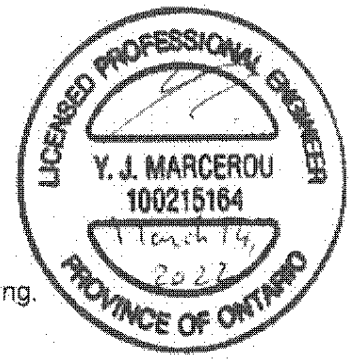
Any use which a third party makes of this report, or any reliance on, or decisions to be made based on it, are the responsibilities of such third parties. Golder Associates Ltd. accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

The findings and conclusions of this report are valid only as of the date of this report. If new information is discovered in future work, including excavations, borings, or other studies, Golder Associates Ltd. should be requested to re-evaluate the conclusions of this report, and to provide amendments as required.

Signature Page

We trust this report satisfies your current requirements. If you have any further questions regarding this report, please contact the undersigned.

Golder Associates Ltd.



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ETB/YJM/PLE/sg
https://golderassociates.sharepoint.com/sites/154022/project files/6 deliverables/1000 2021 amr/rpt 02 - ifg monitoring/21497772-002-r-rev 0-wcc landfill gas 2021_14mar2022.docx

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PARAMETER	November 29, 1994					June 13, 2002				
	MDL	MH-12	G.L. Q-7	MH-7	MH-0	MDL	Ambient (Parking)	Passive Vent F-4	MH-9	Pump Station
		SMP1	SMP2	SMP3	SMP4		SMP1	SMP2	SMP3	SMP4
Nitrogen, N_2 (%)	0.1	77	75	79	79	0.1	77.6	80.1	77.7	78.2
Oxygen, O_2 (%)	0.1	20	15	20	21	0.1	21.6	17.6	21.4	21.7
Carbon Dioxide,CO_2 (%)	0.1	1.8	7.8	1	ND	0.1	ND	1.5	0.3	ND
Methane, CH_4 (%)	0.1	0.7	3.8	0.6	ND	0.1	ND	ND	0.5	ND
Carbon Monoxide, CO (%)	0.1	ND	ND	ND	ND	0.1	ND	ND	ND	ND
Carbon Disulfide (PPM)	0.02	*	ND	-	-	0.04	ND	ND	ND	ND
Dimethyl Disulfide (PPM)	0.03	ND	ND	-	-	0.05	ND	ND	ND	ND
Ethyl Mercaptan / Dimethyl Sulfide (PPM)	0.03	0.4	ND	-	-	0.1	ND	ND	ND	ND
Hydrogen Sulfide / Carbonyl Sulfide (PPM)	0.02	120	0.4	-	-	0.05	ND	ND	ND	-
						2.1	-	-	-	2.2*
Methyl Mercaptan (PPM)	0.03	1	ND	-	-	0.05	ND	ND	ND	ND
Propyl Mercaptan / Ethyl Methyl Sulfide (PPM)	0.03	ND	ND	-	-	0.1	ND	ND	ND	ND
Sulfur Dioxide (PPM)	0.1	ND	ND	-	-	0.4	ND	ND	ND	ND
1,1,1-Trichloroethane (ppb)	0.2	0.1	ND	-	-	-	-	-	-	-
1,3,5-Trimethylbenzene (ppb)	-	-	-	-	-	1	8	ND	9	ND
1,4-Dichlorobenzene	-	-	-	-	-	1	ND	5	6	<1
Benzene (ppb)	0.1	0.1	ND	-	-	1	ND	ND	ND	7
Cyclohexane (ppb)	0.1	0.1	0.1	-	-	-	-	-	-	-
Ethylbenzene (ppb)	-	-	-	-	-	1	ND	3	2	15
Hexane (ppb)	0.1	ND	0.2	-	-	-	-	-	-	-
m,p-Xylene (ppb)	-	-	-	-	-	2	ND	9	2	35
Naphthalene (ppb)	-	-	-	-	-	10	40	ND	48	ND
Other VOC parameters analysed (refer to lab report)	-	-	-	-	-		ND	ND	ND	ND
o-Xylene (ppb)	-	-	-	-	-	1	<1	4	3	11
Styrene (ppb)	-	-	-	-	-	1	11	5	3	6
Toluene (ppb)	0.1	0.7	0.1	-	-	1	15	29	19	170
Total VOCs - EPA 624 (ppb)		4.1	0.4	-	-	-	-	-	-	-
Total Volatile Organics (ppb)	-	-	-	-	-	0.1	0.43	0.24	0.46	0.51
Trichloroethene (ppb)	-	-	-	-	-	1	ND	ND	ND	7
Trichlorofluoromethane (ppb)	0.5	3.1	ND	-	-	-	-	-	-	-

MDL - Method Detection Limit
ND - Not Detected

Created by: BLB
Checked by: PLE

Table 2: Field Monitoring Results - May 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Spring Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Atm. Pressure (inHg)	Atm. Pressure (mBars)
WEST AND SOUTH FACES	G1	a	OW-95-8	0.0	0.1	21.7	0	0	30.18	1022
		b	OW-95-8 Ambient Air	0.0	0.1	21.8	0	0	30.17	1022
	G2	a	MH-10	0.0	0.2	21.9	0	0	30.17	1022
		b	MH-10 Ambient Air	0.0	0.1	22.1	0	0	30.15	1021
	G3	a	MH-9	0.0	0.1	22.1	0	0	30.16	1021
		b	MH-9 Ambient Air	0.0	0.1	22.1	0	0	30.16	1021
	G4	a	MH-8	0.0	0.1	22.2	0	0	30.16	1021
		b	MH-8 Ambient Air	0.0	0.1	22.2	0	0	30.16	1021
	G5	a	MH-7	0.0	0.1	22.2	0	0	30.17	1022
		b	MH-7 Ambient Air	0.0	0.1	22.2	0	0	30.16	1021
	G6	a	MH-6	0.2	1.4	19.7	1	1	30.1	1019
		b	MH-6 Ambient Air	0.0	0.1	20.3	1	0	30.1	1019
	G7		OW-94-1	0.0	0.2	20.2	0	0	30.1	1019
	G8		OW-94-2	0.0	0.2	20.1	1	1	30.1	1019
	G9		05-R3	0.0	0.5	20.2	0	0	30.1	1019
	G10		Ambient Air (OW94-1, 94-2 & 05-R3)	0.0	0.1	20.2	0	0	30.1	1019
	G11	a	MH-5	0.0	0.7	20.0	8	0	30.1	1019
		b	MH-5 Ambient Air	0.0	0.1	20.0	9	0	30.1	1019
	G12	a	MH-4	0.7	0.8	20.6	0	0	30.19	1022
		b	MH-4 Ambient Air	0.0	0.1	20.9	0	0	30.19	1022
	G13	a	MH-3	0.9	1.8	19.9	0	0	30.2	1023
		b	MH-3 Ambient Air	0.0	0.1	20.9	0	0	30.19	1022
	G14		OW-92-7	0.0	0.1	20.8	0	0	30.2	1023
	G15		OW-92-8	0.0	0.3	20.5	0	1	30.2	1023
	G16		05-8	0.3	0.0	20.7	0	0	30.2	1023
	G17		Ambient Air (OW92-7, 92-8 & 05-8)	0.0	0.1	20.8	0	0	30.2	1023
	G18	a	MH-2	0.0	0.9	20.5	3	0	30.21	1023
		b	MH-2 Ambient Air	0.0	0.1	20.8	4	0	30.14	1021
	G19	a	MH-1	Sealed						
		b	MH-1 Ambient Air	0.0	0.1	20.6	0	0	30.19	1022
	G20		05-11	0.0	0.4	20.3	0	0	30.21	1023
	G21		OW-92-9	0.0	0.1	20.5	1	0	30.21	1023
	G22		OW-92-10	0.0	0.2	20.4	0	0	30.21	1023
	G23		OW-92-11	0.0	0.6	19.6	0	0	30.2	1023
	G24		Ambient Air (05-11, OW92-9, 92-10, 92-11)	0.0	0.1	20.6	0	0	30.19	1022
	G25	a	Pump House Ambient	0.0	0.1	20.5	2	0	30.21	1023
		b	Air Vent Along Pump House	0.0	0.1	21.3	0	0	30.21	1023
		c	pump House (inside)	0.0	0.1	21.4	0	0	30.22	1023
	G26	a	Wet Well MH	0.0	0.1	21.3	0	0	30.21	1023
		b	Blower Shed	0.0	0.1	21.4	0	0	30	1023
		c	Sea can (blue trailer - inside)	0.0	0.1	21.4	0	0	30.21	1023
		d	Primary Tank #1	0.0	1.6	25.0	0	1	30.21	1023
		e	Primary Tank #2	N/A						
		f	Secondary Tank #1	0.0	0.2	22.2	0	0	30.22	1023
		g	Secondary Tank #2	0.0	0.3	22.2	0	0	30.21	1023
		i	Collector MH	0.0	0.8	22.1	0	0	30	1023
	G27		Grid Line (R-19)	0.0	0.1	22.5	0	0	30.19	1022
	G81	a	Pipeline Ambient Air	0.0	0.1	22.0	0	0	30.17	1022
		b	Pipeline Clean Out	0.0	0.1	22.0	0	0	30.17	1022
	G82	a	Pipeline Clean Out	0.0	0.1	22.2	0	0	30.17	1022
		b	Pipeline Ambient Air	0.0	0.1	22.2	0	0	30.15	1021
	G83	a	Pipeline Ambient Air	0.0	0.1	22.2	0	0	30.15	1021
		b	Pipeline Clean Out MH	Sealed						
	G84	a	Tank Truck loading station MH	0.0	0.1	22.1	0	0	30.17	1022
		b	Ambient Air Tank Truck loading station MH	0.0	0.1	22.1	0	0	30.16	1021
	G98	a	MH-0	0.0	0.1	22.2	0	0	30.15	1021
		b	MH-0 - Ambient Air	0.0	0.1	22.2	0	0	20.14	682
OFFICE BUILDING AREA	G26	a	Garage	0.0	0.1	20.9	1	0	30.1	1019
		b	Garage (outdoors)	0.0	0.2	20.9	1	0	30.1	1019
	G27		Lunch Room	0.0	0.2	21.0	0	0	30.1	1019
	G31	g	Gate Clerk	Removed						
		c	New Scale (outside)	0.0	0.1	20.8	1	0	30.1	1019
		f	New Gate Clerk (Inside)	0.0	0.1	20.8	1	0	30.1	1019
	G32		Henri's Office	0.0	0.2	21.0	0	0	30.1	1019
	G34		OW-92-18	0.1	0.2	21.1	0	0	30.1	1019
	G35		OW-92-19	0.0	0.2	21.0	0	0	30.1	1019
	G36		Ambient Air (OW92-18, 92-19)	0.0	0.1	21.2	1	0	30.1	1019
	G100		Small Vehicle Drop-Off Area	0.0	0.2	20.5	1	0	30.1	1019

Table 2: Field Monitoring Results - May 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Spring Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO ppm	Hydrogen Sulfide H_2S ppm	Atm. Pressure (inHg)	Atm. Pressure (mBars)
AIR VENTS	G89	a	Passive Air Vent	0.0	0.1	21.9	0	0	30.17	1022
		b	Ambient Air	0.0	0.1	21.9	0	0	30.15	1021
	G90	a	New Passive Air Vent	Could not locate - may have been destroyed						
		b	Ambient Air							
	G101	a	Ambient Air - Sealed Pipeline Cleanout	0.0	0.1	22.1	0	0	30.14	1021
		c	Manhole	Sealed						
	G102	a	Passive Air Vent	0.0	0.1	22.1	0	0	30.16	1021
		c	Passive Air Vent - Ambient Air	0.0	0.1	22.1	0	0	30.17	1022
FORMER COMPOST AREA	G52		Compost Area East Side	0.0	0.1	22.0	0	0	30.16	1021
	G53		Compost Area North Side	0.0	0.1	22.1	0	0	30.15	1021
	G54		Compost Area South Side	0.0	0.1	22.1	0	0	30.15	1021
	G55		Compost Area West Side	0.0	0.1	22.1	0	0	30.15	1021
AMBIENT AIR COLLECTOR PIPES	G58	a	Pipe F/G-6/7	Sealed						
		b	Ambient Air Collector Pipe F/G-6/7	0.1	0.1	27.3	0	0	30.11	1020
	G60	a	Pipe F-7/8	Sealed						
		b	Ambient Air Collector Pipe F-7/8	0.1	0.1	23.3	0	0	30.11	1020
	G61	a	Pipe E/F-9	Sealed						
		b	Ambient Air Collector Pipe E/F-9	0.1	0.1	23.3	0	0	30.11	1020
	G62	a	Pipe E-10	Sealed						
		c	Ambient Air Collector Pipe E-10	0.0	0.1	23.2	0	0	30.11	1020
	G63	a	Pipe E-11	Sealed						
		c	Ambient Air Collector Pipe E-11	0.0	0.1	23.1	0	0	30.11	1020
EAST AND NORTH FACES	G85	a	E-12 Ambient Air	0.0	0.1	22.1	0	0	30.11	1020
		b	E-12 Passive Air Vent	Sealed						
	G86	a	E-13 Ambient Air	0.0	0.1	23.1	0	0	30.11	1020
		b	E-13 Passive Air Vent	Sealed						
	G91	a	G-17 Ambient Air	N/A						
		b	G-17 Passive Air Vent	Part of new landfill cell						
	G200	a	D/E-14 Ambient Air	0.0	0.1	23.0	0	0	30.11	1020
		b	D/E-14 Passive Air Vent	Sealed						
	G201	a	D/E-15 Ambient Air	0.0	0.1	22.9	0	0	30.11	1020
		b	D/E-15 Passive Air Vent	Sealed						
	G202	a	D-15/16 Ambient Air	0.0	0.1	22.9	0	0	30.11	1020
		b	D-15/16 Passive Air Vent	Sealed						
	G203		Pipe Cleanout	0.0	0.1	20.6	1	0	30.1	1019
	G204		Pipe Cleanout	0.0	0.1	20.6	1	0	30.1	1019
	G205		Pipe Cleanout	0.0	0.1	20.6	0	0	30.1	1019
	G206		Pipe Cleanout	0.0	0.1	20.5	0	0	30.1	1019
	G207		Pipe Cleanout	0.0	0.1	20.5	1	0	30.1	1019
	G208		Pipe Cleanout	0.0	0.1	20.4	1	0	30.1	1019
CENTRE AREA / MISCELLANEOUS	G64		New Recycling Area	0.0	0.1	22.1	0	0	30.14	1021
	G65		Cont. Soil @ O-16	0.0	0.1	23.2	0	0	30.13	1020
	G66		Cont. Soil @ M-6	0.0	0.1	22.0	0	0	30.15	1021
	G67	a	M.H.	Sealed						
		b	M.H. Ambient Air	0.0	0.1	22.1	0	0	30.13	1020
	G68		Active Face (location=K-17)	0.0	0.1	22.5	0	0	30.10	1019
	G69		Recycling Area (old)	0.0	0.1	22.1	0	0	30.13	1020
	G70		Grid Line Location G-2	0.0	0.1	21.7	0	0	30.15	1021
OFF SITE	G73		NEAR PAGE STREET @ new subdivision	0.0	0.1	23.2	0	0	30.11	1020
	G74		NEAR MONTE BLUE	0.0	0.2	22.7	0	0	30.11	1020
NAVAN ROAD	G75		3516 Navan Road	0.0	0.2	22.5	0	0	30.11	1020
	G76		3546 Navan Road	0.0	0.1	22.6	0	0	30.11	1020
	G77		Between 3550 and 3588 Navan Road	0.0	0.1	22.6	0	0	30.11	1020
	G78		3602 Navan Road	0.0	0.1	22.6	0	0	30.11	1020
	G79		3626 Navan Road	0.0	0.1	22.6	0	0	30.11	1020
	G80		3650 Navan Road	0.0	0.1	22.7	0	0	30.11	1020
Gas Extraction Wells	GW-1		Gas Extraction Well - Ambient Air	0.0	0.1	22.1	0	0	30.14	1021
	GW-2		Gas Extraction Well - Ambient Air	0.0	0.1	22.1	0	0	30.15	1021
	GW-3		Gas Extraction Well - Ambient Air	0.0	0.1	22.1	0	0	30.10	1019
	GW-4		Gas Extraction Well - Ambient Air	0.0	0.1	22.2	0	0	30.10	1019

Notes

The day was: here during the ✓ morning; ✓ afternoon
Temperatures ranged from: 20 to 29 degrees Celsius.
Winds were from: ✓ North; ___East; ___ West; ___ South and ✓ Mild; ___Moderate; ___Strong
Odours were: ___ not noticeable; ✓ faint but noticeable; __ moderate but not offensive; _ strong

Prepared by: ETB
Checked by: RPM

Date: May 20, 2021

https://golderassociates.sharepoint.com/sites/15462/Project Files/6 Deliverables/1000 2021 AMR/RPT 02 - LFG Monitoring/Tables/LFG monitoring data_2021

Table 3: Field Monitoring Results - August 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Summer Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO ppm	Hydrogen Sulfide H_2S ppm	Atm. Pressure (inHg)	Atm. Pressure (mBars)
WEST AND SOUTH FACES	G1	a	OW-95-8	0.0	0.2	20.9	1	0	29.77	1008
		b	OW-95-8 Ambient Air	0.0	0.0	21.1	1	0	29.77	1008
	G2	a	MH-10	1.1	1.3	20.2	0	0	29.77	1008
		b	MH-10 Ambient Air	0.0	0.0	21.1	0	0	29.77	1008
	G3	a	MH-9	0.4	0.3	20.9	1	0	29.77	1008
		b	MH-9 Ambient Air	0.0	0.0	21.2	1	0	29.77	1008
	G4	a	MH-8	0.4	0.3	21.1	0	0	29.77	1008
		b	MH-8 Ambient Air	0.0	0.0	21.2	1	0	29.77	1008
	G5	a	MH-7	0.0	0.1	21.2	1	0	29.77	1008
		b	MH-7 Ambient Air	0.0	0.0	21.3	1	0	29.77	1008
	G6	a	MH-6	0.1	1.8	19.8	0	0	29.77	1008
		b	MH-6 Ambient Air	0.0	0.1	20.9	0	0	29.77	1008
	G7		OW-94-1	0.0	0.5	20.6	1	0	29.77	1008
	G8		OW-94-2	0.0	0.4	20.6	1	0	29.77	1008
	G9		05-R3	0.0	1.2	20.9	1	0	29.77	1008
	G10		Ambient Air (OW94-1, 94-2 & 05-R3)	0.0	0.1	20.8	1	0	29.77	1008
	G11	a	MH-5	6.9	9.4	15.7	1	0	29.77	1008
		b	MH-5 Ambient Air	0.0	0.1	20.8	0	0	29.77	1008
	G12	a	MH-4	1.7	1.6	20.2	0	0	29.77	1008
		b	MH-4 Ambient Air	0.0	0.1	20.8	1	0	29.77	1008
	G13	a	MH-3	17.8	10.8	15.8	1	0	29.77	1008
		b	MH-3 Ambient Air	0.0	0.1	20.9	1	0	29.77	1008
	G14		OW-92-7	0.0	0.1	20.9	1	0	29.77	1008
	G15		OW-92-8	0.9	2.2	20.2	0	0	29.77	1008
	G16		05-6	0.1	0.4	20.8	1	0	29.77	1008
	G17		Ambient Air (OW92-7, 92-8 & 05-8)	0.0	0.1	20.9	1	0	29.77	1008
	G18	a	MH-2	9.5	7.2	17.0	1	0	29.77	1008
		b	MH-2 Ambient Air	0.0	0.1	20.9	1	0	29.77	1008
	G19	a	MH-1 (sealed)	Sealed						
		b	MH-1 Ambient Air	0.0	0.1	21.0	0	0	29.77	1008
	G20		05-11	0.0	1.3	20.4	1	0	29.77	1008
	G21		OW-92-9	0.0	0.5	20.4	1	0	29.77	1008
	G22		OW-92-10	0.0	0.3	20.6	1	0	29.77	1008
	G23		OW-92-11	0.0	2.6	20.9	1	0	29.77	1008
	G24		Ambient Air (05-11, OW92-9, 92-10, 92-11)	0.0	0.0	20.9	1	0	29.77	1008
	G25	a	Pump House Ambient	0.0	0.0	20.8	1	0	29.77	1008
		b	Air Vent Along Pump House	0.0	0.0	20.8	1	0	29.77	1008
		c	pump House (inside)	0.0	0.0	20.9	1	0	29.77	1008
	G26	a	Wet Well MH	0.0	0.5	20.8	1	0	29.77	1008
		b	Blower Shed	0.0	0.0	20.8	1	0	29.77	1008
		c	Sea can (blue trailer - inside)	0.0	0.0	20.9	0	0	29.77	1008
		d	Primary Tank #1	0.0	3.0	20.5	1	0	29.77	1008
		e	Primary Tank #2	0.0	2.3	20.6	2	0	29.77	1008
		f	Secondary Tank #1	0.0	0.3	20.8	2	0	29.77	1008
		g	Secondary Tank #2	0.0	0.3	20.8	2	0	29.77	1008
		i	Collector MH	0.1	0.4	20.7	1	0	29.77	1008
	G27		Grid Line (R-19)	0.0	0.0	20.9	1	0	29.77	1008
	G31	a	Pipeline Ambient Air	0.0	0.0	21.1	0	0	29.77	1008
		b	Pipeline Clean Out	0.0	0.0	21.1	0	0	29.77	1008
	G32	a	Pipeline Clean Out	0.0	0.0	21.2	1	0	29.77	1008
		b	Pipeline Ambient Air	0.0	0.0	21.2	1	0	29.77	1008
	G33	a	Pipeline Ambient Air	Not found						
		b	Pipeline Clean Out MH	Not found						
	G34	a	Tank Truck loading station MH	0.0	0.0	21.3	1	0	29.77	1008
		b	Ambient Air Tank Truck loading station MH	0.0	0.0	20.8	1	0	29.77	1008
	G98	a	MH-0	0.0	0.1	21.7	1	0	29.77	1008
		b	MH-0 Ambient Air	0.0	0.0	21.8	1	0	29.77	1008
OFFICE/BUILDING AREA	G28	a	Garage	0.0	0.1	20.9	1	0	29.77	1008
		b	Garage (outdoors)	0.0	0.1	20.7	1	0	29.77	1008
	G29		Lunch Room	0.0	0.1	20.9	1	0	29.77	1008
	G31	a	Gate Clerk	Removed						
		b	New Scale (outside)	0.0	0.1	20.9	0	0	29.77	1008
		c	New Gate Clerk (Inside)	0.0	0.1	20.9	1	0	29.77	1008
	G32		Henri's Office	0.0	0.1	20.9	1	0	29.77	1008
	G34		OW-92-18	0.0	0.1	21.1	1	0	29.77	1008
	G35		OW-92-19	0.0	0.2	21.0	1	0	29.77	1008
	G36		Ambient Air (OW92-18, 92-19)	0.0	0.1	21.2	1	0	29.77	1008
	G100		Small Vehicle Drop-Off Area	0.0	0.1	20.9	1	0	29.77	1008

Table 3: Field Monitoring Results - August 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Summer Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Atm. Pressure (inHg)	Atm. Pressure (mBars)
AIR VENTS	G99	a	Passive Air Vent	0.0	0.0	21.1	1	0	29.77	1008
		b	Ambient Air	0.0	0.0	21.1	1	0	29.77	1008
	G98	a	New Passive Air Vent	0.0	0.0	21.5	1	0	29.77	1008
		b	Ambient Air	0.0	0.0	21.8	0	0	29.77	1008
	G101	a	Ambient Air - Sealed Pipeline Cleanout	0.0	0.0	21.3	1	0	29.77	1008
		b	Manhole	Sealed						
	G102	a	Passive Air Vent	No passive air vent						
		b	Passive Air Vent - Ambient Air	0.0	0	21.4	1	0	29.77	1008
FORMER COMPOST AREA	G62		Compost Area East Side	0.0	0.0	21.4	0	0	29.77	1008
	G63		Compost Area North Side	0.0	0.0	21.4	1	0	29.77	1008
	G64		Compost Area South Side	0.0	0.0	21.4	1	0	29.77	1008
	G65		Compost Area West Side	0.0	0.0	21.4	1	0	29.77	1008
AMBIENT AIR COLLECTOR PIPES	G59	a	Pipe F/G-6/7	Sealed						
		b	Ambient Air Collector Pipe F/G-6/7	0.0	0.0	21.3	1	0	29.77	1008
	G60	a	Pipe F-7/8	Sealed						
		b	Ambient Air Collector Pipe F-7/8	0.0	0.0	21.3	1	0	29.77	1008
	G61	a	Pipe E/F-9	Sealed						
		b	Ambient Air Collector Pipe E/F-9	Not found						
	G62	a	Pipe E-10	Sealed						
		b	Ambient Air Collector Pipe E-10	0.0	0.0	21.3	1	0	29.77	1008
	G63	a	Pipe E-11	Sealed						
		b	Ambient Air Collector Pipe E-11	0.0	0.0	21.3	1	0	29.77	1008
EAST AND NORTH FACES	G95	a	E-12 Ambient Air	Not found						
		b	E-12 Passive Air Vent	Sealed						
	G96	a	E-13 Ambient Air	Not found						
		b	E-13 Passive Air Vent	Sealed						
	G91	a	G-17 Ambient Air	Part of new landfill cell						
		b	G-17 Passive Air Vent							
	G200	a	D/E-14 Ambient Air	0.0	0.0	21.2	1	0	29.77	1008
		b	D/E-14 Passive Air Vent	Sealed						
	G201	a	D/E-15 Ambient Air	0.0	0.0	21.2	1	0	29.77	1008
		b	D/E-15 Passive Air Vent	Sealed						
	G202	a	D-15/16 Ambient Air	Inadvertently missed during this monitoring session.						
		b	D-15/16 Passive Air Vent	Sealed						
	G203		Pipe Cleanout	No longer present						
	G204		Pipe Cleanout							
	G205		Pipe Cleanout							
	G206		Pipe Cleanout							
	G207		Pipe Cleanout							
	G208		Pipe Cleanout							
CENTRE AREA - MISCELLANEOUS	G92		New Recycling Area	0.0	0.1	21.2	1	0	29.77	1008
	G66		Cont. Soil @ L-16	0.0	0.0	21.4	1	0	29.77	1008
	G68		Cont. Soil @ M-6	0.0	0.0	21.3	1	0	29.77	1008
	G97	a	M.H.	Sealed						
		b	M.H. Ambient Air	0.0	0.0	21.4	1	0	29.77	1008
	G69		Active Face (location=JK-20/21)	0.0	0.0	21.6	1	0	29.77	1008
	G09		Recycling Area (old)	0.0	0.0	21.4	0	0	29.77	1008
	G70		Grid Line Location G-2	0.0	0.0	21.0	1	0	29.77	1008
OFF SITE	G73		NEAR PAGE STREET @ new subdivision	0.0	0.0	21.5	1	0	29.78	1008
	G74		NEAR MONTE BLUE	0.0	0.0	21.3	1	0	29.78	1008
NAVAN ROAD	G75		3518 Navan Road	0.0	0.1	21.1	0	0	29.78	1008
	G76		3546 Navan Road	0.0	0.0	21.2	0	0	29.78	1008
	G77		Between 3550 and 3588 Navan Road	0.0	0.0	21.2	1	0	29.78	1008
	G78		3602 Navan Road	0.0	0.0	21.2	0	0	29.78	1008
	G79		3626 Navan Road	0.0	0.0	21.2	1	0	29.78	1008
	G80		3650 Navan Road	0.0	0.1	21.2	1	0	29.78	1008
Gas Extraction Wells	GW-1		Gas Extraction Well - Ambient Air	0.0	0.0	21.4	0	0	29.77	1008
	GW-2		Gas Extraction Well - Ambient Air	0.0	0.0	21.4	1	0	29.77	1008
	GW-3		Gas Extraction Well	0.0	0.0	21.5	1	0	29.77	1008
	GW-4		Ambient Air	0.0	0.0	21.5	1	0	29.77	1008

Notes:	The day was:	__overcast; ✓ sunny; ___ cloudy; __ wet; during the ✓morning; ✓afternoon
	Temperatures ranged from:	18 to 32 degrees Celsius
	Winds were from the:	___North; ___ East; ✓ West; ✓ South and: ✓ Mild; __ Moderate; __ Strong
	Odours were:	✓ not noticeable; faint but noticeable; __ moderate but not offensive; ___ strong.
	Date: August 25, 2021	Prepared by: ETB Checked by: RPM

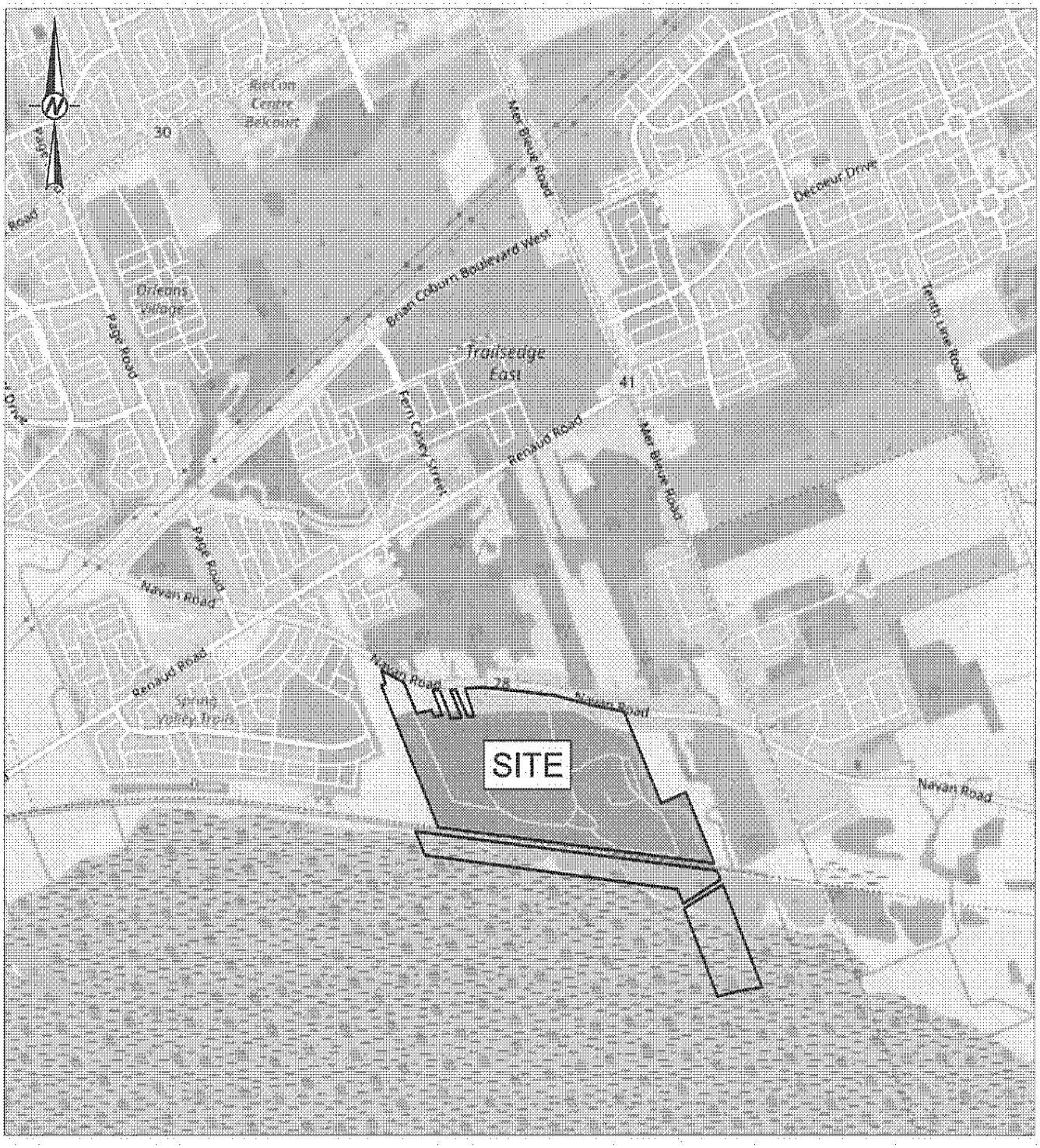
Table 4: Field Monitoring Results - December 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Winter Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO, ppm	Hydrogen Sulfide H_2S, ppm	Atm. Pressure (inHg)	Atm. Pressure (mBars)
WEST AND SOUTH FACES	G1	a	OW-95-8	0.0	0.2	22.2	0	0	29.47	998
		b	OW-95-8 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G2	a	MH-10	2.1	1.3	21.4	0	0	29.47	998
		b	MH-10 Ambient Air	0.0	0.1	22.3	0	0	29.47	998
	G3	a	MH-9	3.8	2.2	21.8	0	0	29.47	998
		b	MH-9 Ambient Air	0.0	0.1	22.3	0	0	29.47	998
	G4	a	MH-8	0.0	0.1	22.3	0	0	29.47	998
		b	MH-8 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G5	a	MH-7	2.1	1.5	21.6	0	0	29.47	998
		b	MH-7 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G6	a	MH-6	0.0	0.6	22.2	0	0	29.47	998
		b	MH-6 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G7		OW-94-1	0.0	0.2	22.2	0	0	29.47	998
	G8		OW-94-2	0.0	0.4	22.2	1	0	29.47	998
	G9		05-R3	0.0	0.7	22.3	0	0	29.47	998
	G10		Ambient Air (OW94-1, 94-2 & 05-R3)	0.0	0.1	22.3	0	0	29.47	998
	G11	a	MH-5	0.0	0.2	22.3	0	0	29.47	998
		b	MH-5 Ambient Air	0.0	0.1	22.3	0	0	29.47	998
	G12	a	MH-4	0.0	0.2	22.3	0	0	29.47	998
		b	MH-4 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G13	a	MH-3	0.1	0.8	22.2	0	0	29.47	998
		b	MH-3 Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G14		OW-92-7	0.0	0.2	22.2	0	0	29.47	998
	G15		OW-92-8	0.1	9.7	21.1	0	0	29.47	998
	G16		05-8	0.0	0.2	22.2	0	0	29.47	998
	G17		Ambient Air (OW92-7, 92-8 & 05-8)	0.0	0.1	22.3	0	0	29.47	998
	G18	a	MH-2	0.0	0.2	22.3	0	0	29.47	998
		b	MH-2 Ambient Air	0.0	0.1	22.3	0	0	29.47	998
	G19	a	MH-1 (sealed)	Sealed						
		b	MH-1 Ambient Air	0.0	0.1	22.3	0	0	29.47	998
	G20		05-11	0.0	0.5	22.2	0	0	29.47	998
	G21		OW-92-9	0.1	0.4	22.2	0	0	29.47	998
	G22		OW-92-10	0.0	0.8	22.2	0	0	29.47	998
	G23		OW-92-11	0.0	1.3	22.2	0	0	29.47	998
	G24		Ambient Air (05-11, OW92-9, 92-10, 92-11)	0.0	0.1	22.2	0	0	29.47	998
	G25	a	Pump House Ambient	0.0	0.1	22.3	0	0	29.47	998
		b	Air Vent Along Pump House	0.0	0.1	22.2	0	0	29.47	998
		c	pump House (inside)	0.0	0.1	22.3	0	0	29.47	998
	G26	a	Wet Well MH	0.0	0.1	22.3	0	0	29.47	998
		b	Blower Shed	0.0	0.1	22.3	0	0	29.47	998
		c	Sea can (blue trailer - inside)	0.0	0.1	22.3	0	0	29.47	998
		d	Primary Tank #1	0.0	0.2	22.2	1	0	29.47	998
		e	Primary Tank #2	0.0	0.2	22.2	0	0	29.47	998
		f	Secondary Tank #1	0.0	0.2	22.2	0	0	29.47	998
		g	Secondary Tank #2	0.0	0.2	22.2	0	0	29.47	998
		i	Collector MH	0.0	0.1	22.3	0	0	29.47	998
	G27		Grid Line (R-19)	0.0	0.1	22.3	0	0	29.47	998
	G81	a	Pipeline Ambient Air	0.0	0.1	22.2	0	0	29.47	998
		b	Pipeline Clean Out	0.0	0.1	22.2	0	0	29.47	998
	G82	a	Pipeline Clean Out	0.0	0.1	22.2	0	0	29.47	998
		b	Pipeline Ambient Air	0.0	0.1	22.2	0	0	29.47	998
	G83	a	Pipeline Ambient Air	0.0	0.1	21.7	0	0	29.47	998
		b	Pipeline Clean Out MH	Sealed						
	G84	a	Tank Truck loading station MH	0.1	0.2	21.7	0	0	29.47	998
		b	Ambient Air Tank Truck loading station MH	0.0	0.1	21.8	0	0	29.47	998
	G98	a	MH-0	Sealed						
		b	MH-0 Ambient Air	0.0	0.1	21.7	0	0	29.47	998
OFFICE/BUILDING AREA	G28	a	Garage	0.0	0.1	22.0	0	0	29.47	998
		b	Garage (outdoors)	0.0	0.1	22.0	0	0	29.47	998
	G29		Lunch Room	0.0	0.2	22.0	0	0	29.47	998
	G31	a	Gate Clerk	Removed						
		b	New Scale (outside)	0.0	0.1	22.0	0	0	29.47	998
		c	New Gate Clerk (Inside)	0.0	0.1	22.0	0	0	29.47	998
	G32		Henri's Office	0.0	0.2	22.0	0	0	29.47	998
	G34		OW-92-18	0.0	0.1	22.0	0	0	29.47	998
	G35		OW-92-19	0.1	3.0	21.8	0	0	29.47	998
	G36		Ambient Air (OW92-18, 92-19)	0.1	0.1	22.0	0	0	29.47	998
	G100		Small Vehicle Drop-Off Area	0.0	0.1	22.0	0	0	29.47	998

Table 4: Field Monitoring Results - December 2021
WCC - Navan Waste Recycling and Disposal Facility
2021 Landfill Gas Monitoring - Winter Session

Monitoring Location			Description	Methane CH_4 %	Carbon Dioxide CO_2 %	Oxygen O_2 %	Carbon Monoxide CO ppm	Hydrogen Sulfide H_2S ppm	Atm. Pressure (inHg)	Atm. Pressure (mBars)
AIR VENTS	G39	a	Passive Air Vent	0.0	0.1	22.1	0	0	29.47	998
		b	Ambient Air	0.0	0.1	22.1	0	0	29.47	998
	G56	a	New Passive Air Vent	0.0	0.1	21.7	0	0	29.47	998
		b	Ambient Air	0.0	0.1	21.7	0	0	29.47	998
	G101	a	Ambient Air - Sealed Pipeline Cleanout	0.0	0.1	22.9	0	0	29.47	998
		b	Manhole	Sealed						
	G102	a	Passive Air Vent	0.0	0.1	21.8	0	0	29.47	998
		b	Passive Air Vent - Ambient Air	0.0	0.1	21.8	0	0	29.47	998
FORMER COMPOST AREA	G52		Compost Area East Side	0.0	0.1	21.8	0	0	29.47	998
	G53		Compost Area North Side	0.0	0.1	21.8	0	0	29.47	998
	G54		Compost Area South Side	0.0	0.1	21.9	0	0	29.47	998
	G55		Compost Area West Side	0.0	0.1	21.8	0	0	29.47	998
AMBIENT AIR COLLECTOR PIPES	G59	a	Pipe F/G-6/7	Sealed						
		b	Ambient Air Collector Pipe F/G-6/7	0.0	0.1	21.7	0	0	29.47	998
	G60	a	Pipe F-7/8	Sealed						
		b	Ambient Air Collector Pipe F-7/8	0.0	0.1	21.7	0	0	29.47	998
	G61	a	Pipe E/F-9	Sealed						
		b	Ambient Air Collector Pipe E/F-9	0.0	0.1	21.6	0	0	29.47	998
	G62	a	Pipe E-10	Sealed						
		b	Ambient Air Collector Pipe E-10	0.0	0.1	21.5	0	0	29.47	998
	G63	a	Pipe E-11	Sealed						
		b	Ambient Air Collector Pipe E-11	0.0	0.1	21.5	0	0	29.47	998
EAST AND NORTH FACES	G85	a	E-12 Ambient Air	0.0	0.1	21.4	0	0	29.47	998
		b	E-12 Passive Air Vent	Sealed						
	G86	a	E-13 Ambient Air	0.0	0.1	21.4	0	0	29.47	998
		b	E-13 Passive Air Vent	Sealed						
	G91	a	G-17 Ambient Air	0.0	0.1	21.3	0	0	29.47	998
		b	G-17 Passive Air Vent	Part of new landfill cell						
	G200	a	D/E-14 Ambient Air	0.0	0.1	21.3	0	0	29.47	998
		b	D/E-14 Passive Air Vent	Sealed						
	G201	a	D/E-15 Ambient Air	0.0	0.1	21.2	0	0	29.47	998
		b	D/E-15 Passive Air Vent	Sealed						
	G202	a	D-15/16 Ambient Air	Abandoned Well						
		b	D-15/16 Passive Air Vent							
	G203		Pipe Cleanout	0.0	0.1	22.2	0	0	29.47	998
	G204		Pipe Cleanout	0.0	0.1	22.1	0	0	29.47	998
	G205		Pipe Cleanout	0.0	0.1	22.1	0	0	29.47	998
	G206		Pipe Cleanout	0.0	0.1	22.0	0	0	29.47	998
	G207		Pipe Cleanout	0.0	0.1	22.0	0	0	29.47	998
	G208		Pipe Cleanout	0.0	0.1	22.0	0	0	29.47	998
CENTRE AREA - MISCELLANEOUS	G84		New Recycling Area	0.0	0.1	22.1	0	0	29.47	998
	G85		Cont. Soil @ L-16	0.0	0.1	21.8	0	0	29.47	998
	G86		Cont. Soil @ M-6	0.0	0.1	22.0	0	0	29.47	998
	G87	a	M.H.	Sealed						
		b	M.H. Ambient Air	0.0	0.1	22.0	0	0	29.47	998
	G88		Active Face (location=G19)	0.0	0.1	22.4	0	0	29.47	998
	G89		Recycling Area (old)	0.0	0.1	22.2	0	0	29.47	998
	G70		Grid Line Location G-2	0.0	0.1	22.1	0	0	29.47	998
OFF SITE	G73		NEAR PAGE STREET @ new subdivision	0.0	0.1	21.6	0	0	29.47	998
	G74		NEAR MONTE BLUE	0.0	0.1	21.8	0	0	29.47	998
NAVAN ROAD	G75		3516 Navan Road	0.0	0.1	21.9	0	0	29.47	998
	G76		3546 Navan Road	0.0	0.1	21.9	0	0	29.47	998
	G77		Between 3550 and 3588 Navan Road	0.0	0.1	21.9	0	0	29.47	998
	G78		3602 Navan Road	0.0	0.1	21.9	0	0	29.47	998
	G79		3626 Navan Road	0.0	0.1	21.8	0	0	29.47	998
	G80		3650 Navan Road	0.0	0.1	21.8	0	0	29.47	998
Gas Extraction Wells	GW-1		Gas Extraction Well - Ambient Air	0.0	0.1	22.0	0	0	29.47	998
	GW-2		Gas Extraction Well - Ambient Air	Location was inadvertently missed in monitoring session						
	GW-3		Gas Extraction Well - Ambient Air	0.0	0.1	22.1	0	0	29.47	998
	GW-4		Ambient Air	0.0	0.1	22.0	0	0	29.47	998

Notes:	The day was:	✓overcast; ✓sunny; __cloudy; __wet; during the ✓morning; ✓afternoon
	Temperatures ranged from:	3 to 15 degrees Celsius
	Winds were from the:	__North; __East; ✓West; ✓South and: __Mild; ✓Moderate; ✓Strong
	Odours were:	✓ not noticeable; __faint but noticeable; __ moderate but not offensive; strong
		Prepared by: ETB
	Date: December 15, 2021	Checked by: RPM



WASTE CONNECTIONS OF CANADA

0 500 1,000
1:25,000 METRES

NOTE(S)
1. ALL LOCATIONS ARE APPROXIMATE

CLIENT
WASTE CONNECTIONS OF CANADA

PROJECT
REPORT ON 2021 LANDFILL MONITORING
NAVAN WASTE RECYCLING AND DISPOSAL FACILITY
3354 NAVAN ROAD, OTTAWA, ONTARIO

CONSULTANT
WSP GOLDER

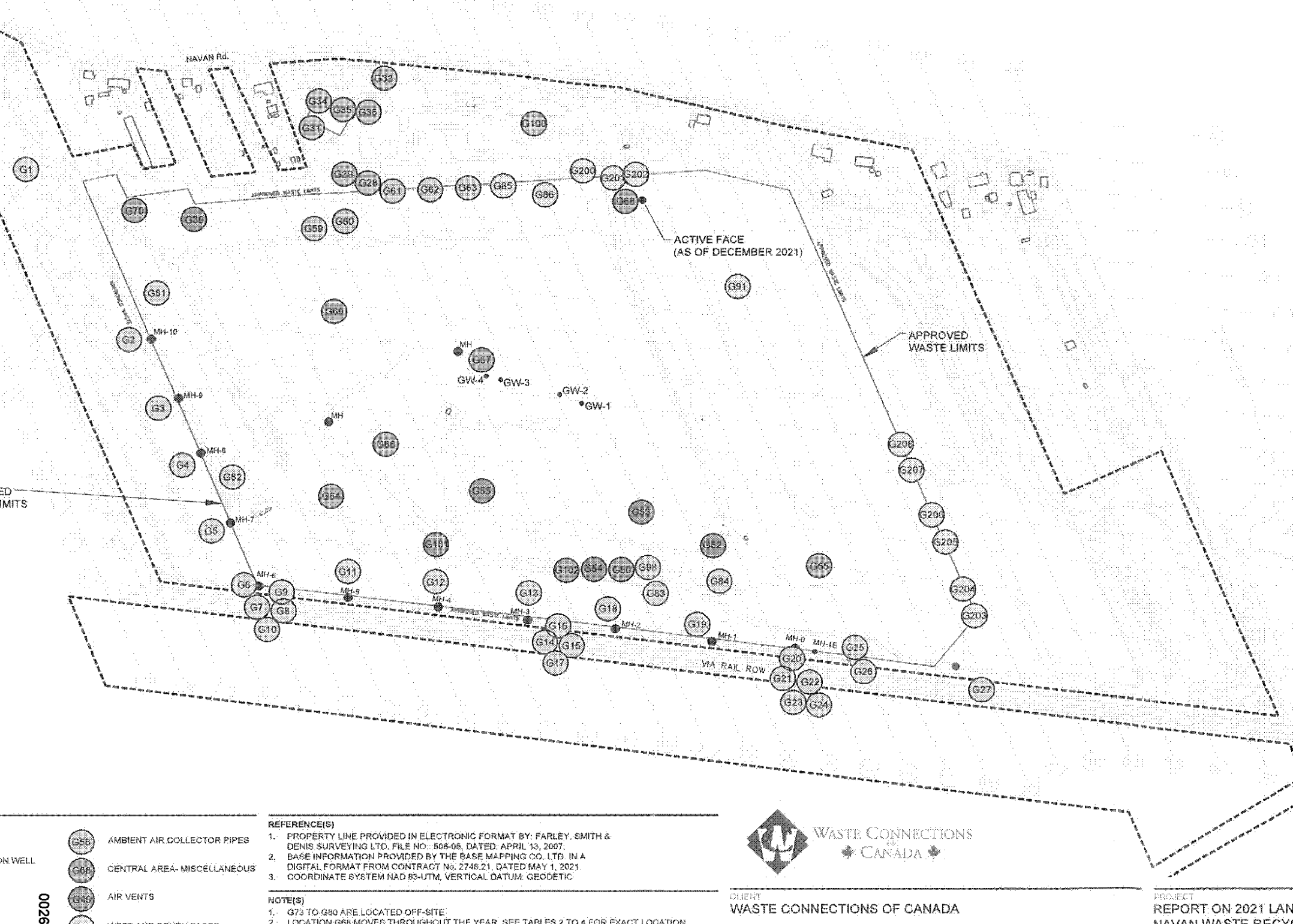
YYYY-MM-DD	2022-01-05
DESIGNED	YJM
PREPARED	ABD
REVIEWED	YJM
APPROVED	PLE

TITLE
KEY PLAN

PROJECT NO.	CONTROL	REV.	FIGURE
21497772	0001	0	1

25 mm

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G56 AMBIENT AIR COLLECTOR PIPES

G68 CENTRAL AREA- MISCELLANEOUS

G45 AIR VENTS

G5 WEST AND SOUTH FACES

G30 OFFICE/BUILDING AREA

002661

REFERENCE(S)

1. PROPERTY LINE PROVIDED IN ELECTRONIC FORMAT BY: FARLEY, SMITH & DENIS SURVEYING LTD., FILE NO.: 506-05, DATED: APRIL 13, 2007.
2. BASE INFORMATION PROVIDED BY THE BASE MAPPING CO. LTD. IN A DIGITAL FORMAT FROM CONTRACT No. 2748.21, DATED MAY 1, 2021.
3. COORDINATE SYSTEM NAD 83-UTM, VERTICAL DATUM: GEODETIC

NOTE(S)

1. G73 TO G80 ARE LOCATED OFF-SITE.
2. LOCATION G68 MOVES THROUGHOUT THE YEAR, SEE TABLES 2 TO 4 FOR EXACT LOCATION

WASTE CONNECTIONS OF CANADA

CLIENT
WASTE CONNECTIONS OF CANADA

PROJECT
REPORT ON 2021 LAN
NAVAN WASTE RECY
3354 NAVAN ROAD, O

DESIGN & DRAFT

YYYY-MM-DD 2022-01-05

TITLE

APPENDIX A

2009 Landfill Gas Characterization

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Re-[illegible] Gas
			QRAE	GEM-2000			QRAE	GEM-2000			
MH-6 (tubing inside manhole)	0.1	1.1	20.5	22.6	2	0	3	1	984	76.2	
hole MH-6 (ambient air)	0.0	0.1	20.9	22.1	0	0	0	0	984	77.8	
MH-5 (tubing inside manhole)	0.1	1.1	20.9	22.1	2	0	3	0	984	76.7	
hole MH-5 (ambient air)	0.0	0.1	20.5	21.6	0	0	0	0	984	78.3	
MH-4 (tubing inside manhole)	0.9	2.3	19.5	20.7	1	0	21	18	985	76.1	
hole MH-4 (ambient air)	0.0	0.1	20.7	22.1	1	0	0	0	984	77.8	
MH-3 (tubing inside manhole)	0.1	0.7	20.5	21.7	0	0	0	2	984	77.5	
hole MH-3 (ambient air)	0.1	0.1	20.9	22.3	0	0	0	0	984	77.5	
MH-2 (tubing inside manhole)	0.7	0.9	20.4	21.9	1	0	30	0	984	76.5	
hole MH-2 (ambient air)	0.0	0.0	20.9	22.2	0	0	0	0	984	77.8	
MH-1 (tubing inside manhole)	10.7	8.2	17.5	18.0	0	0	>100	>60	984	63.1	
hole MH-1 (ambient air)	0.0	0.0	20.9	22.3	0	0	0	0	984	77.7	
anout E-12 (ambient air)	0.1	0.1	20.9	22.3	0	0	2	1	983	77.5	
E-12 (tubing inside cleanout)	53.5	47.3	2.2	0.2	39	169	43	>60	983	-1.0	
anout E-13 (ambient air)	0.0	0.1	20.9	22.4	0	0	0	0	983	77.5	
E-13 (tubing inside cleanout)	55.0	48.2	20.9*	0.5	7	161	>100	>60	983	-3.7	
anout I-17 (ambient air)	0.0	0.1	20.9	22.4	0	0	0	0	984	77.5	
I-17 (tubing inside cleanout)	0.8	3.6	17.8	18.5	0	0	32	16	983	77.1	
anout K-17 (ambient air)	0.0	0.0	20.9	22.4	0	0	0	0	984	77.6	
K-17 (tubing inside cleanout)	48.7	34.3	5.7	2.8	12	15	>100	>60	983	14.2	
anout L-17 (ambient air)	0.0	0.0	20.9	22.4	0	0	0	0	983	77.6	
L-17 (tubing inside cleanout)	20.4	20.1	11.4	11.1	2	0	>100	>60	983	48.4	
anout M-17 (ambient air)	0.0	0.0	20.9	22.5	0	0	0	0	983	77.5	
M-17 (tubing inside cleanout)	0*	0.0	18.0	19.0	0	168	>100	>60	983	81.0	
anout G-17 (ambient air)	0.0	0.0	20.9	22.6	0	0	0	0	983	77.4	
G-17 (tubing inside cleanout)	0.2	0.4	20.3	22.1	0	0	5	3	984	77.3	
anout N-17 (ambient air)	0.0	0.0	20.9	22.6	0	0	0	0	983	77.4	
N-17 (tubing inside cleanout)	N/A (monitoring location blocked/clogged)										
anout H-17 (ambient air)	0.0	0.0	20.9	22.6	0	0	0	0	992	77.4	
H-17 (tubing inside cleanout)	N/A (monitoring location blocked/clogged)										
anout E-16 (ambient air)	0.0	0.1	20.9	22.5	0	0	0	0	1000	77.4	
E-16 (tubing inside cleanout)	51.3	50.8	2.4	0.6	68	169	>100	>60	1000	-2.7	
anout F-16 (ambient air)	0.0	0.3	20.9	22.3	0	0	1	0	1000	77.4	
F-16 (tubing inside cleanout)	8.2	11.1	12.9	13.1	0	0	>100	>60	1000	67.6	
anout F-17 (ambient air)	0.0	0.1	20.9	22.5	0	0	0	0	999	77.4	
F-17 (tubing inside cleanout)	0.0	3.1	18.6	20.1	0	0	0	0	999	76.8	
nout G-16 (ambient air)	0.0	0.1	20.9	22.6	0	0	0	0	999	77.3	
G-16 (tubing inside cleanout)	0.0	1.8	19.5	21.1	0	0	0	0	999	77.1	
al Manhole (tubing inside)	54.6	38.4	2.4	1.8	19	168	>100	>60	983	5.2	
al M ole (ambient air)	0.0	0.0	20.9	22.5	0	0	0	0	983	77.5	

ble ieous reading based on other measurement at this monitoring location

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	10.5	4.6	17.7	16.9	0	0	>100	>60	997	68.0	4.6
Manhole MH-10 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	0	997	79.4	2.5
Manhole MH-9 (tubing inside manhole)	15.1	6.6	16.2	15.4	56	0	>100	>60	996	62.9	5.2
Manhole MH-9 (ambient air)	0.0	0.1	20.9	20.3	0	0	0	0	996	79.6	3.5
Manhole MH-8 (tubing inside manhole)	18.6	9.8	14.5	13.5	12	0	>100	>60	997	58.1	7.5
Manhole MH-8 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	997	79.5	3.0
Manhole MH-7 (tubing inside manhole)	0.7	0.5	20.9	20.1	0	0	33	15	997	78.7	3.3
Manhole MH-7 (ambient air)	0.1	0.2	20.9	20.3	0	0	0	1	997	79.4	3.3
Manhole MH-6 (tubing inside manhole)	0.0	0.8	20.3	19.7	22	0	0	1	1001	79.5	5.6
Manhole MH-6 (ambient air)	0.0	0.1	20.9	20.2	0	0	0	0	1001	79.7	4.0
Manhole MH-5 (tubing inside manhole)	1.1	4.0	18.3	17.7	0	0	47	22	1001	77.2	10.8
Manhole MH-5 (ambient air)	0.0	0.1	20.9	20.2	0	0	0	0	1001	79.7	4.0
Manhole MH-4 (tubing inside manhole)	0.0	0.9	20.5	19.9	28	0	7	2	1001	79.2	4.6
Manhole MH-4 (ambient air)	0.0	0.1	20.9	20.3	0	0	0	0	1001	79.6	3.5
Manhole MH-3 (tubing inside manhole)	0.6	1.4	20.2	19.7	0	0	26	13	1001	78.3	4.4
Manhole MH-3 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	1001	79.5	3.0
Manhole MH-2 (tubing inside manhole)	10.3	9.3	16.7	15.7	20	0	>100	>60	1001	64.7	5.8
Manhole MH-2 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	0	1001	79.4	2.5
Manhole MH-1 (tubing inside manhole)	0.0	0.8	20.5	20.2	0	0	0	1	1001	79.0	3.3
Manhole MH-1 (ambient air)	0.0	0.1	20.9	20.6	0	0	0	0	1001	79.3	2.1
Cleanout E-12 (ambient air)	46.0	3.2	20.9	18.6	0	28	>100	>60	996	32.2	-37.6
Cleanout E-12 (tubing inside cleanout)	N/A (gas odours too strong; measurements not recorded due to safety)										
Cleanout E-13 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	996	79.5	3.0
Cleanout E-13 (tubing inside cleanout)	>60	53.0	2.4	0.4	30	157	>100	>60	996		
Cleanout I-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	999	79.5	3.0
Cleanout I-17 (tubing inside cleanout)	1.1	6.1	13.9	13.6	8	0	54	23	999	79.2	28.2
Cleanout K-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	1	999	79.5	3.0
Cleanout K-17 (tubing inside cleanout)	59.3	39.3	3.4	0.1	9	1	>100	>60	999	1.3	0.9
Cleanout L-17 (ambient air)	0.0	0.1	20.9	20.0	0	0	0	1	999	79.9	4.9
Cleanout L-17 (tubing inside cleanout)	9.6	10.6	14.8	13.6	25	0	>100	>60	999	66.2	15.2
Cleanout M-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	0	999	79.5	3.0
Cleanout M-17 (tubing inside cleanout)	9.0	6.0	17.2	16.5	1	160	>100	>60	999	68.5	6.6
Cleanout G-17 (ambient air)	0.0	0.1	20.9	20.4	0	0	0	1	998	79.5	3.0
Cleanout G-17 (tubing inside cleanout)	0.4	1.6	19.0	18.6	0	0	0	9	998	79.4	9.7
Cleanout N-17 (ambient air)	N/A										
Cleanout N-17 (tubing inside cleanout)	N/A										
Cleanout H-17 (ambient air)	N/A										
Cleanout H-17 (tubing inside cleanout)	N/A										
Cleanout E-16 (ambient air)	0.2	0.2	20.9	20.4	0	0	0	1	996	79.2	2.7
Cleanout E-16 (tubing inside cleanout)	> max. limit	52.4	2.4	0.5	51	59	>60	>60	996		
Cleanout F-16 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	1	996	79.4	2.5
Cleanout F-16 (tubing inside cleanout)	0.0	5.6	15.3	14.8	0	0	9	2	996	79.6	24.1
Cleanout F-17 (ambient air)	0.0	0.1	20.9	20.4	4	0	0	0	996	79.5	3.0
Cleanout F-17 (tubing inside cleanout)	18.6	20.7	2.4	3.1	35	0	>100	>60	996	57.6	46.0
Cleanout G-16 (ambient air)	0.0	0.1	20.9	20.5	0	0	0	0	996	79.4	2.5
eanout G-16 (tubing inside cleanout)	0.0	7.2	3.0	14.5	0	0	14	0	996	78.3	23.9
Central Manhole (tubing inside)	56.2	43.0	2.7	0.3	26	160	>100	>60	999	0.5	-0.6
Central Manhole (ambient air)											

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	4.0	2.0	19.9	20.0	13	0	>100	>60	1003	74.0	-1.0
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	12.1	5.3	17.5	17.4	23	0	>100	>60	1003	65.2	0.0
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	2.8	1.5	19.8	20.3	41	0	>100	>60	1003	75.4	-0.7
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)	0.2	0.3	20.9	21.2	57	0	0	4	1003	78.3	-1.2
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)	0.0	0.5	20.9	20.4	0	1	0	0	1005	79.1	2.6
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)	0.5	1.8	19.6	19.9	83	0	14	11	1005	77.8	3.2
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)	0.0	0.4	20.9	21.2	178	4	0	0	1005	78.4	-1.1
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)	1.2	2.1	19.9	20.8	37	70	27	24	1005	75.9	-2.1
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)	29.8	22.5	10.4	10.3	78	0	>100	>60	1005	37.4	-1.2
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)	0.0	0.2	20.1	21.9	23	0	10	1	1005	77.9	-4.2
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)	50.5	46.1	1.8	1.8	28	1	>100	>60	1003	1.6	-5.2
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)	50.9	42.5	8.1	1.9	7	1	>100	>100	1003	4.7	-2.4
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)	0.2	0.9	20.9	20.8	3	0	6	4	1005	78.1	0.1
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)	33.8	24.1	10.8	8.8	65	7	>100	1	1005	33.3	0.3
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)	0.7	1.2	19.5	20.7	40	0	41	15	1004	77.4	-0.2
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)	1.2	1.3	20.2	20.6	33	3	38	25	1004	76.9	-0.3
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)	45.7	50.3	5.9	7.7	45	196	>100	>60	1004	-3.7	-32.6
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)	13.8	13.7	3.7	15.6	78	0	>100	>100	1003	56.9	-1.6
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)	0.0	0.1	20.9	20.1	0	0	0	0	1003	79.8	4.4
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)	8.6	10.8	11.6	13.0	44	0	>100	>100	1003	67.6	18.9
Cleanout G-16 (ambient air)											
leanout G-16 (tubing inside cleanout)	0.0	0.2	20.1	21.1	46	0	0	0	1003	78.7	-0.4
Central Manhole (tubing inside)	59.4	40.1	3.6	0.3	4	208	>100	>60	1002	9.2	-0.9
Central Manhole (ambient air)											

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)											
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	10.2	5.2		12.1						72.5	27.1
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	12.2	6.8		16.1						64.9	4.5
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)											
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)											
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)											
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)											
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)											
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)											
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)											
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)											
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)											
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)											
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)											
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)											
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)											
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)											
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)											
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)											
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)											
Cleanout G-16 (ambient air)											
leanout G-16 (tubing inside cleanout)											
Central Manhole (tubing inside)											
Central Manhole (ambient air)											

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas, (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	0.4	0.5		21.0				8	1017	78.1	-0.7
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	0.2	1.2		20.9				4		77.7	-0.7
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	1.1	2.5		20.3				21		76.1	0.0
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)	0.0	0.1		21.2				1		78.7	-0.8
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)	0.1	2.4		20.3				2		77.2	1.1
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)	2.1	6.5		18.6				42		72.8	3.1
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)	0.0	0.0		21.3				0		78.7	-1.2
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)	11.2	9.9		15.6				>100		63.3	4.8
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)	2.5	3.9		19.6				51		74.0	0.5
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)	0.0	0.8		21.0				0		78.2	-0.5
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)	49.6	45.9		2.4				>100		2.1	-6.9
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)	55.5	43.2		1.0				>100		0.3	-3.5
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)	0.2	2.4		18.4				5		79.0	10.0
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)	46.5	32.6		2.8				>100		18.1	7.6
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)	3.2	1.0		13.1				64		82.7	33.6
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)	2.6	2.5		19.6				53		75.3	1.8
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)	0.0	0.9		20.0				0		79.1	4.1
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)	52.8	46.3		0.9				>100		0.0	-3.4
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)	12.5	17.5		4.7				>100		65.3	47.7
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)	0.0	4.9		16.3				0		78.8	17.7
Cleanout G-16 (ambient air)											
Cleanout G-16 (tubing inside cleanout)	0.0	2.0		19.0				0		79.0	7.8
Central Manhole (tubing inside)	7.8	8.8		16.4				>100		67.0	5.5
Central Manhole (ambient air)											

002697

Notes: (1) Pressure previously recorded as 30 mmHg. Assumed error and has been corrected to inHg. Received client confirmation March 8, 2019

Monitoring Location	Methane CH_4 (%)	Carbon Dioxide CO_2 (%)	Oxygen O_2 (%)		Carbon Monoxide CO (ppm)	Hydrogen Sulfide H_2S (ppm)	Combustible Gas (COMB % LEL)		Pressure (mBars)	Balance Gas (Calculated)	Residual Balance Gas (Calculated)
			QRAE	GEM-2000			QRAE	GEM-2000			
Manhole MH-10 (tubing inside manhole)	0.7	0.7		21.3					1017	77.3	-2.6
Manhole MH-10 (ambient air)											
Manhole MH-9 (tubing inside manhole)	0.5	1.8		21.1		0				76.6	-2.5
Manhole MH-9 (ambient air)											
Manhole MH-8 (tubing inside manhole)	0.3	1.4		21.2		0				77.1	-2.4
Manhole MH-8 (ambient air)											
Manhole MH-7 (tubing inside manhole)	0.0	0.2		21.7		0				78.1	-3.3
Manhole MH-7 (ambient air)											
Manhole MH-6 (tubing inside manhole)	0.0	1.8		21.1		0				77.1	-2.0
Manhole MH-6 (ambient air)											
Manhole MH-5 (tubing inside manhole)	2.0	6.6		18.7		0				72.7	2.6
Manhole MH-5 (ambient air)											
Manhole MH-4 (tubing inside manhole)	12.8	9.7		15.7		0				61.8	2.9
Manhole MH-4 (ambient air)											
Manhole MH-3 (tubing inside manhole)	24.0	19.3		10.0		0				46.7	9.2
Manhole MH-3 (ambient air)											
Manhole MH-2 (tubing inside manhole)	2.6	5.0		19.5		0				72.9	-0.2
Manhole MH-2 (ambient air)											
Manhole MH-1 (tubing inside manhole)	0.0	1.3		21.1		0					
Manhole MH-1 (ambient air)											
Cleanout E-12 (ambient air)											
Cleanout E-12 (tubing inside cleanout)	48.9	45.4		2.8		204		>100		2.9	-7.6
Cleanout E-13 (ambient air)											
Cleanout E-13 (tubing inside cleanout)	54.2	45.5		0.2		204		>100	1024	0.1	-0.7
Cleanout I-17 (ambient air)											
Cleanout I-17 (tubing inside cleanout)	0.4	3.2		17.8		0				78.6	11.9
Cleanout K-17 (ambient air)											
Cleanout K-17 (tubing inside cleanout)	47.7	33.0		2.9		2				16.4	5.5
Cleanout L-17 (ambient air)											
Cleanout L-17 (tubing inside cleanout)	4.8	11.2		12.0		0				72.0	27.0
Cleanout M-17 (ambient air)											
Cleanout M-17 (tubing inside cleanout)	2.0	2.1		19.9		0				76.0	1.4
Cleanout G-17 (ambient air)											
Cleanout G-17 (tubing inside cleanout)	0.0	0.9		20.0		0				79.1	4.1
Cleanout N-17 (ambient air)											
Cleanout N-17 (tubing inside cleanout)											
Cleanout H-17 (ambient air)											
Cleanout H-17 (tubing inside cleanout)											
Cleanout E-16 (ambient air)											
Cleanout E-16 (tubing inside cleanout)	52.0	46.8		0.5		54		>100		0.7	-1.2
Cleanout F-16 (ambient air)											
Cleanout F-16 (tubing inside cleanout)	10.6	16.5		5.5		5		>100		67.4	46.8
Cleanout F-17 (ambient air)											
Cleanout F-17 (tubing inside cleanout)	0.0	4.5		17.1		0		0		78.4	14.3
Cleanout G-16 (ambient air)											
Cleanout G-16 (tubing inside cleanout)	0.0	2.0		19.5		0		0		78.5	5.4
Central Manhole (tubing inside)	6.6	7.6		17.2		0				68.6	4.1
Central Manhole (ambient air)											

002668

Notes: (1) Pressure previously recorded as 30 mmHg. Assumed error and has been corrected to inHg. Received client confirmation March 8, 2019

Appendix '3'

Golder 2021 Noise Monitoring Memorandum

GOLDER
MEMBER OF WSP

TECHNICAL MEMORANDUM

DATE February 16, 2022 **Project No.** 20412275

TO Henri Huneault, Landfill Site Manager
Waste Connections of Canada

CC joe_tomaselli@golder.com

FROM Yanqing Zeng **EMAIL** yanqing_zeng@Golder.com

WASTE CONNECTIONS OF CANADA NAVAN FACILITY NOISE MONITORING 2021

Dear Mr. Huneault:

Golder Associates Ltd. (Golder) was retained to carry out annual noise monitoring for the Waste Connections of Canada (WCC) Navan Waste Recycling and Disposal Facility (WCC Navan Facility) in the eastern portion of Ottawa, Ontario. Noise monitoring was carried out to fulfill the requirements as outlined in Section 9.5 of the Design & Operations Report Navan Landfill Site Expansion Approvals (January 2008). This memorandum provides a summary of the noise monitoring results for 2021.

Site Operations

The WCC Navan Facility is a waste management facility that handles solid, non-hazardous industrial and commercial waste (including construction and demolition waste), asbestos waste, dry non-putrescible (i.e., non-organic) domestic waste and impacted soil. The facility operates six days a week, from 7:00 am to 5:00 pm on weekdays and 8:00 am to 1:00 pm on Saturday. The existing operations allow for a maximum of 234,750 tonnes of waste per year to be landfilled with an average daily maximum of 1,500 tonnes. Figure 1 (attached) shows a key plan of the site and surrounding area.

Methodology

An annual noise monitoring program was completed in 2021 using two Larson Davis 820 sound level meters located at the nearest residential receptors (i.e., points of reception (POR(s))) to the WCC Navan Facility. Noise data was logged every hour for the duration of the monitoring period. The monitoring was carried out from November 1 to November 9, 2021. Monitoring locations are shown in Figure 1 (attached). All monitoring data is summarized in Appendix A. Weather data during the monitoring program is provided in Appendix B.

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Results

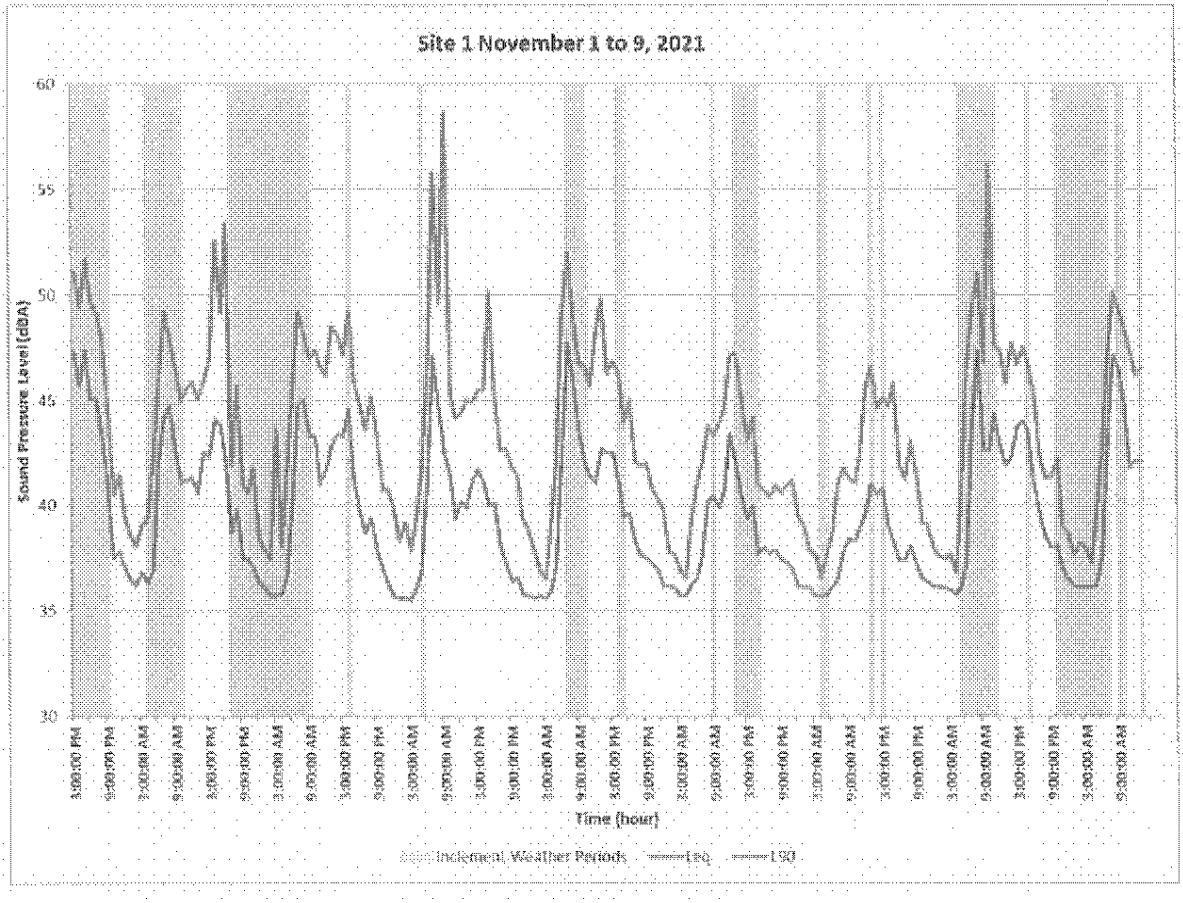
Table 1 summarizes the noise monitoring results for the 2021 monitoring program.

Table 1: Summary of Daytime Noise Levels

Monitoring Site	Minimum Daytime Hourly L_{eq} (dBA)	Minimum Daytime Hourly L_{90} (dBA)	Average Daytime Hourly L_{eq} (dBA)	Average Daytime Hourly L_{90} (dBA)
Monitoring Site 1	41	37	48	42
Monitoring Site 2	48	30	57	49

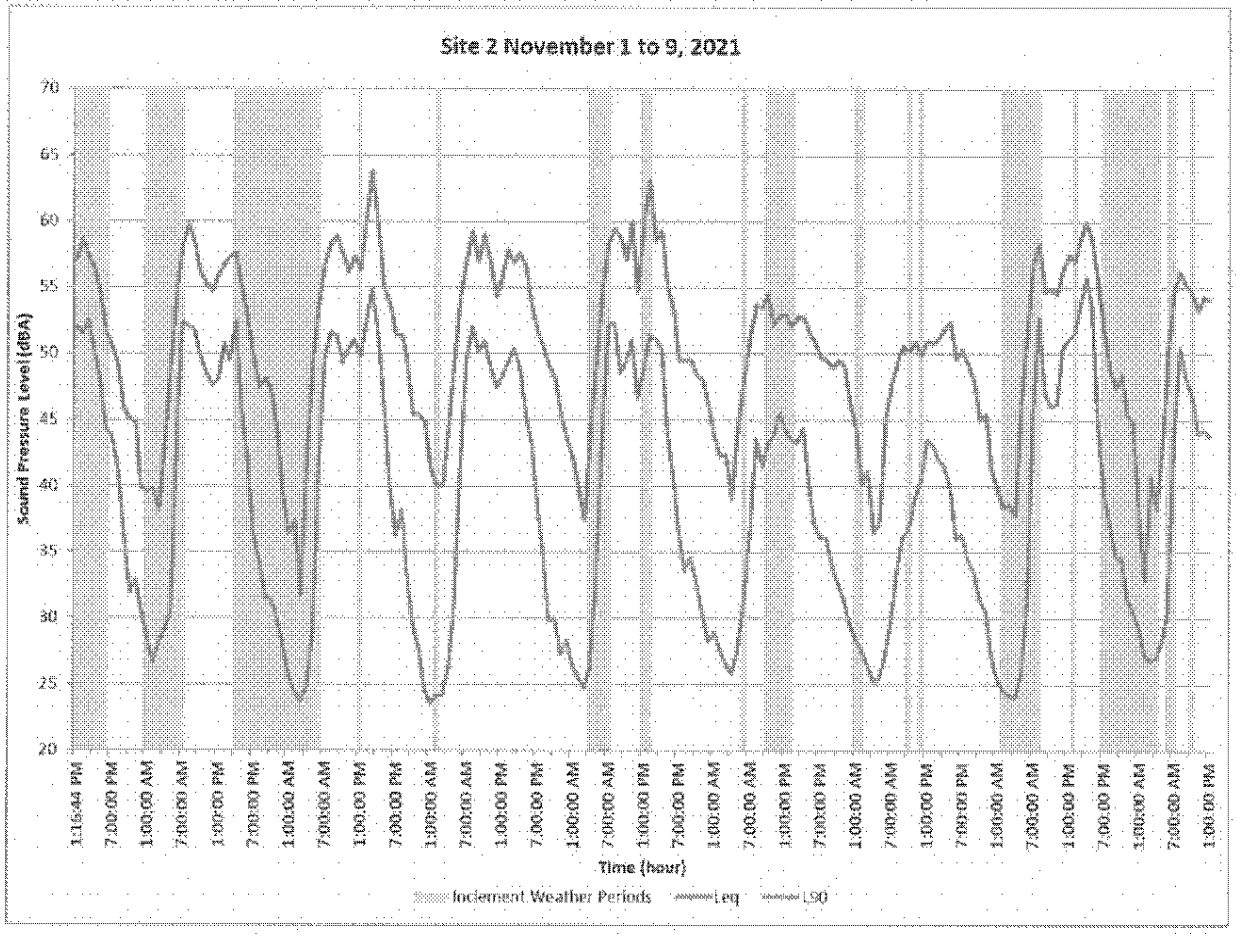
Notes: Data represents monitored levels over the entire monitoring period

Data collected during periods of inclement weather (i.e., rain and/or high wind speeds, in excess of 18 km/h, the limit described in International Standards Organization (ISO) 1996-2 (2007) Standard *Acoustics – Description, measurement and assessment of environmental Noise – Part 2: Determination of environmental noise levels for favourable sound propagation conditions*) were excluded from the calculated levels provided in Table 1.
The periods of monitoring for which data was excluded from the calculation are shown in Plots 1 and 2 as shaded regions.



Plot 1: November 2021 Noise Monitoring Results – Monitoring Site 1

002671



Plot 2: November 2021 Noise Monitoring Results – Monitoring Site 2

Criteria and Guidelines

The WCC Navan Facility and PORs are located on Parts of Lots 2, 3 and 4, Concession 4, Ottawa Front (formerly the City of Gloucester). The noise criteria for the WCC Navan Facility are based on the Ministry of Environment, Conservation and Parks (MECP) (formerly known as the Ministry of the Environment and Climate Change (MOECC)) Noise Guidelines for Landfill Sites (October 1998) and Noise Pollution Control (NPC) publication NPC 300 (August 2013). The Landfill Guideline outlines the sound level limit criteria for evaluating landfill site operations (i.e., landfilling activities) and NPC 300 provides the criteria for on-site stationary noise sources (i.e., non-landfilling activities). Table 2 summarizes the sound level limits at a POR due to landfill site operations.

Table 2: Applicable Noise Limits

	Daytime (07:00 – 19:00)	Night-time (19:00 – 07:00)
Landfilling Operations – 1-Hour Equivalent Sound Level – L_{eq} (dBA)	55	45
Stationary Sources – 1-Hour Equivalent Sound Level – L_{eq} (dBA)	50	45

002672

Discussion

Based on site observations, the noise levels at the two PORs are dominated by road traffic noise along Navan Road and with audible noise from landfilling operations of the WCC Navan Facility, as confirmed during Golder staff visits (i.e., deployment and collection of the monitoring equipment). Golder's January 2008 report predicted a noise impact level for the existing site operations of the WCC Navan Facility on the surrounding PORs to be between 27 and 37 dBA due to site operations. The measured average hourly noise levels were equal to 48 dBA and 57 dBA at Monitoring Location 1 and Monitoring Location 2, respectively. The noise level at Monitoring Location 1 was below the applicable MECP Landfill Guidelines for landfilling operations noise limit, whereas at Monitoring Location 2 the average cumulative (i.e. ambient plus landfill) hourly noise level was 2 dB above the noise limit. During the site visit it was observed that noise levels at Monitoring Location 1 were predominantly influenced by traffic on the adjacent road with lesser contributions from the landfill. The noise level at Monitoring Location 2 was dominated by both; activities at the landfill and contributions from traffic on the adjacent road. In 2021 and into the near future there was and continues to be construction works in the vicinity of the landfill. These activities are expected to include increased traffic from the construction of residential and infrastructure projects in the area.

Monitor Location 2 has historically been used to represent the area due to the ease of gaining access to the property as WCC owns the property. This monitoring site is not actually the nearest point of reception (POR) in the vicinity of the Facility as this residence is located within the Facility property line. The closest POR relevant to the Monitoring Location 2 would be located approximately 100 m northeast of the Monitoring Location 2 site. It is expected that the Facility noise contributions measured at the actual nearest off-site noise POR would be lower due to the increased distance between the Facility noise sources and the POR. Based on the above, it is expected that the noise emissions from the Facility operations could be meeting the applicable noise limit at the noise receptors located north of the Monitoring Location 2 site. Therefore, the Facility is expected to be able to operate within compliance with the relevant noise limits based on the results of 2021 noise monitoring.

It should be noted that it is understood the Facility is not a source of noise complaints from area residents.

Proposed Future Noise Monitoring

As discussed above, the noise levels in the area are dominated by traffic along Navan Road as well as current operations of the Facility (i.e., within the northeast area of the Landfill). Based on the findings from the 2021 and previous monitoring programs, Golder recommends that the noise monitoring at the WCC Navan Facility continue to be conducted on an annual basis with one monitoring session per year. In addition, if a noise complaint is received, it is recommended that additional noise investigations be completed to determine whether noise control (e.g., administrative or engineering) will be required.

Closure

Golder Associates Ltd. was retained to carry out noise monitoring for Waste Connections Canada (WCC) at the WCC Navan Facility in the eastern portion of Ottawa, Ontario. The monitoring results and site observations indicate that the landfilling noise levels, expressed in average 1-hour Leq is observed to be below the noise limit at Monitoring Location 1 and slightly above the noise limit at the Monitoring Location 2. With the understanding that the current Monitoring Location 2 site is located within the property line of the landfill, and the actual nearest offsite POR is located further from the landfill equipment, it is expected that the noise levels from the Facility operations at the nearest off-site PORs would be within the applicable noise limit. Based on these results, the operations of the WCC Navan Facility are expected to be operating in compliance with the MECP Landfill Guideline and NPC 300 limits as summarized in Table 2, where applicable.

If you have any further questions or concerns, please do not hesitate to contact the undersigned at your earliest convenience.

Golder Associates Ltd.

Yanqing Zeng, M.A.E.
Acoustics, Noise and Vibration Specialist

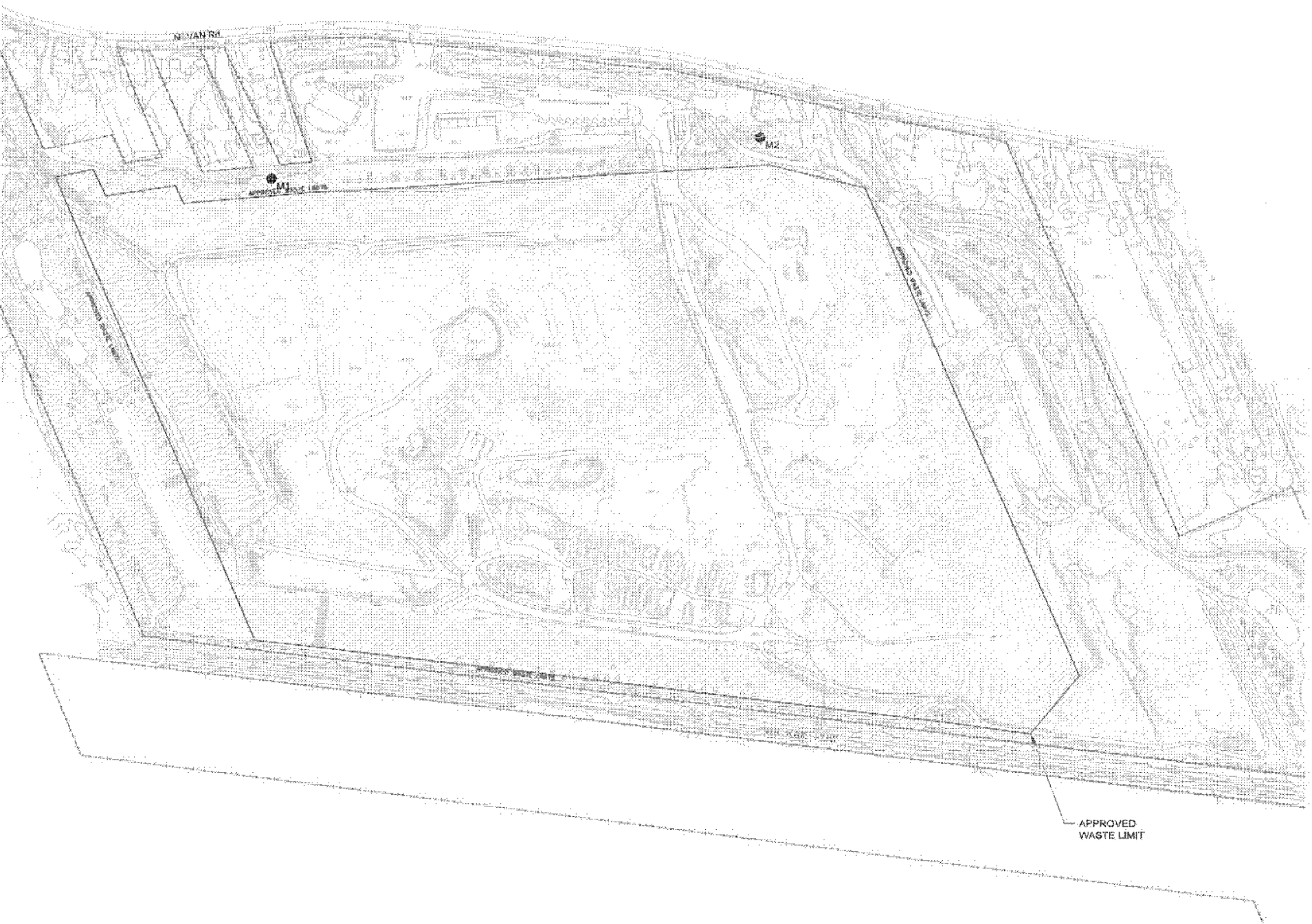
Joe Tomaselli, M.Eng., P.Eng.
Associate/Senior Acoustics, Noise and Vibration Engineer

YZ/TN/JT/sg
https://golderassociates.sharepoint.com/sites/136820/project files/6 deliverables/1200_2021 noise memo/20412275-tm-rev0 waste connections of canada navan_16feb2022.docx

Attachments: Figure1 – Noise Monitoring Locations
Appendix A – Noise Data
Appendix B – Weather Data November 1 to 9, 2021

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FIGURE



SITE

LEGEND

- MONITORING
- VERTICAL / H
- INDEX / INTE
- SPOT ELEVA
- HEDGE LINE
- GUARD RAIL
- RETAINING W
- FENCE LINE
- WOODED AR
- SINGLE TRE
- SHORELINE A
- DITCH / STRE
- MARCH
- BUILDING
- POST
- AREA OUTLI
- PAVED / LOO
- PROPERTY B

REFERENCE(S)

1. PROPERTY LINE PROVIDED I
   DENIS SURVEYING LTD. FILE
2. BASE INFORMATION PROVIDE
   FORMAT FROM CONTRACT No
3. COORDINATE SYSTEM NAD 8

0

1:5,000

CLIENT

WASTE CONNECTIONS CANADA

CONSULTANT

YYYY-MM-DD 2021-12-10

PROJECT

NAVAN WASTE RECYC
3354 NAVAN ROAD, OT

TITLE

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APPENDIX A

Noise Data

Table A1 summarizes noise levels measured at Monitoring Site 1 and Monitoring Site 2.

Table A1: Measured Noise Levels [dBA]

Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-1-21	15:00	51.1	47.3	57.3	52.5
11-1-21	16:00	49.4	45.7	56.5	50.3
11-1-21	17:00	51.7	47.4	54.7	48
11-1-21	18:00	49.7	45.1	51.7	44.4
11-1-21	19:00	49.2	45.1	50.6	43.7
11-1-21	20:00	47.8	43.3	49.2	41.4
11-1-21	21:00	44.6	41	45.8	36.6
11-1-21	22:00	40.5	37.5	45.1	32
11-1-21	23:00	41.5	37.8	44.8	32.9
11-2-21	0:00	39.5	37.1	39.9	30.8
11-2-21	1:00	38.6	36.5	39.6	28.6
11-2-21	2:00	38.1	36.2	39.8	26.7
11-2-21	3:00	39.1	36.8	38.2	28.1
11-2-21	4:00	39.3	36.3	43.6	29.2
11-2-21	5:00	42.2	36.9	49.5	30.5
11-2-21	6:00	45.8	42.2	55.2	45.1
11-2-21	7:00	49.2	44.2	58	52.4
11-2-21	8:00	47.9	44.7	59.8	52.1
11-2-21	9:00	46.5	42.5	58.4	51.8
11-2-21	10:00	45	41.1	56.1	49.8
11-2-21	11:00	45.6	41.2	55.3	48.5
11-2-21	12:00	45.9	41.3	54.7	47.6
11-2-21	13:00	45.1	40.6	55.9	48
11-2-21	14:00	45.9	42.5	56.7	50.7
11-2-21	15:00	46.9	42.3	57.3	49.5
11-2-21	16:00	52.6	44.1	57.6	52.4
11-2-21	17:00	49.2	43.8	55	45.7
11-2-21	18:00	53.4	42.2	52.7	42
11-2-21	19:00	41.9	38.7	49.6	36.3
11-2-21	20:00	45.7	39.8	47.4	34.3
11-2-21	21:00	41	37.5	48.2	31.6
11-2-21	22:00	40.6	37.4	47.1	31.3
11-2-21	23:00	41.9	37.1	44.3	30.1
11-3-21	0:00	38.4	36.3	39.5	28.1

Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-3-21	1:00	37.9	36.1	36.4	25.7
11-3-21	2:00	37.4	35.7	37.3	24.4
11-3-21	3:00	43.7	35.7	31.8	23.7
11-3-21	4:00	38	35.8	42.5	24.7
11-3-21	5:00	41.6	36.6	49.8	29.1
11-3-21	6:00	45.5	40.2	53.6	40.9
11-3-21	7:00	49.2	44.8	56.7	49.7
11-3-21	8:00	48.2	45	58.3	51.6
11-3-21	9:00	47	43.3	58.9	51.4
11-3-21	10:00	47.4	43.3	57.6	49.4
11-3-21	11:00	46.6	41	56.2	50.4
11-3-21	12:00	46.2	41.7	57.3	51
11-3-21	13:00	48.5	42.8	56.4	49.8
11-3-21	14:00	48.1	43.4	60	52.2
11-3-21	15:00	47.2	43.3	63.8	54.8
11-3-21	16:00	49.2	44.5	59.6	51.5
11-3-21	17:00	45.9	41.3	55	46.3
11-3-21	18:00	44.8	39.7	53.8	40
11-3-21	19:00	43.6	38.7	51.4	36.3
11-3-21	20:00	45.2	39.4	51.4	38.2
11-3-21	21:00	43.2	37.9	49.4	33.5
11-3-21	22:00	40.7	37	45.4	29.6
11-3-21	23:00	40.8	36.3	45.4	27.8
11-4-21	0:00	39.8	35.7	44.8	24.6
11-4-21	1:00	38.3	35.6	41.2	23.6
11-4-21	2:00	39.2	35.6	40	24.1
11-4-21	3:00	37.9	35.5	40	24.2
11-4-21	4:00	39.6	36.1	44.8	26.3
11-4-21	5:00	41.8	36.8	49.3	30.6
11-4-21	6:00	46.2	40.9	54.2	41.6
11-4-21	7:00	55.8	47.1	57	49.6
11-4-21	8:00	49.6	44.7	59.3	52
11-4-21	9:00	58.7	42.5	56.9	50.2
11-4-21	10:00	45.3	41.4	59	50.9
11-4-21	11:00	44.2	39.4	56.9	49
11-4-21	12:00	44.3	40.2	54.3	47.5
11-4-21	13:00	45	39.9	55.7	48.2

Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-4-21	14:00	44.9	41.2	57.8	49.3
11-4-21	15:00	45.5	41.7	56.9	50.4
11-4-21	16:00	45.5	41.1	57.6	49
11-4-21	17:00	50.2	40	56.6	45.4
11-4-21	18:00	45.3	40.1	53.5	43.1
11-4-21	19:00	42.6	38.1	51.6	38.4
11-4-21	20:00	42.7	37.2	50.6	35.2
11-4-21	21:00	41.8	36.4	49.1	29.8
11-4-21	22:00	41.4	36.5	48.2	30
11-4-21	23:00	39.4	35.8	45.4	27.3
11-5-21	0:00	38.8	35.7	43.5	28.3
11-5-21	1:00	37.9	35.6	42.2	26.4
11-5-21	2:00	36.9	35.7	39.7	25.5
11-5-21	3:00	36.5	35.6	37.4	24.7
11-5-21	4:00	39.2	36	44.2	26.4
11-5-21	5:00	42.1	37.2	49.5	32.9
11-5-21	6:00	48.9	42.7	55	44.2
11-5-21	7:00	52	47.7	58.5	52.2
11-5-21	8:00	49	45.8	59.4	52.3
11-5-21	9:00	46.7	43.4	58.8	48.6
11-5-21	10:00	46.7	42	57.1	49.5
11-5-21	11:00	45.7	41.4	60	51
11-5-21	12:00	48.1	41.1	54.7	46.7
11-5-21	13:00	49.8	42.7	60.1	48.9
11-5-21	14:00	46.3	42.5	63.1	51.4
11-5-21	15:00	46.8	42.5	58.5	51.1
11-5-21	16:00	46.3	41.1	59.3	50.4
11-5-21	17:00	44	39.5	55	43.9
11-5-21	18:00	45	39.6	53.3	40.6
11-5-21	19:00	42.1	38.3	49.5	36.7
11-5-21	20:00	41.9	37.6	49.5	33.6
11-5-21	21:00	42	37.5	49.6	34.6
11-5-21	22:00	40.7	37.2	48.4	32.7
11-5-21	23:00	40.4	37	48	30.4
11-6-21	0:00	39.8	36.2	46	28.2
11-6-21	1:00	37.8	36.2	43.6	28.9
11-6-21	2:00	37.7	36.1	42.4	27.7

Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-6-21	3:00	36.9	35.7	42.4	26.6
11-6-21	4:00	36.6	35.7	39.1	25.8
11-6-21	5:00	39.2	36.2	44.6	27.6
11-6-21	6:00	40.9	36.5	48.2	31.3
11-6-21	7:00	42.1	37.6	51.3	36.4
11-6-21	8:00	43.8	40.2	53.7	43.6
11-6-21	9:00	43.3	40.4	53.5	41.5
11-6-21	10:00	43.9	39.9	54.5	43.2
11-6-21	11:00	44.6	40.7	52.2	43.8
11-6-21	12:00	47.2	43.4	52.9	45.5
11-6-21	13:00	47.2	42	53	44.3
11-6-21	14:00	45.1	40.4	52	43.5
11-6-21	15:00	43.1	39.4	52.8	43.3
11-6-21	16:00	44.2	40	52.8	44.4
11-6-21	17:00	41	37.7	51.6	39.9
11-6-21	18:00	40.7	38	50.9	37.1
11-6-21	19:00	40.4	37.7	49.8	36.1
11-6-21	20:00	40.9	37.9	49.6	36.1
11-6-21	21:00	40.6	37.4	49	33.9
11-6-21	22:00	41	37.3	49.5	32.6
11-6-21	23:00	41.2	37	49.1	31.4
11-7-21	0:00	39.5	36.2	46.1	29.4
11-7-21	1:00	39	36.1	44.6	28.5
11-7-21	2:00	37.9	36.1	40.1	27.6
11-7-21	3:00	37.7	35.7	41.1	26.5
11-7-21	4:00	36.6	35.7	36.5	25.3
11-7-21	5:00	37.6	35.7	37.2	25.5
11-7-21	6:00	38.6	36.1	45.2	27.3
11-7-21	7:00	41	36.5	47.7	30.1
11-7-21	8:00	41.8	37.8	49.5	34
11-7-21	9:00	41.3	38.4	50.6	36.1
11-7-21	10:00	41.1	38.3	50.2	36.7
11-7-21	11:00	42.5	39	51	39.1
11-7-21	12:00	45.6	39.6	50	40.4
11-7-21	13:00	46.6	41	51	43.5
11-7-21	14:00	44.6	40.5	50.8	43.1
11-7-21	15:00	45.1	40.8	51.2	42

Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-7-21	16:00	44.7	39	51.9	41.6
11-7-21	17:00	45.8	38.3	52.4	39.9
11-7-21	18:00	41.9	37.4	49.6	36
11-7-21	19:00	41.3	37.4	50.3	36.3
11-7-21	20:00	43.1	38.1	49.2	34.4
11-7-21	21:00	41.4	37.2	47.9	33.5
11-7-21	22:00	39.2	36.5	45	31.3
11-7-21	23:00	39.1	36.4	45.4	30.5
11-8-21	0:00	38	36.2	41.3	27.2
11-8-21	1:00	37.6	36.1	39.8	25.4
11-8-21	2:00	37.5	36.1	38.4	24.5
11-8-21	3:00	37.7	36	38.6	24.2
11-8-21	4:00	36.8	35.8	37.7	24
11-8-21	5:00	40.5	36.1	46.6	25.7
11-8-21	6:00	46.5	37.2	51.9	31.1
11-8-21	7:00	49.3	44	56.7	45.3
11-8-21	8:00	51.1	47.4	58.4	52.7
11-8-21	9:00	46.8	42.6	54.7	47.1
11-8-21	10:00	56.2	42.6	54.9	46
11-8-21	11:00	47.6	44.3	54.5	46.2
11-8-21	12:00	47.4	42.9	56.3	50.5
11-8-21	13:00	45.8	41.9	57.5	51.1
11-8-21	14:00	47.7	42.3	57	51.6
11-8-21	15:00	46.7	43.7	58.6	53.6
11-8-21	16:00	47.5	44	60	55.8
11-8-21	17:00	46.7	43.5	58.6	53.4
11-8-21	18:00	45.3	41.1	55.4	44.5
11-8-21	19:00	42.2	39.6	51.8	39.6
11-8-21	20:00	41.3	38.5	48.8	37
11-8-21	21:00	41.4	38	47.4	34.7
11-8-21	22:00	42.2	38.1	48.4	34.5
11-8-21	23:00	39	37.1	45.4	31.6
11-9-21	0:00	38.7	36.5	44.7	30.5
11-9-21	1:00	37.6	36.2	37.6	29.3
11-9-21	2:00	38.2	36.1	32.9	27.2
11-9-21	3:00	38	36.1	40.7	26.8
11-9-21	4:00	37.3	36.1	38.3	27.1

Date (mm-dd-yy)	Time	Measured Noise Levels [dBA]			
		Monitoring Site 1		Monitoring Site 2	
		Leq	L(90)	Leq	L(90)
11-9-21	5:00	39.5	36.2	43.6	28.4
11-9-21	6:00	42.6	37.5	50.1	30.5
11-9-21	7:00	47	43.1	55	44
11-9-21	8:00	50.1	47.1	56.2	50.5
11-9-21	9:00	49.3	46.5	55.2	48.1
11-9-21	10:00	48.3	44.6	54.6	46.9
11-9-21	11:00	47.4	41.8	53.3	44
11-9-21	12:00	46.2	42.1	54.3	44.2
11-9-21	13:00	46.5	42.1	54.1	43.8

Notes: Rows highlighted in yellow represent data monitored during the Facility daytime period of operations.
[a] Noise data not available for this period of measurement

APPENDIX B

Weather Data November 1 to 9, 2021

Station Name	OTTAWA INT'L
Province	ONTARIO
Latitude	45.32
Longitude	-75.67
Elevation	114
Climate Identifier	6106001
WMO Identifier	71628
TC Identifier	YOW

All times are specified in Local Standard Time (LST). Add 1 hour to adjust for Daylight Saving Time where and when it is observed.

Table B1: Weather Data November 1 to November 9, 2021

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-01 13:00	10.6	-2.5	40	25	32	99.98	Mainly Clear
2021-11-01 14:00	11.1	-1.6	41	24	27	100	NA
2021-11-01 15:00	9.6	-2.2	43	24	22	100.02	NA
2021-11-01 16:00	9	-0.6	51	25	29	100.06	Mostly Cloudy
2021-11-01 17:00	6.7	1	67	26	29	100.14	NA
2021-11-01 18:00	5.5	0.7	71	23	21	100.19	NA
2021-11-01 19:00	4.6	0.9	77	23	20	100.25	Clear
2021-11-01 20:00	3.9	0.7	80	23	17	100.29	NA
2021-11-01 21:00	3.3	0.5	82	24	13	100.36	NA
2021-11-01 22:00	2.5	0.4	86	25	8	100.39	Clear
2021-11-01 23:00	1.7	-0.9	83	24	10	100.4	NA
2021-11-02 0:00	1.6	-0.1	89	24	4	100.41	NA
2021-11-02 1:00	1.1	-0.6	89	25	5	100.38	Clear
2021-11-02 2:00	-1	-1.9	94	18	4	100.4	NA
2021-11-02 3:00	0.1	-0.4	96	19	7	100.39	NA
2021-11-02 4:00	0.7	0.2	96	25	8	100.39	Mostly Cloudy
2021-11-02 5:00	0.5	-0.2	95	21	8	100.41	NA
2021-11-02 6:00	-0.1	-0.7	96	19	8	100.41	NA
2021-11-02 7:00	-0.2	-0.9	95	19	8	100.45	Mainly Clear
2021-11-02 8:00	1.1	0	93	20	9	100.48	NA
2021-11-02 9:00	3.4	1.4	86	22	10	100.48	NA
2021-11-02 10:00	4.1	1.5	83	21	11	100.5	Mostly Cloudy
2021-11-02 11:00	5.6	1.6	76	23	10	100.48	NA
2021-11-02 12:00	7.9	1.7	65	22	13	100.41	NA

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-02 13:00	9.2	0.7	55	22	18	100.36	Mostly Cloudy
2021-11-02 14:00	6.8	2.6	74	15	5	100.35	NA
2021-11-02 15:00	7.5	0.9	63	19	10	100.34	NA
2021-11-02 16:00	6.1	2.1	75	32	14	100.38	Mostly Cloudy
2021-11-02 17:00	3.3	2.1	92	32	20	100.43	Rain Showers
2021-11-02 18:00	3.3	2.1	92	24	8	100.5	Rain Showers
2021-11-02 19:00	3.1	2.4	95	26	8	100.55	Rain Showers
2021-11-02 20:00	1.8	1.2	96	23	8	100.55	NA
2021-11-02 21:00	1.2	0.8	97	25	3	100.58	NA
2021-11-02 22:00	1.4	1.2	99	22	7	100.6	Mostly Cloudy
2021-11-02 23:00	0.9	0.8	99	22	8	100.62	NA
2021-11-03 0:00	0.8	0.6	99	25	5	100.63	NA
2021-11-03 1:00	0.9	0.8	99	25	5	100.66	Cloudy
2021-11-03 2:00	1.1	1	99	29	7	100.68	NA
2021-11-03 3:00	1.3	1.2	99	36	8	100.67	NA
2021-11-03 4:00	1	0.7	98	2	7	100.68	Cloudy
2021-11-03 5:00	1	0.3	95	29	4	100.72	NA
2021-11-03 6:00	1.3	0.3	93	33	11	100.78	NA
2021-11-03 7:00	1.1	-0.2	91	32	10	100.82	Mostly Cloudy
2021-11-03 8:00	1.6	-0.3	88	33	13	100.91	NA
2021-11-03 9:00	2.2	-0.8	80	32	10	100.96	NA
2021-11-03 10:00	2.8	-1.6	73	33	9	101	Clear
2021-11-03 11:00	3.2	-3.8	60	33	9	101.05	NA
2021-11-03 12:00	4.1	-4	56	34	14	101.02	NA
2021-11-03 13:00	4.9	-5.6	47	28	15	100.98	Mostly Cloudy
2021-11-03 14:00	5.2	-5.4	46	29	24	101.01	NA
2021-11-03 15:00	4.8	-5.6	47	28	18	101.03	NA
2021-11-03 16:00	4.4	-6.2	46	27	16	101.05	Mostly Cloudy
2021-11-03 17:00	0.7	-6	61	25	12	101.09	NA
2021-11-03 18:00	0.5	-5.7	63	25	9	101.13	NA
2021-11-03 19:00	-0.1	-6.3	63	27	11	101.16	Mainly Clear
2021-11-03 20:00	-0.9	-6.5	66	25	8	101.17	NA
2021-11-03 21:00	-3	-5.4	83	23	4	101.22	NA
2021-11-03 22:00	-1.6	-6.2	71	24	7	101.25	Mainly Clear
2021-11-03 23:00	-2	-5.4	78	24	5	101.27	NA

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-04 0:00	-2.7	-5.1	83	24	3	101.28	NA
2021-11-04 1:00	-3.5	-5.7	85	32	4	101.27	Mainly Clear
2021-11-04 2:00	-2.7	-4.8	86	29	4	101.28	NA
2021-11-04 3:00	-3.1	-4.3	91	36	5	101.28	NA
2021-11-04 4:00	-2.3	-4.3	86	3	6	101.27	Mostly Cloudy
2021-11-04 5:00	-1.3	-4	82	1	6	101.29	NA
2021-11-04 6:00	-3	-5.3	84	1	8	101.27	NA
2021-11-04 7:00	-3	-4.8	87	1	4	101.31	Mostly Cloudy
2021-11-04 8:00	-0.9	-2.6	88	6	4	101.33	NA
2021-11-04 9:00	0.9	-3	75	34	4	101.35	NA
2021-11-04 10:00	2.7	-3	66	10	4	101.34	Mainly Clear
2021-11-04 11:00	4.2	-4.3	54	20	11	101.35	NA
2021-11-04 12:00	3.7	-3.6	59	28	7	101.3	NA
2021-11-04 13:00	4.8	-5.3	48	25	4	101.19	Mostly Cloudy
2021-11-04 14:00	3.9	-4.1	56	30	10	101.17	NA
2021-11-04 15:00	5.2	-5.4	46	27	15	101.15	NA
2021-11-04 16:00	4.3	-5.2	50	25	15	101.14	Mainly Clear
2021-11-04 17:00	2.2	-6.3	53	30	9	101.15	NA
2021-11-04 18:00	2.6	-6.3	52	34	7	101.21	NA
2021-11-04 19:00	-0.9	-6.5	66	18	3	101.21	Clear
2021-11-04 20:00	-2	-6.6	71	13	3	101.17	NA
2021-11-04 21:00	-2.5	-5.8	78	16	7	101.18	NA
2021-11-04 22:00	-1.7	-6.6	69	16	5	101.23	Clear
2021-11-04 23:00	-2.4	-6.1	76	13	7	101.21	NA
2021-11-05 0:00	-2.2	-5.7	77	17	10	101.21	NA
2021-11-05 1:00	-1.5	-4.4	81	15	8	101.18	Mostly Cloudy
2021-11-05 2:00	-1.8	-4.1	84	10	3	101.18	NA
2021-11-05 3:00	-1.9	-4.3	83	16	6	101.18	NA
2021-11-05 4:00	-1.7	-3.7	86	36	1	101.21	Mostly Cloudy
2021-11-05 5:00	-3	-4.2	91	21	4	101.24	NA
2021-11-05 6:00	-2.1	-3.3	92	23	5	101.28	NA
2021-11-05 7:00	-4.2	-4.9	95	23	7	101.35	Clear
2021-11-05 8:00	-1.1	-1.9	95	24	8	101.41	NA
2021-11-05 9:00	1.6	-0.5	86	26	12	101.45	NA
2021-11-05 10:00	3.6	-0.3	76	24	13	101.46	Clear

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-05 11:00	5.8	-2	57	28	10	101.46	NA
2021-11-05 12:00	6.9	-3.1	49	23	9	101.44	NA
2021-11-05 13:00	7.9	-5.9	37	30	17	101.37	Clear
2021-11-05 14:00	8.5	-5.8	36	26	19	101.31	NA
2021-11-05 15:00	8.3	-6.4	35	26	19	101.28	NA
2021-11-05 16:00	6.9	-6.1	39	22	15	101.24	Mainly Clear
2021-11-05 17:00	4.9	-5	49	23	11	101.25	NA
2021-11-05 18:00	6	-4.2	48	23	13	101.3	NA
2021-11-05 19:00	4.3	-2.8	60	23	13	101.31	Mainly Clear
2021-11-05 20:00	3.3	-2.9	64	22	12	101.34	NA
2021-11-05 21:00	2.9	-2.8	66	21	9	101.35	NA
2021-11-05 22:00	2.2	-2.9	69	21	7	101.35	Mainly Clear
2021-11-05 23:00	1.7	-2.9	72	21	6	101.33	NA
2021-11-06 0:00	1.2	-3	74	22	8	101.33	NA
2021-11-06 1:00	0.5	-2.8	79	23	6	101.36	Clear
2021-11-06 2:00	-0.7	-3.6	81	20	9	101.36	NA
2021-11-06 3:00	-0.3	-3.2	81	19	8	101.37	NA
2021-11-06 4:00	-0.5	-3.2	82	19	10	101.38	Mainly Clear
2021-11-06 5:00	-1.2	-3.6	84	19	10	101.41	NA
2021-11-06 6:00	-1.2	-2.9	88	18	10	101.4	NA
2021-11-06 7:00	-1.2	-2.5	91	20	7	101.44	Mainly Clear
2021-11-06 8:00	0.7	-1.1	88	21	9	101.44	NA
2021-11-06 9:00	3.8	0.1	77	18	9	101.4	NA
2021-11-06 10:00	6.7	1.3	68	20	16	101.35	Mainly Clear
2021-11-06 11:00	8.6	1.2	60	21	25	101.32	NA
2021-11-06 12:00	9.5	0.3	52	20	23	101.23	NA
2021-11-06 13:00	9.8	-0.1	50	21	22	101.12	Mostly Cloudy
2021-11-06 14:00	10.2	0.7	52	18	21	101.03	NA
2021-11-06 15:00	9.7	1.2	55	20	21	100.98	NA
2021-11-06 16:00	8.8	0.9	58	19	17	100.93	Mainly Clear
2021-11-06 17:00	6.7	0.8	66	18	10	100.92	NA
2021-11-06 18:00	5.1	0.8	74	16	10	100.95	NA
2021-11-06 19:00	4.9	0	71	19	11	100.93	Mainly Clear
2021-11-06 20:00	3.8	-0.4	74	21	13	100.91	NA
2021-11-06 21:00	2.8	-0.8	77	21	9	100.89	NA

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-06 22:00	2.4	-0.4	82	21	13	100.89	Clear
2021-11-06 23:00	2.5	-0.6	80	19	7	100.85	NA
2021-11-07 0:00	1.8	-0.9	82	17	7	100.82	NA
2021-11-07 1:00	0.9	-0.9	88	10	4	100.8	Mostly Cloudy
2021-11-07 2:00	-1	-2	93	10	6	100.78	NA
2021-11-07 3:00	-2.7	-3.7	93	11	8	100.74	NA
2021-11-07 4:00	0.8	-1.5	84	19	8	100.73	Mostly Cloudy
2021-11-07 5:00	1.2	-1.4	83	19	6	100.73	NA
2021-11-07 6:00	0.9	-1.6	84	18	8	100.68	NA
2021-11-07 7:00	-0.4	-2.9	84	14	5	100.67	Mainly Clear
2021-11-07 8:00	2	-0.5	83	18	9	100.69	NA
2021-11-07 9:00	5.4	2.1	80	21	14	100.68	NA
2021-11-07 10:00	8.2	3.7	73	19	16	100.63	Mainly Clear
2021-11-07 11:00	10.9	4	62	22	26	100.6	NA
2021-11-07 12:00	12.4	4.5	58	22	18	100.54	NA
2021-11-07 13:00	13	3.8	54	23	22	100.46	Mainly Clear
2021-11-07 14:00	13.4	4.8	56	18	16	100.42	NA
2021-11-07 15:00	13.6	5.1	56	20	14	100.38	NA
2021-11-07 16:00	12.5	5.2	61	19	14	100.38	Mainly Clear
2021-11-07 17:00	10.6	5	68	16	9	100.4	NA
2021-11-07 18:00	9.7	4.8	72	17	9	100.47	NA
2021-11-07 19:00	8.8	4.8	76	19	11	100.51	Mainly Clear
2021-11-07 20:00	7.4	4.5	81	17	10	100.51	NA
2021-11-07 21:00	7.3	5.1	86	28	10	100.58	NA
2021-11-07 22:00	7.4	5.1	85	19	9	100.56	Mostly Cloudy
2021-11-07 23:00	7.3	5.4	87	20	8	100.54	NA
2021-11-08 0:00	7.4	5.5	88	22	7	100.57	NA
2021-11-08 1:00	6.8	5	88	26	7	100.57	Mostly Cloudy
2021-11-08 2:00	7	5.4	90	26	6	100.59	NA
2021-11-08 3:00	5.6	4.5	93	24	4	100.6	NA
2021-11-08 4:00	5.1	4.5	96	25	6	100.65	Mainly Clear
2021-11-08 5:00	4.5	4.3	98	30	4	100.64	NA
2021-11-08 6:00	2	1.6	97	21	7	100.7	NA
2021-11-08 7:00	1.7	1.6	99	36	2	100.75	Mainly Clear
2021-11-08 8:00	3.8	3.8	100	17	7	100.76	NA

Date/Time	Temperature (°C)	Dew Point Temperature (°C)	Relative Humidity (%)	Wind Direction (10s deg.)	Wind Speed (km/h)	Stn Pressure (kPa)	Weather
2021-11-08 9:00	7.3	6	92	17	4	100.77	NA
2021-11-08 10:00	10.7	6.4	75	13	8	100.72	Clear
2021-11-08 11:00	12.8	6.6	66	18	13	100.73	NA
2021-11-08 12:00	13.8	6.9	63	19	15	100.67	NA
2021-11-08 13:00	14.3	7.3	62	18	15	100.58	Mainly Clear
2021-11-08 14:00	14	7.5	65	17	13	100.51	NA
2021-11-08 15:00	13.6	7.9	68	16	19	100.41	NA
2021-11-08 16:00	12.7	7.9	73	17	12	100.38	Mainly Clear
2021-11-08 17:00	11.3	7.6	78	18	14	100.3	NA
2021-11-08 18:00	10.1	7.6	84	21	10	100.35	NA
2021-11-08 19:00	9.1	7.5	90	20	13	100.31	Mainly Clear
2021-11-08 20:00	8.4	7.5	94	19	8	100.3	NA
2021-11-08 21:00	7.2	6.3	94	23	6	100.3	NA
2021-11-08 22:00	7.7	7.5	99	20	8	100.27	Fog
2021-11-08 23:00	7	6.7	98	20	9	100.23	Fog
2021-11-09 0:00	6.6	6.3	98	20	12	100.21	Fog
2021-11-09 1:00	6.3	6.1	99	19	10	100.18	Fog
2021-11-09 2:00	5.6	5.5	99	21	8	100.21	Fog
2021-11-09 3:00	6.2	6.1	99	22	11	100.3	Fog
2021-11-09 4:00	6.9	6.7	99	22	8	100.31	Fog
2021-11-09 5:00	7.4	7.1	98	26	10	100.36	Fog
2021-11-09 6:00	8.4	6.8	90	30	15	100.4	NA
2021-11-09 7:00	7.6	6.5	93	29	12	100.4	Mostly Cloudy
2021-11-09 8:00	8.9	7.6	91	31	22	100.54	NA
2021-11-09 9:00	9.3	7.7	90	30	13	100.55	NA
2021-11-09 10:00	11.6	8.3	80	32	13	100.53	Mostly Cloudy
2021-11-09 11:00	13.2	7.8	70	32	19	100.55	NA
2021-11-09 12:00	13.6	6.5	62	29	12	100.51	NA
2021-11-09 13:00	14	4.9	54	31	13	100.49	Mostly Cloudy

Appendix '4'

Schedule 'A' – 2021 Complaints Summary
Schedule 'B' – 2021 Material Tonnage Summary
Schedule 'C' – Brief Site History
Schedule 'D" – Amendment to Environmental Compliance Approval Number A460702 Notice No. 13

Schedule 'A'

Complaints Summary

Schedule 'A'
2021 COMPLAINTS SUMMARY

No.	Event Date	Event	Response
		Odours	
1	14/10/2021	1 complaint Received an e-mail complaint from a neighbor (RC) about odours @ 11:30 pm	Odour! It stinks outside (and consequently in my home) quite badly right now. Also, it seems in the last month there has been an increase in stink/smell from the dump. Winds SE, 18 °C, Overcast HH drove to the address and throughout the neighbourhood at 7:00 am the next morning. Winds were from the east. Resident resides west of the landfill. No odours were observed at the time of inspection.

Schedule 'A'
2021 COMPLAINTS SUMMARY

No.	Event Date	Event	Response
		Odours	
1	14/10/2021	1 complaint Received an e-mail complaint from a neighbor (RC) about odours @ 11:30 pm	Odour! It stinks outside (and consequently in my home) quite badly right now. Also, it seems in the last month there has been an increase in stink/smell from the dump. Winds SE, 18 °C, Overcast HH drove to the address and throughout the neighbourhood at 7:00 am the next morning. Winds were from the east. Resident resides west of the landfill. No odours were observed at the time of inspection.

Schedule 'A'
2021 COMPLAINTS SUMMARY

No.	Event Date	Event	Response
		Odours	
1	14/10/2021	1 complaint Received an e-mail complaint from a neighbor (RC) about odours @ 11:30 pm	Odour! It stinks outside (and consequently in my home) quite badly right now. Also, it seems in the last month there has been an increase in stink/smell from the dump. Winds SE, 18 °C, Overcast HH drove to the address and throughout the neighbourhood at 7:00 am the next morning. Winds were from the east. Resident resides west of the landfill. No odours were observed at the time of inspection.

Schedule 'B'

2021 Tonnage Summary

SCHEDULE "B"

Month	Total Inbound Monthly Tonnage	2021 Outbound and Re-Used Monthly Tonnage														Total Outbound and Re-Used Monthly Tonnage	Total Tonnage Landfilled
		Cardboard	Tires	Glass	Drywall	E-Waste	Shingles	Wood	Metals&WG	Aggregate	Asphalt	Rock/Concrete	Cont Soil (cover/treated/re-used)	Clean Fill	Wet Waste		
Jan-21	32,535.70	-	-	-	-	-	(54.70)	(236.57)	(95.68)	(523.50)	(18.42)	(75.00)	(19,400.26)	(5.28)	(3.00)	(20,412.41)	12,123.29
Feb-21	24,771.80	-	(1.12)	-	-	-	(14.03)	(281.18)	(51.73)	(683.49)	-	(50.00)	(13,964.44)	(3.99)	(3.00)	(15,042.98)	9,728.82
Mar-21	28,486.50	(0.45)	-	-	-	(2.95)	(101.68)	(569.60)	(41.54)	(957.93)	(54.86)	(5,275.00)	(9,492.00)	(18.57)	(3.00)	(16,517.58)	11,968.92
Q1	85,794.00	(0.45)	(1.12)	-	-	(2.95)	(170.41)	(1,087.35)	(188.95)	(2,164.92)	(73.28)	(5,400.00)	(42,846.70)	(27.84)	(9.00)	(51,972.97)	33,821.03
Apr-21	48,485.90	-	-	-	(5.87)	-	(413.01)	-	(40.20)	(639.11)	(2,729.89)	(3,048.28)	(26,850.51)	(160.81)	(3.00)	(33,890.68)	14,595.22
May-21	45,869.90	-	(1.86)	-	-	(2.70)	(545.86)	(67.10)	(63.48)	(542.30)	(2,185.70)	(1,650.00)	(25,565.59)	(367.91)	(3.00)	(30,995.50)	14,874.40
Jun-21	81,876.00	-	(2.44)	-	-	(2.60)	(531.44)	(86.77)	(60.69)	(1,011.10)	(842.47)	(1,147.78)	(60,871.65)	(313.56)	(3.00)	(64,873.50)	17,002.50
Q2	176,031.80	-	(4.30)	-	(5.87)	(5.30)	(1,490.31)	(153.87)	(164.37)	(2,192.51)	(5,758.06)	(5,846.06)	(113,287.75)	(842.28)	(9.00)	(129,759.68)	46,272.12
Jul-21	54,442.60	-	-	-	-	-	(479.38)	(257.81)	(44.28)	(617.53)	(156.07)	(6,550.00)	(31,795.67)	(330.06)	(3.00)	(40,233.80)	14,208.80
Aug-21	39,536.90	(0.77)	-	-	-	-	(411.38)	(410.94)	(37.61)	(541.40)	(8.48)	(200.00)	(3,812.08)	(268.16)	(3.00)	(5,693.82)	33,843.08
Sep-21	29,099.60	(0.98)	-	(32.27)	-	-	(530.45)	(20.05)	(44.99)	(725.89)	-	(3,080.00)	(20,651.90)	(253.62)	(3.00)	(25,343.15)	3,756.45
Q3	123,079.10	(1.75)	-	(32.27)	-	-	(1,421.21)	(688.80)	(126.88)	(1,884.82)	(164.55)	(9,830.00)	(56,259.65)	(851.84)	(9.00)	(71,270.77)	51,808.33
Oct-21	44,604.50	-	(2.53)	-	-	(2.26)	(552.57)	(675.53)	(34.47)	(804.96)	(2.70)	(2,125.54)	(22,444.38)	(220.18)	(3.00)	(26,868.12)	17,736.38
Nov-21	57,753.80	-	(2.73)	-	-	(0.14)	(510.80)	(1,257.71)	(47.10)	(483.16)	-	(2,395.03)	(32,122.02)	(159.37)	(3.00)	(36,981.06)	20,772.74
Dec-21	25,815.10	(0.30)	(1.58)	-	-	-	(159.82)	(563.48)	(22.18)	(403.20)	-	(2,206.10)	(2,430.87)	(19.74)	(3.00)	(5,810.27)	20,004.83
Q4	128,173.40	(0.30)	(6.84)	-	-	(2.40)	(1,223.19)	(2,496.72)	(103.75)	(1,691.32)	(2.70)	(6,726.67)	(56,997.27)	(399.29)	(9.00)	(69,659.45)	58,513.95
Total:	513,078.30	(2.50)	(12.26)	(32.27)	(5.87)	(10.65)	(4,305.12)	(4,426.74)	(583.95)	(7,933.57)	(5,998.59)	(27,802.73)	(269,391.37)	(2,121.25)	(36.00)	(322,662.87)	190,415.43

Schedule 'C'

Brief Site History

Schedule 'C'
BRIEF SITE HISTORY

Landfilling at the Site started in the early 1960s and served, at the time, as a rural dump operation for local residents. In 1971, the Ministry of Environment and Climate Change (MOECC), formerly the MOE, issued a Provisional Certificate of Approval (CofA No. 460702) to Mr. D. J. Huneault for disposal of industrial waste including construction and demolition waste. Currently the site receives all types of solid, non-hazardous waste for disposal excluding putrescible waste. In 1995, the CofA was amended for the operation of waste processing and composting facilities at the site. Composting operations were suspended with the issuance of the CofA amendments in April 2009. In 2016, the CofA, now an Environmental Compliance Approval (ECA) was amended to permit the treatment of contaminated soils.

Annual monitoring of groundwater and surface water was initiated in 1987 and has evolved into a comprehensive monitoring program that is reported to the MOECC on an annual basis. In 1992, a leachate collection system was constructed along the down-gradient toe of the landfill and surface water diversion ditches were constructed up-gradient within the north buffer zone. Leachate was initially collected in retention ponds and re-circulated onto and into the landfill following treatment through a peat filter and constructed wetland system. Transport of leachate by tanker truck to the municipal wastewater treatment plant was initiated in 1997 and used for 11 years. Construction of the existing leachate pre-treatment/pumping station and forcemain connection to the City of Ottawa sanitary sewer system was completed in 2007 and commissioned in early 2008.

In 2001, a landfill gas collection and flaring system was constructed as an interim odour control system. This system was commissioned in April of 2012 and has remained operational since then.

Construction for the last landfill cell was completed in 2019.

A detailed record of milestones in the site's history is presented as follows:

1960s The site was established to serve the local resident population, operating as a rural dump operation.

1971 The first Ministry of Environment (MOE) Provisional Certificate of Approval (CofA No. A460702) was issued to D.J. Huneault and revised in 1980.

1981 Detailed inspections, surveys and water samplings were undertaken. Monitoring wells were installed. Ownership of the site was transferred to Huneault Waste Management (474299 Ontario Ltd.). An application was submitted to update the CofA.

1983 The CofA was re-issued to 474299 Ontario Ltd. for a 100-acre landfill site limited to construction rubble and inert materials.

1984 Following an Ontario Municipal Board hearing, the site was re-zoned to permit landfilling.

1987 An annual monitoring program for groundwater and surface water was initiated.

1989 Four groundwater-monitoring stations were installed along the south property boundary.

1991 A land use agreement was entered into between the City of Gloucester (now City of Ottawa) and 474299 Ontario Ltd. Monitoring of surface water, groundwater and leachate was increased from annual to semi-annual monitoring events.

1992 A leachate collection system was constructed along the down-gradient toe of the landfill. Surface water diversion ditches were constructed up gradient within the north buffer zone. A leachate retention pond was constructed in the southeast corner of the landfill area. The first of two large cells was excavated in the northwest quadrant.

1993 A second leachate retention pond was constructed in the southeast corner of the landfill area. The CofA was re-issued. Waste types were limited to construction and demolition debris, asbestos; non-hazardous solid industrial waste including impacted soil. The second of two large cells was excavated in the northwest quadrant.

1994 The company changed its name from 474299 Ontario Ltd. to Huneault Waste Management Ltd.

1995 Landfilling continued in the west half of the landfill. Landfill gas monitoring was carried out and passive ventilation trenches were constructed. A large peat filter for leachate treatment was constructed east of the leachate retention ponds. The CofA was amended to permit the processing (recycling) and composting of waste materials (leaf and yard waste).

1996 The CofA was amended to allow for the receipt and composting of wet waste. Constructed wetlands were used for on-site treatment of leachate. A compost pad was constructed within the landfill area with recycled asphalt. In the fall, composting of leaf and yard waste as well as composting of mixed organics began.

1997 Due to complaints from neighbouring residents related to odour issues at the Site during the spring and summer, the use of leachate retention ponds and the composting of wet waste were suspended. Leachate was trucked by tanker to the municipal wastewater treatment plant (ROPEC) in compliance with a field order issued by the MOE. Updates to the 1994 Water Management Systems Report were submitted to the MOE for approval and included a design for a long-term leachate pumping station.

1998 Leachate continued to be trucked by tanker to the municipal wastewater treatment plant (ROPEC). The CofA was amended to insure the company submit a revised compost management plan for approval by the MOE prior to receiving mixed organics at the composting site.

1999 In July of 1999, ownership of the landfill changed. Leachate continued to be trucked by tanker to the municipal wastewater treatment plant (ROPEC). The 1994 Water Management Systems Report (1998 Revisions – Leachate Management) and the Huneault Landfill Leachate/Effluent Pumping Station

Design prepared by Totten Sims Hubicki Associates Ltd., both dated December 1998, were approved by the MOE and the CofA was amended.

2000 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). Construction of a new leachate wet well and pump station was completed. The leachate loading station was relocated to the top of the waste pile near Grid Line P-13 following the construction of the pump station. In September 2000 the corporation changed its name from Huneault Waste Management Ltd. to Waste Services Inc. (WSI).

2001 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). A second scale house was added at the entrance to the site to better serve WSI clients and to improve inbound and outbound traffic control. Active landfilling was being carried out in the southeast quadrant of the Site.

2002 Waste Services Inc. (WSI) was acquired by Capital Environmental Services Inc. (CERI), a publicly traded company. An amendment to the CofA was approved to allow foundry sand, wood chips and contaminated soil to be used as alternative daily cover, to allow recycled asphalt and inert granular materials to be used as road base, and to increase the service area to include the Province of Ontario. A CofA (Air) No. 6141-XKF9 was approved to permit the use of a tub grinder on site. A new scale and scale house were constructed at the entrance to the landfill to ease traffic congestion on Navan Road. Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). Active landfilling was being carried out in the southeast quadrant of the Site.

2003 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). Ainley Graham and Associates, a municipal engineering firm, completed a preliminary design for a leachate forcemain connection to the City of Ottawa sanitary sewer system. A small parcel of land referred to as the Larivière property and running the length of the Site's east property line was acquired in late 2003.

2004 Leachate continued to be trucked by tanker to the City of Ottawa wastewater treatment plant (ROPEC). A land exchange agreement was completed with the National Capital Commission giving WSI ownership of a 6.91 hectare parcel of land being a 100 metre strip south of the VIA right of way (ROW) in exchange for an 8.43 hectare parcel south of land owned by WSI (Plan 4R-19707). This brings its total land mass in and around the landfill Site to 69.05 hectares.

2005 Leachate continued to be trucked by tanker to ROPEC. A compliance order was received from the City of Ottawa to pre-treat the leachate and reduce the concentrations of hydrogen sulphide discharged at the wastewater treatment plant. The engineering firm Ainley Graham and Associates completed a Stage 1 Detailed Design for the Leachate Pre-Treatment/Pump Station and Forcemain with connection to the City of Ottawa sanitary sewer system. A small parcel of land referred to as the Robert property, running along the landfill Site's east property line, and a residential property located at 3516 Navan Road were acquired. Golder Associates Ltd. was retained to undertake geotechnical and slope stability analysis for the Site as well as monitoring for landfill gas, groundwater, surface water, leachate and sediment. Golder was also retained to undertake a leachate pre-treatment study. In November, WSI announced to the public that it was undertaking

a project to expand the capacity of the landfill and extend its operational life by at least 10 years beyond 2011. The first public Open House was held on December 8, 2005.

2006 In May 2006, the MOE issued an amended CofA No. A460702 consolidating previous Certificates of Approval and associated notices and updating the CofA to the current standards. An updated Design and Operations Report prepared by Gartner Lee Ltd. was adopted. Also in May, a proposed Terms of Reference for the expansion of the landfill in accordance with the Environmental Assessment Act was submitted to the MOE and these were approved in October 2006. Leachate continued to be trucked by tanker to ROPEC. Chemical treatment of leachate to reduce H_2S concentrations began in the spring. An approval for the Leachate Pre-Treatment/Pumping Station and another to install a leachate forcemain within the Navan and Renaud Road allowances were obtained from city council with construction commencing in early December. Additional property to the east of the landfill located at 3326, 3548, 3560 and 3578 Navan Road were acquired by WSI bringing its total land mass in and around the landfill site to 90 ha.

2007 WSI considered and used the results of an environmental assessment (EA) to identify a preferred landfill expansion alternative for the Site thereby extending its operational life. The expansion of the WSI Navan Waste Recycling and Disposal Facility received approval under the Ontario Environmental Assessment Act (EAA) on August 3, 2007. Construction of the leachate forcemain and associated site modifications were completed in August. At the request of the City of Ottawa, modifications to the leachate pre-treatment and sampling system were undertaken with design and construction completed during the later part of 2007.

2008 A revised D&O Report was prepared by Golder Associates Ltd. (January, 2008) to meet the regulatory requirements described in the Landfill Standards (MOE, 1998) and the associated Ontario Regulation 232/98 to address the related Conditions of Approval for the proposed landfill expansion under the EAA. The proposed expansion of the Navan Waste Recycling and Disposal Facility required approval under the Ontario *Environmental Protection Act* (EPA) as well as other legislation. In early 2008, WSI presented submissions to the MOE to satisfy both the conditions of the approved EA and the requirements of the EPA and OWRA. Commissioning of the leachate pre-treatment/pump station was completed in February with leachate being pumped via forcemain to the City of Ottawa sewer system. Construction of new weigh scales, scale house and access roads began in the fall.

2009 Expansion of the Navan Landfill under the Ontario Environmental Protection Act (EPA) received approval with the issuance of the revised CofA No. A460702 (Waste Disposal Site) on April 16, 2009 along with CofA No. 4816-7C7M6C (Industrial Sewage Works) and CofA No. 6733-7BYS9A (Air). CofA No. A460702 was subsequently amended by Notice 1 on October 9th 2009. Significant facility improvements were completed at the entrance to the Site consisting of new scales and scale house, new Site entrance, new office/maintenance facilities, a new small vehicle unloading area and a new wheel wash station. An east diversion ditch c/w fish habitat features was constructed along the east edge of the property and commissioned in the fall following South Nation Conservation Authority approval. A 963 m^2 segment of property bordering Navan Road and west of the new site entrance was severed and transferred to the City of Ottawa for the future

widening of Navan Road. Leachate continued to be pre-treated and discharged via forcemain to the City of Ottawa sewer system.

2010 In July, Waste Services Inc (WSI) merged with BFI Canada Inc., a Progressive Waste Solutions company, to become the third largest provider of waste services in North America. This merger had no impacts on the operations of the Navan Waste Recycling and Disposal Facility. Facility improvements continued to be made throughout 2010 and included completing the pavement structure for the main entrance and access to the site, the small vehicle unloading area and office/maintenance facility parking area and fire route. Berm construction and landscaping east of the wheel wash station and west of the site entrance were also completed. The design for modifications to the leachate pre-treatment/pumping station was approved by the MOE and, the Certificate of Approval (Industrial Sewage Works) was amended (CofA # 5616-86NKNW). The design for an interim odour control system at the site was approved by the MOE and the Certificate of Approval (Air) was amended (CofA # 3536-8APNZD). Construction of the landfill gas forcemain and flaring system was started in November. Cell development continued in the Phase 2 area of the site with active landfilling being carried out in Phases 3 and 4.

2011 Construction of the landfill gas forcemain and flaring system was completed and awaiting approval by the Technical Standards and Safety Authority (TSSA). Construction of the leachate pre-treatment and pumping station improvements were completed. Monitoring well MW11-1 was installed to replace monitoring well OW92-8. E-waste recycling services were introduced for the benefit of the local community. The east storm water management pond was completed in the fall. Cell development was completed in the area of Phase 2. Landfill was carried out in Phases 2, 3, and 4.

2012 An interim odour control system comprising of a landfill gas collection and flaring system was commissioned and approval by the Technical Standards and Safety Authority (TSSA) was received in April. The west stormwater management pond and east diversion ditch were completed in the fall. A new access road to the recycling facility and active landfill areas was constructed along the top of the existing waste mound just west of the East Cell expansion area. Landfilling was carried out in the area of Phases 3 and 4.

2013 An interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation. Leachate collection and pre-treatment was continued throughout 2013. A forcemain obstruction causing a cleanout flange failure resulting in a spill along Navan Road was experienced in December. The event was reported to the MOE and the City. The spill was cleaned up and the system repaired and returned to regular operations. Efforts were concentrated in completing the north facing waste slope west of the site access and the west facing waste slope. Landfilling was carried out in the area of Phases 3 and 4. In 2013, BFI collaborated with a third party to develop a market for recycled drywall. Other materials recycled and re-used consist of glass, tires, cardboard, e-waste, shingles, wood, metals and white goods, aggregate, asphalt, rock and concrete, clean fill and impacted soils for re-use as cover material.

2014 An interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of horizontal collection wells. Leachate collection and pre-treatment was continued throughout 2014. Construction of the east expansion cell (Phase 1) drainage system was started in 2014 with completion anticipated in early 2015. Waste placement efforts were concentrated in completing the west-facing slope (Phase 3). In 2014 BFI continued to recycle and re-use materials such as glass, tires, cardboard, e-waste, shingles, wood, metals and white goods, aggregate, asphalt, rock and concrete, clean fill as well as impacted soils re-used as cover material.

2015 In 2015, the company changed its operating name from BFI Canada Inc. to Progressive Waste Solutions Canada Inc. Leachate collection and pre-treatment was continued throughout 2015. Construction of the east expansion cell (Phase 1), drainage system started in 2014 was completed in 2015, and landfilling within the cell began in mid December. Waste placement efforts focused on completing the Phase 3 fill area and the west end of Phases 4 and 5 prior to starting waste placement in the new east cell. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of horizontal collection wells. In addition to recycling various waste materials, PWS in 2015 received MOECC approval for the treatment of contaminated soils.

2016 Leachate collection and pre-treatment was continued throughout 2016. Waste placement efforts continued in the new east cell (Phase 1). Contaminated soil placement to raise the grades to final elevations continued in the Phase 3 fill area and the west end of Phases 4 and 5. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of horizontal collection wells at the west end of Phase 5. Recycling and treatment of hydrocarbon impacted soils were on-going operations throughout 2016. Treated soils were used as final cover and to raise the grades in the east buffer adjacent the waste column. Cell construction continued in the north half of the east cell (Phase 6) and consisted of excavation work. A screening plant was added to the processing operations for the screening of oversize materials and rock. Amended Environmental Compliance Approval number 2427-AETKQ5 issued by the MOECC dated November 2016 was received for the construction and operation of an enclosed flare.

2017 Leachate collection and pre-treatment with discharge to the City of Ottawa sanitary sewer system was continued throughout 2017. In 2017, two Notices of Violation were issued by the City. One for over strength parameters in the leachate that were later addressed and the second for elevated volatile organic readings in a sampling manhole, that was also addressed. Waste placement efforts continued in the east cell (Phase 1). The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of a horizontal collection well in the active fill area and seven permanent vertical wells. Recycling and treatment of hydrocarbon-impacted soils were on-going operations throughout 2017. Treated soils were used as final cover and to raise the grades in the east buffer adjacent the waste column. Cell construction continued in the north half of the east cell (Phase 6) and consisted of excavation work. Design of the final and permanent landfill gas flaring system was completed and submitted in December by Golder Associates Ltd. to the Technical Standards and Safety Authority (TSSA) for review and approval. In the spring of 2017, the company changed its name to Waste Connections of Canada Inc.

2018 Leachate collection and pre-treatment with discharge to the City of Ottawa sanitary sewer system was continued throughout 2018. In 2018, one Notice of Violation was issued by the City for a leachate spill along Renaud Road. An obstruction to the discharge pipe inside the sampling manhole located on Renaud Road caused the manhole to fill and overflow onto Renaud Road. The event was reported to the MOE and the City. The spill was cleaned up and the system cleaned out and returned to regular operations. Waste placement efforts continued in the east cell (Phase 1) and in October resumed in the Phase 4 area of the landfill. Excavation of the northeast cell in Phase 6 was continued and construction of the leachate collection and drainage system was substantially completed. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the connection of three vertical wells installed in late 2017. Recycling and treatment of hydrocarbon-impacted soils were on-going operations throughout 2018. Treated soils were used as fill to raise the grades in the east buffer adjacent the waste column in the Phase 6 area..

2019 Leachate collection and pre-treatment with discharge to the City of Ottawa sanitary sewer system was continued throughout 2019. Construction of a new cell in Phase 6 was completed and an as-built report prepared by Golder Associates Ltd. was submitted to the Ministry of the Environment, Conservation and Parks. Waste placement efforts continued in Phase 1, in the area of Phase 4 and then in the new cell (Phase 6) for the last quarter of the year. The interim odour control system comprising of a landfill gas collection and flaring system continued to be in operation and was expanded with the addition of four permanent vertical wells in the area of Phase 4. Recycling and treatment of hydrocarbon-impacted soils were on-going operations throughout 2019. Treated soils were used to raise the grades in the east buffer adjacent the waste column. An existing stormwater ditch along the north edge and the northwest edge of the new cell in Phase 6 was replaced by a large diameter culvert complete with concrete headwalls.

2020 WCC continued discharging pre-treated leachate to the City of Ottawa sewer system via a forcemain located on the south shoulder of Navan Road and the east shoulder of Renaud Road connecting at the intersection of Page Road and Renaud Road. The interim landfill gas flaring system continued to be operational and effective in reducing odour causing fugitive gas emissions. In 2020, waste placement was concentrated on the east side of the waste footprint in the Phase 6 cell area. A ditch diversion culvert constructed along the north and east perimeter of the waste cell was located in the Phase 6 area by S.W. Farrell and Sons (1979) Ltd. The drainage layer on the sloped north and east walls of the waste cell in the Phase 6 area was also completed. Recycling, re-use and treatment of hydrocarbon-impacted soils were on-going operations throughout 2020.

2021 WCC continued discharging pre-treated leachate to the City of Ottawa sewer system via a forcemain. The interim landfill gas flaring system continued to be operational and effective in reducing odour causing fugitive gas emissions. In 2021, waste placement was concentrated on the east side of the waste footprint in the Phase 6 cell area. A 300 mm diameter HDPE landfill gas header pipe was installed along the north, west and south edges of the waste footprint by Les Entreprises Forlam Inc. to accommodate the long-term gas collection system. A concrete flare pad and gas extraction plant pad was constructed at the southeast corner of the landfill by S.W. Farrell and Sons (1979) Ltd. A new access road running along the east edge of the waste footprint was 90% completed in 2021. Recycling, rock screening, re-use and treatment of hydrocarbon-impacted soils were on-going

operations throughout 2021. An ECA amendment was issued by the Ministry of the Environment, Conservation and Park, permitting a temporary tonnage exemption for contaminated soils.

Schedule 'D'

Amendment to Environmental Compliance Approval Number A460702 Notice No. 13

Ontario

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

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A460702
Notice No. 13
Issue Date: September 29, 2021

Waste Connections of Canada Inc.
6220 Highway 7, No. 600
Vaughan, Ontario
L4G 4H3

Site Location: 3354 Navan Road
Lot Part of Lots 2,3,4, Concession 4
Ottawa City,
K4B 1H9

You are hereby notified that I have amended Approval No. A460702 issued on April 16, 2009, and subsequently amended for a 40 hectare landfill and processing site within a total site area of 92.85 hectares, , as follows:

I. The following conditions are hereby added to this ECA:

Temporary Tonnage Exemption for Contaminated Soil

50.1 Notwithstanding Condition 48, up to 1,693 tonnes of waste and cover material per day may be received at the Site for the year 2021.

50.2 Notwithstanding Condition 50, contaminated/impacted soil to be used as an alternative daily or interim cover may be received at the Site in excess of the maximum annual waste limit provided the amount of such soil received in 2021 is no greater than 190,000 tonnes and the waste to cover ratio is no less than 2.75:1.

50.3 Conditions 50.1 and 50.2 expire on January 1, 2022.

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

63. Letter dated August 19, 2021 to Mohsen Keyvani from Waste Connections Canada and the enclosed Environmental Compliance Approval Application for an emergency amendment to the ECA to temporary increase the annual tonnage limit for contaminated soil.

64. Email dated September 22, 2021 from Brian Forrestal, Waste Connections of Canada to Mohsen Keyvani, MECP regarding the revised additional tonnage for contaminated soil.

The reason for this amendment to the Approval is to allow the Site to temporarily accept additional contaminated soil in 2021 for waste cover to accommodate the extra soil generated from construction sites.

This Notice shall constitute part of the approval issued under Approval No. A460702 dated November 17, 1993

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:

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

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

The Notice should also include:

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

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

This Notice must be served upon:

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, Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

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

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

DATED AT TORONTO this 29th day of September, 2021

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

RL/

c: District Manager, MECP Ottawa
Brian Forrestal, P.Eng., Waste Connections of Canada Inc.

APPENDIX 5

EACMR

1.0 INTRODUCTION

1.1 Background

In August 2007, Waste Services (Canada) Inc. (WSI) now Waste Connections of Canada Inc. (WCC) received approval from the Minister of the Environment under the Environmental Assessment Act for expansion of the Navan Landfill in Ottawa, Ontario. Condition 4 of that approval required that WSI (WCC) prepare an annual compliance report describing the extent of compliance with the Environmental Assessment (EA) conditions of approval and the results of WSI's (WCC's) compliance monitoring program. In accordance with Condition 3 of the EA approval, WSI previously submitted a separate document proposing an EA Compliance Monitoring Program.

In October 2008 WSI (WCC) submitted the first Environmental Assessment Compliance Monitoring Report (EACMR), which was intended to fulfill condition 4 of the EA approval conditions. The report addressed the period August 3, 2007 to August 2, 2008. In November 2008, the Ministry expressed its general satisfaction with the EACMR and noted outstanding requirements. It also allowed WCC (WSI) to coordinate submission of the EACMR with submission of the Annual Operations and Monitoring Report, which is submitted annually by March 31st. Accordingly, this EACMR is submitted as an Appendix to the Annual Report and covers the period January 1st to Dec. 31st, 2021.

The Ministry's EAAB File # is EA 02 08 02.

1.2 Report Organization

- The EACMR comprises six sections as follows:
- Introduction – provides an overview of the purpose, context of submission and structure of the report as well as the proponent's contact information and an overview of significant activities at the Navan Landfill during the reporting period;
- Physical Works/Mitigation Measures – are presented in Table A, which lists WCC's commitments to make physical improvements to the site and in-design mitigation measures made during the EA and subsequent review, and provides a discussion on WCC's progress in meeting the commitments;
- Studies and Other Commitments – during the EA and review of the EA, WCC made commitments to other studies or activities, such as developing an end use plan and property value protection plan. These and other commitments are listed in Table B and WCC's progress in meeting these requirements is assessed;

- Public Consultation – is presented in Table C, which lists commitments and conditions of approval involving public consultation. A discussion is provided summarizing consultation activities during the reporting period and assessing WCC's fulfillment of these requirements;
- EA Conditions of Approval – the conditions of EA approval contained in the Minister's letter are listed in Table D and WCC's progress in meeting these conditions is described.
- Compliance Status – the final section of the report summarizes the findings in Tables A – D and provides concluding remarks on the overall status of compliance with the EA. Potential non-compliance issues, if any, are discussed in this section.

1.3 Proponent Contact Information

Waste Connections of Canada Inc. (WCC) is a multi-regional, integrated solid waste services company providing collection, transfer, recycling, composting, and disposal services to its customers. WCC is committed to excellence in environmental management and to conducting its business in a manner that protects the environment, health and safety of its employees, customers and communities in which it operates. Waste Connections of Canada Inc. is the owner and operator of the Navan Waste Recycling and Disposal Facility. WCC's contact information is as follows:

Waste Connections of Canada Inc.

3354 Navan Road

Ottawa, ON

K4B 1M9

Attn: Mr. Henri Huneault, Landfill Manager

2.0 PHYSICAL WORKS/MITIGATION MEASURES

There were thirteen (13) commitments made by WSI (WCC) during the EA and subsequent review process. These commitments relate to installation of physical works and/or implementation of mitigation measures. WSI (WCC) made the majority of the commitments during the EA as documented in the EA Study Report (EASR). Table A provides a listing of the outstanding commitments during the current reporting period. For each commitment a reference is provided regarding the documented source of the commitment, the time frame in which it is expected to be implemented and comments on WCC's progress in fulfilling the commitment such as 'completed', 'in progress', 'ongoing' etc.

WCC has now completed nine (9) of the original thirteen (13) commitments in Table A and the remaining four (4) are ongoing. There are no non-compliance issues.

Table A: EA Compliance Status for Physical Works and Mitigation Measures

Commitments	Where Commitment Made	Implementation Schedule	Status
A-5: WCC will install an active gas management system consistent with the requirements of Ontario Regulation 232/98.	▪ Section 8.3 of the EASR.	Landfill gas/odour control system will begin construction in 2010 and the remainder phased in as the landfill is developed.	**Ongoing** Studies for landfill gas completed in 2009. Approved interim LFG odour control system header pipe and connections abstraction plant and candlestick flare equipment was completed in 2011 and commissioned in early 2012. The operation and expansion of the system as required is on-going. Final Design of the permanent enclosed flaring system was completed by Golder Associates Ltd. in 2017 and modified in 2020. In 2020 WCC retained Perennial Energy Inc. to fabricate the enclosed flare and extraction plant for the permanent system to be installed at the site. In 2021, Forlam Construction installed the permanent header pipe on the north, west and south sides of the landfill and are awaiting the flare and extraction plant delivery from Perennial for connection.
A-6: WSI will undertake best management practices (BMP) for dust control.	▪ Section 8.3 of the EASR.	Following receipt of all necessary approvals to allow expansion of the Navan Landfill and ongoing during operations.	**Ongoing** Best management practices for dust control were implemented in 2009 and will continue over the operating life of the landfill. A wheel wash system was constructed and commissioned in late 2009 and operated from April to November 2020 to reduce dirt and mud drag out onto paved roads (internal roads and Navan Road). A Best Management Practices Plan for Fugitive Dust Control was completed by

Table A: EA Compliance Status for Physical Works and Mitigation Measures

Commitments	Where Commitment Made	Implementation Schedule	Status
			Dillon Consulting dated October 2015 and submitted to the MECP in accordance with the requirement of an amendment for the treatment of contaminated soils.
A-7: WSI will vegetate side slopes and berms in order for the landfill to blend in as much as possible with the environment. Species native to Site area will be used wherever possible.	▪ Section 9.1 of the EASR	Following receipt of all necessary approvals to allow expansion of the Navan Landfill. Vegetation planting will be ongoing during operations. Details of vegetation planting will be refined during the EPA approval process.	**Ongoing** Approvals have been received. In 2021 vegetation was maintained and preserved where possible. The south, north and west facing waste slopes have been covered with final cover and seeded. As closure progresses, additional tree planting at the top of the landfill is on-going.

Commitments	Where Commitment Made	Implementation Schedule	Status
A-12: Best management practices (BMP) will be used to mitigate dust from activities at the Navan landfill.	▪ Response to MOE GRT Comments, p. 24 ▪ MOE EA Approval Condition # 10.5	Following receipt of all necessary approvals to allow expansion of the Navan Landfill and ongoing during operations.	**Ongoing** Approvals received.

3.0 STUDIES AND OTHER COMMITMENTS

WSI (WCC) agreed to undertake a total of thirty one (31) studies and additional tasks/commitments during the course of the EA and subsequent review. Table B lists the outstanding commitments during the reporting period along with a brief description of their status. Of the thirty one (31) original commitments listed in Table B, WCC has completed all but three (3) with one (1) not yet started, one (1) ongoing and one (1) in progress. Most of the completed commitments relate to providing additional information and detail during the EPA approval process.

There are no issues with non-compliance associated with any of the Table B commitments.

Table B: EA Compliance Status for Studies and Other Communication

Commitments	Where Commitment Made	Implementation Schedule	Status
B-1: WSI will undertake an evaluation of end-use alternatives.	▪ EASR Table 8.3-1, p. 120d	Three years prior to the landfill closure.	**Not yet started** The evaluation of end use alternatives will be undertaken and documented as part of a closure plan to the MECP as required by Regulation 232/98. Status of the development of the end use plan will be reported in the EACMR section of the annual O&M Report to the MECP starting three years prior to site closure.
B-3: WSI will continue to pursue further waste diversion programs as appropriate.	▪ EASR p.120e	Schedule is based on economic and technical viability and approvals.	**Ongoing** Treatment of hydrocarbon contaminated soils along with the recycling and re-use of other landfill materials such as glass, wood, metals, roofing shingles, aggregates, tires and other materials was on-going throughout 2021.
B-11: WSI will maintain sufficient financial assurance for proper decommissioning of the site in keeping with MOE requirements, community plans and input from the PAC.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill.	**In Progress** Financial assurance plan is in place and will be maintained throughout the life of the landfill site.

4.0 PUBLIC CONSULTATION

WSI (WCC) agreed to seven (7) commitments regarding public consultation during the EA, including the formation of a Public Advisory Committee (PAC). The status of these commitments is provided in Table C. All four (4) of the commitments remaining are ongoing.

Table C: EA Compliance Status for Public Consultations

Commitments	Where Commitment Made	Implementation Schedule	Status
C-3: WSI will work with the PAC on an ongoing basis to consider enhanced opportunities to improve re-cycling and diversion at the Navan Road Landfill to work towards the diversion goals articulated by the City of Ottawa and the province.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill and completion of the City's study.	**Ongoing** Treatment of hydrocarbon contaminated soils along with the recycling and re-use of other landfill materials such as glass, wood, metals, roofing shingles, aggregates, tires and other materials was on-going throughout 2021. WCC continues to add marketable materials to its recycling efforts.
C-4: WSI will work with the PAC on an ongoing basis to consider other opportunities to reduce odour, dust and road dirt.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill.	**Ongoing** A wheel wash station was constructed and commissioned at the end of 2009. Construction of an interim odour control system was completed in 2011 and commissioned in early 2012. Final design of a permanent landfill gas system was completed in 2017 and modified in 2020. WCC, in 2020, retained Perennial Energy Inc. to fabricate the flare and extraction plant. In 2021, Forlam Construction installed the permanent header pipe on the north, west and south sides of the landfill and are awaiting delivery of the flare and abstraction plant from Perennial for connection.

Table C: EA Compliance Status for Public Consultations

Commitments	Where Commitment Made	Implementation Schedule	Status
C-5: WSI is prepared to address new issues arising from the EA or detailed EPA assessment work and will work with the PAC on these issues.	▪ WSI – Friends of Mer Bleue Agreement	As these issues become known.	**Ongoing**
C-7: WSI will work with the City of Ottawa, the Friends of the Mer Bleue and the PAC to identify and develop community projects to enhance and improve the community and its public spaces.	▪ WSI – Friends of Mer Bleue Agreement	Following receipt of all necessary approvals to allow expansion of the Navan Landfill.	**Ongoing** An agreement for a funding mechanism by WCC for community projects was included in the Terms of Reference for the PAC. A number of community projects were funded in 2021 by the WCC-PAC fund.

5.0 EA CONDITIONS OF APPROVAL

In the Notice of Approval to Proceed with the Undertaking, the Minister of the Environment listed forty three (43) conditions grouped into ten (10) categories of which sixteen (16) remain, as listed in Table D. Many of these conditions result from commitments made by WSI (WCC) during the EA review and are listed in Tables A, B or C. For convenience to the reader, cross-references have been provided to the corresponding WSI (WCC) commitment listed in Tables A, B or C. Where no cross-reference is available (i.e., this is a new condition), "not applicable" (n/a) is recorded in Table D. It should be noted that many of the conditions are the same as WSI (WCC) commitments contained in Tables A, B and C.

No non-compliance issues have been identified.

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
1. General Requirements			
1.1 The proponent shall comply with the provisions in the EA which are hereby incorporated in this approval by reference except as provided in these conditions and as provided in any other approval or permit that may be issued for the site.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	Ongoing
1.2 The proponent shall implement any additional commitments made by them and recorded in their response and attachments as noted above, except as provided for in these conditions or as provided for under other approvals, authorizations or permits required for the undertaking.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	Ongoing
1.3 These conditions do not prevent more restrictive conditions being imposed under other statutes.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	Ongoing

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
2. Public Record			
2.1 Where a document is required for the public record, the proponent shall provide two copies of the document to the Director, one copy for filing within the specific public record file maintained for the undertaking and one copy for staff use.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
2.2 The proponent shall provide additional copies of such documents at the request of the: • Regional Director; • Clerk of the City of Ottawa; and, • PAC.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
2.3 The proponent shall quote EAAB file number EA 02 08 02 on the documents.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**
2.4 The proponent may also provide these documents through other means as it considers appropriate.	n/a	Throughout the operation of the landfill in accordance with the EA approval.	**Ongoing**

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
3. Compliance Monitoring Program			
3.6 The proponent shall carry out the monitoring program as amended by the Director.	n/a	Throughout the operation of the landfill until all conditions/commitments have been fulfilled.	**Ongoing**
3.7 The proponent shall make the documentation available to the ministry or it's designate upon request in a timely manner when so requested by the ministry during an on-site inspection, audit, or response to a pollution incident report or when information concerning compliance is requested by the ministry.	n/a	Throughout the operation of the landfill until all conditions/commitments have been fulfilled.	**Ongoing**
4. Compliance Reporting			
4.1 The proponent shall prepare an annual compliance report which describes compliance with the conditions of approval set out in this notice and which describes the results of the proponent's EA compliance monitoring program.	n/a	The EACMR is required annually, until all conditions have been met.	**Ongoing**

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
4.2 The proponent shall issue the first compliance report no later than one year following the date of this approval, and in each subsequent year shall issue a compliance report covering the previous year, on the date that is the anniversary of this approval or the proponent can coordinate the timing of its reporting with its annual Design and Operations report required under the EPA.	n/a	MOE has agreed for the EACMR to be submitted annually April 1 with the Annual O & M Report	**Ongoing**
4.3 The proponent shall submit the annual compliance report to the Director for placement on the public record.			**Ongoing**
4.4 The proponent shall submit annual compliance reports until all conditions of this approval are satisfied.	n/a	Beginning in 2008 and annually during the operation of the landfill until all conditions have been satisfied.	**Ongoing** The first annual EACMR was submitted in 2008 and are provided annually attached to the Operations and Monitoring Report.
4.5 When all conditions have been satisfied, the proponent shall indicate in the annual compliance report that this is its final submission.	n/a		**Ongoing**
4.6 The proponent shall retain, either on site or in another location approved by the Director, copies of the annual compliance reports for each reporting year and any associated documentation of compliance monitoring activities.	n/a	Throughout the operation of the landfill until all conditions/commitments have been fulfilled.	**Ongoing** In 2008, WSI established a library on site where EACMR and associated documentation is available for viewing by the public.

Table D: EA Compliance Status for Conditions of EA Approval

Conditions	Where Commitment Made	Implementation Schedule	Status
4.7 The proponent shall make the documentation available to the ministry or it's designate upon request in a timely manner when so requested by the ministry during an on-site inspection, audit, or in response to a pollution incident report or when information concerning compliance is requested by the ministry.	n/a		**Ongoing**
5. Public Advisory Committee			
5.4 The proponent may dispense with the PAC if, after a period of time and after giving sufficient notice, there is no interest from the public in continuing with it. The proponent shall review the need for such a PAC yearly.	n/a	Ongoing throughout operational life of landfill expansion	**Ongoing**
6. Planting Plan			
6.3 The proponent shall make best efforts to protect existing mature trees and vegetation on site that could be used to screen the construction of the landfill berms, where appropriate.			**Ongoing** On-going throughout life of the landfill.

6.0 COMPLIANCE STATUS

WSI (WCC) made a total of 51 commitments during the EA and subsequent review as listed in Tables A, B and C. Eleven (11) commitments remain "ongoing" or "in progress". In other words, about 78% of the original commitments have now been fulfilled and some will remain in ongoing throughout the operating life of the Site.

The Minister listed fourty three (43) conditions in her Notice of Approval to Proceed with the undertaking, which are listed in Table D. Several conditions (13) were derived from WSI (WCC) commitments made during the EA and subsequent review. Eighteen (18) conditions remain at the end of the reporting period and will remain ongoing throughout the operating life of the landfill. WCC continues to make progress in all of the remaining conditions.

No non-compliance issues were identified during the report period.

Normand G Castonguay

APPENDIX 3

2019 Complaints Summary

2020 Complaints Summary

2021 Complaints Summary

Schedule 'A'
2019 COMPLAINTS SUMMARY

No.	Event Date	Event	Response
		Odours	
1	13/01/2019	1 complaint Received an e-mail complaint from a neighbor (AM) about odours @ 11:45 pm	Just got home. Strong smell on all of Wintergreen Drive. Stood outside for 10 mins, odour was consistent, gets stronger as you walk towards landfill. Winds calm, -18 °C, HH with WCC called and visited the complainant the following morning and left him his cell phone number to call at any time. No odours noticed at time of visit.
2	15/05/2019	1 complaint Received an e-mail complaint from a neighbor (VT) about odours @ 7:00 am	Odeur nauséabonde, plus qu'a l'habitude, environ un 7 sur 10 au niveau odeur. Winds from SE, 8 km/hr, 12 °C, HH with WCC stopped by and spoke with the complainant. She mentioned the odour was strong this morning but for the most part no issue. The smell was detected as soon as she opened the door.
3	18/06/2019	1 complaint Received an e-mail complaint from a neighbor (AM) about odours @ 8:45 pm	Absolute horrid smell from landfill on Winterhaven Drive for the last two hours. Backyard and front yard. Had to close all windows upstairs. We have 3 kids. Winds from E, calm km/hr, 8 °C, overcast HH with WCC visited the residence at 4:25 am, no odours with winds still from the east. Spoke with one neighbor who was indoors that evening but did not smell anything that afternoon or evening. Spoke with another neighbor who was out walking his dog the previous evening and did not notice any landfill odours. He has called about odours in the past but lately it has been very good.
4	4/07/2019	1 complaint Received a complaint from a neighbor (CT) about odours @ 6 – 10 pm	Landfill odour 6 – 9 pm Winds from SE/S, 6-8 km/hr, 27 °C, sunny/overcast HH with WCC responded at 10:05 pm and found no odours. Spoke with a neighbor who indicated there were no odours on July 4th and that it has been good the last 1 ½ years. Spoke with another neighbor who indicated there were no odours on July 4th and mentioned sometimes on a hot muggy day there is a slight odour.
5	18/07/2019	1 complaint Received an e-mail complaint from a neighbor (AM) about odours @ 8:20 pm	Strong smell from landfill on Winterhaven Drive for the last 15 minutes. Had to close patio doors and windows. Winds from SE/S, 5 km/hr, 24 °C, rain HH with WCC drove the area at 10:25 pm and following morning and did not notice odours. Spoke with a neighbor who has lived on Winterhaven since 2014 and he has not had any odour issues.. HH responded by e-mail.

6	20/9/2019	1 complaint Received a text complaint from a neighbor (CT) about odours @ 8:11 am	Stinks again this morning – worse. Winds noted from the SW, from the direction of the complainant. JC with WCC responded immediately and visited the area and spoke with the resident and a few other neighbours. Odours usually in early morning. Complainant noticed it more in back yard. House is located adjacent to a storm water discharge ditch which drains a storm water pond to the west. HH drove around area and noticed a slight odour. Spoke with a neighbor who did not have any issues but mentioned that just sometimes she smells odours but not very often.
7	25/9/2019	1 complaint Received an e-mail complaint from a neighbor (TR) about odours @ 1 pm	It been about a week now in the morning and late evening the smell is so bad we cannot open the windows of the house. RM with WCC responded by e-mail.
8	25/9/2019	1 complaint Received an e-mail complaint from a neighbor (KP) about odours @ am	Smell is very strong on Shinleaf. RM with WCC responded by e-mail.
9	25/9/2019	1 complaint Received an e-mail complaint from a neighbor (KL) about odours @ 9:30 am	Odour from the dump. Can't even open windows. RM with WCC responded by e-mail.
10	25/9/2019	1 complaint Received an e-mail complaint from a neighbor (EW) about odours @ 8:00 am	Very strong smell of garbage noted by visitors and all members of household. RM with WCC responded by e-mail
11	25/9/2019	1 complaint Received an e-mail complaint from a neighbor (NP) about odours @ 7:00 am	Very strong odour that I've come to recognize comes from the dump. Winds reported to be from S 6 km/hr, temp 8 °C, overcast HH drove to the location and in the surrounding area around 7:05 pm with same wind direction, no distinct odour found.
12	25/9/2019	1 complaint Received an e-mail complaint from a neighbor (AR) about odours @ 7:00 am	Odor from the dump. RM with WCC responded by e-mail.

13	27/9/2019	1 complaint Received an e-mail complaint from a neighbor (KC) about odours @ 10:00 pm	Could not keep window open smell was awful. HH visited the complainant on the morning of Sept. 28th and responded by e-mail.
14	25/10/2019	1 complaint Received an e-mail complaint from a neighbor (PD) about odours @ 3:00 pm onward	Strong dump smell Request for contact by a WCC representative declined. Winds reported to be from E 12 km/hr, temp 8 °C, sunny HH visited the area on Oct 27th with same wind conditions and did not notice any odours. HH responded with e-mail.
15	27/10/2019	1 complaint Received an e-mail complaint from a neighbor (CL) about odours all day	Terrible odour throughout the area, and all day Winds reported to be from E/SE 20 km/hr, temp 7 °C, HH visited the area that evening at about 8 pm, wind s from the S, no odours. HH responded with e-mail.
16	31/10/2019	1 complaint Received an e-mail complaint from a neighbor (JM) about odours @ 7:00 am	Arounf 7:00 am while going to work, I noticed a bad smell when I stepped out of the door coming from the landfill on Navan Road. Request for contact by a WCC representative declined. Winds reported to be from E 13 km/hr, temp 8 °C, overcast HH drove the neighborhood around 10:30 am, with E winds and noticed no odours.
17	4/11/2019	1 complaint Received an e-mail complaint from a neighbor (DB) about odours @ 8:00 am	and yet again the whole neighborhood smells like a DUMP. Everubody has been complaining for the past few years, and nothing is being done, at least nothing that solves the problem. You ask that they keep filing complaints, but for what? We've been living in the neighborhood for 4 years … it's such a shame. Request for contact by a WCC representative declined. Winds reported to be from SE 7 km/hr, temp -2 °C, rain
18	4/11/2019	1 complaint Received an e-mail complaint from a neighbor (AS) about odours @ 5:40 pm	Request for contact by a WCC representative declined. Winds reported to be from SE 16 km/hr, temp 5 °C, overcast
19	4/11/2019	1 complaint Received an e-mail complaint from a neighbor (JC) about odours @ 7:15 pm	A sewage smell as been noted in the area and it has been frequent. Request for contact by a WCC representative declined. Winds reported to be from SE 7 km/hr, temp -2 °C.
20	4/11/2019	1 complaint Received an e-mail complaint from a neighbor (MO) about odours @ 6:00 pm	Strong odour in the air. Smells from the Waste Connection site have been reaching my property since the spring. I'm disappointed and disgusted. The smell seems to intensify in humid conditions or on day with little wind. Requested contact by a WCC representative. Followed up by e-mail by RM with WCC. Winds reported to be from SE 16 km/hr, temp 4 °C, rain

21	17/11/2019	1 complaint Received an e-mail complaint from a neighbor (LC) about odours @ 11:00 am	Request for contact by a WCC representative declined. R M from WCC drove around the atra at about 4 pm and no odours detected at that time.
	30/10/2019	FOMB Public Meeting	The purpose of the meeting held at le Rendez-vous des ainés francophone d'Ottawa was to hear about any issues and concerns local residents may have regarding the operation and impact of the landfill so that they are being properly understood and effectively communicated The desired outcome was to see if there were any on-going issues affecting a large area of the community that could be addressed. Flyers were sent to over 4,000 homes. Approximately 8 families or 12 people attended. It did not appear that any of those who previously complained attended. A summary of the meeting is attached.
Other			

Schedule 'A'
2020 COMPLAINTS SUMMARY

No.	Event Date	Event	Response
		Odours	
1	1/02/2020	1 complaint Received an e-mail complaint from a neighbor (EC) about odours @ 5:30 pm	A strong sewage like odour was noticeable approaching Renaud & Joshua (heading east on Renaud). I turned into Bradley Estates / Spring Valley Trails and the odour got weaker but is still present. Winds E-SE 5 – 9 km/hr, -8 °C, HH and ST with WCC independently inspected the area and the landfill following the complaint and the following morning. No odours were noticeable at time of the visits.
2	07/06/2020	1 complaint Received an e-mail complaint from a neighbor (RK) about odours @ ~8:00 am	There was an awful smell of sewer this morning in our neighborhood (Nature View Estates) and I suspect it came from the landfill as we are on septic and it wasn't a septic smell (it was in the whole neighborhood). Winds from NW, 15 km/hr, 14 °C, HH and RM with WCC inspected the area at a later date. Winds that morning were from the NW and home is located west of the landfill. RM contacted the complainant by e-mail. With NW winds, the odours observed would be from a source located to the west north-west and not the landfill to the east. RM provided hi cell # and indicated he could be reached at any time if he had any further concerns.
3	18/06/2020	1 complaint Received an e-mail complaint from a neighbor (A P-E) about odours @ ~8:00 am	There was an awful smell of sewer this morning in our neighborhood (Nature View Estates) and I suspect it came from the landfill as we are on septic and it wasn't a septic smell (it was in the whole neighborhood). Winds from S-SW, 7 km/hr, 13 °C, HH with WCC inspected the area at around 10 am and did not notice any odours. Winds that morning were from the S-SW, from the opposite direction of the landfill which is approximately 2 km from the location. It was also noted that the neighboring Millen site had approximately 4,000 tonnes of uncovered waste which could be causing issues.

Schedule 'A'
2021 COMPLAINTS SUMMARY

No.	Event Date	Event	Response
		Odours	
1	14/10/2021	1 complaint Received an e-mail complaint from a neighbor (RC) about odours @ 11:30 pm	Odour! It stinks outside (and consequently in my home) quite badly right now. Also, it seems in the last month there has been an increase in stink/smell from the dump. Winds SE, 18 °C, Overcast HH drove to the address and throughout the neighbourhood at 7:00 am the next morning. Winds were from the east. Resident resides west of the landfill. No odours were observed at the time of inspection.