2018 Annual Report
Deep River (Miller's Road)
Waste Disposal Site

Prepared For:

THE TOWN OF DEEP RIVER
ONTARIO, CANADA

Prepared by

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EXECUTIVE SUMMARY

The Miller's Road Waste Disposal Site is located in Part Lot 6, Concession XIII, Township of Buchanan now in the Town of Deep River, east of Highway 17 along Miller's Side Road. Regionally the site lies in the east margin of the Algonquin Highlands and is characterized by areas of thin till over bedrock and deposits of fine sand. The Environmental Compliance Approval (ECA) allows for the use and operation of a 4.5 ha landfilling area within an 8.55 hectare property. In addition to the 8.55 ha landfill property, 14.14 ha has been registered on title as contaminant attenuation zone establishing a total site area of 22.69 ha. ECA A413106 amended April 4, 2014 has been issued for the site and monitoring and reporting as per the amended ECA has been completed and is detailed herein.

Operational details are found in **Part 1** of this report. Environmental monitoring completed in 2018 is provided in **Part 2** of this report.

Overburden groundwater monitors have been established at and around the site to document the physical conditions at the site, as well as the groundwater quality. The direction of groundwater flow has been determined to be southeast towards Maskinonge Lake. Some radial flow may exist west of the site due to groundwater mounding. An assessment of groundwater quality has confirmed the presence of a leachate plume leaving the site to the southeast in the direction of the Landfill Creek. Contaminants in this direction will be contained within a Contaminant Attenuation Zone that extends south to Spring Creek and south east to Maskinonge Lake that is located on Canadian Nuclear Laboratories (Federal) property. Elevated leachate concentrations are also evident along the western property boundary. The chemical parameters exhibit a rapid decrease in concentration in a westerly direction as monitoring wells located further to the west and south west exhibit significantly lower values and are not impacted by leachate. The Municipality has acquired additional properties to the west of the landfill site (i.e. approximately 14 hectares) registered on title as a Contaminant Attenuation Zone in July 2011. The Reasonable Use Assessment revealed an exceedance of iron at monitoring well 96-1S and manganese at monitoring well 96-1D. An assessment of "trigger values" also revealed an exceedance of iron and manganese at monitoring wells 96-1A and 96-1D. These parameters are thought to be prevalent in the environment as all other leachate indicator parameters are low, and not indicative of leachate. It is believed that the concentrations of iron and manganese are naturally occurring with no obvious increasing trends and are within the historical background concentrations. The site is currently interpreted to be in compliance with Guideline B-7 as impacts of the landfill site are not revealed at the compliance monitoring wells.

Surface water samples were collected on three occasions in 2018. Samples were collected from upstream and downstream of the landfill site in both Spring Creek and the Landfill Creek.

Some impact is present in the Landfill Creek located to the southeast of the site. The impact is characterized by elevated metal concentrations as well as iron precipitate on the streambed. The 2018 chemical values from monitoring station SW-6 revealed laboratory values of unionized ammonia to be greater than PWQOs and trigger values. Unionized ammonia calculations based on field data are lower than PWQOs and trigger values. Consequently, contingencies are not required at this time.

Continued landfill operations and monitoring as per the ECA are recommended.

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PART 1

2018 OPERATIONS

1.0 INTRODUCTION

This report presents the results of the 2018 activities that were completed at the Deep River (Miller's Road) Waste Disposal Site. The Millers Road Landfill Site operates under ECA No. A413106 originally issued April 23, 1980 and most recently amended September 20, 2017. The ECA allows for the use and operation of a 4.5 ha landfilling area within an 8.55 hectare property. In addition to the 8.55 ha landfill property, 14.14 ha has been registered on title as contaminant attenuation zone establishing a total site area of 22.69 ha. The site is licensed to accept Construction and Demolition (C & D) wastes only. The site is located in Part Lot 6, Concession XIII, Township of Buchanan now in the Town of Deep River east of Highway 17 along Miller's Side Road a site location plan is provided as **Figure 1**. The ECA is provided as **Appendix A**.

1.1 Background

The Miller's Road Waste Disposal Site is presently leased by the Town of Deep River from Canadian Nuclear Laboratories (CNL) formerly Atomic Energy of Canada Limited (AECL) and has been the landfill Site for the Municipality since 1965. In response to an Application for an amended ECA dated April 2002, the Ministry of the Environment, Conservations and Parks (MECP), (also known as the MOE, MOEE, MOECC and the Ministry) issued ECA No. A413106 dated November 14, 2002. The supporting documentation listed as items 2 to 6 on Schedule "A" described the operation and development and monitoring requirements of the Construction & Demolition (C & D) waste disposal site. The landfilling of domestic waste ceased in July 2002 and the designated areas within the 4.5 ha landfilling area have received C & D waste within the design contours. As required under Conditions 11 and 12, an Operations Report and Sludge Lagoon Decommissioning Plan dated November 2003 was filed providing further detail on site operations. As a part of the expansion application, filed in March 2013, an updated Design and Operations report was prepared by Jp2g Consultants Inc.

The Site encompasses a total area of approximately 22.69 ha, of which approximately 4.5 ha has been utilized for landfilling. The remaining lands serve as a buffer and contaminant attenuation zone to the landfill Site. Additional lands have been identified through the lease agreement with CNL to act as attenuation zone property.

The Site receives C&D waste generated within the geographic boundaries of the Town of Deep River and the Town of Laurentian Hills. The properties surrounding the site are comprised of CNL property to the north, south and east. As per the ECA issued on April 4, 2014 the approved capacity of the site is 321,825m^3.

The most recent amended ECA was issued on September 20, 2017 for approval of the Trigger Mechanism and Contingency Plan for the site.

1.2 Annual Reporting

Condition 11.1 of the ECA requires the preparation of an annual report to be submitted to the MECP District Manager by June 1 the year following. Condition 11.2 subsections (i) to (xx) inclusive outline the operational details at the site and the results of the environmental monitoring. The annual report will address the following:

Part 1	Site Operations
Part 2	Environmental Quality Monitoring

1.3 Ministry of the Environment, Conservation and Parks

Under the MECP site compliance review program, the Ottawa District Office has conducted site inspections and directed the Technical Support Section (TSS) to complete groundwater and surface water reviews of the Annual Reports. For convenience the following describes the results of recent inspections and reviews, and the actions taken as reported in previous Annual Reports.

2004 Annual Report

- as required under Condition 13 the final cover was applied to the south slopes which had reached approved design contours
- the north limits were graded to a 4:1 slope

2005 Annual Report

- installation of a bear fence
- liaison with AECL to review construction requirements of their security road and final grading of the westerly limits of the landfilling area and 30m buffer area
- entered into lease agreement with AECL for operation of the site, establishment of the CAZ and securing a cover material source

2006 Annual Report

- MOE filed an Inspection Report dated November 2006 requesting an upgrade and repair of monitoring wells, cover protruding waste and collection of litter
- Jp2g filed an Action Plan dated December 21, 2006
- annual report included a report and photographic record of monitoring wells.

2007 Annual Report

- August 29, 2007 MOE filed a surface water review of the 2006 Annual Report dated August 8, 2007
- September 2007 monitoring wells 85-F, 89-2 and 88-3 replaced with 07-F, 07-2 and 07-3 respectively
- November 7, 2007 MOE filed a groundwater review of the 2006 Annual Report dated October 29, 2007
- January 17, 2008 Jp2g filed a proposal with MOE to address off-site impact beyond the western property limit
- March 13, 2008 MOE acknowledgement and interim approval of the work program

2008 Annual Report and CAZ

- On August 6, 2008 the MOE filed a groundwater review of the 2007 Annual Report dated July 30, 2008. The Ministry requested that a report documenting the results of the proposed 2008 work program be submitted to the District Office by December 31, 2008 under a Voluntary Abatement Plan (VAP).

- The "Report on Off-Site Groundwater Quality Characteristics" prepared by Jp2g Consultants Inc. was filed on December 23, 2008. The report included a summary of the 2008 monitoring program and addressed the MOE technical review comments.

- In response the MOE acknowledged receipt of the report on February 11, 2009 and requested a work plan and schedule. Jp2g filed a response dated February 17, 2009.

- On April 23, 2009 the MOE filed a TSS review dated March 31, 2008 of the Jp2g report dated December 1, 2008. The MOE requested that an Application be submitted to the Director by September 1, 2009 detailing the extent of the CAZ required.

- On August 27, 2009 Jp2g Consultants Inc. filed an application with the EAAB to amend the ECA to recognize the extent of the CAZ.

- On September 15, 2009 the MOE confirmed receipt of the Application.

- On November 26, 2009, the MOE issued Notice 6 to the ECA that included Condition 31 that required the Town to "purchase or otherwise obtain an agreement with the property owner(s) of the land(s) required to establish an extended Contaminant Attenuation Zone as per Items 11 and 12 of Schedule A".

- In February 2010 the Town purchased adjacent properties to be incorporated as a contaminant attenuation zone (CAZ). The property has been registered on title as a CAZ under a Certificate of Requirement July 2011.

2009 Annual Report

- September 7, 2010 TSS memo surface water review comments on the 2009 Annual Report.

2010 Annual Report

- Accompanying a September 16, 2011 Site Inspection Report a TSS groundwater review dated August 29, 2011 was filed.

- December 9, 2011 TSS memo surface water review comments on the 2010 Annual Report.

2012 Annual Report and Application To Recognize Site Expansion

- December 3, 2013 TSS memo groundwater review comments on the 2012 Annual Report and the Environmental Assessment Screening Report for The Expansion of The Deep River (Miller's Road) Waste Disposal Site and the Environmental Monitoring Report, Deep River (Miller's Road) Waste Disposal Site

- December 23, 2013 letter from Dale Gable MOE to Town

- January 8, 2014 Letter from Andrew Buzza to Dale Gable MOE providing additional information to the Design and Operations plan

Comments on the Environmental Assessment Screening Report (2012), the Environmental Monitoring Report (2013) and the Design and Operations Report (2013) all prepared by Jp2g were issued in December 2013 and the Surface Water Comments were issued in December 2011.

In 2015 and 2016 correspondence was not provided to or sent from the MECP regarding the Millers Road Site aside from select reports detailed in **Section 1.4** of this report.

The most recent Technical Support Sections Groundwater and Surface Water comments regarding the Millers Road Site are on the 2016 Annual Monitoring Report (2017). There is also a memorandum addressing the contingency plan submission dated March 28, 2017 and May 17, 2017.

The comments where applicable are provided in **Appendix B** and are summarised in **Table 1.**

Table 1
MECP TSS Groundwater & Surface Water Comments

MECP	Response
Groundwater Comments on the: 2012 AMR (May 2012) Environmental Assessment Screening Report (June 2012) Environmental Monitoring Report (March 2013) and Design and Operations Report March 2013	
The above reports were reviewed to assess compliance with B-7 and to provide comments on the proposed expansion of the site. The memorandum is divided into 3 sections one each dealing with: The annual report, the environmental assessment to support the expansion and design and operations. Below is the summary for each section.	
2012 AMR	
The site is in compliance with Guideline B-7 in the overburden unit.	Agreed.
Given its presence in groundwater at high levels to the west of the site, vinyl chloride should be included as a Guideline B-7 parameter.	Vinyl chloride is included as a Guideline B-7 parameter and is discussed in Section 6.7.
Given that local flow is westward from the western end of the site, it is my opinion that monitoring wells at location 95-3 should also be included as compliance monitoring wells (this will also not impact compliance at this time based on 2012 results).	Monitoring well 95-3 is listed as a compliance location and is assessed against B-7 guidelines.
Iron and manganese are not included as Guideline B-7 parameters at this site based on the presence of these parameters in background water. Guideline B-7 limits should be derived for these parameters in future reports.	Iron and manganese are included as B-7 parameters.
It is acknowledged that naturally elevated levels of these parameters can be present however, these parameters are also good leachate indicators and, as such, they should be considered as part of the Guideline B-7 assessment.	Iron and manganese can be present in this environment at concentrations that are substantially greater than the ODWS/OG.
As a precaution, I recommend that groundwater supply wells within 500 metres of the site are sampled twice per year in 2014 and 2015 (2 years) with samples analysed for the inorganic list and VOCs.	All groundwater supply wells were included in the regular sampling program in 2014 and 2015. The sample locations included 1227, 1224, 1235, and 1236 Miller Road. Samples were analyzed for inorganic parameters and VOC's as listed in Column 1 of the landfill standards document. Sampling of the residential wells was not completed in 2016.

Full chemistry results could not be located for monitoring well 96-1 beyond those shown in Table 8 of the report. Full results should be included in the next report.	The full chemistry results for location 96-1 both shallow and deep are provided in Appendix H of this report.
The site plan in future reports should show the entire CAZ areas to the west and south of the site.	The CAZ is shown in entirety on **Figure 3**.
Future reports should include a more detailed discussion on organic results (section 5.7 of the AMR).	Organic results are discussed in Section 6.8 of this report and data is provided in **Appendix H**.
Recommendations presented in the "Groundwater Monitoring Program" above should be addressed by the Town / Jp2g.	Recommendations have been addressed in subsequent reports and continue to be discussed in this report.
There is potential for surface water impact due to surface water runoff and groundwater discharge.	There is little overland surface water runoff at the site. Groundwater discharge does occur in the vicinity of SW-2. Section 10 of this report provides a discussion on the surface water quality at the site.
Environmental Assessment Report	
Atomic Energy of Canada Limited staff has determined, pursuant to Section 5(1)(C) of the Canadian Environmental Assessment Act (CEAA) that a Federal EA is required for this project.	Subsequent to the initiation of the Federal EA, regulations changed and there was no further requirement for an Environmental Assessments for this type of project. The Environmental Assessment was however completed and filed with and signed off by AECL (now CNL).
The Millers Road waste disposal site is on AECL's Chalk River Laboratory Property and is presently leased by the Town of Deep River from AECL. The proposed expansion of the waste disposal site will require that AECL extend the lease to the Town of Deep River.	The Millers Road WDS is located on Federal Property and a lease agreement is in place. The Town has the right and option to extend the lease.
This proposal is to increase the approved landfilling capacity by 40,000m^3 but not more than 100,000m^3. The landfill will continue to accept C&D wastes only. The current and proposed landfilling area expansion is located on the existing footprint. The proposed expansion is not to increase the areal extent of the site but rather to extend the life of the site.	This is correct and the MOECC issued an amended ECA dated April 14, 2014 reflecting the site expansion.
The Ontario Ministry of the Environment has determined that the Ontario Environmental Assessment Act does not apply to the proposed waste disposal site expansion because the project will be implemented on lands that are owned by a federal Crown Corporation; namely Atomic Energy of Canada Limited.	The waste disposal site is located entirely on Federal Property of AECL (now CNL). In lieu of completing a Provincial Environmental Assessment, a Federal Environmental Assessment was completed.
The Ontario Ministry of the Environment has determined that although the Ontario Environmental Assessment Act, and thus Ontario Regulation 101/07, do not apply to the proposed expansion, environmental compliance approvals will still be	The site is assessed for compliance against guideline B-7.

required.	
The site has been in operation for a period of over 40 years. Leachate plumes have been identified and are currently managed through the adoption of Contaminant Attenuation Zones (CAZ). The extent of the plume will be continuously monitored to ensure the extent of the plume remains within the CAZ. In addition, the site is licensed to accommodate essentially inert C&D wastes. This will not increase the strength of documented plumes. The annual monitoring and reporting of the site incorporates an assessment of the 'trigger values' to assist mitigation of off-site impacts.	Agreed. The currently landfilling is to not increase the aerial extent of the foot print and thus not alter any plume configuration.
No mitigation measures, additional to monitoring as per the Certificate of Approval, are required at this time.	The site continues to perform as expected and as in 2012. No mitigation is required at this time.
Localized change in groundwater flow may occur as a result of emplacement of waste increasing the height of the waste mound. Any change is anticipated to be minor. For normal operations it is estimated that the leachate will be maintained within the CAZ. Transfer and emplacement activities will be done according to the operational procedures. Leachate will be maintained within the CAZ. The placement of C&D waste only will not increase the strength of the existing leachate plume. Monitoring will continue to confirm the extent of the leachate plume.	Nothing has changed that would alter this opinion. Trigger values are assessed and discussed in **Section 8.0** of this report. Continued monitoring since the issuance of the amended ECA dated April 14, 2014 confirms that mitigation measures are not required at this time. The direction of groundwater flow is consistent with historical data.
Design and Operations Report	
The Design and Operations Report is acceptable from a groundwater perspective provided that recommendations provided for the AMR are incorporated into the ongoing groundwater monitoring plan.	Recommendation have been incorporated into the ongoing groundwater management of the site.
Surface Water Comments on the: 2010 AMR, dated May 2011	
The majority of the 2010 data shows the upstream background surface water quality of Spring Creek to be relatively un-impacted but with iron concentrations routinely exceeding the PWQO.	Iron concentrations continue exceed PWQOs. Iron results in 2016 continue to be similar to 2010 results.
The surface water quality of Landfill Creek immediately downstream of the landfill during 2010 appeared to be not significantly impacted by the landfill site.	In 2016 the water quality at the head of the Landfill Creek (i.e. SW2 revealed all parameters to be less than PWQOs with the exception of iron and one total phosphorous value. The iron values in 2010 exceeded the PWQOs but to a slightly lesser degree. Other parameters reveal similar characteristics.
The reviewer is in agreement with Jp2g's assessment which has interpreted that given the absence of boron concentrations at surface water stations immediately	In 2016 boron at SW-2 varied from 0.039 to 0.049 mg/L. In 2010 boron values varied between 0.04 and 0.05 mg/L. These values continue to be less than boron

south of waste disposal site it is likely the contribution of boron in surface water is from source(s) other than the waste disposal site.	concentrations downstream.
Overall, the majority of water quality data at downstream sample station SW-6 did not indicate the creek to be adversely impacted during 2010.	The water quality in 2016 at station SW-6 continues to be similar to the water quality at SW-6 from 2010.
Iron concentrations were observed to consistently exceed the PWQO and the dissolved oxygen concentration of 1.93 mg/L for the August 2010 sampling event was observed to be significantly below the PWQO of 4.0 mg/L. It is unlikely that the landfill site was a significant contributor, if any, to the impacted water quality observed at the Spring Creek sample station SW-7. Regarding the low dissolved oxygen levels this was observed to be a consistent impact observed at all surface water stations upstream and downstream of the landfill site which were monitored during the August 2010 sampling event.	Iron concentration at SW-7 in 2016 are less than the values during the 2010 sampling. The dissolved oxygen values are higher and somewhat sporadic over the sampling history.
The sampling results do not suggest the triggering of Tier II level surface water monitoring to be required for the landfill site.	An assessment of the surface water trigger mechanism is provided in **Sections 10.7** and **10.8** of this report. No contingencies are required at this time.
The reviewer is in agreement with the landfill site owner's assessment that the surface water quality data for the 2010 sampling year for the Deep River (Miller's Road) waste disposal site which identified some limited impact to be observed in Landfill Creek downstream southeast of the landfill site; however, the surface water quality was determined to be not adversely impacted.	
The reviewer is in agreement with the landfill site owner's recommendation that surface water monitoring for the Deep River (Miller's Road) waste disposal site be continued as specified in the 2010 Annual Report recommendations.	Surface water sampling continues to be completed in general as in 2010.
Contingency Plan Comments Dated March 28, 2017	
The proposed trigger mechanism and contingency plan is acceptable. However, based on the previous comments provided by the MOECC, monitoring well 95-3 should be included in the compliance well list for the proposed trigger mechanism and contingency plan. Dissolved organic carbon (DOC) and vinyl chloride (VC) should be included in the analyzed parameter list and be used as the parameters for the RUG assessment, trigger mechanism and contingency plan.	Monitoring well 95-3 has been included in the compliance well list for the trigger mechanism and contingency plan. Dissolved organic carbon and vinyl chloride have been included in the analyzed parameter list and will be used as the parameters for the RUG assessment, trigger mechanism and contingency plan.

Contingency Plan Comments Dated May 17, 2017	
Trigger concentrations should be established for landfill indicator parameters with Provincial Water Quality Objectives (PWQO) (or Canadian Water Quality Guidelines (CWQG) as applicable). Where the concentration of a leachate indicator parameter for which a PWQO / CWQG has been established exceeds the guideline value at upstream monitoring stations, the trigger concentration should be considered as the 75th percentile concentration from background. Please note, 75th percentile values should be updated as sampling data become available.	Agreed. The 75th percentile values will be updated as sampling data becomes available.
I do not support the proposed change to the trigger mechanism to require four trigger concentration exceedances (rather than two) prior to the activation of contingency measures.	The trigger mechanism will require two trigger concentration exceedances prior to the activation of contingency measures.
Timelines should be set out for the activation of confirmatory sampling and/or contingency actions once the prescribed number of trigger exceedances has occurred.	Agreed.
If additional study is carried out and identifies unacceptable impacts to surface water, remedial measures should not be delayed pending additional exceedances, but should commence as soon as is practical following approval of the District Manager.	Agreed.
Comments on hydrogeological aspects of the 2016 AMR Dated January 4, 2018	
It is recommended to include the residential wells on a 3-year basis with the next sampling scheduled for 2018. I concur with this.	Residential wells will be sampled on a 3-year basis. The residential houses were sampled in 2018, and the next sampling event will be scheduled for 2021.
Jp2g attributed manganese and iron concentrations to the local area mineralogy, and accordingly concluded that the site is interpreted to be compliant with Guideline B-7. I concur with this conclusion.	Agreed.
An MECP Surface Water Scientist should continue to be consulted with respect to surface water management at this site.	We will continue to consult an MECP Surface Water Scientist with respect to surface water management at the site.
The contingency plan involves conducting additional sampling and investigation to determine the source and extent of impacts, and to identify an acceptable mitigation/remediation program, should one be required. The specifics of the plan will be dependent on the nature and extent of the impact. I concur with the proposed trigger mechanisms and contingency plan. I recommend continuing monitoring iron and manganese as trigger values, for any future leachate-related impacts that may occur.	We will continue to monitor iron and manganese as trigger values for any future leachate-related impacts that may occur.
Methane was not detected in any of the monitored wells or the on-site attendants shed during the 2016	Agreed. We will continue to conduct landfill gas monitoring. As well, landfill gas migration will continue to

monitoring events. The onsite risks associated with landfill gas associated with this site are beyond the scope of my review. Landfill gas monitoring should continue, and the need for landfill gas mitigation should continue to be assessed and discussed in future monitoring reports.	be assessed and discussed in future monitoring reports.

No other recent TSS comments from the MECP have been provided to Jp2g for review.

In February 2017 the Ministry completed a "Solid Non-Hazardous Waste Disposal Site Inspection Report". Section 5 of the Site Inspection Report listed actions to be completed by the Town that included:

1. Ensuring that on-site roads are maintained and safe access to the landfill working face is provided.
2. The Town of Deep River will implement daily site inspection records in the form of a daily log book as required by Condition 6(2).
3. Apply daily cover at the end of each working day as per Condition 4(16)i of the ECA.

A written action plan outlining how the Town of Deep River will address the above action items was requested. The Town provided the required information through a series of emails. The information can be found on file in the Ottawa District Office of the Ministry of the Environment, Conservation and Parks.

1.4 Additional Reports Required by the ECA

The ECA for the Miller's Road WDS issued on April 14, 2014 contain certain conditions that require select reports to be provided to the MECP. The reports listed below were submitted to the Ministry in 2015.

Condition 3.2 of the ECA requires that '*…an operations and procedures manual that addresses the requirements of this ECA is prepared for the Site.*' An operations manual was prepared by Jp2g Consultants on behalf of the Town of Deep River in February 2015 and provided to the Town and the MECP.

Condition 8.2 of the ECA required that '*…the Owner shall submit to the Director for approval and copies to the District Manager, details of a contingency plan to be implemented in the event that the surface water or groundwater quality exceeds the trigger mechanism,*' A contingency plan was prepared by Jp2g Consultants on behalf of the Town of Deep River in January 2015 and provided to the MECP.

Condition 10.3 of the ECA required that '*The owner shall prepare an Emergency Response Manual for the Site and Submit to the District Manager…*' An Emergency Response Manual was prepared by Jp2g Consultants on behalf of the Town of Deep River in January 2015 and provided to the MECP.

2.0 SITE OPERATIONS

The information compiled for the C&D waste disposal site operations for 2018 is based on data gathered, and a Jp2g field inspection and site survey. The Millers Road Landfill Site operating hours are Tuesday and Saturday 9:00 a.m. to 12:00 p.m. An attendant is on duty when the site is opened to the public and directs C & D waste deliveries to the designated disposal area. Cover of the waste

is to occur at the end of each working day. An existing conditions plan is provided in **Figure 2** at the end of text.

Annual reporting is required under Section 11.2 of the ECA dated April 4, 2014. The following details the required information included in the annual report as per Section 11 of the ECA.

i. The results and an interpretive analysis of the results of all leachate, groundwater, surface water and landfill gas monitoring, including an assessment of the need to amend the monitoring programs;

Completed in Part 2 – 2018 Environmental Monitoring

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

Completed in Part 2 – 2018 Environmental Monitoring

iii. An assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the Site, and the adequacy of and need to implement the contingency plan;

There are no engineered facilities at the site. There are no changes to the site design or site operation required at this point.

iv. Site plans showing the existing contours of the Site;

An Existing Condition Plan is provided as **Figure 2** at the end of text.

v. Areas of landfilling operation during the reporting period;

The landfilling area and active face are shown on the Existing Conditions Plan, **Figure 2**, provided at the end of text.

vi. Areas of intended operation during the next reporting period;

Landfilling in 2019 will be completed consistent with Section 6 of the Design and Operations Manual.

vii. Areas of excavation during the reporting period;

No excavation outside of regular landfilling activities occurred at the Site in 2018.

viii. The progress of final cover, vegetative cover, and any intermediate cover application;

Daily cover is applied at the end of each working day. As final contours are reached a final cover is applied and is seeded by the Town.

ix. Previously existing site facilities;

All site facilities that existed in 2018 are shown in the existing conditions plan, **Figure 2**, provided at the end of text.

x. Facilities installed during the reporting period;

No new facilities were installed in the 2018 reporting period.

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

There are no planned facility installations for the 2019 monitoring period.

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

The total volume of waste and cover deposited at the Site in 2018 was estimated to be approximately 4,400m³. The total remaining capacity as of the end of 2018 is estimated to be approximately 87,000³. The following table provides a summary or waste landfilling and remaining capacity.

Period of Waste Deposition	Yearly Waste & Cover based on a comparison of yearly surveys (m^3)	Remaining Capacity Based on Comparison of Yearly Survey Surface to Final Surface Contours (m^3)
Initial volume subsequent to ECA amendment		**104,800**
Period from Fall 2013 to Fall 2014	3,074	103,200
Period from Fall 2014 to Fall 2015	2,822	97,100
Period from Fall 2015 to Fall 2016	3,122	93,974
Period from Fall 2016 to Fall 2017	2,983	91,072
Period from Fall 2017 to Fall 2018	4,381	86,728

xiii. A summary estimated annual quantity (m^3) of waste received at the site.

Assuming a 4:1 waste to cover ratio and an approximate total volume of 4,400m³ landfilled in 2018, the resultant waste landfilled is (3,100m³ waste and 1,100m³ of cover).

xiv. A summary of any complaints received, and the responses made;

No complaints were received regarding the site during the 2018 monitoring period.

xv. A discussion of any operational problems encountered at the Site and corrective action taken;

No operational problems occurred during the 2018 monitoring period.

xvi. A summary of the amount of waste refused for disposal at the Site, the reasons for refusal and the carrier who brought the waste to the Site;

There were no waste loads refused from the Millers Road WDS in 2018.

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

All monitoring wells at the site are operational.

xviii Any other information with respect to the site which the District Manager or Regional Director may require from time to time.

See Section 1.4 Part 1.

xix A statement of compliance with all conditions of this ECA and other relevant Ministry groundwater and surface water requirements;

An assessment of groundwater and surface water compliance is provided in Part 2 – 2018 Environmental Monitoring.

xx A confirmation that the site inspection program as required by this ECA has been complied with by the Owner;

The Town is aware of the site inspections as detailed in Conditions 6.4 and 6.5 of the ECA.

xxi Any changes in operations, equipment or procedures employed at the Site;

No changes are required at this time.

xxii Recommendations regarding any proposed change in operation of the Site;

It is recommended that the Town continue operations as outlined in item 13 of Schedule "A" of the revised ECA dated April 2014: "ii. Design and Operations Report – Millers Road Waste Disposal Site Prepared by Jp2g Consultants Inc." March, 2013.

It is recommended that the Town investigate the use of alternative daily cover that is comprised of "shredded" C&D wastes. An application to revise the ECA would be required.

PART 2 – 2018
ENVIRONMENTAL MONITORING

1.0 INTRODUCTION

Part 2 of this report presents the results of the 2018 monitoring that was completed at the Town of Deep River (Miller's Road Landfill Site). The Miller's Road Landfill Site operates under ECA No. A413106 originally issued April 23, 1980 and most recently amended September 20, 2017. The ECA allows for the use of, and operation of a 4.5 ha landfilling area within an 8.55 hectare property. In addition to the 8.55 ha landfill property, 14.14 ha has been registered on title as contaminant attenuation zone establishing a total site area of 22.69 ha. The site is located in Part Lot 6, Concession XIII, in the former Township of Buchanan, now Town of Deep River (**Figure 1**).

The overall objective of the environmental quality monitoring is to document and characterize the hydrogeological conditions at the site and based on the data obtained provide an assessment of the impact of the waste disposal site on the ground and surface water regimes. The assessment of the hydrogeological performance of the waste disposal site is based on the determination of the following:

i) hydrogeologic setting
ii) leachate plume (direction of groundwater flow and impact of water quality)
iii) Ministry of the Environment, Conservations and Parks (MECP) Reasonable Use Policy

The report and activities have been completed and reported on in general conformance with the November 2010 Ministry of the Environment Technical Guidance Document for the submission of reports for ground and surface monitoring for Waste Disposal Sites. The "Monitoring and Screening Checklist" is provided in **Appendix C.**

2.0 HYDROGEOLOGIC SETTING

The physiography, geology and hydrogeology of the waste disposal site are described in the following sections and are repeated in part or in whole from previous reports submitted to the Town (as in part listed at the end of this report). The descriptions are based on a review of existing information (MECP well records and published geologic maps) and on-site specific data obtained from the field investigations.

2.1 Site Description and Physiography

The site is presently leased by the Town of Deep River from Canadian Nuclear Laboratories (CNL) formerly Atomic Energy of Canada Limited (AECL) and has been the waste disposal site for the Municipality since approximately 1965 (Greer Galloway 1985). In December 2005, the Town of Deep River and Atomic Energy of Canada Limited at the time put in place a new lease agreement for the operation of the waste disposal site. The waste disposal site is made up of four areas comprising a total area of 8.55 ha (21.12 acres). Landfilling within Areas 1 and 2 (3.22 ha) has been cleared and used for waste disposal. The northerly portions of Areas 3 and 4 (5.33 ha) are approximately 5 m lower in elevation than Areas 1 and 2 and are heavily wooded. The properties to the west of the site have been purchased for the purpose of a Contaminant Attenuation Zone (CAZ). A site plan showing the 2018 landfilling is provided in **Figure 2** and a plan showing well locations and the CAZ is shown in **Figure 3.**

Regionally, the Millers Road WDS and adjacent Canadian Nuclear Laboratories (CNL) lies within the Ottawa-Bonnechere graben, a rift valley that was generated by tension faulting. In the region

around CNL, the Ottawa River occupies the fault zone that defines the northeastern boundary of the graben; the southwestern boundary of the rift valley lies approximately 60 km southwest near the Bonnechere River, but there are a number of smaller or secondary faults within the graben. One prominent secondary fault cuts through the CNL site and defines the valley now occupied by the Little Rat, Big Rat, Maskinonge, and Chalk Lakes. The general northwest-southeast fabric in the region's physiography is a product of these faults. Initial development of the graben occurred between 700 and 600 million years ago, with a second episode of tensional faulting occurring between 150 and 90 million years ago. **Figure 4** shows the **Li**ght **D**etection **A**nd **R**anging (LiDAR) relief map of the CNL site. Topographically, one of the dominant features of the CNL property is the ridge (maximum elevation 220 m asl) that separates the Maskinonge-Chalk Lake valley from the Ottawa River. The river lies at a nominal elevation of 111 m asl, while Maskinonge Lake is only slightly higher, at a nominal elevation of 113 m asl. To the west-southwest of the Maskinonge-Chalk Lake valley, the land rises to a former terrace of the Ottawa River. Where exposed, the bedrock surface is frequently knobby, with highs and lows on a scale of several hundred metres laterally and tens of metres vertically. Even when bedrock is not exposed, many of the topographic features of the CNL site are bedrock controlled. Regional topography is shown in **Figure 5**.

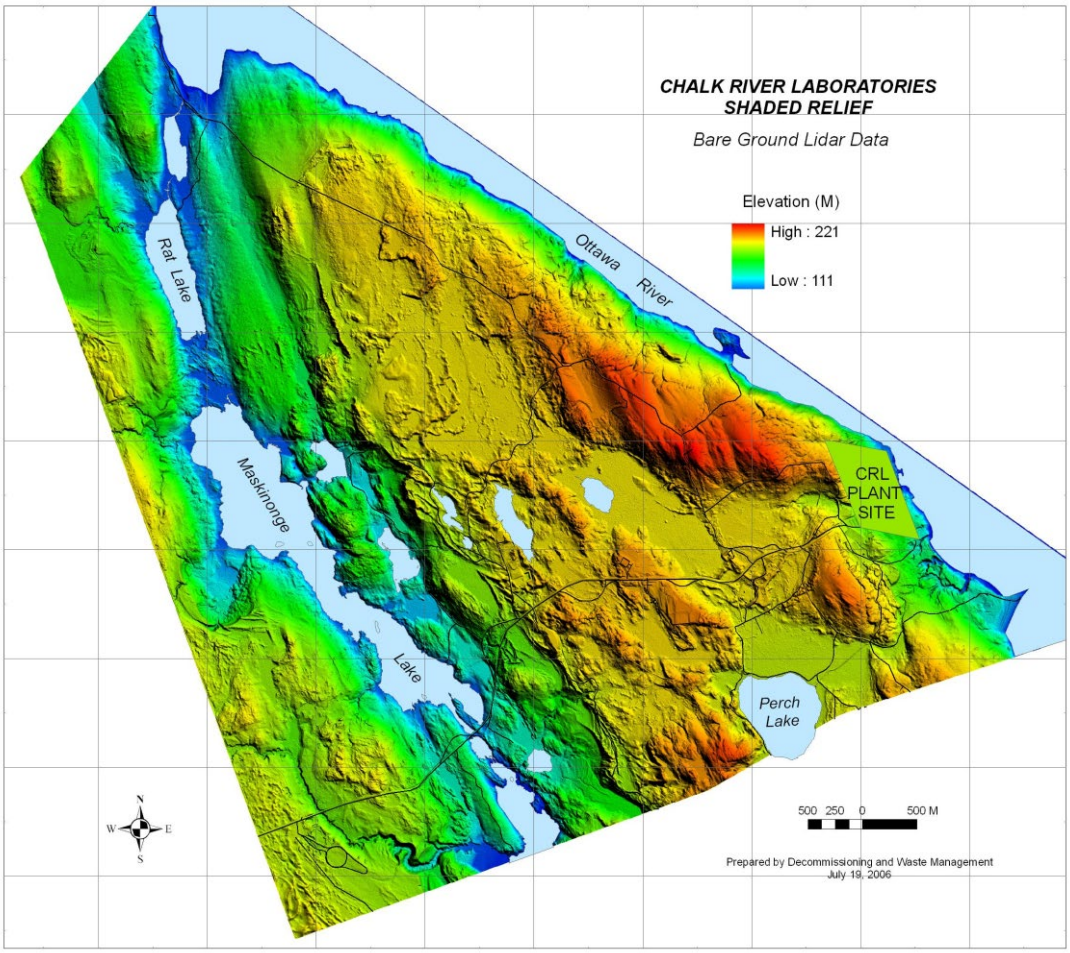


Figure 4 LiDAR Shaded Relief Map of the CNL Site[1]

[1] Environmental Assessment Study Report For The Bulk Material Landfill Project 165-03710-ENA-001 Revision 1 March 2009

Figure 5 shows topography at the Miller's Road WDS. The general lay of the land slopes toward Maskinonge Lake.

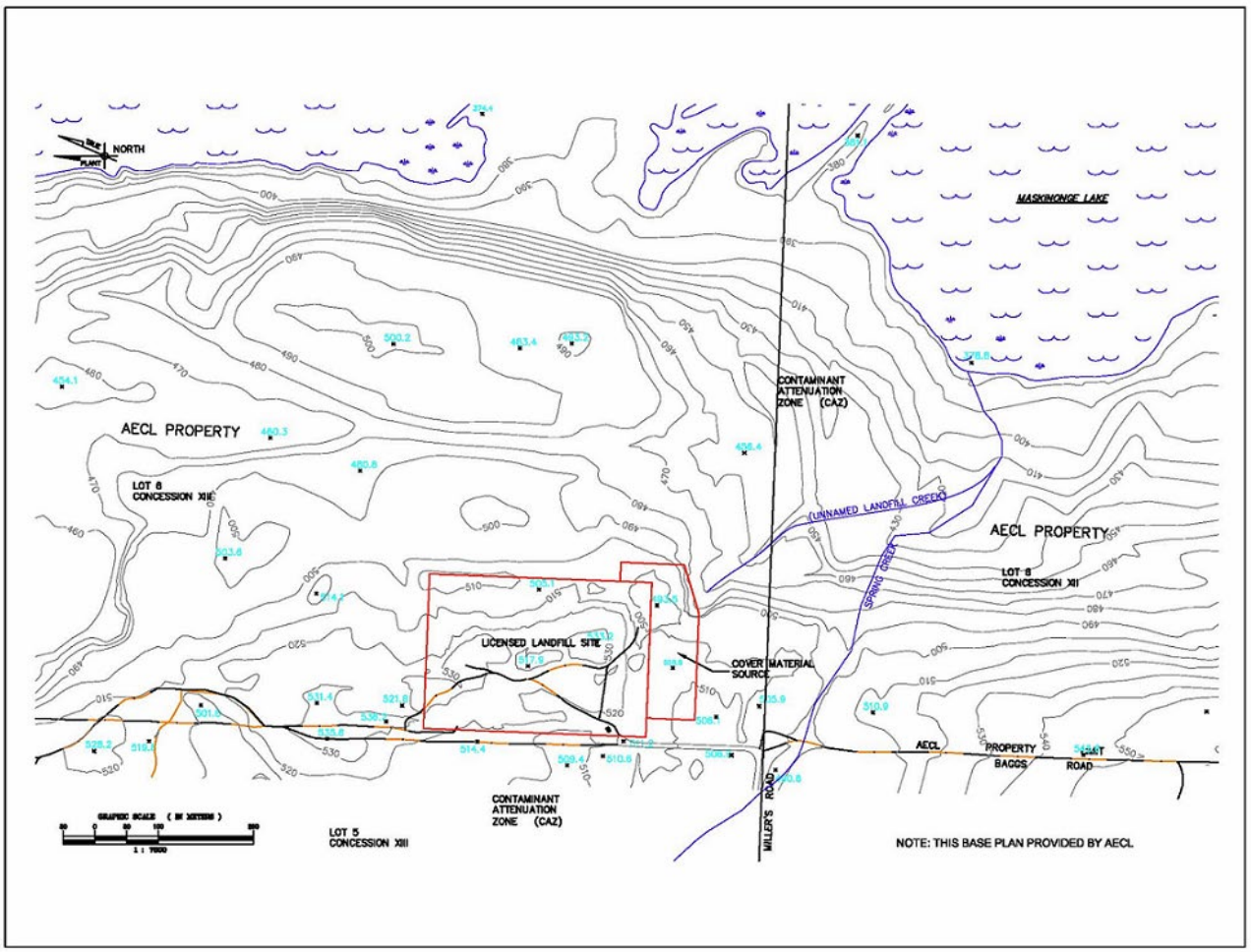


Figure 5 Topography in the Region Around the Millers Road WDS[2]

Spring Creek flows east towards Maskinonge Lake passing south of the site by approximately 270 m (approximately 90 m south of the unopened road allowance extension of Miller's Side Road). Spring Creek originates up gradient in the privately-owned properties west of the site.

Locally, the site is characterized by relatively flat terrain. A drainage divide runs east-west, through the approximate centre of the site. At the north of the property, north of the divide, the topography slopes gently to the northeast. South of the divide and beyond the landfill boundaries the topography slopes steeply eastward in a series of terraces toward Maskinonge Lake and the Ottawa River. Consequently, drainage from the site flows mostly south-southeast towards Maskinonge Lake. There are no land use concerns or water users observed downstream of the waste disposal site. Currently, the nearby residences are located up gradient (approximately 500m) of the waste disposal site and potential impact on these water supplies is not anticipated (refer to **Section 6.5**). Furthermore, it is anticipated that Spring Creek will act as a hydraulic boundary to any leachate migrating south-westward.

[2] 2010 Annual Report Deep River (Miller's Road) Waste Disposal Site, Jp2g Consultants Inc. May 2011

2.2 Bedrock Geology

Bedrock geologic information is based on published geology maps, MECP water well records, and previous work programs. The site is reported to be underlain by Precambrian, felsic metasedimentary basement rock. The depth to bedrock, as encountered during various drilling programs, varies from 0 m to approximately 30 m. Bedrock outcrops occur throughout the area but are particularly numerous in the northern half of the site and along the pathway to Maskinonge Lake southeast of the landfill area. From the northern area, the bedrock dips severely to the west and south varying from near surface to depths of approximately 40 metres.

The following outlines the approximate bedrock surface elevations at selected monitoring wells that are located along the western edge of the site. The elevations are referenced to an assumed datum.

91-5D	107.88
85-3D	103.87
95-4D	101.55
07-FD	112.85
07-3D	116.66
08-1D	106.81

2.3 Overburden Geology

Surficial geologic information is taken from field data, existing surficial mapping and MECP water well records. There are three major terrain units in the study area, namely thin till over rock, fluvial fine-grained sand and recent organic deposits (Gadd, 1963). A thin veneer of till overlying the bedrock surface occurs in parts of Area 2, Area 3 and Area 4. A grain size analysis of the till describes the overburden as reddish-brown gravelly fine sand with a trace of silt. There are numerous cobbles, stones and boulders throughout the unit. The thickness of the till ranges from 0 to 1.75 m. Thus, this deposit is fairly thin and any leachate migration will be controlled by the bedrock surface characteristics. Grain size analysis is provided in **Appendix D.**

A thick deposit of uniform, fine grained fluvial sand with a trace of silt underlies Area 1, the western portion of Area 2, and the portion of the study site located south between Spring Creek and the existing landfill site. The total thickness of this sand unit varies with the bedrock surface topography that slopes steeply in an easterly direction. The thickness of the sand is at least greater than 10.7 m throughout most of Areas 1 and 2.

Falling head tests have previously measured the hydraulic conductivity of these materials. The resultant hydraulic conductivity varies between 4.8×10^{-5} and 6.95×10^{-5} cm/sec. The shallow soils characterized by a Guelph Permeameter revealed hydraulic conductivity values to vary between 1.3×10^{-2} and 7.47×10^{-3} cm/sec.

2.4 Surface Hydrogeology

The regional area surrounding the Millers Road WDS and the CNL lies entirely within the Ottawa River watershed. On the Ontario side of the Ottawa River, all of the major tributary rivers originate in the Algonquin Highlands; Chalk River and Petawawa River are the two major tributaries near CNL.

Figure 6 delineates the major drainage basins around the site and on the CNL property. Much of the surface drainage from the narrow strip adjacent to the Ottawa River is directed to the river. Maskinonge Lake is the largest surface water body entirely within the CNL site boundary, and its

catchment (75% of which is within the site boundaries) is also the largest basin on CNL property, accounting for almost 40% of the site's area.

The Miller's Road WDS is located within the Maskinonge Lake Basin. The basin drains to Maskinonge Lake, which in turn drains via Chalk Lake to the Ottawa River.

Surface water features in the vicinity of the Miller's Road WDS include an un-named "Landfill Creek" that is located approximately 100m south east of the site and Spring Creek that originates west of the site and passes by the site to the south (**Figure 3**).

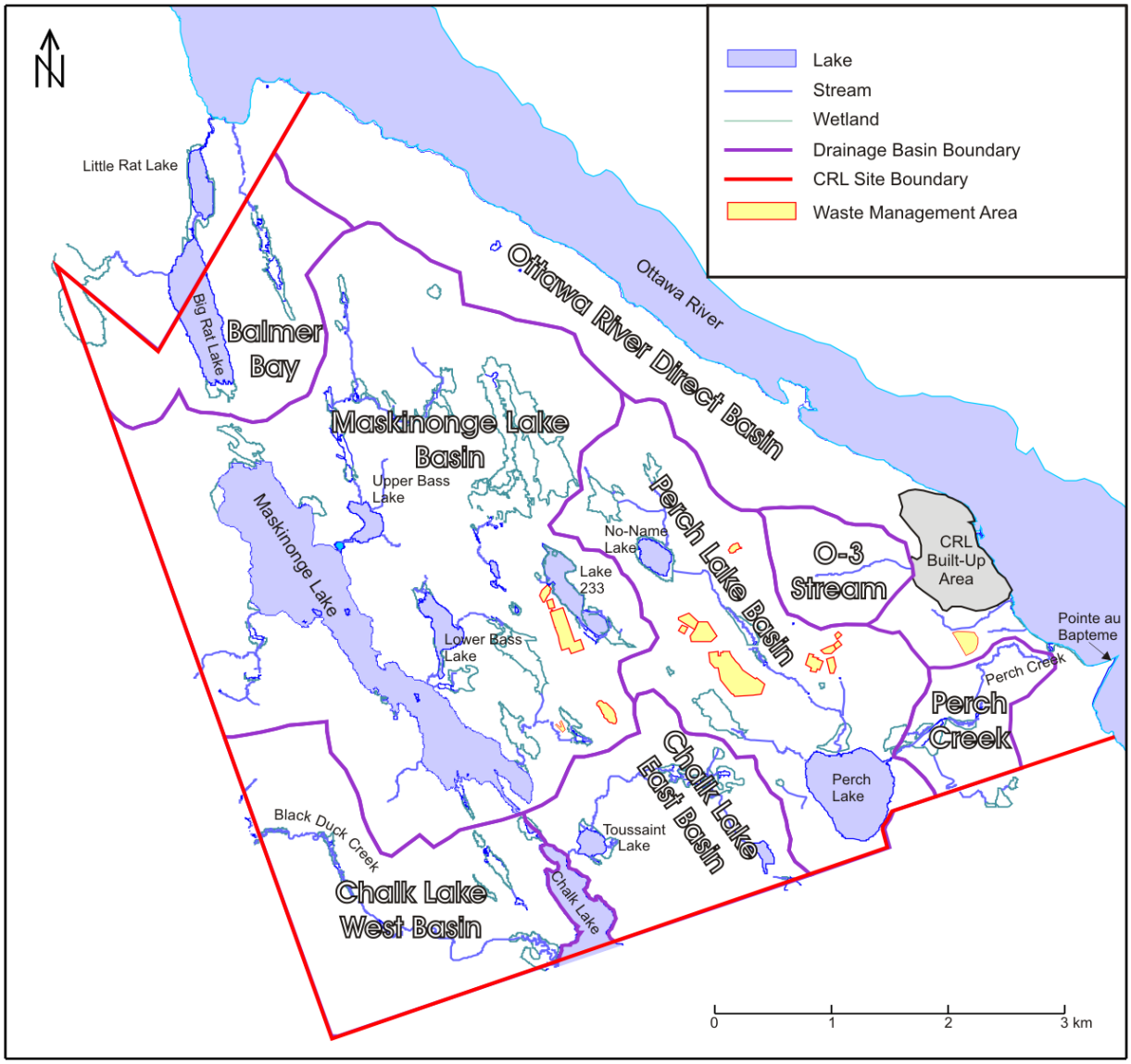


Figure 6 Chalk River Laboratories Drainage Basins[3]

[3] Environmental Assessment Study Report For The Bulk Material Landfill Project 165-03710-ENA-001 Revision 1 March 2009

2.5 Hydrogeology

2.5.1 Hydraulic Properties

Hydraulic properties governing groundwater flow and velocity are hydraulic conductivity (the permeability of the subsurface material with respect to water) and porosity. Groundwater specific discharge (the volumetric flow rate per unit area) in a groundwater flow system is controlled by the hydraulic conductivity of the subsurface materials and the differences in hydraulic head or pressure in the flow system over specified horizontal and/or vertical distances (hydraulic gradient). In overburden flow systems the linear average groundwater velocity is given by the ratio of the specific discharge *q* (the volumetric flow rate per unit area) to the porosity *n*.

2.5.2 Hydraulic Conductivity

A thick deposit of uniform, fine grained fluvial sand with a trace of silt underlies the western portion of the site and the portion of the study site located south between Spring Creek and the existing landfill site. The total thickness of this sand unit varies with the bedrock surface topography that slopes steeply in an easterly direction. The thickness of the sand is at least greater than 10.7 m throughout this area. Historical falling head tests and permeameter testing have previously measured the hydraulic conductivity of these sandy materials. The resultant hydraulic conductivity varies between 1.3 x 10^{-2} cm/sec and 6.95 x 10^{-5} cm/sec. **Table 2** outlines the hydraulic conductivity of these materials.

Table 2
Hydraulic Conductivity Tests

Location	Date	Depth (mm)	Hydraulic Conductivity cm/sec	Type of Test
85-F	1991	400	1.3 x 10^{-2}	Guelph Permeameter
85-A	1991	250	7.47 x 10^{-3}	Guelph Permeameter
91-3	1991	400	1.75 x 10^{-3}	Guelph Permeameter
91-1	1991	6070	5.53 x 10^{-5}	Falling Head Test
91-2	1991	9840	4.83 x 10^{-5}	Falling Head Test
91-3	1991	8920	6.95 x 10^{-5}	Falling Head Test

2.5.3 Porosity

Due to a well-sorted character, the porosities of the sands, and even of the interstratified sands and silts, are towards the upper end of the range observed in natural materials. The porosities range from 0.35 to 0.45. A representative porosity of the interstratified sands and silts and till is 0.30 [4].

2.6 Physical Hydrogeology

2.6.1 Water Table and Hydraulic Head Elevations

Groundwater levels were measured at selected locations during the monitoring program. Groundwater elevations for samples collected in May and October 2018 are provided in **Table 3**.

[4] Environmental Assessment Study Report For The Bulk Material Landfill Project 165-03710-ENA-001 Revision 1 March 2009

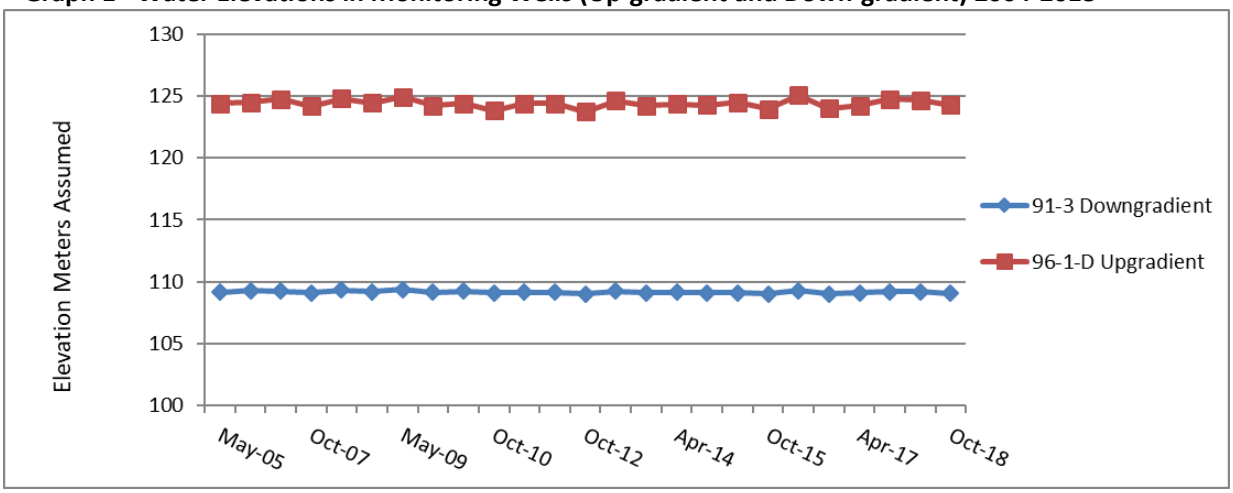
Table 3
Groundwater Elevations and Vertical Gradients

Monitoring Well	Reference Elevation	May-18		Oct-18		Vertical Gradient (Oct-18)
		Static	Elevation	Static	Elevation	
85-A	128.4	5.37	**123.03**	5.61	**122.79**	
85-B	129.87	5.79	**124.08**	6.12	**123.75**	
85-C	129.44	5.56	**123.88**	5.88	**123.56**	
85-D	132.25	8.96	**123.29**	9.30	**122.95**	
88-2-S	133.1	9.72	**123.38**	10.04	**123.06**	↑
88-2-D	133.09	9.64	**123.45**	9.97	**123.12**	
89-1-S	128.4	7.06	**121.34**	7.26	**121.14**	↑
89-1-D	128.32	6.51	**121.81**	6.71	**121.61**	
91-1	128.234	5.35	**122.88**	5.79	**122.44**	
91-2	129.769	9.39	**120.38**	9.67	**120.10**	
91-3	118.05	8.87	**109.18**	8.99	**109.06**	
91-4	127.97	5.74	**122.23**	DRY	**120.06**	
91-5 S	129.161	4.80	**124.36**	5.18	**123.98**	→
91-5 D	129.558	5.22	**124.34**	5.59	**123.97**	
95-3-S	129.066	4.91	**124.16**	5.28	**123.79**	↓
95-3 D	129.053	4.99	**124.06**	5.35	**123.70**	
95-4 S	129.846	5.20	**124.65**	5.61	**124.24**	↓
95-4 D	129.864	5.26	**124.60**	5.69	**124.17**	
95-5	129.391	4.43	**124.96**	4.90	**124.49**	
95-6	126.988	4.14	**122.85**	4.58	**122.41**	
96-1-S	128.353	3.46	**124.89**	3.96	**124.39**	↓
96-1-D	128.327	3.64	**124.69**	4.04	**124.29**	
96-2	--	3.89	--	Dry	--	
96-3	129.98	6.25	**123.73**	6.58	**123.40**	
07-2S	123.68	2.05	**121.63**	2.34	**121.34**	↓
07-2D	123.96	5.23	**118.73**	5.78	**118.18**	
07-F S	130.26	6.65	**123.61**	7.05	**123.21**	↑
07-F D	130.986	6.41	**124.58**	6.81	**124.18**	
07-3S	129.63	5.07	**124.56**	5.48	**124.15**	→
07-3D	129.76	5.20	**124.56**	5.61	**124.15**	
08-1S	129.845	5.31	**124.54**	5.70	**124.15**	↑
08-1D	129.858	5.26	**124.60**	5.67	**124.19**	

Note:
All data is referenced to an assumed datum and is anticipated to be approximatley 25.0m lower than geodetic elevations

In general, water elevation data is collected twice-yearly from a significant subset of the monitoring wells in the study area around the Miller's Road WDS. The water table elevations range from approximately 125 m (assumed elevation) located up-gradient of the site to approximately 110m (assumed elevation) down-gradient of the site. **Graph 1** provides records of measurements of two monitoring wells (up-gradient and down-gradient) located close to the site for the period of 2004 to 2018.

Graph 1 - Water Elevations in Monitoring Wells (Up-gradient and Down-gradient) 2004-2018



Water table measurements reveal a fairly stable regime over the annual cycle as well as on a longer-term basis. In most years, the annual variations follow patterns that show minimal in fall and late fall with slightly higher levels in the spring. The monitoring wells show long-term fluctuations (2004 – 2018) of up to 0.37m down-gradient and 1.31m up-gradient. The difference between the minimum and maximum groundwater levels at each location suggest a consistent hydraulic gradient.

2.6.2 Horizontal Gradients

The direction of groundwater flow at the site is influenced by the bedrock surface topography and is predominantly east and south-east. Groundwater flow in the vicinity of Area 2 may at times take on a south-western trend under a low hydraulic gradient. It may be that the groundwater in this area takes on a radial pattern of flow due to groundwater mounding in the waste area. The direction of flow in close proximity to Spring Creek located south of the site takes on a south-eastern component towards Maskinonge Lake. The direction of groundwater flow leaving the southern portion of Area 4 flows immediately to the southeast and eventually Maskinonge Lake. These flows are influenced by the dipping bedrock surface and topography and reveal a steeper hydraulic gradient. Potential flows from Areas 3 and 4 would also have a southern component (with the exception of the northern section of Area 3). Flows from this area are to the north to a wetland. The flows in this direction are also controlled by the bedrock surface topography and will eventfully migrate to Maskinonge Lake. The direction of groundwater flow at the site during the 2018 monitoring events are provided in **Figures 7A, 7B, 8A** and **8B**.

2.6.3 Vertical Gradients

Vertical gradients were estimated from the water level measurements collected from the multilevel monitoring wells 88-2, 89-1 and 07-02 at the south end of the site and 95-3, 95-4, 96-1, 07-03, 07-F and 08-1 at the northwest end of the site. On balance there is little difference in elevation of water levels between the shallow and deep settings from the majority of monitoring wells.

The vertical gradients in close proximity to the Landfill Creek south of the site reveal a downward movement of groundwater (i.e. 07-2). Away from the creek at the south end of the site the groundwater reveals an upward movement (i.e. 88-2 and 89-1). Upwards trends were also observed along the west side of the landfill at 07-F and 08-1. The vertical gradients are outlined in **Table 3**.

2.6.4 Groundwater Velocity

The linear velocity of the groundwater flow is estimated based on horizontal gradients from May 2018 and is calculated below.

Linear velocity south of landfill (88-2D to 91-3; 290m)

V velocity Ki/n
K K value is average of the falling head test results from the south wells 5.7 x 10^{-5} cm/sec
I gradient between 88 2D and 91-3; 0.04m/m
N porosity 0.38

V Ki / n = 5.7 x 10^{-5} x 0.04 / 0.38

= app 3 m/year

Linear velocity south west from western property line (91-5D to 95-3D; 200m)

V velocity Ki/n
K K value is average of the falling head test results from the south wells 5.7 x 10^{-5} cm/sec
I gradient between 91-5 and 95-3 0.0014 m/m
N porosity 0.38

V = Ki / n = 5.7 x 10^{-5} x 0.0013 / 0.38

= 1 m/year

The values are relatively low and typically representative of the low K values established from 1991. It is recommended that the hydraulic conductivities and velocity calculations be updated in 2019.

3.0 MONITORING WELL STATUS

The status of all monitoring wells has been assessed. Each well was located and checked for any deficiencies. All wells requiring sampling under the ECA are reported to be in good working order. The status of all monitoring wells is summarized in **Table 4**. A photo log of wells is provided in **Appendix E.**

3.1 Monitoring Well Installations

Numerous monitoring well installation programs have been completed at the site, the most recent having been completed in the fall of 2008. Borehole logs of all wells dating up to and including 1996 are documented in the Robinson Consultants Inc. February 1998 submission. Borehole logs from recent programs are provided in **Appendix F**.

4.0 LEASE AGREEMENT

The Millers Road Waste Disposal Site is located on Federal Property and is currently leased by the Town of Deep River from Atomic Energy of Canada Limited (now Canadian Nuclear Laboratories). In December 2005 the Town of Deep River and Atomic Energy of Canada Limited (AECL) put in place a new lease agreement for the operation of the waste disposal site. Included in the agreement was the use of additional lands to act as a Contaminant Attenuations Zone (CAZ). The CAZ extends south to Spring Creek and east to Maskinonge Lake. A copy of that agreement and an outline of the CAZ are provided in **Appendix G**. It is our understanding that the Town and CNL are in discussions to update the agreement.

5.0 MONITORING PROGRAM

The approved monitoring program under the ECA dated April 4, 2014 is based on the supporting documentation for the Expansion Application, Section 7.0 of the Design and Operations Report, Jp2g letter dated January 8, 2014 in response to the EAB review, and ECA Condition 7.6(2).

5.1 Assessment Program

Approved Groundwater Inorganic Monitoring

Groundwater monitoring occurs two times per year and includes:

Monitoring Wells: 91-2 (background), 91-5 S/D, 95-3 S/D, 95-4 S/D, 95-5, 95-6 (leachate), 96-1 S/D, 96-2, 96-3, 07-2 S/D, 07-3 S/D, 07-F S/D, 08-1 S/D. Currently sampled Groundwater Parameters: alkalinity, chloride, conductivity, nitrite, nitrate, TDS, TKN, hardness, calcium, magnesium, potassium, sodium, aluminium, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, silicon, strontium, thallium, titanium, vanadium, zinc.

Approved Groundwater Organic Monitoring

Organic groundwater monitoring occurs two times per year and includes:

95-3S, 95-3D, 96-1S, 96-1D, 95-6, 07-3D, 07-3S

Approved Surface Water Monitoring

Surface water sampling occurs three times per year and includes:

Stations: SW-1 through SW-7
Parameters; (ICP metal scan), alkalinity, BOD, calcium, chloride, COD, conductivity (field), hardness, ammonia, nitrite, nitrate, pH (field), phenols, turbidity, total P, ammonia unionized, DO, Note physical characteristics of sample location.

A monitoring summary is provided in **Table 4**.

Table 4: Monitoring Summary

Monitoring Location	Sampling Per ECA	Water Level Per ECA	Compliance Location	Well Status	May-18	Jul-18	Oct-18
85-A		✓		Operational			
85-B		✓		Operational			
85-C		✓		Operational			
88-2-S		✓		Operational			
88-2-D		✓		Operational			
89-1-S		✓		Operational			
89-1-D		✓		Operational			
91-1		✓		Operational			
91-2 (background)	✓	✓		Operational	✓		✓
91-3		✓		Operational			
91-4		✓		Operational			
91-5 S	✓	✓		Operational	✓		✓
91-5 D	✓	✓		Operational	✓		✓
95-3-S	✓	✓	TSS	Operational	✓		✓+ Vocs
95-3 D	✓	✓	TSS	Operational	✓+ Vocs		✓+ Vocs
95-4 S	✓	✓		Operational	✓		✓
95-4 D	✓	✓		Operational	✓		✓
95-5 (background)	✓	✓		Operational	✓+ Dup		✓+ Dup
95-6 (leachate)	✓	✓		Operational	✓+ Vocs		✓+ Vocs
96-1-S	✓	✓	ECA	Operational	✓		✓+ Vocs
96-1-D	✓	✓	ECA	Operational	✓+ Vocs		✓+ Vocs
96-2	✓	✓		Operational	✓		
96-3	✓	✓		Operational	✓		✓
07-2S	✓	✓		Operational	✓		✓
07-2D	✓	✓		Operational	✓		✓
07-F S	✓	✓		Operational	✓		✓
07-F D	✓	✓		Operational	✓		✓
07-3S	✓	✓		Operational	✓+ Vocs		✓+ Vocs
07-3D (leachate)	✓	✓		Operational	✓+ Vocs		✓+ Vocs
08-1S	✓	✓		Operational	✓		✓
08-1D	✓	✓		Operational	✓+ Dup		✓+ Dup
1227 Millers Rd*				Operational			
1235 Millers Rd*				Operational			
1236 Millers Rd*				Operational			
1244 Millers Rd*				Operational			

Monitoring Location	Sampling Per ECA	Water Level Per ECA	Compliance Location	Well Status	May-18	Jul-18	Oct-18
SW-1	✓			Operational	✓+ Dup	✓+ Dup	✓+ Dup
SW-2	✓			Operational	✓	✓	✓
SW-3	✓			Operational	✓	✓	✓
SW-4	✓			Operational	✓	✓	✓
SW-5	✓			Operational	✓	✓	✓
SW-6	✓			Operational	✓	✓	✓
SW-7	✓			Operational	✓	✓	✓

Notes:
** Required by TSS*
Dup - In addition to the sample, a duplicate sample was taken for QA/QC purposes
Vocs - In addition to the sample, a sample of volatile organic compounds was taken

6.0 GROUNDWATER QUALITY ASSESSMENT

Groundwater sampling was completed at the waste disposal site to evaluate the background water quality and the impact of the waste disposal site on the local water quality. Sampling has been carried out at the waste disposal site since 1985. Since this time numerous monitoring events have been completed, the latest groundwater sampling having been completed in the fall of 2018. The results of the chemical and physical analysis are provided in **Appendix H**. Standard Sampling Protocols are also provided in **Appendix H**.

The following sections discuss the variation of chemical concentrations of samples collected during recent monitoring events. These sections include the site background water quality assessment, leachate characteristics, on-site water quality assessment, and off-site water quality assessment (lands adjacent to the waste disposal site).

6.1 Background Water Quality

The background water quality is defined as the groundwater quality unaffected by human activity. That is the groundwater quality in its natural state. For the purpose of the landfill site background assessment, background water quality will be defined as that water quality that is believed to be unaffected by leachate from the landfill site. The background water quality in the overburden in the vicinity of the site that has been considered to be representative of background water quality conditions is at monitoring wells 91-2 and 95-5. Monitoring well 91-2 is located south of the site and typically reveals low chemical concentrations. Monitoring well 95-5 is located northwest and out of the direction of groundwater flow from the waste disposal site. Groundwater chemical concentrations from the 2018 monitoring at location 95-5 are all less than Ontario Drinking Water Standards/Objectives and Guidelines (ODWS/OG). Historic sampling has occasionally revealed aluminium and manganese to exceed ODWS/OG. The 2018 chemical analysis from monitoring well 91-2 indicates all parameters to be less than ODWS/OG. Isolated ODWS/OG exceedances of manganese, iron and aluminium have occurred at monitoring well 91-2. The historical range of background chemical concentrations is provided in **Table 5**. Chemical trends for these wells reveal consistent concentrations over time. Anomalous values are noted for monitoring well 95-5 in 2002. Graphs that illustrate the trends are provided in **Appendix I.**

Table 5
Range of Background Values
Historical Monitoring

Parameter	ODWS/OG Objective	Background Values Monitoring Wells 91-2 and 95-5	
		Median	Range
Al mg/L	0.1	0.02	0.007 – **0.67**
Alkalinity CaCO3	30-500	50.5	30 – 177
B mg/L	5	0.01	<0.005 – 0.025
Ba mg/L	1	0.0155	0.005 – 0.08
Be mg/L		0.0002	<0.0001 - <0.005
Ca mg/L		14.2	8 – 52.9
Cd mg/L	0.005	0.0004	<0.00002 - <0.001
Cl mg/L	250	1	0.25 – 21
Co mg/L		0.0006	<0.0001 – 0.039
Cr mg/L	0.05	0.002	<0.001 – 0.011
Cu mg/L	1	0.002	0.0001 – 0.07
Fe mg/L	0.3	0.03	0.005 – **3.01**
Hardness mg/L	500	51	28 – 65
K mg/L		1.78	<0.4 – 7.1
Mg mg/L		3.75	<0.001 – 43
Mn mg/L	0.05	0.012	<0.001 – **46**
Mo mg/L		0.00190	<0.0001 - 0.04
Na mg/L	200	3.1	0.7 – 7
N-N03 mg/L	10	0.1	<0.05 – 1.12
Pb mg/L	0.01	0.00027	<0.00002 – 0.0022
TDS mg/L	500	78	42.4 – 198

Notes:
***Bold** values exceed ODWS/OG*
Range of values from monitoring well 91-2 from years 1991 - 2018
Range of values from monitoring well 95-5 from years 1995 - 2018
Median values averaged between median values from 91-2 and 95-5 from last ten sample events
Hardness objective listed as maximum value in MECP ODWS/OG Technical Guidance Document

6.2 Leachate Characteristics

Leachate characteristics are typically those chemical concentrations that exhibit the highest chemical values. Historically, in the case of the Miller's Road Waste Disposal Site, chemical values from monitoring wells 95-6 and 88-3D (replaced as 07-3D) typically reveal the highest concentrations and are deemed to be representative of leachate concentrations. Monitoring well 95-6 is located in the immediate down gradient flow path from the fill area at the south end and monitoring well 07-3D is

located along the northwest property line of Area 2. **Table 6** outlines the 2018 range of leachate concentrations from monitoring wells 95-6 and 07-3D.

Table 6
Range of Leachate Values

Parameter	ODWS/OG Objective	Background Monitoring Wells 91-2 and 95-5		Monitoring Well 07-3D May-18 - Oct-18	Monitoring Well 95-6 May-18 - Oct-18
		Median	Range		
Al mg/L	0.1	0.02	0.007 – **0.67**	<0.01 - <0.01	<0.01 - <0.01
Alkalinity	30-500	50.5	30 – 177	**314 - 261**	**343 - 326**
B mg/L	5	0.01	<0.005 – 0.025	**0.07 - 0.07**	**0.74 - 0.78**
Ba mg/L	1	0.0155	0.005 – 0.08	**0.32 - 0.32**	**0.56 - 0.52**
Be mg/L		0.0002	<0.0001 - <0.005	<0.0005 - <0.0005	<0.0005 - <0.0005
Ca mg/L		14.2	8 – 52.9	86 - 56	**121 - 88**
Cd mg/L	0.005	0.0004	<0.00002 - <0.001	< 0.0001 - <0.0001	< 0.0001 - <0.0001
Cl mg/L	250	1	0.25 – 21	7 - 7	**24 - 23**
Co mg/L		0.0006	<0.0001 – 0.039	0.022 - 0.0183	0.0025 - 0.0021
Cr mg/L	0.05	0.002	<0.001 – 0.011	0.001 - 0.001	0.001 - 0.001
Cu mg/L	1	0.002	0.0001 – 0.07	<0.001 - <0.001	<0.001 - <0.001
Fe mg/L	0.3	0.03	0.005 – **3.01**	***47.7 - 44.5***	***10.8 - 10.6***
Hardness mg/L	500	51	28 – 65	**272 - 181**	**405 - 306**
K mg/L		1.78	<0.4 – 7.1	**13 - 14**	**14 - 12**
Mg mg/L		3.75	<0.001 – 43	**14 - 10**	**25 - 21**
Mn mg/L	0.05	0.012	<0.001 – **46**	***3.81 - 3.08***	***8.04 - 7.18***
Mo mg/L		0.00190	<0.0001 - 0.04	<0.0005 - <0.005	<0.005 - <0.005
Na mg/L	200	3.1	0.7 – 7	**9 - 8**	**31 - 26**
N-N03 mg/L	10	0.1	<0.05 – 1.12	<0.10 - <0.10	<0.1 - <0.1
Pb mg/L	0.01	0.00027	<0.00002 – 0.0022	<0.001 - <0.001	<0.001 - <0.001
TDS mg/L	500	78	42.4 – 198	**406 - 340**	***567 - 532***

Notes:

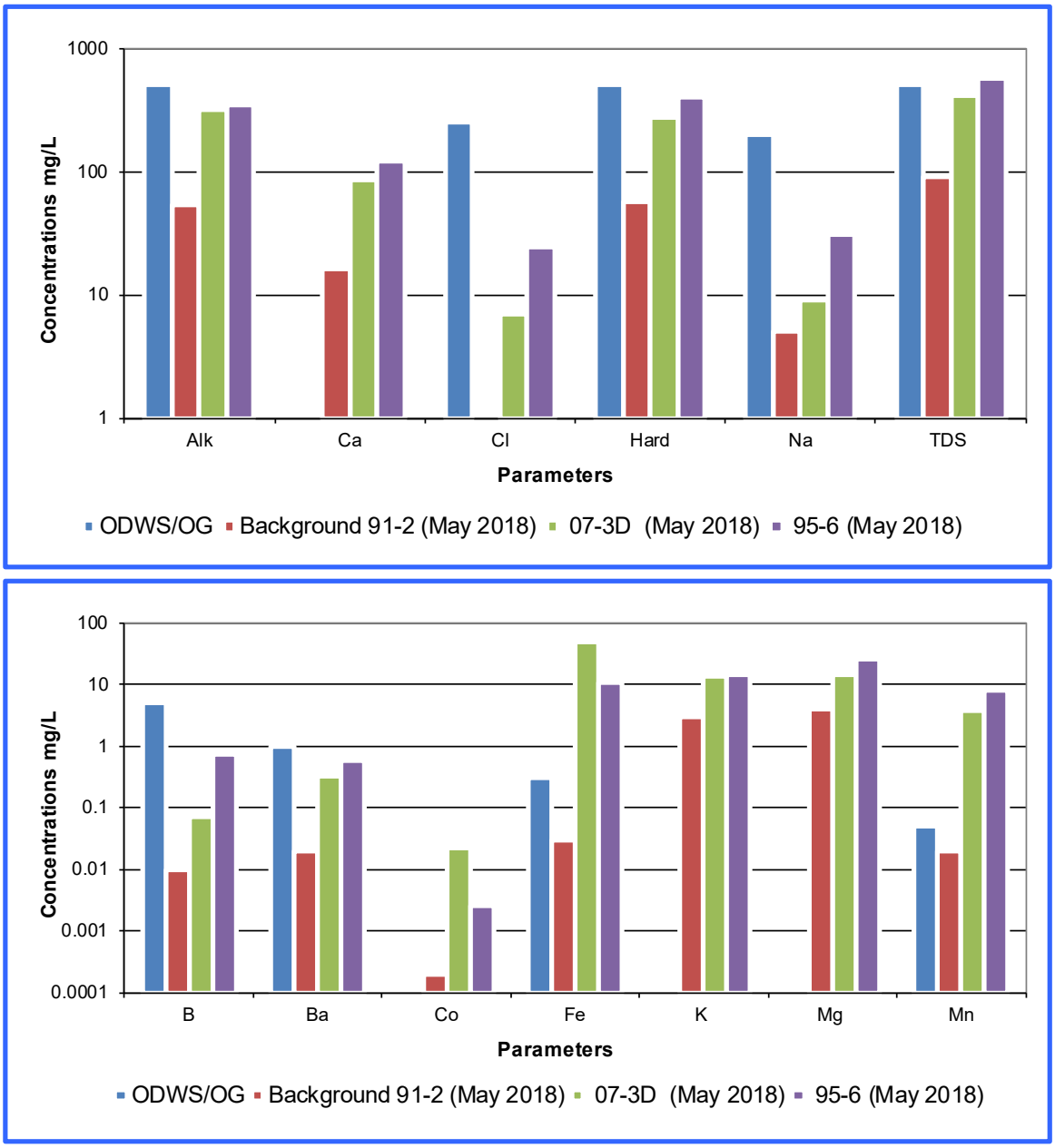
Red bold *values represent parameters indicative of leachate impact*

Bold *values exceed ODWS/OG*

Hardness objective listed as maximum value in MECP ODWS/OG Technical Guidance Document

As indicated in **Table 6**, leachate at the site is characterized by inorganic parameters with elevated concentrations above background values and in instances greater than ODWS/OG. While both monitoring wells reveal parameters with elevated chemical concentrations in relation to background values, water quality from monitoring well 95-6 generally reveals the highest impact. **Graph 2** illustrates the relationship between the two inorganic leachate signatures and background values (background values are from monitoring well 91-2 - Spring 2018).

Graph 2
Leachate Values vs Background Values



6.3 On-Site Monitoring Wells

The on-site monitoring wells located on the 8.55 hectare site are: 91-5, 96-3, 85-C, 88-2S, 88-2D, 85-D, 85-Y, 03-1 and 95-6. Their locations are provided on **Figure 9**. All of these wells are located between the licensed fill area and the perimeter of the buffer zone with the exception of monitoring well 03-1. Monitoring wells 85-Y, 85-D and 95-6 are located in the immediate downgradient flow path from Area 4 in an area of steep hydraulic gradient. Monitoring well 91-5 is located along the western perimeter of the site within an area of a low hydraulic gradient. Monitoring wells 85-C and 96-3 are located along the southern perimeter of the waste disposal site and are considered to be in the direction of groundwater flow originating from the southwest corner of Area 1. During the 2018 monitoring events, samples were collected from the following on-site locations: 91-5S, 91-5D, 95-6 and 96-3 (water quality from 95-6 has been determined to be representative of leachate at the site). **Table 7** outlines concentrations from on-site wells that are greater than ODWS/OG and reflective of leachate loading.

Table 7
2018 On-Site Chemical Parameters Indicating
Increased Leachate Loading and Greater Than ODWS/OG

Parameter	ODWS/OG Objective	Background Monitoring Wells 91-2 and 95-5 Historical Range of Values	Leachate Characteristics Monitoring Well 95-6 May-18 - Oct-18	Monitoring Well 91-5D May-18 - Oct-18	Monitoring Well 91-5S May-18 - Oct-18	Monitoring Well 96-3 May-18 - Oct-18
Alkalinity CaCO3	30-500	30 – 177	343 - 326	61 - 85	90 - 86	57 - 61
B mg/L	5	<0.005 – 0.025	0.74 - 0.78	<0.01 - <0.01	<0.01 - <0.01	<0.01 - <0.01
Ba mg/L	1	0.005 – 0.08	0.56 - 0.52	0.05 - 0.06	0.04 - 0.04	0.01 - 0.01
Ca mg/L		8 – 52.9	121 - 88	14 - 14	27 - 20	16 - 14
Cl mg/L	250	0.25 – 21	24 - 23	52 - 50	6 - 4	<1 - 3
Fe mg/L	0.3	0.005 – **3.01**	**10.8 - 10.6**	**13.2 - 16.3**	**0.43 - 0.41**	0.04 - 0.04
Hardness mg/L	500	28 – 65	405 - 306	51 - 56	96 - 70	65 - 56
K mg/L		<0.4 – 7.1	14 - 12	2 - 2	2 - 1	2 - 2
Mg mg/L		<0.001 – 43	25 - 21	4 - 5	7 - 5	6 - 5
Mn mg/L	0.05	<0.001 – **46**	**8.04 - 7.18**	**0.11 - 0.14**	0.03 - 0.03	<0.01 - <0.01
Na mg/L	200	0.7 – 7	31 - 26	38 - 26	5 - 6	2 - 2
TDS mg/L	500	42.4 – 198	**567 - 532**	186 - 178	131 - 124	89 - 92

Notes:
Bold *values exceed ODWS/OG*
Hardness listed as maximum value in MECP ODWS/OG Technical Guidance Document

Table 7 illustrates that the major component of on-site leachate impact is focused in the vicinity of leachate monitoring well 95-6. The leachate impact is characterized by elevated inorganic chemical parameters (alkalinity, boron, barium, chloride, calcium, COD, hardness, sodium, TDS, manganese and iron). To a lesser degree, impact is recognized along the western property line at monitoring station 91-5D. Impact at this location is characterized by elevated levels of chloride and sodium

greater than background levels and iron at levels greater than background and ODWS/OG. The shallow setting, 91-5S, reveals iron to exceed ODWS/OG. As the chloride values at 91-5S are in-line with background values it is interpreted that this location does not reveal impact from the waste site. Iron and manganese values are in part attributed to the overburden geology in the area. Monitoring location 96-3 located along the south-western limit of the landfill site does not reveal any exceedances to ODWS/OG, and concentrations remain in line with the background ranges.

The historical trends of selected chemical concentrations from the on-site wells (91-5D, 96-3) are provided in **Appendix I** and do not reveal any increasing trends in concentrations, with the exception of a slight increase of chloride in 2018 for monitoring well 96-3. Data will continue to be tracked for any increasing trends.

6.4 Off-Site Monitoring Wells

The groundwater quality of the waste disposal site has historically been characterized by samples collected from the remainder of the monitoring wells that are located off-site but within the CAZ (to the south) and include:

South wells:
85-A, 85-Z, 89-1S, 89-1D, 89-2S, 89-2D, 07-2S. 07-2D, 91-1, 91-2, 91-3.
(89-2S and D have been replaced by 07-2S and D).

Monitoring wells 85-Z and 07-2 are located southeast of Area 1 in an area with a steep hydraulic gradient. Monitoring wells 91-1, 91-2, 91-3, 85-A and 89-1 are all located south of the site. Samples from monitoring wells 91-2 and 95-5 have been determined to be representative of background values. In 2018, samples were collected from 07-2S, 07-2D, and 91-2; **Table 8** outlines chemical concentrations that are greater than ODWS/OG and reflective of leachate at the site.

Table 8
Off-Site South Chemical Parameters Indicating Increased Leachate Loading

Parameter	ODWS/OG Objective	PWQO	Background Monitoring Wells 91-2 and 95-5 Historical Range of Values	Leachate Characteristics Monitoring Well 95-6 May-18 - Oct-18	Monitoring Well 07-2S May-18 - Oct-18	Monitoring Well 07-2D May-18 - Oct-18
Alkalinity CaCO3	30-500	a	30 – 177	343 - 326	344 - 95	372 - 361
B mg/L	5	0.2 1.5 (CWQG)	<0.005 – 0.025	0.74 - 0.78	0.21 - 0.03	0.72 - 0.89
Ba mg/L	1		0.005 – 0.08	0.56 - 0.52	0.13 - 0.04	0.4 - 0.42
Ca mg/L			8 – 52.9	121 - 88	114 - 19	138 - 104
Cl mg/L	250		0.25 – 21	24 - 23	8 - 2	40 - 39
Fe mg/L	0.3	0.3	0.005 – **3.01**	**10.8 - 10.6**	**3.27 - 1.45**	**12.2 - 13**
Hardness mg/L	500		28 – 65	405 - 306	396 - 72	468 - 367
K mg/L			<0.4 – 7.1	14 - 12	2 - 2	7 - 6
Mg mg/L			<0.001 – 43	25 - 21	27 - 6	30 - 26
Mn mg/L	0.05		<0.001 – **46**	**8.04 - 7.18**	**0.13** - 0.04	**6.69 - 6.38**
Na mg/L	200		0.7 – 7	31 - 26	6 - 2	42 - 37
TDS mg/L	500		42.4 – 198	**567 - 532**	442 - 114	**634 - 612**

Notes:
Bold *values exceed ODWS/OG*
Hardness listed as maximum value in MECP ODWS/OG Technical Guidance document
'a' refer to water quality notes in ***Appendix H***
Underline exceeds PWQO

As indicated above, the groundwater in the vicinity of monitoring well 07-2 is characterized by water quality that reveals chemical concentrations that are in instances greater than background values and less than concentrations indicative of leachate at the site. Iron and manganese exceeded ODWS/OG for the shallow setting. Iron and manganese revealed concentrations that are greater than ODWS/OG at the shallow and deep setting in 2018, with TDS exceeding ODWS/OG in the deep setting in 2018. At this location the deep piezometer setting typically reveals higher chemical values indicating that the deeper groundwater is more impacted than the shallow groundwater.

As per the Ministry's TSS Comments dated December 3, 2013, monitoring wells 07-2S and 07-2D have been compared to PWQOs. As described in the TSS review there is potential for contaminants to reach the Landfill Creek from the groundwater in the vicinity of monitoring well 07-2S and D. The results indicate iron and boron at both piezometer settings exceed the PWQOs. Iron exists in the historical background concentrations and therefore is considered a poor parameter in assessing landfill impact. Boron is revealed to exist at levels above PWQOs but below CWQGs (1.5 mg/L) along Landfill Creek. The higher presence of boron in the deep setting may indicate slight impact from the landfill site in the deep overburden aquifer. It is recommended that water quality from monitoring wells 07-2S and 07-2D continue to be compared to PWQOs to assess any potential impacts groundwater migrating from the landfill may have on the local surface water environment.

West wells:
85-B, 88-3S, 88-3D, 95-3S, 95-3D, 95-4S, 95-4D, 95-5, 96-1S, 96-1D, 07-3S, 07-3D, 07-FS, 07-FD, 08-1S and 08-1D.

Monitoring wells 85-B, 88-3 (replaced by 07-3) and 08-1 are located west of the site in the road allowance, while monitors 95-3, 95-4, 95-5 and 96-1, are located further west on the property purchased by the municipality (incorporated as part of the CAZ). Samples from monitoring wells 07-3D have been interpreted to be representative of leachate at the site. Monitoring well 95-5 that is located west of, and up gradient from the site has been determined to be representative of background values. In 2018, samples were collected from monitoring wells 07-3S, 07-3D, 95-3S, 95-3D, 95-4S, 95-4D, 95-5, 96-1D, 96-1S, 07-FS, 07-FD, 08-1S and 08-1D. **Table 9** outlines chemical concentrations that are greater than ODWS/OG and reflective of leachate impact at the site.

Table 9
Off-Site West Wells
Chemical Parameters Indicating Increased Leachate Loading and Greater Than ODWS/OG

Parameter	ODWS/OG Objective	Background Monitoring Wells 91-2 and 95-5 Historical Range	Leachate Monitoring Well 95-6 May-18 - Oct-18	95-3 May-18 - Oct-18		95-4 May-18 - Oct-18		96-1 May-18 - Oct-18	
				Shallow	Deep	Shallow	Deep	Shallow	Deep
Alkalinity CaCO3	30-500	30 – 177	343 - 326	69 - 72	78 - 81	169 - 148	37 - 38	<5 - 25	103 - 108
B mg/L	5	<0.005 – 0.025	0.74 - 0.78	<0.01 - <0.01	<0.01 - <0.01	<0.01 - <0.01	<0.01 - <0.01	<0.005 - <0.01	<0.01 - <0.01
Ba mg/L	1	0.005 – 0.08	0.56 - 0.52	<0.01 - 0.01	0.02 - <0.02	0.04 - 0.04	0.06 - 0.07	0.006 - <0.01	0.02 - 0.02
Ca mg/L		8 – 52.9	121 - 88	18 - 15	25 - 21	51 - 36	15 - 14	2.47 - 5	30 - 24
Cl mg/L	250	0.25 – 21	24 - 23	<1 - 1	6 - 7	<1 - 1	76 - 87	<0.6 - <1	2 - 2
Fe mg/L	0.3	0.005 – **3.01**	**10.8 - 10.6**	0.04 - 0.05	0.04 - 0.05	<0.03 - <0.03	**12.1 - 14.6**	**0.521** - <0.05	0.11 - 0.11
Hardness mg/L	500	28 – 65	405 - 306	74 - 62	95 - 81	185 - 135	58 - 56	11 - 21	116 - 97
K mg/L		<0.4 – 7.1	14 - 12	1 - 1	3 - 3	<1 - <1	2 - 3	0.4 - <1	2 - 2
Mg mg/L		<0.001 – 43	25 - 21	7 - 6	8 - 7	14 - 14	5 - 5	1.14 - 2	10 - 9
Mn mg/L	0.05	<0.001 – **46**	**8.04 - 7.18**	<0.01 - <0.01	0.02 - 0.02	0.05 - 0.05	**0.1 - 0.13**	0.009 - 0.03	0.04 - 0.04
Na mg/L	200	0.7 – 7	31 - 26	2 - 2	5 - 5	2 - 2	45 - 45	1.7 - <2	2 - 2
TDS mg/L	500	42.4 – 198	**567 - 532**	96 - 96	133 - 134	211 - 186	233 - 263	11 - 39	142 - 144
Parameter	**ODWS/OG Objective**	**Background Monitoring Wells 91-2 and 95-5 Historical Range**	**Leachate Monitoring Well 95-6 May-18 - Oct-18**	**07-F May-18 - Oct-18**		**07-3 May-18 - Oct-18**		**08-1 May-18 - Oct-18**	
				Shallow	Deep	Shallow	Deep	Shallow	Deep
Alkalinity CaCO3	30-500	30 – 177	343 - 326	236 - 209	102 - 120	180 - 191	314 - 261	88 - 97	85 - 108
B mg/L	5	<0.005 – 0.025	0.74 - 0.78	<0.01 - <0.01	0.03 - 0.04	<0.01 - <0.01	0.07 - 0.07	<0.01 - <0.01	0.01 - 0.01
Ba mg/L	1	0.005 – 0.08	0.56 - 0.52	0.08 - 0.08	0.04 - 0.04	<0.06 - 0.06	0.32 - 0.32	0.02 - 0.03	0.05 - 0.05
Ca mg/L		8 – 52.9	121 - 88	71 - 53	22 - 21	57 - 44	86 - 56	26 - 23	30 - 25
Cl mg/L	250	0.25 – 21	24 - 23	2 - 2	4 - 5	1 - 1	7 - 7	<1 - 1	18 - 17
Fe mg/L	0.3	0.005 – **3.01**	**10.8 - 10.6**	<0.03 - <0.03	**0.48 - 0.59**	<0.03 - <0.03	**47.7 - 44.5**	0.11 - <0.1	**1.17 - 1.33**
Hardness mg/L	500	28 – 65	405 - 306	251 - 194	84 - 81	204 - 163	272 - 181	94 - <86	100 - 87
K mg/L		<0.4 – 7.1	14 - 12	3 - 2	6 - 6	2 - 1	13 - 14	1 - 1	3 - 2
Mg mg/L		<0.001 – 43	25 - 21	18 - 15	7 - 7	15 - 13	14 - 10	7 - 7	6 - 6
Mn mg/L	0.05	<0.001 – **46**	**8.04 - 7.18**	<0.01 - <0.01	**0.12 - 0.16**	<0.01 - <0.01	**3.81 - 3.08**	0.04 - 0.04	**0.92 - 0.93**
Na mg/L	200	0.7 – 7	31 - 26	2 - 3	8 - 9	2 - 2	9 - 8	2 - 2	9 - 11
TDS mg/L	500	42.4 – 198	**567 - 532**	287 - 264	140 - 159	234 - 227	406 - 340	118 - 127	166 - 168

Notes:

Bold *values exceed ODWS/OG*

Hardness listed as maximum value in MECP ODWS/OG Technical Guidance document

Table 9 illustrates that the major component of off-site leachate impact is focused in the vicinity of monitoring wells 07-3, 07-F and to a lesser extent 08-1 and 95-4. Wells 07-3, 07-F and 08-1 are located in the road allowance in close proximity to the waste area. Monitoring well 95-4 is located slightly further west. Similar to the groundwater south of the site, the deeper groundwater on balance reveals parameters with the higher chemical concentrations. Chemical concentrations dissipate rapidly moving west from the site as evidenced by the low chemical concentrations in the other monitoring wells that are located on the property recently purchased by the municipality (i.e. wells 95-3, 95-5 and 96-1). The groundwater at these locations is not impacted by leachate from the waste disposal site. Historical trends of the chemical results from the off-site wells located to the west on the newly acquired property are provided in **Appendix I.** The water quality at these locations does not reveal any increasing trends in concentrations with the exception of slight increasing trends in chloride and conductivity concentrations at monitoring well 95-4D.

6.5 Residential Monitoring Wells

As required by Item 14 of the ECA, groundwater supply wells local to the site were sampled most recently during the 2018 monitoring program.

In 2018 the residential wells were sampled to ensure impacts from landfilling are not reaching drinking water wells in the vicinity of the site. Sampling was completed during the 2018 program at four (4) residential wells along Millers Road near the landfill site. The results of the residential groundwater sampling are shown in **Table 10**. None of the sampled residential wells exceeded ODWS/OG for the prescribed analytes. It is interpreted that the landfill is not influencing the water quality of the residential wells. It is recommended to include the residential wells on a 3-year basis with the next sampling scheduled for 2021.

Table 10
Residential Wells

Parameter	ODWS/OG Objective	Background Monitoring Wells 91-2 and 95-5 Historical Range of Values	Leachate Characteristics Monitoring Well 95-6 May 18 - Oct 18	1227 May 18 - Oct 18	1235 May 18 - Oct 18	1236 May 18 - Oct 18	1244[1] Oct 18
Alkalinity CaCO3	30-500	30 – 177	343 - 326	108 - 124	112 - 51	36 - 33	51
B mg/L	5	<0.005 – 0.025	0.74 - 0.78	0.06 - 0.07	0.02 - 0.03	<0.01 - <0.01	<0.01
Ba mg/L	1	0.005 – 0.08	0.56 - 0.52	0.01 - 0.01	<0.01 - <0.01	<0.01 - <0.01	<0.01
Ca mg/L		8 – 52.9	121 - 88	16 - 16	15 - 9	12 - 6	14
Cl mg/L	250	0.25 – 21	24 - 23	1 -2	10 - 10	3 - 1	1
Fe mg/L	0.3	0.005 – **3.01**	**10.8 - 10.6**	<0.03 - 0.03	<0.03 - <0.03	<0.03 - <0.03	<0.03
Hardness mg/L	500	28 – 65	405 - 306	56 - 56	50 - 31	38 - 19	47
K mg/L		<0.4 – 7.1	14 - 12	<1 - <1	1 - 1	1 - <1	<1
Mg mg/L		<0.001 – 43	25 - 21	4 - 4	3 - 2	2 - 1	3
Mn mg/L	0.05	<0.001 – **46**	**8.04 - 7.18**	<0.01 - <0.01	<0.01 - <0.01	<0.01 - <0.01	<0.01
Na mg/L	200	0.7 – 7	31 - 26	33 - 31	21 - 16	3 - 3	3
TDS mg/L	500	42.4 – 198	**567 - 532**	153 - 155	138 - 99	64 - 56	78

Bold *values exceed ODWS/OG*

Notes: 1244[1] No sample was collected in spring 2018 sampling event

Hardness listed as maximum value in MOE ODWS/OG Technical Guidance document

Residential sample locations numbered by their municipal address along Millers road

6.6 Bedrock Groundwater

Bedrock at the site is discussed in depth in **Section 2.2** and is comprised of basement Precambrian felsic metasediments.

Overall the bedrock surface dips to the east to the Ottawa River. Intuitively the groundwater, although controlled by the fracture network within the Precambrian bedrock will be east onto CNL property that is restricted for development. As per TSS comments dated December 3, 2013, and as a precautionary measure, water wells from users within 500m of the site were sampled. Sampling was completed during the spring and fall events in 2018. The sampling included the analysis of inorganics and organic (VOCs) parameters. Of the four (4) residential wells sampled, one (1) is reported to be utilize the bedrock as a water supply aquifer. As indicated in **Section 6.5**, no impact from the landfilling is interpreted to be impacting the residential well network near the site. We have recommended that sampling from the residential wells be completed periodically on a three-year basis with the next sampling to be completed in 2021.

6.7 Assessment of Impact of the Landfill Site on Groundwater

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

Aesthetic Parameters

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

Health Related Parameters

Degradation of less than 25% of the difference between the background quality and the established objective for the particular health related parameter.

Acceptable concentrations are based on background levels and water quality guidelines (ie. drinking water objectives).

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

Health Related:

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

Non-Health Related:

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

Where:

C_{allow} = Maximum allowable concentration of parameter as per the RUC guidelines
C_m = Maximum acceptable concentration (MAC) of parameter as per the ODWS/OG
P_b = Chosen background value of parameter

As per Condition 7.7 of the ECA it must be ensured that the site is in compliance with MECP Guideline B-7. All monitoring points along the property boundary must meet the RUC to ensure the sites compliance. The parameters used in this assessment of Guideline B-7 include: alkalinity, boron, barium, chloride, sodium and TDS. As suggested by the Ministry in their memorandum of May 2001 (**Appendix B**) it is not uncommon for manganese and other parameters (iron, TDS, aluminium) to naturally occur in excess of ODWS/OG. It was however suggested by MECP TSS review dated December 3, 2013 that iron and manganese be added to the list of Reasonable Use parameters for the Guideline B-7 assessment. As such, iron and manganese have been included in the assessment.

Item 14 of the ECA recommends vinyl chloride be added as a compliance parameter. As a result of this recommendation, vinyl chloride has been included as a compliance parameter.

Table 11 outlines the Reasonable Use Criteria for selected parameters at the site.

Table 11
Reasonable Use Criteria

Parameter mg/L	P_b	C_m	F	C_{allow}
Vinyl Chloride	0.0002	0.002	0.25	0.0009
Boron	0.01	5	0.25	1.26
Barium	0.0155	1	0.25	0.26
Alkalinity	50.5	500	0.5	275.3
Chloride	1	250	0.5	125.3
Iron	0.03	0.3	0.5	0.165
Manganese	0.012	0.05	0.5	0.035
Sodium	3.1	200	0.5	101.6
TDS	78	500	0.5	285

Notes:

Background values are the median values from monitoring wells 91-2 and 95-5 from 1991/1995 to 2018

Background values of vinyl chloride assumed to be laboratory detection limit

The maximum acceptable concentrations, C_{allow} are compared to the groundwater quality results for the monitoring wells sampled during 2018. The monitoring wells considered in the Reasonable Use Assessment have historically been those wells that are located along or beyond the western landfill boundary and included: 07-3S, 07-3D, 07-FS, 07-FD, 91-5S, 91-5D, 95-3S, 95-3D, 95-4S, 95-4D,95-5, 96-1S and 96-1D. Wells to the south and southeast are not considered in the Reasonable Use Assessment as we concur with the MECP in their memorandum of October 29, 2007 that impacts to the groundwater quality in the southeast downgradient direction will be contained within the contaminant attenuation zone. As a result of the recent purchase of property to the west of the landfill site by the Municipality (for the purpose of a CAZ), the compliance monitoring well for the Reasonable Use Performance Objectives (RUPO) assessment will be monitoring well 96-1S and 96-1D. As per TSS comments dated December 3, 2013, and recommendations from item 14 of the ECA, monitoring wells 95-3S and 95-3D have been added to the assessment. **Table 12** outlines the chemical values from these wells in comparison to the RUPO.

Table 12
Summary of 2018 MECP Guideline B-7
Reasonable Use Calculations
Western Property Line

Parameters		Callow	95-3S	95-3D	96-1S	96-1D
Health Parameters	***Boron mg/L***	1.26				
	May-18		<0.01	<0.01	<0.005	<0.01
	Oct-18		<0.01	<0.01	<0.01	<0.01
	Barium mg/L	0.26				
	May-18		<0.01	0.02	0.006	0.02
	Oct-18		<0.01	<0.02	<0.01	0.02
	Vinyl Chloride mg/L	0.0009				
	May-18		<0.2	<0.2	<0.2	<0.2
	Oct-18		<0.2	<0.2	<0.2	<0.2
Aesthetic Parameters	***Alkalinity mg/L***	275.3				
	May-18		69	78	5	103
	Oct-18		72	81	25	108
	Chloride mg/L	125.3				
	May-18		<1	6	<0.6	2
	Oct-18		1	7	<1	2
	Iron mg/L	0.165				
	May-18		0.04	0.04	0.521	0.11
	Oct-18		0.05	0.05	<0.05	0.11
	Manganese mg/L	0.035				
	May-18		<0.01	0.02	0.009	0.04
	Oct-18		<0.01	0.02	<0.05	0.04
	Sodium mg/L	101.6				
	May-18		2	5	1.7	2
	Oct-18		2	5	<2	2
	TDS mg/L	285				
	May-18		96	133	11	142
	Oct-18		96	134	39	144

Notes:

exceeds RUC

All parameters reveal concentrations that are less than the RUPO with the exception iron (spring) for monitoring well 96-1S, and manganese (spring and fall) for monitoring well 96-1D. The presence of naturally occurring manganese and iron throughout the area has been documented. Neither manganese nor iron reveal increasing trends in concentration (Manganese range from 0.01 mg/L to 0.18 mg/L dating to 1996, for monitoring well 96-1D, and iron ranged from <0.005 mg/l to 6.74 mg/l, dating to 1996 for monitoring well 96-1S. Due to the low values of all other leachate indicator parameters we believe the concentrations are likely attributed to the local mineralogy in the area. Accordingly, the site is interpreted to be compliant with Guideline B-7.

6.8 Organic Analysis

Organic sampling was completed in 2018 at selected sample locations. The sample locations analysed for organic parameters include:

95-3D (Spring and Fall)
95-3S (Spring and Fall)
96-1S (Spring and Fall)
96-1D (Spring and Fall)
07-3S (Spring and Fall)
07-3D (Spring and Fall)
95-6 (Spring and Fall)

The organic sampling did not reveal any exceedances of ODWS with the exception of vinyl chloride at monitoring wells 07-3D (spring and fall) and 95-6 (spring and fall). The exceedances of vinyl chloride are consistent with historical organic sampling at these locations. Vinyl chloride was added to the compliance assessment list as per Item 14 of the ECA. Vinyl chloride was not present at other locations revealed in the assessment outside of monitoring wells 07-3D and 95-6 and therefore is not migrating off-site.

Monitoring wells 07-3S and 07-3D are located along the western landfill line. Monitoring well 95-6 is located to the south east within the flow path. The chemical results are tabulated and provided in **Appendix H**.

Residential sampling in 2018 included the analysis of benzene, 1,4-dichlorobenzene, dichloromethane, toluene and vinyl chloride. All parameters revealed concentrations that were less than ODWS/OGs.

6.9 Leachate Impacted Areas

Leachate impact has been measured at monitoring wells that are located along the western perimeter of the waste fill boundary at monitoring wells 07-3D, 07-FD and 08-1D and southeast of the site at monitoring well 95-6. To the west, the impact has been characterized by inorganic parameters at elevated concentrations and the presence of organic parameters at concentrations greater than minimum detection limits and Ontario Drinking Water Standards Objectives and Guidelines. Vertically, the impact is restricted to the deeper overburden groundwater as the shallow piezometer settings at all locations do not reveal any impact. Horizontally, the leachate impact is confirmed to be at least as far as monitoring well 95-4 but not as far as wells located further to the west and southwest (i.e. 96-1 and 95-3). Groundwater elevations confirm a direction of the groundwater flow to be southeast from the site. Chemical concentrations to the west continue to be reduced significantly in a short distance. The low chemical concentrations as indicated in samples collected from both the deep and shallow monitoring levels from wells 95-3 and 95-5 (in comparison to the respective levels from wells 07-3, 07-F, 95-4 and 08-1) confirm a rapid decrease in plume strength in this direction. The compliance monitoring well 96-1S & D now located along the western edge of the municipal holdings is not impacted by the waste disposal site.

7.0 SITE COMPLIANCE

The purpose of this report is to confirm the mitigation of any off-site impacts as a result of the landfilling operations and to ensure compliance with respect to MECP Guideline B-7.

In 2009, the municipality had taken action to assess and mitigate off-site leachate impacts to the south and east. Currently any impacts leaving the site to the southeast are contained within the CAZ that was established under the Lease Agreement of 2005.

As discussed in the December 2008 annual report completed by Jp2g Consultants, groundwater monitoring indicated that ODWS/OG exceedances attributed to landfill leachate impacts were at the western site boundary and beyond (monitoring wells 07-3D, 07-FD and 08-1D). These monitoring wells revealed concentrations of selected inorganic (primarily 07-3D) and organic concentrations that were greater than ODWS/OG limits.

With this in mind the following options were presented to the Municipality for consideration to achieve compliance of the Miller's Road Waste Disposal Site.

Option 1	Source containment or removal.
Option 2	Establish a CAZ to bring the site into compliance with respect to Guideline B-7 based on ODWS/OG limits.
Option 3	Install a pump and treat groundwater recovery system.

As per Condition 31 of the former ECA (i.e. Notice 6 dated November 26, 2009), the Municipality acquired an approximate 14 hectare parcel of land located immediately west of the Millers Road Waste Disposal Site for the purpose of a CAZ (**Figure 3**). The property has been registered on title as a Contaminant Attenuation Zone.

In addition to the recently purchased CAZ (i.e. the lands to the west of the Miller's Road Waste Disposal Site, beyond the 66 foot road allowance located in Part Lot 5, Concession 13, geographic Township of Buchanan now in the Town of Laurentian Hills), the Official Plan for the Town of Laurentian Hills includes policies for setbacks and influence areas for waste disposal sites. Section 8.6.5 generally states that no development will be permitted within 30m of the boundary of the licensed fill area, and the development of sensitive land uses proposed within 500m may be permitted where justified by an environmental impact study. The study must demonstrate that the proposed development will not be negatively impacted by the waste disposal facility eg. leachate methane gas, rodents, vermin, odours, fire etc. Where recommended by the impact statement, measures to mitigate any adverse effects will be required as a condition of development.

The Town of Laurentian Hills Zoning By-Law 11-05 adopts similar provisions for land uses adjacent to a waste disposal site. The minimum distance separation (30m) and the influence area (500m) provisions are included in Section 4.23 of the By-Law.

8.0 ASSESSMENT OF TRIGGER VALUES

The trigger mechanism for the Millers Road WDS is recommended to be identified as the exceedance of 75% of the MECP Guideline B-7 limits along the western limit of the designated contaminant attenuation zone (i.e. monitoring well 96-1S and D) where the exceedance of parameters used in the RUC assessment is observed over two (2) consecutive groundwater monitoring events. A trigger mechanism is not required south east of the site as the property is comprised of restricted federal lands (i.e. CNL property) and the Ministry has indicated that contaminants will be maintained within the CAZ in this direction. As per item 14 of the ECA monitoring locations 95-3S and D have been included in the trigger assessment as compliance locations.

Table 13 outlines the 75% trigger value of selected reasonable use parameters for monitoring wells 96-1 and 95-3. Monitoring well 96-1 is located along the western property line and monitoring location 95-3 is located much closer to the landfill area. In the event of exceedances over two (2) consecutive monitoring periods a tiered monitoring program as described in **Section 8.1** shall be implemented.

Table 13
Trigger Values

Parameter mg/L	C_{allow}	75% value	95-3S*		95-3D*		96-1S		96-1D	
			May-18	Oct-18	May-18	Oct-18	May-18	Oct-18	May-18	Oct-18
Vinyl Chloride	0.0009	0.00068	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Boron	1.26	0.945	<0.01	<0.01	<0.01	<0.01	<0.005	<0.01	<0.01	<0.01
Barium	0.26	0.195	<0.01	<0.01	0.02	<0.02	0.006	<0.01	0.02	0.02
Alkalinity	275.3	206.48	69	72	78	81	5	25	103	108
Chloride	125.3	93.98	<1	1	6	7	<0.6	<1	2	2
Iron	0.165	0.12375	0.04	0.05	0.04	0.05	0.521	<0.05	0.11	0.11
Manganese	0.035	0.02625	<0.01	<0.01	0.02	0.02	0.009	<0.05	0.04	0.04
Sodium	101.6	76.2	2	2	5	5	1.7	<2	2	2
TDS	285	213.75	96	96	133	134	11	39	142	144

Notes:
**Compliance location as recommended by MECP*
Exceeds Trigger Value

As indicated in **Table 13**, no parameters exceed the 75% trigger values with the exception manganese, for both spring and fall events at monitoring location 96-1D, and iron at 96-1S for the spring sampling event.

For the same reasons discussed in Section 6.7, iron and manganese are considered poor indicators of off-site impact. These parameters have been documented to be prevalent in the environment, there is no increasing trends in concentrations over time and other parameters concentrations are low at this location. Based on this information and the location of 96-1 S/D being up gradient from the site, it is interpreted that this well is not impacted by the waste site.

Accordingly, the site is interpreted to be compliant with Guideline B-7 and subsequent tiered monitoring is not warranted.

8.1 Tiered Monitoring

As per the ECA dated April 4, 2014 a contingency plan was developed to formalize an action plan in the event of a groundwater or surface water exceedance of the trigger mechanism. Condition 8.2 of the ECA required that '*…the Owner shall submit to the Director for approval and copies to the District Manager, details of a contingency plan to be implemented in the event that the surface water or groundwater quality exceeds the trigger mechanism,*' A contingency plan was prepared by Jp2g Consultants on behalf of the Town of Deep River in January 2015 and provided to the MECP. The plan was approved by the amended ECA dated September 20, 2017.

The trigger mechanism for the Millers Road WDS is recommended to be identified as the exceedance of 75% of the MECP Guideline B-7 limits along the western limit of the designated contaminant attenuation zone (i.e. monitoring well 96-1S and D) where the exceedance of parameters used in the RUC assessment is observed over two (2) consecutive groundwater monitoring events. As per item 14 of the ECA monitoring locations 95-3 S and D have been included in the trigger assessment as compliance locations. A trigger mechanism is not required south east of the site as the property is

comprised of restricted federal lands (i.e. CNL property) and the Ministry has indicated that contaminants will be maintained within the CAZ in this direction.

In the event that chemical values from the designated monitoring station/s (96-1S and D and 95-3S and D) exceed the trigger mechanism values (during 2 consecutive sampling events), a tier type sampling program will be initiated. The three-tier monitoring program is listed below.

Tier 1 Trigger Level

Any two consecutive ground water samples from the routine annual monitoring program that exceed the trigger values may trigger the Tier II monitoring as indicated below. Subsequent to the exceedance, an assessment will be provided to the MECP to determine the necessity of Tier II monitoring.

Tier II Trigger Level

Tier II monitoring will consist of consecutive monthly groundwater sampling of the compliance wells (96-1 and 95-3). The list of parameters will be as in the routine sampling. The Tier II monitoring results shall be provided to the MECP District Manager as soon as they are available. Any two consecutive groundwater samples from the Tier II monitoring program that exceed values as indicated above, will trigger the implementation of the appropriate contingency plan(s) and Tier III monitoring as outlined below. If the above Tier II monitoring does not show further exceedances, or, if in the opinion of the district manager the monitoring may return to the routine program.

Tier III Trigger Level

Within 60 days of the triggering of Tier III (ie. two consecutive monthly exceedances), the Town will provide to the MECP District Manager a detailed work plan and implementation schedule for an appropriate contingency to control leachate and Tier III monitoring program to verify the effectiveness of the contingency, or alternatively, rational for the cessation of tiered monitoring.

8.2 Groundwater Contingency

Under MECP Guideline B-7, the owner of a waste disposal site is responsible for preventing unacceptable off-property groundwater impacts. Should the groundwater monitoring program indicate the existence of, or potential for, unacceptable impacts, the owner shall prepare and present a mitigation plan for the approval of the MECP. In this event, actions taken by the Town of Deep River to prevent or remediate the off-property impacts could consist of:

a) acquisition of additional land to bring the Site in compliance with MECP Guideline B-7;
b) gaining control over the contaminated groundwater to bring the Site into compliance; or
c) developing and implementing groundwater control/treatment measures to bring the Site into compliance with MECP guideline B-7.

9.0 METHANE MONITORING

Methane monitoring was completed during the 2018 monitoring events. Methane was not detected in any of the monitored wells or the on-site attendants shed during the monitoring.

10.0 SURFACE WATER ASSESSMENT

10.1 Introduction

This section outlines the results of the 2018 surface water monitoring at the Miller's Road Landfill Site. The purpose of this sampling is to assess the impact of the site on the local surface water as well as to compare the chemical concentrations to historical data, the Provincial Water Quality Objectives (PWQO), the Canadian Water Quality Guidelines (CWQGs) and Aquatic Protection Values (APVs). The PWQO's are values established by the Ministry to serve as chemical and physical indicators and provide guidance in making water quality management decisions. The Ministry last completed a review of and commented on the surface water monitoring as part of the *Miller's Road Waste Disposal Site Contingency Plan, 2015*. This memorandum (dated May 17, 2017 is provided in **Appendix B**.

10.2 Surface Water Setting

There are two surface water features in close proximity to the landfill site. They are Spring Creek and the unnamed Landfill Creek. Spring Creek originates upgradient and west of the landfill site and passes under Miller's Road approximately 300 metres west of the access road to the site entrance. From here, Spring Creek meanders south of the site in an eastward direction to Maskinonge Lake. The Landfill Creek originates south east of the site and meanders in this direction until it meets with Spring Creek approximately 0.5 km south east of the site. The following provides a brief description of the surface water stations. Pictures are taken from the October 2018 sampling event. The surface water stations are located in **Figure 9**.

SW-1



Surface water station SW-1 is located upgradient of the site as Spring Creek passes under Miller's Road. This site has been deemed to be representative of background conditions.

SW-2



Monitoring station SW-2 is located as the Landfill Creek emerges from the ground south east of the landfill site. This station is often characterized by iron precipitate and a visual presence of leachate.

SW-3



Monitoring station SW-3 is located approximately 100 metres southeast downgradient of station SW-2. Iron precipitate is often present at this location although to a lesser extent than SW-2.

SW-4



Monitoring station SW-4 is located further downstream in the Landfill Creek.



SW-5

Monitoring station SW-5 is located further downstream in the Landfill Creek.



SW-6

This monitoring station is the last station along the Landfill Creek prior to the convergence with Spring Creek. This station is considered a compliance station.



SW-7

This monitoring station is located in Spring Creek just downstream of the convergence of the Landfill Creek and Spring Creek.

10.3 Assessment Program

Surface water sampling was completed at the waste disposal site to evaluate the impact of the waste disposal site on the local water quality. Overall, sampling has been carried out at the waste disposal site since 1985 and the surface water information dates back to the summer of 1996. Since this time several monitoring events have been completed, the latest surface water monitoring event being discussed was completed in the fall of 2018. The results of the chemical and physical analysis are provided in **Appendix H**.

10.4 Background Surface Water Quality

For the purpose of the landfill site assessment the background surface water quality (SW-1) is unaffected by leachate from the landfill site. The data collected from SW-1 was therefore used to compare to all the other sampling locations.

Throughout the monitoring period, chemical parameters from station SW-1, in general, revealed exceedances of similar parameters as were found in most of the other sampling locations. The parameters exceeding PWQOs for the 2018 monitoring event were dissolved aluminium and iron.

Summary statistics for dissolved aluminium and iron are as follows:

	PWQO	Median (last 10 events)	75th percentile (1996 - 2018)	Min	Max
Dissolved Aluminium mg/L	0.075	0.06	0.11	0.007	0.19
Iron mg/L	0.3	0.74	1	0.26	2.13

While both the Landfill Creek and Spring Creek reveal exceedances of similar parameters, the Landfill Creek does however exhibit some varied characteristics from Spring Creek. For instance, concentrations of alkalinity, boron, calcium, hardness, potassium, manganese and magnesium are higher in the Landfill Creek than that of Spring Creek.

10.5 Surface Water Quality

Table 14 lists the parameters from the recent sampling that exceed the Provincial Water Quality Objectives and Interim Provincial Water Quality Objectives (PWQO, IPWQO).

Table 14
2018 Chemical Parameters Above PWQO's

Monitoring Station PWQO ->	Boron 0.2	Iron 0.3	Unionized Ammonia 0.02	Aluminum 0.075
SW-1				
May-18				
Jul-18		1.02		0.08
Oct-18		0.66		
SW-2				
May-18		0.83		
Jul-18		0.81		
Oct-18				
SW-3				
May-18	0.26	4.35		
Jul-18	0.29	2.42		
Oct-18	0.1	2.77		
SW-4				
May-18	0.36	2.32	0.05	
Jul-18	0.41	2.8	0.03	
Oct-18	0.31	1.6		
SW-5				
May-18	0.35	2.29	0.05	
Jul-18	0.4	2.89	1	
Oct-18	0.3	1.81		
SW-6				
May-18	0.35	2.3	0.04	
Jul-18	0.4	2.26	0.04	
Oct-18	0.31	0.98		
SW-7				
May-18		0.42		
Jul-18		1.34		
Oct-18		0.72		

Notes:
All values in mg/L
CWQG for Boron is 1.5 mg/L

As indicated in **Table 14**, surface water exceedances were noted in the background sample location as well as sample locations in the Landfill Creek. The most prevalent parameter that reveals concentrations greater than PWQOs is iron. There is no apparent pattern with respect to iron concentrations as they vary along the Landfill Creek. The iron concentrations are in part perceived to be naturally occurring as both up gradient and downgradient monitoring locations reveal similar

values. Concentrations of boron in the downstream samples regularly reveal concentrations that are marginally greater than PWQO's. The boron values are however significantly less than the draft Canadian Water Quality Guidelines (1.5mg/L) that have been established and are interpreted to be based on more up-to-date aquatic toxicology information than the PWQOs from 1994. All unionized ammonia field parameters were below the PWQO. The field calculations are provided in **Appendix H**.

A spatial distribution graph of iron and boron is provided in **Appendix I**. The Graph indicates that both iron and boron are present in the landfill creek at concentrations that increase with distance from the landfill site (i.e. SW4, 5 and 6 are greater than SW-2 and 3). Intuitively, we would expect the reverse to occur.

Selected chemical values in the surface water from station SW-2 (the first sampling point leaving the site) were compared to the 2018 leachate samples (groundwater monitoring well 95-6). These are provided in **Table 15**.

Table 15
Water Quality Comparison SW-2 and 95-6

Parameters	ODWS/OG	PWQO	Surface water SW-2 Apr 17 - Oct 17	Monitoring Well 95-6 May 18 - Oct 18
Aluminum	0.1	0.075	<0.01 - <0.01	<0.01 - <0.01
Boron	5	0.2	0.04 - 0.04	0.74 - 0.78
Cobalt	--	0.0009	<0.0002 - <0.0002	0.0025 - 0.0021
Copper	1	0.005	<0.001 - <0.001	<0.001 - <0.001
Iron	0.3	0.3	**0.83** - 0.19	**10.8 - 10.6**
Zinc	5	0.03	<0.01 - <0.01	<0.01 - <0.01
Chloride	250	--	6 - 7	24 - 23

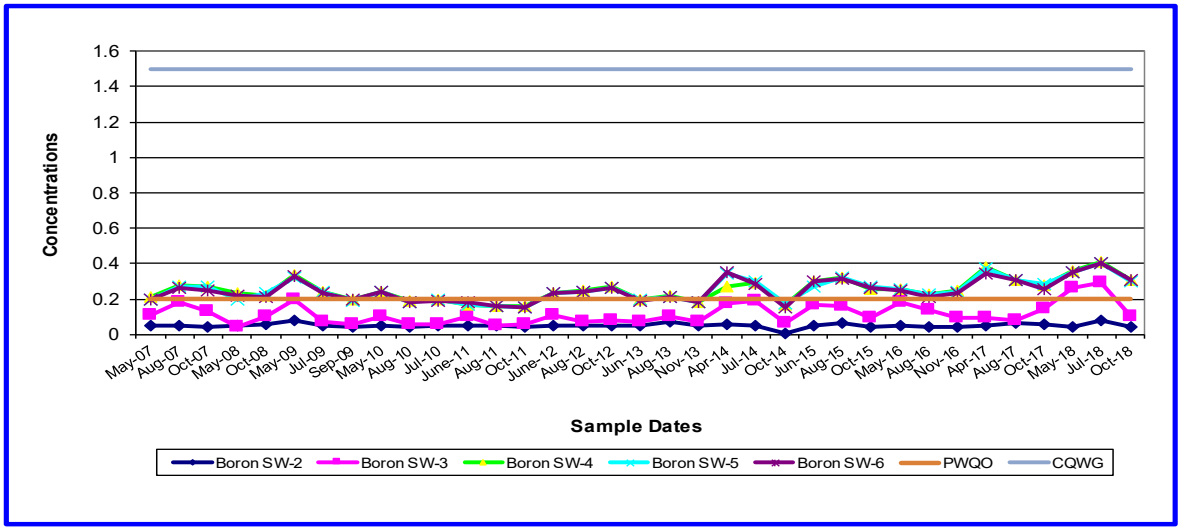
Bold exceeds ODWS/OG
Red exceeds PWQO

In general, it can be seen from **Table 15** that all parameters reveal lower chemical values in the surface water than the groundwater. The iron concentrations, although higher in the groundwater are likely a result of landfill impact as well as the natural occurrences.

We note the presence of boron at monitoring stations SW-4, SW-5 and SW-6. The concentrations are greater than the concentrations from monitoring stations SW-2 and SW-3 that are located closer to and are more likely to be impacted by the landfill site. The bedrock topography south east of the landfill site is such that groundwater will follow the bedrock surface to surface water locations SW-2 and SW-3. As indicated above, a spatial distribution graph is provided in **Appendix I**.

A review of the stream flows from the 2018 monitoring generally reveals slight increases at monitoring stations SW-4, SW-5 and SW-6 over monitoring station SW-3. The increased flows suggest slight contributions to the stream from areas other than the waste disposal site. Given the absence of boron concentrations at the surface water stations immediately south of the waste disposal site (SW-2) we can interpret some contribution from other sources. A comparison of the boron concentrations over the past ten years is provided in **Graph 3**. As shown in **Graph 3**, SW-2 and SW-3 located closest to the landfill site have the lowest boron concentrations in comparison to the monitoring locations further downstream.

Graph 3
Boron Concentrations



10.6 Surface Water Trigger Location

The Trigger Monitoring Station is SW-6. This monitoring point is located in the Landfill Creek before the confluence of the Landfill Creek and Spring Creek.

10.7 Surface Water Trigger Mechanism

Currently surface water monitoring occurs three times a year at seven (7) sampling locations. This is considered sufficient to confirm whether the subsurface and streams in the downgradient catchment area maintains PWQO standards. The following trigger location, mechanism and sampling protocols will assist in determining this.

- The trigger location is surface water station SW-6. This station is located before the confluence of the Landfill Stream and Spring Creek. The trigger mechanism was last reviewed and subsequently approved as part of the submission to expand the landfilling operations in 2014.

- Trigger mechanism parameters include

Unionized Ammonia	75th percentile	0.018 mg/L
Chloride	75th percentile	34.75 mg/L

- Other parameters (selected metals including iron) are not considered "stand-alone" trigger constituents, as these parameters were observed to occasionally exceed the PWQO at the unaffected background station SW-1.

- Sample collection should only be undertaken when there is continuous flow in the watercourse as stagnant ponded water is not representative of the surface water conditions.

- Any exceedance for any listed parameter should be defined as the numerical elevation of an analytical value above the trigger concentration or above the background concentration at up gradient station SW-1 if higher that the trigger concentration.

- Two consecutive exceedances for any listed trigger parameter at the SW-6 sample station should be deemed to be caused by the landfill and a contingency plan should be prepared and submitted to the MECP District Manager shortly after detection of the second exceedance.

In 2018 no trigger exceedance occurred for chloride. Field calculations for unionized ammonia revealed values to be lower, below 0.018 mg/l, ranging from 0.0024 mg/L to 0.0030 mg/L. The calculations based on field data are provided in **Appendix H** at the end of the surface water data base. No contingency measures are required at this time.

10.8 Surface Water Contingency

In the event two (2) consecutive exceedances occur the conductance of a detailed surface water/biological study to determine if the trigger exceedance causes acceptable or unacceptable quality/biological impact on the receiving watercourse will occur. We would add that prior to the initiation of such a study an assessment be provided to the Ministry on the need to move ahead with the surface water/biological study.

- recommendations for:

  - the site closure or continued operation with the design/construction of appropriate engineered facilities (such as leachate collection/treatment works, surface water drainage control, low permeability soil or geotextile capping of the refuse footprint);

  - the timing for the installation of the recommended remedial facilities; and

  - the subsequent quality monitoring program needed to confirm acceptable surface water impact.

If acceptable impact should be demonstrated by the surface water/biological study, the MECP would be requested to support the continuance of routine sampling program without mitigation regarding the specific trigger exceedance.

11.0 DISCUSSION AND RECOMMENDATIONS

The following discussion and recommendations are provided.

Groundwater Monitoring

- Two groundwater monitoring events (spring and fall) were completed as part of the regular monitoring program at the site.
- The direction of groundwater from the site is to be south east towards Maskinonge Lake. There may be some radial flow in the vicinity of Area 2 as a result of groundwater mounding under the landfilling area.
- Leachate impact has been measured at monitoring wells 07-3D, 07-FD, 08-1D, 95-4D (Area 2) and in the groundwater monitors 95-6 and 07-2 (south-eastern corner of Area 4).

- The leachate impact is measured by elevated inorganic concentrations (alkalinity, boron, barium, chloride, calcium, COD, hardness, sodium, TDS, manganese and iron). Groundwater leaving the site from Area 4 (southeast) will be contained with the CAZ in this direction.
- Impact west of Area 2 is also characterized by elevated organic parameters in the groundwater. The vertical impact in this direction is restricted to the deeper groundwater. The horizontal extent measures as far as monitoring well 95-4 but not as far as wells 95-3 and 96-1.
- The water quality from wells that are located slightly further to the west (95-3, 95-5 and 96-1S and 96-1D) is characterized by low levels of inorganic parameters and organic parameters below detections limits. The groundwater at these locations is not impacted by the Waste Disposal Site.
- As per Condition 31 of the former ECA, the Municipality purchased an approximate 14-hectare parcel of land immediately to the west of the landfill site. This acquisition has been registered on title as a Contaminant Attenuation Zone (CAZ).
- Groundwater organic sampling was completed in 2018. The organic sampling did not reveal any exceedances of ODWS with the exception of vinyl chloride at 07-3D and 95-6. Vinyl chloride was not revealed in the assessment outside of monitoring wells 07-3D and 95-6 and therefore is not migrating off-site. The presence of vinyl chloride at these locations is consistent with historical results.
- In 2018 the residential wells were sampled to ensure impacts from landfilling are not reaching drinking water wells in the vicinity of the site. Sampling was completed during the 2018 program at four (4) residential wells along Millers Road near the landfill site. None of the sampled residential wells exceeded ODWS/OG for the prescribed analytes. It is interpreted that the landfill is not influencing the water quality of the residential wells. It is recommended to include the residential wells on a 3-year basis with the next sampling scheduled for 2021, as per the MECP memorandum dated January 4, 2018 (provided in **Appendix B**).
- The site is interpreted to be in compliance with Guideline B-7 as revealed by the RUC assessment at monitoring wells 96-1S, 96-1D, 95-3S and 95-3D. Iron and manganese were revealed in the Reasonable Use Assessment however they are deemed to be at natural concentrations and not a result of landfilling activities. However, both parameters will continue to be included in the RUC and trigger assessments for future monitoring programs.
- No parameters exceed trigger values with the exception of iron and manganese at 96-1S and 96-1D. This is consistent with the B-7 assessment. Tier II sampling is not recommended.
- Continued ground and surface water monitoring is recommended as per the ECA.

Surface Water Monitoring

- Surface water sampling has been completed upstream and downstream from the landfill site in both Spring Creek and the Landfill Creek. Three surface water-sampling events (spring, summer and fall) were completed in 2018.
- The chemical values at monitoring station SW-1 are deemed reflective of background conditions. Surface water station SW-1 is located up gradient as Spring Creek passes under Miller's Road.
- All samples exhibit iron at all SW stations. Select metals and unionized ammonia were revealed to exceed PWQOs at select monitoring locations.

- Some impact is present in the Landfill Creek located to the southeast of the site. The impact is characterized by elevated metal concentrations as well as iron precipitate on the streambed.
- Surface water trigger mechanisms have been identified at monitoring station SW-6. The 2018 chemical values from monitoring station SW-6 revealed laboratory values of unionized ammonia to exceed the drinking water value and subsequently the trigger value. Unionized ammonia calculations based on field data are lower than PWQOs and trigger values. Consequently, contingency measures are not required at this time.
- Surface water will be sampled and reported on in 2019 as per the ECA.

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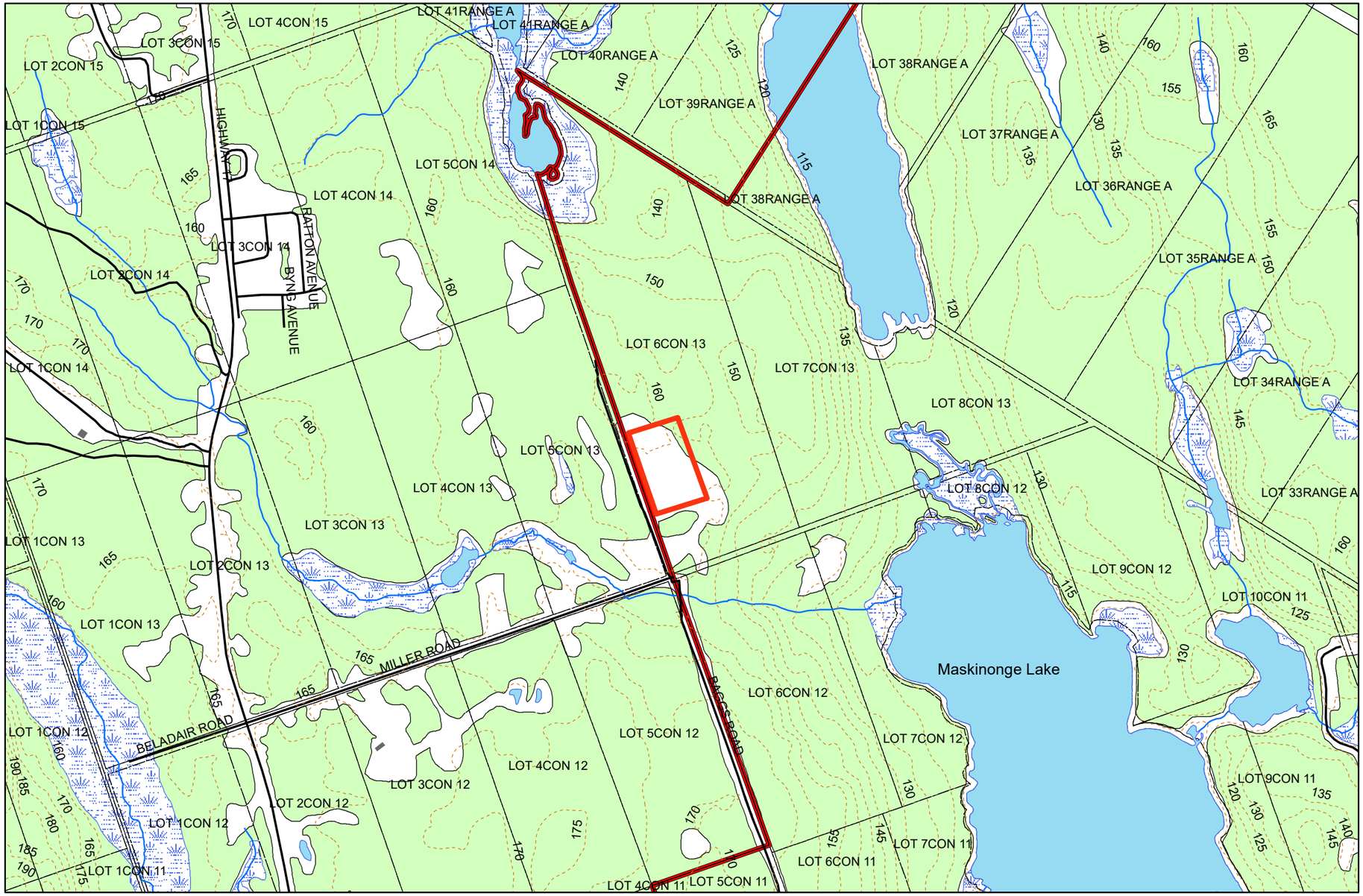
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LIMITATIONS AND USE OF THE REPORT

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

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

Figures



Legend

- Landfill Site
- Contour 5m Interval
- Road
- Railway
- Federal Land
- Waterbody
- Water Course
- Building to Scale
- Wetland
- Wooded Area

N
W
E
S

Notes:
Data obtained from Land Information Ontario, 2019
Shapefiles created by Jp2g Consultants Inc.

0 0.375 0.75 1.5 Kilometers

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

Millers Road WDS
Deep River, ON

1:15,000

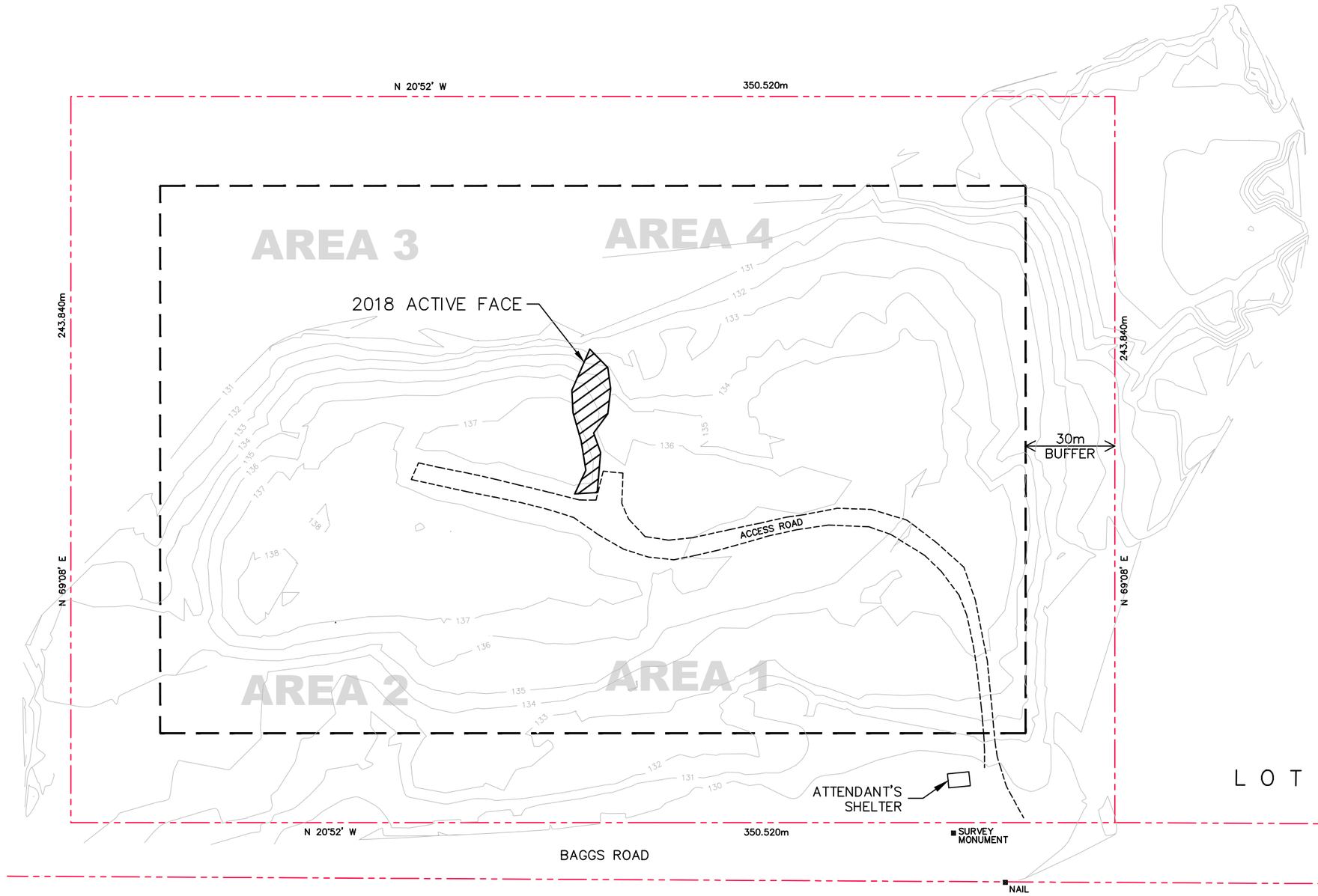
Project No. 17-6015C

Figure 1 - Site Location Map

Drawn By: JF

Checked by: AB

Date: May 2019



LEGEND

- PROPERTY LINE
- LIMITS OF FILL AREA
- 132 — 2018 SURFACE CONTOURS
- GRAVEL ROAD
- 2018 ACTIVE FACE AREA

NOTES

1) GROUND LEVEL CONTOURS ARE BASED ON THE MOST RECENT SITE SURVEY ON DECEMBER 18, 2018. COMPLETED BY JP2G CONSULTANTS INC.

N E S W

1:1 500

0 25 50 75 m

0 1:1 5 cm

No.	DATE	BY		REVISIONS

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

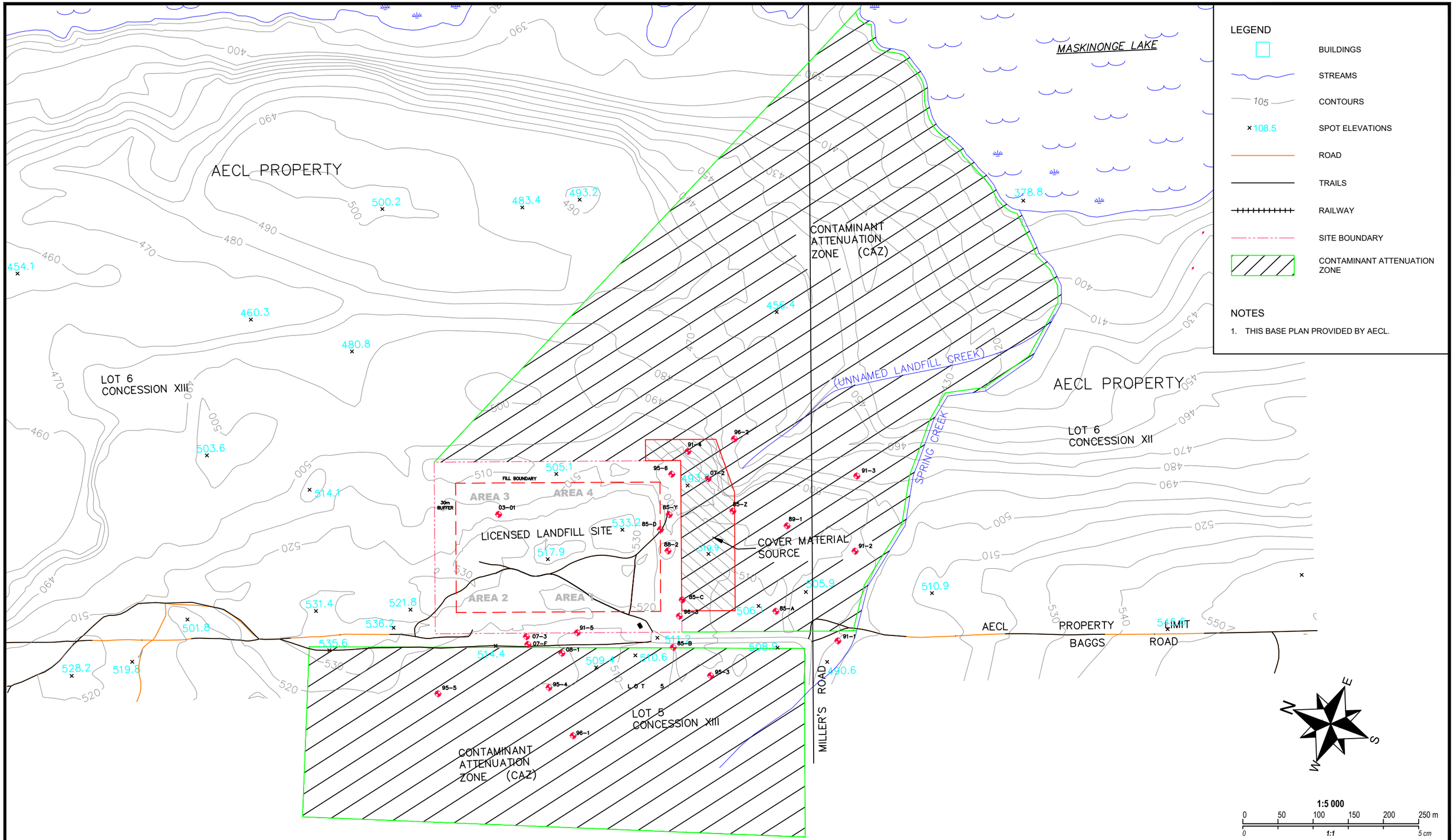
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DRAWN	BWS
CHECKED	KM
APPROVED	AB
SCALE	1:1500

MILLER'S ROAD LANDFILL SITE

TOWN OF DEEP RIVER

2018 EXISTING CONDITIONS PLAN

DATE	MAY 2019
PROJECT	17-6015C
PLOTTED	17-MAY-2019
FIGURE	2



No.	DATE	BY	REVISIONS

Jp2g Consultants Inc.
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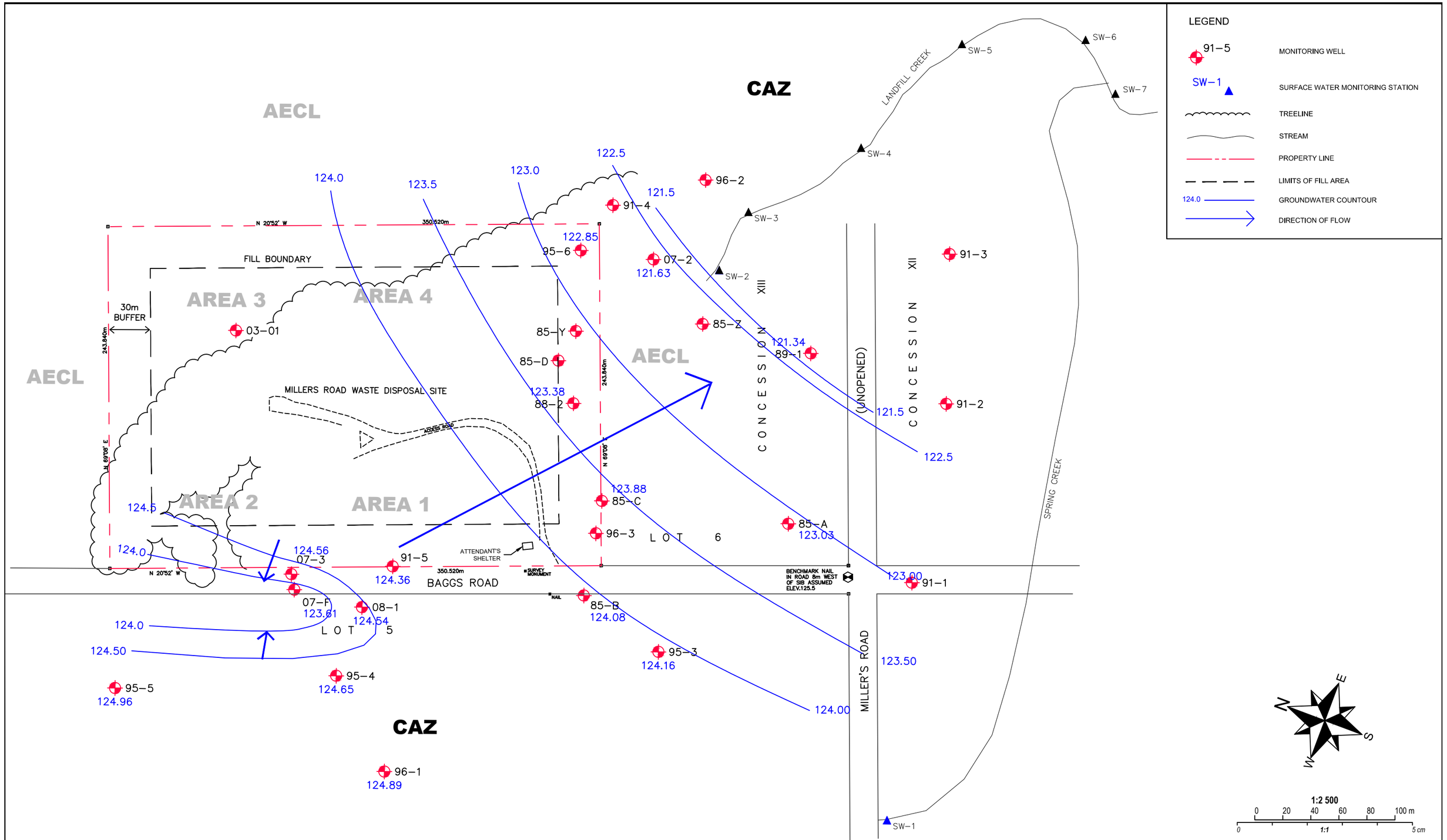
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APPROVED	AB
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MILLER'S ROAD LANDFILL SITE
TOWN OF DEEP RIVER

CONTAMINANT ATTENUATION ZONE

DATE	MAY 2019
PROJECT	17-6015C
PLOTTED	27-MAY-2019
FIGURE	3

DWG NAME: J:\6-ENVIRONMENTAL\ACTIVE\17-6015A - MILLERS ROAD\06 DRAWINGS\2019\2018 AMR\FIGURES.DWG LAYOUT: 03 SAVED ON Monday, May 27, 2019



No.	DATE	BY	REVISIONS

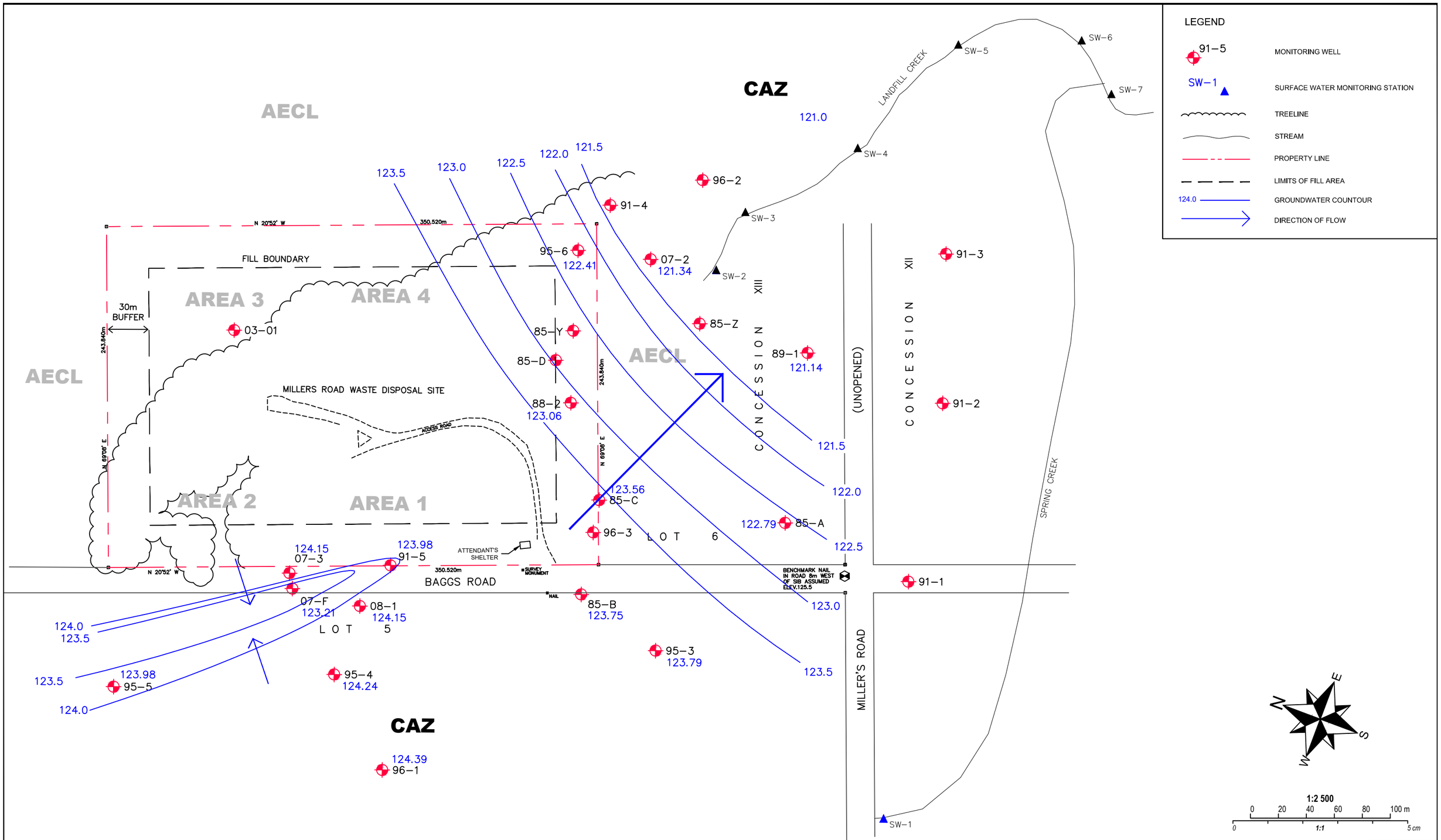
Jp2g Consultants Inc.
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APPROVED	AB
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MILLER'S ROAD LANDFILL SITE
TOWN OF DEEP RIVER

DIRECTION OF SHALLOW OVERBURDEN GROUNDWATER FLOW
SPRING 2018

DATE	MAY 2019
PROJECT	17-6015C
PLOTTED	05-05-19
FIGURE	7A



No.	DATE	BY		REVISIONS

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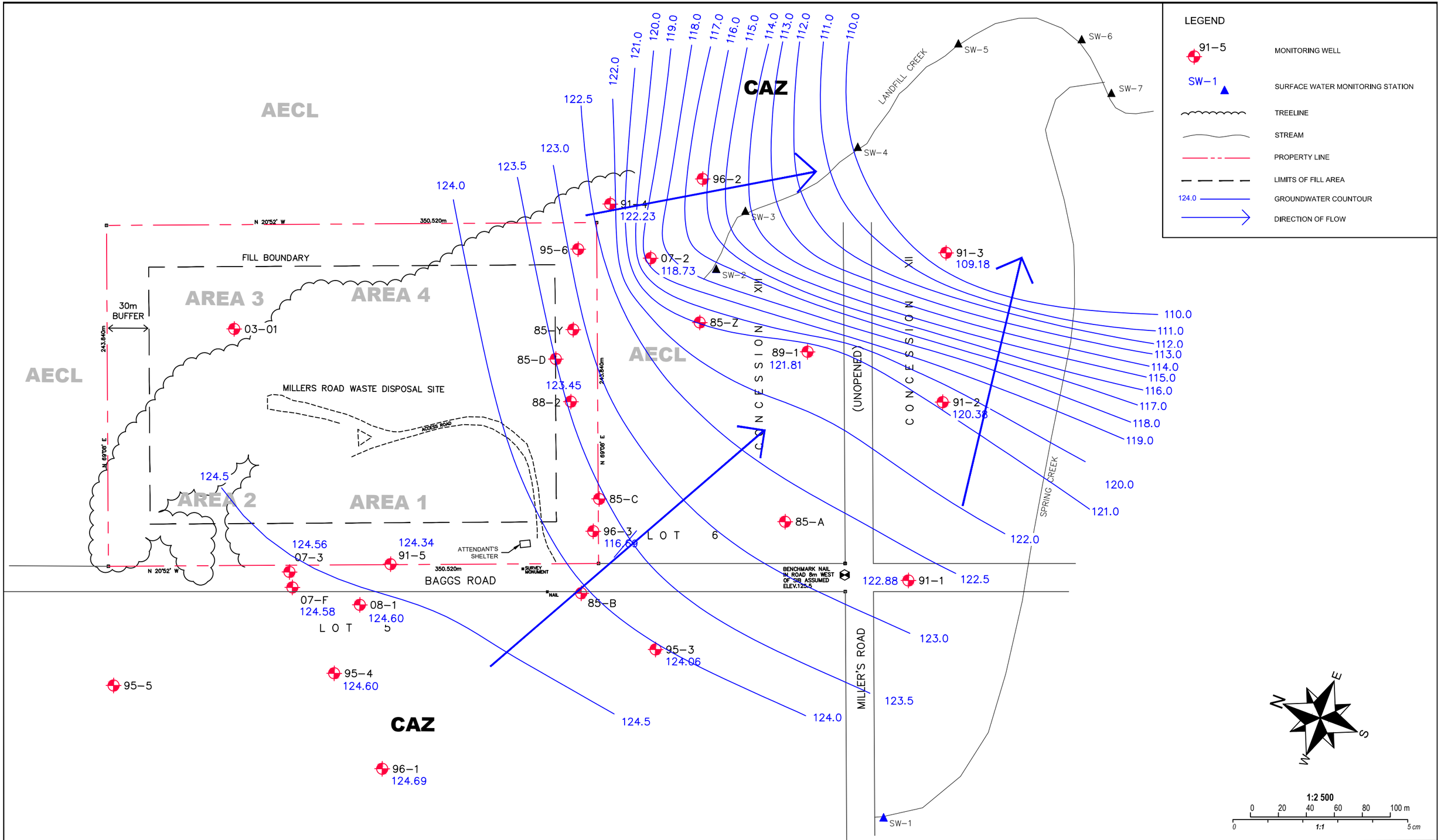
MILLER'S ROAD LANDFILL SITE

TOWN OF DEEP RIVER

DIRECTION OF SHALLOW OVERBURDEN GROUNDWATER FLOW

Fall 2018

DATE	MAY 2019
PROJECT	17-6015C
PLOTTED	05-05-19
FIGURE	7B



No.	DATE	BY	REVISIONS

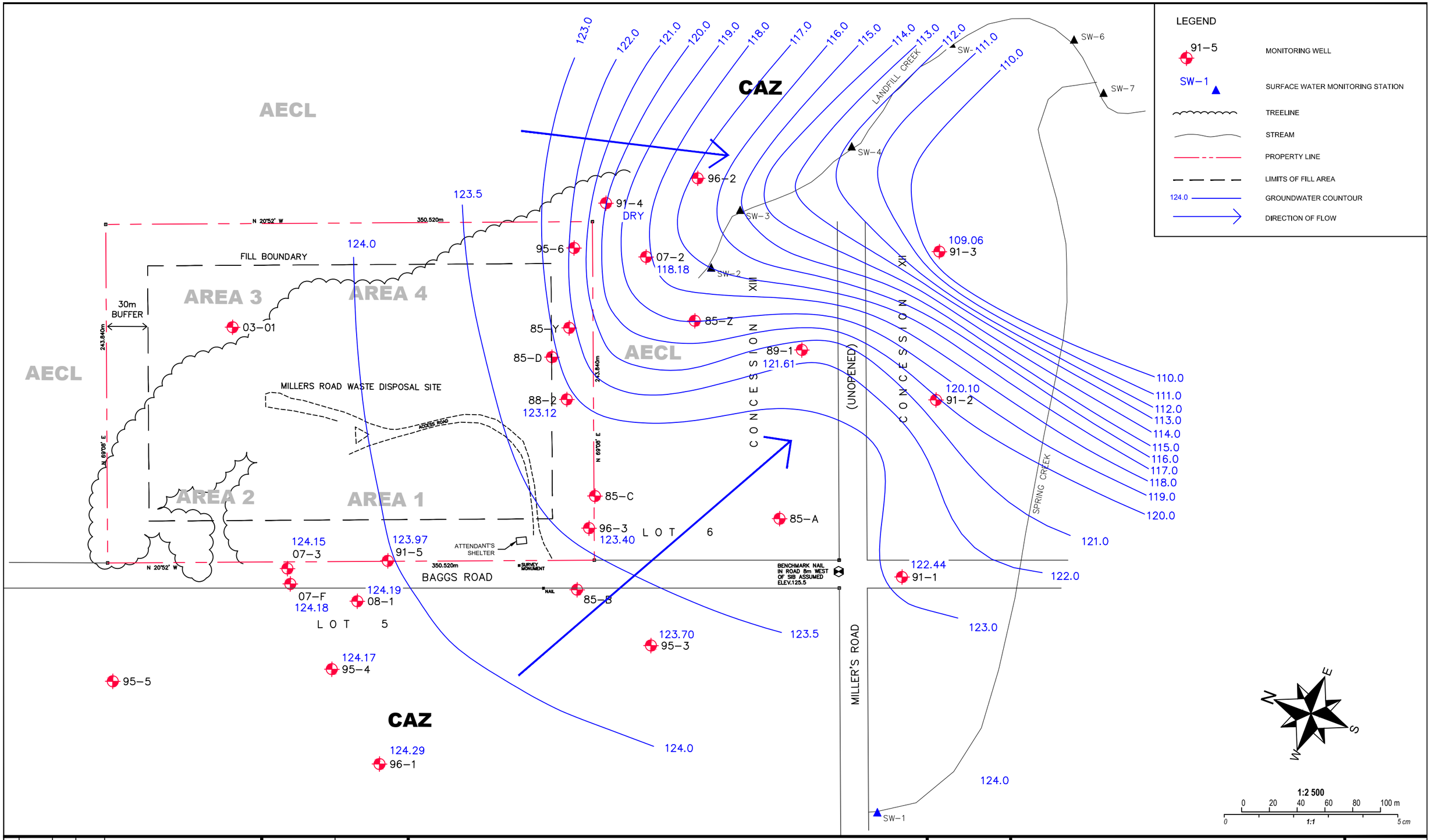
Jp2g Consultants Inc.
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APPROVED	AB
SCALE	1:2500

MILLER'S ROAD LANDFILL SITE
TOWN OF DEEP RIVER

DIRECTION OF DEEP OVERBURDEN GROUNDWATER FLOW
SPRING 2018

DATE	MAY 2019
PROJECT	17-6015C
PLOTTED	05-05-19
FIGURE	8A



No.	DATE	BY	REVISIONS

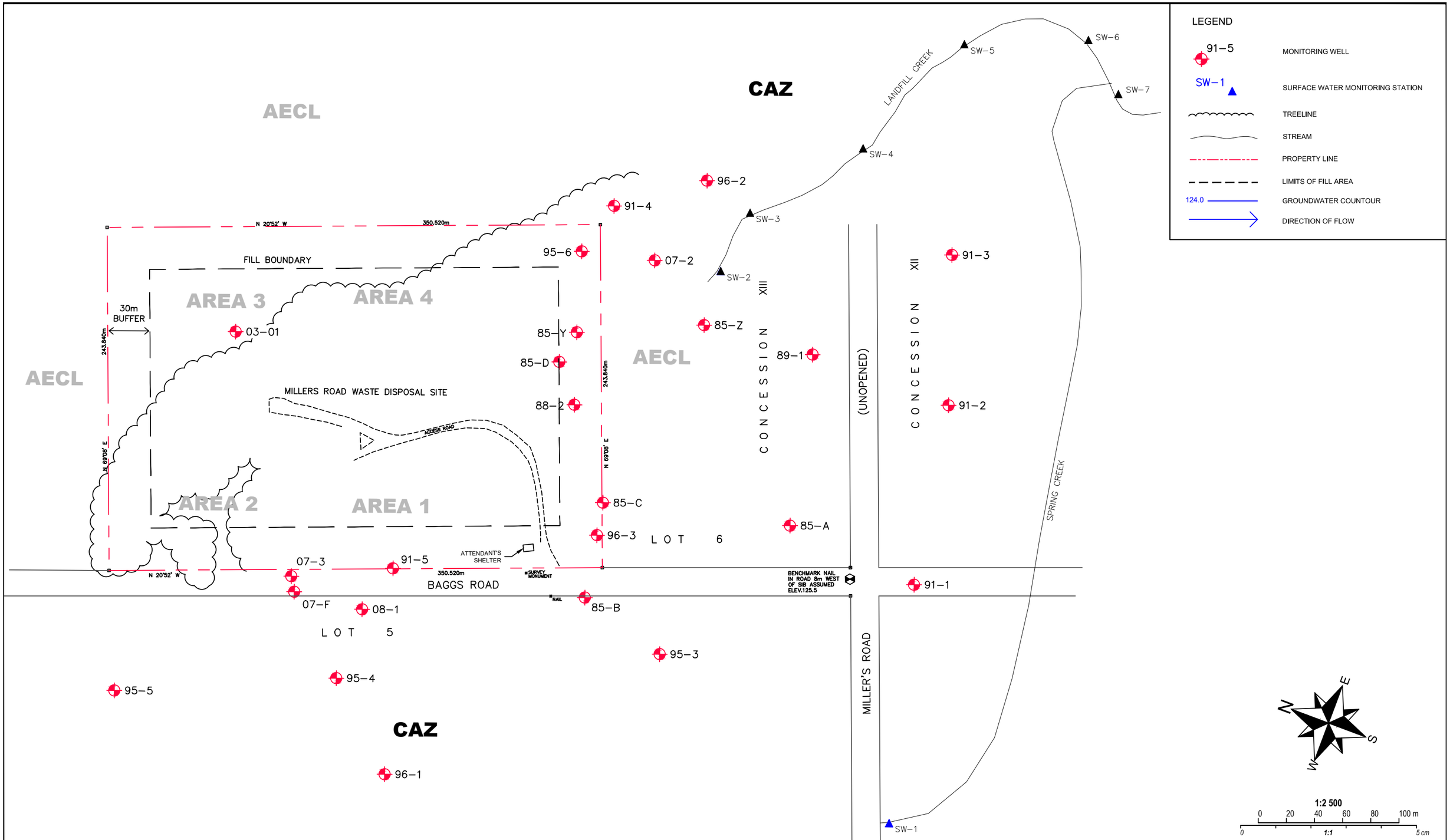
Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

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DRAWN	AS
CHECKED	AB
APPROVED	AB
SCALE	1:2500

MILLER'S ROAD LANDFILL SITE
TOWN OF DEEP RIVER

DIRECTION OF DEEP OVERBURDEN GROUNDWATER FLOW
FALL 2018

DATE	MAY 2019
PROJECT	17-6015C
PLOTTED	05-05-19
FIGURE	8B



No.	DATE	BY		REVISIONS

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS

DESIGNED	AS
DRAWN	AS
CHECKED	AB
APPROVED	AB
SCALE	1:2500

MILLER'S ROAD LANDFILL SITE
TOWN OF DEEP RIVER

MONITORING WELLS AND SURFACE WATER LOCATIONS

DATE	MAY 2019
PROJECT	17-6015C
PLOTTED	05-05-19
FIGURE	9

Appendix A

Environmental Compliance Approval

Content Copy Of Original

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDMENT TO ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A413106
Notice No. 1
Issue Date: September 20, 2017

The Corporation of the Town of Deep River
Post Office Box, No. 400
Deep River, Ontario
K0J 1P0

Site Location: Miller's Road Landfill Site
Lot 6, Concession 13
Town of Deep River, County of Renfrew
K0J 1P0

You are hereby notified that I have amended Approval No. A413106 issued on April 4, 2014 for a 4.5 hectare waste disposal site within a total site area of 8.55 ha being known as the Miller's Road Landfill Site , as follows:

The following Condition is hereby revoked and replaced with the following:

8.2 The Trigger Mechanism and Contingency Plan for the Site is hereby approved in accordance with Items 39, 40 and 41 in Schedule "A:

The following items are added to Schedule A:

39. Document package submitted dated February 5, 2015 and received on February 12, 2015.

40. Email from Andrew Buzza, Jp2g dated August 24, 2017 re: inclusion of well 95-3 as compliance well and vinyl chloride on compliance assessment list (attached in IDS).

41. Letter from Andrew Buzza, Jp2g dated August 30, 2017 re: revised Trigger and contingency program.

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

1. To acknowledge fulfilment of condition 8.2 and include the above documents in Schedule A.

This Notice shall constitute part of the approval issued under Approval No. A413106 dated April 4, 2014

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 and Climate Change
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 20th day of September, 2017

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

BH/
c: District Manager, MOECC Ottawa
Andrew Buzza, Jp2g Consultants Inc.

CONTENT COPY OF ORIGINAL

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER A413106
Issue Date: April 4, 2014

The Corporation of the Town of Deep River
Post Office Box, No. 400
Deep River, Ontario
K0J 1P0

Site Location: Miller's Road Landfill Site
Lot 6, Concession 13
Deep River Town, County of Renfrew
K0J 1P0

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

a 4.5 hectare waste disposal site within a total site area of 8.55 ha being known as the Miller's Road Landfill Site.

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

"***Adverse Effect***" means the same as the definition in the EPA.

"***Contaminating Lifespan"or "CLS"*** refers to the period of time, after closure until the *Site* finally produces contaminants at concentrations below levels which have unacceptable health or environmental effects;

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

"*District Manager*" refers to the *District Manager* in the Ministry of the Environment's Ottawa District Office;

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

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

"***EMP***" refers to the Environmental Monitoring Plan;

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

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

"*Major Works*" are those works that have an engineering component.

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

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

"*Owner*" means Town of Deep River;

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

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

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

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

"*Regulation 232*" or "*Reg. 232" or "O. Reg. 232/98"* means Ontario Regulation 232/98 (New Landfill Standards) made under the *EPA*, as amended from time to time;

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

"***Site***" means the entire waste disposal site being known as the Miller's Road Landfill Site located on Lot 6, Concession 13 in the Town of Deep River in the County of Renfrew, approved by this *Certificate*.

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

a. relevant waste management legislation, regulations and guidelines;
b. major environmental concerns pertaining to the waste to be handled;
c. occupational health and safety concerns pertaining to the processes and wastes to be handled;
d. management procedures including the use and operation of equipment for the processes and wastes to be handled;
e. emergency response procedures;
f. specific written procedures for the control of nuisance conditions;
g. specific written procedures for refusal of unacceptable waste loads;
h. the requirements of this *Certificate*.

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

TERMS AND CONDITIONS

1.0 GENERAL

Compliance

1.1 The *Owner* shall ensure that any person authorized to carry out work on or operate any aspect of the *Site* is notified of the *ECA* and the conditions herein and shall take all reasonable measures to ensure the person complies with the same.

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

In Accordance

1.3 Except as otherwise provided for in this *ECA*, the *Site* shall be designed, developed, constructed, operated and maintained in accordance with the supporting documentation listed in Schedule "A".

Other Legal Obligations

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

a. relieve any person of any obligation to comply with any provision of the *EPA* or any other applicable statute, regulation or other legal requirement; or
b. limit in any way the authority of the *Ministry* to require certain steps be taken or to request that any further information related to compliance with this *ECA* be provided to the *Ministry*.

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

Adverse Effect

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

Furnish Information

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

1.7 The receipt of any information by the *Ministry* or the failure of the *Ministry* to prosecute any person or to require any person to take any action, under this *ECA* or under any statute, regulation or subordinate legal instrument, in relation to the information, shall not be construed as:

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

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

Interpretation

1.9 This *ECA* revokes and replaces the previous *ECA* and all subsequent amendments.

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

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

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

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

Certificate of Requirement

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

1.15 The Certificate of Requirement shall be registered in the appropriate land registry office on title to the *Site* and a duplicate registered copy shall be submitted to the *Director* within ten (10) calendar days of receiving the Certificate of Requirement signed by the *Director*.

No Transfer or Encumbrance

1.16 No portion of this *Site* shall be transferred or encumbered prior to or after closing of the *Site* unless the *Director* is notified in advance and is satisfied with the arrangements made to ensure that all conditions of this *ECA* will be carried out

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

Change of Owner

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

i. the ownership of the *Site*;
ii. the *Operator* of the *Site*;
iii. the address of the *Owner* or *Operator*;
iv. the partners, where the *Owner* or *Operator* is or at any time becomes a partnership and a copy of the most recent declaration filed under the *Business Names Act*, R. S. O. 1990, c. B.17, shall be included in the notification;
v. the name of the corporation where the *Owner* or *Operator* is or at any time becomes a corporation, other than a municipal corporation, and a copy of the most current information filed under the *Corporations Information Act*, R. S. O. 1990, c. C.39, shall be included in the notification.

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

Inspections

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

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

2.0 CONSTRUCTION, INSTALLATION and PLANNING

2.1 As-built drawings for the landfill shall be retained on site and made available to *Ministry* staff for inspection.

3.0 GENERAL OPERATIONS

Proper Operation

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

Operations Manual

3.2 The Owner shall ensure that an operations and procedures manual that addresses the requirements of this *ECA* is prepared for the Site:

a. Health and safety;
b. Operation and maintenance of the *Site*;

c. Waste acceptance;
d. Waste disposal area and development;
e. Nuisance management;
f. Leachate management;
g. Landfill gas management;
h. Surface water/Storm water management;
i. Inspections and monitoring;
j. Contingency plans and emergency procedures;
k. Complaints; and,
l. Reporting and record keeping.

3.3 The operations and procedures manual shall be:

a. retained at the *Site*;
b. reviewed on an annual basis and updated by the *Owner* as required; and
c. be available for inspection by *Ministry* staff.

Capacity

3.4 (1) The Design and Operations Plan is approved for a total capacity of **321,825 cubic meters** (including waste, daily and interim cover material); and

(2) The total capacity as identified in Condition No. 3.4 (1) does not include the final cover.

(3) The theoretical capacity for the Site is **355,950 cubic meters**.

(4) To utilize the remaining theoretical capacity which is the difference between the volume identified in Condition 4.4 (3) and 4.4 (1), the *Owner* must receive approval from the *Director* through an amendment to the *ECA* to utilize this capacity.

Service Area

3.5 Only waste that is generated in the within the boundaries of the Town of Deep River Valley and the Town of Laurentian Hills shall be accepted at the *Site***.** No waste shall be received for disposal at this *Site* from outside the approved service area.

Hours of Operation

3.6 Waste shall only be accepted at the *Site* during the following time periods:

i. Tuesday - 9:00 a.m. to 12:00 p.m; and
ii. Saturday - 9:00 am to 12:00 p.m.

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

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

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

Signage

3.10 Signs shall be placed at the landfill *Site* entrance/exit indicating, at a minimum, the following:

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

Site Security

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

On-Site Roads

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

Waste Inspection Procedures

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

Waste Inspection and Deposition

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

Litter Control:

3.15 The *Owner* shall take all practical steps to prevent escape of litter from the *Site*. The *Owner* shall inspect and collect litter from the *Site* on a monthly basis from April to November and as needed between December and March. All loose, windblown litter shall be collected and disposed of at the landfill working face.

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

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

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

Dust

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

Noise

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

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Spills

3.20 All spills and upsets shall be immediately reported to the Ministry's Spills Action Centre (SAC) and shall be recorded in a log as to the nature of the spill or upset, and the action taken for clean-up, correction and prevention of future occurrences.

Overall Surface Water Management

3.21 (1) The *Owner* shall take all appropriate measures to minimize surface water from coming in contact with waste. Temporary berms and ditches shall be constructed around active waste disposal areas to prevent extraneous surface water from coming in contact with the active working face.

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

Landfill Gas

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

4.0 LANDFILL SITE OPERATIONS

Waste Types

4.1 Only solid non-hazardous Construction and Demolition waste generated within the Town of Deep River and Town of Laurentian Hills shall be accepted at the *Site* for landfilling.

Unacceptable Waste

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

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

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

Burning of Waste

4.3 (1) Burning of waste is not permitted at the *Site* with the exception of the material under Condition 4.4 (2)

(2) Only clean wood and brush shall be permitted for burning. Burning of the materials shall be completed as per the Ministry of the Environment Guideline C-7 (Burning at Landfill Sites);

Waste Placement

4.4 No waste shall be landfilled outside of the **limit of fill area** for the *Site* as shown in Item 13 in Schedule “A” attached to this *ECA*.

4.5 No waste shall be landfilled below the **base grades** as discussed and shown in Item 13 in Schedule “A” attached to this *ECA*.

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4.6 i. No waste shall be landfilled at any time above the **final waste grades** as shown in Item 13 in Schedule "A" attached to this *ECA*; and

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

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

4.8 No waste shall be landfilled in the buffer area.

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

Asbestos Waste

4.10 Any waste that is considered asbestos waste shall be handled in accordance with Section 17 of *O. Reg. 347* as amended from time to time.

4.11 A suitable sized excavation for the asbestos waste shall be made by the *Owner* in a location away from the active landfilling face.

4.12 All asbestos waste shall be inspected to ensure that the asbestos waste is properly bagged or contained and free from puncture, tears or leaks.

4.13 The asbestos waste shall be placed in the excavation to avoid damage to the containers and to prevent dust and spillage.

4.14 Upon completion of the unloading and deposition of the asbestos in the excavation, at least 125 centimetres of cover or waste material shall be placed over the asbestos.

4.15 All asbestos waste shall be deposited to a level no higher that 1.25 metres below the general elevation of the disposal area to ensure that daily cover material removal in the future does not encounter the asbestos waste.

Cover Material

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

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

Landfill Surface Water Management

4.17 Stormwater runoff generated from the active waste fill area shall be considered contaminated and treated as leachate. Operational methods shall ensure that any precipitation falling onto active waste fill areas, not under final cover, shall be directed into the waste or into a control structure for testing prior to confirm surface water can be discharged to the natural environment.

5.0 TRAINING

Employees and Training

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

i. the relevant waste management legislation *including EPA, O. Reg. 347* , regulations and guidelines;

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

6.0 INSPECTIONS AND RECORD KEEPING

Daily Inspections and Log Book

6.1 An inspection of the entire *Site* and all equipment on the *Site* shall be conducted each day the *Site* is in operation to ensure that the site is being operated in compliance with this *ECA*. Any deficiencies discovered as a result of the inspection shall be remedied immediately, including temporarily ceasing operations at the *Site* if needed.

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

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

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

(2) At least once a year before the submission of the Annual Report required by Condition 11.1, the *Owner* shall conduct a topographic survey of the limit of landfilling to determine the approximate volume of waste that has been landfilled at the *Site*. The survey results shall be included in the Annual Report required by Condition 11.1

Site Inspections

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

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

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

Record Retention

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

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

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

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

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

7.0 MONITORING

Groundwater Monitors

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

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

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

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

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

Monitoring Programs

7.6. (1) Monitoring programs shall be carried out for groundwater, surface water, and leachate , in accordance with Item No. 13 (Section 7) in Schedule "A" and Item No. 14 in Schedule A.

(2) In addition to the monitoring program listed in Condition 11.6, the Owner shall:

i. Sample and analyze for VOCs at monitoring locations 96-1 and 95-3; and
ii. Include Monitoring well 96-2 to the monitoring program and monitor for the the inorganic list.

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

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

Compliance Criteria

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

Groundwater Supply Well

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7.8 The Owner shall sample and analysis groundwater supply wells within 500 metres of the site twice per year in 2014 and 2015 with samples analysed for the inorganic list and VOCs (Parametes as listed listed in Column 1 of the MOE Document titled Landfill Standards: A ine on the Regulatory and Approval Requirements for New or Expanding Landfills Sites" June 2012)

8.0 TRIGGER MECHANISMS AND CONTINGENCY PLANS

Trigger Mechanisms

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

i. immediately notify the *District Manager*; and
ii. an investigation into the cause and the need for implementation of remedial or contingency actions shall be carried out by the *Owner* in accordance with the approved trigger mechanisms and associated contingency plans described in the Item 13 (Section 7) in Schedule "A"

Contingency Plans

8.2 By **December 31, 2014**, the *Owner* shall submit to the *Director* for approval, and copies to the *District Manager*, details of a contingency plan to be implemented in the event that the surface water or groundwater quality exceeds the a trigger mechanism.

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

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

b. Detailed plans, specifications and descriptions for the design, operation and maintenance of the contingency measures shall be prepared and submitted by the *Owner* to the *Director* and *District Manager* for approval within 90 days after confirmation of the exceedances; and

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

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

9.0 COMPLAINTS PROCEDURE

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

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

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

10.0 EMERGENCY SITUATIONS

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

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

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

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

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

11.0 ANNUAL REPORTING

11.1 A written report on the development, operation, monitoring and closure of the *Site*, shall be completed annually (the "Annual Report"). The Annual Report shall be submitted to the *District Manager* by **June 1st** of each year and shall cover the year ending the preceding December 31st.

11.2 The Annual Report shall include the following:

i. the results and an interpretive analysis of the results of all leachate, groundwater, surface water and landfill gas monitoring, including an assessment of the need to amend the monitoring programs;
ii. An assessment with regards to compliance of the groundwater quality at the property boundary and compliance point with regards to Guideline B-7 - Reasonable Use Concept;
iii. an assessment of the operation and performance of all engineered facilities, the need to amend the design or operation of the *Site*, and the adequacy of and need to implement the contingency plans;
iv. *Site* plans showing the existing contours of the *Site;*
v. areas of landfilling operation during the reporting period;
vi. areas of intended operation during the next reporting period;
vii. areas of excavation during the reporting period;
viii. the progress of final cover, vegetative cover, and any intermediate cover application;
ix. previously existing site facilities;
x. facilities installed during the reporting period;
xi. *Site* preparations and facilities planned for installation during the next reporting period;
xii. calculations of the volume of waste, daily and intermediate cover, and final cover deposited or placed at the *Site* during the reporting period and a calculation of the total volume of Site capacity used during the reporting period;
xiii. a summary estimated annual quantity (cubic metres) of waste received at the Site.
xiv. a summary of any complaints received and the responses made;
xv. a discussion of any operational problems encountered at the *Site* and corrective action taken;
xvi. a summary of the amount of wastes refused for disposal at the *Site*, the reasons for refusal and the carrier who brought the waste to the *Site*;
xvii. a report on the status of all monitoring wells and a statement as to compliance with Ontario Regulation 903;

xviii

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xviii. any other information with respect to the site which the *District Manager or Regional Director may require from time to time;*
xix. a statement of compliance with all conditions of this *ECA* and other relevant *Ministry* groundwater and surface water requirements;
xx. a confirmation that the site inspection program as required by this *ECA* has been complied with by the *Owner*;
xx. Any changes in operations, equipment or procedures employed at the *Site*; and
xx. Recommendations regarding any proposed changes in operations of the *Site*.

12.0 SITE CLOSURE

12.1 At least two (2) years prior to the anticipated date of closure of this *Site* or the date 90 per cent of the total waste disposal volume is reached, whichever occurs first, the *Owner* shall submit to the *Director* for approval, with copies to the *District Manager*, a detailed *Site* Closure Plan pertaining to the termination of landfilling operations at this *Site*, post-closure inspection, maintenance and monitoring, and end use.

Schedule "A"

1. Letter from the Town of Deep River to the Ministry of the Environment and Energy dated June 26, 1995 and enclosed "Application for a Certificate of Approval for a Waste Disposal Site", dated June 26, 1995 and supporting documentation entitled "Town of Deep River Leaf and Yard Waste Composting Operation" providing site plans, site description and operation information, public consultation and municipal approval

2. Deep River (Miller's Road) Waste Disposal Site Certificate of Approval A413106 Final Report prepared by Robinson Consultants Inc. and dated February 1998.

3. Hydrogeologic Report Deep River (Miller's Road) Waste Disposal Site prepared by Robinson Consultants Inc. and dated April 2001.

4. Miller's Road Landfill Closure and C&D Waste Operation and Development Plan prepared by Jp2g Consultants Inc. and dated August 2001.

5. Deep River Waste Disposal Site Application for Approval for Waste Disposal Site Amendment to C of A A413106 Town of Deep River prepared by Robinson Consultants Inc. and dated April 2002.

6. Surface Water Assessment Deep River (Miller's Road) Waste Disposal Site (Revised Sections Only) prepared by Robinson Consultants Inc. and dated October 2002.

7. Application for approval signed by Belo Csomor, The Corporation of the Town of Deep River and the accompanying cover letter dated November 13, 2003 from Andrew Buzza, Robinson Consultant Inc.

8. Application for a Provisional Certificate of Approval for a Waste Disposal Site, signed by Belo Csomo, The Corporation of the Town of Deep River, and dated January 1, 2004.

9. Letter to Margaret Wojcik, Ontario Ministry of the Environment, from Andrew Buzza, Robinson Consultants Inc., dated January 26, 2004, describing the proposal.

10. Letter to Margaret Wojcik, Ontario Ministry of the Environment, from Andrew Buzza, Robinson Consultants Inc., dated May 6, 2004, providing additional clarification on the proposal.

11. Letter dated December 21, 2005 to Ian Parrott, Ontario Ministry of the Environment, from Belo Csomor, The Corporation of the Town of Deep River, including the attached lease agreement between the Town of Deep River and Atomic Energy of Canada Ltd. to permit the continued operation of Miller's Road Landfill Site and to delineate and establish

the contaminant attenuation zone on Atomic Energy of Canada lands and to include a drawing showing the extend of the contaminant attenuation zone.

11. Application for a Provisional Certificate of Approval for a Waste Disposal Site, signed by Belo Csomo, The Corporation of the Town of Deep River, and dated August 28, 2009.

12. Letter dated August 27, 2009 to Tesfaye Gebrezghi, Ontario Ministry of the Environment, from Andrew Buzza, Project Manager, Jp2g Consultants Inc.

13. Application for Expansion - Deep River (Miller's Road) Waste Disposal Site prepared for the Town of Deep River by Jp2g Consultants Inc. dated March 2013. The document included the following Items:

> i. Environmental Compliance Approval Application dated April 4, 2013 and signed by Christopher Carroll, Treasurer, Town of Deep River.
> ii. Design and Operations Report - Millers Road Waste Disposal Site prepared by Jp2g Consultants Inc. (Project No. 2106142B) dated March 2013.
> iii. Millers Road Physical Assessment Report prepared by Jp2g Consultants Inc. (Project No. 2106142B) dated March 2013.

14. Letter dated December 23, 2013 addresses to Michelle Larose, Town of Deep River from Dale Gable, Ministry of the Environment requesting additional information on the application to utilized remaining capacity.

15. Letter dated January 8, 2014 addressed to Dale Gable, Ministry of the Environment from Mr. Andrew Buzza, Jp2g Consultants Inc. providing additional information on the Design and Operations Plan.

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

1. *The reason for Conditions 1.1 and 1.2 is to ensure that the Site is designed, operated, monitored and maintained in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider.*
2. *The reason for Conditions 1.3, 1. 4. 1. 5, 1.9, 1.10, 1.11, 1.12, 1.13, 3.1, 3.2, 3.3 and 7.7 is to clarify the legal rights and responsibilities of the Owner under this ECA.*
3. *Conditions 1.6, 1.7 and 1.8 are included to ensure that the appropriate Ministry staff have ready access to information and the operations of the Site, which are approved under this Certificate.*
4. *Conditions 1.14 and 1.15 are included, pursuant to subsection 197(1) of the EPA, to provide that any persons having an interest in the Site are aware that the land has been approved and used for the purposes of waste disposal.*
5. *The reasons for Condition 1.16 are to restrict potential transfer or encumbrance of the Site without the approval of the Director and to ensure that any transfer of encumbrance can be made only on the basis that it will not endanger compliance with this ECA.*
6. *The reasons for Conditions 1.17 and 1.18 are to ensure that the Site is operated under the corporate name which appears on the application form submitted for this approval and to ensure that the Director is informed of any changes.*
7. *The reason for Condition 1.19 is to ensure that appropriate Ministry staff have ready access to the Site for inspection of facilities, equipment, practices and operations required by the conditions in this ECA. This condition is supplementary to the powers of entry afforded a Provincial Officer pursuant to the EPA and OWRA.*
8. *The reason for Condition 2.1 is to ensure the Owner keeps a record of as-built drawing for the set available.*
9. *The reasons for Conditions 3.1, 3.2 and 3.3 are to ensure the Owner operates the Site in an environmentally safe manner. This to is ensure the environment and public health are protected.*
10. *The reasons for Conditions 3.4 and 3.5 is to specify the approved areas from which waste may be accepted at the Site and the types and amounts of waste that may be accepted for disposal at the Site, based on the Owner's application and supporting documentation.*
11. *The reasons for Conditions 3.6, 3.7, 3.8 and 3.9 are to specify the normal hours of operation for the landfill Site and a mechanism for amendment of the hours of operation.*
12. *The reason for Condition 3.10 is to ensure that users of the Site are fully aware of important information and*

restrictions related to Site operations under this ECA of Approval.

13. *The reasons for Condition 3.11 are to specify Site access to/from the Site and to ensure the controlled access and integrity of the Site by preventing unauthorized access when the Site is closed and no Site attendant is on duty.*
14. *The reason condition 3.12 has been included is to ensure that access roads are clear and do not pose a safety hazard to the general public.*
15. *The reason for Condition 3.13 is needed in order to make certain that the waste received at the site is in accordance with the ECA and O. Reg. 347.*
16. *The reason for Condition 3.14 is necessary in order to ensure that all waste loads are inspected and waste that is disposed of at the site is in accordance with the terms and conditions in this ECA .*
17. *The reasons for Conditions 4.15, 4.16 and 4.18 are to ensure that the Site is operated, inspected and maintained in an environmentally acceptable manner and does not result in a hazard or nuisance to the natural environment or any person.*
18. *The reasons for Condition 4.17 are the protection of public health and safety and minimization of the potential for damage to environmental control, monitoring and other works at the landfill Site. Scavenging is the uncontrolled removal of material from waste at a landfill site.*
19. *The reason for Condition 3.19 is to ensure that noise from or related to the operation of the landfill is kept to within Ministry limits and does not result in a hazard or nuisance to any person.*
20. *The reasons for Conditions 3.20, 10.1 and 10.2 are to ensure that the Ministry is informed of any spills or fires at the Site and to provide public health and safety and environmental protection.*
21. *The reason for Condition 3.21 is to ensure that appropriate measures are taken in order to prevent surface water from contacting waste so as not to cause an adverse effect on the environment.*
22. *Condition 3.22 has been inserted in order to ensure that concentrations of landfill gas do not pose a hazard to human health or the environment.*
23. *The reasons for Conditions 4.1 and 4.2 are to specify the approved types of waste that may be accepted for disposal at the Site, based on the Owner's application and supporting documentation.*
24. *The reason for Condition 4.3 is that open burning of municipal waste is unacceptable because of concerns with air emissions, smoke and other nuisance affects, and the potential fire hazard.*
25. *The reason for Condition 4.4, 4.5, 4.6, 4.7, 4.8 and 4.9 is to specify restrictions on the extent of landfilling at this Site based on the Owner's application and supporting documentation. These limits define the approved volumetric capacity of the site. Approval to landfill beyond these limits would require an application with supporting documentation submitted to the Director.*
26. *Conditions 4.10 to 4.15 inclusive have been included in order to ensure asbestos waste is handled and disposed of in accordance with O. Reg. 347 as amended from time to time. Proper handling and disposal of asbestos waste ensures that the asbestos waste does not cause an adverse impact on the environment and also does not affect human health.*
27. *The reason for Condition 4.16 is to ensure that landfilling operations are conducted in an environmentally acceptable manner. Daily and intermediate cover is used to control potential nuisance effects, to facilitate vehicle access on the site, and to ensure an acceptable site appearance is maintained. The proper closure of a landfill site requires the application of a final cover which is aesthetically pleasing, controls infiltration, and is suitable for the end use planned for the site.*
28. *The reason for Condition 4.17 is to ensure impacted surface water at the site is handled in a manner that does not impact the environment or human health.*
29. *The reason for Condition 5.1 is to ensure that the Site is supervised and operated by properly trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person.*
30. *The reason for Conditions 6.1, 6.2, 6.4 and 6.5 are needed to ensure regular inspections of the site are conducted in order to protect the natural environment.*
31. *The reason for Conditions 6.3, 6.6, 6.7, 6.8, 6.9 and 6.10 is to ensure that accurate waste records are maintained to ensure compliance with the conditions in this ECA (such as fill rate, site capacity, record keeping, annual reporting, and financial assurance requirements), the EPA and its regulations.*
32. *The reasons for Conditions 7.1 to 7.5 inclusive are to ensure protection of the natural environment and the integrity of the groundwater monitoring network.*
33. *The reason for Condition 7.6 inclusive is to demonstrate that the landfill site is performing as designed and the impacts on the natural environment are acceptable. Regular monitoring allows for the analysis of trends over time and ensures that there is an early warning of potential problems so that any necessary remedial/contingency action can be taken.*
34. *The reason for Condition 7.8 is to ensure the Owner samples groundwater supply wells within 500 m of the Site to ensure the Site is not impacting those wells. This is to ensure the long-term health and safety of the public and the*

CONTENT COPY OF ORIGINAL

environment.

35. *The reason for Conditions 8.1, 8.2 and 8.3 is to ensure that the Owner follows a plan with an organized set of procedures for identifying and responding to unexpected but possible problems at the Site. A remedial action / contingency plan is necessary to ensure protection of the natural environment. A leachate contingency plan is a specific requirement of Reg. 232.*
36. *The reason for Conditions 9.1 and 9.2 is to establish a forum for the exchange of information and public dialogue on activities carried out at the landfill Site. Open communication with the public and local authorities is important in helping to maintain high standards for site operation and environmental protection.*
37. *The reasons for Conditions 11.1 and 11.2 are to ensure that regular review of site development, operations and monitoring data is documented and any possible improvements to site design, operations or monitoring programs are identified. An annual report is an important tool used in reviewing site activities and for determining the effectiveness of site design.*
38. *The reasons for Condition 12.1 is to ensure that final closure of the Site is completed in an aesthetically pleasing manner and to ensure the long-term protection of the natural environment.*

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). A413106 issued on April 23, 1980

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

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

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

The Notice should also include:

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

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

This Notice must be served upon:

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

AND

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

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-3717 or www.ert.gov.on.ca**

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

CONTENT COPY OF ORIGINAL

DATED AT TORONTO this 4th day of April, 2014

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

DG/
c: District Manager, MOE Ottawa
Andrew Buzza, Jp2g Consultants Inc.

RECEIVED
Dec. 7/09

Ontario

Ministry of the Environment
Ministère de l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A413106
Notice No. 6
Issue Date: November 26, 2009

The Corporation of the Town of Deep River
Post Office Box, No. 400
Deep River, Ontario
K0J 1P0

Site Location: Miller's Road Landfill Site
Lot 6, Concession 13
Deep River Town, County of Renfrew
K0J 1P0

You are hereby notified that I have amended Provisional Certificate of Approval No. A413106 issued on April 23, 1980 for the Deep River Town Landfill (Miller's Road Landfilling Site) , as follows:

I The follow Condition is hereby added:

31. By June 1, 2010, the Township of Deep River shall purchase or obtain a written easement agreement with the property owner(s) of the land(s) required to establish a extended Contaminant Attenuation Zone (CAZ) as per Items 11 and 12 of Schedule "A".

II The following Items are hereby added to Schedule "A":

11. Application for a Provisional Certificate of Approval for a Waste Disposal Site, signed by Belo Csomo, The Corporation of the Town of Deep River, and dated August 28, 2009.

12. Letter dated August 27, 2009 to Tesfaye Gebrezghi, Ontario Ministry of the Environment, from Andrew Buzza, Project Manager, Jp2g Consultants Inc.

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

1. *The reasons for the amendment to Condition 31 is to ensure the Owner obtain sufficient CAZ used for landfilling operations. This is to ensure the long-term health and safety of the public and the environment.*

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A413106 dated April 23, 1980, as amended.

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

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

The Notice should also include:

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

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

This Notice must be served upon:

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

AND

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

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

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

DATED AT TORONTO this 26th day of November, 2009

THIS NOTICE WAS MAILED
ON Dec 4, 2009
9 C
(Signed)

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

AT/
c: District Manager, MOE Ottawa
Andrew Buzza, P. Geo, Jp2g Consultants Inc. √

Ontario

Ministry of the Environment / Ministère de l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A413106
Notice No. 5
Issue Date: February 20, 2007

MINISTRY OF THE ENVIRONMENT
MAR 12 2007
OTTAWA

The Corporation of the Town of Deep River
PO Box 400, 100 Deep River Road
Deep River, Ontario
K0J 1P0

Site Location: Miller's Road Landfill Site
Lot 6, Concession 13
Deep River Town, County of Renfrew
K0J 1P0

You are hereby notified that I have amended Provisional Certificate of Approval No. A413106 issued on April 23, 1980 for the Deep River Town Landfill (Miller's Road Landfilling Site) , as follows:

The following document is added to Schedule "A":

10. Letter dated December 21, 2005 to Ian Parrott, Ontario Ministry of the Environment, from Belo Csomor, The Corporation of the Town of Deep River, including the attached lease agreement between the Town of Deep River and Atomic Energy of Canada Ltd. to permit the continued operation of Miller's Road Landfill Site and to delineate and establish the contaminant attenuation zone on Atomic Energy of Canada lands and to include a drawing showing the extend of the contaminant attenuation zone.

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

This Notice of Amendment is issued to add to Schedule "A" a lease agreement between the Town of Deep River and Atomic Energy of Canada Ltd. for the continued operation of Miller's Road Landfill Site and to approve the contaminant attenuation zone on Atomic Energy of Canada lands.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A413106 dated April 23, 1980, as amended.

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

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

The Notice should also include:

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

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

This Notice must be served upon:

The Secretary*
Environmental Review Tribunal
2300 Yonge St., Suite 1700
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

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

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

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

DATED AT TORONTO this 20th day of February, 2007

THIS NOTICE WAS MAILED
ON March 6, 2007
9 c
(Signed)

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

MW/
c: District Manager, MOE Ottawa ✓
Belo Csomor, The Corporation of the Town of Deep River

Millers -

Ontario

Ministry of the Environment / Ministère de l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A413106
Notice No. 4

ROBINSON CONSULTANTS
RECEIVED
NOV 2 9 2004
Initial:
File No. 98072

The Corporation of the Town of Deep River
PO Box 400
Deep River, Ontario
K0J 1P0

Site Location: Miller's Road Landfill Site
Lot 6, Concession 13
Deep River Town, County of Renfrew
K0J 1P0

You are hereby notified that I have amended Provisional Certificate of Approval No. A413106 issued on April 23, 1980 for the Deep River Town landfill, as follows:

1. Condition 8 is amended to read as follows:

   8. The Town shall obtain from the Atomic Energy of Canada a lease agreement to use the site for the landfilling operations, by December 31, 2005.

2. Condition 9 is amended to read as follows:

   9. The Town shall delineate and establish a Contaminant Attenuation Zone in order to put the Landfill in compliance with the RUG, by December 31, 2005.

3. Condition 13 is amended to read as follows:

   13. The final cover shall be installed in Areas 1 and 4 which shall not receive construction and demolition waste, by December 31, 2004.

4. The following Condition 30 is added:

   30. (a) The Town shall establish and maintain a record of negotiations with Atomic Energy of Canada required by Conditions 8 and 9. This record shall be in the form of a log or a dedicated electronic file and shall include as a minimum:

   (i) date and time of the meeting;
   (ii) persons attending the meeting; and

(iii) conclusions reached and decisions made at the meeting.

(b) The record required by Condition 30(a) shall be made available to the District Manager upon a request.

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

Conditions 8, 9 and 10 are amended to extend the deadlines for negotiations with the Atomic Energy of Canada and for the final cover application over Areas 1 and 4, which are closed and not receiving any more waste.

Condition 30 is included to require the Town to keep records to demonstrate that the Town is putting a reasonable amount of effort to obtain the agreements required by this Certificate.

All in accordance with the application for approval signed by Belo Csomor, The Corporation of the Town of Deep River and the accompanying cover letter dated November 13, 2003 from Andrew Buzza, Robinson Consultant Inc.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A413106 dated April 23, 1980

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

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

The Notice should also include:

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

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

This Notice must be served upon:

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

AND

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

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

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

DATED AT TORONTO this 22nd day of November, 2004

THIS NOTICE WAS MAILED
ON Nov. 24, 2004
gc
(Signed)

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

MW/
c: District Manager, MOE Ottawa
Andrew Buzza, P.Geo, Robinson Consultants Inc. ✓

RECEIVED
MAY 27 2004
Initial: AB
File No. 9972.

Ontario

Ministry of the Environment / Ministère de l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A413106
Notice No. 3

The Corporation of the Town of Deep River
PO Box 400
Deep River, Ontario
K0J 1P0

613-592-5995
Andrew Buzza
from: MW - MOE
416-314-7993

Site Location: Miller's Road Landfill Site
Lot 6, Concession 13
Deep River Town, County of Renfrew
K0J 1P0

You are hereby notified that I have amended Provisional Certificate of Approval No. A413106 issued on April 23, 1980 for the Deep River Town Landfill, as follows:

1. Condition No. 6 is changed to read as follows:

   6. (a) The Landfill shall be used for the disposal of construction and demolition waste only.
   (b) The approved service area is the Town of Deep River and the Town of Laurentian Hills.

2. The following documents are added to Schedule "A":

   7. Application for a Provisional Certificate of Approval for a Waste Disposal Site, signed by Belo Csomo, The Corporation of the Town of Deep River, and dated January 1, 2004.

   8. Letter to Margaret Wojcik, Ontario Ministry of the Environment, from Andrew Buzza, Robinson Consultants Inc., dated January 26, 2004, describing the proposal.

   9. Letter to Margaret Wojcik, Ontario Ministry of the Environment, from Andrew Buzza, Robinson Consultants Inc., dated May 6, 2004, providing additional clarification on the proposal.

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

Condition No. 6 was amended to explicitly show the service area, already approved by a Notice of Amendment, dated November 14, 2002.

All in accordance with the documents listed above and added to Schedule "A".

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A413106 dated April 23, 1980.

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

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

The Notice should also include:

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

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

This Notice must be served upon:

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

AND

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

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

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

DATED AT TORONTO this 19th day of May, 2004

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

MW/
c: District Manager, MOE Ottawa
Andrew Buzza, P.Geo, Robinson Consultants Inc.

Post-it™ Fax Note 7671E | Date 03 04 24 | # of pages ▸ 8

To Ewen Mooder	From Andrew Buzza
Co./Dept. Tp2g Consultants	Co. RCI
Phone #	Phone # 592-6066
Fax # 828-2600	Fax # 592-5995

Ministry of Environment and Energy / Ministère de l'Environnement et de l'Énergie

Ontario

AMENDMENT TO CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE
NUMBER A413106

ROBINSON CONSULTANTS
RECEIVED
NOV 2 2 2002
Initial: AM
File No. SD77

The Corporation of the Town of Deep River
PO Box 400
Deep River, Ontario
K0J 1P0

Site Location: Miller's Road Landfill Site
Part Lot 6, Conc. 13, Former Twp. of Buchanan
Deep River Town, County of Renfrew

You are hereby notified that I have amended Provisional Certificate of Approval No. A413106 issued on April 23, 1980 and amended on November 16, 1995 for the Deep River Town landfill site, as follows:

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

a) "Town" means the Deep River Town, County of Renfrew;
b) "Ministry", or "MOE" means the Ministry of the Environment;
c) "Director" means the one or more persons who from time to time so designated for the purpose of Section 30 of the *Environmental Protection Act;*
d) "District Manager" means the District Manager, the Ottawa District Office of the MOE Eastern Region;
e) "Landfill" means Part of Lot 6, Concession 13, Former Township of Buchanan, Deep River Town, County of Renfrew;
f) "ODWS" means the Ontario Drinking Water Standards;
g) "RUG" means the Ministry Guideline B-7 (Incorporation of the Reasonable Use Concept into MOE Groundwater Management Activities); and
h) "This Certificate" means this Provisional Certificate of Approval as amended from time to time , including all Schedules attached to and forming part of this Certificate.

II. Condition 1 of this Certificate has been revoked.

III. Conditions 2 through 7 amended to this Certificate on November 16, 1995, shall re-number as Conditions 21 through 26 under the heading "The Leaf and Yard Waste Composting Facility".

IV. The second paragraph on the front page shall read as follows:
"for the use and operation of a 4.5 ha landfilling area within a 8.55 ha total site area

all in accordance with the following plans and specifications:

as listed in Schedule "A"."

V. TERMS AND CONDITIONS

GENERAL

1. The Landfill shall be developed,operated and maintained in accordance with all of the plans and specifications in the documents listed in Schedule "A". Should there be discrepancies between the documents listed in Schedule "A" and these conditions, conditions shall take precedence. Should there be discrepancies among the documents listed in Schedule "A", the document bearing the most recent data shall take precedence.

2. Requirements specified in this Certificate are the requirements under the *Environmental Protection Act*. Issuance of this Certificate in no way abrogates the Township's legal obligations to take all reasonable steps to avoid violating other applicable provisions of the *Act* and other legislation and regulations and to obtain any other approvals required by legislation.

3. Requirements of this Certificate are severable. If any requirement of this Certificate, or the application of any requirement of this Certificate to any circumstance, is held invalid, the application of such requirement to other circumstances and the remainder of this Certificate shall not be affected thereby.

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

   (a) carry out any and all inspections authorized by Section 156, 157 or 158 of the Act, Section 15, 16, or 17 of the *Ontario Water Resources Act*, R.S.O. 1990, or Section 19 or 20 of the *Pesticide Act*, R.S.O. 1990, as amended from time to time, of any place to which this Certificate relates; and, without restricting the generality of the foregoing to:

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

   ii) have access to and copy, at any reasonable time, any records required by the Conditions of this Certificate ;

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

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

5. All records and monitoring data required by the Conditions of this Certificate must be kept on the site for a minimum period of at least two (2) years.

LANDFILL

6. The Landfill shall be used for the disposal of construction and demolition waste only.

7. Waste disposal at the Landfill shall be limited to a 4.5 hectare landfilling area shown on Drawing 1 of Item 4, Schedule "A".

8. Within one year of the issuance of this Notice, the Town shall obtain from the Atomic Energy of Canada a lease agreement to use the site for landfilling operations.

9. Within one year of the issuance of this Notice, the Town shall delineate and establish a Contaminant Attenuation Zone in order to put the Landfill in compliance with the RUG.

10. The Landfill shall be closed when final contours shown on Drawing 2 of Item 4, Schedule "A" and reduced by 0.6 m for final cover, have been reached.

LANDFILL OPERATIONS

11. Within four (4) months of the issuance of this Notice, the Town shall submit for the District Manager's approval a detailed operation report for the continued use of the Landfill. A report shall include but not be limited to the following subjects: operating hours, supervision, detailed description of daily operations, a detailed contoured site plan, site cross-sections, dust control measures, and site inspections.

12. Within four (4) months of the issuance of this Notice, the Town shall submit for the District Manager's approval a detailed sludge lagoon decommissioning plan.

13. Within one year of the issuance of this Notice, final cover shall be installed in Areas 1 and 4 which shall not receive construction and demolition waste.

GROUNDWATER MONITORING

14. Within eight (8) months of the issuance of this Notice, the Town shall install a monitoring well in the northeast corner of the Landfill.

15. Within six (6) months of the issuance of this Notice, the Town shall submit for the District Manager's approval the updated groundwater monitoring program.

16. Within one year of the issuance of this Notice, the Town shall submit for the District Manager's approval the groundwater trigger mechanism which shall include the following: trigger locations,

the list of trigger parameters, trigger concentrations, and the re-sampling procedure.

17. Any changes to the groundwater monitoring program and/or the groundwater trigger mechanism that may be necessary in the future, shall be made subject to the District Manager's approval.

SURFACE WATER MONITORING

18. Within six (6) months of the issuance of this Notice, the Town shall submit for the District Manager's approval the updated surface water monitoring program.

19. Immediately upon the issuance of this Notice, the Town shall implement the surface water trigger mechanism described in Item 6 of Schedule "A".

20. Any changes to the surface water monitoring program and /or the surface water trigger mechanism that may be necessary in the future, shall be made subject to the District Manager's approval.

CLOSURE PLAN

27. Two years before this Certificate is due to expire, the Town shall submit for the Director's approval the Final Closure Plan. The Final Closure Plan shall address:

a) Details of any additional cover which may be necessary;
b) Details of any additional vegetative plantings which may be necessary;
c) Post-closure and end-use plans;
d) Plans and schedules for the continued groundwater and surface water monitoring; and
e) Plans and schedules for the routine Landfill inspections.

ANNUAL REPORT

28. The Town shall submit to the District Manager an Annual Monitoring Report by June 1st of the year following the calendar year covered by the Report. The Annual Monitoring Report shall include the following:

a) The results of an annual survey of the waste mound and comparison of the actual capacity used to the capacity approved;
b) A plan of the Landfill outlining all groundwater and surface water monitoring locations;
c) Tables outlining groundwater monitoring locations, analytical parameters sampled, and frequency of sampling;
d) An analysis and interpretation of groundwater and surface water monitoring data, a review of the adequacy of monitoring programs, conclusions of the monitoring data, and recommendations for any changes to monitoring programs that may be necessary;
e) An assessment of groundwater quality in relation to the groundwater trigger concentrations, the RUG and the ODWS;
f) An assessment of surface water quality in relation to the surface water trigger concentrations and the PWQO;

g) An assessment of the efficiency of the Contaminant Attenuation Zone;
h) An update of changes in operations, equipment, or procedures made or produced at the Landfill, and any operating difficulties encountered;
i) A summary of complaints regarding Landfill operations and the Town's response and action;
j) Recommendations respecting any proposed change in the operation of the Landfill; and
k) A statement on compliance with all Conditions of this Certificate.

29. Any changes to the Annual Monitoring Report that may be necessary in the future, shall be made subject to the District Manager's approval.

VI. The following Items have been added to Schedule "A":

2. Deep River (Miller's Road) Waste Disposal Site Certificate of Approval A413106 Final Report prepared by Robinson Consultants Inc. and dated February 1998.

3. Hydrogeologic Report Deep River (Miller's Road) Waste Disposal Site prepared by Robinson Consultants Inc. and dated April 2001.

4. Miller's Road Landfill Closure and C&D Waste Operation and Development Plan prepared by Jp2g Consultants Inc. and dated August 2001.

5. Deep River Waste Disposal Site Application for Approval for Waste Disposal Site Amendment to C of A A413106 Town of Deep River prepared by Robinson Consultants Inc. and dated April 2002.

6. Surface Water Assessment Deep River (Miller's Road) Waste Disposal Site (Revised Sections Only) prepared by Robinson Consultants Inc. and dated October 2002.

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

The reason for Amendment I is to provide definitions of terms used in this Certificate.

The reason for Amendment IV is to define a landfilling area and a total site area.

The reason for Condition 1 is to ensure that the Landfill shall be developed, operated, maintained, monitored and closed in accordance with all of the plans and specifications in the documents listed in Schedule "A". Should there be discrepancies between the documents listed in Schedule "A" and these conditions, conditions shall take precedence. Should there be discrepancies among the documents listed in Schedule "A", the document bearing the most recent data shall take precedence.

The reason for Condition 2 is to ensure that the issuance of this Certificate in no way abrogates the Town's legal obligations to take all reasonable steps to avoid violating other applicable provisions of the *Environmental Protection Act* and other legislation and regulations and to obtain any other approvals required by legislation.

The reason for Condition 3 is to ensure that requirements of this Certificate are severable. If any

requirements of this Certificate, or the application of any requirement of this Certificate to any circumstance, is held invalid, the application of such requirement to other circumstances and the reminder of this Certificate shall not be affected thereby.

The reason for Condition 4 is to ensure that Ministry personnel shall be able to conduct necessary Landfill inspections, monitoring and sampling.

The reason for Condition 5 is to ensure that all records and monitoring data shall be kept on-site for a minimum period of two (2) years.

The reason for Condition 6 is to ensure that the Landfill shall be used for the disposal of construction and demolition waste only.

The reason for Condition 7 is to ensure that waste disposal at the Landfill shall be limited to a 4.5 hectare landfilling area shown on Drawing 1 of Item 3, Schedule "A".

The reason for Condition 8 is to ensure that within one year of the issuance of this Notice, the Town shall obtain from the Atomic Energy of Canada a lease agreement to use the site for landfilling operations.

The reason for Condition 9 is to ensure that within one year of the issuance of this Notice, the Town shall delineate and establish a Contaminant Attenuation Zone in order to put the Landfill in compliance with the RUG.

The reason for Condition 10 is to ensure that the Landfill shall be closed when final contours shown on Drawing 2 of Item 3, Schedule "A" and reduced by 0.6 m for final cover, have been reached.

The reason for Condition 11 is to ensure that within four (4) months of the issuance of this Notice, the Town shall submit for the District Manager's approval a detailed operation report for the continued use of the Landfill.

The reason for Condition 12 is to ensure that within four (4) months of the issuance of this Notice, the Town shall submit for the District Manager's approval a detailed sludge lagoon decommissioning plan.

The reason for Condition 13 is to ensure that within one year of the issuance of this Notice, final cover shall be installed in Areas 1 and 4 which shall not receive construction and demolition waste.

The reason for Condition 14 is to ensure that within eight (8) months of the issuance of this Notice, the Town shall install a monitoring well in the northeast corner of the Landfill.

The reason for Condition 15 is to ensure that within six (6) months of the issuance of this Notice, the Town shall submit for the District Manager's approval the updated groundwater monitoring program.

The reason for Condition 16 is to ensure that within one year of the issuance of this Notice, the Town shall submit for the District Manager's approval the groundwater trigger mechanism which shall include

the following: trigger locations, the list of trigger parameters, trigger concentrations, and the re-sampling procedure.

The reason for Condition 17 is to ensure that any changes to the groundwater monitoring program and/or the groundwater trigger mechanism that may be necessary in the future, shall be made subject to the District Manager's approval.

The reason for Condition 18 is to ensure that within six (6) months of the issuance of this Notice, the Town shall submit for the District Manager's approval the updated surface water monitoring program.

The reason for Condition 19 is to ensure that immediately upon the issuance of this Notice, the Town shall implement the surface water trigger mechanism described in Item 6 of Schedule "A".

The reason for Condition 20 is to ensure that any changes to the surface water monitoring program and/or the surface water trigger mechanism that may be necessary in the future, shall be made subject to the District Manager's approval.

The reason for Condition 27 is to ensure that two years before this Certificate is due to expire, the Town shall submit for the Director's approval the Final Closure Plan.

The reason for Condition 28 is to ensure that the Town shall submit to the District Manager an Annual Monitoring Report by June 1st of the year following the calendar year covered by the Report.

The reason for Condition 29 is to ensure that any changes to an Annual Monitoring Report that may be necessary in the future, shall be made subject to the District Manager's approval.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A413106 dated April 23, 1980

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

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

The Notice should also include:

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

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

This Notice must be served upon:

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

AND

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

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

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

DATED AT TORONTO this 14th day of November, 2002

THIS CERTIFICATE WAS MAILED
ON Nov. 20. 2002
(Signed)

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

EZ/

c: District Manager, MOEE Ottawa
Andrew Buzza, Project Manager, Robinson Consultants Inc. ✓

APR-24-2003 09:03 RI

Deep River C of A
Nov 20, 2002

F2

Ministry of Environment and Energy / Ministère de l'Environnement et de l'Énergie

Ontario

WASTE DISPOSAL SITE
NUMBER A413106

ROBINSON CONSULTANTS
RECEIVED
NOV 2 2 2002
Initial: AM
File No. 5D72

The Corporation of the Town of Deep River
PO Box 400
Deep River, Ontario
K0J 1P0

Site Location: Miller's Road Landfill Site
Part Lot 6, Conc. 13, Former Twp. of Buchanan
Deep River Town, County of Renfrew

You are hereby notified that I have amended Provisional Certificate of Approval No. A413106 issued on April 23, 1980 and amended on November 16, 1995 for the Deep River Town landfill site, as follows:

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

a) "Town" means the Deep River Town, County of Renfrew;
b) "Ministry", or "MOE" means the Ministry of the Environment;
c) "Director" means the one or more persons who from time to time so designated for the purpose of Section 30 of the *Environmental Protection Act;*
d) "District Manager" means the District Manager, the Ottawa District Office of the MOE Eastern Region;
e) "Landfill" means Part of Lot 6, Concession 13, Former Township of Buchanan, Deep River Town, County of Renfrew;
f) "ODWS" means the Ontario Drinking Water Standards;
g) "RUG" means the Ministry Guideline B-7 (Incorporation of the Reasonable Use Concept into MOE Groundwater Management Activities); and
h) "This Certificate" means this Provisional Certificate of Approval as amended from time to time, including all Schedules attached to and forming part of this Certificate.

II. Condition 1 of this Certificate has been revoked.

III. Conditions 2 through 7 amended to this Certificate on November 16, 1995, shall re-number as Conditions 21 through 26 under the heading "The Leaf and Yard Waste Composting Facility".

IV. The second paragraph on the front page shall read as follows:
"for the use and operation of a 4.5 ha landfilling area within a 8.55 ha total site area

all in accordance with the following plans and specifications:

as listed in Schedule "A"."

V. TERMS AND CONDITIONS

GENERAL

1. The Landfill shall be developed,operated and maintained in accordance with all of the plans and specifications in the documents listed in Schedule "A". Should there be discrepancies between the documents listed in Schedule "A" and these conditions, conditions shall take precedence. Should there be discrepancies among the documents listed in Schedule "A", the document bearing the most recent data shall take precedence.

2. Requirements specified in this Certificate are the requirements under the *Environmental Protection Act*. Issuance of this Certificate in no way abrogates the Township's legal obligations to take all reasonable steps to avoid violating other applicable provisions of the *Act* and other legislation and regulations and to obtain any other approvals required by legislation.

3. Requirements of this Certificate are severable. If any requirement of this Certificate, or the application of any requirement of this Certificate to any circumstance, is held invalid, the application of such requirement to other circumstances and the remainder of this Certificate shall not be affected thereby.

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

   (a) carry out any and all inspections authorized by Section 156, 157 or 158 of the Act, Section 15, 16, or 17 of the *Ontario Water Resources Act*, R.S.O. 1990, or Section 19 or 20 of the *Pesticide Act*, R.S.O. 1990, as amended from time to time, of any place to which this Certificate relates; and, without restricting the generality of the foregoing to:

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

   ii) have access to and copy, at any reasonable time, any records required by the Conditions of this Certificate ;

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

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

5. All records and monitoring data required by the Conditions of this Certificate must be kept on the site for a minimum period of at least two (2) years.

LANDFILL

6. The Landfill shall be used for the disposal of construction and demolition waste only.

7. Waste disposal at the Landfill shall be limited to a 4.5 hectare landfilling area shown on Drawing 1 of Item 4, Schedule "A".

8. Within one year of the issuance of this Notice, the Town shall obtain from the Atomic Energy of Canada a lease agreement to use the site for landfilling operations.

9. Within one year of the issuance of this Notice, the Town shall delineate and establish a Contaminant Attenuation Zone in order to put the Landfill in compliance with the RUG.

10. The Landfill shall be closed when final contours shown on Drawing 2 of Item 4, Schedule "A" and reduced by 0.6 m for final cover, have been reached.

LANDFILL OPERATIONS

11. Within four (4) months of the issuance of this Notice, the Town shall submit for the District Manager's approval a detailed operation report for the continued use of the Landfill. A report shall include but not be limited to the following subjects: operating hours, supervision, detailed description of daily operations, a detailed contoured site plan, site cross-sections, dust control measures, and site inspections.

12. Within four (4) months of the issuance of this Notice, the Town shall submit for the District Manager's approval a detailed sludge lagoon decommissioning plan.

13. Within one year of the issuance of this Notice, final cover shall be installed in Areas 1 and 4 which shall not receive construction and demolition waste.

GROUNDWATER MONITORING

14. Within eight (8) months of the issuance of this Notice, the Town shall install a monitoring well in the northeast corner of the Landfill.

15. Within six (6) months of the issuance of this Notice, the Town shall submit for the District Manager's approval the updated groundwater monitoring program.

16. Within one year of the issuance of this Notice, the Town shall submit for the District Manager's approval the groundwater trigger mechanism which shall include the following: trigger locations,

the list of trigger parameters, trigger concentrations, and the re-sampling procedure.

17. Any changes to the groundwater monitoring program and/or the groundwater trigger mechanism that may be necessary in the future, shall be made subject to the District Manager's approval.

SURFACE WATER MONITORING

18. Within six (6) months of the issuance of this Notice, the Town shall submit for the District Manager's approval the updated surface water monitoring program.

19. Immediately upon the issuance of this Notice, the Town shall implement the surface water trigger mechanism described in Item 6 of Schedule "A".

20. Any changes to the surface water monitoring program and /or the surface water trigger mechanism that may be necessary in the future, shall be made subject to the District Manager's approval.

CLOSURE PLAN

27. Two years before this Certificate is due to expire, the Town shall submit for the Director's approval the Final Closure Plan. The Final Closure Plan shall address:

    a) Details of any additional cover which may be necessary;
    b) Details of any additional vegetative plantings which may be necessary;
    c) Post-closure and end-use plans;
    d) Plans and schedules for the continued groundwater and surface water monitoring; and
    e) Plans and schedules for the routine Landfill inspections.

ANNUAL REPORT

28. The Town shall submit to the District Manager an Annual Monitoring Report by June 1st of the year following the calendar year covered by the Report. The Annual Monitoring Report shall include the following:

    a) The results of an annual survey of the waste mound and comparison of the actual capacity used to the capacity approved;
    b) A plan of the Landfill outlining all groundwater and surface water monitoring locations;
    c) Tables outlining groundwater monitoring locations, analytical parameters sampled, and frequency of sampling;
    d) An analysis and interpretation of groundwater and surface water monitoring data, a review of the adequacy of monitoring programs, conclusions of the monitoring data, and recommendations for any changes to monitoring programs that may be necessary;
    e) An assessment of groundwater quality in relation to the groundwater trigger concentrations, the RUG and the ODWS;
    f) An assessment of surface water quality in relation to the surface water trigger concentrations and the PWQO;

g) An assessment of the efficiency of the Contaminant Attenuation Zone;
h) An update of changes in operations, equipment, or procedures made or produced at the Landfill, and any operating difficulties encountered;
i) A summary of complaints regarding Landfill operations and the Town's response and action;
j) Recommendations respecting any proposed change in the operation of the Landfill; and
k) A statement on compliance with all Conditions of this Certificate.

29. Any changes to the Annual Monitoring Report that may be necessary in the future, shall be made subject to the District Manager's approval.

VI. The following Items have been added to Schedule "A":

2. Deep River (Miller's Road) Waste Disposal Site Certificate of Approval A413106 Final Report prepared by Robinson Consultants Inc. and dated February 1998.

3. Hydrogeologic Report Deep River (Miller's Road) Waste Disposal Site prepared by Robinson Consultants Inc. and dated April 2001.

4. Miller's Road Landfill Closure and C&D Waste Operation and Development Plan prepared by Jp2g Consultants Inc. and dated August 2001.

5. Deep River Waste Disposal Site Application for Approval for Waste Disposal Site Amendment to C of A A413106 Town of Deep River prepared by Robinson Consultants Inc. and dated April 2002.

6. Surface Water Assessment Deep River (Miller's Road) Waste Disposal Site (Revised Sections Only) prepared by Robinson Consultants Inc. and dated October 2002.

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

The reason for Amendment I is to provide definitions of terms used in this Certificate.

The reason for Amendment IV is to define a landfilling area and a total site area.

The reason for Condition 1 is to ensure that the Landfill shall be developed, operated, maintained, monitored and closed in accordance with all of the plans and specifications in the documents listed in Schedule "A". Should there be discrepancies between the documents listed in Schedule "A" and these conditions, conditions shall take precedence. Should there be discrepancies among the documents listed in Schedule "A", the document bearing the most recent data shall take precedence.

The reason for Condition 2 is to ensure that the issuance of this Certificate in no way abrogates the Town's legal obligations to take all reasonable steps to avoid violating other applicable provisions of the *Environmental Protection Act* and other legislation and regulations and to obtain any other approvals required by legislation.

The reason for Condition 3 is to ensure that requirements of this Certificate are severable. If any

requirements of this Certificate, or the application of any requirement of this Certificate to any circumstance, is held invalid, the application of such requirement to other circumstances and the reminder of this Certificate shall not be affected thereby.

The reason for Condition 4 is to ensure that Ministry personnel shall be able to conduct necessary Landfill inspections, monitoring and sampling.

The reason for Condition 5 is to ensure that all records and monitoring data shall be kept on-site for a minimum period of two (2) years.

The reason for Condition 6 is to ensure that the Landfill shall be used for the disposal of construction and demolition waste only.

The reason for Condition 7 is to ensure that waste disposal at the Landfill shall be limited to a 4.5 hectare landfilling area shown on Drawing 1 of Item 3, Schedule "A".

The reason for Condition 8 is to ensure that within one year of the issuance of this Notice, the Town shall obtain from the Atomic Energy of Canada a lease agreement to use the site for landfilling operations.

The reason for Condition 9 is to ensure that within one year of the issuance of this Notice, the Town shall delineate and establish a Contaminant Attenuation Zone in order to put the Landfill in compliance with the RUG.

The reason for Condition 10 is to ensure that the Landfill shall be closed when final contours shown on Drawing 2 of Item 3, Schedule "A" and reduced by 0.6 m for final cover, have been reached.

The reason for Condition 11 is to ensure that within four (4) months of the issuance of this Notice, the Town shall submit for the District Manager's approval a detailed operation report for the continued use of the Landfill.

The reason for Condition 12 is to ensure that within four (4) months of the issuance of this Notice, the Town shall submit for the District Manager's approval a detailed sludge lagoon decommissioning plan.

The reason for Condition 13 is to ensure that within one year of the issuance of this Notice, final cover shall be installed in Areas 1 and 4 which shall not receive construction and demolition waste.

The reason for Condition 14 is to ensure that within eight (8) months of the issuance of this Notice, the Town shall install a monitoring well in the northeast corner of the Landfill.

The reason for Condition 15 is to ensure that within six (6) months of the issuance of this Notice, the Town shall submit for the District Manager's approval the updated groundwater monitoring program.

The reason for Condition 16 is to ensure that within one year of the issuance of this Notice, the Town shall submit for the District Manager's approval the groundwater trigger mechanism which shall include

the following: trigger locations, the list of trigger parameters, trigger concentrations, and the re-sampling procedure.

The reason for Condition 17 is to ensure that any changes to the groundwater monitoring program and/or the groundwater trigger mechanism that may be necessary in the future, shall be made subject to the District Manager's approval.

The reason for Condition 18 is to ensure that within six (6) months of the issuance of this Notice, the Town shall submit for the District Manager's approval the updated surface water monitoring program.

The reason for Condition 19 is to ensure that immediately upon the issuance of this Notice, the Town shall implement the surface water trigger mechanism described in Item 6 of Schedule "A".

The reason for Condition 20 is to ensure that any changes to the surface water monitoring program and/or the surface water trigger mechanism that may be necessary in the future, shall be made subject to the District Manager's approval.

The reason for Condition 27 is to ensure that two years before this Certificate is due to expire, the Town shall submit for the Director's approval the Final Closure Plan.

The reason for Condition 28 is to ensure that the Town shall submit to the District Manager an Annual Monitoring Report by June 1st of the year following the calendar year covered by the Report.

The reason for Condition 29 is to ensure that any changes to an Annual Monitoring Report that may be necessary in the future, shall be made subject to the District Manager's approval.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A413106 dated April 23, 1980

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

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

The Notice should also include:

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

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

This Notice must be served upon:

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

AND

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

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

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

DATED AT TORONTO this 14th day of November, 2002

THIS CERTIFICATE WAS MAILED
ON Nov. 20, 2002
(Signed)

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

EZ/
c: District Manager, MOEE Ottawa
Andrew Buzza, Project Manager, Robinson Consultants Inc. ✓

file

Notice & (D)

MINISTRY OF THE ENVIRONMENT

DEC 0 8 1995

PEMBROKE

APPROVALS BRANCH
3rd Floor
Phone: (416) 440-3544
Fax: (416) 440-6973

9 November 1995

Mr. Mike Richardson, Town Superintendent
Town of Deep River
P.O. Box 400, 100 Deep River Road
Deep River , Ontario
K0J 1P0

Dear Mr. Richardson:

Re: Corporation of the Town of Deep River Landfill Site (Miller's Road Landfill Site)
Provisional Certificate of Approval No. A 413106

Enclosed is a copy of the Notice of Amendment for the above mentioned Provisional Certificate of Approval. The amendment approves the establishment and the operation of a central leaf and yard composting facility located within the existing landfill site.

It is suggested that this Notice be carefully read in order to ensure that all conditions are met. Please note that all other terms and conditions as outlined in the original Certificate of Approval remain unchanged.

I trust this document is adequate. Should you have any questions or comments concerning the above, please feel free to contact Mr. Osman Ibrahim at (416) 440-3717.

Sincerely,

ORIGINAL SIGNED BY
A. Dominski

A. Dominski, P.Eng.,
Supervisor, Waste Unit

Encl.
OI/am
cc: A. Polley, Pembroke District Office
J. Mulder, Eastern Region

Ontario

Ministry of Environment and Energy

Ministère de l'Environnement et de l'Énergie

NOTICE
Page 1 of 4

TO: The Corporation of the Town of Deep River
P.O Box 400, 100 Deep River Road
Deep River, Ontario
K0J 1P0

You are hereby notified that Provisional Certificate of Approval No. A 413106 dated April 23, 1980 is hereby amended to include the approval of the establishment and operation of a central leaf and yard waste composting facility all in accordance with the application dated June 26, 1995 and the supporting information as provided in the document entitled "Town of Deep River Leaf and Yard Waste Composting Operation", and subject to the following conditions:

2. The Leaf and Yard Waste Composting Facility shall be operated in accordance with the application for a Waste Disposal Site submitted June 26, 1995 and supporting information as provided in the document entitled "Town of Deep River Leaf and Yard Waste Composting Operation", and Parts IV and V of Ontario Regulation 101/94, except for paragraphs 16, 18, and 19 of Section 23, Part IV.

3. All building and processing or storage areas that are part of the Site shall be located at least 100 m from the boundaries of the Site and from any lake, river, pond, stream, reservoir, spring or well except for the 30 m buffer on the south side of the Site as shown on the Site Development Plan (Figure 2) of the document entitled "Town of Deep River Leaf and Yard Waste Composting Operation", and referenced in item 1 of Schedule "A".

4. The maximum capacity of leaf and yard waste which may be received and composted at the Site is limited to 190 tonnes (540 cubic metres) per year. Any additional capacity requires the approval of the Director.

5. The Operator shall ensure that the operation of this Site does not impede or is impeded by other activities associated with the landfill site on which this Site is located.

6. All waste shall be delivered to the Site by the householder responsible for the waste, or through an approved waste management system, or in compliance with Part II of Ontario Regulation 101/94.

7. The composting facility shall cease to function upon final closure of the landfill site and any processed leaf and yard waste shall be utilized or landfilled on or before this date.

SCHEDULE "A"

This Schedule "A" forms part of Provisional Certificate of Approval No. A413106 dated April 23, 1980.

1. Letter from the Town of Deep River to the Ministry of Environment and Energy dated June 26, 1995 and enclosed "Application for a Certificate of Approval for a Waste Disposal Site", dated June 26, 1995 and supporting document entitled "Town of Deep River Leaf and Yard Waste Composting Operation" providing site plans, site description and operation information, public consultation and municipal approval.

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

1. The reason for conditions 2 and 3 is to ensure that the leaf and yard waste composting facility is operated in accordance with the application for this Provisional Certificate of Approval and supporting information; and in accordance with Ontario Regulation 101/94.

2. The reason for condition 4 is to ensure that the type and amount of waste deposited in the Site is in accordance with that approved by this Notice of Amendment.

3. The reason of condition 5 is to ensure that the Site is properly managed such that it does not impede or is impeded by the operation of the landfill site on which this Site is located.

4. The reason for condition 6 is to ensure that the collection and transportation of the waste is conducted in an environmentally acceptable manner in accordance with provincial regulations.

5. The reason for condition 7 is to ensure that the property is cleaned up and restored to the satisfaction of the Ministry prior to closure of the landfill site.

In accordance with Section 139 of the Environmental Protection Act, R.S.O. 1990, Chapter E-19, you may by written notice served upon me, the Environmental Appeal Board and the Environmental Commissioner, Environmental Bill of Rights, S.O. 1993, Chapter 28, within 15 days after receipt of this Notice, require a hearing by the Board. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 142 of the Environmental Protection Act, as amended provides that the Notice requiring a hearing shall state:

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

In addition to these legal requirements, the Notice should also include:

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

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

This Notice must be served upon:

The Secretary,
Environmental Appeal Board,
112 St. Clair Avenue West,
Suite 502,
Toronto, Ontario,
M4V 1N3

The Environmental Commissioner,
1075 Bay Street,
Suite 605
6th Floor
Toronto, Ontario
M5S 2W5

The Director,
Section 39, Environmental Protection Act,
Ministry of the Environment and Energy,
250 Davisville Avenue, 3rd Floor,
Toronto, Ontario.
M4S 1H2

This instrument is subject to Section 38 of the Environmental Bill of Rights, that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek to appeal for 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.

DATED AT TORONTO this 16th *day of* November, 1995.

THIS IS A TRUE COPY OF
THE ORIGINAL NOTICE
SIGNED BY

A. DOMINSKI, P. ENG.

MAILED ON Nov 20/95

BY _____

OI/am

203784

Ministry of the Environment
Ontario

Provisional Certificate No. A 413106

PROVISIONAL CERTIFICATE OF APPROVAL
WASTE DISPOSAL SITE

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

Corporation of the Town of Deep River
P.O. Box 400
Deep River, Ontario
K0J 1P0

for the use and operation of an 8.0 hectare landfilling site

all in accordance with the following plans and specifications:

1. "Plan of Part of Lot 6, Concession XIII, Township of Buchanan, County of Renfrew" dated March 26, 1965. and attached hereto as Schedule "A"
2. Sketch entitled "Deep River Landfilling Site".

Located: S.1/2 Lot 6, Concession 13
Township of Buchanan
County of Renfrew

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

and subject to the following conditions:

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

Dated this 23rd day of April, 1980.

Director, Section 39,
The Environmental Protection Act, 1971

Ministry of the Environment

Ontario

NOTICE

TO: Corporation of the Town of Deep River
P.O. Box 400
Deep River, Ontario
K0J 1P0

You are hereby notified that Provisional Certificate of Approval No. A 413106 has been issued to you subject to the conditions outlined therein.

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

The reason for the condition requiring registration of the Certificate is that Section 46 of The Environmental Protection Act, 1971 prohibits any use being made of the lands after they cease to be used for waste disposal purposes in order to protect future occupants of the site and the environment from any hazards which might occur as a result of waste being disposed of on the site. This prohibition and potential hazard should be drawn to the attention of future owners and occupants by the Certificate being registered on title.

You may by written notice served upon me and the Environmental Appeal Board within 15 days after receipt of this Notice, require a hearing by the Board.

This Notice should be served upon:

The Secretary,
Environmental Appeal Board,
1 St. Clair Ave. West,
5th Floor,
Toronto, Ontario.
M4V 1K7

AND

The Director,
Section 3a E.P.A.
Ministry of the Environment,

DATED this 23rd day of April , 1980 .

D. P. Caplice

Director,
Section 3a E.P.A.

SCHEDULE "A"

Part of Lot 6, Concession XIII
Township of Buchanan, now in the Town of Deep River

ALL AND SINGULAR that certain parcel or tract of land and premises, situate, lying and being in the Township of Buchanan, in the County of Renfrew, in the Province of Ontario and being composed of part of Lot 6, Concession XIII of the said Township of Buchanan, containing therein by admeasurement an area of 21.12 acres be the same more or less which parcel or tract of land may be more particularly described as follows: -

PREMISING that the western limit of said Lot 6 has a bearing of N 20°52' W and relating all bearings herein thereto: -

COMMENCING at a survey post planted in the said western limit of Lot 6 distant 579.0 feet measured N 20° 52' W along the said western limit of Lot 6 from the south western angle of said Lot 6;

THENCE continuing N 20° 52' W along the said western limit of Lot 6 a distance of 1150.0 feet to a survey post planted;

THENCE N 69° 08' E a distance of 800.0 feet to a survey post planted;

THENCE S 20° 52' E parallel to the western limit of said Lot 6 a distance of 1150.0 feet to a survey post planted;

THENCE S 69° 08' W a distance of 800.0 feet more or less to the point of commencement;

THE PARCEL herein described being shown outlined in red in accordance with the plan hereto attached.

LOT 6, CONCESSION XIII
TOWNSHIP OF BUCHANAN
COUNTY OF RENFREW
SCALE: 1 INCH = 200 FEET

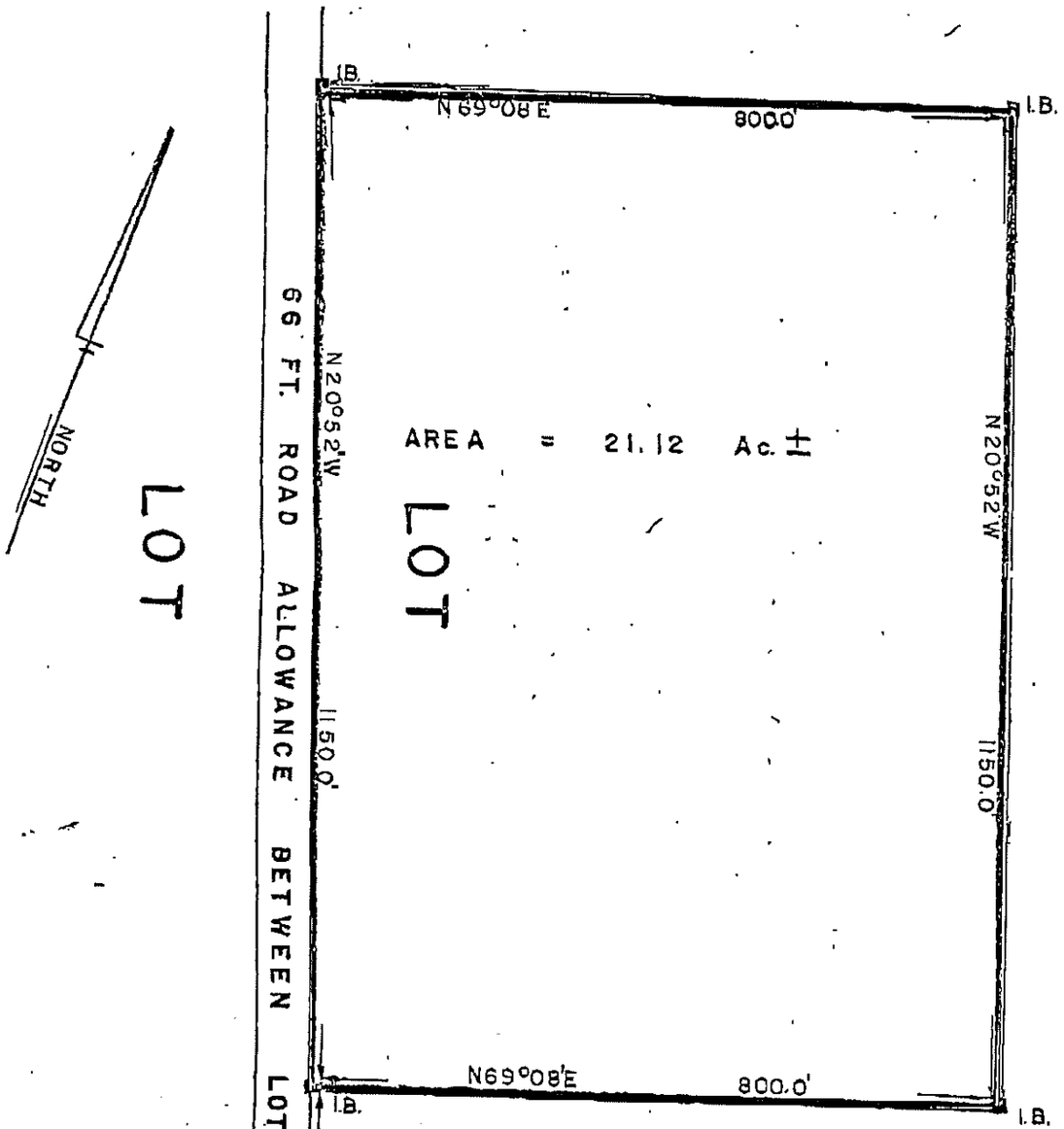
BEARINGS DERIVED FROM THE WESTERN LIMIT OF LOT 6, CONCESSION XIII ASSUMED N 20°52'W.

■ I.B. DENOTES IRON SURVEY POST.

BOURNE & SIMPSON
ONTARIO LAND SURVEYORS
PEMBROKE, ONTARIO

ALAN J. SIMPSON O.L.S.

DATE: 26th. MARCH 1965



CONCESSION XIII

S.W. ANGLE LOT 6, CONCESSION XIII

66 FT. ROAD ALLOWANCE BETWEEN CONCESSIONS

CONCESSION XII

ab. pg. 43 Bk. 1 Deep River
hs

T-356 P.006/006 F-611

DATED THE 23rd DAY OF

APRIL, 1980

BETWEEN

THE DIRECTOR

-and-

CORPORATION OF THE TOWN OF DEEP RIVER

PROVISIONAL CERTIFICATE

OF APPROVAL

UNDER

THE ENVIRONMENTAL

PROTECTION ACT, 1971

S.1/2 LOT 6, CONCESSION 13

TOWNSHIP OF BUCHANAN (now in the Town of Deep River)

COUNTY OF RENFREW

CORPORATION OF THE TOWN OF DEEP RIVER

DEEP RIVER, ONTARIO

K0J 1P0

No. 203784
Registry Division of Renfrew (No. 49)
I CERTIFY that this instrument is registered
as of 58 P.M. MAY - 8 1980 in the
Land Registry Office at Pembroke, Ontario.
E.L. O'Briens
REGISTRAR

Nov-02-2005 08:54am From-

Appendix B

MECP Correspondence

Ministry of the Environment and Climate Change

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

Ministère de l'Environnement et de l'Action en matière de changement climatique

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Ontario

M E M O R A N D U M

January 4, 2018

TO: Emily Tieu
Senior Environmental Officer
Ottawa District Office
Eastern Region

FROM: Obai Mohammed
Hydrogeologist
Technical Support Section
Eastern Region

RE: 2016 Annual Monitoring Report – Miller's Road Waste Disposal Site (WDS)
Lot 6, Concession 13, Geographic Township of Buchanan
Township of Deep River, County of Renfrew
Environmental Compliance Approval (ECA) Number A413106

Purpose

I have reviewed the 2016 Annual Monitoring Report (AMR) for Miller's Road Waste Disposal Site (WDS) prepared by Jp2g Consultants Inc. (Jp2g) on behalf of The Corporation of the Town of Deep River and dated May 2017. The current review is limited to hydrogeological aspects of the report. I offer the following comments for your consideration:

Summary

- Reasonable Use Guideline B-7 applies to all operating waste disposal sites and those closed after 1986. Thus, Guideline B-7 applies to Miller's Road WDS.

- The site is in compliance with Guideline B-7 as determined by the Reasonable Use Concept (RUC) assessment at monitoring wells 96-1S, 96-1D, 95-3S and 95-3D.

- An approximately 14 hectare parcel of land immediately to the west of the landfill site was purchased and registered on title as a Contaminant Attenuation Zone (CAZ).

- Iron and manganese concentrations exceeded the RUC values, however they are deemed to be at natural concentrations and not as a result of landfilling activities. No increasing trends for manganese and iron concentrations have been observed over time. All other Leachate Indicator Parameters (LIP) concentrations were found to be low as part of the regulatory assessment.

- Iron and manganese should be included in the RUC and trigger assessments in future monitoring activities, for any future leachate-related impacts that may occur.

- The direction of groundwater from the site is determined to be south east towards Maskinonge Lake. Groundwater mounding under the landfilling area is causing some radial flow in the vicinity of Area 2 towards the west.

- The leachate impact is measured by elevated inorganic concentrations (alkalinity, hardness, calcium, chloride, TDS, DOC and selected metals). Groundwater leaving the site from Area 4 (southeast) will be contained with the CAZ in this direction. Any groundwater impacts migrating to the southeast would likely discharge to surface water, and therefore the intent of Guideline B-7 in this direction is met.

- Impact west of Area 2 is also characterized by elevated organic parameters in the groundwater. The vertical impact in this direction is restricted to the deeper groundwater. The horizontal extent of impact measures as far as monitoring well 95-4 but not as far as wells 95-3 and 96-1.

- The water quality from wells located further to the west from the site (95-3, 95-5 and 96-1S and 96-1D) is characterized by low levels of inorganic parameters and organic parameters below detections limits. The groundwater at these locations is not impacted by the Waste Disposal Site.

- Organic sampling did not reveal any exceedances of ODWS with the exception of vinyl chloride at monitors 07-3D and 95-6, consistent with historical results. Vinyl chloride was not revealed outside of monitors 07-3D and 95-6 and therefore is not migrating off-site.

- None of the sampled residential wells exceeded ODWS/OG for the LIP concentrations. The landfill therefore is not influencing the water quality of the residential wells. It is recommend to include the residential wells on a 3 year basis with the next sampling scheduled for 2018. I support this recommendation.

- Continued ground and surface water monitoring is recommended as per the amended Certificate of Approval A413106 dated April 4, 2014. Future monitoring reports should include a discussion to understand groundwater surface water interaction.

Environmental Compliance Approval

The Deep River (Miller s Road) waste disposal site (the site) operates under ECA A413106 issued in April, 1980 and most recently amended April, 2014. The site is licensed for the use and operation of a 4.5 hectare landfill within a total area of 8.55 hectares. Additional 14.14 hectares has been registered on title as Contaminant Attenuation Zone (CAZ) establishing a total site area of 22.69 hectares. The landfill operates as a naturally attenuating site. The site is used entirely for the disposal of construction and demolition waste and it is understood that no radioactive waste is disposed at the site. The site does not contain engineered control systems and therefore is considered a natural attenuating landfill site.

Site Description

The site is located on Lot 6, Concession 13, Township of Deep River east of Highway 17 along Miller s Side Road. The site is presently leased by the Town of Deep River from Canadian Nuclear Laboratories (CNL) formerly Atomic Energy of Canada Limited (AECL). The waste disposal site is made up of four areas comprising a total area of 8.55 hectares. Landfilling within Areas 1 and 2 (3.22 hectares) has been cleared and used for waste disposal. The northerly portions of Areas 3 and 4 (5.33 hectares) are approximately 5 meters lower in elevation than Areas 1 and 2 and are heavily wooded. A site plan that includes the location of all monitoring wells is provided in Figure 2 and the CAZ is shown in Figure 3.

The site is located within the Maskinonge Lake Basin. The basin drains to Maskinonge Lake, which in turn drains via Chalk Lake to the Ottawa River. Surface water features in the vicinity of the site include an un-named Landfill Creek that is located approximately 100 meters south east of the site and Spring Creek that originates west of the site and passes by the site to the south. The site is characterized by relatively flat terrain.

The drainage from the site flows mostly south-southeast towards Maskinonge Lake. There are no land use concerns or water users observed downstream of the site. Currently, the nearby residences are located up gradient (approximately 500 meters) of the waste disposal site and potential impact on these water supplies is not anticipated. It also is expected that Spring Creek will act as a hydraulic boundary to any leachate migrating southwestward according to Jp2g.

Geology

Jp2g determined the geology to be as follows:

- Till with gravelly sand and silt in Areas 2, 3 and 4 with till thickness ranging from 0 to 1.75 m;
- Fine-grained sand with trace silt in Areas 1 and 2 and extending south to Spring Creek with thickness generally greater than 10.7 m; and,
- Precambrian felsic metasedimentary bedrock with depth to bedrock ranging from 0 meters at the surface to approximately 30 meters.

Hydrogeology

Jp2g determined the hydrogeological conditions to be as follows:

- Groundwater flow in the overburden is influenced by underlying bedrock topography and is predominantly to the east and southeast;
- Groundwater flow in the vicinity of Area 2 flows southwest under a low hydraulic gradient possibly related to groundwater mounding in this area;
- Local groundwater flow from the north of Area 3 is north towards a wetland;
- The groundwater flow leaving the southern portion of Area 4 flows immediately to the southeast and eventually to Maskinonge Lake;
- Hydraulic conductivity values range between 1.3×10^{-2} to 6.95×10^{-5} cm/s;
- Historical horizontal gradients reported in previous AMRs ranged from 0.001 in Area 2 to 0.02 in Areas 3 and 4. The higher gradient values are reportedly influenced by the dipping bedrock surface and topography;
- Vertical gradients are variable across the site as shown in Table 3 of the report; and,
- The average linear velocity is 2 m/year south of the landfill and 0.06 m/year southwest from the western property line.

Background Groundwater Quality

Background groundwater quality has been monitored at monitoring wells 91-2 and 95-5, located south and northwest of the site, respectively, and are considered representative of background water quality. The 2016 chemical analysis from these wells indicates that all parameters concentrations are less than Ontario Drinking Water Standards (ODWS), and no impacts from landfilling activities are detected.

Leachate

Wells 95-6 and 07-3D were used to characterize leachate conditions. Both monitors typically reveal the highest concentrations and are deemed to be representative of leachate parameter concentrations. Monitoring well 95-6 is located in the immediate down gradient flow path from the fill area of the site at the south end and monitoring well 07-3D is located along the northwest property line of Area 2. Table 6 outlines the 2016 range of leachate concentrations from monitoring wells 95-6 and 07-3D.

In 2016, elevated concentrations of alkalinity, boron, barium, calcium, hardness, iron, potassium, magnesium, manganese, sodium and TDS were observed compared to concentrations measured in background wells and these serve as leachate indicator parameters (LIP) at the site. Concentrations above ODWS were observed for iron, manganese, DOC, and TDS at both leachate monitors during the 2016 monitoring year.

Volatile organic compounds (VOCs) analysis results indicated that only vinyl chloride (VC) concentrations have exceeded the ODWS at both leachate monitors in 2016, consistent with previous years. VC was not present at other locations revealed in the assessment outside of monitoring wells 07-3D and 95-6 and therefore is not migrating off-site.

Downgradient Groundwater Quality

On-site downgradient monitoring wells

The downgradient groundwater quality is monitored at the site by monitoring wells 91-5, 96-3, 85-C, 88-2S, 88-2D, 85-D and 85-Y. Their locations are provided on Figure 9. All of these wells are located between the licensed fill area and the perimeter of the buffer zone. Monitoring wells 88-2S, 88-2D, 85-Y and 85-D are located in the immediate downgradient flow path from Area 4 in an area of steep hydraulic gradient. Monitoring well 91-5 is located along the western perimeter of the site within an area of a low hydraulic gradient. Monitoring wells 85-C and 96-3 are located along the southern perimeter of the waste disposal site and are considered to be in the direction of groundwater flow originating from the southwest corner of Area 1. During the 2016 monitoring events, samples were collected from the following monitoring locations: 91-5S, 91-5D, and 96-3. Table 7 outlines concentrations from monitoring wells that are greater than ODWS and reflective of Leachate impacts.

Minor leachate impact is recognized along the western property line at monitoring station 91-5D. Impact at this location is characterized by elevated levels of chloride and sodium greater than background levels. Iron and manganese concentrations were found to be at levels greater than background and ODWS at monitor 91-5D location. The shallow setting, 91-5S, reveals hardness to exceed background values and the iron concentration was found to be exceeding the ODWS. As the chloride values at 91-5S are in-line with background values it is interpreted that this location does not reveal impact from the waste site. Iron and manganese values at monitor 91-5 were attributed by Jp2g to the overburden geology in the area, despite that none of both compounds were found to be exceeding the ODWS at the background monitors in 2016. The historical trends of selected chemical concentrations from monitors 91-5D and 96-3 do not reveal any increasing trends in concentrations.

Off-site downgradient monitoring wells

Groundwater samples collected from monitors 07-2S, 07-2D, located southeast of Area 1 within the CAZ to the south, in an area with a steep hydraulic gradient, revealed concentrations of iron and manganese that are greater than ODWS. TDS concentration was exceeding the ODWS at monitor 07-2D during the fall 2016 sampling event. Monitoring wells 07-2S and 07-2D have also been compared to Provincial Water Quality Objectives (PWQOs) to determine the potential for contaminants to reach the Landfill Creek from the groundwater in the vicinity of monitoring well 07-2S and 07-2D. The results indicate iron and barium at both shallow and deep settings, and boron at the deep setting exceeded the PWQOs.

Jp2g noted that barium and iron exist in the historical background concentrations and therefore are poor parameters in assessing landfill impact. I disagree with this statement since barium is found recently and historically in background monitors at concentrations lower by one order of magnitude than barium concentrations measured in 2016 at monitors 07-2S and 07-2D. Further, boron is revealed to exist at levels above PWQOs at this location. The presence of boron in the deep setting indicate impact from the landfill site in the deep overburden aquifer. It is recommended by Jp2g that water quality from monitoring wells 07-2S and 07-2D continue to be compared to PWQOs to assess any potential impacts groundwater migrating from the landfill may have on the local surface water environment. I support this recommendation.

Groundwater samples collected from monitors 95-3S, 95-3D, 95-4S, 95-4D, 96-1D, 96-1S, 07-FS, 07-FD, 08-1S and 08-1D, located to the west within the CAZ, revealed that the major component of off-site leachate impact is focussed in the vicinity of monitoring wells 07-3, 07-F and to a lesser extent 08-1 and 95-4. Similar to the groundwater south of the site the deeper groundwater on balance reveals parameters with the higher chemical concentrations. Chemical concentrations dissipate rapidly moving west from the site as evidenced by the low chemical concentrations in the other monitoring wells that are located on the property recently purchased by the municipality (95-3 and 96-1). The groundwater quality at monitoring wells located to the west within the CAZ does not reveal any increasing trends in concentrations with the exception of slight increasing trends in chloride and conductivity concentrations at monitoring well 95-4D, and alkalinity, hardness, calcium and barium concentrations at monitoring well 08-1S.

Residential monitoring wells

Condition 14 of the ECA requires that groundwater supply wells in the vicinity of the site are sampled. The last sampling event was completed during the 2015 program at four (4) residential wells along Millers Road near the landfill site. The location of the supply wells is not shown within the site plan. The results of the residential groundwater sampling are shown in Table 10. None of the sampled residential wells LIP concentrations exceeded ODWS. Residential sampling in 2015 included the analysis of benzene, 1,4-dichlorobenzene, dichloromethane, toluene and vinyl chloride. All parameters revealed concentrations that were less than ODWS.

It is interpreted that the landfill is not impacting residential wells water quality, thus sampling was not included in the 2016 monitoring program. It is recommend to include the residential wells on a 3 year basis with the next sampling scheduled for 2018. I concur with this.

Regulatory Evaluation

Guideline B-7 applies to operating waste disposal sites and those closed after 1986. Therefore, Guideline B-7 applies to Miller s Road WDS. The parameters used in this assessment of Guideline B-7 include: alkalinity, boron, barium, chloride, DOC, sodium, iron, manganese, VC and TDS. Jp2g compares the calculated Reasonable Use Concept (RUC) concentrations of the aforesaid parameters to the groundwater quality results at monitoring wells located along or beyond the western landfill boundary and included: 07-3S, 07-3D, 07-FS, 07-FD, 91-5S, 91-5D, 95-3S, 95-3D, 95-4S, 95-4D,95-5, 96-1S and 96-1D. Impacts to the groundwater quality in the southeast downgradient direction will be contained within the contaminant attenuation zone, hence, wells to the south and south east are not considered in the RUC assessment. Any groundwater impacts migrating to the southeast would likely discharge to surface water, and therefore the intent of Guideline B-7 in this direction is met. All parameters concentrations were less than the RUC except for manganese and iron during spring monitoring event at monitoring well 96-1D. The report noted the presence of naturally occurring manganese and iron throughout the area. No increasing trends for manganese and iron concentrations have been observed over time. Due to the low values of all other LIP concentrations, and the stability of manganese and iron concentrations over time since 2012, Jp2g attributed manganese and iron concentrations to the local area mineralogy, and accordingly concluded that the site is interpreted to be compliant with Guideline B-7. I concur with this conclusion.

Groundwater Surface water Interaction

Vertical hydraulic gradients exist variably across the site as shown in Table 3. The report did not discuss the groundwater surface water interaction, and as such it is unknown if potentially impacted groundwater could discharge to surface. Future monitoring reports should include a discussion to understand groundwater surface water interaction. A number of surface water features are located near the landfill site. These include Landfill Creek, Spring Creek, and Maskinonge Lake to the southeast and a wetland to the northeast and downgradient of Area 3. There is potential for surface water impact due to surface water runoff and groundwater discharge. Results from monitoring wells 07-2S and 07-2D (located north of Landfill Creek) indicate a potential groundwater pathway for these contaminants to reach Landfill Creek.

An MOECC Surface Water Scientist should continue to be consulted with respect to surface water management at this site.

Trigger Mechanisms and Contingency Plans

The groundwater trigger mechanism indicates that if the concentration of any parameter used in the assessment of Guideline B-7 (i.e. alkalinity, boron, barium, chloride, DOC, sodium, iron, manganese, VC and TDS) exceeds the calculated RUC along the western limit of the designated CAZ area (96-1S and D and 95-3S and D) over four (4) consecutive groundwater monitoring events, a contingency plan would be activated. A trigger mechanism is not required south east of the site as the property is comprised of restricted federal lands (i.e. Canadian Nuclear Laboratory property) and the MOECC has indicated that contaminants will be maintained within the CAZ in this direction. The contingency plan involves conducting additional sampling and investigation to determine the source and extent of impacts, and to identify an acceptable mitigation/remediation program, should one be required. The specifics of the contingency plan will be dependent on the nature and extent of the impact. I concur with the proposed trigger mechanisms and contingency plan proposed.

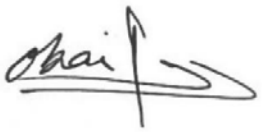
Jp2g recommended that iron and manganese be removed as trigger values in the compliance assessment. I do not agree with this recommendation. Iron and manganese were reported exceeding the ODWS at monitors 07-2S and 07-2D, located southeast of Area 1 within the CAZ to the south, compared to their background concentrations. I recommend to continue monitoring iron and manganese as trigger values, for any future leachate-related impacts that may occur.

Landfill Gas

Methane was not detected in any of the monitored wells or the on-site attendants shed during the 2016 monitoring events. The onsite risks associated with landfill gas associated with this site are beyond the scope of my review. Landfill gas monitoring should continue to be conducted, and the need for landfill gas mitigation should continue to be assessed and discussed in future monitoring reports.

Groundwater Monitoring Program

The approved monitoring program under the ECA dated April 4, 2014 is based on the supporting documentation for the Expansion Application, Section 7.0 of the Design and Operations Report, Jp2g letter dated January 8, 2014 and ECA Condition 7.6 (2). No changes are proposed for the approved groundwater monitoring program. Groundwater monitoring should be continued on a semi-annual basis (summer and fall), as part of the regular monitoring program at the site.



Obai Mohammed, P.Eng.
OYM/ob

ec: Greg Faaren
Peter Taylor
Lauren Forrester
Tara Macdonald

c: File GW RE DE 01 02 C13 (Miller's Road WDS)
OM/IDS 2404-AS8K6V

Ministry of the Environment and Climate Change

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Ontario

M E M O R A N D U M

May 17, 2017

TO: Tammy Watson
Senior Environmental Officer
Ottawa District Office
Eastern Region

FROM: Lauren Forrester
Surface Water Specialist
Technical Support Section
Eastern Region

RE: Contingency Plan
Millers Road (Deep River) Waste Disposal Site
Lot 6, Concession 8, Geographic Township of Buchanan
Environmental Compliance Approval (ECA) No. A413106

As requested, I have reviewed the *Miller's Road Waste Disposal Site Contingency Plan*, prepared by Jp3g Consultants Inc. and dated January 2015. For the purpose of this review, I have also consulted the comments of groundwater reviewer T. Guo, dated March 28, 2017. I offer the following comments with respect to surface water matters.

Background

The landfill site is presently leased by the Town of Deep River from Atomic Energy of Canada Limited. The site has been a waste disposal site for the municipality since approximately 1965 and operates under ECA No. A413106 as a naturally attenuating site. The total site area is approximately 8.55 ha and is divided in to four Areas. Areas 1 and 2 are cleared and are used for waste disposal. Areas 3 and 4 are approximately 5 metres lower in elevation than Areas 1 and 2 and are currently heavily wooded. The Town has acquired lands to the southeast and west which serve as contaminant attenuation zone for the landfill.

A Trigger Mechanism was established for this site as per Amended ECA No. A413106 issued April 4, 2014 and is described in Item 6 of Schedule A of that approval (Robinson Consultants, 2002). Contingency options are also described (please see enclosure). A Design and Operations Report was prepared by Jp2g in March 2013, but does not describe surface water trigger mechanism or contingency plans. As such, it is my interpretation that the Trigger Mechanism and Contingency plans (Item 6 of the Approval) have remained relevant up to this point.

Surface Water Regime

The site is located northwest of Maskinonge Lake. A drainage divide runs east-west through the approximate centre of the site. Spring Creek and the unnamed Landfill Stream both occur in close proximity to the landfill site. Spring Creek originates up-gradient and west of the site and passes under Miller`s Road approximately 300 metres west of the access road to the site entrance. Spring Creek meanders south to the site in an eastward direction to Maskinonge Lake, Ottawa River Basin. The Landfill Stream originates southeast of the site and meanders south-easterly until it meets up with Spring Creek approximately 0.5 km southeast of the site.

Drainage from the site flows mostly south-southeast towards Maskinonge Lake and eventually to the Ottawa River. It is anticipated that Spring Creek will act as a hydraulic boundary to any leachate migrating south-westward and that groundwater is may discharge to Landfill Stream.

Previous review by Bruce Metcalf (2014) found that Spring Creek was not significantly impacted at that time. Landfill Creek was interpreted to be not significantly impacted by leachate, but with signs of possible leachate influence at the downstream station (SW4 and SW5).

Leachate is characterized based on results from wells 95-6 and 07-3D. Leachate indicator parameters include alkalinity, boron, barium, hardness, iron, potassium, manganese, sodium, chemical oxygen demand (COD), dissolved organic carbon (DOC), and total dissolved solids (TDS). Volatile organic compounds (VOCs) have also been monitored in these wells. Various VOCs have been detected, including vinyl chloride exceeding Ontario Drinking Water Quality Standards from both wells.

Proposed Surface water Trigger and Contingency

Trigger Mechanism:

Surface water monitoring occurs three times per year at seven locations for this site. It appears that several modifications are proposed to the Trigger Mechanism, previously established by Robinson Consultants (2002). The following trigger mechanism is proposed:

- SW-6 (upstream of the confluence of Landfill Stream and Spring Creek) is proposed as a trigger location.
- Trigger parameters include un-ionized ammonia and chloride (75th percentile).
- Jp2g define an exceedance for any listed parameter as the numerical elevation of an analytical value above the trigger concentration or above the background concentration at the up-gradient station SW-1 if higher than the trigger concentration.
- Jp2g propose that four consecutive exceedances for any listed trigger parameter at SW-6 should be deemed to be caused by the landfill and would trigger the preparation of a contingency plan for submission to the MOECC shortly after the detection of the fourth exceedance.

Contingency Plan:

My understanding is that the contingency plan would consist of tiered actions, as follows:

1. Following the fourth exceedance of a trigger concentration, an assessment of existing water quality data would be undertaken to evaluate the need for further surface water / biological study;
2. If exceedances are deemed to be caused by the landfill, detailed surface water / biological study would be undertaken to determine if trigger exceedance cause acceptable or unacceptable quality / biological impact on the receiving watercourse;
3. The resulting report would be submitted to the MOECC and would include recommendations for:
    a. Site closure (or) continued operation with the design / construction of appropriate engineered facilities;
    b. Proposed timelines for installation of recommended remedial facilities;
    c. Proposed water quality monitoring program.

If impacts are deemed to be acceptable, Jp2G recommend the continuation of the routine sampling program without mitigation with respect to the specific trigger exceedance.

If impacts are deemed to be unacceptable, Jp2G recommend that remedial plans be implemented after the next result exceeding the trigger value during routine sampling. I do not agree with this approach.

Discussion

The proposed trigger evaluation location (SW-6) is consistent with the existing trigger mechanism and remains acceptable to the reviewer; however, the limitation of trigger parameters to chloride and unionized ammonia is a concern. Jp2g have excluded parameters that occasionally exceed the PWQO in background (SW1) for consideration as trigger parameters. I recommend that, for leachate indicator parameters found in excess of applicable PWQO or CWQG at the background monitoring location, the 75th percentile concentration from background should be considered as the trigger concentration.

The proposal to initiate contingency planning only after four consecutive exceeds could result in impacts going on for over a year prior to any actions being taken. This is a concern. The consultant should provide the rational for this proposed timeline for implementing contingency measures. Consideration should be given to confirmatory re-sampling following trigger concentration exceedances. For example, following two consecutive exceedances of a trigger concentration, confirmatory resampling could be carried out within 30 days as a component of a typical tiered contingency plan.

The consultant has not proposed a timeline for the submission of the proposed report on the contingency measures to the MOECC. The plan would benefit from the inclusion of set timelines for any proposed contingency actions (i.e. within 30 days of a confirmed trigger exceedance).

The proposed contingency plan is generally reasonable; however, if impacts are deemed to be unacceptable based on additional study, remedial measures should not be delayed. Remedial measures should be implemented as soon as is practical, not only additional exceedances. I also propose that potential recommendations within the report to the MOECC may include modifications to the trigger mechanism and contingency plan.

SUMMARY OF RECOMMENDATIONS

- Trigger concentrations should be established for landfill indicator parameters with Provincial Water Quality Objectives (PWQO) (or Canadian Water Quality Guidelines (CWQG) as applicable). Where the concentration of a leachate indicator parameter for which a PWQO / CWQG has been established exceeds the guideline value at upstream monitoring stations, the trigger concentration should be considered as the 75th percentile concentration from background. Please note, 75th percentile values should be updated as sampling data become available.

- I do not support the proposed change to the trigger mechanism to require four trigger concentration exceedances (rather than two) prior to the activation of contingency measures.

- As described above, timelines should be set out for the activation of confirmatory sampling and/or contingency actions once the prescribed number of trigger exceedances has occurred.

- If additional study is carried out and identifies unacceptable impacts to surface water, remedial measures should not be delayed pending additional exceedances, but should commence as soon as is practical following approval of the District Manager

- I note that the possible outcomes of water quality evaluation should include the option to propose modifications to the trigger mechanism.

If you have any questions about these comments, please feel free to contact me.

"Original Signed By"

Lauren Forrester, M.Sc.
LF/dv

Encl: Surface Water Trigger Mechanism (Robinson Consultants, 2002)

ec: Peter Taylor, Technical Support Manager
Greg Faaren, Water Resources Unit Supervisor
Tara MacDonald, Ottawa District Supervisor

c: SW RE DE 03 06 13 □ Deep River (Miller□s Road) LFS
SW 13 01 07 02 SP □ Spring Creek, Ottawa River Basin (Central)
LF/IDS No. 0667-AKJHJC

5.6 Surface Water Trigger Mechanism

The environmental monitoring program will be used to identify the time at which contingency plans may need to be implemented, if ever. The 'triggering mechanism' for the landfill site is based on the MOE Eastern Region's 'Interim Guidance Document Surface Water Monitoring Trigger Mechanism For Waste Disposal Sites (July 2002).

The extend of groundwater impact and the Reasonable Use Policy has been based on choride and TDS values. The parameters to be considered as trigger mechanisms for surface water impact are chloride and unionized ammonia.

The proposed trigger values are defined as the 75th percentile value of the recommended trigger parameters from the background surface water location. The trigger values are as follows:

Chloride	30.5
Unionized Ammonia	0.01

The current values from monitoring station SW-6 are below the proposed trigger values.

Tier 1 Trigger Level

Any two consecutive surface water samples from the routine annual monitoring program that exceed the trigger values or other parameters which are considered to be excessively high at the compliance station SW-6 may trigger the Tier II monitoring as indicated below. The Tier II sampling is to be completed within 30 days subsequent to an assessment that will be provided to the MOE to determine the necessity of Tier II monitoring.

Tier II Trigger Level

Tier II monitoring will consist of consecutive monthly surface water sampling for four locations located between the landfill and the compliance of the Landfill Creek and Spring Creek (SW-2, SW-3, SW-6 and SW-7). The list of parameters will be as in the routine sampling as well as "toxic indicator" parameters. The Tier II monitoring results shall be provided to the MOE District Manager as soon as they are available. Any two consecutive surface water samples from the Tier II monitoring program that exceed values as indicated above, will trigger the implementation of the appropriate contingency plan (s) and Tier III monitoring as outlined below.

If the above Tier II monitoring does not show further exceedances, then monitoring may return to the routine program.

Tier III Trigger Level

Within 30 days of the triggering of Tier III (ie. Two consecutive monthly exceedances), the Town will provide to the MOE District Manager a detailed work plan and implementation schedule for an appropriate contingency to control leachate and Tier III monitoring program to verify the effectiveness of the contingency. Following approval from MOE, these will be immediately implemented.

5.7 Contingency Options

Potential contingency actions that would be viable are as follows:

a) collection and treatment of contaminated groundwater or surface water below the drop towards SW-2, and /or

b) pumping and treatment of contaminated groundwater from purge wells.

The following provides a review of each of the above contingency measures, describing the concept and indicating its technical feasibility. Any one of these are considered to be viable at this site, or in combinations depending on the circumstances.

5.7.1 Primary Contingency Plan

Low Permeability Final Cover

The current natural attenuation design of the site assumes infiltration rates and leachate production equivalent to the natural infiltration rate in the surrounding sandy soils. This is a conservation approach, but a practical one as well since there is no source of fine-grained (ie. Clay) soils on-site from which to construct a low-permeability final cover. (The cut and fill for the site have been balanced to provide for a sand final cover.) However, if unexpected leachate impacts were detected, then one straightforward solution would be to import fine grained soils and/or synthetic membranes and construct a low permeability final cover (that could be progressively installed). This is technically feasible since there is experience with these types of covers at landfill sites all across Ontario. A cover of this type could be easily several orders of magnitude lower in permeability than the native sand material.

Leachate Re-Infiltration

Leachate re-infiltration would be a reasonable and viable contingency on a short-term basis or in conjunction with other contingencies noted above. Leachate could be collected at points of discharge, such as at the base of the waste mound along the buffer area adjacent to the rail line. French drains and other standard drainage works could be used. Then, the leachate could be pumped back to the landfill footprint area and re-infiltrated via ponds, trenches or infiltration galleries. Leachate re-circulation can provide effective control for certain leachate types. Typical problems such as odours and visibility may not be an issue at this site because it is fairly isolated.

Collection and Treatment of Contaminated Water at the Base of the Escarpment

Similar to the leachate re-infiltration contingency discussed above, this technique would allow for the collection of leachate at easily assessable points of discharge as noted above. However, the leachate could instead be collected, probably in temporary holding tanks, then treated off-site. The Deep River Sewage Treatment Plant would likely be a suitable treatment facility, based on the successful experience with leachate treatment at other sewage treatment plants in the province. However, purpose built treatment or pre-treatment systems, either on-site or off-site, are also technically viable with current technology.

Pumping and Treatment of Contaminated Ground Water From Purge Wells

Purge wells are a proven method of removing contaminated groundwater for treatment at landfill sites. The uniform characteristics of the surficial sand deposit at this site should lend itself to effective purge well design, although numerous wells might be needed because of the high permeability of the unit. On the other hand, only partial removal of the leachate might be needed to allow the natural attenuation concept to return to its designed function. In terms of treatment, the discussion above regarding use of the sewage treatment plants, or purpose-built treatment or pre-treatment also applies here.

7.0 DISCUSSION AND RECOMMENDATIONS

Surface water sampling has been completed upstream and downstream from the landfill site in both Spring Creek and the Landfill Creek. The chemical values at monitoring station SW-1 are deemed to be reflective of background conditions. All samples exhibit parameters which exceed Provincial Water Quality Objectives. Impact is present in the Landfill Creek located to the southwest of the site. The impact is characterized by elevated metal concentrations as well as iron precipitation on the stream bed. Surface water trigger mechanisms have been identified at monitoring station SW-6.

Ministry of the Environment and Climate Change

P.O. Box 22032
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613/549-4000 or 1-800/267-0974
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Ministère de l'Environnement et de l'Action en matière de changement climatique

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Ontario

M E M O R A N D U M

March 28, 2017

TO: Tammy Watson
Senior Environmental Officer
Ottawa District Office
Eastern Region

FROM: Thomas Guo
Hydrogeologist
Technical Support Section
Eastern Region

RE: Contingency Plan
Miller's Road Waste Disposal Site
Lot 6, Concession XIII, Township of Deep River
Environmental Compliance Approval: A413106

I have reviewed the hydrogeologically pertinent sections of the document entitled "Miller's Road Waste Disposal Site, Contingency Plan", prepared by Jp2g Consultants Inc. (Jp2g) and dated January 2015.

The report presents the details of contingency plan for the Miller's Road Waste Disposal Site to address Condition 8.2 of the ECA. I offer the following comments for your consideration.

Environmental Compliance Approval (ECA)

The Miller's Road waste disposal site (site) operates under ECA A413106 issued in April, 1980 and last amended November 2009. The site is located on Lot 6, Concession XIII, Township of Deep River. The site is licensed for the use and operation of a 4.5 ha landfill within a total area of 8.55 ha. In addition to the 8.55 ha landfill property, 14.14 ha has been registered on title as contaminant attenuation zone establishing a total site area of 22.69 ha. The site is licensed to accept Construction and Demolition (C & D) wastes only. ECA amended on April 4, 2014 has been issued for the site.

The landfill operates as a naturally attenuating site. The site is used entirely for the disposal of construction and demolition waste and it is understood that no radioactive waste is disposed at the site.

Background

The Miller's Road Waste Disposal Site is presently leased by the Town of Deep River from Canadian Nuclear Laboratories (CNL) formerly Atomic Energy of Canada Limited (AECL) and has been the landfill Site for the Municipality since 1965.

In response to an Application for an Amended Certificate dated April 2002, the MOE issued ECA No. A413106 dated November 14, 2002. The supporting documentation listed as items 2 to 6 on Schedule "A" described the operation and development and monitoring requirements of the C & D waste disposal Site. The landfilling of domestic waste ceased in July 2002 and the designated areas within the 4.5 ha landfilling area have received C & D waste within the design contours. As required under Conditions 11 and 12, an Operations Report and Sludge Lagoon

Decommissioning Plan dated November 2003 was filed providing further detail on site operations. As a part of the expansion application, filed in March 2013, an updated Design and Operations report was completed by Jp2g Consultants Inc.

Site Setting

The site is located on Baggs Road in Part of Lot 6, Concession XIII, in former Geographic Township of Buchanan, now Town of Deep River.

The site lies in the Ottawa-Bonnechere graben, a rift valley that was generated by tension faulting. In the region around the site, the Ottawa River occupies the fault zone that defines the northeastern boundary of the graben; the southwestern boundary of the rift valley lies approximately 60 km southwest near the Bonnechere River, but there are a number of smaller or secondary faults within the graben.

The site is located within the Maskinonge Lake Basin. The basin drains to Maskinonge Lake, which in turn drain via Chalk Lake to the Ottawa River. Surface water features in the vicinity of the site include an unnamed Landfill Creek that is located approximately 100 m southeast of the site and Spring Creek that originates west of the site and passes by the site to the south.

Geology

Jp2g determined the geology to be as follows:

- Till with gravelly sand and silt in Areas 2, 3 and 4 with till thickness ranging from 0 to 1.75 m;
- Fine-grained sand with trace silt in Areas 1 and 2 and extending south to Spring Creek with thickness generally greater than 10.7 m; and,
- Precambrian felsic metasedimentary bedrock.

Hydrogeology

Jp2g determined the hydrogeological conditions to be as follows:

- Groundwater flow in the overburden is influenced by underlying bedrock topography and is predominantly to the east and southeast;
- Groundwater flow in the vicinity of Area 2 flows southwest under a low hydraulic gradient possibly related to groundwater mounding in this area;
- Local groundwater flow from the north of Area 3 is north towards a wetland;
- Hydraulic conductivity values range between 1.3×10^{-2} to 6.95×10^{-5} cm/s;
- Horizontal gradients range from 0.001 in Area 2 to 0.02 in Areas 3 and 4. The higher gradient values are reportedly influenced by the dipping bedrock surface and topography;
- The average linear velocity is 60 m/year south of the landfill and 7.5 m/year southwest from the western property line; and,
- The conceptual contaminant transport movement at the site is through the overburden from the northwest to the southeast with a slight component

Background Groundwater quality

Wells 91-2 and 95-5 are located south and northwest of the site, respectively, and are considered representative of background water quality. Current sampling from these wells indicates that all parameters meet Ontario Drinking Water Quality Standards (ODWQS) and no impacts from landfilling activities are detected.

Leachate

Wells 95-6 and 07-3D were used to characterize leachate. Elevated concentrations of alkalinity, boron, barium, hardness, iron, potassium, manganese, sodium, chemical oxygen

demand (COD), dissolved organic carbon (DOC) and total dissolved solids (TDS) are present and these serve as leachate indicator parameters at the site. Volatile Organic Compounds (VOCs) were also monitored at these wells in 2012 and numerous VOCs were detected at both wells with vinyl chloride levels exceeding ODWQS at both wells.

Groundwater Surface Water Interaction

There is potential for surface water impact due to surface water runoff and groundwater discharge. Results from monitoring wells 07-2S and 07-2D (located north of Landfill Creek) indicate a potential groundwater pathway for these contaminants to reach Landfill Creek.

Existing Leachate Management

Leachate generated from the landfill is managed through natural attenuation. CAZs exist to the southeast and to the west of the landfill site. Jp2g states that all leachate generated at the landfill site is attenuated within the CAZ.

There are currently no surface water control features at the site. The land surrounding the site is vegetated and surface water in the vicinity of the site infiltrates the glaciofluvial coarse textured overburden. Surface water monitoring is completed at the site to ensure that the leachate is not negatively impacting the local surface water environment.

Groundwater Monitoring Program

Groundwater monitoring occurs two times a year and includes: Monitoring Wells: 91-2, 91-5 S□D, 95-3 S□D, 95-4 S□D, 95-5, 95-6, 96-1 S□D, 96-3, 07-2 S□D, 07-3 S□D, 07-F S□D, and 08-1 S□D.

Currently analyzed parameters are: alkalinity, chloride, conductivity, nitrite, nitrate, TDS, total Kjeldahl nitrogen, hardness, calcium, magnesium, potassium, sodium, aluminium, barium, beryllium, boron, cadmium, chromium, cobalt, copper, iron, lead, manganese, molybdenum, nickel, silicon, strontium, thallium, titanium, vanadium and zinc.

Groundwater Trigger Mechanism

The proposed trigger mechanism for the Miller□s Road Waste Disposal Site is recommended by Jp2g as the exceedance of 75□ of MOECC Reasonable Use Guideline (RUG) B-7 limits along the western limit of the designated CAZ (i.e. monitoring well 96-1 S□D) where the exceedance of parameters used in the RUG assessment is observed over four (4) consecutive groundwater monitoring events.

A trigger mechanism is not required southeast of the site as the property is comprised of restricted federal lands (i.e. CNL property) and MOECC has indicated that contaminants will be maintained within the CAZ in this direction.

In the event that chemical values from the designated monitoring station (96-1 S□D and any new stations) exceed the trigger mechanism values (during four (4) consecutive sampling events), a tier type sampling program will be initiated. The three tier monitoring program is listed below:

Tier I Trigger Level

Any four (4) consecutive groundwater samples from the routine annual monitoring program that exceed the trigger values may trigger the Tier II monitoring as indicated below. Subsequent to the exceedance, an assessment will be provided to the MOECC to determine the necessity of Tier II monitoring.

Tier II Trigger Level
Tier II monitoring consists of consecutive monthly groundwater sampling of the compliance well (96-1). The list of parameters will be as the routine sampling. The Tier II monitoring results shall be provided to the MOECC District Manager as soon as they are available. Any two (2) consecutive groundwater samples from the Tier II monitoring program that exceed values as indicated above, will trigger the implementation of the appropriate contingency plan(s) and Tier III monitoring as outlined below. If the above Tier II monitoring does not show further exceedances, or, if in the opinion of the district manager the monitoring may return to the routine program.

Tier III Level
Within 60 days of the triggering of Tier III (i.e. two consecutive monthly exceedances), the Town will provide to the MOECC District Manager a detail work plan and implementation schedule for an appropriate contingency plan to control leachate and Tier III monitoring program to verify the effectiveness of the contingency, or alternatively, rational for the cessation of tiered monitoring.

Groundwater Contingency Plan
Under the RUG, the owner of a waste disposal site is responsible for preventing unacceptable off-property groundwater impacts. Should the groundwater monitoring program indicate the existence of, or potential for, unacceptable impacts, the owner shall prepare and present a mitigation plan for the approval of the MOECC. In this event, actions taken by the Town of Deep River to prevent or remediate the off property impacts could consist of:

a) Acquisition of additional land to bring the site in compliance with the RUG;
b) Gaining control over the contaminated groundwater to bring the site into compliance; or,
c) Developing and implementing groundwater control/treatment measures to bring the site into compliance with the RUG.

Conclusions and Recommendations
The proposed trigger mechanism and contingency plan is acceptable. However, based on the previous comments provided by the MOECC, monitoring well 95-3 should be included in the compliance well list for the proposed trigger mechanism and contingency plan. Dissolved organic carbon (DOC) and vinyl chloride (VC) should be included in the analyzed parameter list and be used as the parameters for the RUG assessment, trigger mechanism and contingency plan.



Thomas Guo, M. Eng, P. Geo.
TG/dv

ec: Peter Taylor, Technical Support Manager
Greg Faaren, Water Resources Supervisor
Kyle Stephenson, Groundwater Group Leader

c: Dale Gable, Supervisor, Approvals Services Unit, EAB
Lauren Forrester, Surface Water Specialist
File No. GW RE DE 01 02 (Miller□s Road WDS □A413106)
TG/IDS□ 0342-AKVL3P

Jp2g Consultants Inc.
ENGINEERS ■ PLANNERS ■ PROJECT MANAGERS

J.M. Janota, P.Eng., M.Sc.
J.E. Hunton, MCIP, RPP

January 8, 2014

Ministry of the Environment
Operations Division
Floor 12A
2 St. Clair Ave West
Toronto, ON

via email only
Dale.Gable@ontario.ca

Attention: **Mr. Dale Gable, P.Eng**

Re: Application for Approval of Waste Disposal Site
Expansion of Millers Road Landfill Site
Town of Deep River, County of Renfrew
MOE Reference Number 0772-96NNMW
Our Project No. 2106142B

Dear Sir:

We are in receipt of your letter dated December 23, 2013 regarding the Millers Road Expansion Project. As requested, we are pleased to provide this letter in response to your concerns. For clarity, we have addressed your comments in the order that they appear in your letter.

Section 3.2 indicates that in place waste at the Site is 215,825 cubic meters. Section 3.4 indicates that the theoretical capacity for the Site is 355,950 cubic meters. Section 3.4 also indicates the design of the expanded landfill is not intended to utilize the remaining capacity theoretical capacity of the Site. It is unclear the rationale for this statement.

It is a statement of fact only, suggesting that when an additional 100,000m^3 is added to the site, the total landfill volume is less than the theoretical volume which was established in previous reports (items 3 and 4, Schedule "A" of the ECA).

***Whether or not the expansion was vertical or horizontal, the Township had ample available capacity to apply under the Environmental Protection Act to seek to utilize and amend the current approved footprint that capacity. There was no reason for the Town to undertake an environmental screening process at this time*.**

It is our understanding that with respect to correspondence from Ms. Alida Mitton and Ms. Vicki Mitchell of the Ontario Ministry of the Environment that an ESP was required.
Re: Ms. Mitton (Letter dated August 18, 2010; attached)

"The Town is proposing to expand the total waste disposal volume of Millers Road Waste Disposal Site by 40,000 m3; but not more than 100,000 m^3. This project will proceed under Ontario Regulation 101/07 made under the *Environmental Assessment Act.* This project is exempt from Part II of the *Environmental Assessment Act* provided the Town completes the Environmental Screening Process as per Ontario Regulation 101/07.

Re: Ms. Mitchell (email correspondence dated November 29, 2011; attached)

"Thank you for informing Lance Larkin and me about the proposed landfill site expansion project. It is the Ministry's position that the Ontario Environmental Assessment Act does not apply to the proposed landfill site expansion based on our understanding that the project will be Implemented on lands that are owned by a federal Crown Corporation; namely Atomic Energy of Canada Limited. Although it is the Ministry's position that the Ontario Environmental Assessment Act, and thus Ontario Regulation 101/07, would not apply to the proposed expansion, MOE environmental compliance approvals would still be required. We understand that the project is undergoing a federal environmental assessment, and request that the Town continue to share the information developed in support of the federal EA with MOE staff. We would like to ensure that the expansion of the site as proposed during the federal EA review will meet MOE standards and that there will not be undue delay at the MOE environmental compliance approval stage"

This statement suggests that in fact an ESP under Ontario Regulation 101/07 would be required if not for the fact that the site is on Federal Land.

As a result of Ms. Mitchell's email, a Provincial Environmental Screening Process project was not required. At that time however, there was a requirement to complete a Federal EA which was completed, and at the request of the MOE we provided documentation for their files. Nearing the end of the process, the Federal Government had a "Policy Change" and as a result a Federal EA was not required for small projects in which this was classified. The Federal EA was however completed, reviewed by the Federal scientists and subsequently approved.

With regards to the ESP, it appears that the undertaking did not take into account the 100,000 expansion from the theoretical capacity amount, therefore, the ESP is considered to be incomplete. As a result, it may be premature for the ministry to approve a 100,000 cubic metre expansion on top of the theoretical capacity.

We are not asking for an expansion of 100,000m^3 on top of the theoretical capacity. We have merely stated that the total volume when adding 100,000m^3 would be less than the theoretical volume.

As a result, the theoretical capacity will remain the same until the ESP is updated to consider the expansion using the theoretical capacity as the Site baseline. In the meantime, given the proposed capacity is still within the theoretical capacity, the ministry can continue the review from an EPA perspective.

The ESP requirements have been satisfied through the Federal EA process, proposing to increase the capacity by 100,000m^3. The EPA application identified a baseline design capacity of 221,825m^3 in the D&O report March 2013 (which referenced the D&O report dated April 2001, Item 4 Schedule "A" of ECA No. A413106). The final design capacity proposal is 321,825m^3 so the ECA application requests an amendment to Condition 10 of the ECA which limits the volume to 215,825m^3.

Section 5.6 discusses final cover material. Final cover should be low-permeable soil. This requirement can be addressed through a Condition in the ECA.

We agree that this requirement can be considered through a Condition in the ECA. We would however suggest that the use of low-permeable soil should not be required. This site is based on natural attenuation and as long as the site remains compliant with MOE Guideline B-7 locally available native soils should be satisfactory. In the event that contingencies are required the use of low-permeable material could be considered.

Section 5.6 indicates that the concentration of the substances in the Soil should not exceed the concentrations exceeded in Table 3 in O. Reg. 153/04. It should be noted that the Regulation is specifically for Record of Site Condition sites, in which this site does not apply.

This statement is based on similar wording contained in the Sample Application Package prepared by the EAAB in 2008, MOE document PIBS 6839e01. The intent is to ensure that the final cover material contaminant levels are acceptable.

Regulation 232/98 has specific requirements for surface water management requirements. The design does not incorporate the requirements. Section 5.7 indicates that a trigger mechanism is in place to ensure performance. Please provide the rationale for not including the surface water requirements into the design.

There is no on-site surface water drainage or discharge at the site to any nearby water body. Any precipitation at the site will migrate vertically through more porous overburden material until intersected by the groundwater table. As a result, surface water controls are not required. This issue is further addressed in Section 3.4.4 of the Environmental Assessment Screening Report for the Expansion of the Deep River (Millers Road) Waste Disposal Site as follows:

3.4.4 Storm Water Management

3.4.4.1 Construction

No special storm water management measures are required for the expansion. The base of the landfill is located above the water table. Any storm water accumulating will rapidly infiltrate.

3.4.4.2 Operations

The landfill will be designed to direct storm water away from the landfill area. Design measures to direct water away from the landfill may include a system of drainage swales. It is anticipated that storm water will rapidly infiltrate due to the high permeability of local soils.

No impacts on streams/wetlands from storm water management are expected. Runoff from the fill area would typically infiltrate the subsurface as a result of the high permeability of the sands. The nearest stream/wetland is Spring Creek and the Un-named creek located to the southeast from the site. The runoff path length from the landfill site to Un-named stream is approximately 100 m with a very low average slope.

There is, as described in Section 9 of the Environmental Monitoring Report two nearby surface water features. As indicated above, there is no direct surface discharge to either of these two features. In recent years, the Ministry of the Environment Technical Support Section has reviewed the annual reports and more specifically the surface water content;

August 7, 2007, review of 2006 Annual Report
September 7, 2010, review of 2009 Annual Report
December 9, 2011, review of 2010 Annual Report

All reviews have confirmed that “the surface water quality was determined not to be adversely impacted”. The results do not suggest the Triggering of Tier II Level surface water monitoring to be required at the landfill.

As the proposed expansion is not changing the landfill foot print and is intended to continue only with essentially inert waste we would suggest that the current monitoring and sampling protocol is sufficient.

We would suggest that any changes could be addressed though conditions in the Certificate.

Section 6.2.4 describes the waste acceptance procedures. The section does not provide a description on waste that is rejected or inadvertently accepted. Can you please provide details on waste rejection and procedures/locations for storage of waste that should not have been accepted at the site.

The site attendant at the gate and/or office will inspect the waste load and direct to the appropriate drop off area. Rejected loads will be directed to the nearby Baggs Road Waste Disposal Site. The Baggs Road site is the other landfill site that serves the municipality. Materials accepted at the Baggs Road WDS are listed at the following web address:

http://northrenfrewlandfill.com/wasteaccepted.html

Waste loads that are inadvertently accepted will be stockpiled and transferred to the Baggs Road Site during the next working day in which both sites are open.

The following changes to the monitoring program:

- ***i. VOC analysis should be added to deep overburden intervals at monitoring locations 96-1 and 95-3 in addition to 95-6, 07-3D and 07-3S (as monitored in 2012); and,***
- ***ii. Monitoring well 96-2 should be added to the monitoring program (monitored for at least the inorganic list) in order to better understand the distribution of contaminants in the main flow Direction towards Maskinonge Lake.***

We do not object to adding the above to the monitoring program

Given its presence in groundwater at high levels to the west of the site, vinyl chloride should be included as a Guideline B-7 parameter. Vinyl chloride is not detectable at the compliance boundary well (96-1) and will not impact compliance at this time however this parameter should be included in the assessment moving forward. Given that local flow is westward from the western end of the site, the ministry is recommending that monitoring wells at location 95-3 should also be included as compliance monitoring wells.

We do not object to adding vinyl chloride as a Guideline B-7 parameter. We do not however agree that the wells located at 95-3 should be included as compliance monitoring wells. Compliance wells are typically located along property lines to assist in assessing off-site impact. Monitoring well 95-3 will not accomplish this. Monitoring well 95-3 could however be considered in the future as a trigger location.

It is recommended that groundwater supply wells within 500 metres of the site be sampled twice per year in 2014 and 2015 (2 years) with samples analysed for the inorganic list and VOCs. Based on a file search, two (2) wells were sampled in the 80's and the ministry recommends that samples should be collected again from nearby groundwater users to confirm that landfill impacts do not influence bedrock wells west of the site.

We will incorporate the sampling of the two nearest residences in the 2014 and 2015 monitoring program.

I trust that the above information is satisfactory and adequately addresses your concerns. We look forward to reviewing a copy of the draft Environmental Compliance Approval. Should you require clarification or have any further questions, please do not hesitate to contact the undersigned.

Yours truly,

Jp2g Consultants Inc.
Engineers • Planners • Project Managers



Andrew Buzza. P.Geo
Project Manager

AB/jlp

Cc: - Sean Patterson: Town of Deep River via email – spatterson@deepriver.ca
- Kyle Straberger: MOE Ottawa District Office via email – kyle.straberger@ontario.ca

Appendix B Government Agencies and Their Areas of Interest

This information is a subset of the Government Review Team list that is provided to applicants/proponents at the start of their planning process. This is for information only, and the particular agency or ministry must be contacted to determine if they have a mandated interest in the proposal.

AGENCY/MINISTRY	TYPE OF PROJECT/ POTENTIAL AREAS OF INTEREST
FEDERAL AGENCIES	
Canadian Environmental Assessment Agency	Undertakings that: • will require federal approvals, financing; • are on or abutting federal lands; • will require federal funding.
Canadian Transportation Agency	Undertakings with the potential to affect railway lines or property.
Indian and Northern Affairs Canada	Undertakings with the potential to affect: • Aboriginal communities; • traditional territories, and reserves; • lands/waters surrounding reserves.
Environment Canada	Undertakings with the potential to: • result in the deposit of deleterious substances into fisheries water; • affect migratory birds; • affect federal wetlands; • affect natural wildlife areas and national parks; • cause transboundary effects on air or water quality; • endanger or threaten species at risk.
Fisheries and Oceans Canada	Undertakings in or near water that have the potential to: • harmfully alter disrupt or destroy fish or fish habitat; • impact passage of fish around migration barriers; • impact provision of sufficient water flows; • result in the destruction of fish by means other than fishing (blasting); • impact aquatic species at risk.
Health Canada	Undertakings with human health implications.
Transport Canada	Undertakings that: • are located in the vicinity of a federal airport and may attract birds; • may cause electrical interference to navigational aids; • may affect a navigable waterway.

AGENCY/MINISTRY	TYPE OF PROJECT/ POTENTIAL AREAS OF INTEREST
PROVINCIAL AGENCIES & MINISTRIES	
GO Transit	Undertakings with the potential to affect GO Transit service or property.
Ontario Realty Corporation	Undertakings whose associated lands are adjacent or proximate to lands owned by the Ministry of Energy and Infrastructure.
Niagara Escarpment Commission	Undertakings in or with the potential to affect the Niagara Escarpment Planning Area.
Ministry of Aboriginal Affairs	For identification of Aboriginal communities potentially affected by an undertaking. Also for undertakings with the potential to affect Crown land and resource usage.
Ministry of Agriculture, Food and Rural Affairs	Undertakings with the potential to affect: • prime agricultural areas (areas of classes 1–3 agricultural soils); • specialty crop areas; • agricultural uses, agriculture-related uses and secondary uses on farms.
Ministry of Culture	Undertakings that may affect properties having recognized or potential cultural heritage value or interest, which may include: • built heritage resources; • cultural heritage landscapes; • areas of archaeological potential; • undertakings whose associated lands are adjacent or proximate to lands owned by the Royal Botanical Gardens, the McMichael Canadian Collection, or owned or protected by the Ontario Heritage Trust.
Ministry of Tourism	Undertakings with the potential to affect sport/recreational areas or tourist facilities.
Ministry of Education (consult local school board) Ministry of Training, Colleges and Universities (consult local institution)	Undertakings with the potential to affect school/institution, building property, or staff and students.
Ministry of Community Safety and Correctional Services	Undertakings with the potential to have a direct physical impact on a Correctional Services correctional centre, jail or a detention centre.
Ontario Provincial Police	Undertakings with the potential to have a direct physical impact on an Ontario Provincial Police correctional centre, jail or detention centre.
Ministry of Economic Development and Trade	Undertakings which involve investments in large-scale manufacturing facilities or co-generation projects.

AGENCY/MINISTRY	TYPE OF PROJECT/ POTENTIAL AREAS OF INTEREST
Ministry of Energy and Infrastructure	Undertakings with energy implications, including renewable energy such as small hydro or wind. Undertakings within an area covered by the Growth Plan for the Greater Golden Horseshoe or the *Places to Grow Act, 2005*.
Ministry of Health and Long-Term Care (Local Medical Officers of Health)	Undertakings with potential health impacts such as groundwater contamination and air quality impacts.
Ministry of Municipal Affairs and Housing	Undertakings that: • relate to municipal services; • involve a municipal proponent; • may have an effect on the Oak Ridges Moraine Conservation Plan Area.
Ministry of Natural Resources	Undertakings that may have a potential effect on: • permanent and intermittent watercourses or water bodies; • rare, vulnerable, threatened, endangered or otherwise significant species; • Areas on Natural and Scientific Interest or an Environmentally Significant Area; • mineral aggregate resources; • Crown land/resources; • provincially significant wetlands.
Ministry of Northern Development, Mines and Forestry	Undertakings that may potentially affect: • geological and mineral resources; • economic development in northern Ontario; • tourism in northern Ontario.
Ministry of Transportation	Undertakings within: • any study area for a transportation corridor or route planning project; • 800 metres of any existing/designated provincial highway or other provincial transportation facility; • adjacent to Ministry of Transportation property (i.e. patrol yards, carpool lots, etc.).
OTHER	
Ontario Power Generation	Undertakings that could potentially directly affect an Ontario Power Generation generating site.
Hydro One Networks Inc.	Undertakings that could potentially directly have an impact on Hydro One facilities or plants (includes transmission/distribution lines or transformer/distribution stations).

AGENCY/MINISTRY	TYPE OF PROJECT/ POTENTIAL AREAS OF INTEREST
Local Conservation Authority	Undertakings with the potential to affect: • area in and adjacent to watercourses (including valley lands), wetlands, shorelines of inland lakes and the Great Lakes-St. Lawrence System and other hazard lands; • fish and fish habitat; • drinking water sources; • sensitive natural features; • hydrology and storm water.

Note: Municipalities and Aboriginal peoples, while not formally on the Government Review Team, are consulted about a class environmental assessment project if it is located in their municipality or community or if it may affect their municipality or community as required by the *Environmental Assessment Act*.

CONTENT COPY OF ORIGINAL

(Optional) Letter Description:

Ministry of the Environment
Operations Division
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Ontario

December 23, 2013

Michelle Larose, CAO/Clerk
The Corporation of the Town of Deep River
Post Office Box, No. 400
Deep River, Ontario
K0J 1P0

Dear Ms. Larose:

Re: Application for Approval of Waste Disposal Sites
Expansion of Miller's Road Landfill Site
Deep River Town, County of Renfrew
MOE Reference Number 0772-96NNMW

I have been assigned to review your application submission for Environmental Compliance Approval (ECA) No.A413106 (Miller Road Waste Disposal Site) in which you are requesting approval for a capacity expansion for the Site.

I have completed my initial review of the application and the supporting documentation prepared by Jp2g Consultants dated March 2013. Based on my initial review, I am providing the following comments:

Design and Operations

1. Section 3.2 indicates that in place waste at the Site is 215,825 cubic meters. Section 3.4 indicates that the theoretical capacity for the Site is 355,950 cubic meters. Section 3.4 also indicates the design of the expanded landfill is not intended to utilize the remaining capacity theoretical capacity of the Site. It is unclear the rationale for this statement. Whether or not the expansion was vertical or horizontal, the Township had ample available capacity to apply under the Environmental Protection Act to seek to utilize and amend the current approved footprint that capacity. There was no reason for the Town to undertake an environmental screening process at this time. With regards to the ESP, it appears that the undertaking did not take into account the 100,000 expansion from the theoretical capacity amount, therefore, the ESP is considered to be incomplete. As a result, it may be premature for the ministry to approve an 100,000 cubic metre expansion on top of the theoretical capacity. As a result, the theoretical capacity will remain the same until the ESP is updated to consider the expansion using the theoretical capacity as the Site baseline. In the meantime, given the proposed capacity is still within the theoretical capacity, the ministry can continue the review from an EPA perspective.

2. Section 5.6 discusses final cove material. Final cover should be low-permeable soil. This requirement can be addressed through a condition in the ECA.

3. Section 5.6 indicates that the concentration of the substances in the Soil should not exceed the concentrations exceeded in Table 3 in O. Reg. 153/04. It should be noted that the Regulation is specifically for Record of Site Condition sites, in which this site does not apply.

4. Regulation 232/98 has specific requirements for surface water management requirements. The design does not incorporate the requirements. Section 5.7 indicates that a trigger mechanism is in place to ensure performance. Please provide the rationale for not including the surface water requirements into the design.

5. Section 6.2.4 describes the waste acceptance procedures. The section does not provide a description on waste that is rejected or inadvertently accepted. Can you please provide details on waste rejection and procedures/locations for storage of waste that should not have been accepted at the Site.

CONTENT COPY OF ORIGINAL

Groundwater

6. The following changes to the monitoring program:

i. VOC analysis should be added to deep overburden intervals at monitoring locations 96-1 and 95-3 in addition to 95-6, 07-3D and 07-3S (as monitored in 2012); and,
ii. Monitoring well 96-2 should be added to the monitoring program (monitored for at least the inorganic list) in order to better understand the distribution of contaminants in the main flow direction towards Maskinonge Lake.

7. Given its presence in groundwater at high levels to the west of the site, vinyl chloride should be included as a Guideline B-7 parameter. Vinyl chloride is not detectable at the compliance boundary well (96-1) and will not impact compliance at this time however this parameter should be included in the assessment moving forward. Given that local flow is westward from the western end of the site, the ministry is recommending that monitoring wells at location 95-3 should also be included as compliance monitoring wells.

8. It is recommend that groundwater supply wells within 500 metres of the site be sampled twice per year in 2014 and 2015 (2 years) with samples analysed for the inorganic list and VOCs. Based on a file search, two (2) wells were sampled in the 80's and the ministry recommends that samples should be collected again from nearby groundwater users to confirm that landfill impacts do not influence bedrock wells west of the site.

Please provide a response to the items above which require a response by no later than January 16, 2014. Please copy the District Office in your correspondence.

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

Yours truly,

Dale Gable
Acting Supervisor

c: District Manager, MOE Ottawa
Andrew Buzza, Jp2g Consultants Inc.

M E M O R A N D M December 3, 2013

TO: K. Straberger
Sr. Environmental Officer
Ottawa District Office
Eastern Region

FROM: K. Stephenson
ydrogeologist
Technical Support Section
Eastern Region

RE: - 2012 Annual Monitoring Report
- Proposed Site Expansion
Miller's Road Waste Disposal Site
Lot 6, Concession III, Township of Deep River
Environmental Compliance Approval A413106

Purpose

I have reviewed the following reports related to the Miller's Road Waste Disposal Site (site):

- "2012 Annual Monitoring Report, Deep River (Miller's Road) Waste Disposal Site" dated May, 2012 and completed by Jp2g Consultants Inc. (Jp2g) on behalf of The Corporation of the Town of Deep River (Town);

- "Environmental Assessment Screening Report for The Expansion of the Deep River (Miller's Road) Waste Disposal Site" dated June 2012 and prepared by Jp2g;

- "Environmental Monitoring Report, Deep River (Miller's Road) Waste Disposal Site Proposed Site Expansion" dated March 2013 and prepared by Jp2g; and,

- "Design and Operations Report, Miller's Road Waste Disposal Site" dated March 2013 and prepared by Jp2g.

I reviewed the reports to determine site compliance with Guideline B-7 and to provide comments on the proposed expansion of the site. I have organized this memorandum into three sections dealing with the annual report, the environmental assessment submitted to support the expansion and the proposed landfill design and operations report. I have provided a summary in each section for your consideration.

1. 2012 Annual Monitoring Report (AMR)

Environmental Compliance Approval (ECA)

The Deep River waste disposal site (site) operates under ECA A413106 issued in April, 1980 and last amended November 2009. The site is located on Lot 6, Concession III, Township of Deep River. The site is licensed for the use and operation of a 4.5 hectare landfill within a total area of 8.55 hectares. A condition was added as part of the 2009 amendment to ensure that an extended Contaminant Attenuation one (CA) would be established by June 1, 2010. I understand that this condition has been met. The landfill operates as a naturally attenuating site. The site is used entirely for the disposal of construction and demolition waste and it is understood that no radioactive waste is disposed at the site.

Geology

Jp2g determined the geology to be as follows:

- Till with gravelly sand and silt in Areas 2, 3 and 4 with till thickness ranging from 0 to 1.75 m;
- Fine-grained sand with trace silt in Areas 1 and 2 and extending south to Spring Creek with thickness generally greater than 10.7 m; and,
- Precambrian felsic metasedimentary bedrock.

ydrogeology

Jp2g determined the hydrogeological conditions to be as follows:

- Groundwater flow in the overburden is influenced by underlying bedrock topography and is predominantly to the east and southeast;
- Groundwater flow in the vicinity of Area 2 flows southwest under a low hydraulic gradient possibly related to groundwater mounding in this area;
- Local groundwater flow from the north of Area 3 is north towards a wetland;
- ydraulic conductivity values range between 1.3×10^{-2} to 6.95×10^{-5} cm/s;
- orizontal gradients range from 0.001 in Area 2 to 0.02 in Areas 3 and 4. The higher gradient values are reportedly influenced by the dipping bedrock surface and topography;
- Vertical gradients are variable across the site as shown in Table 3 of the report; and,
- The average linear velocity is 60 m/year south of the landfill and 7.5 m/year southwest from the western property line.

Background Water uality

Wells 91-2 and 95-5 are located south and northwest of the site, respectively, and are considered representative of background water quality. Current sampling from these wells indicates that all parameters meet Ontario Drinking Water Standards (ODWS) and no impacts from landfilling activities are detected.

Leachate uality

Wells 95-6 and 07-3D were used to characterize leachate. Elevated concentrations of alkalinity, boron, barium, hardness, iron, potassium, manganese, sodium COD, DOC and TDS are present and these serve as leachate indicator parameters at the site. Volatile Organic Compounds (VOCs) were also monitored at these wells in 2012 and numerous VOCs were detected at both wells with vinyl chloride levels exceeding ODWS at both wells.

Downgradient Water uality

Leachate impacts are evident at the following wells monitored in 2012: 07-2S, 07-2D, 91-5D, 91-5S, 95-4D, 95-4S, 07-FS, 07-FD, 07-3S, 07-3D, 08-1D, 08-1S and 96-1D.

Consistent VOC impacts have been observed at the following monitoring wells: 88-3D, 95-6, 07-FD, 07-2S, 07-3D and 08-1D.

Monitoring results generally show greater impacts to deeper groundwater as compared to shallow groundwater.

Full chemistry results could not be located for monitoring well 96-1 beyond those shown in Table 8 of the report. Full results should be included in the next report.

All impacted groundwater that has been identified in the report is contained within the CA .

Future reports should include a more detailed discussion on organic results (section 5.7 of the annual monitoring report).

Guideline B-7

The site is in compliance with Guideline B-7 within the overburden aquifer.

Given its presence in groundwater at high levels to the west of the site, vinyl chloride should be included as a Guideline B-7 parameter. Vinyl chloride is not detectable at the compliance boundary well (96-1) and will not impact compliance at this time however this parameter should be included in the assessment moving forward. Given that local flow is westward from the western end of the site, it is my opinion that monitoring wells at location 95-3 (shallow and deep) should also be included as compliance monitoring wells (this will also not impact compliance at this time based on 2012 results).

Iron and manganese are not included as Guideline B-7 parameters at this site based on the presence of these parameters in background water. Guideline B-7 limits should be derived for these parameters in future reports. It is acknowledged that naturally elevated levels of these parameters can be present however, these parameters are also good leachate indicators and, as such, they should be considered as part of the Guideline B-7 assessment.

There are no bedrock wells at the site however Jp2g has indicated that they have assumed that groundwater in bedrock would flow to the east and on to federal land that is restricted for development. As such, Jp2g does not see the need to complete an assessment of groundwater in bedrock.

The bedrock surface is variable and dips steeply to the west near the western end of the site. It is also evident that there are leachate impacts in deep overburden extending to the west of the landfill. The bedrock surface influences groundwater flow direction and there is potential for impacted groundwater to reach bedrock and move with groundwater in bedrock. I understand the position from Jp2g however, as a precaution, I recommend that groundwater supply wells within 500 metres of the site are sampled twice per year in 2014 and 2015 (2 years) with samples analysed for the inorganic list and VOCs (it is noted that groundwater supply wells in the area are generally completed in bedrock). Based on a file search, two (2) wells (presumably along Miller's Road) were sampled in the 80's and it is my opinion that samples should be collected again from nearby groundwater users to confirm that landfill impacts do not influence bedrock wells west of the site.

I recommend that the site plan in future reports show the entire CA areas to the west and south of the site.

Trigger Mechanisms and Contingency Plans

Trigger mechanisms and contingency plans are presented in section 7.0 of the report. The plans are acceptable provided that additional compliance wells discussed above are included in the trigger mechanism going forward.

Groundwater Monitoring Program

The recommended groundwater monitoring program is presented in Section 10.0 of the annual report. I support the program and I recommend the following changes to the monitoring program:

- VOC analysis should be added to deep overburden intervals at monitoring locations 96-1 and 95-3 in addition to 95-6, 07-3D and 07-3S (as monitored in 2012); and,
- Monitoring well 96-2 should be added to the monitoring program (monitored for at least the inorganic list) in order to better understand the distribution of contaminants in the main flow direction towards Maskinonge Lake.

It would also be helpful if a table could be included in future reports showing the details of the proposed groundwater monitoring program (wells, water level measurement, sampling, parameters, frequency, etc.).

Groundwater – Surface Water Interaction

A number of surface water features are located near the landfill site. These include Landfill Creek, Spring Creek, and Maskinonge Lake to the southeast and a wetland to the northeast and downgradient of Area 3. There is potential for surface water impact due to surface water runoff and groundwater discharge. Results from monitoring wells 07-2S and 07-2D (located north of Landfill Creek) indicate a potential groundwater pathway for these contaminants to reach Landfill Creek.

2012 AMR Summary

- The site is in compliance with Guideline B-7 in the overburden unit.

- Given its presence in groundwater at high levels to the west of the site, vinyl chloride should be included as a Guideline B-7 parameter. Vinyl chloride is not detectable at the compliance boundary well (96-1) and will not impact compliance at this time however this parameter should be included in the assessment moving forward. Given that local flow is westward from the western end of the site, it is my opinion that monitoring wells at location 95-3 should also be included as compliance monitoring wells (this will also not impact compliance at this time based on 2012 results).

- Iron and manganese are not included as Guideline B-7 parameters at this site based on the presence of these parameters in background water. Guideline B-7 limits should be derived for these parameters in future reports. It is acknowledged that naturally elevated levels of these parameters can be present however, these parameters are also good leachate indicators and, as such, they should be considered as part of the Guideline B-7 assessment.

- As a precaution, I recommend that groundwater supply wells within 500 metres of the site are sampled twice per year in 2014 and 2015 (2 years) with samples analysed for the inorganic list and VOCs. Based on a file search, two (2) wells (presumably along Miller's Road) were sampled in the 80's and it is my opinion that samples should be collected again from nearby groundwater users to confirm that landfill impacts do not influence bedrock wells west of the site.

- Full chemistry results could not be located for monitoring well 96-1 beyond those shown in Table 8 of the report. Full results should be included in the next report.

- The site plan in future reports should show the entire CA areas to the west and south of the site.

- Future reports should include a more detailed discussion on organic results (section 5.7 of the AMR).

- Recommendations presented in the "Groundwater Monitoring Program" above should be addressed by the Town / Jp2g.

- There is potential for surface water impact due to surface water runoff and groundwater discharge.

2. Environmental Assessment Report

The Environmental Assessment Report indicates the following information relevant to potential groundwater impacts at the site resulting from expansion:

- *Atomic Energy of Canada Limited staff has determined, pursuant to Section 5(1)(C) of the Canadian Environmental Assessment Act (CEAA) that a Federal EA is required for this project. The Millers Road waste disposal site is on AECL's Chalk River Laboratory Property and is presently leased by the Town of Deep River from AECL. The proposed expansion of the waste disposal site will require that AECL extend the lease to the Town of Deep River.*

- *This proposal is to increase the approved landfilling capacity by 40,000 m^3 but not more than 100,000 m^3. The landfill will continue to accept C&D wastes only. The current and proposed landfilling area expansion is located on the existing footprint. The proposed expansion is not to increase the areal extent of the site but rather to extend the life of the site.*

- *The Ontario Ministry of the Environment has determined that the Ontario Environmental Assessment Act does not apply to the proposed waste disposal site expansion because the project will be implemented on lands that are owned by a federal Crown Corporation; namely Atomic Energy of Canada Limited.*

- *The Ontario Ministry of the Environment has determined that although the Ontario Environmental Assessment Act, and thus Ontario Regulation 101/07, do not apply to the proposed expansion, environmental compliance approvals will still be required.*

- *The site has been in operation for a period of over 40 years. Leachate plumes have been identified and are currently managed through the adoption of Contaminant Attenuation Zones (CAZ). Contaminant attenuation zones exist to the east, south east, and to the west of the Miller's Road WDS. The intent of the expansion is to increase the site volume by extending the height of the waste mound, as opposed to increasing the size of the areal extent of the landfill footprint. As a result, the leachate plumes will likely not vary in areal extent. The overall major direction of groundwater flow and plume delineation is to the south east. There is a component of flow to the west as result of groundwater mounding. The flow in a western direction, while not confirmed through head measurements is evident by the presence of a weak leachate plume in this direction. The extent of the plume will be continuously monitored to ensure the extent of the plume remains within the CAZ. In addition, the site is licensed to accommodate essentially inert C&D wastes. This will not increase the strength of documented plumes. The annual monitoring and reporting of the site incorporates an assessment of the 'trigger values' to assist mitigation of off-site impacts.*

- *As per MOE regulations the site will be monitored for compliance with Guideline B-7 - Reasonable Use Concept.*

- *No mitigation measures, additional to monitoring as per the Certificate of Approval, are required at this time.*

- *Localized change in groundwater flow may occur as a result of emplacement of waste increasing the height of the waste mound. Any change is anticipated to be minor. For normal operations it is estimated that the leachate will be maintained within the CAZ. Transfer and emplacement activities will be done according to the operational procedures. Leachate will be maintained within the CAZ. The placement of C&D waste only will not increase the strength of the existing leachate plume. Monitoring will continue to confirm the extent of the leachate plume.*

The proposed expansion is acceptable to me, from a groundwater perspective, provided that recommendations provided for the AMR (above) are incorporated into the ongoing groundwater monitoring plan.

3. Design and Operations Report

The Design and Operations Report is acceptable from a groundwater perspective provided that recommendations provided for the AMR (above) are incorporated into the ongoing groundwater monitoring plan.



K. Stephenson, M.Sc., P.Eng.
KMS/sh

ec: D. Gable
V. Mitchell
B. Metcalfe
G. Dagg-Foster
P. Taylor
T. MacDonald
E. Tieu

c: FC/File GW 01 02 RE DE
KMS/IDS 1008-98E W3, 1533-98DSK

Ministry of the Environment

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Ontario

M E M O R A N D U M

09 December 2011

TO: Lance Larkin
Senior Environmental Officer
Ottawa District Office
Eastern Region

FROM: Bruce Metcalfe
Senior Environmental Officer
Water Resources Unit, Surface Water Group
Technical Support Section
Eastern Region

RE: 2010 Annual Monitoring Report
Deep River (Miller's Road) Waste Disposal Site
Lot 6, Concession 13, Geographic Township of Buchanan
Town of Deep River
Certificate of Approval No. A413106

I have reviewed the noted report dated May 2011 which was prepared by Jp2g Consultants Inc. (Jp2g) for the Town of Deep River and the following comments are offered relative to surface water impact concerns.

Background Information

The landfill site is presently leased by the Town of Deep River from Atomic Energy of Canada Limited (AECL) and has been the waste disposal site for the Town of Deep River since approximately 1965. The waste disposal site is made up of four areas comprising a total area of 8.55 hectares. The landfilling area within southern Areas 1 and 2 (3.22 hectares) has been cleared and used for waste disposal. The northerly portions of Areas 3 and 4 (5.33 hectares) are approximately 5 metres lower in elevation than Areas 1 and 2 and are identified to currently be heavily wooded. The properties to the west of the site have been recently purchased by the municipality for the purpose of Contaminant Attenuation Zones (CAZ). The Miller's Road landfill site operates under Certificate of Approval No. A413106 and is licensed to receive the disposal of construction and demolition waste only. The landfill site functions as a natural attenuation site.

Surface Water Regime

A drainage divide runs east-west through the approximate center of the site. There are two surface water features in close proximity to the landfill site identified as Spring Creek and an unnamed creek (a.k.a. Landfill Creek). Spring Creek originates upgradient and west of the landfill site, and passes under Miller's Road approximately 300 metres west of the access road to the site entrance. Spring Creek meanders south of the site in an eastward direction ultimately discharging to Maskinonge Lake. The Landfill Creek originates southeast downgradient of the site and meanders south-easterly until it meets up with Spring Creek approximately 0.5 km southeast of the site. Drainage from the site flows mostly south-southeast towards Maskinonge Lake. Jp2g has determined that Spring Creek likely functions as a hydraulic boundary to any landfill leachate migrating south-westward from the site.

Leachate Quality Characterization

Landfill leachate quality characterization is monitored at groundwater sample well locations 95-6 and 88-3D (replaced as 07-3D). Monitoring well 95-6 is located in the immediate downgradient flow path from the active fill area at the south end of the site and well 88-3D (now 07-3D) which is located along the northwest property line of landfill Area 2. Leachate indicator parameters (LIP) for the Miller's Road landfill site have been determined by Jp2g to include alkalinity, boron, barium, calcium, chloride, COD, iron, hardness, potassium, manganese, magnesium, sodium and TDS.

2010 Surface Water Sampling Program

Surface water samples were collected on three occasions during 2010 on May 10 (spring), August 10 (summer) and October 10 (fall). Samples were collected at locations upstream and downstream of the landfill site from both Spring Creek and the unnamed creek (a.k.a. Landfill Creek).

Spring Creek – Upstream Background (SW-1)

Surface water station SW-1 monitors Spring Creek upgradient of the landfill site and is accepted to define background surface water quality that is un-impacted by the landfill site.

The surface water quality at SW-1 during 2010 was characterized having levels of BOD5 (< 1 – 1 mg/L), COD (30 – 43 mg/L), Dissolved Oxygen (3.49 – 9.54 mg/L), Alkalinity (14 – 35 mg/L), pH (7.13 – 7.45), Conductivity (131 -138 µS/cm), Chloride (27 – 36 mg/L), Total Ammonia (<0.02 – 0.06 mg/L), Un-ionized Ammonia (< 0.02 mg/L), Nitrates (<0.10 – 0.45 mg/L), Total Phosphorus (0.01 – 0.04 mg/L), Turbidity (7.0 -.2.5 t.u.) and Phenols (<0.001 mg/L).

Provincial Water Quality Objective (PWQO) exceedances were limited to aluminum (0.08 mg/L, slightly exceeded 0.075 mg/L – Oct. 10/10), iron (0.58 – 0.76 mg/L, exceeded 0.30 mg/L), total phosphorus (0.04 mg/L, slightly exceeded 0.03 mg/L - May 10/10) and dissolved oxygen (3.49 mg/L, less than 4.00 mg/L – August 10/10).

- The majority of the 2010 data shows the upstream background surface water quality of Spring Creek to be relatively un-impacted but with iron concentrations routinely exceeding the PWQO.

Landfill Creek □Downstream Impact (SW-2)

The unnamed creek (a.k.a. Landfill Creek) monitoring station SW-2 is located where the stream emerges approximately 90 metres downgradient southeast of the landfill site. Sample station SW-2 is the surface water sampling station downstream closest to the waste disposal site.

The surface water quality at SW-2 during 2010 was characterized having levels of BOD5 (<1 mg/L), COD (<5 – 10 mg/L), Dissolved Oxygen (3.42 – 11.93 mg/L), Alkalinity (190 – 210 mg/L), pH (7.9 – 8.1), Conductivity (289 - 411 µS/cm), Chloride (8 – 9 mg/L), Total Ammonia (<0.02 mg/L), Un-ionized Ammonia (< 0.02 mg/L), Nitrates (<0.10 – 0.10 mg/L), Total Phosphorus (< 0.01 mg/L), Turbidity (0.8 -.2.3 t.u.) and Phenols (<0.001 mg/L).

PWQO exceedance was limited to iron (0.38 – 0.49 mg/L, slightly exceeded 0.30 mg/L) and dissolved oxygen (3.42 mg/L, less than 4.0 mg/L – August 10/10).

- The surface water quality of Landfill Creek immediately downstream of the landfill during 2010 appeared to be not significantly impacted by the landfill site.

Landfill Creek □Downstream Impact (SW-6)

The unnamed creek (a.k.a. Landfill Creek) sampling station SW-6 is located approximately 340 metres downstream of sample station SW-2 and is approximately 40 metres upstream of its confluence with Spring Creek.

The surface water quality at SW-6 during 2010 was characterized having levels of BOD5 (<1 – 1 mg/L), COD (8 – 15 mg/L), Dissolved Oxygen (2.37 – 13.50 mg/L), Alkalinity (184 – 190 mg/L), pH (7.9 – 8.1), Conductivity (343 - 466 µS/cm), Chloride (19 – 20 mg/L), Total Ammonia (0.24 – 0.35 mg/L), Un-ionized Ammonia (< 0.02 – 0.04 mg/L), Nitrates (0.22 – 0.27 mg/L), Total Phosphorus (< 0.01 – 0.02 mg/L), Turbidity (2.0 – 10.6 t.u.) and Phenols (<0.001 mg/L).

PWQO exceedances occurred for un-ionized ammonia (0.04 mg/L, exceeded 0.02 mg/L – May 10/10), boron (0.24 mg/L, slightly exceeded 0.20 mg/L), iron (0.45 – 2.49 mg/L, exceeded 0.30 mg/L) and dissolved oxygen (2.37 mg/L, significantly less than 4.0 mg/L – August 10/10).

The surface water quality at sample station SW-6 during 2010 was shown to be relatively more impacted than at sample station SW-2, which is closer the landfill site. Boron concentrations though only slightly higher than its PWQO was notably consistently and historically present at SW-6. Iron concentrations were also observed to be slightly higher at SW-6 than levels at sample station SW-2. The reviewer is in agreement with Jp2g's assessment which has interpreted that given the absence of boron concentrations at surface water stations immediately south of waste disposal site it is likely the contribution of boron in surface water is from source(s) other than the waste disposal site.

- Overall, the majority of water quality data at downstream sample station SW-6 did not indicate the creek to be adversely impacted during 2010.

Spring Creek - Downstream Impact (SW-7)

Sampling station SW-7 monitors the surface water quality of Spring Creek approximately 10 metres downstream of the confluence of the Landfill Creek. The surface water quality at SW-7 during 2010 was characterized having levels of BOD5 (< 1 – 1 mg/L), COD (13 – 25 mg/L), Dissolved Oxygen (1.93 – 14.13 mg/L), Alkalinity (86 – 125 mg/L), pH (8.3 – 8.6), Conductivity (244 - 262 µS/cm), Chloride (19 – 23 mg/L), Total Ammonia (0.08 – 0.17 mg/L), Un-ionized Ammonia (< 0.02 mg/L), Nitrates (0.14 – 0.22 mg/L), Total Phosphorus (< 0.01 – 0.03 mg/L), Turbidity (2.3 – 6.5 t.u.) and Phenols (<0.001 mg/L).

PWQO exceedances occurred for iron (0.38 – 1.00 mg/L, exceeding 0.30 mg/L), pH (8.6. exceeded 8.5) and dissolved oxygen (1.93 mg/L, significantly less than 4.0 mg/L – August 10/10).

- Iron concentrations were observed to consistently exceed the PWQO and the dissolved oxygen concentration of 1.93 mg/L for the August 2010 sampling event was observed to be significantly below the PWQO of 4.0 mg/L. It is unlikely that the landfill site was a significant contributor, if any, to the impacted water quality observed at the Spring Creek sample station SW-7. Regarding the low dissolved oxygen levels this was observed to be a consistent impact observed at all surface water stations upstream and downstream of the landfill site which were monitored during the August 2010 sampling event.

Surface Water Trigger

The downstream surface water trigger monitoring station is at Landfill Creek sample station SW-6 located upstream of the confluence with terminal receiving Spring Creek.

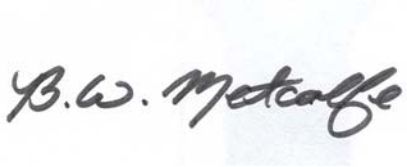
The surface water trigger mechanism parameters are chloride and un-ionized ammonia and based on the upstream 75th percentile background concentration. The trigger concentration for chloride is 32 mg/L and for un-ionized ammonia is 0.02 mg/L (the PWQO). The 2010 current chloride

and un-ionized ammonia concentrations at sample station SW-6 were below the trigger values. Therefore, the sampling results do not suggest the triggering of Tier II level surface water monitoring to be required for the landfill site.

Summary and Recommendations

The reviewer is in agreement with the landfill site owner's assessment that the surface water quality data for the 2010 sampling year for the Deep River (Miller's Road) waste disposal site which identified some limited impact to be observed in Landfill Creek downstream southeast of the landfill site; however, the surface water quality was determined to be not adversely impacted. The 2010 sampling results do not suggest the triggering of Tier II level surface water monitoring to be required for the landfill site.

The reviewer is in agreement with the landfill site owner's recommendation that surface water monitoring for the Deep River (Miller's Road) waste disposal site be continued as specified in the 2010 Annual Report recommendations.



Bruce Metcalfe
BWM/sh

ec: Peter Taylor
Tara MacDonald

c: Frank Crossley
Bruce Metcalfe (1813-8JKPL6 \ X-ref. 4757-867Q52
File SW RE DR C13 03 06, Deep River (Miller's Road) WDS, Town of Deep River
File SW-07-02-13-01-01, Maskinonge Lake, Ottawa River Basin

Andrew Buzza

From: Mitchell, Vicki (ENE) <Vicki.Mitchell@ontario.ca>
Sent: Tuesday, November 29, 2011 2:51 PM
To: khayat@deepriver.ca; andrewb@jp2g.com
Cc: Larkin, Lance (ENE)
Subject: Millers Road Landfill Site Expansion, Town of Deep River

Dear Mr. Hayat and Mr. Buzza,

Thank you for informing Lance Larkin and me about the proposed landfill site expansion project.

It is the Ministry s position that the Ontario Environmental Assessment Act does not apply to the proposed landfill site expansion based on our understanding that the project will be implemented on lands that are owned by a federal Crown Corporation; namely Atomic Energy of Canada Limited.

Although it is the Ministry s position that the Ontario Environmental Assessment Act, and thus Ontario Regulation 101/07, would not apply to the proposed expansion, MOE environmental compliance approvals would still be required.

We understand that the project is undergoing a federal environmental assessment, and request that the Town continue to share the information developed in support of the federal EA with MOE staff. We would like to ensure that the expansion of the site as proposed during the federal EA review will meet MOE standards, and that there will not be undue delay at the MOE environmental compliance approval stage.

Vicki Mitchell
Environmental Assessment Coordinator
Ministry of the Environment, Eastern Region

1259 Gardiners Road, P.O. Box 22032,
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Ministry of the Environment

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M E M O R A N D U M

August 29, 2011

TO: L. Larkin
Environmental Officer
Ottawa District Office
Eastern Region

FROM: T. Praamsma
Hydrogeologist
Technical Support Section
Eastern Region

RE: 2010 Annual Monitoring Report
Miller□s Road Waste Disposal Site
Lot 6, Concession XIII, Township of Deep River
Certificate of Approval A413106

Purpose

I have reviewed the □2010 Annual Monitoring Report Miller□s Road Waste Disposal Site□dated May, 2011, which was completed by Jp2g Consultants Inc. (Jp2g) on behalf of The Corporation of the Town of Deep River to determine site compliance with Guideline B-7.

Summary

- The Miller□s Road Waste Disposal Site (site) is an operating Waste Disposal Site. Guideline B-7 applies to operating waste disposal sites and sites that closed after 1986, thus Guideline B-7 applies.

- The site is in compliance with Guideline B-7 since the acquisition of a 14 hectare parcel of land to the west of the site. The CAZ is owned by AECL and is leased to the municipality. The Certificate of Approval (CofA) should be amended to reflect the Contaminant Attenuation Zone (CAZ).

- Further work should be undertaken to define groundwater conditions in the bedrock.

- The potential exists for surface water impact to occur. Wells 07-2S and 07-2D should be used as indicator wells for groundwater-surface water interaction in Landfill Creek.

- A groundwater trigger mechanism and contingency plan should be presented in the next annual report.

- The groundwater monitoring program recommended by Jp2g is acceptable.

Certificate of Approval

The Deep River Waste Disposal Site (site) operates under CofA A413106 issued in April, 1980 and last amended November, 2009. The site is located on Lot 6, Concession XIII, Township of Deep River. The site is licensed for the use and operation of a 4.5 hectare landfill within a total area of 8.55 hectares. A condition was added to the 2009 amendment to ensure that an extended CAZ would be established by June 1, 2010. The landfill operates as a naturally attenuating site.

Geology

Jp2g determined the geology to be as follows:

- Till with gravelly sand and silt in Areas 2, 3 and 4 with till thickness ranging from 0 to 1.75m.

- Fine-grained sand in Areas 1 and 2 and extending south to Spring Creek with thicknesses greater than 10.7m.

- Precambrian felsic metasedimentary bedrock.

Hydrogeology

Jp2g determined the hydrogeological characteristics to be as follows:

- Groundwater flow in the overburden is influenced by underlying bedrock topography and is predominantly to the southeast;

- Hydraulic conductivity values range between 1.3 x 10-2 to 6.95 x 10-5 cm/s;

- Horizontal gradients range from 0.001 in Area 2 to 0.02 in Areas 3 and 4. The higher gradient values are reportedly influenced by the dipping bedrock surface and topography;

- Vertical gradient calculations indicate downward movement of groundwater, expect near the creek where upward flow is apparent; and

- The average linear velocity is 60 m/year south of the landfill and 10m/year southwest from the western property line.

Further work should be undertaken to define groundwater conditions in the bedrock.

Background Water Quality

Wells 91-2 and 95-5 are located south and northwest of the site, respectively, and are considered representative of background water quality. Current sampling from these wells indicates that all parameters are within ODWS and no impacts from landfilling activities are detected.

Leachate Quality

Wells 95-6 and 07-3D were used to characterize leachate conditions. Elevated concentrations (above ODWSOG) were observed for iron, manganese, DOC, and TDS. Concentrations of these parameters are elevated compared to concentrations measured in background wells. VOC impacted groundwater is reported to be in some of the western monitors but the results were not included in the report. Two sets of the inorganic analyses were provided instead. Next year, please provide the results of VOC analyses.

Downgradient Water Quality

Leachate impacts are evident at the following monitoring wells: 91-5D, 91-5S, 96-3, 03-1, 07-2D, 07-2S, 07-3D, 07-3S, 95-4D, 95-4S, 96-1D, 07-FD, 07-FS, 08-01D, and 08-01S.

VOCs have impacted the following monitoring wells: 88-3D, 95-6, 07-FD, 07-2D, 07-3D, and 08-10.

All impacted groundwater that has been identified in the report is contained within a CAZ.

Groundwater □Surface Water Interaction

A number of surface water features are located near the landfill site. These include Landfill Creek, Spring Creek, and Maskinonge Lake to the southeast and a wetland to the northeast and downgradient of Area 3. There is potential for surface water impact due to surface water runoff and groundwater discharge.

Wells 07-2S and 07-2D, located north of Landfill Creek, are impacted by DOC, TDS, iron, and Manganese. In addition 07-2S has elevated alkalinity and 07-2D is impacted by aluminium, vinyl chloride and benzenes. Results from these wells indicate a potential groundwater pathway for these contaminants to Landfill Creek.

Regulatory Compliance

Overburden Aquifer

The site is in compliance with Guideline B-7 within the overburden aquifer. The Municipality acquired an approximately 14 hectare parcel of land located immediately west of the site for the purpose of a CAZ as per Condition 31 of the amended Certificate.

Bedrock Aquifer

Site compliance with Guideline B-7 within the bedrock aquifer cannot be determined at this time. At least three bedrock monitoring wells should be constructed to determine the hydrogeological characteristics of the bedrock aquifer at the site. Three monitoring wells should provide enough data to calculate groundwater flow direction in the deep aquifer along with water quality data for the bedrock on site.

Trigger Mechanisms and Contingency Plans

Future trigger mechanisms and contingency plans were not discussed in this report. Three options (source containment or removal, establishing a CAZ, installing a pump and treat groundwater recovery system) were discussed to bring the site into compliance with Guideline B-7. The Municipality chose to create a CAZ by acquiring a 14 hectare parcel of land immediately west of the site. The CAZ is owned by AECL and is leased to the municipality. It is not clear that the lease is sufficient to create a CAZ.

A groundwater trigger mechanism and contingency plan should be presented in the next annual report.

Groundwater Monitoring Program

Jp2g recommends groundwater monitoring to remain as per the normal operating procedures of the site. This is acceptable.

Landfill Gas

Landfill gas monitoring was not reported for this site.

T. Praamsma, M.Sc., P.Geo.
TP/gl

ec: T. MacDonald (Acting Supervisor)
P. Taylor

c: B. Metcalfe
File GW 03-03 Miller□s Road WDS, Geographic Twp DERI (A413106)
TP/IDS □7330-867Q6T

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M E M O R A N D U M

07 September 2010

TO: L. Larkin
Senior Environmental Officer
Ottawa District Office
Eastern Region

FROM: B. W. Metcalfe
Senior Environmental Officer
Water Resources Unit, Surface Water Group
Technical Support Section
Eastern Region

RE: 2009 Annual Report
Deep River (Miller's Road) Waste Disposal Site
Part Lot 6, Concession 13, Former Township of Buchanan
Township of Deep River
Certificate of Approval A413106

I have reviewed the noted report dated May 2010 prepared by Jp2g Consultants Inc. for the Town of Deep River. The following comments are offered relative to surface water impact concerns.

Background Information

The landfill site is presently leased by the Town of Deep River from Atomic Energy of Canada Limited and has been the waste disposal site for the municipality since approximately 1985. In December 2005 the Town of Deep River and Atomic Energy of Canada put in place a new lease agreement for the operation of the waste disposal site.

The waste disposal site is made up of four areas comprising a total area of 8.55 ha. The landfilling area within southern Areas 1 and 2 (3.22 ha) has been cleared and used for waste disposal. The northerly portions of Areas 3 and 4 (5.33 ha) are approximately 5 m lower in elevation than Areas 1 and 2 and are currently heavily wooded.

The landfill site operates under Certificate of Approval No. A413106 and is licensed to receive the disposal of construction and demolition waste only.

Surface Water Regime

A drainage divide runs east-west through the approximate centre of the site. There are two surface water features in close proximity to the landfill site. They are Spring Creek and the unnamed Landfill Creek. Spring Creek originates upgradient and west of the landfill site, and passes under Miller's Road approximately 300 metres west of the access road to the site entrance. Spring Creek meanders south of the site in an eastward direction to Maskinonge Lake. The Landfill Creek originates southeast of the site and meanders south-easterly until it meets up with Spring Creek approximately 0.5 km southeast of the site. Drainage from the site flows mostly south-southeast towards Maskinonge Lake. Spring Creek is anticipated that it will act as a hydraulic boundary to any leachate migrating south-westward.

Leachate Quality Characterization

Landfill leachate quality characterization was monitored at groundwater sample well locations 95-6 and 88-3D (replaced as 07-3D). Monitoring well 95-6 is located in the immediate down gradient flow path from the active fill area of the site at the south end and well 88-3D (now 07-3D) is located along the north west property line of Area 2.

Leachate indicator parameters (LIP) for the landfill site have been determined to include alkalinity, boron, barium, calcium, chloride, COD, iron, hardness, potassium, manganese, magnesium, sodium, sulphate, DOC, and TDS.

2009 Surface Water Sampling Program

Surface water samples were collected on three occasions in 2009. Samples were collected from upstream and downstream of the landfill site in both Spring Creek and the Landfill Creek.

2009 Surface Water Quality Impact Assessment

Spring Creek Upstream Background (SW-1)

Surface water station SW-1 is located upgradient of the landfill site monitoring Spring Creek and which is accepted to characterize background surface water quality un-impacted by the landfill site.

The surface water quality at SW-1 was characterized having levels of BOD5 (< 1 mg/L), Alkalinity (11 – 21 mg/L), field pH (7.7 – 8.1), field Conductivity (97 – 147 µS/cm), Chloride (17 – 35 mg/L), Total Ammonia (<0.02 – 0.03 mg/L), Nitrates (<0.10 – 0.10 mg/L), Total Phosphorus (0.02 – 0.06 mg/L) and Turbidity (1.0 -.2.0 t.u.).

PWQO exceedance was limited to aluminum (0.11- 0.12 mg/L, slightly exceeded 0.075 mg/L), iron (0.48 – 0.90 mg/L, slightly exceeded 0.30m mg/L), total phosphorus (0.06 mg/L, exceeded 0.03 mg/L).

The nature of surface water quality impact showed that iron is the most prevalent parameter which exceeds the Provincial Water Quality Objective (PWQO).

Landfill Creek □Downstream Impact (SW-2)

Monitoring station SW-2 is located where the Landfill Creek emerges south east of the landfill site. The water quality at SW-2 historically is characterized by observance of iron precipitate and the presence of leachate.

The surface water quality at SW-2 was characterized having levels of BOD5 (< 1 mg/L), Alkalinity (187 - 209 mg/L), field pH (7.9 – 8.0), field Conductivity (338 – 490 µS/cm), Chloride (8 – 11 mg/L), Total Ammonia (<0.02 mg/L), Nitrates (<0.10 mg/L), Total Phosphorus (<0.01 – 0.01 mg/L) and Turbidity (0.3 -.3.8 t.u.).

PWQO exceedance was limited only to iron (0.49 mg/L, slightly exceeded 0.30m mg/L).

Landfill Creek □Downstream Impact (SW-4)

Sample station SW-4 monitors the downstream surface water quality of Landfill Creek located at Miller's Road situated approximately 130 metres downstream of sample station SW-2.

The surface water quality at SW-4 was characterized having levels of BOD5 (< 1 – 2 mg/L), Alkalinity (187 - 200 mg/L), field pH (7.6 – 7.9), field Conductivity (429 – 531 µS/cm), Chloride (18 – 20 mg/L), Total Ammonia (0.35 – 0.40 mg/L), Nitrates (0.16 – 0.21 mg/L), Total Phosphorus (0.01 – 0.02 mg/L) and Turbidity (7.6 -.11.9 t.u.).

PWQO exceedance occurred only for boron (0.24 – 0.34 mg/L, slightly exceeded 0.20 mg/L), and iron (2.2 – 3.73 mg/L, notably exceeded 0.30 mg/L).

Downstream Surface Water Quality

The nature of downstream surface water quality impact showed that iron is the most prevalent parameter which routinely exceeds the Provincial Water Quality Objective (PWQO). For the 2009 sampling events the iron concentrations routinely exceeded the PWQO of 0.30 mg/L at the Spring Creek upstream background sample station SW-1 (0.48 – 0.89 mg/L) and also at all Landfill Creek downstream surface water sampling stations with levels ranging from 0.73 mg/L (SW-3) to 3.73 mg/L (SW-4). The background iron concentrations at SW-1 averaged 0.71 mg/L

while Landfill Creek downstream sample stations showed 8 of 12 samples (67%) having iron concentrations exceeding 1.0 mg/L with average concentrations of 0.49 mg/l (SW-2), 0.80 mg/L (SW-3), 2.73 mg/L (SW-4), 1.73 mg/L (SW-5), and 1.31 mg/L (SW-6).

Boron was also identified to marginally exceed the PWQO of 0.20 mg/L at Landfill Creek downstream sample stations SW-4 (0.24- 0.34 mg/L), SW-5 (0.24 – 0.32 mg/L), and SW-6 (0.23 – 0.33 mg/L).

Surface Water Trigger

The downstream surface water trigger monitoring station is at Landfill Creek sample station SW-6 situated just upstream of the confluence with Spring Creek.

The surface water trigger mechanism parameters are chloride and un-ionized ammonia and based on the upstream 75th percentile background concentration. The trigger concentration for chloride is 32 mg/L and for un-ionized ammonia is 0.02 mg/L (the PWQO). The 2009 current chloride and un-ionized ammonia concentrations at sample station SW-6 were below the trigger values. Therefore, the sampling results do not suggest the triggering of Tier II level surface water monitoring to be required for the landfill site.

Summary and Recommendations

The reviewer is in overall agreement with the consultant's surface water quality impact assessment presented in the 2009 Annual Monitoring Report.

The consultant's assessment of groundwater quality has confirmed the presence of a leachate plume leaving the site to the southeast in the direction of the Landfill Creek. The overall direction of groundwater flow has been determined to be towards Maskinonge Lake.

The nature of surface water quality impact showed that iron is the most prevalent parameter which exceeds the Provincial Water Quality Objective (PWQO). Iron concentrations routinely exceeded the PWQO of 0.30 mg/L both upstream of the landfill site in Spring Creek and also at all downstream surface water sampling stations in Landfill Creek which did show iron concentrations to be consistently higher than the upstream background levels.

The surface water trigger mechanism parameters are chloride and un-ionized ammonia and the sampling results for at the compliance downstream surface water sample station SW-6 showed there was no requirement for the triggering of the Tier II level surface water monitoring for the landfill site in 2009.

The majority of the surface water quality data for the 2009 sampling year did not indicate an adverse impact occurring to the downstream surface water quality of the Landfill Creek or Spring Creek.

The reviewer is in agreement with the consultant's recommendations for the continued surface water monitoring program as presented in the 2009 Annual Report for the Deep River (Millers Road) Waste Disposal Site.



Bruce Metcalfe
BWM/gl

c: S. Kinney
P. Kehoe
B. Metcalfe (Aba2010\aba3910.mem) 5182-867Q8H \ X-re. 4757-867Q52
File SW 05-04, Deep River (Miller's Road) Landfill Site, Township of Deep River
File 13-01-01, Maskinonge Lake, Ottawa River Basin

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aug 20/10

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August 18, 2010

Jp2g Consultants Inc.
1150 Morrison Drive, Suite 410
Ottawa, Ontario
K2H 8S9

Attention: Mr. Andrew Buzza
Project Manager

Dear Mr. Buzza:

Re: Town of Deep River
Millers Road Waste Disposal Site
Proposed Expansion – C of A No. A413106

I have reviewed the Work Plan for Millers Road Waste Disposal Site Expansion Project, Town of Deep River, submitted by your firm dated July 2010.

The Town is proposing to expand the total waste disposal volume of Millers Road Waste Disposal Site by 40,000 m^3; but not more than 100,000 m^3. This project will proceed under Ontario Regulation 101/07 made under the *Environmental Assessment Act.* This project is exempt from Part II of the *Environmental Assessment Act* provided the Town completes the Environmental Screening Process as per Ontario Regulation 101/07.

This type of project is a self-assessment process and therefore the proponent is responsible for determining the contact list of government review agencies for the Notice of Commencement. I have attached a list of possible agencies that you might consider contacting.

MOE recommends that proponents contact the relevant agencies to determine whether there are potentially affected Aboriginal communities in the project area. The up-to-date list of agency contacts is maintained on the Environmental Assessment and Approvals Branch website at the following link:

http://www.ene.gov.on.ca/en/eaab/aboriginal-resources.php?print=1

Once identified, it is recommended that you provide notification directly to the Aboriginal communities who may be affected by the project and provide them with an opportunity to participate in the planning of the project.

Your proposed work plan appears to meet the requirements of the Environmental Screening Process as per MOE's Guide to Environmental Assessment Requirements for Waste Management Projects.

If you have any questions concerning these comments, please contact me at 613-540-6861 or by email at alida.mitton@ontario.ca.

Yours truly,

Alida Mitton
Divisional Program Specialist
Program Services Section
Eastern Region
AM/gl

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Ontario

April 23, 2009

VIA FAX & MAIL.

Mr. Belo Csomor, Superintendent
The Corporation of the Town of Deep River
100 Deep River Rd
Deep River, Ontario, K0J 1P0

Dear Sir,

RE: Miller's Road Landfill (Certificate of Approval - A413106) - Off-site groundwater non-compliance

Please find attached for your perusal the groundwater review of the latest documents provided to the Ministry. The reviewer recommends that the process to acquire the necessary contaminant attenuation zone (CAZ) lands proceeds in a timely manner upon completion of one further groundwater sampling event to confirm the apparent trends. The reviewer also provided clear direction regarding the extent of the necessary CAZ lands.

As such, I am revising the direction provided in my February 11, 2009 letter to accommodate sampling during the summer of 2009 and an evaluation of the results. Consequently, it is requested that an application be submitted by **September 1, 2009** to the Director, Section 39 of the *Environmental Protection Act* , detailing the extent of the CAZ required to bring the site back into compliance. Please note that the 2008 Annual Report to be submitted by June 1, 2009 must also provide an update of the steps/actions taken to resolve the above matter.

The Ministry continue to considers the above work as a VAP in accordance with the Compliance Policy (May, 2007) and will monitor progress for compliance.

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

Marc-Etienne Lesieur

Senior Environmental Officer
Ottawa District Office

File Storage Number: SI RE BH C13 610
c. Bob Putzlocher, MOE
Andrew Buzza, P.Geo., Jp2g Consultants (via fax only - 613-828-2600).

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MEMORANDUM

March 31, 2009

TO: Marc-Etienne LeSieur
Senior Environmental Officer
Ottawa District Office

FROM: Robert Putzlocher
Hydrogeologist
Technical Support Section
Eastern Region

Re: Off-site Groundwater Quality Investigation
Miller's Road Waste Disposal Site
Lot 6, Concession XIII, Twp of Deep River (Buchanan)
A413106

I have reviewed the document titled "Report on Off-Site Groundwater Quality Characteristics, Deep River (Miller's Road) Waste Disposal Site", prepared by Jp2g Consultants and dated December, 2008. The following comments are provided with respect to groundwater issues.

Background

The report was prepared in response to concerns regarding the presence of leachate impacted groundwater along the western site boundary. Recent annual monitoring reports have indicated that levels of organic contaminants in groundwater are above ODWS at wells along the property boundary and within the off-site road allowance. Further site investigation was completed in 2008 in accordance with a work plan to characterize off-site groundwater quality.

Work completed in 2008 included the construction of a new bi-level monitoring well (08-01) and the installation of additional monitoring intervals in 4 other wells (91-5, 95-3, 94-4, and 07-F). Groundwater samples were retrieved from each well and analyzed for VOC's.

Results

Sampling results were consistent with recent surveys and confirmed the elevated concentration of VOC's (primarily chlorinated solvent) at boundary and off-site wells. The compound with the highest concentration was vinyl chloride (VC): 123 ppb at 07-3D; 11.2 ppb at 95-6; 8.3 ppb at 07-FD; and 8.0 ppb at 08-1D. Each of these values exceeds the ODWS of 2 ppb.

Consultant's Recommendations

The consultant identifies the non-compliance issues related to off-site groundwater quality and provides potential mitigation measures: source removal; contaminant migration control; or establishment of a Contamination Attenuation Zone (CAZ). The report states that the Municipality has begun investigating the potential for acquiring a CAZ to the west of the landfill site and that this measure would be fully explored before considering other options.

In a letter dated February 17, 2009, the consultant provides a workplan for bringing the site into compliance. This proposed timeline allows time for the completion of four (4) rounds of groundwater sampling and evaluation prior to delineating and formally incorporating a CAZ through the C of A process.

Groundwater Unit Comments

The further site characterization has confirmed leachate impact to off-site groundwater resources above regulatory limits. The nature of the contaminant and site characteristics suggests the presence of either PCE or TCE which has migrated off-site at depth to the west of the property boundary. The high levels of final anaerobic dechlorination product (vinyl chloride) and lesser concentrations of other breakdown compounds (cis- and trans DCE) indicates that the parent compound(s) have been present for considerable time.

Near the western property boundary, the borehole logs show that the bedrock surface declines steeply in the upgradient direction (southwest). It is likely that at some point a DNAPL phase of contaminant migrated along this pathway and offsite. Vinyl chloride is the lightest and most mobile compound associated with chlorinated solvents and it is also the most toxic.

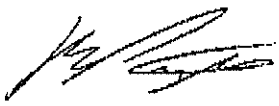
I concur that the acquisition of a CAZ is an appropriate mitigation measure. Neither source removal or migration control is practical at this site. The source zone is either very deep and complexly distributed or it may be present only as residual within the porous overburden or fractured bedrock. Monitoring indicates that the extent of off-site contamination in the upgradient and there is currently considerable CAZ available in the downgradient direction – therefore migration control would not be a preferred option.

Acquiring a CAZ would bring the impacted zone into the control of the site owner and into compliance. While I agree that more sampling is beneficial, I am not certain that it is required in order to outline the CAZ extents – unless further well installation is proposed. Examining results from the current monitoring network, contaminant trends are apparent.

- There have been 7 sampling events since October 2000 at 88-3D/07-3D. The presence of VC is consistent with a steady increase of concentrations.
- Downgradient at 95-6 VC has increased from 0.3 ppb in 2004 to 11.2 ppb in 2008.
- Upgradient wells 95-4 and 95-3 have consistently been non-detect for VOC's.
- There has only been one sampling event at new downgradient wells 08-1 and 07-FD and these show similar lower (but above ODWS) concentrations of VC.

It is obvious that a CAZ needs to incorporate the area of new wells and should extend westward to some point between 95-4 and 08-1. Unless VC appears at 95-4 or if a new well between 08-1 and 95-4 were to provide further information, the most precautious and possibly expedient action would be to bring 95-4 into a CAZ as a boundary monitoring well.

I suggest that the process for acquiring the CAZ proceed as quickly as possible and that the results of one further sampling event be evaluated for any significant variation from the current understanding at the site.



Robert Putzlocher, P. Eng

C: Peter Taylor (Water Unit Supervisor)
Paul Kehoe (Ottawa District Office)
Laurel Grills (Surface Water Unit)
File GW-03-03 (Buchanan) DE RI (A413106) / IDS 1578-7P6MLR

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Ontario

February 11, 2009

VIA FAX & MAIL.

Mr. Belo Csomor, Superintendent
The Corporation of the Town of Deep River
100 Deep River Rd
Deep River, Ontario, K0J 1P0

Dear Sir:

RE: Miller's Road Landfill (Certificate of Approval - A413106) - Off-site groundwater non-compliance.

This letter acknowledges receipt of the document entitled "Report on Off-Site Groundwater Quality Characteristics, Deep River (Miller's Road) Waste Disposal Site, December 2008" prepared by Jp2g Consultants Inc. for the Town of Deep River (Town). Submission of the report was part of a Voluntary Abatement Plan (VAP) to bring the subject site back into compliance as detailed in my correspondence of August 6, 2008. Please note that the report has been submitted to the Technical Support Section for a scientific review.

It is my understanding that the Town has initiated the process of investigating the acquisition of additional contaminant attenuation zone (CAZ) to bring the site into compliance and that an update of the CAZ acquisition would be provided to the Ministry twice yearly with the first update to be concurrent with the 2008 Annual Report to be submitted by June 1, 2009.

I am of the opinion that the above schedule and workplan do not provide a sufficiently detailed timeline to bring the site back into compliance. In addition, it should be noted that the acquisition of a CAZ will require an amendment to the site Certificate of Approval. As such, it is requested that an application be submitted by **June 1, 2009** to the Director, Section 39 of the *Environmental Protection Act* , detailing the extent of the CAZ required to bring the site back into compliance. Please note that the 2008 Annual Report to be submitted by June 1, 2009 must also provide an update of the steps/actions taken to resolve the above matter.

The Ministry continue to considers the above work as a VAP in accordance with the Compliance Policy (May, 2007) and will monitor progress for compliance.

Should you have any comments, questions or concerns, please contact me directly at (613)

521-3450 extension 229 (1-800-860-2195x229) or marc.lesieur@ontario.ca.
Yours truly,



Marc-Etienne Lesieur
Senior Environmental Officer
Ottawa District Office

File Storage Number: SI RE BH C13 610
c. Bob Putzlocher, MOE
Andrew Buzza, P.Geo., Jp2g Consultants (via fax only - 613-828-2600).

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File 200615

March 13, 2008

Mr. Belo Csomor, Superintendent.
The Corporation of the Town of Deep River
P.O. Box 400
100 Deep River Road
Deep River, Ontario, K0J 1P0

Re: Western boundary work program
Miller's Road Landfill – (A413106).

Dear Mr. Csomor:

This acknowledges receipt of the letter dated January 17, 2008 prepared by Jp2g Consultants Inc. regarding the impacted groundwater detected along the western property boundary at the subject site.

Please note that attached to my correspondence of November 7, 2007, I provided the Town with a Ministry groundwater review. The Ministry reviewer noted the following: "*Adjacent land to the west is privately owned. Along the western site boundary, concentrations of chloride do not exceed Reasonable Use criteria. However, concentrations of vinyl chloride, ethylbenzene, and nitrate are above ODWS at border monitoring wells. The next annual monitoring report should provide a thorough evaluation of groundwater quality at the western site boundary and make recommendations for addressing the cross-border contaminant migration.*".

I note that the January 17, 2008 letter provides a work program and recommendations to be implemented in 2008 to address the above issue. In the interim, I concur that the work program and recommendations be implemented to address to above situation. However, it is requested that a detailed schedule be provided in the 2007 Annual Report regarding the work to be implemented in 2008.

Furthermore, please note that the January 17, 2008 letter and the 2007 Annual Report to be submitted to the Ministry by June 1, 2008 in accordance with Condition 28 of the Certificate of Approval will be forwarded to the Technical Support Section for a scientific evaluation. As such, please take all reasonable steps to ensure that the 2007 Annual Report contain all relevant information, discussion and recommendations regarding the above. Upon review of the documents, the Ministry may require further action to be taken.

Should you have any comments, questions or concerns, please contact me directly at (613) 521-

3450 extension 229 (1-800-860-2195x229) or marc.lesieur@ontario.ca.

Sincerely,

Marc-Etienne LeSieur
Senior Environmental Officer

File: SI RE BH C13 610

c. B. Putzlocher, MOE
A. Buzza, Jp2g Consultants (via fax only 613-828-2600).

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Ontario

MEMORANDUM

29 October 2007

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

MINISTRY OF THE ENVIRONMENT
OCT 31 2007
OTTAWA

FROM: Robert Putzlocher
Hydrogeologist
Technical Support Section
Eastern Region

RE: 2006 Annual Monitoring Report
Miller's Road Waste Disposal Site
Lot 6, Concession XIII, Township of Deep River (Buchanan)
A413106

Purpose

I have reviewed the document titled "2006 Annual Report Deep River (Miller's Road) Waste Disposal Site", prepared by Jp2g Consultants and dated May, 2007. The following comments are provided with respect to groundwater issues.

Summary

- The Reasonable Use evaluation does not appropriately address the presence of contaminants above ODWS along the western border of the site.
- The consultant has previously recommended that a CAZ be established along the western border. This issue should be addressed.
- The potential exists for surface water impacts to occur. Numerous surface water features are located downgradient of the waste area and vertical migration of leachate is limited due to the geology.
- The consultants recommended well rehabilitation and groundwater monitoring program is acceptable.

Certificate of Approval

The Miller's Road Waste Disposal Site operates under Certificate of Approval No. A413106 issued in April, 1980 and last amended in November, 2005. The C of A allows landfilling on a 4.5 hectare site within a total site area of 8.55 hectares. Included in the 2004 amendments were requirements for establishing a Contamination Attenuation Zone and for applying final cover to 2 of the 4 waste area quadrants. The landfill operates as a naturally attenuating site.

Geology

The consultant determined the geology to be:

- Till with gravelly sand and silt in Areas 2, 3 and 4. The till thickness ranges from 0 to 1.75 metres.
- Fine-grained sand in Areas 1 and 2 and extending south to Spring Creek. The sand thickness is at least 10.7 metres.
- Precambrian, felsic metasedimentary bedrock.

Hydrogeology

Groundwater flow in the overburden is influenced by underlying bedrock topography and is predominantly to the south-southeast. The report states that the land surface also slopes toward the northwest and that there is a drainage divide running roughly north-south across the centre of the site. It is not clear if this influences groundwater movement near the current active area (Area 2).

Background Water Quality

Wells 91-2 and 95-5 are located south and northwest of the site, respectively and are considered representative of background water quality. Current sampling from these wells indicates that all parameters are within ODWS and no impacts from landfill activities are detected.

Leachate Water Quality

Monitoring well 95-6 is located in the southeast corner of the site and directly downgradient of the waste area. The water quality in this well shows elevated concentrations of numerous typical leachate indicator parameters when compared to background water quality.

Downgradient Water Quality

Leachate impacts are evident at the following monitoring wells: 88-3D, 88-3S, 89-2D, 89-2S and 91-5. The consultant has interpreted the presence of two leachate plumes associated with waste disposal in Areas 2 and 4.

From Area 4, leachate impacts are observed at and beyond the southern limit of the site. Impacts south of the site are characterized by elevated concentrations of chloride and TDS and are interpreted to be migrating with groundwater flow to the southeast. In addition to chloride and TDS, a number of other elevated parameters are measured along the western border near Area 2. These include nitrate, BTEX, and VOC's. Notably vinyl chloride was found to be present in 88-3D at a concentration of 15.8 ug/L and nitrate at 88-3S at 15.4 mg/L. These are well above the ODWS of 2 ug/L and 10 mg/L, respectively.

The direction of contaminant migration along the western boundary is unclear. The consultant suggests that it is in a westerly direction. However, groundwater elevations in both overburden and bedrock indicate that flow is toward the southeast. It may be that water quality along the western site boundary is influenced by radial flow due to groundwater mounding in the waste area. Impacts do appear to be dissipated within a short distance westward as no contaminants are detected at either of 95-5, 95-4, or 96-1. Still, the presence of vinyl chloride in the deep interval of 88-3 is a concern. Vinyl chloride is a breakdown product of more fully chlorinated compounds (e.g., PCE and TCE). Such parent products may have been present at some point but have now been degraded. Vinyl chloride is more persistent and has the lowest ODWS.

Characteristics of leachate from Area 2 differ from those at Area 4. The high concentrations of nitrate, BTEX, and VOC's apparent along the western boundary are not observed in the leachate characterization well at Area 4 (95-6). Most of these parameters are detected at 88-3. The report states that 88-3 will be replaced. Following results of groundwater sampling at the replacement wells, it may be appropriate to install a leachate characterization well in Area 2.

Groundwater-Surface Water Interaction

A number of surface water features are located near the landfill site. These include an unnamed creek, Spring Creek, and Maskinonge Lake to the southeast and a wetland to the northeast and downgradient of Area 3. There is potential for surface water impact due to surface water runoff and groundwater discharge.

Guideline B-7

Reasonable Use Guideline B-7 applies to this waste disposal site operation. The consultant provides Reasonable Use criteria for chloride only. While chloride is a prime indicator of

leachate derived impacts, it is generally the case that a variety of common leachate indicator parameters are evaluated for Reasonable Use evaluation. The report references a November 2003 document that outlined monitoring locations and trigger mechanisms for characterization or and/or remedial actions at the site. This document was not reviewed by the Technical Support Section. The next annual monitoring report should provide a justification for the current method of Reasonable Use evaluation.

It is understood that a Contamination Attenuation Zone has been extending from the south and east site boundaries to Spring Creek and Maskinonge Lake (in accordance with C of A Condition 9). This zone should be delineated on a site plan figure in the main report. Impacts to groundwater quality in the southeast downgradient direction will be contained within this zone.

Adjacent land to the west is privately owned. Along the western site boundary, concentrations of chloride do not exceed Reasonable Use criteria. However, concentrations of vinyl chloride, ethylbenzene, and nitrate are above ODWS at border monitoring wells. The next annual monitoring report should provide a thorough evaluation of groundwater quality at the western site boundary and make recommendations for addressing the cross-border contaminant migration.

The consultant has previously recommended that a CAZ be established along the western border. The present report does not contain this recommendation; it should, however, be considered.

Groundwater Monitoring Program

A survey of all monitoring wells was conducted in 2006. It was determined that a number of wells required replacement. I support the recommendation to replace the identified wells. Any wells that cannot be rehabilitated should be abandoned in accordance with O.Reg. 903.

The consultant proposes that the current groundwater monitoring program continue with twice per year sampling at selected monitoring wells. The program is acceptable for parameters and frequency.

Robert Putzlocher, P. Eng
RP/gl

c: Peter Taylor (Water Unit Supervisor)
Paul Kehoe (Ottawa District Office)
Laurel Grills (Surface Water Unit)
File GW-03-03 (Buchanan) DE RI (A413106) / IDS 2108-3UKM4

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Ontario

August 29, 2007

Town of Deep River
P.O. Box 400
100 Deep River Road
Deep River, Ontario
K0J 1P0

Attention: Belo Csomor, Superintendent.

Reference: 2006 Annual Report – Miller's Road – CofA# A413106
Waste Disposal Site - Town of Deep River

Dear Mr. Csomor:

Please find attached the surface water review of the 2006 Annual Report of the subject site. A groundwater review is pending and will be provided to you once available.

Please note that the Ministry's reviewer is in agreement with your consultant recommendations regarding the 2007 surface water monitoring program and evaluation. Please peruse the attached review for additional details.

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

Sincerely,

Marc-Etienne LeSieur
Senior Environmental Officer

Attachment

File: SI RE DE C13 610

c. B. Metcalfe, MOE

Ministry of the Environment

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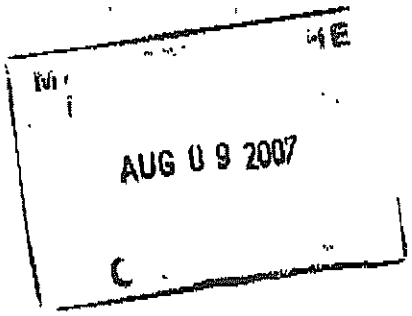
Ministère de l'Environnement

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Ontario

MEMORANDUM

08 August 2007



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

FROM: Bruce Metcalfe
Senior Environmental Officer (Surface Water)
Technical Support Section
Eastern Region

RE: 2006 Annual Report
Deep River (Miller's Road) Waste Disposal Site
Part Lot 6, Concession 13, Former Township of Buchanan
Township of Deep River
Certificate of Approval A413106

I have reviewed the noted report dated May 2007 prepared by Jp?g Consultants Inc. for the Town of Deep River. The following comments are offered relative to surface water impact concerns.

Background Information

The landfill site is presently leased by the Town of Deep River from Atomic Energy of Canada Limited and has been the waste disposal site for the municipality since approximately 1985. In December 2005 the Town of Deep River and Atomic Energy of Canada put in place a new lease agreement for the operation of the waste disposal site.

The waste disposal site is made up of four areas comprising a total area of 8.55 ha. The landfilling area within southern Areas 1 and 2 (3.22 ha) has been cleared and used for waste disposal. The northerly portions of Areas 3 and 4 (5.33 ha) are approximately 5 metres lower in elevation than Areas 1 and 2 and are currently heavily wooded.

The landfill site operates under Certificate of Approval No. A413106 and is licensed to receive the disposal of construction and demolition waste only.

Surface Water Regime

There are two surface water features in close proximity to the landfill site. They are Spring Creek and the unnamed Landfill Creek. Spring Creek originates upgradient and west of the landfill site, and passes under Miller's Road approximately 300 metres west of the access road to the site

entrance. Spring Creek meanders south of the site in an eastward direction to Maskinonge Lake. The Landfill Creek originates southeast of the site and meanders south-easterly until it meets up with Spring Creek approximately 0.5 km southeast of the site. Drainage from the site flows mostly south-southeast towards Maskinonge Lake. It is anticipated that Spring Creek will act as a hydraulic boundary to any leachate migrating south-westward.

Surface Water Sampling Program

During 2006 surface water samples were collected from both Spring Creek and Landfill Creek during the months of May, August and October. Seven surface water sampling stations were monitored and identified as follows:

SW-1: Spring Creek, located upgradient of the site and representative of background quality.

SW-2: Landfill Creek, located downstream southeast of the site.

SW-3: Landfill Creek, located approximately 100 metres southeast downstream of SW-2.

SW-4: Landfill Creek, located approximately 200 metres downstream of SW-3.

SW-5: Landfill Creek, located approximately 200 metres downstream of SW-4.

SW-6: Landfill Creek, located approximately 80 metres upstream of the confluence with Spring Creek.

SW-7: Spring Creek, located approximately 20 metres downstream of the confluence with Landfill Creek.

Surface Water Impact Assessment

Surface water samples collected for 2006 were analyzed for general inorganic chemistry and metals parameters. Field parameters measured for each sampling event included stream flow, pH, dissolved oxygen, conductivity and temperature. Surface water samples were compared to Provincial Water Quality Objectives (PWQO).

Spring Creek Background Surface Water Quality (SW-1)

For the purpose of surface water impact assessment the water quality at sample station SW-1 (culvert crossing Miller's Road) is considered to be representative of background surface water quality unaffected by landfill leachate.

During 2006 general chemistry water quality at SW-1 was characterized having BOD (<1 mg/L), COD (39 – 68 mg/L), pH (7.93 – 8.09), conductivity (102 – 181 µS/cm), chlorides (18 -31 mg/L), TKN (0.54 – 0.76 mg/L), and total phosphorus (<0.01 – 0.03 mg/L).

PWQO exceedances occurred for aluminum (0.08 – 0.16 mg/L, exceeding 0.075 mg/L), iron (0.68 – 1.11 mg/L, exceeding 0.30 mg/L), and dissolved oxygen (2.84 – 4.96 mg/L, less than 5.0 mg/L).

Landfill Creek Downstream of Site (SW-2)

Surface water sample station SW-2 monitors the downstream water quality of Landfill Creek closest to the site's southern boundary.

During 2006 general chemistry water quality at SW-2 was characterized having BOD (<1 mg/L), COD (<5 - 5 mg/L), pH (7.48 – 7.67), conductivity (388 - 467 µS/cm), chlorides (10 -14 mg/L), TKN (<0.05 – 0.23 mg/L), and total phosphorus (0.03 – 0.11 mg/L).

PWQO exceedances occurred for iron (1.54 – 4.36 mg/L, exceeding 0.30 mg/L), total phosphorus (0.09 – 0.11 mg/L, exceeding 0.03 mg/L), and zinc (0.04 mg/L, exceeding 0.0.02 mg/L).

Landfill Creek Downstream Surface Water Trigger Location (SW-6)

Surface water sample station SW-6 monitors the downstream water quality of Landfill Creek just before it discharges to Spring Creek. Sample station SW-6 was also identified to be the site contingency plan surface water trigger monitoring station.

During 2006 general chemistry water quality at SW-6 was characterized having BOD (<1 mg/L), COD (9 - 14 mg/L), pH (6.91 – 7.7), conductivity (444 - 461 µS/cm), chlorides (20 mg/L), TKN (0.28 – 0.47 mg/L), and total phosphorus (0.02 – 0.04 mg/L).

PWQO exceedances occurred for iron (0.31 – 2.84 mg/L, exceeding 0.30 mg/L), and total phosphorus (0.04 mg/L, exceeding 0.03 mg/L).

The parameters identified as trigger mechanisms for surface water impact are chloride and un-ionized ammonia. The trigger parameter concentrations are based on the 75th percentile background concentrations which are for chloride (31.45 mg/L) and unionized ammonia (0.01 mg/L, which is less than the PWQO of 0.02 mg/L).

The sample results for the 2006 surface water monitoring were determined to be below the trigger concentrations and therefore a Level II monitoring program was not required to be triggered for the landfill site.

Summary

- The surface water monitoring program conducted by the landfill site owner during 2006 was considered to be acceptable to the reviewer.
- The reviewer is in overall agreement with the consultant's recommendations presented in the 2006 Annual Report.
- The impact to the downstream surface water regime from the landfill site was considered to be minimal. The sample results for the 2006 surface water monitoring were determined to be below the trigger concentrations and therefore a Level II monitoring program was not required to be triggered for the landfill site.
- The landfill site surface water monitoring program for 2007 should continue as had been conduoted in 2006.

Bruce Metcalfe
BWM/sh

c: Bob Putzlocher
Peter Taylor
Paul Kehoe
Bruce Metcalfe (Aba2007\aba4007.mem) 2108-73UKM4
File SW-05-04, Deep River (Miller's Road) Landfill Site, Township of Deep River
File 13-01-01, Maskinonge Lake, Ottawa River Basin

Ministry of the Environment

133 Dalton Avenue
P O Box 820
Kingston ON K7L 4X6

Ministère de l'Environnement

133 avenue Dalton
C P 820
Kingston ON K7L 4X6

FAX → ERNST ZALTSBERG
→ ANDREW POLLET
as requested.
5
DATE: _____

MEMORANDUM

18 May 2001



TO: Andrew Polley
Senior Environmental Officer
Ottawa District Office
Eastern Region

FROM: Bob Putzlocher 613-5494000 2659
Hydrogeologist
Water Resources Unit
Technical Support Section
Eastern Region

RE: Hydrogeologic Report
Deep River (Millers Road) Waste Disposal Site
Certificate of Approval #A413106

I have completed a hydrogeological review of the "Deep River (Miller's Road) Waste Disposal Site, Certificate of Approval #A413106, Hydrogeologic Report" prepared by Robinson Consultants and offer the following comments. It is understood this report was prepared as an annual monitoring report and in response to previous comments on the report "Deep River (Miller's Road) Waste Disposal Site, Certificate of Approval #A413106, Final Report" dated February 1998. The 1998 report was in support of an application for revision to Provisional C of A #413106 and in order to address Ministry concerns of off-site contamination of groundwater and surface water as stated in the compliance inspection report prepared by Andrew Polley, Senior Environmental Officer, Ottawa District Office on July 11, 1997.

The site has been used for waste disposal by the Town of Deep River since 1965. It is located in Lot 6, Concession XIII, formerly Township of Buchanan now in the Town of Deep River. The 8.55 ha property is owned by Atomic Energy of Canada Limited (AECL) and leased by the Town for landfilling purposes. Property to the west of the site is privately owned and separated from the site by an unopened municipal road. Lands to north, south and east of the landfill are owned by AECL.

For convenience, the site is subdivided into four areas. Numbering of the areas begins with Area 1 in the southwest quadrant and continues clockwise to Area 4 in the southeast quadrant. Over a twenty year period from 1965 to 1985 approximately 2 ha of the site were used for landfilling of domestic and commercial wastes. Between 1986 and 1989 a trench and cover

method of operation was employed in Area 2. Construction and demolition waste was disposed in Area 3, while a portion of Area 4 was utilized for disposal of water treatment and sewage sludge. Between 1989 and 1991 a trench and cover operation was continued in the northeasterly portion of Area 4, until excavation was restricted due to large boulders, bedrock and a high watertable. In 1991 the method of operation in Area 4 was revised to a modified area method. The recognition of a 30 m buffer within the extent of the leased land reduces the 8.55 ha area to 5.55 ha. Although historic operations have deposited waste within the 30 m buffer, the buffer zone has been recently observed. A 1997 Capacity Study delineates the areal limits of waste disposal indicating a 4.45 ha footprint. The Site Development and Operations Plan (1997) suggests future landfilling be restricted to a 2.0 ha area.

Geology

The site is underlain by Precambrian, felsic metasedimentary bedrock. Bedrock outcroppings occur throughout the site and are numerous in the northern portion. The bedrock surface topography slopes steeply in an easterly direction in the southern portion of the site. A thick deposit of fine grained fluvial sand is present over most of Areas 1 and 2 and is generally between 10 and 30 m in thickness. A thin veneer of till is found in parts of Areas 2, 3, and 4 with thicknesses ranging from 0 to 1.75 m.

Hydrogeology

Water level monitoring has shown that groundwater flow in the shallow overburden is strongly influenced by the underlying bedrock topography which creates a groundwater divide at the site. Flow from Area 4 is in a southeasterly direction toward Maskinonge Lake. From Area 1 and the southern portion of Area 2, groundwater flow is southerly but may at times have a westerly influence. The direction of flow from the north eastern corner of the site will be northeasterly toward a wetland. In all areas, vertical hydraulic gradients are weak and groundwater flow is primarily horizontal. Surface water bodies that are potential groundwater discharge areas include Spring Creek and Landfill Creek to the south of the site and Maskinonge Lake to the southeast.

Guideline B-7 Compliance

For purposes of determining impacts of waste disposal, water quality in areas considered unaffected by human activity is measured. Wells 91-2 and 95-5 are located south and northwest of the site respectively and are considered representative of background water quality. Current sampling from these wells indicates levels of aluminum in excess of Ontario Drinking Water Standards (ODWS). Past results have shown ODWS exceedances of iron, manganese, and Total Dissolved Solids (TDS). It is noted that it is not uncommon for these parameters to naturally occur in excess of ODWS.

Off-site parameters exceeding ODWS are found in various other locations. Aluminum concentrations are high throughout the area in Wells 85-A, 85-B, 89-1, 95-3, 95-5, 96-1, and 91-3. Iron levels are high in Wells 85-B, 89-1, 95-3, 95-5, and 91-3 and elevated manganese levels are found in Wells 85-B and 89-1. Each of these monitoring wells are located in areas which are not considered impacted by leachate.

The consultant has interpreted the presence of two distinct leachate plumes associated with waste disposal Areas 2 and 4. From Area 4, leachate impacts are observed at and beyond the southern limit of the site. The 2000 sampling program shows parameters exceeding Reasonable Use (RU) concentrations along the southern boundary are aluminum, alkalinity, iron, manganese, and TDS. Along the western border, near Area 2, parameters exceeding RU are aluminum, alkalinity, nitrate, barium, iron, manganese, and TDS.

Within the monitoring report, the leachate plume originating from Area 4 is characterized by concentrations of chloride and TDS. The plume is demonstrated as evolving in the direction of groundwater flow (SE). Concentration contours of chloride and TDS are depicted although it is unclear how such contours can be drawn when only two wells in the immediate area were included in the recent sampling program. Similarly, the plume from Area 2 is represented by chloride and TDS contours and is oriented in a southwesterly direction. However, the existence of a westerly component of flow has not been clearly demonstrated.

In either plume, concentrations of chloride are not above RU. The plume, then, is defined by TDS with no reference to RU exceedances of other parameters. This is reasonable considering the occurrence of naturally high levels of inorganics throughout the site and area and the tendency of elevated metal concentrations to be associated with dissolved solids.

To deal with off-site groundwater contamination, the consultant recommends that contaminant attenuation zones be established around the site. Monitoring wells to the west of the site (95-3, 95-4, 95-5, and 96-1) do not reveal exceedances of the Reasonable Use Policy other than for aluminum. However it is recommended that the municipality take control of groundwater rights in this direction such that the monitoring wells are incorporated into a buffer zone. To the south and east of the landfill site, an attenuation zone is proposed that would include the drainage basin extending to Maskinonge Lake.

It should be noted that Table 9 "On-Site Parameters Indicating Increased Leachate Loading" as it appears in the report does not reflect 2000 monitoring results although it is titled so. Contaminant concentrations from Wells 91-5 and 95-6 displayed in the table as 2000 results were actually measured in September 1995. Additionally, of the two values quoted for calcium one has digits transposed and the other has an inaccurate decimal placing. Contrary to the impression given by the title of the table, it appears leachate strength is diminishing. Current sampling from monitoring well 95-6 shows no increase from the previously highest recorded values of any parameter. Some concentrations (namely Ca, K, Mn, N-NO3, P, and conductivity) exhibit the lowest concentrations ever recorded.

Other tables in the report which do not reflect current conditions or contain inaccuracies are Table 6 - "Range of Background Values" and Table 7 - "Range of Leachate Values". The background concentrations of aluminum, iron, and manganese have a wider range than that depicted and there appears to be two records for SO_4 values within the same table. The utility of these tables could be improved by including a column for the most recent sampling results as well as displaying the historic concentration range for each parameter.

In response to previous comments concerning elevated levels of toluene, a set of samples were taken from ten locations and analyzed for VOC's. Analysis showed all samples to be below detection limits for organics with the exception of wells 88-3 and 95-6 which had a few parameters above detection limits but within ODWS.

In summary, hydrogeological monitoring to date indicates evidence of a limited leachate plume on Federal lands outside the current Provisional Certificate of Approval property limits. Analysis shows concentrations within the plume exceed MOE policies to the west and south of the site. Continued operations of the site will likely result in the leachate plume extending southeasterly within AECL lands towards Maskinonge Lake.

To this end, conditions on the revised Certificate of Approval are required to provide for:

- Continued groundwater monitoring as described below
- Take all necessary steps to bring site into compliance with RU
- Incorporate CAZ/buffer land into an amended C of A with an updated site plan showing these areas as buffer lands
- Have buffer lands registered on title
- After two years of groundwater monitoring as described below, condition C of A to allow District Manager to alter sample frequency and parameters
- Annual groundwater monitoring report
- Delineate reduced footprint and final contours of future landfilling showing all buffer lands

Groundwater from Area 3 is described as flowing in a northeasterly direction. Area 3 has been utilized for construction waste disposal. To date no monitoring has occurred near this area. In order to determine compliance, it is recommended that a monitoring well be installed in the northeast corner of the site and be included in the regular sampling program as described below. A surface water review is necessary to assess the proposed contamination attenuation zone defined by the Maskinonge Lake catchment area south and east of the site. Additional consideration should be given to the potential for effects in the northeast wetlands.

The Monitoring Program set out in Appendix "F" of the report is concurred with except Subsection "i.C" and Section V which set out parameters for groundwater sampling and the monitoring wells to be sampled. In addition to monitoring locations listed in Section V, I recommend the inclusion of wells 91-4, 85-Y, and 85-Z. All locations should be sampled twice yearly, April and September, for the following parameters:

General Chemistry:

Hardness, alkalinity, chloride, sulphate, ammonia, nitrate, nitrite, TDS, Total Kjeldhal Nitrogen, Dissolved Organic Carbon, phenols, Biological Oxygen Demand, Chemical Oxygen Demand, total phosphorous

Field Tests:

Conductivity, pH, temperature, water level

Metals:

Al, Ca, Mn, Mg, Na, K, Fe, Selenium, Bo, Ba, Cd, Cr, Cu, Pb, Hg, Ag, Vanadium

Volatile Organic Compounds:

wells 95-6 and 88-3 (once every two years)

Future reporting should address the following concerns:

- There are no listings of analytical results from water quality testing at locations 85-Y and 85-Z, although reference is made to such within the report. If these locations have been tested in the past, the results should be included.
- Features which should be delineated or indicated on site maps include: active and proposed limits of waste disposal; location of adjacent residential wells (particularly Broome and Baker wells); and location of proposed new monitoring well(s).
- Correct discrepancies and update data and tables with current monitoring results.
- There is no mention of methane gas monitoring/migration potential.
- Groundwater flow along the western border of the site has not been clearly defined. Considering future disposal activity is proposed in Area I, the direction of flow requires more investigation.

Bob Putzlocher
BP/sh

c: P. Kehoe / Ottawa District Office
File SI RE BU CXIII/GW-07-04, Buchanan Township (A413106)
BP/Star # 12,895

Appendix C

Monitoring and Screening Checklist and Standard Sampling Protocol

Appendix D-Monitoring and Screening Checklist
General Information and Instructions

General Information: The checklist is to be completed, and submitted with the Monitoring Report.
Instructions: A complete checklist consists of:
(a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.
(b) completed contact information for the Competent Environmental Practitioner (CEP)
(c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

Definition of Groundwater CEP:
For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:
(a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or
(b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..
Definition of Surface water CEP:
A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

Monitoring Report and Site Information	
Waste Disposal Site Name	Millers Road Waste Disposal Site
Location (e.g. street address, lot, concession)	Part Lot 6, Concession XIII, former Twp of Buchanan not in the Town of Deep River
GPS Location (taken within the property boundary at front gate/ front entry)	NAD 83 UTM zone 18 310060E, 5103350N
Municipality	Town of Deep River
Client and/or Site Owner	Town of Deep River
Monitoring Period (Year)	2018
This Monitoring Report is being submitted under the following:	
Environmental Compliance Approval Number:	A413106
Director's Order No.:	N/A
Provincial Officer's Order No.:	N/A
Other:	N/A

Report Submission Frequency	◉ **Annual** ○ **Other**		
The site is: **(Operation Status)**	◉ **Open** ○ **Inactive** ○ **Closed**		
Does your Site have a Total Approved Capacity?	◉ **Yes** ○ **No**		
If yes, please specify Total Approved Capacity	321,825	*Units*	Cubic Metres
Does your Site have a Maximum Approved Fill Rate?	○ **Yes** ◉ **No**		
If yes, please specify Maximum Approved Fill Rate		*Units*	
Total Waste Received within Monitoring Period (Year)	4,400	*Units*	Cubic Metres
Total Waste Received within Monitoring Period (Year) *Methodology*	Comparison to previous year survey		
Estimated Remaining Capacity	86,728	*Units*	Cubic Metres
Estimated Remaining Capacity *Methodology*	Autocad calculation 2017 - 2018 surface comparison		
Estimated Remaining Capacity *Date Last Determined*	December 2018		
Non-Hazardous Approved Waste Types	☐ Domestic ☒ Industrial, Commercial & Institutional (IC&I) ☐ Source Separated Organics (Green Bin) ☐ Tires	☐ Contaminated Soil ☒ Wood Waste ☐ Blue Box Material ☐ Processed Organics ☐ Leaf and Yard Waste	☐ Food Processing/Preparation Operations Waste ☐ Hauled Sewage Other: C & D waste exclusively
Subject Waste Approved Waste Classes: Hazardous & Liquid Industrial *(separate waste classes by comma)*	na		
Year Site Opened *(enter the Calendar Year only)*	1965	**Current ECA Issue Date**	April 4, 2014
Is your Site required to submit Financial Assurance?		○ **Yes** ◉ **No**	
Describe how your Landfill is designed.		◉ Natural Attenuation only ○ Fully engineered Facility ○ Partially engineered Facility	
Does your Site have an approved Contaminant Attenuation Zone?		◉ **Yes** ○ **No**	

If closed, specify C of A, control or authorizing document closure date:	N/A

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

Groundwater WDS Verification:

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

Sampling and Monitoring Program Status:

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

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

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

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

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

Sampling and Monitoring Program Results/WDS Conditions and Assessment:			
5) The site has an adequate buffer, Contaminant Attenuation Zone (CAZ) and/or contingency plan in place. Design and operational measures, including the size and configuration of any CAZ, are adequate to prevent potential human health impacts and impairment of the environment.	(•) **Yes** ( ) **No**	As per Condition 31 of the former ECA (i.e. Notice 6 dated November 26, 2009), the Municipality acquired an approximate 14 hectare parcel of land located immediately west of the Millers Road Waste Disposal Site for the purpose of a CAZ (Figure 3). The property is has been registered on title as a Contaminant Attenuation Zone.	
6) The site meets compliance and assessment criteria.	(•) **Yes** ( ) **No**	See Table 12 and 13 of report Part 2	
7) The site continues to perform as anticipated. There have been no unusual trends/ changes in measured leachate and groundwater levels or concentrations.	(•) **Yes** ( ) **No**		
1) Is one or more of the following risk reduction practices in place at the site: ***(a)*** **There is minimal reliance on natural attenuation of leachate due to the presence of an effective waste liner and active leachate collection/ treatment; or** ***(b)*** **There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or** ***(c)*** **The site meets the following two conditions (typically achieved after 15 years or longer of site operation):** ***i.*** **The site has developed stable leachate mound(s) and stable leachate plume geometry/concentrations; and** ***ii.*** **Seasonal and annual water levels and water quality fluctuations are well understood.**	(•) **Yes** ( ) **No**	**Note which practice(s):**	☐ **(a)** ☐ **(b)** ☒ **(c)**
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	(•) **Yes** ( ) **No** ( ) **Not Applicable**	Trigger exceedances are not a result of landfilling. The exceeding trigger parameter is manganese which are naturally variable in the vicinity of the site. The manganese and iron values revealed are well within historical background concentrations. The exceedance is thought to be naturally occurring due to the low concentrations of all other leachate indicator parameters at the compliance monitoring wells.	

Groundwater CEP Declaration:

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

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

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

Recommendations:

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

◉ **No changes to the monitoring program are recommended**	
○ **The following change(s) to the monitoring program is/are recommended:**	
◉ **No Changes to site design and operation are recommended**	
○ **The following change(s) to the site design and operation is/ are recommended:**	The municipality may wish to investigate the use of a "tub grinder" to mulch and grind waste. At the same time they may wish to investigate the use of alternative daily cover. Applications will be submitted if the decision is made to follow through.

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

Surface Water WDS Verification:

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

Name (s)	There are two surface water features in close proximity to the landfill site. They are Spring Creek and the unnamed Landfill Creek.
Distance(s)	The unnamed Landfill Creek begins 125m south east of the landfilling area. Spring Creek meets with landfill creek approximately 500m south east the landfilling area

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

Sampling and Monitoring Program Status:

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

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

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

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

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

Sampling and Monitoring Program Results/WDS Conditions and Assessment:

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

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

Parameter	Compliance or Assessment Criteria or Background	Amount by which Compliance or Assessment Criteria or Background Exceeded
e.g. Nickel	e.g. C of A limit, PWQO, background	e.g. X% above PWQO
See Attachment 1		
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**	Contributions to elevated parameters likely in part a combination of landfill and natural

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**	See Report Part 2
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	A comparison of 95-6 and SW-2 has been provided in Report Part 2, Table 15. These locations represent the groundwater zone adjacent to the unnamed landfill creek and the headwater of the landfill creek. The elevated concentrations in the groundwater at 95-6 do not appear to have correlation with the chemistry of the surface water station SW-2.
9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):	(●) **Yes** ( ) **No** ( ) **Not Applicable**	In 2018 no trigger exceedance occurred for chloride, Unionized ammonia based on field data were below PWQOs and trigger values. No contingency measures are required at this time.

Surface Water CEP Declaration:

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

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

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

Select Date

Recommendations:

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

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

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

Save As		**Print Form**

Monitoring Station PWQO ->	Boron 0.2	% exceedance	Iron 0.3	% exceedance	Aluminum 0.075	% exceedance	Unionzied Ammonia 0.02	% exceedance
SW-1								
May-18					0.08	7		
Jul-18			1.02	240				
Oct-18			0.66	120				
SW-2								
May-18			0.83	176				
Jul-18			0.81	170				
Oct-18								
SW-3								
May-18	0.26	30	4.35	1350				
Jul-18	0.29	45	2.42	706				
Oct-18			2.77	823				
SW-4								
May-18	0.36	80	2.32	673				
Jul-18	0.41	105	2.8	833				
Oct-18	0.31	55	1.6	433				
SW-5								
May-18	0.35	75	2.29	663			0.05	150
Jul-18	0.4	100	2.89	863			0.03	50
Oct-18	0.3	50	1.81	503				
SW-6								
May-18	0.35	75	2.3	666			0.04	100
Jul-18	0.4	100	2.26	653			0.04	100
Oct-18	0.31	55	0.98	226				
SW-7								
May-18			0.42	40				
Jul-18			1.34	346				
Oct-18			0.72	140				

Notes:

All concentration values in mg/L and all quantified exceedance values in percent

CWQG for Boron is 1.5 mg/L

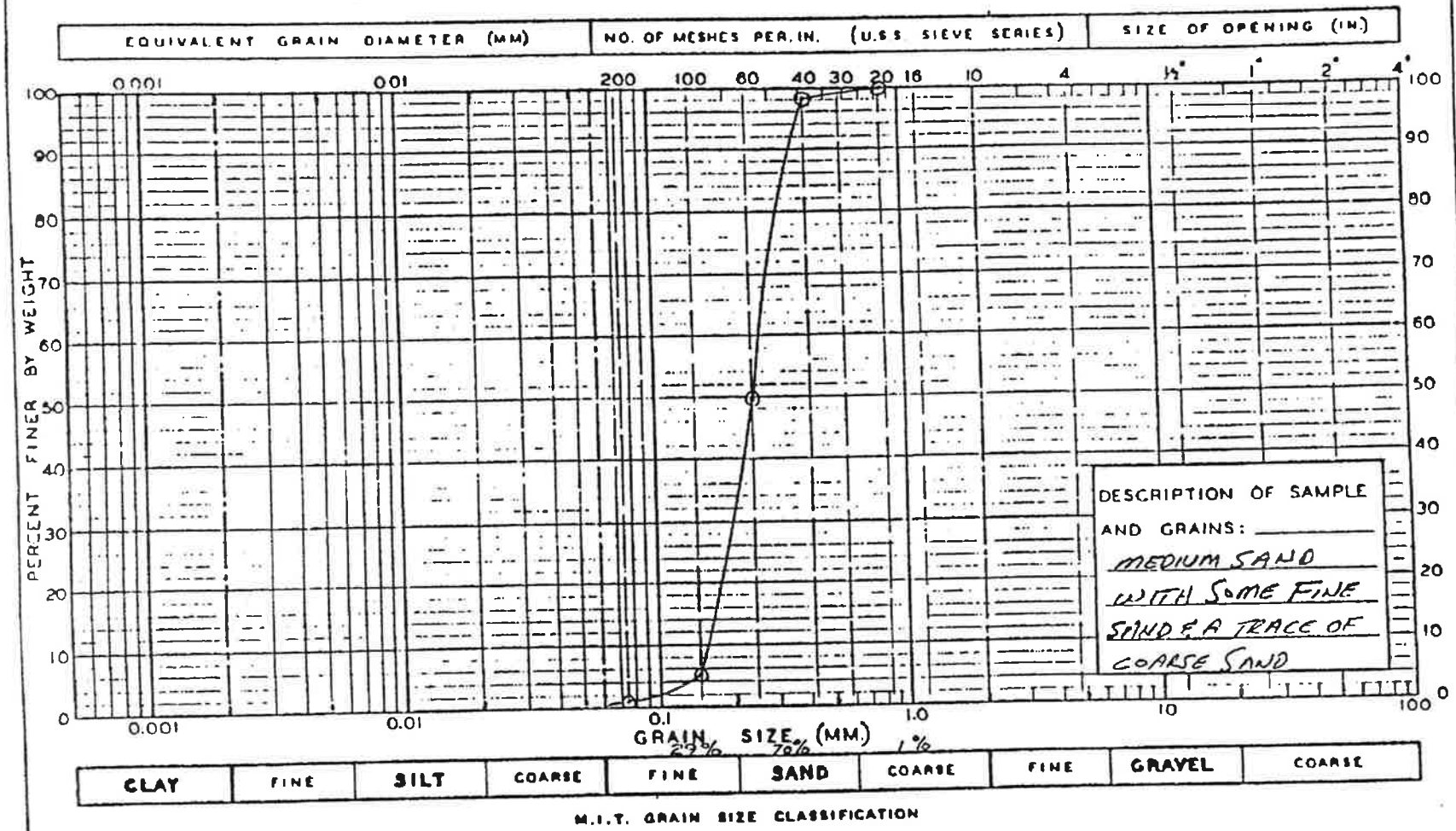
Appendix D

Grain Size Distribution

Samples for grain size analysis were collected from the following piezometer locations.

Sample no. 1	Deep overburden piezometer no. 1 Depth 4.6 m
Sample no. 2	Deep overburden piezometer no. 1 Depth 20.4 m
Sample no. 3	Deep overburden piezometer no. 1 Depth 12.0 m
Sample no. 4	Deep overburden piezometer no. 2 Depth 23.8 m

MECHANICAL ANALYSIS OF SOILS



M.I.T. GRAIN SIZE CLASSIFICATION

E-595'S
PROJECT: GEO-ANALYSIS REF. NO. G-8824

SAMPLE NO. 1 88-1

PLOTTED: E.S DATE: 20-10-88

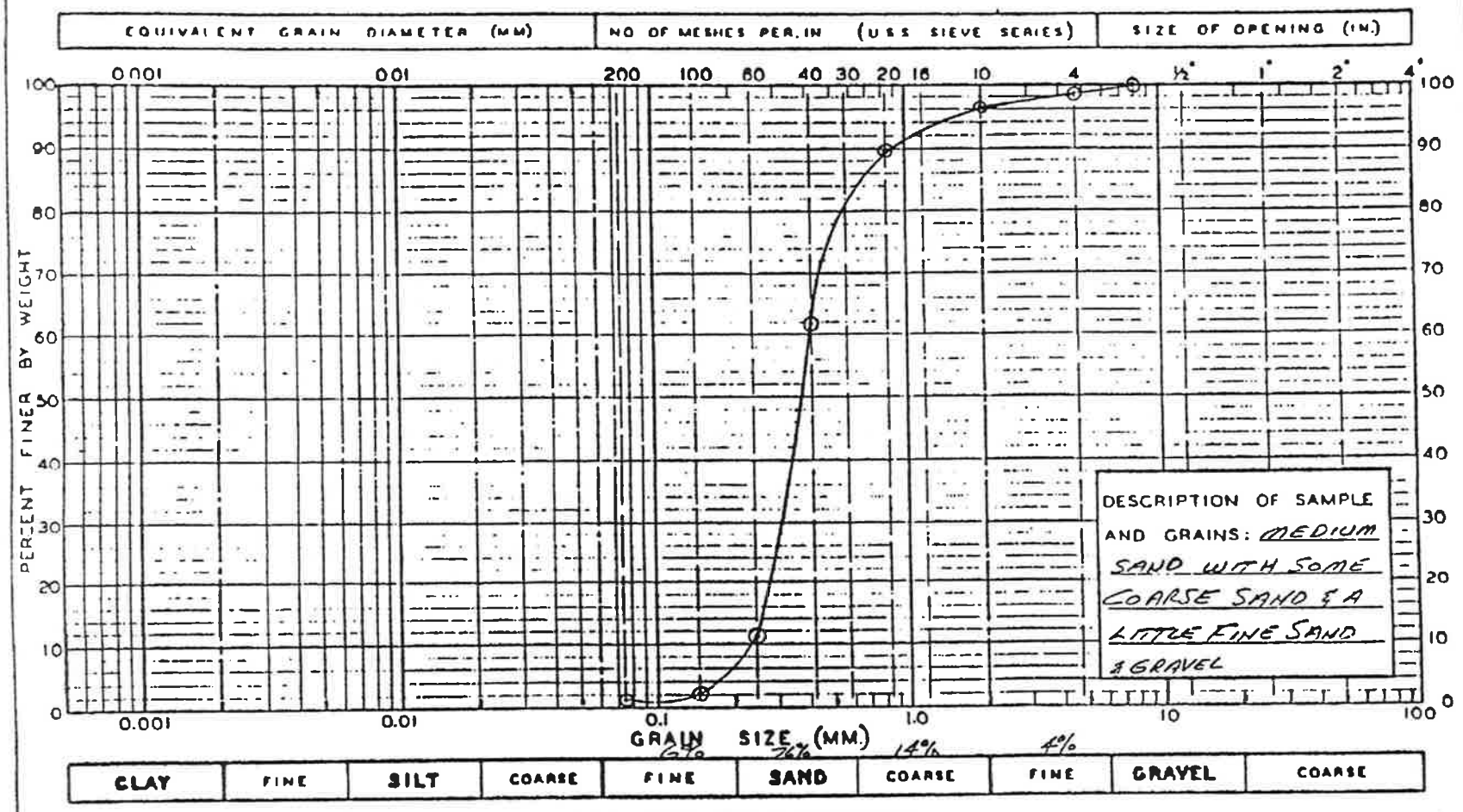
CHECKED: K.B. DATE: 24-10-88

REMARKS:

McROSTIE GENEST MIDDLEMISS
& ASSOCIATES LTD. — & ASSOCIÉS LTÉE
CONSULTING ENGINEERS — INGÉNIEURS CONSEILS
OTTAWA, CANADA

SAMPLE ON

MECHANICAL ANALYSIS OF SOILS



M.I.T. GRAIN SIZE CLASSIFICATION

E-5955
PROJECT: GEO-ANALYSIS REF. No. G-8824 | SAMPLE NO. 2 88-1

PLOTTED: E.S. DATE: 20-10-88

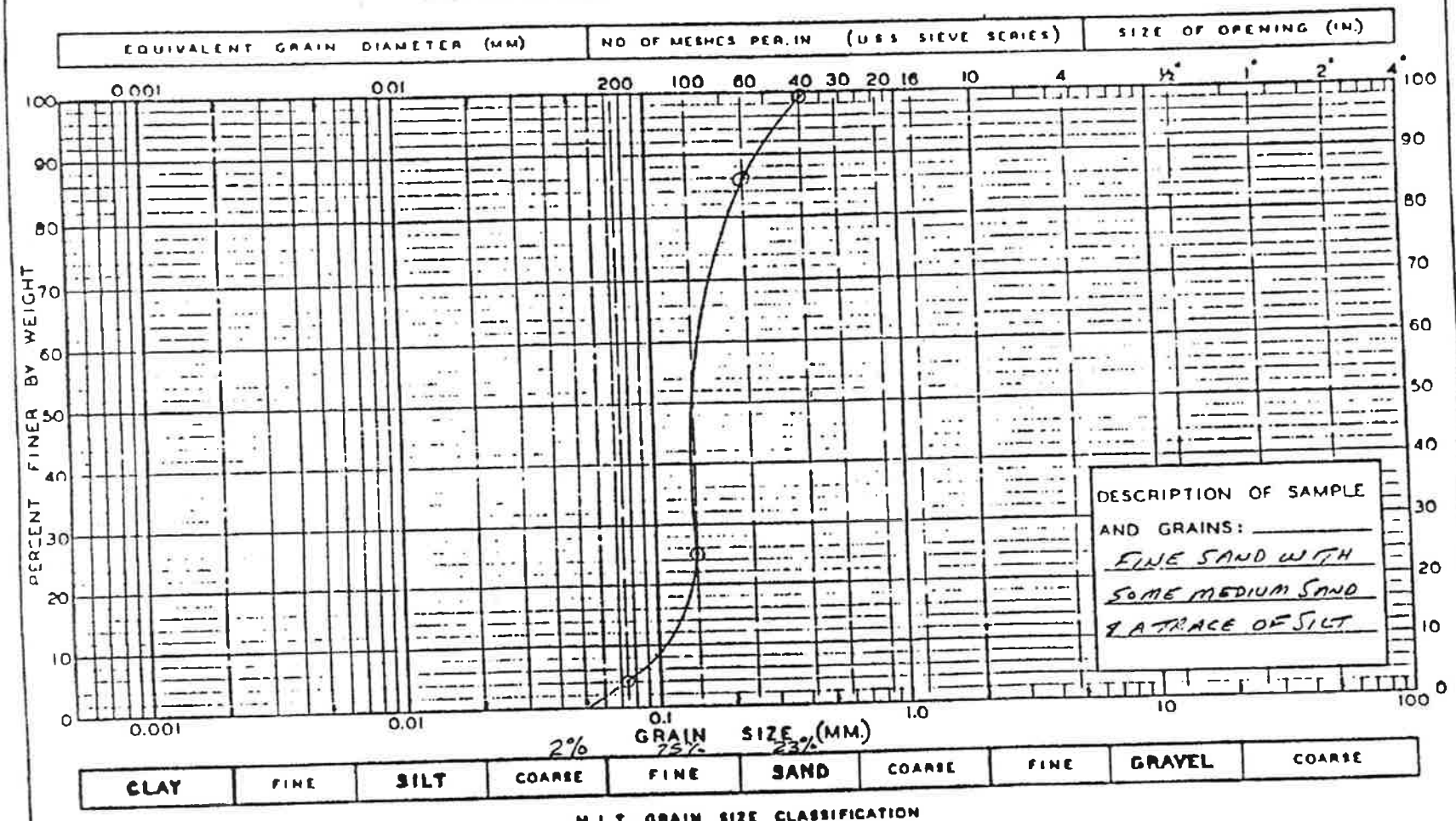
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REMARKS:

McROSTIE GENEST MIDDLEMISS
& ASSOCIATES LTD. — & ASSOCIÉS LTÉE
CONSULTING ENGINEERS — INGÉNIEURS CONSEILS
OTTAWA, CANADA

SHEET No.

MECHANICAL ANALYSIS OF SOILS



E-STSS
PROJECT: GEO-ANALYSIS REF NO. G-8824

SAMPLE NO. 3 88-1

PLOTTED: E.S. DATE: 20-10-88

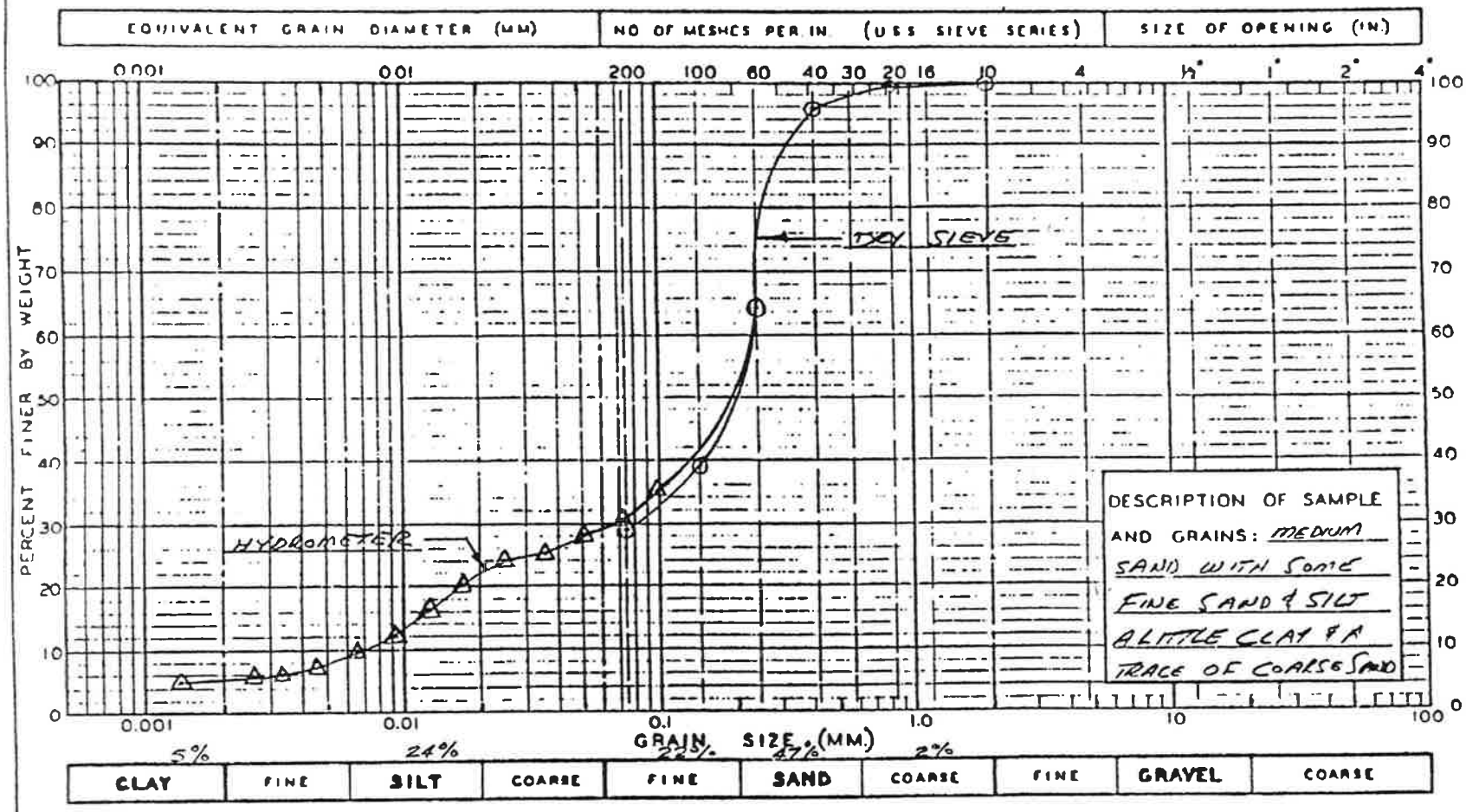
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CONSULTING ENGINEERS — INGÉNIEURS CONSEILS
OTTAWA, CANADA

SAMPLE NO.

MECHANICAL ANALYSIS OF SOILS



M.I.T. GRAIN SIZE CLASSIFICATION

E-5955
PROJECT: GEO-ANALYSIS REF. NO. G-5824

SAMPLE NO. 4 88-2

PLOTTED: E.S. DATE: 20-10-88

CHECKED: K.B. DATE: 24-10-88

REMARKS:

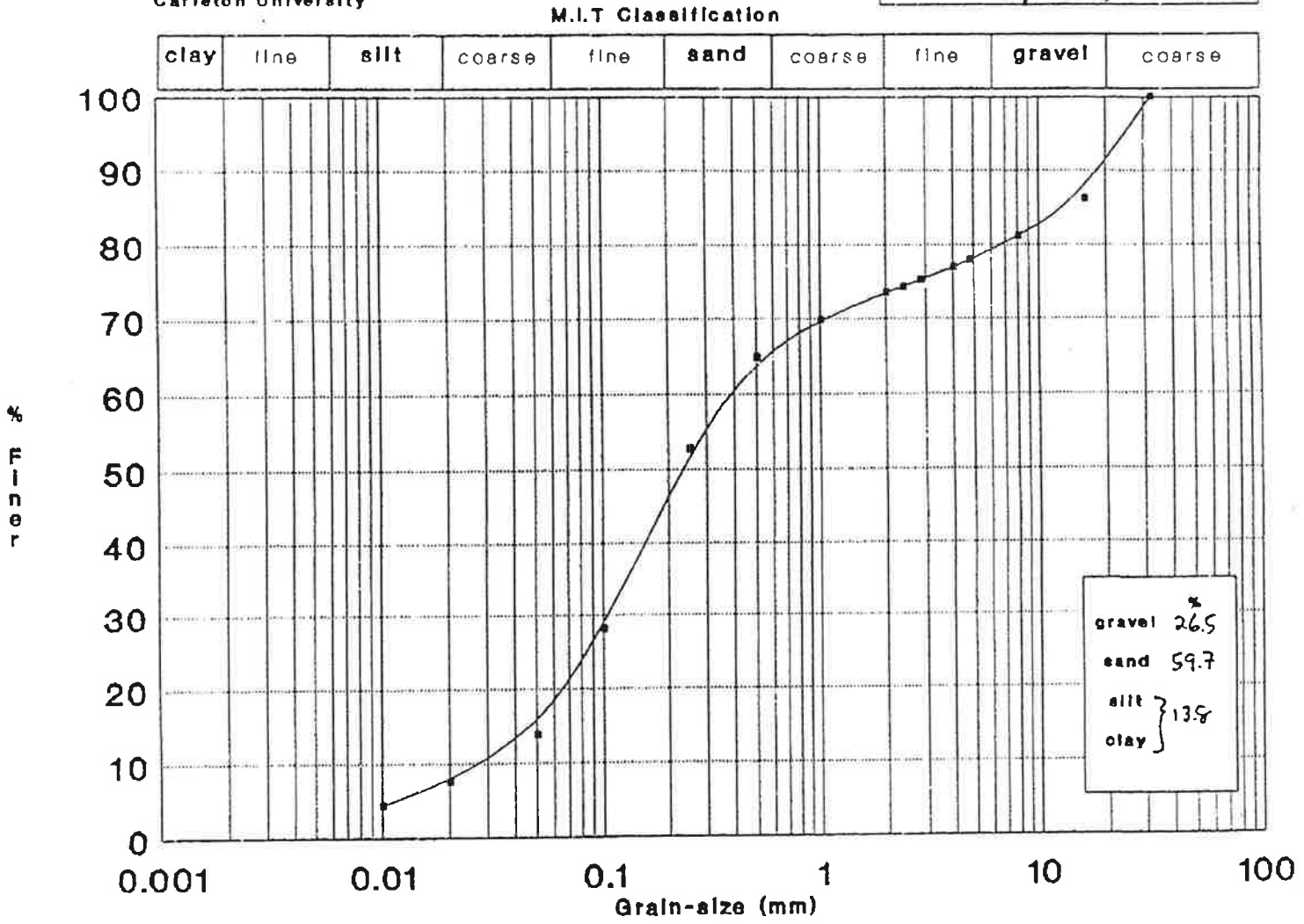
McROSTIE GENEST MIDDLEMISS
& ASSOCIATES LTD. — & ASSOCIÉS LTÉE
CONSULTING ENGINEERS — INGÉNIEURS CONSEILS
OTTAWA, CANADA

SAMPLE NO.

Grain-size Analysis

Geotechnical Science Laboratories
Carleton University

Project: G8923 89-1
Sample: Deep River, Well 1 at 19.7m



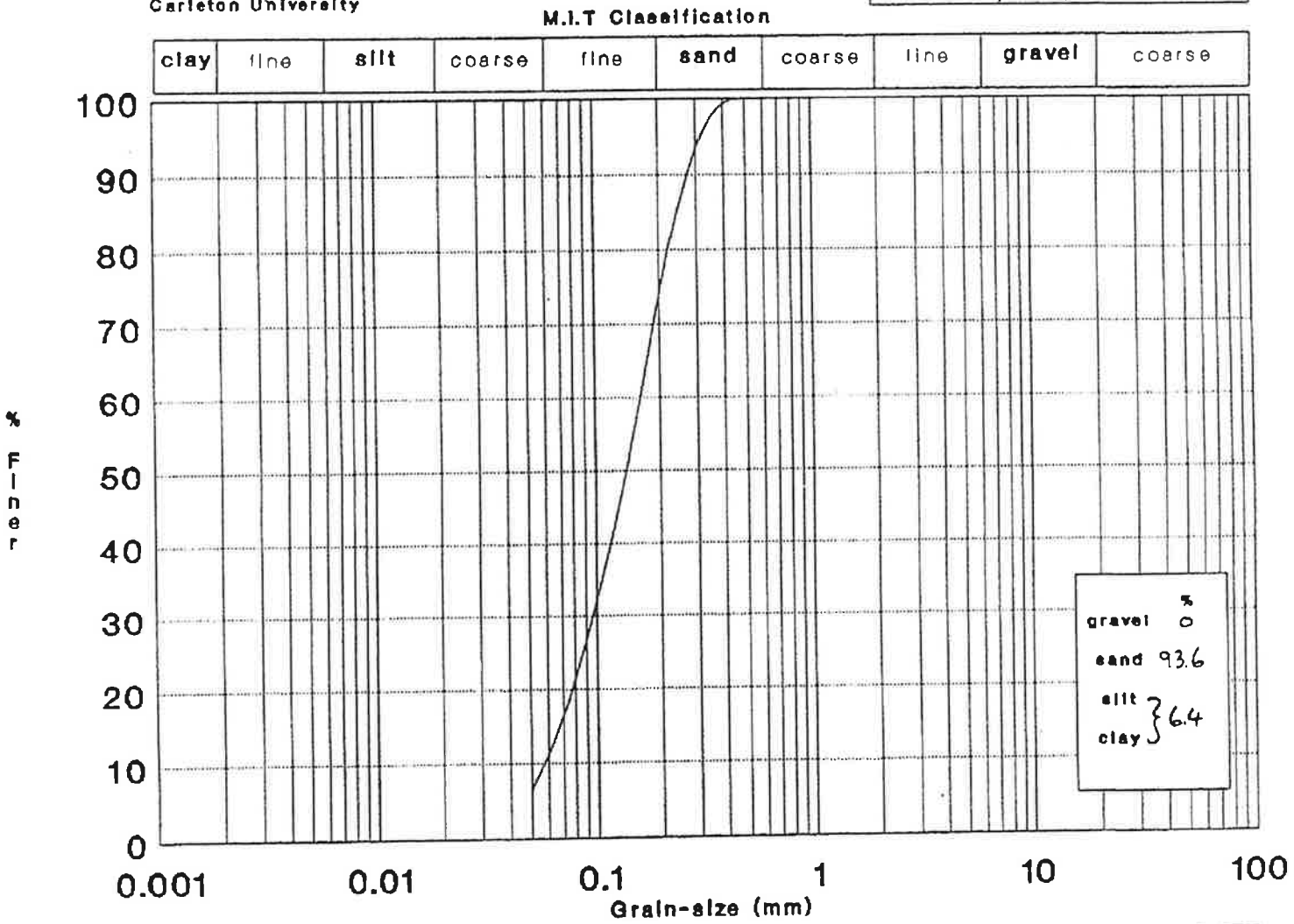
Description: Gravelly-Sand with coarse silt

Comments: Grey-black in colour, gravel fraction angular & mixed composition

Grain-size Analysis

Geotechnical Science Laboratories
Carleton University

Project: G8923 89-1
Sample: Deep River, Well 1 at 7-7.6m



Description: Sand, some silt-clay

Comments

Appendix E

Monitoring Well Status



SW 1



SW 3



SW 5



SW 2



SW 4



SW 6

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Miller's Road Waste Disposal Site

Fall 2018 Surface Water Monitoring Locations

DATE	02-Oct-18
PROJECT	17-6015A
FIGURE	1



SW 7

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Miller's Road Waste Disposal Site

Fall 2018 Surface Water Monitoring Locations

DATE	02-Oct-18
PROJECT	17-6015C
FIGURE	2



BH 85A



BH 85C



BH 88-2 (Deep & Shallow)



BH 85B



BH 85D



BH 89-1 (Deep & Shallow)

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Miller's Road Waste Disposal Site

Fall 2018 Groundwater Monitoring Locations

DATE	03-Oct-18
PROJECT	17-6015C
FIGURE	3



BH 91-1



BH 91-3



BH 91-5 Shallow



BH 91-2



BH 91-4

BH 91-5 Deep

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Miller's Road Waste Disposal Site

Fall 2018 Groundwater Monitoring Locations

DATE	03-Oct-18
PROJECT	17-6015C
FIGURE	4



BH 95-3 Shallow



BH 95-4 Shallow



BH 95-5



BH 95-3 Deep



BH 95-4 Deep



BH 95-6 (Leachate Well)

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Miller's Road Waste Disposal Site

Fall 2018 Groundwater Monitoring Locations

DATE	03-Oct-18
PROJECT	17-6015C
FIGURE	5



BH 96-1 (Deep & Shallow)



BH 96-3



BH 07-2 Deep



BH 96-2



BH 07-2 Shallow



BH 07-3 Shallow

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Miller's Road Waste Disposal Site

Fall 2018 Groundwater Monitoring Locations

DATE	03-Oct-18
PROJECT	17-6015C
FIGURE	6



BH 07-3 Deep



BH 07-F Deep



BH 08-1 (Deep &Shallow)



BH 07-F Shallow

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Miller's Road Waste Disposal Site

Fall 2018 Groundwater Monitoring Locations

DATE	03-Oct-18
PROJECT	17-6015C
FIGURE	7

Appendix F

Borehole Logs from Recent Programs

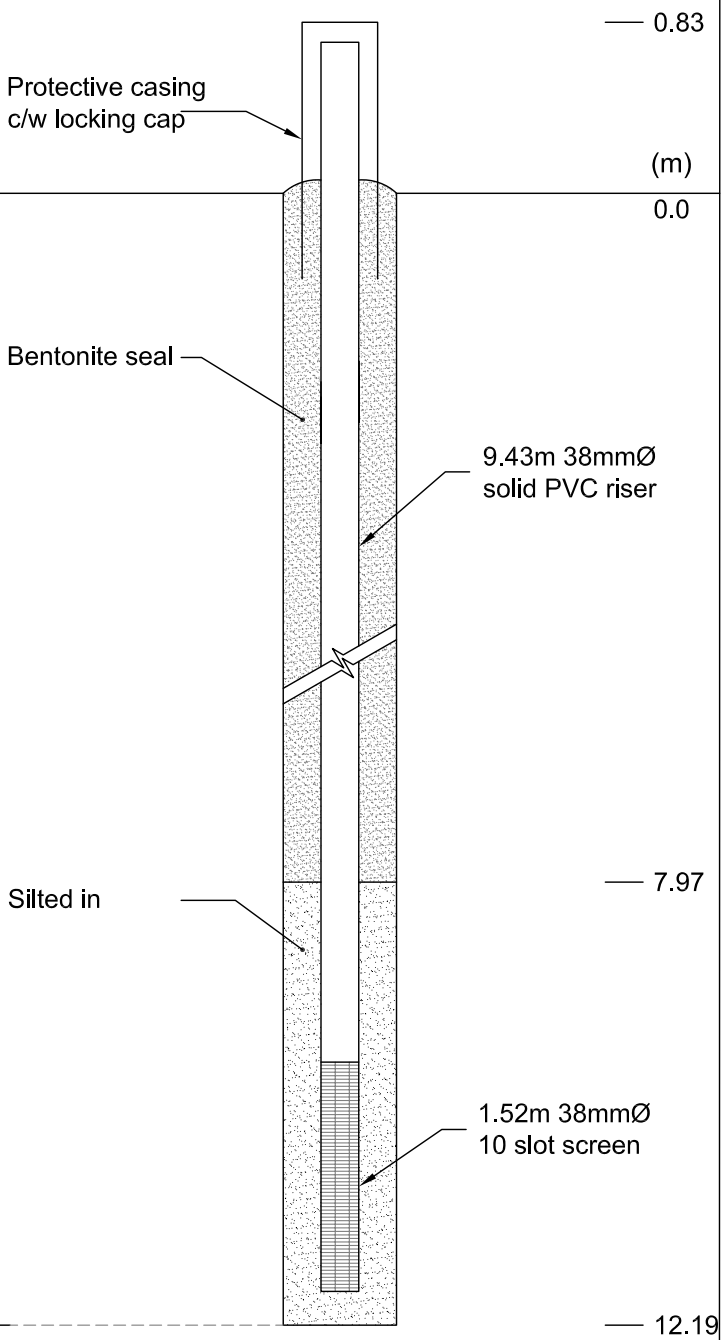
BH# 91-5S

BOREHOLE LOG NO: 91-5S

PROJECT No.: 2006015J
CLIENT: Town of Deep River
PROJECT: Miller's Road Landfill
LOCATION: BH# 91-5S
STATION: ---
DATE: October 2008

DRILLING DATA
METHOD: Air Rotary
DEPTH OF HOLE: 12.19m
TOP OF PIEZOMETER:
GROUND ELEVATION:

ELEV (m)	DEPTH (m)	PROFILE	DESCRIPTION
	0.0		Brown and grey sand with some stones.
	12.19		Terminated.



TYPICAL GROUND-WATER MONITORING WELL
SCALE: 1:50

REMARKS:

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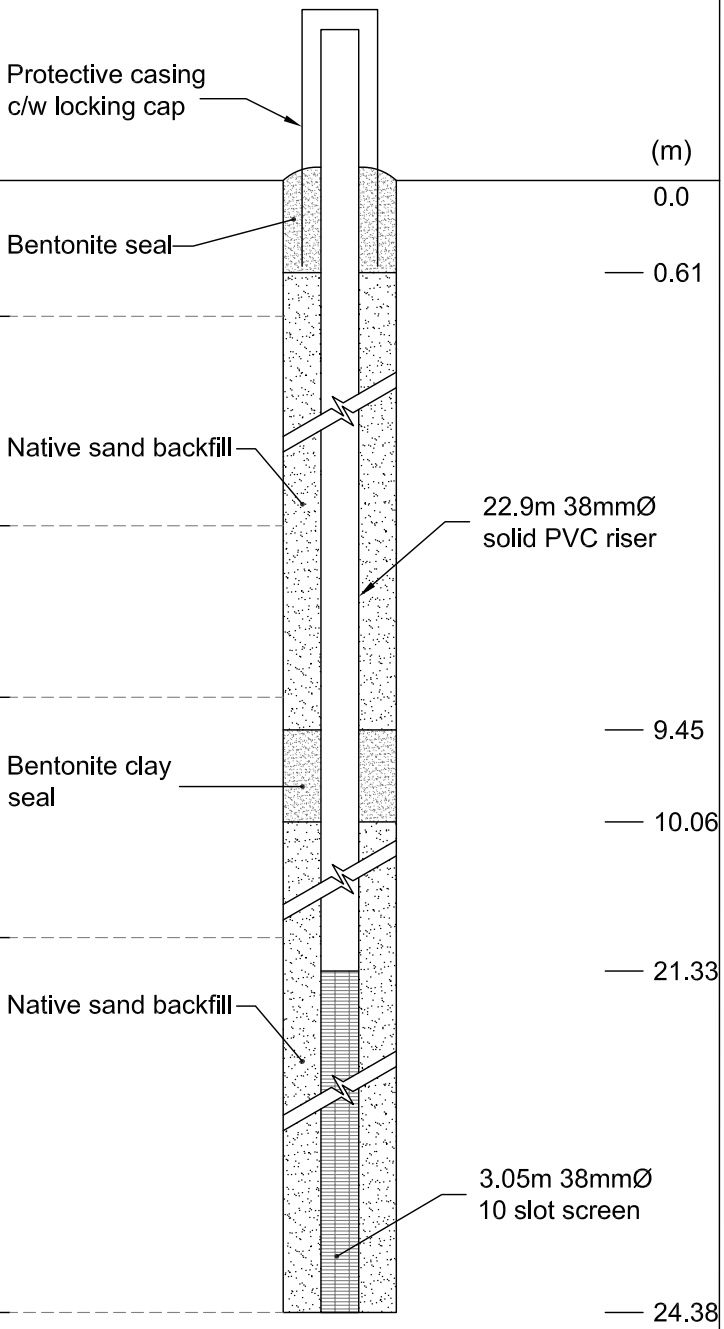
BH# 95-3D

BOREHOLE LOG NO: 95-3D

PROJECT No.: 2006015J
CLIENT: Town of Deep River
PROJECT: Miller's Road Landfill
LOCATION: BH# 95-3D
STATION: ---
DATE: October 2008

DRILLING DATA
METHOD: Hollow Stem Auger
DEPTH OF HOLE: 24.38m
TOP OF PIEZOMETER:
GROUND ELEVATION:

ELEV (m)	DEPTH (m)	PROFILE	DESCRIPTION
	0.0		Dry brown topsoil.
	0.90		Dry brown medium to fine sand with some mottling.
	4.59		Damp fine brown sand.
	7.62		Saturated fine brown and grey sand. Some stones.
	13.72		Saturated fine grey flowing sand. Stones and boulders at depth.
	24.38		Driller refusal. Flowing sand and boulders.



TYPICAL GROUND-WATER MONITORING WELL
SCALE: 1:50

REMARKS:

Jp2g Consultants Inc.
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PEMBROKE · OTTAWA

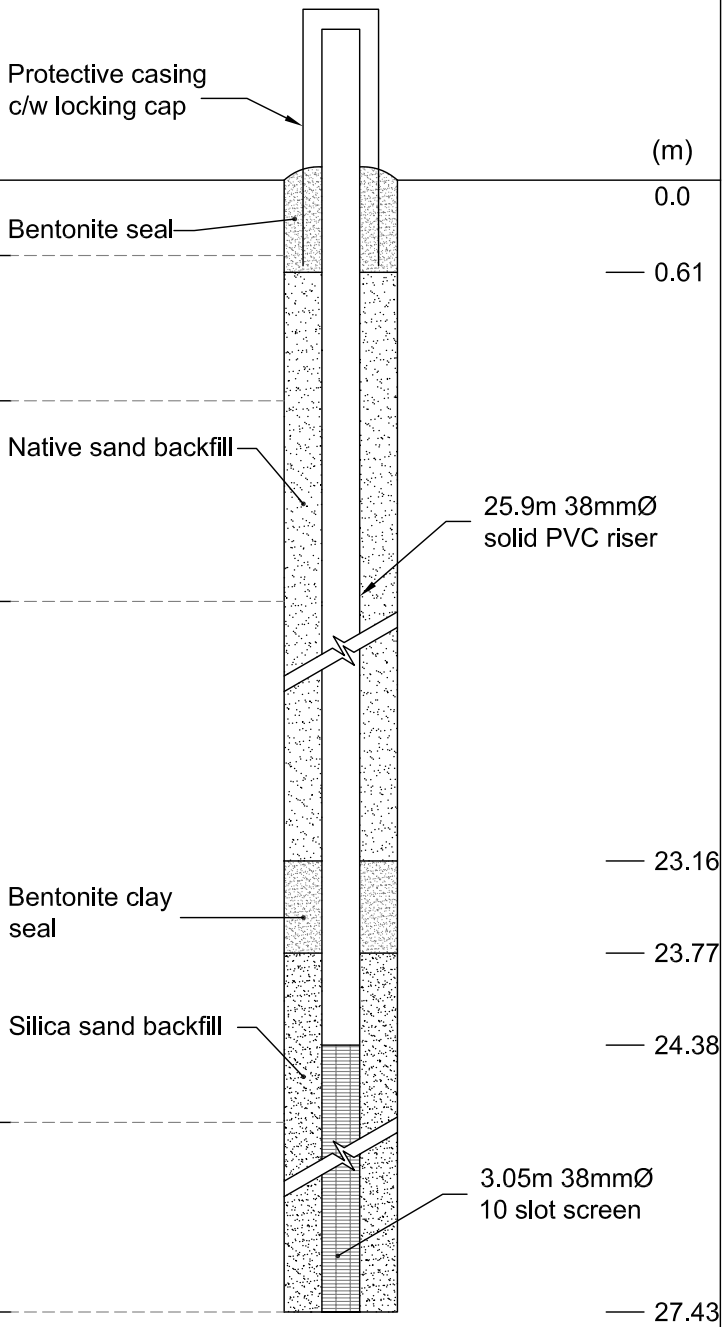
BH# 95-4D

BOREHOLE LOG NO: 95-4D

PROJECT No.: 2006015J
CLIENT: Town of Deep River
PROJECT: Miller's Road Landfill
LOCATION: BH# 95-4D
STATION: ---
DATE: October 2008

DRILLING DATA
METHOD: Hollow Stem Auger
DEPTH OF HOLE: 27.43m
TOP OF PIEZOMETER:
GROUND ELEVATION:

ELEV (m)	DEPTH (m)	PROFILE	DESCRIPTION
	0.0		Dark brown sandy topsoil.
	0.15		Dry light brown fine sand.
	6.01		Wet light brown to grey fine sand. Some mottling.
	10.67		Saturated fine grey sand.
	24.38		Saturated medium grey sand. Some clay layers.
	27.43		Terminated. Driller refusal.



TYPICAL GROUND-WATER MONITORING WELL
SCALE: 1:50

REMARKS:

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS
PEMBROKE · OTTAWA

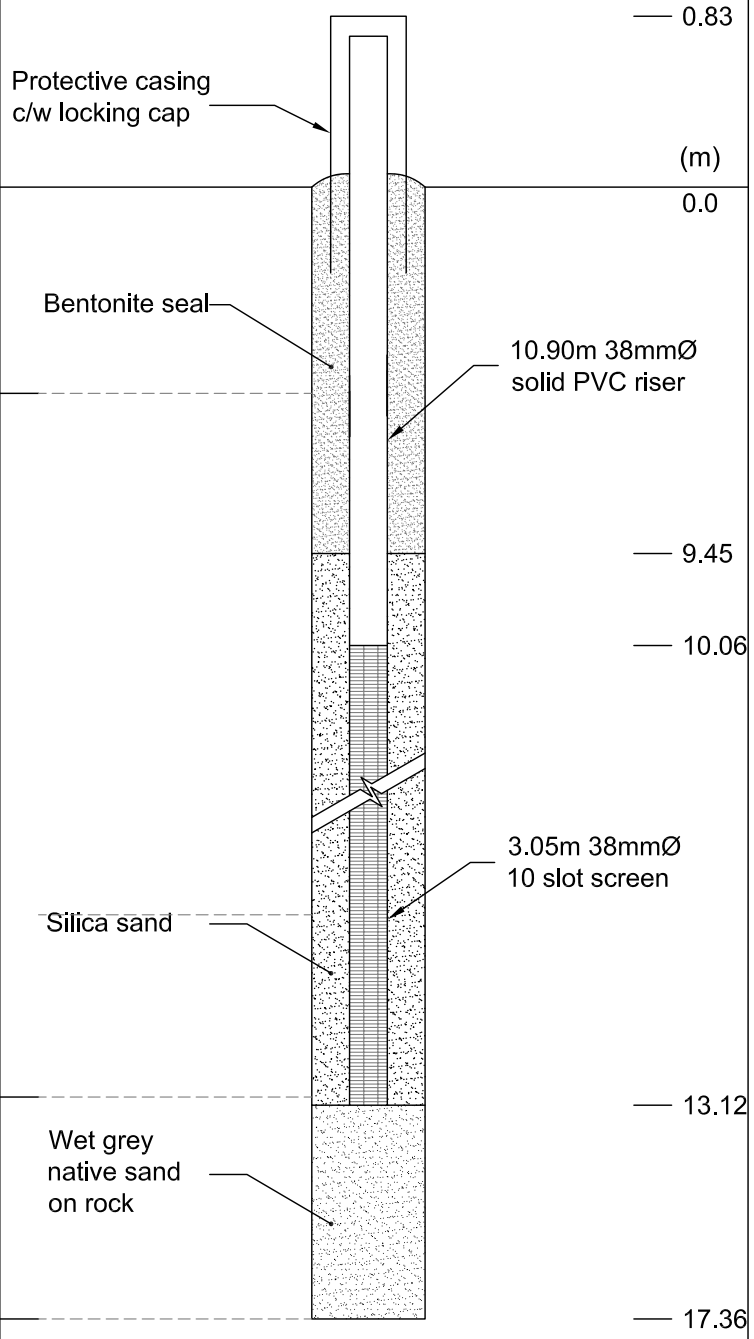
BH# 07-FD

BOREHOLE LOG NO: 07-FD

PROJECT No.: 2006015J
CLIENT: Town of Deep River
PROJECT: Miller's Road Landfill
LOCATION: BH# 07-FD
STATION: ---
DATE: November 2008

DRILLING DATA
METHOD: Air Rotary
DEPTH OF HOLE: 17.36m
TOP OF PIEZOMETER:
GROUND ELEVATION:

ELEV (m)	DEPTH (m)	PROFILE	DESCRIPTION
	0.0		Brown medium sand with some stones.
	2.0		Wet fine grey sand and gravel mixed with cobbles.
	13.11		Fine saturated grey sand.
	17.36		Terminated. Driller refusal, bedrock.



TYPICAL GROUND-WATER MONITORING WELL
SCALE: 1:50

REMARKS:

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS
PEMBROKE · OTTAWA

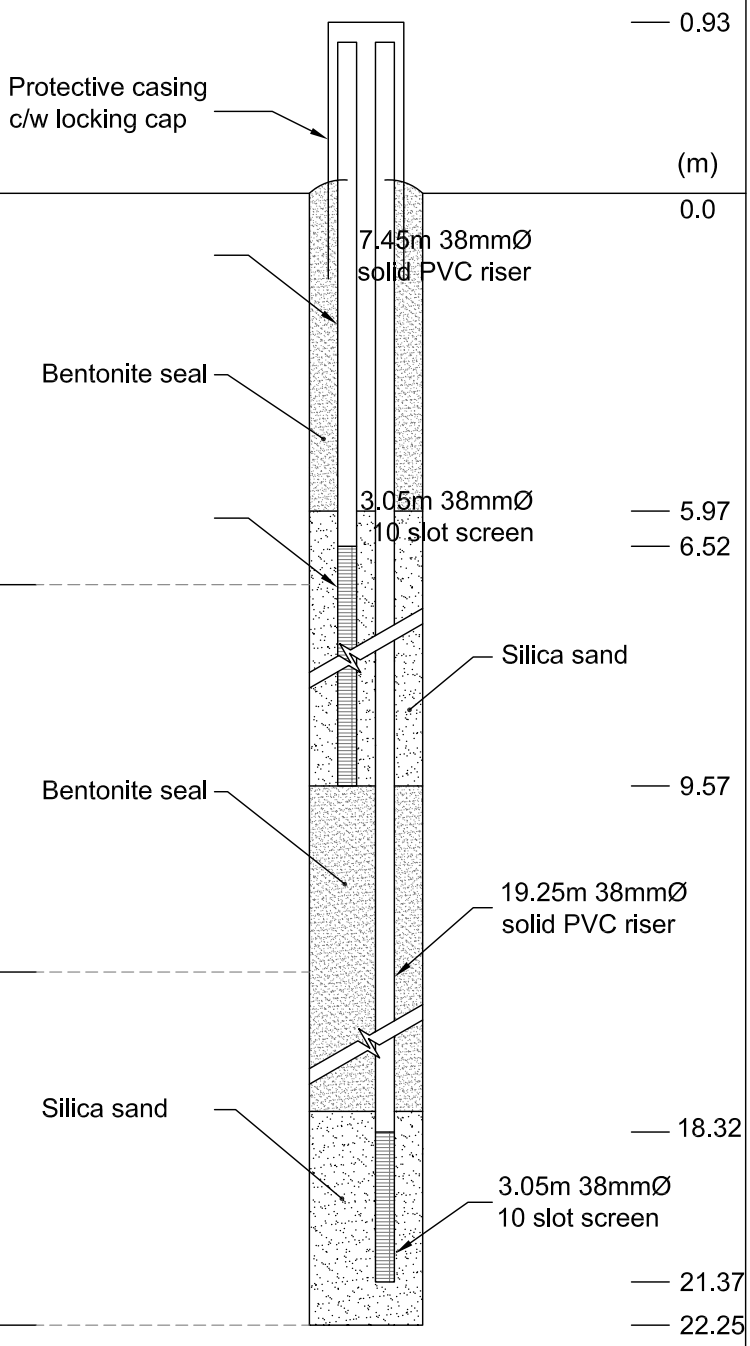
BH# 08-1 D/S

BOREHOLE LOG NO: 08-1 D/S

PROJECT No.: 2006015J
CLIENT: Town of Deep River
PROJECT: Miller's Road Landfill
LOCATION: BH# 08-1 Deep and shallow
STATION: ---
DATE: November 2008

DRILLING DATA
METHOD: Air Rotary
DEPTH OF HOLE: 22.25m
TOP OF PIEZOMETER:
GROUND ELEVATION:

ELEV (m)	DEPTH (m)	PROFILE	DESCRIPTION
	0.0		Medium brown sand with stones.
	10.06		Fine saturated grey sand.
	20.42		Grey sand and rock fragments.
	22.25		Driller refusal, bedrock.



TYPICAL GROUND-WATER MONITORING WELL

SCALE: 1:50

REMARKS:

Jp2g Consultants Inc.
ENGINEERS · PLANNERS · PROJECT MANAGERS
PEMBROKE · OTTAWA

Appendix G

Lease Agreement

Conditions 8+9

File 2006015 G

The Corporation of the Town of Deep River

By-law No. 23-2005

A By-law to authorize the municipality to enter into an agreement to amend the lease agreement with respect to the Miller Road waste disposal site.

WHEREAS on March 3, 1965, Council adopted By-law Number 386 to authorize the signing of a lease;

AND WHEREAS it is advisable and agreeable between the parties to the said lease that the terms thereof should be amended;

NOW THEREFORE the Council of the Corporation of the Town of Deep River **ENACTS AS FOLLOWS**:

1 The Corporation of the Town of Deep River is hereby authorized to enter into an agreement with Atomic Energy of Canada Limited to amend the lease agreement adopted under By-law 386 with respect to the Miller Road waste disposal site.

2 The terms of the agreement referred to in Section 1 shall be substantially the same as the terms of the agreement attached to this by-law as Schedule 'A'.

3 The Mayor and the Clerk-Administrator shall sign the agreement authorized under this by-law on behalf of the Corporation, and the Clerk-Administrator and the Town Superintendent are authorized to take such actions as may be necessary and appropriate to implement the agreements, or as may be required from time to time under the agreements.

4 This by-law comes into force upon adoption by Council of the Corporation of the Town of Deep River.

READ A FIRST AND SECOND TIME THIS 21st DAY OF DECEMBER, 2005.

READ A THIRD TIME AND FINALLY PASSED THIS 21st DAY OF DECEMBER, 2005.

Ann Quirk
Mayor

Clerk-Administrator

Addendum to the Lease Agreement dated March 1, 1965 Between Atomic Energy of Canada Limited and the Corporation of the Town of Deep River

Paragraph 3 changed to read To have and to hold the premises unto the Lessee, from and after the First day of January 2006 for a term of ten years, fully to be complete and ended on the thirty-first day of December, 2015; provided however that the Lessee shall have the right and option, exercisable at any time during the last year of the aforesaid term, to renew this lease for a further period of 10 years and the right and option, exercisable at any time during the last year of any such renewal, to further renew this lease for one further period of 10 years.

Condition 1 changed to read That the Lessee will use the premises only for construction and demolition waste and only as an area for waste disposal in accordance with the MOE Provisional Certificates.

Condition 5 changed to read Burning of waste materials within the leased area shall be prohibited.

Condition 11 changed to read That the Lessee shall at all times indemnify and save harmless the Lessor from and against all claims and demands, loss, costs, damages, actions, suits or other proceedings by whomsoever made, brought or prosecuted, in any manner based upon, occasioned by or attributable to the execution of these presents, or any action taken or things done or maintained by virtue hereof, or the exercise in any manner of rights arising hereunder. The above conditions shall survive the termination or expiration of this Agreement,

Condition 12 added to read That the Lessor shall grant unto the Lessee, at all reasonable times during the term of the lease, access upon the lands described in the schedule annexed to this Addendum herein after called "Schedule B Contaminant Attenuation Zone".

a) To install, maintain, inspect, sample, repair and keep in good condition, the boreholes including all appurtenances necessary for the monitoring of the landfilling operation compliance.
b) To maintain, inspect and sample surface water locations for the monitoring of the landfilling operation compliance.
c) For the employees, agents and contractors of the Lessor to access with material, vehicles and equipment as may be necessary for all purposes to the exercise the works as described above.
d) Upon completion of the said work or any future work, the Lessee shall remove its equipment and restore the property to substantially the same condition.
e) If ever the extent of the boundary of the schedule annexed to this Addendum/ Contaminant Attenuation Zone is in dispute, to resolve the dispute, the Lessee shall pay to have the boundary surveyed by a registered professional land surveyor.
f) That the Lessor is entitled to request and receive all information on the contaminant monitoring.

Condition 13 added to read That the Lessor shall grant unto the Lessee access to the lands described in the schedule annexed to this Addendum herein after called Schedule B Contaminant Attenuation Zone, as "Cover Material Source".

a) To excavate and remove native earth material for the purpose of covering waste disposed at the landfill site. The material removed from the cover material source as identified on Schedule B is for the use only at the Miller's Road Landfill Site.



b) For the employees, agents and contractors of the Lessee to access the material, with vehicles and equipment as may be necessary for all purposes to exercise the works as described above. All excavation and removal of native earth material shall take place in compliance with applicable federal and provincial laws and guidelines regarding aggregate extraction. Phased rehabilitation of the excavated area (every two years) will be conducted at no cost to AECL.

c) Upon completion of the said work, the Lessee shall undertake the final rehabilitation of the pit in accordance with best management practices to the satisfaction of the Lessor.

Condition 14 added to read That the Lessee shall provide the Lessor with a copy of the Annual Report that is submitted to the Ministry of the Environment by June 1st of the year following the calendar year covered by the report.

All other terms and conditions of the March 1, 1965 Agreement shall remain in force and effect.

IN WITNESS WHEREOF the parties have caused these presents to be signed by their proper officers authorized on their behalf under their respective corporate seals.

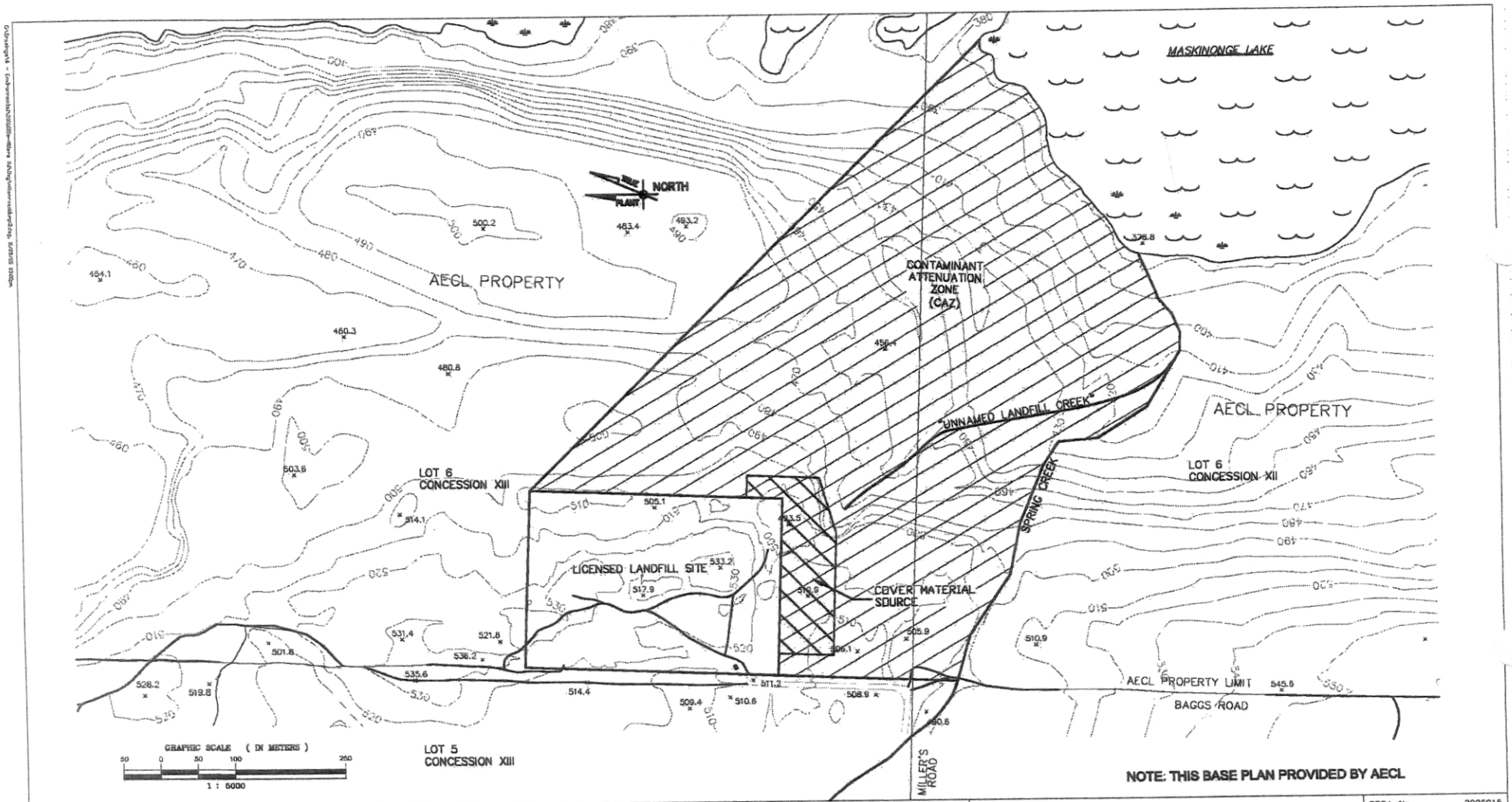
ATOMIC ENERGY OF CANADA LIMITED

Stephen Lawton
General Manager
Facilities and Site Infrastructure Services

THE CORPORATION OF THE
TOWN OF DEEP RIVER

Mayor

Clerk-Administrator



Jp2g Consultants Inc.

No.	DATE	BY	REVISION
1	08/09/05	A.S.	CAZ

MILLER'S ROAD LANDFILL SITES
PART LOT 6 CONCESSION XIII
TOWN OF DEEP RIVER

SCHEDULE B CONTAMINANT ATTENUATION ZONE

PROJ. No.:	2006015
DATE:	AUG. 09, 2005
DRAWN BY:	J.M.S.
FIGURE:	1 of 1

Fil
2006/56

OFFICE CONSOLIDATION

THIS INDENTURE made this First day of March One Thousand Nine Hundred Sixty-five, in pursuance of the Short Form of Leases Act.

BETWEEN:

ATOMIC ENERGY OF CANADA LIMITED
(hereinafter called "the Lessor)

OF THE FIRST PART

- and -

THE CORPORATION OF THE TOWN OF DEEP RIVER
(hereinafter called "The Lessee")

OF THE SECOND PART

WITNESSETH THAT the Lessor, in consideration of the rents, covenants, provisos and conditions hereinafter reserved and contained, hath demised and leased, and, by these presents, doth demise and lease unto the Lessee:

ALL AND SINGULAR that certain parcel or tract of land situate lying and being in the Town Deep River in the Province of Ontario described in the schedule annexed to this Indenture (hereinafter called "the premises")

TO HAVE AND TO HOLD the premises unto the Lessee, from and after the First day of January 2006 for a term of ten years, fully to be complete and ended on the thirty-first day of December, 2015; provided however that the Lessee shall have the right and option, exercisable at any time during the last year of the aforesaid term, to renew this lease for a further period of 10 years and the right and option, exercisable at any time during the last year of any such renewal, to further renew this lease for one further period of 10 years.

YIELDING AND PAYING therefor, in advance, an annual rental of One Dollar ($1.00), the first such rental payment to be effected on the execution of these presents.

IT IS AGREED by and between the said parties hereto that these presents are made and executed upon and subject to the covenants, provisos, conditions and reservations hereinafter set forth and contained, and that the same and every of them, representing and expressing the exact intention of the parties, are to be strictly observed, performed and complied with namely:-

1. That the Lessee will use the premises only for construction and demolition waste and only as an area for waste disposal in accordance with the MOE Provisional Certificates.

2. That the Lessee shall, at the Lessee's expense, erect a fence, satisfactory to the Lessor, around the portion of the leased area which is in use for the disposal of garbage, shall maintain such fence in a manner satisfactory to the Lessor and shall, at the expiration of the term of this lease or any renewal thereof, if the Lessor so directs, remove the said fence at the Lessee's expense.

3. That, within one month following the execution of these presents, the Lessee shall cause the area of the premises to be cleared and scarified and shall, during the Lessee's occupancy of the premises, take all reasonable measures(including measures directed by the Lessor to be taken) by way of burning and filling to ensure that the premises at no time present a fire or health hazard.

4. That the Lessee shall, within one month following the execution of these presents, effect measures to exterminate so far as possible the rat population in or about the premises and shall, during the term of this lease or any renewal thereof, continue to effect measures directed toward the effective control of the rat infestation of the said premises.

5. Burning of waste materials within the leased area shall be prohibited.

6. That the Lessee will pay or cause to be paid all rates, taxes and assessments, of whatsoever description, that may at any time during the existence of these presents be lawfully imposed, or become due and payable, upon, or in respect of the said premises, or any part thereof.

7. That if, after the expiration or termination of this lease or any renewal thereof, the Lessee shall remain in possession of the said premises, with or without the consent of the Lessor, or without any further written agreement, the Lessee shall be deemed a monthly tenant, at a monthly rental equal to one-twelfth or the annual rental herein set out, payable in advance on the first day of each month, and subject in all other respects to the terms of this lease.

8. That the Lessee shall in all respects abide by and comply with all lawful rules, regulations and by-laws of municipalities and other governing bodies, in any manner affecting the said premises.

9. That the Lessee shall not make any assignment of these presents, nor any transfer or sub-lease of any of the lands, rights or privileges demised or leased hereunder, without obtaining the consent in writing of the Lessor to such assignment, transfer or sub-lease.

10. That it shall be lawful for the Lessor and its agents at all reasonable times during the term of this lease to enter the said premises to examine the condition thereof.

11. That the Lessee shall at all times indemnify and save harmless the Lessor from and against all claims and demands, loss, costs, damages, actions, suits or other proceedings by whomsoever made, brought or prosecuted, in any manner based upon, occasioned by or attributable to the execution of these presents, or any action taken or things done or maintained by virtue hereof, or the exercise in any manner of rights arising hereunder. The above conditions shall survive the termination or expiration of this Agreement.

12. That the Lessor shall grant unto the Lessee, at all reasonable times during the

term of the lease, access upon the lands described in the schedule annexed to this Addendum herein after called "Schedule B Contaminant Attenuation Zone".

a) To install, maintain, inspect, sample, repair and keep in good condition, the boreholes including all appurtenances necessary for the monitoring of the landfilling operation compliance.

b) To maintain, inspect and sample surface water locations for the monitoring of the landfilling operation compliance.

c) For the employees, agents and contractors of the Lessor to access with material, vehicles and equipment as may be necessary for all purposes to the exercise the works as described above.

d) Upon completion of the said work or any future work, the Lessee shall remove its equipment and restore the property to substantially the same condition.

e) If ever the extent of the boundary of the schedule annexed to this Addendum/ Contaminant Attenuation Zone is in dispute, to resolve the dispute, the Lessee shall pay to have the boundary surveyed by a registered professional land surveyor.

f) That the Lessor is entitled to request and receive all information on the contaminant monitoring.

13. That the Lessor shall grant unto the Lessee access to the lands described in the schedule annexed to this Addendum herein after called Schedule B Contaminant Attenuation Zone, as "Cover Material Source".

a) To excavate and remove native earth material for the purpose of covering waste disposed at the landfill site. The material removed from the cover material source as identified on Schedule B is for the use only at the Miller's Road Landfill Site.

b) For the employees, agents and contractors of the Lessee to access the material, with vehicles and equipment as may be necessary for all purposes to exercise the works as described above. All excavation and removal of native earth material shall take place in compliance with applicable federal and provincial laws and guidelines regarding aggregate extraction. Phased rehabilitation of the excavated area (every two years) will be conducted at no cost to AECL.

c) Upon completion of the said work, the Lessee shall undertake the final rehabilitation of the pit in accordance with best management practices to the satisfaction of the Lessor.

14. That the Lessee shall provide the Lessor with a copy of the Annual Report that is submitted to the Ministry of the Environment by June 1st of the year following the calendar year covered by the report.

IN WITNESS WHEREOF the parties have caused these presents to be signed by their proper officers authorized in that behalf under their respective corporate seals.

Appendix H

Water Quality Analysis

Water Quality Notes

Surface Water

	ME ater ualit ui eli es r t e r te ti A uati i e r i ial ater ualit e ti es
I	I teri ater ualit e ti es
“a”	*Alkalinity* ul t e e rease re t a 2
“b”	*Beryllium* I ar ess t e 0 011
	I ar ess t e 1 1
“c”	*Cadmium*
	0 0002
	I I ar ess 0 100 t e 0 0001
	I ar ess 100 t e 0 000
	a iu e trati $10^{0\ 6}$ I 10 ar ess 3 2 µg/L
“d”	*Copper*
	0 00
	I I ar ess 0 –20 t e 0 001
	I ar ess 20 t e 0 00
	pper e trati $e^{0\ 4}$ I ar ess 1 46 0 2
“e”	*Lead*
	I al ali it 20 t e 0 00
	I al ali it 20 40 t e 0 010
	I al ali it 40 0 t e 0 02
	I al ali it 0 t e 0 02
	I I ar ess 30 t e 0 001
	I ar ess 30 0 t e 0 003
	I ar ess 0 t e 0 00
	ea e trati $e^{1\ 2\ 3}$ I ar ess 4 0
“f”	*DO*
	aries it te perature
“g”	*Nickel*
	Ni el e trati $e^{0\ 6}$ I ar ess 1 06

Groundwater

MA	Ma i u A epta le e trati
IMA	I teri Ma i u A epta le e trati perati al ui eli e ealt relate
MD	Ma i u Desira le e trati
A	Aest eti e ti e

STANDARD SAMPLING PROTOCOL

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

Equipment Cleaning and Calibration

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

GROUNDWATER

Monitoring Well Assessment

provide an assessment of the status of all monitoring wells at the site;

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

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

Groundwater Monitoring

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

check all field equipment for cleanliness; and

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

Gas Detection in Wells (Prior to Measuring Water Levels)

turn on gas meter and prepare for sampling atmospheric condition inside monitoring well;

remove protective casing cover and well cap avoiding introduction of foreign materials into the well;

immediately insert the probe attached to the gas meter into the well and wait for readings to stabilize;

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

Water Level Measurements (Prior to Purging)

always take water level measurements prior to purging or sampling;

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

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

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

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

Well Purging (Prior to Sampling)

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

purge the well only after water levels have been confirmed;

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

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

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

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

Field Measurements

Field measurements are to be collected and recorded as outlined in the Certificate of Approval or the approved monitoring program.

Well Sampling

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

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

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

transfer the sample into a pre-labelled sample bottle;

for samples that require filtering, attach the disposable filter onto the end of the tubing (a 0.45 micron membrane filter should be used);

attempt to keep sample agitation to a minimum during sample transfer;

store samples in a cooler, with ice packs to keep cool;

conduct field measurements (these typically include: temperature, pH and conductivity; and

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

Volatile Organic Compound (VOC) Sampling

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

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

vials must be filled just to overflowing in such a manner that no air bubbles pass through the vial as it is being filled (this is easier to accomplish by inserting a 4□length of □ □poly tubing into the existing wattera tubing and filling the vial from the □ □tubing);

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

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

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

VOC samples should be submitted in duplicate.

SURFACE WATER SAMPLING (GENERAL)

Surface water samples should be collected at the same designated location during each sample event (do not collect samples from any station which is frozen, stagnant or otherwise not representative of normal conditions).
if you must stand in the stream, position yourself downstream of the sample location to avoid contaminating the sample with sediment, debris, and other floating materials;
all equipment must be thoroughly rinsed with distilled water at the beginning of each station to avoid cross-contamination;
wear gloves to handle the sample bottles;
fill all bottles using an unpreserved transfer bottle (to avoid overflowing pre-preserved bottles);
when sampling for dissolved metals, the sample must be filtered and placed in a separate metals bottle, while sampling for total metals, the sample is placed in a common bottle for metals that is provided by the laboratory;
label and store all samples in the same manner as for groundwater samples; and
conduct field measurements (these typically include: temperature, pH, conductivity, Dissolved Oxygen and Flow).

Flow Measurements (General)

Discharge flow measurements must be taken at designated stations.

QA/QC Water Samples

A field quality assurance and quality control program for all monitoring events will be established as follows:

where groundwater or surface water samples are taken, a field blank in which a set of sample bottles is filled with distilled water at a known site or monitoring station is submitted to the laboratory for analysis along with the samples;

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

duplicate of at least one sample set per sampling event or 1 duplicate for every 10 groundwater samples (do not identify the well number to the laboratory, but have it recorded in the field notes) use the sampling technique as for observation wells.

SAMPLING

Station Sampling Order

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

Monitoring Periods

The monitoring periods are as recommended in either the annual report or the Certificate of Approval.:

Analytical Parameters

Analysis will be as recommended in either the annual report or the Certificate of Approval.

Gas Detection of On-site Buildings

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

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 85-A

Sample Date			Jul-85	Jul-91	Sep-91	Aug-96	Jul-99	May-04
PARAMETER	Limit	ODWO/S						
Silver						<0.01	<0.01	<0.005
Aluminum	OG	0.1				1.85	0.02	0.069
Alkalinity (C_aCO3)	OG	30-500				97	104	80
Arsenic	IMAC	0.025					<0.001	<0.001
Boron	IMAC	5		<0.01	<0.01	<0.01	0.01	<0.005
BOD								
Barium	MAC	1				0.045	0.020	0.026
Beryllium						<0.005	<0.005	<0.001
Calcium						32.6	28.5	29.1
Cadmium	MAC	0.005		<0.002	<0.002	<0.0001		<0.0001
Chloride	AO	250	22.0	<1	<1	5.8	2.1	1.9
Cobalt						<0.01	<0.01	<0.005
COD			740				248	14
Conductivity us/cm			320			237	246	232
Chromium	MAC	0.05				<0.01	<0.01	<0.001
Copper	AO	1				0.01	<0.01	<0.002
Fluoride	MAC	1.5						
Iron	AO	0.3		7.31	11.3	1.24	0.05	0.156
Hardness as CaCo3	OG	500		165	95		94	94
Mercury	MAC	0.001					<0.0001	
Potassium			3.5			8.9	3.8	5.3
Magnesium						5.94	5.47	5.12
Manganese	AO	0.05				0.02	<0.01	0.01
Molybdenum						0.03	<0.02	<0.01
Sodium	AO	200	11.0			11.4	3.0	3.2
Nickel						<0.02	<0.02	<0.01
N-NH3			0.5				0.02	
N-NO2	MAC	1	0.12				<0.1	
N-NO3	MAC	10	<0.2			1.1	0.7	
Phosphorus						0.2	<0.1	
Lead	MAC	0.01				<0.0002	0.0003	0.0003
pH (no units)	OG	6.5-8.5	7.6	7.78	7.68	7.23	7.24	
Phenols						0.01	0.001	<0.001
DOC	AO	5						0.6
Selenium	MAC	0.01					<0.001	<0.001
Silicon						11.30	5.94	6.7
Tin						<0.2	<0.02	<0.05
Sulphate	AO	500				13	12	8
Strontium						0.090	0.060	0.072
Total Dissolved Solids	AO	500	208*	108	106	164		
Titanium						0.09	<0.01	<0.005
Total Kjeldahl Nitrogen							1.08	
Vanadium						0.006	<0.005	<0.005
Zinc	AO	5				0.01	0.03	0.005
Total phosphorous							0.39	0.34
Thallium								
Field Parameters								
Temp								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 85-A

Sample Date Sep-04

PARAMETER	Limit	ODWO/S						
Silver			<0.005					
Aluminum	OG	0.1	0.006					
Alkalinity (C_aCO3)	OG	30-500	86					
Arsenic	IMAC	0.025	0.001					
Boron	IMAC	5	<0.005					
BOD								
Barium	MAC	1	0.019					
Beryllium			<0.001					
Calcium			24					
Cadmium	MAC	0.005	<0.0001					
Chloride	AO	250	1.7					
Cobalt			<0.005					
COD			8					
Conductivity us/cm			190					
Chromium	MAC	0.05	<0.001					
Copper	AO	1	<0.002					
Fluoride	MAC	1.5						
Iron	AO	0.3	0.025					
Hardness as CaCo3	OG	500	78					
Mercury	MAC	0.001						
Potassium			4					
Magnesium			4.45					
Manganese	AO	0.05	<0.001					
Molybdenum			<0.01					
Sodium	AO	200	2.6					
Nickel			<0.01					
N-NH3								
N-NO2	MAC	1						
N-NO3	MAC	10						
Phosphorus								
Lead	MAC	0.01	<0.0005					
pH (no units)	OG	6.5-8.5						
Phenols			<0.001					
DOC	AO	5	0.6					
Selenium	MAC	0.01	<0.001					
Silicon			6.65					
Tin			<0.05					
Sulphate	AO	500	8					
Strontium			0.055					
Total Dissolved Solids	AO	500						
Titanium			<0.005					
Total Kjeldahl Nitrogen								
Vanadium			<0.005					
Zinc	AO	5	<0.005					
Total phosphorous			0.12					
Thallium								
Field Parameters								
Temp								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 85-B

Sample Date			Jul-85	Jul-91	Sep-91	Nov-92	Sep-95	Aug-96
PARAMETER	Limit	ODWO/S						
Silver						<0.01	0.015	<0.01
Aluminum	OG	0.1				0.12	3.50	1.03
Alkalinity (C_aCO3)	OG	30-500				122	100	96
Arsenic	IMAC	0.025					<0.1	<0.1
Boron	IMAC	5		<0.01	<0.01	<0.01	<0.01	<0.01
BOD								
Barium	MAC	1				0.050	0.730	0.065
Beryllium						<0.01	<0.005	<0.005
Calcium						31	25.2	26.6
Cadmium	MAC	0.005		<0.002	<0.002	<0.01	<0.0001	<0.0001
Chloride	AO	250	23.0	2.0	4.0	2.0	3.1	1.6
Cobalt						<0.01	<0.01	<0.01
COD			1330				55	
Conductivity us/cm			360					209
Chromium	MAC	0.05				<0.01	0.022	<0.01
Copper	AO	1				<0.01	<0.046	0.02
Fluoride	MAC	1.5						
Iron	AO	0.3		3.13	0.11	0.07	4.8	1.72
Hardness as CaCo3	OG	500		114	138			
Mercury	MAC	0.001						
Potassium			3.1			1	1.9	5.6
Magnesium						9.00	7.39	7.48
Manganese	AO	0.05				0.09	0.20	0.14
Molybdenum						<0.01	<0.02	0.03
Sodium	AO	200	15.0			3.0	3.2	2.4
Nickel						<0.01	<0.02	<0.02
N-NH3			0.3					
N-NO2	MAC	1	0.2					
N-NO3	MAC	10	0.2			<0.1	0.5	0.2
Phosphorus						<0.1	<0.1	0.2
Lead	MAC	0.01				<0.05	0.0053	0.002
pH (no units)	OG	6.5-8.5	7.6	7.64	7.56	8.09	7.76	7.8
Phenols							0.005	<0.001
DOC	AO	5				3		
Selenium	MAC	0.01						
Silicon						7.80	16.40	10.20
Tin						<0.05	<0.2	<0.2
Sulphate	AO	500				8	10	8
Strontium						0.040	0.048	0.049
Total Dissolved Solids	AO	500	234	170	184	150	140	176
Titanium						<0.01		0.04
Total Kjeldahl Nitrogen								
Vanadium						<0.01	0.025	0.016
Zinc	AO	5				0.02	0.011	<0.01
Total phosphorous								
Thallium								
Field Parameters								
Temp								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 85-B

Sample Date			Nov-99	Jun-00				
PARAMETER	Limit	ODWO/S						
Silver			<0.01	<0.01				
Aluminum	OG	0.1	0.30	0.83				
Alkalinity (C_aCO3)	OG	30-500	130	91				
Arsenic	IMAC	0.025	<0.1	<0.1				
Boron	IMAC	5	0.02	<0.01				
BOD								
Barium	MAC	1	0.030	0.015				
Beryllium			<0.005	<0.005				
Calcium			28.7	22.3				
Cadmium	MAC	0.005	<0.0001	<0.0001				
Chloride	AO	250	1.6	1.1				
Cobalt			<0.01	<0.01				
COD								
Conductivity us/cm			215	178				
Chromium	MAC	0.05	<0.01	<0.01				
Copper	AO	1	<0.01	<0.01				
Fluoride	MAC	1.5						
Iron	AO	0.3	0.2	0.86				
Hardness as CaCo3	OG	500						
Mercury	MAC	0.001						
Potassium			2.5	2.3				
Magnesium			6.39	6.35				
Manganese	AO	0.05	<0.01	0.07				
Molybdenum			<0.02	<0.02				
Sodium	AO	200	11.9	2.3				
Nickel			<0.02	<0.02				
N-NH3								
N-NO2	MAC	1						
N-NO3	MAC	10	0.7	<0.1				
Phosphorus			<0.1	<0.1				
Lead	MAC	0.01	<0.0002	<0.0002				
pH (no units)	OG	6.5-8.5	7.95	7.98				
Phenols			<0.001	0.004				
DOC	AO	5						
Selenium	MAC	0.01						
Silicon			7.84	11.40				
Tin			<0.2	<0.2				
Sulphate	AO	500	7	7				
Strontium			0.050	0.035				
Total Dissolved Solids	AO	500	132	126				
Titanium			0.01	0.03				
Total Kjeldahl Nitrogen								
Vanadium			<0.005	<0.005				
Zinc	AO	5	<0.01	<0.01				
Total phosphorous								
Thallium								
Field Parameters								
Temp								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 85-C

Sample Date			Jul-85	Sep-91	Sep-95	Aug-96	Jun-01	Jun-02
PARAMETER	Limit	ODWO/S						
Silver					0.012	<0.01	<0.01	<0.01
Aluminum	OG	0.1			0.58	0.05	0.40	0.12
Alkalinity (C_aCO3)	OG	30-500			140	117	133	101
Arsenic	IMAC	0.025			<0.1	<0.1	0.001	<0.1
Boron	IMAC	5			<0.01	<0.01	<0.01	<0.01
BOD								
Barium	MAC	1		<0.01	0.570	0.050	0.025	0.020
Beryllium					<0.005	<0.005	<0.005	<0.005
Calcium					46.4	41.5	31.9	28.1
Cadmium	MAC	0.005		<0.002	0.0001	<0.0001	<0.0001	<0.01
Chloride	AO	250	16.0	4.0	4.9	1.5	2.5	1.7
Cobalt					<0.01	0.01	<0.01	<0.01
COD			1880		270			
Conductivity us/cm			560			242	267	198
Chromium	MAC	0.05			<0.01	<0.01	<0.01	<0.01
Copper	AO	1			0.016	<0.01	<0.01	<0.01
Fluoride	MAC	1.5					0.1	
Iron	AO	0.3		0.16	1	0.06	0.11	0.12
Hardness as CaCo3	OG	500		163				
Mercury	MAC	0.001						
Potassium			3.6		2.9	7.9	0.6	1.4
Magnesium					10.10	11.00	7.76	7.75
Manganese	AO	0.05			1.00	0.10	0.01	<0.01
Molybdenum					<0.02	0.05	<0.02	<0.02
Sodium	AO	200	14.0		4.3	2.8	2.1	1.8
Nickel					<0.02	<0.02	<0.02	<0.02
N-NH3			0.3					0.2
N-NO2	MAC	1	0.02					
N-NO3	MAC	10	0.2		0.1	0.3		
Phosphorus					<0.1	<0.1		<0.1
Lead	MAC	0.01			0.0017	<0.0002	<0.0002	<0.1
pH (no units)	OG	6.5-8.5	7.4	7.39	7.6	8.02	7.68	
Phenols					0.001	<0.001	0.02	<0.001
DOC	AO	5						
Selenium	MAC	0.01						
Silicon					8.83	8.24	6.61	8.14
Tin					<0.2	<0.2		<0.2
Sulphate	AO	500			12	5	5	4
Strontium					0.100	0.079	0.055	0.045
Total Dissolved Solids	AO	500	364	226	176	176	152	136
Titanium					0.043	<0.01	<0.01	<0.01
Total Kjeldahl Nitrogen								
Vanadium					<0.01	<0.005	<0.005	<0.005
Zinc	AO	5			0.013	<0.01	<0.01	<0.01
Total phosphorous							3.53	
Thallium								
Field Parameters								
Temp								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 85-C

Sample Date			May-04	May-05				
PARAMETER	Limit	ODWO/S						
Silver			<0.005	<0.0001				
Aluminum	OG	0.1	0.126	0.060				
Alkalinity (C_aCO3)	OG	30-500		115				
Arsenic	IMAC	0.025	<0.001					
Boron	IMAC	5	0.008	<0.01				
BOD				<1				
Barium	MAC	1	0.030	0.020				
Beryllium			<0.001	<0.001				
Calcium			31.8	28				
Cadmium	MAC	0.005	<0.0001	<0.0001				
Chloride	AO	250		2.0				
Cobalt			<0.005	0.0003				
COD			24	<5				
Conductivity us/cm				218				
Chromium	MAC	0.05	0.001	<0.001				
Copper	AO	1	0.006	0.001				
Fluoride	MAC	1.5						
Iron	AO	0.3	0.175	0.05				
Hardness as CaCo3	OG	500	113	103				
Mercury	MAC	0.001						
Potassium			2.9	1				
Magnesium			8.07	8.00				
Manganese	AO	0.05	0.008	<0.01				
Molybdenum			<0.01	<0.005				
Sodium	AO	200	3.2	<2				
Nickel			<0.01	<0.005				
N-NH3								
N-NO2	MAC	1		<0.10				
N-NO3	MAC	10		0.76				
Phosphorus								
Lead	MAC	0.01	0.0004	<0.001				
pH (no units)	OG	6.5-8.5						
Phenols			<0.001	<0.001				
DOC	AO	5		1.1				
Selenium	MAC	0.01	<0.001					
Silicon			7.00	8.80				
Tin			<0.05					
Sulphate	AO	500		5				
Strontium			0.050	0.050				
Total Dissolved Solids	AO	500		142				
Titanium			0.006	<0.01				
Total Kjeldahl Nitrogen				0.14				
Vanadium			<0.005	0.002				
Zinc	AO	5	0.013	<0.01				
Total phosphorous			0.5					
Thallium				<0.0001				
Field Parameters								
Temp				10.9				
pH				9.07				
Conductivity us/cm				175				

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 85-D

Sample Date			Jul-85	Jul-91				
PARAMETER	Limit	ODWO/S						
Silver								
Aluminum	OG	0.1						
Alkalinity (C_aCO3)	OG	30-500						
Arsenic	IMAC	0.025						
Boron	IMAC	5		0.37				
BOD								
Barium	MAC	1						
Beryllium								
Calcium								
Cadmium	MAC	0.005		<0.002				
Chloride	AO	250	185.0	82.0				
Cobalt								
COD			2900					
Conductivity us/cm			2150					
Chromium	MAC	0.05						
Copper	AO	1						
Fluoride	MAC	1.5						
Iron	AO	0.3		3.11				
Hardness as CaCo3	OG	500		640				
Mercury	MAC	0.001						
Potassium			29					
Magnesium								
Manganese	AO	0.05						
Molybdenum								
Sodium	AO	200	100.0					
Nickel								
N-NH3			14					
N-NO2	MAC	1	0.16					
N-NO3	MAC	10	<0.2					
Phosphorus								
Lead	MAC	0.01						
pH (no units)	OG	6.5-8.5	6.5	6.9				
Phenols								
DOC	AO	5						
Selenium	MAC	0.01						
Silicon								
Tin								
Sulphate	AO	500						
Strontium								
Total Dissolved Solids	AO	500	1397	978				
Titanium								
Total Kjeldahl Nitrogen								
Vanadium								
Zinc	AO	5						
Total phosphorous								
Thallium								
Field Parameters								
Temp								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 85-E

Sample Date Jul-85

PARAMETER	Limit	ODWO/S						
Silver								
Aluminum	OG	0.1						
Alkalinity (C_aCO3)	OG	30-500						
Arsenic	IMAC	0.025						
Boron	IMAC	5						
BOD								
Barium	MAC	1						
Beryllium								
Calcium								
Cadmium	MAC	0.005						
Chloride	AO	250	10.0					
Cobalt								
COD			1064					
Conductivity us/cm			225					
Chromium	MAC	0.05						
Copper	AO	1						
Fluoride	MAC	1.5						
Iron	AO	0.3						
Hardness as CaCo3	OG	500						
Mercury	MAC	0.001						
Potassium			2.7					
Magnesium								
Manganese	AO	0.05						
Molybdenum								
Sodium	AO	200	5.2					
Nickel								
N-NH3			0.6					
N-NO2	MAC	1	0.02					
N-NO3	MAC	10	<0.2					
Phosphorus								
Lead	MAC	0.01						
pH (no units)	OG	6.5-8.5	6.5					
Phenols								
DOC	AO	5						
Selenium	MAC	0.01						
Silicon								
Tin								
Sulphate	AO	500						
Strontium								
Total Dissolved Solids	AO	500	225					
Titanium								
Total Kjeldahl Nitrogen								
Vanadium								
Zinc	AO	5						
Total phosphorous								
Thallium								
Field Parameters								
Temp								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 85-F

Sample Date Jul-85

PARAMETER	Limit	ODWO/S						
Silver								
Aluminum	OG	0.1						
Alkalinity (C_aCO3)	OG	30-500						
Arsenic	IMAC	0.025						
Boron	IMAC	5						
BOD								
Barium	MAC	1						
Beryllium								
Calcium								
Cadmium	MAC	0.005						
Chloride	AO	250	22.0					
Cobalt								
COD			740					
Conductivity us/cm			320					
Chromium	MAC	0.05						
Copper	AO	1						
Fluoride	MAC	1.5						
Iron	AO	0.3						
Hardness as CaCo3	OG	500						
Mercury	MAC	0.001						
Potassium			3.5					
Magnesium								
Manganese	AO	0.05						
Molybdenum								
Sodium	AO	200	11.0					
Nickel								
N-NH3			0.5					
N-NO2	MAC	1	0.12					
N-NO3	MAC	10	<0.2					
Phosphorus								
Lead	MAC	0.01						
pH (no units)	OG	6.5-8.5	7.6					
Phenols								
DOC	AO	5						
Selenium	MAC	0.01						
Silicon								
Tin								
Sulphate	AO	500						
Strontium								
Total Dissolved Solids	AO	500	208					
Titanium								
Total Kjeldahl Nitrogen								
Vanadium								
Zinc	AO	5						
Total phosphorous								
Thallium								
Field Parameters								
Temp								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 88-1D

Sample Date			Oct-88	Jul-91	Sep-91			
PARAMETER	Limit	ODWO/S						
Silver								
Aluminum	OG	0.1						
Alkalinity (C_aCO3)	OG	30-500	44					
Arsenic	IMAC	0.025						
Boron	IMAC	5		<0.01	<0.01			
Barium	MAC	1						
Beryllium								
BOD								
Calcium								
Cadmium	MAC	0.005		<0.002	<0.002			
Chloride	AO	250		<1	<1			
Cobalt								
COD			<3					
Conductivity us/cm			119					
Chromium	MAC	0.05						
Copper	AO	1						
Fluoride	MAC	1.5						
Iron	AO	0.3		0.4	0.08			
Hardness as CaCO3	OG	500		51	56			
Mercury	MAC	0.001						
Potassium								
Magnesium								
Manganese	AO	0.05						
Molybdenum								
Sodium	AO	200						
Nickel								
N-NH3								
N-NO2	MAC	1						
N-NO3	MAC	10						
Phosphorus								
Lead	MAC	0.01	7.1					
pH (no units)	OG	6.5-8.5		7.22	7.58			
Phenols			<0.002					
DOC	AO	5						
Selenium	MAC	0.01						
Silicon								
Tin								
Sulphate	AO	500						
Strontium								
Total Dissolved Solids	AO	500	84	66	78			
Titanium								
Thallium								
Total Kjeldahl Nitrogen								
Vanadium								
Zinc	AO	5						
Dissolved Reactive P								
Total phosphorous								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

			Sample Location 88-1S					
Sample Date			Oct. 1988	Jul-91	Sep-91			
PARAMETER	Limit	ODWO/S						
Silver								
Aluminum	OG	0.1						
Alkalinity (C_aCO3)	OG	30-500	102					
Arsenic	IMAC	0.025						
Boron	IMAC	5		<0.01	<0.01			
Barium	MAC	1						
Beryllium								
BOD								
Calcium								
Cadmium	MAC	0.005		<0.002	<0.002			
Chloride	AO	250		<1	<1			
Cobalt								
COD			8					
Conductivity us/cm			196					
Chromium	MAC	0.05						
Copper	AO	1						
Fluoride	MAC	1.5						
Iron	AO	0.3		2.87	0.44			
Hardness as CaCO3	OG	500		108	80			
Mercury	MAC	0.001						
Potassium								
Magnesium								
Manganese	AO	0.05						
Molybdenum								
Sodium	AO	200						
Nickel								
N-NH3								
N-NO2	MAC	1						
N-NO3	MAC	10						
Phosphorus								
Lead	MAC	0.01						
pH (no units)	OG	6.5-8.5	7.8	8.12	7.78			
Phenols			<0.002					
DOC	AO	5						
Selenium	MAC	0.01						
Silicon								
Tin								
Sulphate	AO	500						
Strontium								
Total Dissolved Solids	AO	500	112	106	120			
Titanium								
Thallium								
Total Kjeldahl Nitrogen								
Vanadium								
Zinc	AO	5						
Dissolved Reactive P								
Total phosphorous								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 88-2D

Sample Date			Oct-88	Jul-91	Sep-91	Nov-92		
PARAMETER	Limit	ODWO/S						
Silver						<0.01		
Aluminum	OG	0.1				2.10		
Alkalinity (C_aCO3)	OG	30-500	86			320		
Arsenic	IMAC	0.025						
Boron	IMAC	5		<0.01	<0.01	<0.01		
Barium	MAC	1				0.160		
Beryllium						<0.01		
BOD								
Calcium						83		
Cadmium	MAC	0.005		<0.002	<0.002	<0.01		
Chloride	AO	250		20.0	19.0	29.0		
Cobalt						0.08		
COD								
Conductivity us/cm			221					
Chromium	MAC	0.05				<0.01		
Copper	AO	1				<0.01		
Fluoride	MAC	1.5						
Iron	AO	0.3		1.52	1.1	0.25		
Hardness as CaCO3	OG	500		136	144			
Mercury	MAC	0.001						
Potassium						4		
Magnesium						27.00		
Manganese	AO	0.05				0.24		
Molybdenum						<0.01		
Sodium	AO	200				11.0		
Nickel						<0.01		
N-NH3								
N-NO2	MAC	1						
N-NO3	MAC	10				<0.1		
Phosphorus						<0.1		
Lead	MAC	0.01				<0.05		
pH (no units)	OG	6.5-8.5	7.5	6.92	7.08	7.92		
Phenols			<0.002					
DOC	AO	5				<3		
Selenium	MAC	0.01						
Silicon						6.70		
Tin						<0.05		
Sulphate	AO	500				<3		
Strontium						0.270		
Total Dissolved Solids	AO	500	112	168		400		
Titanium								
Thallium								
Total Kjeldahl Nitrogen								
Vanadium						<0.01		
Zinc	AO	5				<0.01		
Dissolved Reactive P								
Total phosphorous								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 88-2S

Sample Date			Oct-88	Jul-91	Sep-91	Nov-92		
PARAMETER	Limit	ODWO/S						
Silver						<0.01		
Aluminum	OG	0.1				<0.01		
Alkalinity (C_aCO3)	OG	30-500	2425			110		
Arsenic	IMAC	0.025						
Boron	IMAC	5		<0.01	<0.01	<0.01		
Barium	MAC	1				0.060		
Beryllium						<0.01		
BOD								
Calcium						32		
Cadmium	MAC	0.005		<0.002	<0.002	<0.01		
Chloride	AO	250		4.0	2.0	<1		
Cobalt						<0.01		
COD								
Conductivity us/cm			527					
Chromium	MAC	0.05				0.02		
Copper	AO	1				<0.01		
Fluoride	MAC	1.5						
Iron	AO	0.3		1.41	12.8	<0.01		
Hardness as CaCO3	OG	500		187	156			
Mercury	MAC	0.001						
Potassium						1		
Magnesium						8.00		
Manganese	AO	0.05				1.51		
Molybdenum						<0.01		
Sodium	AO	200				2.0		
Nickel						<0.01		
N-NH3								
N-NO2	MAC	1						
N-NO3	MAC	10				0.2		
Phosphorus						<0.1		
Lead	MAC	0.01				<0.05		
pH (no units)	OG	6.5-8.5	7.4	7.37	7.28	7.89		
Phenols			0.029			9		
DOC	AO	5				3		
Selenium	MAC	0.01						
Silicon						6.20		
Tin						<0.05		
Sulphate	AO	500						
Strontium						0.050		
Total Dissolved Solids	AO	500		208	200	140		
Titanium						<0.01		
Thallium								
Total Kjeldahl Nitrogen								
Vanadium						<0.01		
Zinc	AO	5				<0.01		
Dissolved Reactive P								
Total phosphorous								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 88-3D

Sample Date			Oct-88	Jul-91	Sep-91	Nov-92	Sep-95	Aug-96
PARAMETER	Limit	ODWO/S						
Silver						<0.01	0.012	<0.01
Aluminum	OG	0.1				<0.01	<0.01	<0.01
Alkalinity (C_aCO3)	OG	30-500	386			1040	648	791
Arsenic	IMAC	0.025					<0.1	
Boron	IMAC	5		0.61	0.76	0.6	0.284	0.43
Barium	MAC	1				1.450	0.756	1.980
Beryllium						<0.01	<0.005	<0.005
BOD								
Calcium						242	137	183
Cadmium	MAC	0.005		<0.01	<0.002	<0.01	0.0001	<0.0001
Chloride	AO	250		156.0	138.0	103.0	63.1	126.0
Cobalt						<0.01	0.019	<0.01
COD			35				93	
Conductivity us/cm			842					1790
Chromium	MAC	0.05				<0.01	0.025	<0.01
Copper	AO	1				<0.01	<0.01	<0.01
Fluoride	MAC	1.5						
Iron	AO	0.3		46.8	143	80.33	16.7	75.1
Hardness as CaCO3	OG	500		156	1067			
Mercury	MAC	0.001						
Potassium						44	32.3	45.5
Magnesium						60.00	30.10	40.00
Manganese	AO	0.05				28.89	10.90	15.20
Molybdenum						<0.01	0.033	0.12
Sodium	AO	200				106.0	67.6	68.3
Nickel						<0.01	<0.02	<0.02
N-NH3								
N-NO2	MAC	1						
N-NO3	MAC	10				<0.1	0.1	<0.1
Phosphorus						<0.1	<0.1	<0.1
Lead	MAC	0.01				<0.05	0.0011	<0.0002
pH (no units)	OG	6.5-8.5	7.35	6.05	6.26	6.56	7.16	6.94
Phenols			0.008				0.015	0.016
DOC	AO	5				<3		
Selenium	MAC	0.01						
Silicon						13.90	15.40	17.70
Tin						<0.05	<0.2	0.3
Sulphate	AO	500				<3	<1	<1
Strontium						1.270	0.677	1.050
Total Dissolved Solids	AO	500	521	2820	2398	1430	704	920
Titanium						<0.01	<0.01	<0.01
Thallium								
Total Kjeldahl Nitrogen								
Vanadium						<0.01	<0.01	0.019
Zinc	AO	5				0.03	<0.01	<0.01
Dissolved Reactive P								
Total phosphorous								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 88-3D

Sample Date			Nov-96	Jul-97	Nov-98	Jul-99	Nov-99	Jun-00
PARAMETER	Limit	ODWO/S						
Silver			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aluminum	OG	0.1	0.04	<0.01	0.01	<0.01	0.05	0.17
Alkalinity (C_aCO3)	OG	30-500	548	718	531	420	450	545
Arsenic	IMAC	0.025	0.003	0.1	<0.1	0.002	<0.1	0.1
Boron	IMAC	5	0.38	0.42	0.28	0.29	0.27	0.33
Barium	MAC	1	1.250	1.340	0.662	0.805	0.405	1.000
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
BOD								
Calcium			139	183	93.5	92.5	93.1	96.4
Cadmium	MAC	0.005	<0.0001	<0.01	<0.0001		<0.0001	<0.0001
Chloride	AO	250	58.0	52.0	38.9	17.9	30.4	30.8
Cobalt			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
COD						55		
Conductivity us/cm			1390	1290	1070	987	959	1069
Chromium	MAC	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	AO	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Fluoride	MAC	1.5						
Iron	AO	0.3	59.4	67.1	20	48	2.16	59
Hardness as CaCO3	OG	500				308		
Mercury	MAC	0.001				<0.0001		
Potassium			39.5	40.1	29.4	33.5	33.5	31.8
Magnesium			29.80	30.50	22.00	18.50	18.70	40.00
Manganese	AO	0.05	10.90	11.50	6.87	6.11	5.90	6.80
Molybdenum			0.11	0.16	<0.02	<0.02	<0.02	<0.02
Sodium	AO	200	62.6	58.1	39.8	38.4	46.1	36.5
Nickel			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NH3						22.4		
N-NO2	MAC	1				<0.01		
N-NO3	MAC	10	0.2	<0.1	<0.1	0.2	0.1	0.1
Phosphorus			<0.1	0.2	<0.01	<0.01	<0.1	<0.1
Lead	MAC	0.01	<0.0002	<0.1	0.0002	0.0002	<0.0002	<0.0002
pH (no units)	OG	6.5-8.5	8.14	6.99	6.84	6.48	7.86	6.85
Phenols			0.004	0.004	0.005	0.017	<0.001	0.018
DOC	AO	5						
Selenium	MAC	0.01				<0.001		
Silicon			17.20	18.00	15.40		13.50	16.70
Tin			0.2	0.5	0.2	<0.02	<0.2	0.2
Sulphate	AO	500	<1	<1	<1	<1	<1	<1
Strontium			0.725	0.775	0.505	0.450	0.445	0.525
Total Dissolved Solids	AO	500	794	864	642		488	530
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Thallium								
Total Kjeldahl Nitrogen						22.4		
Vanadium			0.015	0.006	<0.005	<0.005	<0.005	<0.005
Zinc	AO	5	<0.1	<0.01	0.02	<0.01	<0.01	0.03
Dissolved Reactive P								
Total phosphorous						<0.01		
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 88-3D

Sample Date			Oct-00	Jun-01	Oct-01	Jun-02	Nov-02	Jul-03
PARAMETER	Limit	ODWO/S						
Silver			<0.01	<0.01	<0.01	<0.01	<0.01	<0.005
Aluminum	OG	0.1	0.47	0.90	<0.01	<0.01	0.05	<0.005
Alkalinity (C_aCO3)	OG	30-500	487	409	330	444	393	369
Arsenic	IMAC	0.025	<0.1	0.004	0.003	0.1	<0.1	<0.03
Boron	IMAC	5	0.19	0.25	0.26	0.29	0.24	0.211
Barium	MAC	1	0.960	0.785	0.640	0.953	0.755	0.433
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.001
BOD								
Calcium			99.2	87.3	80.2	101	83.5	90.4
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0006	<0.01	<0.01	<0.0001
Chloride	AO	250	32.3	25.3	22.5	27.4	25.3	21.6
Cobalt			<0.01	<0.01	<0.01	<0.01	<0.01	<0.005
COD								53
Conductivity us/cm			880	802	699	913	797	770
Chromium	MAC	0.05	<0.01	<0.01	<0.01	0.03	<0.01	0.001
Copper	AO	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.002
Fluoride	MAC	1.5		0.1	0.2			
Iron	AO	0.3	55.5	44.3	38.3	65.8	50.8	4.67
Hardness as CaCO3	OG	500						287
Mercury	MAC	0.001						
Potassium			29.9	29.7	30.6	29.8	30.3	26.7
Magnesium			23.10	16.60	15.00	18.40	16.20	14.90
Manganese	AO	0.05	6.40	5.63	5.06	6.44	5.67	4.76
Molybdenum			<0.02	<0.02	<0.02	<0.02	<0.02	<0.01
Sodium	AO	200	35.4	27.0	28.3	27.6	26.9	21.5
Nickel			<0.02	<0.02	<0.02	<0.02	<0.02	<0.01
N-NH3						<0.1		
N-NO2	MAC	1					0.2	<0.1
N-NO3	MAC	10	<0.1					0.1
Phosphorus			<0.1			<0.1	<0.1	
Lead	MAC	0.01	<0.0002	0.0017	<0.0012	<0.1	<0.1	0.0006
pH (no units)	OG	6.5-8.5	6.99	6.72	8.35		8.26	
Phenols			0.009	0.015	0.003	0.003	0.002	0.004
DOC	AO	5						
Selenium	MAC	0.01						
Silicon			13.60	15.00	16.30	18.00	16.30	14.00
Tin						<0.2	<0.2	0.05
Sulphate	AO	500	<1	<1	1	1	1	3
Strontium			0.575	0.470	0.360	0.504	0.430	0.340
Total Dissolved Solids	AO	500	456	414	419	410	442	
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.005
Thallium								
Total Kjeldahl Nitrogen								
Vanadium			0.01	<0.005	0.005	<0.005	<0.005	<0.005
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	0.01	<0.005
Dissolved Reactive P								
Total phosphorous				0.08	0.08			0.04
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

			Sample Location 88-3D					07-3D
Sample Date			Sep-04	May-05	Nov-05	May-06	Oct-06	May-07
PARAMETER	Limit	ODWO/S						
Silver			<0.005	<0.0001	<0.0001		<0.0001	<0.0001
Aluminum	OG	0.1	0.062	<0.01	<0.01	<0.01	<0.01	<0.01
Alkalinity (C_aCO3)	OG	30-500	381	383	318	410	341	395
Arsenic	IMAC	0.025	0.002					
Boron	IMAC	5	0.22	0.23	0.17	0.19	0.18	0.22
Barium	MAC	1	0.670	0.780	0.610	0.690	0.580	0.770
Beryllium			<0.001	<0.001	<0.001		<0.001	<0.001
BOD				10	6		4	4
Calcium			73.3	82	59	75	68	79
Cadmium	MAC	0.005	<0.0001	0.0002	<0.0001		<0.0001	<0.0001
Chloride	AO	250	17.7	17.0	17.0	15.0	17.0	17.0
Cobalt			<0.005	0.0013	0.0006	0.0009	0.0007	0.0011
COD			51	47	38	53	43	44
Conductivity us/cm			784	802	674	816	719	806
Chromium	MAC	0.05	0.002	0.004	0.003	0.004	0.002	0.005
Copper	AO	1	<0.002	<0.001	<0.001	0.04	<0.001	0.002
Fluoride	MAC	1.5						
Iron	AO	0.3	4.44	54.5	48.3	62.5	49.4	62.4
Hardness as CaCO3	OG	500	248	258	193		219	255
Mercury	MAC	0.001						
Potassium			27.6	24	20	26	22	27
Magnesium			15.60	13.00	11.00	13.00	12.00	14.00
Manganese	AO	0.05	4.91	5.10	4.40	5.05	3.67	4.69
Molybdenum			<0.01	<0.005	<0.005		<0.005	<0.005
Sodium	AO	200	20.6	19.0	16.0	18.0	17.0	19.0
Nickel			<0.01	<0.005	<0.005		<0.005	<0.005
N-NH3						15.6		
N-NO2	MAC	1		<0.10	<0.10		<0.10	<0.10
N-NO3	MAC	10		<0.10	<0.10		<0.10	<0.10
Phosphorus								
Lead	MAC	0.01	<0.0005	0.002	<0.001		<0.001	<0.001
pH (no units)	OG	6.5-8.5						
Phenols			<0.001	0.003	0.001		<0.001	<0.001
DOC	AO	5		15.8	11.1	15.8	13.5	15.8
Selenium	MAC	0.01	0.001					
Silicon			16.60	22.00	18.40	15.40	19.00	18.20
Tin			<0.05					
Sulphate	AO	500	3	6	3		5	4
Strontium			0.356	0.460	0.350	0.416	0.341	0.432
Total Dissolved Solids	AO	500		521	438	530	467	524
Titanium			<0.005	<0.01	<0.01		<0.01	<0.01
Thallium				<0.0001	<0.0001		<0.0001	0.0002
Total Kjeldahl Nitrogen				17.5	16.1	16.7	16.1	16.3
Vanadium			<0.005	0.011	0.008		0.006	0.012
Zinc	AO	5	0.008	<0.01	<0.01	0.01	0.01	0.01
Dissolved Reactive P						0.11		
Total phosphorous			0.06		0.12		0.08	0.13
Field Parameters								
Temperature ^{0}C				9.1	7.2	8.8	8.2	9.0
pH				6.99	6.75	6.58	6.16	6.42
Conductivity us/cm				869	714	735	673	810

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 88-3D (07-3D)

Sample Date

PARAMETER	Limit	ODWO/S						
Silver								
Aluminum	OG	0.1						
Alkalinity (C_aCO3)	OG	30-500						
Arsenic	IMAC	0.025						
Boron	IMAC	5						
Barium	MAC	1						
Beryllium								
BOD								
Calcium								
Cadmium	MAC	0.005						
Chloride	AO	250						
Cobalt								
COD								
Conductivity us/cm								
Chromium	MAC	0.05						
Copper	AO	1						
Fluoride	MAC	1.5						
Iron	AO	0.3						
Hardness as CaCO3	OG	500						
Mercury	MAC	0.001						
Potassium								
Magnesium								
Manganese	AO	0.05						
Molybdenum								
Sodium	AO	200						
Nickel								
N-NH3								
N-NO2	MAC	1						
N-NO3	MAC	10						
Phosphorus								
Lead	MAC	0.01						
pH (no units)	OG	6.5-8.5						
Phenols								
DOC	AO	5						
Selenium	MAC	0.01						
Silicon								
Tin								
Sulphate	AO	500						
Strontium								
Total Dissolved Solids	AO	500						
Titanium								
Thallium								
Total Kjeldahl Nitrogen								
Vanadium								
Zinc	AO	5						
Dissolved Reactive P								
Total phosphorous								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 88-3S

Sample Date			Oct-88	Jul-91	Sep-91	Nov-92	Jul-97	Nov-98
PARAMETER	Limit	ODWO/S						
Silver						<0.01	<0.01	<0.01
Aluminum	OG	0.1				<0.01	0.07	0.12
Alkalinity (C_aCO3)	OG	30-500	246			112	36	44
Arsenic	IMAC	0.025					<0.1	<0.1
Boron	IMAC	5		<0.01	<0.01	<0.01	0.02	0.03
Barium	MAC	1				0.070	0.024	0.052
Beryllium						<0.01	<0.005	<0.005
BOD								
Calcium						25	11.6	15
Cadmium	MAC	0.005		<0.002	<0.002	<0.01	<0.01	<0.0001
Chloride	AO	250		<1	<1	2.0	1.9	1.1
Cobalt						<0.01	<0.01	<0.01
COD			20					
Conductivity us/cm			653				121	149
Chromium	MAC	0.05				<0.01	<0.01	<0.01
Copper	AO	1				<0.01	<0.01	<0.01
Fluoride	MAC	1.5						
Iron	AO	0.3		4.47	17.6	<0.01	0.12	0.28
Hardness as CaCO3	OG	500		67	72			
Mercury	MAC	0.001						
Potassium						3	4.4	4.4
Magnesium						9.00	3.79	5.21
Manganese	AO	0.05				1.00	0.06	0.09
Molybdenum						<0.01	<0.02	0.03
Sodium	AO	200				5.0	1.8	2.5
Nickel						<0.01	<0.02	<0.02
N-NH3								
N-NO2	MAC	1						
N-NO3	MAC	10				0.15	4.1	4.7
Phosphorus						<0.1	<0.1	<0.1
Lead	MAC	0.01				<0.05	<0.1	<0.0002
pH (no units)	OG	6.5-8.5	7.4	6.41	6.65	6.82	6.75	6.11
Phenols			0.003				<0.001	<0.001
DOC	AO	5				<3		
Selenium	MAC	0.01						
Silicon						6.30	7.38	7.99
Tin						<0.05	0.8	<0.2
Sulphate	AO	500				5	7	9
Strontium						0.180	0.104	0.135
Total Dissolved Solids	AO	500	374	88	110	150	81	114
Titanium						<0.01	<0.01	<0.01
Thallium								
Total Kjeldahl Nitrogen								
Vanadium						<0.01	<0.005	0.006
Zinc	AO	5				<0.01	0.02	0.04
Dissolved Reactive P								
Total phosphorous								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 88-3S

Sample Date			Jun-00	Oct-00	Jun-01	Jun-02	May-04	Sep-04
PARAMETER	Limit	ODWO/S						
Silver			<0.01	<0.01	<0.01	<0.01	<0.005	<0.005
Aluminum	OG	0.1	0.70	0.21	0.18	0.01	0.016	0.017
Alkalinity (C_aCO3)	OG	30-500	47	53	39	42	30	25
Arsenic	IMAC	0.025	<0.1	<0.1	<0.001	<0.1	<0.001	0.001
Boron	IMAC	5	<0.01	0.02	<0.01	0.02	0.017	0.06
Barium	MAC	1	0.020	0.025	0.020	0.028	0.024	0.096
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.001	<0.001
BOD								
Calcium			14.4	16	11.7	13.4	10.9	45.6
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.01	<0.0001	<0.0001
Chloride	AO	250	1.0	1.4	1.7	2.2	1.4	3.7
Cobalt			<0.01	<0.01	<0.01	<0.01	<0.005	<0.005
COD							9	17
Conductivity us/cm			143	117	123	115	911	446
Chromium	MAC	0.05	<0.01	<0.01	<0.01	<0.01	<0.001	<0.001
Copper	AO	1	<0.01	<0.01	<0.01	<0.01	<0.002	0.003
Fluoride	MAC	1.5			0.1			
Iron	AO	0.3	0.54	0.18	0.15	0.29	0.008	0.029
Hardness as CaCO3	OG	500					42	179
Mercury	MAC	0.001						
Potassium			3.3	0.5	1.1	1.9	3.5	8.2
Magnesium			4.74	4.41	3.78	4.01	3.56	15.7
Manganese	AO	0.05	0.03	0.01	0.02	0.03	0.007	0.026
Molybdenum			<0.02	<0.02	<0.02	<0.02	<0.01	<0.01
Sodium	AO	200	1.6	5.0	1.7	1.5	1.4	3.1
Nickel			<0.02	<0.02	<0.02	<0.02	<0.01	<0.01
N-NH3						1.7		
N-NO2	MAC	1						
N-NO3	MAC	10	4	1.9				
Phosphorus			<0.1	<0.1		<0.1		
Lead	MAC	0.01	<0.0002	<0.0002	0.0002	<0.1	0.0003	<0.0005
pH (no units)	OG	6.5-8.5	7.25	6.31	6.14			
Phenols			0.013	0.002	<0.001	<0.001	<0.001	<0.001
DOC	AO	5						
Selenium	MAC	0.01					<0.001	0.001
Silicon			9.94	7.76	7.40	8.87	4.70	8.03
Tin			<0.2			<0.2	<0.05	<0.05
Sulphate	AO	500	6	6	6	5	10	79
Strontium			0.110	0.125	0.110	0.112	0.096	0.361
Total Dissolved Solids	AO	500	116	74	90	84		
Titanium			0.03	<0.01	<0.01	<0.01	<0.005	<0.005
Thallium								
Total Kjeldahl Nitrogen								
Vanadium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	AO	5	<0.01	<0.01	0.01	<0.01	0.006	0.024
Dissolved Reactive P								
Total phosphorous					1.27		1.22	0.93
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

			Sample Location 88-3S				07-3S	
Sample Date			May-05	Nov-05	May-06	Oct-06	May-07	
PARAMETER	Limit	ODWO/S						
Silver			0.001	<0.0001		<0.0001	<0.0001	
Aluminum	OG	0.1	0.030	0.01	<0.01	0.020	<0.01	
Alkalinity (C_aCO3)	OG	30-500	34	34	44	37	46	
Arsenic	IMAC	0.025						
Boron	IMAC	5	0.02	0.04	0.01	0.04	0.02	
Barium	MAC	1	0.02	0.08	0.03	0.08	0.03	
Beryllium			<0.001	<0.001		<0.001	<0.001	
BOD			<1	<1		<1	<1	
Calcium			8	26	12	34	13	
Cadmium	MAC	0.005	<0.0001	<0.0001		<0.0001	0.0003	
Chloride	AO	250	2	1.0	1	3	4	
Cobalt			0.0003	<0.0002	<0.0002	<0.0002	<0.0002	
COD			<5	<5	<5	<5	<5	
Conductivity us/cm			96	276	131	327	129	
Chromium	MAC	0.05	<0.001	0.001	0.001	<0.001	<0.001	
Copper	AO	1	0.001	0.004	0.101	0.004	0.002	
Fluoride	MAC	1.5						
Iron	AO	0.3	0.02	<0.03	<0.03	0.04	<0.03	
Hardness as CaCO3	OG	500	28	102		130	49	
Mercury	MAC	0.001						
Potassium			3	7	5	8	5	
Magnesium			2	9	4	11	4	
Manganese	AO	0.05	<0.01	0.02	0.01	0.02	<0.01	
Molybdenum			<0.005	<0.005		<0.005	<0.005	
Sodium	AO	200	<2	3	<2	3	<2	
Nickel			<0.005	<0.005		<0.005	<0.005	
N-NH3					0.02			
N-NO2	MAC	1	<0.10	<0.10		<0.10	<0.1	
N-NO3	MAC	10	1.55	11.3		15.4	2.02	
Phosphorus								
Lead	MAC	0.01	0.001	<0.001		<0.001	<0.001	
pH (no units)	OG	6.5-8.5						
Phenols			<0.001	<0.001		<0.001	<0.001	
DOC	AO	5	1.6	1.3	1	1.2	1.8	
Selenium	MAC	0.01						
Silicon			4.7	9.9	5.2	10.4	4.3	
Tin								
Sulphate	AO	500	8	46		47	9	
Strontium			0.082	0.295	0.119	0.341	0.131	
Total Dissolved Solids	AO	500	62	179	85	213	84	
Titanium			<0.01	<0.01		<0.01	<0.01	
Thallium			<0.0001	<0.0001		<0.0001	0.0003	
Total Kjeldahl Nitrogen			0.13	0.16	0.11	0.17	0.96	
Vanadium			<0.001	<0.001		<0.001	0.001	
Zinc	AO	5	<0.01	0.01	0.03	0.02	0.02	
Dissolved Reactive P					0.05			
Total phosphorous				0.55		0.6	0.67	
Field Parameters								
Temperature ^{0}C			7.7	6.2	8.8	9.2	8.5	
pH			7.72	7.55	7.56	6.72	7.42	
Conductivity us/cm			80	206	102	314	116	

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 89-1D

Sample Date			Jul-91	Sep-91	Aug-96	Nov-98		
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500			49	50		
BOD								
COD								
Chloride	AO	250	<1	<1	0.9	1.2		
Conductivity umhos/cm					128	142		
DOC	AO	5						
N-NO2	MAC	1						
N-NO3	MAC	10			<0.1	<0.1		
Phenols					0.004	<0.001		
Sulphate	AO	500			14	13		
Total Dissolved Solids	AO	500	90	64	96	84		
Total Kjeldahl Nitrogen								
Total phosphorous								
Hardness	OG	500	51	53				
Calcium					13.4	13		
Magnesium					4.98	4.81		
Potassium					4.9	0.7		
Sodium	AO	200			2.8	2.7		
Aluminum	OG	0.1			0.03	<0.01		
Barium	MAC	1			0.022	0.026		
Beryllium					<0.005	<0.005		
Boron	IMAC	5	<0.01	<0.01	<0.01	0.01		
Cadmium	MAC	0.005	<0.002	<0.002	<0.0001	<0.0001		
Chromium	MAC	0.05			<0.01	<0.01		
Cobalt					<0.01	<0.01		
Copper	AO	1			<0.01	<0.01		
Iron	AO	0.3	1.25	1.09	0.85	0.04		
Lead	MAC	0.01			<0.0002	<0.0002		
Manganese	AO	0.05			0.08	0.02		
Molybdenum					0.03	<0.02		
Nickel					<0.02	<0.02		
Silicon					7.18	6.96		
Silver					<0.01	<0.01		
Strontium					0.042	0.039		
Thallium								
Titanium					<0.01	<0.01		
Vanadium					0.009	<0.005		
Zinc	AO	5			<0.01	0.02		
Arsenic	IMAC	0.025			<0.01	<0.1		
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3								
Phosphorus					0.1	<0.1		
pH (no units)	OG	6.5-8.5	8.08	7.9	7.66	7.23		
Selenium	MAC	0.01						
Tin					<0.2	<0.2		
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 89-1S

Sample Date			Jul-91	Sep-91	Aug-96	Oct-01		
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500			88	97		
BOD								
COD								
Chloride	AO	250	<1	<1	0.9	1.8		
Conductivity umhos/cm					185	176		
DOC	AO	5						
N-NO2	MAC	1						
N-NO3	MAC	10			<0.1			
Phenols					<0.001	0.008		
Sulphate	AO	500			8	6		
Total Dissolved Solids	AO	500	96	80	160	106		
Total Kjeldahl Nitrogen								
Total phosphorous								
Hardness	OG	500		77				
Calcium					24	25.9		
Magnesium					7.22	6.28		
Potassium					2	1.1		
Sodium	AO	200			2.6	4.8		
Aluminum	OG	0.1			0.19	0.15		
Barium	MAC	1			0.025	0.025		
Beryllium					<0.005	<0.005		
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01		
Cadmium	MAC	0.005	<0.002	<0.002	<0.0001	<0.0006		
Chromium	MAC	0.05			<0.01	<0.01		
Cobalt					<0.01	<0.01		
Copper	AO	1			<0.01	<0.01		
Iron	AO	0.3	0.72	3.61	0.48	0.14		
Lead	MAC	0.01			<0.0002	<0.0012		
Manganese	AO	0.05			0.07	<0.01		
Molybdenum					0.02	<0.02		
Nickel					<0.02	<0.02		
Silicon					9.06	8.90		
Silver					<0.01	<0.01		
Strontium					0.043	0.040		
Thallium								
Titanium					<0.01	<0.01		
Vanadium					0.009	0.005		
Zinc	AO	5			<0.01	<0.01		
Arsenic	IMAC	0.025			<0.1	0.001		
Fluoride	MAC	1.5				0.2		
Mercury	MAC	0.001						
N-NH3								
Phosphorus					0.2			
pH (no units)	OG	6.5-8.5	8	7.9	8.04	8		
Selenium	MAC	0.01						
Tin					<0.2			
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 89-2D

Sample Date			Jul-91	Sep-91	Nov-92	Sep-95	Aug-96	Jul-97
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500			78	754	762	630
BOD								
COD						150		
Chloride	AO	250	35.0	34.0	35.0	78.7	199.0	70.0
Conductivity umhos/cm							1750	1150
DOC	AO	5			<3			
N-NO2	MAC	1						
N-NO3	MAC	10			<0.1	0.4	<0.1	<0.1
Phenols						0.021	0.001	0.026
Sulphate	AO	500			8	2	<1	<1
Total Dissolved Solids	AO	500	152	138	190	908	1020	771
Total Kjeldahl Nitrogen								
Total phosphorous								
Hardness	OG	500	113	75				
Calcium					26	293	242	206
Magnesium					9.00	70.10	63.60	43.00
Potassium					1	7.5	12.3	4.4
Sodium	AO	200			10.0	54.7	57.6	49.6
Aluminum	OG	0.1			0.04	<0.01	0.12	0.02
Barium	MAC	1			0.260	0.676	0.830	0.469
Beryllium					<0.01	<0.005	<0.005	<0.005
Boron	IMAC	5	0.02	<0.01	<0.01	0.012	0.2	0.21
Cadmium	MAC	0.005	<0.002	<0.002	<0.01	<0.0001	<0.0001	<0.01
Chromium	MAC	0.05			<0.01	0.031	<0.01	<0.01
Cobalt					0.02	<0.01	<0.01	0.03
Copper	AO	1			<0.01	<0.01	71.6	<0.01
Iron	AO	0.3	30	5.32	2.12	76.3		54
Lead	MAC	0.01			<0.05	0.0011	<0.0002	0.1
Manganese	AO	0.05			0.17	14.80	15.10	9.15
Molybdenum					<0.01	<0.02	0.16	0.16
Nickel					<0.01	<0.02	<0.02	0.02
Silicon					6.90	13.50	17.80	19.20
Silver					<0.01	<0.01	<0.01	<0.01
Strontium					0.110	1.100	1.170	755.000
Thallium								
Titanium					<0.01	<0.01	<0.01	<0.01
Vanadium					<0.01	<0.01	0.011	<0.005
Zinc	AO	5			<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025				<0.1	0.3	<0.1
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3								
Phosphorus					<0.1	<0.1	<0.1	0.3
pH (no units)	OG	6.5-8.5	6.69	6.9	7.61	7.33	6.93	7.01
Selenium	MAC	0.01						
Tin					<0.05	0.266	0.4	0.3
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 89-2D

Sample Date			Nov-98	Jul-99	Jun-00	Jun-01	Jun-02	May-04
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	220	206	297	214	201	74
BOD								
COD				31				79
Chloride	AO	250	51.7	48.6	48.1	51.4	52.8	51.0
Conductivity umhos/cm			565	583	654	525	561	135
DOC	AO	5						
N-NO2	MAC	1		<0.1				
N-NO3	MAC	10	<0.1	0.2	<0.1			
Phenols			0.001	0.029	0.007	0.019	<0.001	<0.001
Sulphate	AO	500	6	8	10	6	9	20
Total Dissolved Solids	AO	500	340		396	320	316	
Total Kjeldahl Nitrogen								
Total phosphorous								6.44
Hardness	OG	500		248				115
Calcium			60.3	70.8	78	67.7	68.4	33
Magnesium			15.90	17.00	19.60	15.60	16.10	7.92
Potassium			2.5	5.9	1.2	2.6	2.4	3.4
Sodium	AO	200	24.3	24.7	24.5	20.7	22.9	24.1
Aluminum	OG	0.1	0.08	0.39	0.20	0.71	<0.01	0.046
Barium	MAC	1	0.175	0.200	0.225	0.175	0.179	0.097
Beryllium			<0.005	0.195	<0.005	<0.005	<0.005	<0.001
Boron	IMAC	5	0.06	0.07	0.08	0.05	0.07	0.045
Cadmium	MAC	0.005	<0.0001		<0.0001	<0.0001	<0.01	<0.0001
Chromium	MAC	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001
Cobalt			<0.01	<0.01	<0.01	<0.01	<0.01	<0.005
Copper	AO	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.002
Iron	AO	0.3	4.49	23.7	25	16.6	18.7	8.37
Lead	MAC	0.01	<0.0002	0.0002	<0.0002	0.0002	<0.1	0.0002
Manganese	AO	0.05	2.88	3.10	3.56	2.67	2.71	1.44
Molybdenum			<0.02	<0.02	<0.02	<0.02	<0.02	<0.01
Nickel			<0.02	<0.02	<0.02	<0.02	<0.02	<0.01
Silicon			13.00	15.70	13.50	11.60	12.50	10.60
Silver			<0.01	<0.01	<0.01	<0.01	<0.01	<0.005
Strontium			0.270	0.290	0.345	0.300	0.284	0.148
Thallium								
Titanium			<0.01	0.03	<0.01	<0.01	<0.01	<0.005
Vanadium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	AO	5	0.03	<.001	0.02	<0.01	<0.01	0.007
Arsenic	IMAC	0.025	<0.1	<0.001	<0.1	0.002	<0.1	<0.001
Fluoride	MAC	1.5				0.1		
Mercury	MAC	0.001		<0.0001				
N-NH3				0.18			0.1	
Phosphorus			0.1	0.1	<0.1		<0.1	
pH (no units)	OG	6.5-8.5	6.93	6.74	7.75	7.06		
Selenium	MAC	0.01		<0.001				<0.001
Tin			<0.2	<0.2	<0.2		<0.2	<0.05
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 89-2D

Sample Date Sep-04

PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	89					
BOD								
COD			28					
Chloride	AO	250	57.1					
Conductivity umhos/cm			377					
DOC	AO	5						
N-NO2	MAC	1						
N-NO3	MAC	10						
Phenols			<0.001					
Sulphate	AO	500	7					
Total Dissolved Solids	AO	500						
Total Kjeldahl Nitrogen								
Total phosphorous			1.4					
Hardness	OG	500	111					
Calcium			31					
Magnesium			8.03					
Potassium			3.3					
Sodium	AO	200	23.1					
Aluminum	OG	0.1	0.021					
Barium	MAC	1	0.096					
Beryllium			<0.001					
Boron	IMAC	5	0.042					
Cadmium	MAC	0.005	<0.0001					
Chromium	MAC	0.05	<0.001					
Cobalt			<0.005					
Copper	AO	1	<0.002					
Iron	AO	0.3	8.58					
Lead	MAC	0.01	<0.0005					
Manganese	AO	0.05	1.36					
Molybdenum			<0.01					
Nickel			<0.01					
Silicon			10.40					
Silver			<0.005					
Strontium			0.139					
Thallium								
Titanium			<0.005					
Vanadium			<0.005					
Zinc	AO	5	0.01					
Arsenic	IMAC	0.025	0.001					
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01	<0.001					
Tin			<0.05					
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 89-2S

Sample Date			Jul-91	Sep-91	Nov-92	Aug-96	Jul-97	Nov-98
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500			104	124	130	130
BOD								
COD								
Chloride	AO	250	23.0	23.0	29.0	25.4	20.4	25.5
Conductivity umhos/cm						360	335	364
DOC	AO	5			5			
N-NO2	MAC	1						
N-NO3	MAC	10			<0.1	<0.1	<0.1	0.1
Phenols						0.001	0.003	<0.001
Sulphate	AO	500			11	22	18	16
Total Dissolved Solids	AO	500	220	164	190	228	224	242
Total Kjeldahl Nitrogen								
Total phosphorous								
Hardness	OG	500	182	124				
Calcium					35	36	35	37.3
Magnesium					9.00	9.19	9.02	8.40
Potassium					2	8.9	4.3	6.6
Sodium	AO	200			9.0	10.8	12.9	14.8
Aluminum	OG	0.1			<0.01	0.03	<0.01	0.06
Barium	MAC	1			0.220	0.152	0.116	0.149
Beryllium					<0.01	<0.005	<0.005	<0.005
Boron	IMAC	5		0.02	<0.01	0.53	0.04	0.05
Cadmium	MAC	0.005		<0.002	<0.01	<0.0001	<0.01	0.0002
Chromium	MAC	0.05			<0.01	<0.01	<0.01	<0.01
Cobalt					<0.01	<0.01	0.01	<0.01
Copper	AO	1			<0.01	<0.01	<0.01	<0.01
Iron	AO	0.3	0.81	6.39	0.51	15.2	13.2	1.76
Lead	MAC	0.01			<0.05	<0.0002	<0.1	<0.0002
Manganese	AO	0.05			0.42	1.55	1.36	1.25
Molybdenum					<0.01	0.06	0.03	0.03
Nickel						<0.02	<0.02	<0.02
Silicon					6.20	9.48	8.22	7.90
Silver					<0.01	<0.01	<0.01	<0.01
Strontium					0.070	0.144	0.120	0.140
Thallium								
Titanium					<0.01	<0.01	<0.01	<0.01
Vanadium					<0.01	0.009	<0.005	<0.005
Zinc	AO	5			<0.01	<0.01	<0.01	0.06
Arsenic	IMAC	0.025				<0.01	<0.1	<0.1
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3								
Phosphorus					<0.1	<0.1	<0.1	<0.1
pH (no units)	OG	6.5-8.5	7.21	7.44	8.11	7.85	7.14	6.94
Selenium	MAC	0.01						
Tin					<0.05	<0.2	<0.2	<0.2
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 89-2S

Sample Date			Jul-99	Jun-00	Jun-01	Jun-02	May-04	
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	170	199	139	109	76	
BOD								
COD			20				59	
Chloride	AO	250	20.7	8.7	10.6	16.2	7.9	
Conductivity umhos/cm			453	410	336	294	297	
DOC	AO	5						
N-NO2	MAC	1	<0.1					
N-NO3	MAC	10	0.2	<0.1				
Phenols			0.004	0.006	0.018	<0.001	<0.001	
Sulphate	AO	500	23	16	18	10	10	
Total Dissolved Solids	AO	500		240	204	162		
Total Kjeldahl Nitrogen								
Total phosphorous							5.46	
Hardness	OG	500	218				86	
Calcium			63.3	44.7	41.7	35.1	24.8	
Magnesium			14.40	11.00	9.13	7.80	5.71	
Potassium			7.7	7.3	6.2	6.1	6	
Sodium	AO	200	15.6	9.2	7.6	8.2	5.2	
Aluminum	OG	0.1	0.09	0.12	0.48	0.01	0.036	
Barium	MAC	1	0.200	0.175	0.145	0.110	0.106	
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.001	
Boron	IMAC	5	0.1	0.06	0.02	0.03	0.029	
Cadmium	MAC	0.005		<0.0001	<0.0001	<0.01	<0.0001	
Chromium	MAC	0.05	<0.01	<0.01	<0.01	<0.01	<0.001	
Cobalt			<0.01	<0.01	<0.01	<0.01	<0.005	
Copper	AO	1	<0.01	<0.01	<0.01	<0.01	<0.002	
Iron	AO	0.3	22.5	18.4	14.1	11	0.158	
Lead	MAC	0.01	<0.0002	<0.0002	0.0006	<0.1	0.0002	
Manganese	AO	0.05	2.66	1.87	1.27	0.98	0.828	
Molybdenum			<0.02	<0.02	<0.02	<0.02	<0.01	
Nickel			<0.02	<0.02	<0.02	<0.02	<0.01	
Silicon			10.30	8.16	7.54	7.59	6.73	
Silver			<0.01	<0.01	<0.01	<0.01	<0.005	
Strontium			0.210	0.155	0.140	0.109	0.083	
Thallium								
Titanium			<0.01	<0.01	<0.01	<0.01	<0.005	
Vanadium			<0.005	<0.005	<0.005	<0.005	<0.005	
Zinc	AO	5	<0.01	<0.01	0.02	<0.01	<0.005	
Arsenic	IMAC	0.025	0.001	<0.1	0.002	<0.1	0.001	
Fluoride	MAC	1.5			0.1			
Mercury	MAC	0.001	0.0001					
N-NH3			0.19			0.1		
Phosphorus			<0.1	<0.1		<0.1		
pH (no units)	OG	6.5-8.5	6.78	7.67	6.98			
Selenium	MAC	0.01	<0.001				<0.001	
Tin			<0.2	<0.2		<0.2	<0.05	
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-1

Sample Date			Oct-01	Nov-02				
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	61	85				
BOD								
COD								
Chloride	AO	250	18.4	2				
Conductivity uS/cm			185	192				
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1		<0.1				
N-NO3 (Nitrate)	MAC	10						
Phenols			0.008	0.001				
Sulphate	AO	500	<1					
Total Dissolved Solids	AO	500	111	118				
Total Kjeldahl Nitrogen								
Total phosphorous			5.85					
Hardness as CaCO3	OG	500						
Calcium			47.5	26				
Magnesium			10.4	5.45				
Potassium			5.4	3				
Sodium	AO	200	10.4	5.3				
Aluminum	OG	0.1	0.13	0.02				
Barium	MAC	1	0.025	0.015				
Beryllium			<0.005	<0.005				
Boron	IMAC	5	0.01	<0.01				
Cadmium	MAC	0.005	<0.0006	<0.01				
Chromium	MAC	0.05	<0.01	<0.01				
Cobalt			<0.01	<0.01				
Copper	AO	1	<0.01					
Iron	AO	0.3	0.28	0.44				
Lead	MAC	0.01	<0.0012	<0.1				
Manganese	AO	0.05	0.15	0.12				
Molybdenum			0.03	<0.02				
Nickel			<0.02	<0.02				
Silicon			9.86	8.65				
Silver			<0.01	<0.01				
Strontium			0.145	0.085				
Thallium								
Titanium			<0.01	<0.01				
Vanadium			<0.005	<0.005				
Zinc	AO	5	<0.01	<0.01				
Arsenic	IMAC	0.025	0.001	<0.1				
Fluoride	MAC	1.5	0.2	<0.01				
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus				<0.1				
pH (no units)	OG	6.5-8.5	7.99	8.17				
Selenium	MAC	0.01						
Tin				<0.2				
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C								
pH								
Conductivity uS/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-2

Sample Date			Sep-91	Nov-92	Aug-96	Nov-96	Jul-97	Nov-98
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500		66	63	59	63	56
BOD								
COD								
Chloride	AO	250	21	<1	1.4	<0.1	1	0.7
Conductivity uS/cm					149	138	143	142
DOC	AO	5		5	<0.2			
N-NO2 (Nitrite)	MAC	1						
N-NO3 (Nitrate)	MAC	10		<0.1	<0.1	0.1	<0.1	0.1
Phenols					0.001	<0.0001	0.007	0.005
Sulphate	AO	500		12	15	11	11	11
Total Dissolved Solids	AO	500	94	110	120	82	96	85
Total Kjeldahl Nitrogen								
Total phosphorous								
Hardness as CaCO3	OG	500	54					57
Calcium				19	16	16.9	17.4	13.4
Magnesium				4	4.23	3.65	4.02	3.58
Potassium				3	7.1	3.7	4.6	3.9
Sodium	AO	200		4	4.7	6.1	6	5.5
Aluminum	OG	0.1		0.08	0.67	0.04	0.25	0.06
Barium	MAC	1		0.08	0.056	0.035	0.035	0.028
Beryllium				<0.01	<0.005	<0.005	<0.005	<0.005
Boron	IMAC	5	<0.01	<0.01	<0.01	0.01	0.01	0.01
Cadmium	MAC	0.005	<0.002	<0.01	<0.0001	<0.0001	<0.01	<0.0001
Chromium	MAC	0.05		<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt				<0.01	<0.01	<0.01	<0.01	<0.01
Copper	AO	1		<0.01	<0.01	<0.01	<0.01	<0.01
Iron	AO	0.3	3.01	0.09	0.88	0.48	0.48	0.12
Lead	MAC	0.01		<0.05	<0.0002	<0.0002	<0.1	<0.0002
Manganese	AO	0.05		0.03	46	0.09	0.06	0.06
Molybdenum					0.02	0.02	<0.02	<0.02
Nickel				<0.01	<0.02	<0.02	<0.02	<0.02
Silicon				8.7	10.5	9.6	9.93	9.17
Silver				<0.01	<0.01	<0.01	<0.01	<0.01
Strontium				0.11	0.106	0.103	0.109	0.092
Thallium								
Titanium				<0.01	0.06	<0.01	0.02	<0.01
Vanadium				<0.01	<0.005	<0.005	<0.005	<0.005
Zinc	AO	5		<0.01	<0.01	<0.01	<0.01	0.02
Arsenic	IMAC	0.025			<0.1	<0.001	<0.1	<0.1
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus				<0.1	0.2	<0.1	<0.1	0.1
pH (no units)	OG	6.5-8.5	8.34	8.13	7.98	8.04	8.18	8.16
Selenium	MAC	0.01						
Tin				<0.05		<0.2	<0.2	<0.2
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C								
pH								
Conductivity uS/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-2

Sample Date			Jul-99	Nov-99	Jun-00	Oct-00	Jun-01	Jun-02
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	56	60	72	60	56	56
BOD								
COD			11					
Chloride	AO	250	1	1	0.9	1	0.9	1.2
Conductivity uS/cm			148	142	145	146	137	139
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	0.1					
N-NO3 (Nitrate)	MAC	10	0.2	0.1	0.1	<0.1		
Phenols			0.021	0.002	0.01	<0.001	0.027	<0.001
Sulphate	AO	500	10	11	10	12	11	12
Total Dissolved Solids	AO	500		98	122	88	92	104
Total Kjeldahl Nitrogen								
Total phosphorous			0.05				0.29	
Hardness as CaCO3	OG	500						
Calcium			16.7	16.3	15.7	15.2	15.8	17.2
Magnesium			3.64	3.38	3.72	3.69	3.44	3.82
Potassium			5.8	2.7	1.4	2.4	0.6	1.7
Sodium	AO	200	5.5	6.4	5.1	5.4	4.7	4.7
Aluminum	OG	0.1	0.6	0.08	0.13	0.16	0.21	0.01
Barium	MAC	1	0.025	0.035	0.02	0.02	0.02	0.024
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	IMAC	5	0.01	0.02	<0.01	0.01	<0.01	0.01
Cadmium	MAC	0.005		<0.0001	<0.0001	<0.0001	<0.0001	<0.01
Chromium	MAC	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	AO	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	AO	0.3	0.06	0.11	0.15	0.13	0.05	0.11
Lead	MAC	0.01	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.1
Manganese	AO	0.05	0.02	0.29	0.04	0.02	0.02	0.03
Molybdenum			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon			9.3	8.58	9.27	7.61	8.31	9.77
Silver			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Strontium			0.09	0.085	0.085	0.095	0.095	0.082
Thallium								
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025	<0.001	<0.1	<0.1	<0.1	<0.001	<0.1
Fluoride	MAC	1.5					0.2	
Mercury	MAC	0.001	0.0001					
N-NH3 (Ammonia)			<0.01					<0.1
Phosphorus			<0.1	<0.1	<0.1	<0.1		<0.1
pH (no units)	OG	6.5-8.5	7.58	7.98	7.89	7.78	6.35	
Selenium	MAC	0.01	<0.001					
Tin			<0.2	<0.2	<0.2			<0.2
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C								
pH								
Conductivity uS/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-2

Sample Date			Sep-04	May-05	Nov-05	May-06	Oct-06	May-07
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	55	60	58	58	56	56
BOD				<1	<1		<1	<1
COD			7	<5	<5	<5	<5	<5
Chloride	AO	250	1.1	2	2	1	1	1
Conductivity uS/cm			160	136	139	138	137	138
DOC	AO	5	<0.5	0.5	0.7	<0.5	<0.5	1
N-NO2 (Nitrite)	MAC	1		<0.10	<0.10		<0.10	<0.10
N-NO3 (Nitrate)	MAC	10		<0.10	<0.10		<0.10	<0.10
Phenols			<0.001	<0.001	<0.001		<0.001	
Sulphate	AO	500	12	12	12		13	13
Total Dissolved Solids	AO	500		88	90	90	89	90
Total Kjeldahl Nitrogen				0.08	<0.05	0.24	<0.05	0.14
Total phosphorous			0.39		1		0.22	0.77
Hardness as CaCO3	OG	500	65	51	47		54	56
Calcium			19.3	14	14	15	15	16
Magnesium			4.15	4	3	4	4	43
Potassium			3.4	3	3	3	3	
Sodium	AO	200	4.7	5	5	4	5	5
Aluminum	OG	0.1	0.007	0.01	0.02	<0.01	<0.01	0.04
Barium	MAC	1	0.031	0.03	0.02	0.02	0.02	0.02
Beryllium			<0.001	<0.001	<0.001		<0.001	<0.001
Boron	IMAC	5	0.005	0.01	0.01	0.01	0.01	0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt			<0.005	0.0002	<0.0002	<0.0002	<0.0002	0.0089
Copper	AO	1	<0.002	<0.001	0.001	0.063	<0.001	<0.001
Iron	AO	0.3	0.02	0.04	0.03	0.03	0.03	0.05
Lead	MAC	0.01	<0.0005	<0.001	<0.001		<0.001	<0.001
Manganese	AO	0.05	0.013	0.02	0.02	0.02	0.02	0.03
Molybdenum			<0.01	<0.005	<0.005		<0.005	<0.005
Nickel			<0.01	<0.005	<0.005		<0.005	<0.005
Silicon			9.05	11.1	11.5	8.7	10	9.5
Silver			<0.005	<0.0001	<0.0001		<0.0001	<0.0001
Strontium			0.095	0.094	0.092	0.079	0.092	0.082
Thallium				<0.0001	<0.0001		<0.0001	<0.0001
Titanium			<.005	<0.01	<0.01		<0.01	<0.01
Vanadium			0.005	<0.001	<0.001		<0.001	<0.001
Zinc	AO	5	0.007	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025	0.001					
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)						0.02		
Phosphorus								<0.001
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01	<0.001					
Tin			<0.05					
Dissolved Reactive P						0.06		
Field Parameters								
Temperature ^{O}C				8.1	6	8.9	7.9	8.3
pH				8.79	7.59	8.29	7.26	7.45
Conductivity uS/cm				123	123	106	111	116

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-2

Sample Date			Oct-07	May-08	Oct-08	May-09	Sep-09	May-10
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	55	55		56	58	56
BOD			<1	1		<1	<1	
COD			<5	<5		8	<5	
Chloride	AO	250	1	1		1	1	1
Conductivity uS/cm			135	135		138	140	140
DOC	AO	5	0.9	1.2		1	1	
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10		<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10		<0.10	<0.10	<0.10
Phenols			<0.001	<0.001		<0.001	<0.001	
Sulphate	AO	500	13	12		12	12	
Total Dissolved Solids	AO	500	88	88		90	91	91
Total Kjeldahl Nitrogen			0.19	<0.10		<0.10	<0.10	<0.10
Total phosphorous			0.56	0.47		0.11	2.28	
Hardness as CaCO3	OG	500	59	59		51	59	59
Calcium			17	17		14	17	17
Magnesium			4	4		4	4	4
Potassium			3	3		3	3	3
Sodium	AO	200	5	5		3	7	5
Aluminum	OG	0.1	<0.01	0.02		0.03	0.18	0.06
Barium	MAC	1	0.02	0.02		0.02	0.02	0.02
Beryllium			<0.001	<0.001		<0.001	<0.001	<0.001
Boron	IMAC	5	0.01	0.01		0.01	0.01	0.02
Cadmium	MAC	0.005	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	<0.001		<0.001	<0.001	<0.001
Cobalt			<0.0002	0.0325		0.003	0.0007	0.0019
Copper	AO	1	0.002	<0.001		<0.001	<0.001	<0.001
Iron	AO	0.3	0.03	0.04		0.04	0.14	0.18
Lead	MAC	0.01	<0.001	<0.001		<0.001	<0.001	<0.001
Manganese	AO	0.05	0.02	0.08		0.03	0.02	0.03
Molybdenum			<0.005	<0.005		<0.005	<0.005	<0.005
Nickel			<0.005	<0.005		<0.005	<0.005	<0.005
Silicon			9.5	9.8		8.5	9.7	9.1
Silver			<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Strontium			0.091	0.081		0.072	0.083	0.08
Thallium			<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01		<0.05	0.01	<0.01
Vanadium			<0.001	<0.001		<0.001	<0.001	<0.001
Zinc	AO	5	0.01	<0.01		<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus			<0.001					
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C			8.2			8.1	7.2	9.3
pH			7.48			8.9	8.8	8.6
Conductivity uS/cm			103			149	129	141

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-2

Sample Date			Oct-10	Jun-11	Jun-12	Jun-13	Apr-14	Oct-14
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	55	58	58	57	52	52
BOD								
COD								
Chloride	AO	250	1	1	1	1	0.7	0.7
Conductivity uS/cm			139	140	136	138	132	130
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	< 0.10	< 0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	< 0.10	< 0.10
Phenols					<0.001	<0.001		
Sulphate	AO	500			13	13		
Total Dissolved Solids	AO	500	90	91	88	90	73.3	72.4
Total Kjeldahl Nitrogen			<0.10	<0.10	<0.10	<0.10	0.16	< 0.05
Total phosphorous								
Hardness as CaCO3	OG	500	54	56	40	54	58	54
Calcium			15	16	11	15	16.6	15.7
Magnesium			4	4	3	4	3.93	3.82
Potassium			3	3	3	3	3.1	3
Sodium	AO	200	4	5	5	5	5.1	4.6
Aluminum	OG	0.1	0.06	0.03	0.02	0.02	0.03	0.03
Barium	MAC	1	0.02	0.02	0.02	0.02	0.022	0.021
Beryllium			<0.001	<0.0005	<0.0005	<0.0005	< 0.0001	< 0.0001
Boron	IMAC	5	0.01	0.01	0.02	<0.01	0.007	0.007
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002	< 0.00002
Chromium	MAC	0.05	<0.001	<0.001	<0.001	<0.001	< 0.002	< 0.002
Cobalt			0.0006	0.0003	0.0008	0.0004	0.0028	< 0.0001
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	0.0001	<0.002
Iron	AO	0.3	0.06	0.04	0.03	0.03	0.032	0.038
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	< 0.00002	0.00002
Manganese	AO	0.05	0.02	0.02	0.02	0.02	0.028	0.02
Molybdenum			<0.005	<0.005	<0.005	<0.005	0.0031	0.0035
Nickel			<0.005	<0.005	<0.005	<0.005	, 0.01	< 0.01
Silicon			9.7	8.2	9.5	9.2	9.36	9.26
Silver			<0.0001	<0.0001	<0.0001	<0.0001		
Strontium			0.087	0.079	0.082	0.092	0.094	0.09
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	< 0.00005	< 0.00005
Titanium			<0.01	<0.01	<0.01	<0.01	< 0.005	< 0.005
Vanadium			<0.001	<0.001	<0.001	<0.001	< 0.005	0.0004
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	< 0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)							< 0.01	< 0.01
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C			7.6	7.6	8.4	8.6	7.7	7.5
pH			8.9	8.5	8.2	5.8	8.2	8.1
Conductivity uS/cm			106	110	119	109	123	130

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-2

Sample Date			Oct-14	Jun-15	Oct-15	May-16	Nov-16	Apr-17
PARAMETER	Limit	ODWO/S	BH 91-7 QA/QC					
Alkalinity (C_aCO3)	OG	30-500	53	54	54	56	56	54
BOD								
COD								
Chloride	AO	250	0.7	0.70	0.7	0.73	0.51	< 0.5
Conductivity uS/cm			131	138	136	146	141	135
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.10	< 0.1	< 0.1	<0.05	<0.05	< 0.1
N-NO3 (Nitrate)	MAC	10	< 0.10	< 0.1	< 0.1	<0.05	<0.05	< 0.1
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	72.8	83	82	78	102	74.5
Total Kjeldahl Nitrogen			< 0.05	< 0.05	< 0.05	0.13	< 0.1	0.11
Total phosphorous								
Hardness as CaCO3	OG	500	58	56	60	55.4	52.3	
Calcium			15.7	15.8	16.6	15.9	15.0	17
Magnesium			3.83	4.06	4.6	3.82	3.60	3.98
Potassium			3	2.9	3	2.95	3.05	3
Sodium	AO	200	4.7	4.9	5.1	4.37	4.42	4.8
Aluminum	OG	0.1	0.03	0.02	0.01	0.007	0.034	0.02
Barium	MAC	1	0.021	0.02	0.024	0.022	0.020	0.025
Beryllium			< 0.0001	< 0.0001	< 0.0001	<0.001	<0.001	< 0.0001
Boron	IMAC	5	0.007	0.01	0.01	< 0.01	< 0.01	0.025
Cadmium	MAC	0.005	0.00004	< 0.00002	< 0.00002	<0.001	<0.001	< 0.000014
Chromium	MAC	0.05	< 0.002	< 0.002	0.003	< 0.003	< 0.003	< 0.002
Cobalt			0.0001	0.0002	< 0.0001	< 0.001	< 0.001	< 0.0001
Copper	AO	1	<0.002	<0.002	<0.002	<0.003	<0.003	<0.002
Iron	AO	0.3	0.032	0.01	0.032	< 0.01	< 0.01	0.02
Lead	MAC	0.01	0.00012	< 0.00002	< 0.00002	<0.002	<0.002	< 0.00002
Manganese	AO	0.05	0.02	0.02	0.025	0.018	0.015	0.019
Molybdenum			0.004	0.0025	0.0041			0.0037
Nickel			< 0.01	< 0.01	< 0.01	<0.003	<0.003	0.0004
Silicon			9.27	8.87	9.38	9.40	9.94	9.97
Silver								
Strontium			0.089	0.09	0.101	0.082	0.070	
Thallium			< 0.00005	< 0.00005	< 0.00005	<0.006	<0.006	< 0.00005
Titanium			< 0.005	< 0.005	< 0.005	<0.002	<0.002	< 0.005
Vanadium			0.0005	0.0003	0.0003	<0.002	<0.002	0.0003
Zinc	AO	5	< 0.005	< 0.005	< 0.005	<0.005	<0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			< 0.01	< 0.01	< 0.01			
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								< 0.05
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C				9	7.7	7.5	6.7	6.6
pH				7.6	8.1	8.3	8.1	7.8
Conductivity uS/cm				148	128	131	138	137

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-2

Sample Date			Oct-17	May-18	Oct-18	Median (Last 10 Events)	Min	Max
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	54	53	55	54	52	72
BOD							< 1	1
COD							< 5	11
Chloride	AO	250	0.6	< 1	< 1	0.7	< 0.1	21
Conductivity uS/cm			139	138	141	138	130	160
DOC	AO	5					< 0.2	5
N-NO2 (Nitrite)	MAC	1	< 0.05	< 0.10	< 0.10		< 0.05	0.1
N-NO3 (Nitrate)	MAC	10	< 0.05	< 0.10	< 0.10		< 0.05	0.2
Phenols							< 0.001	0.027
Sulphate	AO	500					10	15
Total Dissolved Solids	AO	500	72	90	92	78	72	122
Total Kjeldahl Nitrogen			0.08	< 0.8	1.6	0.1	< 0.05	0.24
Total phosphorous							0.05	2.28
Hardness as CaCO3	OG	500	56	56	49	56	40	65
Calcium			15.7	16	13	15.8	11	19.3
Magnesium			4.08	4	4	3.98	3	43
Potassium			3.2	3	3	3	0.6	7.1
Sodium	AO	200	4.7	5	5	4.8	3	7
Aluminum	OG	0.1	0.02	< 0.01	< 0.01	0.02	0.007	0.67
Barium	MAC	1	0.022	0.02	0.02	0.021	0.02	0.08
Beryllium			< 0.0001	< 0.0005	< 0.0005			
Boron	IMAC	5	0.008	< 0.01	< 0.01	0.01	0.005	0.025
Cadmium	MAC	0.005	< 0.000014	< 0.0001	< 0.0001		< 0.000014	0.00004
Chromium	MAC	0.05	< 0.002	< 0.001	< 0.001	0.002	< 0.001	0.003
Cobalt			< 0.0001	< 0.0002	< 0.0002	0.0002	< 0.0001	0.0325
Copper	AO	1	<0.002	<0.001	<0.001	#NUM!	0.0001	0.063
Iron	AO	0.3	0.021	< 0.03	< 0.03	0.0265	< 0.01	3.01
Lead	MAC	0.01	< 0.00002	< 0.001	< 0.001	0.00007	< 0.00002	0.00012
Manganese	AO	0.05	0.017	0.02	0.02	0.02	0.013	46
Molybdenum			0.0034	< 0.005	< 0.005	0.0037	0.0025	0.02
Nickel			0.0002	< 0.005	< 0.005		0.0002	0.0004
Silicon			9.81	9.6	9.6	9.4	7.61	11.5
Silver							< 0.0001	< 0.01
Strontium			0.078	0.074	0.085	0.087	0.07	0.11
Thallium			< 0.00005	< 0.0001	< 0.0001		< 0.00005	< 0.006
Titanium			< 0.005	< 0.01	< 0.01		< 0.002	0.06
Vanadium			0.0002	< 0.001	< 0.001	0.00035	0.0002	0.005
Zinc	AO	5	< 0.005	< 0.01	< 0.01		< 0.005	0.02
Arsenic	IMAC	0.025					< 0.001	< 0.1
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)							< 0.01	0.02
Phosphorus							< 0.001	0.2
pH (no units)	OG	6.5-8.5					6.35	8.34
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C			8.3	7.7	7.5			
pH			8.7	7.9	8.3			
Conductivity uS/cm			122	120	114			

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-3

Sample Date			Nov-98	Jul-99	Nov-99	Jun-00	Oct-00	
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	50	58	60	68	65	
BOD								
COD				<3				
Chloride	AO	250	0.9	1.1	1.1	1.1	1.3	
Conductivity uS/cm			148	149	138	148	151	
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1		<0.1				
N-NO3 (Nitrate)	MAC	10	0.1	0.2	0.1	0.1	0.1	
Phenols			0.005	0.013	<0.001	0.006	0.003	
Sulphate	AO	500	21	10	10	10	11	
Total Dissolved Solids	AO	500			90	110	94	
Total Kjeldahl Nitrogen				0.05				
Total phosphorous				1.92				
Hardness as CaCO3	OG	500		59				
Calcium			16	18	16.9	15.8	17.7	
Magnesium			3.29	3.38	2.98	3.08	3.49	
Potassium			4.3	6.8	5.4	2.2	1.7	
Sodium	AO	200	5.3	5.4	6	4.9	5.4	
Aluminum	OG	0.1		0.25	0.06	0.1	0.33	
Barium	MAC	1	0.035	0.025	0.025	0.015	0.02	
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.005	
Boron	IMAC	5	<0.01	0.01	0.01	<0.01	0.01	
Cadmium	MAC	0.005	<0.0001		<0.0001	<0.0001	<0.0001	
Chromium	MAC	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	
Cobalt			<0.01	<0.01	<0.01	<0.01	<0.01	
Copper	AO	1	<0.01	<0.01	<0.01	<0.01	<0.01	
Iron	AO	0.3	0.26	0.29	0.06	0.19	0.32	
Lead	MAC	0.01	<0.0002	<0.0002	<0.0002	<0.0002	0.0012	
Manganese	AO	0.05	0.14	0.02	0.1	0.02	0.03	
Molybdenum			<0.02	<0.02	<0.02	<0.02	<0.02	
Nickel			<0.02	<0.02	<0.02	<0.02	<0.02	
Silicon			8.6	8.97	7.83	8.52	7.24	
Silver			<0.01	<0.01	<0.01	<0.01	<0.01	
Strontium			0.097	0.105	0.095	0.095	0.11	
Thallium								
Titanium			<0.1	0.01	<0.01	<0.01	<0.01	
Vanadium			<0.005	<0.005	<0.005	<0.005	<0.005	
Zinc	AO	5	0.02	<0.01	<0.01	<0.01	<0.01	
Arsenic	IMAC	0.025	<0.1	<0.001	<0.1	<0.1	<0.1	
Fluoride	MAC	1.5						
Mercury	MAC	0.001		<0.0001				
N-NH3 (Ammonia)				<0.01				
Phosphorus			0.2	<0.1	<0.1	<0.1	<0.1	
pH (no units)	OG	6.5-8.5	8.15	7.72	8.05	7.87	7.32	
Selenium	MAC	0.01		<0.001				
Tin			<0.2	<0.2	<0.2	<0.2		
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C								
pH								
Conductivity uS/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-5 (Deep)

Sample Date			Sep-91	Nov-92	Sep-95	Jul-97	Nov-98	Jul-99
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500		78	30	38	63	78
BOD								
COD					45			<3
Chloride	AO	250	23	49	45.4	46	50.9	45.2
Conductivity uS/cm						248	281	275
DOC	AO	5		6				
N-NO2 (Nitrite)	MAC	1						0.1
N-NO3 (Nitrate)	MAC	10		<0.1	<0.1	<0.1	<0.1	0.2
Phenols					0.009	0.029	0.002	0.013
Sulphate	AO	500		15	16	12	11	9
Total Dissolved Solids	AO	500	188	250	160	166	174	
Total Kjeldahl Nitrogen								0.32
Total phosphorous								1.23
Hardness as CaCO3	OG	500	129					58
Calcium				31	18.2	17.8	16.4	14.5
Magnesium				8	6.2	6.22	5.67	5.3
Potassium				2	1.9	2.7	1.1	5.1
Sodium	AO	200		19	17.7	17.2	20.1	27.1
Aluminum	OG	0.1		0.06	0.115	0.06	0.01	0.81
Barium	MAC	1		0.11	0.061	0.051	0.056	0.06
Beryllium				<0.01	<0.005	<0.005	<0.005	<0.005
Boron	IMAC	5	<0.01	<0.01	<0.01	0.02	0.02	0.01
Cadmium	MAC	0.005	<0.002	<0.01	0.0002	<0.01	<0.0001	
Chromium	MAC	0.05		<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt				<0.01	<0.01	<0.01	<0.01	<0.01
Copper	AO	1		<0.01	<0.01	<0.01	<0.01	<0.01
Iron	AO	0.3	188	0.14	14.6	16.3	2.9	14
Lead	MAC	0.01		<0.05	1.4	<0.1	<0.0002	0.0003
Manganese	AO	0.05		0.56	0.269	0.15	0.19	0.13
Molybdenum				<0.01	<0.02	<0.02	<0.02	<0.02
Nickel				<0.01	<0.02	<0.02	<0.02	<0.02
Silicon				6.8	8.5	8.59	7.31	9.18
Silver				<0.01	<0.01	<0.01	<0.01	<0.01
Strontium				0.08	0.066	0.065	0.063	0.05
Thallium								
Titanium				<0.01	0.014	<0.01	<0.01	<0.05
Vanadium				<0.01	<0.01	0.007	<0.005	<0.005
Zinc	AO	5		<0.01	<0.01	0.02	0.02	<0.01
Arsenic	IMAC	0.025			<0.1	<0.1	<0.1	<0.001
Fluoride	MAC	1.5						
Mercury	MAC	0.001						<0.0001
N-NH3 (Ammonia)								0.12
Phosphorus				<0.1	<0.0	<0.1	<0.1	<0.1
pH (no units)	OG	6.5-8.5	7.46	7.13	6.6	7	6.54	6.6
Selenium	MAC	0.01						<0.001
Tin				<0.05	<0.2	<0.2	<0.2	<0.2
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C								
pH								
Conductivity uS/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-5 (Deep)

Sample Date			Nov-99	Jun-00	Jun-01	Jun-02	Nov-02	May-04
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	50	53	34	39	32	31
BOD								
COD								6
Chloride	AO	250	48	45.8	58.2	61.7	62.4	58.4
Conductivity uS/cm			271	268	280	294	298	915
DOC	AO	5						1
N-NO2 (Nitrite)	MAC	1					<0.1	
N-NO3 (Nitrate)	MAC	10	<0.1	<0.1				
Phenols			<0.001	0.004	0.018	<0.001	<0.001	<0.001
Sulphate	AO	500	9	8	9	9	12	14
Total Dissolved Solids	AO	500	188	168	170	168	170	
Total Kjeldahl Nitrogen								
Total phosphorous					1.71			0.52
Hardness as CaCO3	OG	500						57
Calcium			15.7	12.8	13.8	21.8	15.2	14.2
Magnesium			5.2	4.74	4.8	5.73	5.58	5.2
Potassium			2.4	6	1.2	3	1.4	2.1
Sodium	AO	200	29.4	29.3	25	28.1	33.4	31.8
Aluminum	OG	0.1	0.07	0.22	0.22	0.02	0.02	0.03
Barium	MAC	1	0.045	0.045	0.045	0.05	0.04	0.057
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.001
Boron	IMAC	5	0.01	<0.01	<0.01	0.02	<0.01	0.013
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.01	<0.01	<0.0001
Chromium	MAC	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001
Cobalt			<0.01	<0.01	<0.01	<0.01	<0.01	<0.005
Copper	AO	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.002
Iron	AO	0.3	0.22	12.3	11.7	16.8	0.14	0.287
Lead	MAC	0.01	<0.0002	<0.0002	0.0006	<0.1	<0.1	0.0002
Manganese	AO	0.05	0.15	0.12	0.11	0.14	0.11	0.134
Molybdenum			<0.02	<0.02	<0.02	<0.02	<0.02	<0.01
Nickel			<0.02	<0.02	<0.02	<0.02	<0.02	<0.01
Silicon			6.9	7.76	6.94	7.93	6.85	7.9
Silver			<0.01	<0.01	<0.01	<0.01	<0.01	<0.005
Strontium			0.065	0.05	0.055	0.068	0.06	0.059
Thallium								
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.005
Vanadium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	0.005
Arsenic	IMAC	0.025	<0.1	<0.1	<0.001	<0.1	<0.1	<0.001
Fluoride	MAC	1.5			0.1			
Mercury	MAC	0.001						
N-NH3 (Ammonia)						0.1		
Phosphorus			<0.1	<0.1		<0.1	<0.1	
pH (no units)	OG	6.5-8.5	7.27	7.4	6.6		7.8	
Selenium	MAC	0.01						<0.001
Tin			<0.2	<0.2		<0.2	<0.2	<0.05
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C								
pH								
Conductivity uS/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-5 (Deep)

Sample Date			May-05	May-06	May-07	Oct-08	May-09	May-10
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	47	44	48	46	50	43
BOD			<1		<1	<1	1	
COD			<5	11	<5	7	10	
Chloride	AO	250	57	60	56	61	50	61
Conductivity uS/cm			315	296	303	303	273	312
DOC	AO	5	2.5	1.5	3.4	5.6	3.5	
N-NO2 (Nitrite)	MAC	1	<0.10		<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10		<0.10	<0.10	<0.10	<0.10
Phenols			<0.001		<0.001	<0.001	<0.001	
Sulphate	AO	500	8		6	5	7	
Total Dissolved Solids	AO	500	205	192	197	197	177	203
Total Kjeldahl Nitrogen			0.25	0.27	0.18	0.16	0.2	0.28
Total phosphorous					0.22	0.07	0.09	
Hardness as CaCO3	OG	500	56		58	67	56	65
Calcium			14	14	15	17	14	16
Magnesium			5	5	5	6	5	6
Potassium			2	2	2	2	2	2
Sodium	AO	200	29	29	32	30	26	31
Aluminum	OG	0.1	<0.01	0.01	<0.01	0.02	0.03	0.01
Barium	MAC	1	0.06	0.05	0.05	0.06	0.05	0.06
Beryllium			<0.001		<0.001	<0.001	<0.001	<0.001
Boron	IMAC	5	<0.01	<0.01	0.01	<0.01	0.01	0.01
Cadmium	MAC	0.005	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	0.002	0.002	0.002	0.001	<0.001
Cobalt			0.0002	<0.0002	<0.0002	0.0302	0.0232	0.0017
Copper	AO	1	<0.001	0.058	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	16	14.9	15.2	17.9	19.2	16.8
Lead	MAC	0.01	0.002		<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.12	0.12	0.12	0.2	0.17	0.14
Molybdenum			<0.005		<0.005	<0.005	<0.005	<0.005
Nickel			<0.005		<0.005	<0.005	<0.005	<0.005
Silicon			9.3	7.3	8.1	7.9	8.1	7.5
Silver			<0.0001		<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.061	0.051	0.05	0.069	0.061	0.067
Thallium			<0.0001		0.0003	<0.0001	<0.0001	<0.0001
Titanium			<0.01		<0.01	<0.01	<0.01	<0.01
Vanadium			0.003		0.003	0.003	0.003	0.002
Zinc	AO	5	<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)				0.21	0.21			
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P				0.04	0.04			
Field Parameters								
Temperature ^{O}C			9.2	9.6	8.2		8.1	7.9
pH			8.15	8.13	7.3		7.1	7.5
Conductivity uS/cm			312	266	296		342	353

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-5 (Deep)

Sample Date			Jun-11	Oct-11	Jun-12	Oct-12	Jun-13	Nov-13
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	43	47	49	46	42	42
BOD								
COD								
Chloride	AO	250	64	61	60	64	59	59
Conductivity uS/cm			319	317	305	313	302	303
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols					<0.001	<0.001	<0.001	<0.001
Sulphate	AO	500			7	7	7	8
Total Dissolved Solids	AO	500	207	206	198	203	196	197
Total Kjeldahl Nitrogen			0.11	<0.10	0.2	0.23	<0.10	0.16
Total phosphorous								
Hardness as CaCO3	OG	500	60	66	44	63	49	51
Calcium			16	18	11	17	13	14
Magnesium			5	5	4	5	4	4
Potassium			2	2	2	2	2	2
Sodium	AO	200	32	29	29	29	35	37
Aluminum	OG	0.1	0.03	0.02	0.04	0.05	0.02	0.07
Barium	MAC	1	0.06	0.06	0.06	0.06	0.06	0.05
Beryllium			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IMAC	5	0.01	0.01	0.01	0.02	0.02	0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.002	<0.001	0.002	0.002	0.001	<0.001
Cobalt			<0.0002	0.0002	<0.0002	0.0004	<0.0002	<0.0002
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	18.4	18.4	17.1	17.1	15.5	13.5
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.13	0.15	0.14	0.13	0.12	0.1
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			7.9	7.7	8.2	7.1	7.8	8.3
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.065	0.071	0.064	0.066	0.059	0.049
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			0.003	0.002	0.003	0.003	0.003	0.004
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C			7.3	7.2	7.5	7	8	6.9
pH			6.9	6.9	6.8	6.5	7.2	7.4
Conductivity uS/cm			291	358	309	353	271	338

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-5 (Deep)

Sample Date			Apr-14	Oct-14	Jun-15	Oct-15	May-16	May-16 QAQC
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	41	44	44	42	45	43
BOD								
COD								
Chloride	AO	250	55.8	60.4	54.9	54	66	65.9
Conductivity uS/cm			287	273	273	271	304	304
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.10	< 0.10	< 0.1	< 0.1	<0.05	<0.05
N-NO3 (Nitrate)	MAC	10	< 0.10	< 0.10	< 0.1	< 0.1	<0.05	<0.05
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	157	183	169	172	136	138
Total Kjeldahl Nitrogen			0.27	0.07	0.3	0.11	0.25	0.24
Total phosphorous								
Hardness as CaCO3	OG	500	46	49	48	51	47.2	48.2
Calcium			12.1	12.8	12.5	12.9	12.2	12.5
Magnesium			3.83	4.2	4.1	4.63	4.07	4.12
Potassium			1.9	1.8	1.9	1.7	2.08	2.08
Sodium	AO	200	37.1	30.8	35.1	32.6	35.2	34.4
Aluminum	OG	0.1	0.04	0.04	0.03	< 0.01	0.007	0.006
Barium	MAC	1	0.048	0.049	0.048	0.052	0.052	0.054
Beryllium			< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.001	<0.001
Boron	IMAC	5	0.02	0.018	0.012	0.019	0.011	<0.010
Cadmium	MAC	0.005	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.001	<0.001
Chromium	MAC	0.05	< 0.002	< 0.002	< 0.002	< 0.002	<0.003	<0.003
Cobalt			0.0004	0.0001	0.0002	< 0.0001	<0.001	<0.001
Copper	AO	1	0.0004	< 0.002	< 0.002	< 0.002	<0.003	0.003
Iron	AO	0.3	14.9	16.7	14.4	16.5	13.9	14.0
Lead	MAC	0.01	0.00003	< 0.00002	< 0.00002	< 0.00002	<0.002	<0.002
Manganese	AO	0.05	0.108	0.123	0.11	0.138	0.113	0.113
Molybdenum			0.0001	0.0004	0.0001	0.0002		
Nickel			< 0.01	< 0.01	< 0.01	< 0.01	<0.003	<0.003
Silicon			7.69	7.73	6.36	7.72	7.97	8.24
Silver								
Strontium			0.053	0.059	0.055	0.056	0.049	0.051
Thallium			< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.006	<0.006
Titanium			< 0.005	< 0.005	< 0.005	< 0.005	0.002	0.002
Vanadium			0.0037	0.0013	0.0038	0.0036	0.004	0.004
Zinc	AO	5	< 0.005	< 0.005	< 0.005	< 0.005	<0.005	<0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			0.08	< 0.01	0.08	0.11		
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C			7.3	7.3	8.3	7.8	7.5	
pH			7.7	7.6	7	7	6.7	
Conductivity uS/cm			285	315	339	285	309	

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
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INORGANIC ANALYSIS

Sample Location 91-5 (Deep)

Sample Date			Nov-16	Nov-16 QAQC	Apr-17	Oct-17	May-18	Oct-18
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	42	42	44	64	61	45
BOD								
COD								
Chloride	AO	250	64.7	63.5	57.4	52.8	52	50
Conductivity uS/cm			307	309	295	286	286	274
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.05	<0.05	< 0.1	< 0.05	< 0.10	< 0.10
N-NO3 (Nitrate)	MAC	10	<0.05	<0.05	< 0.1	< 0.05	< 0.10	< 0.10
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	176	172	149	150	186	178
Total Kjeldahl Nitrogen			0.28	0.20	0.34	0.2	2	< 0.8
Total phosphorous								
Hardness as CaCO3	OG	500	50.5	51.4	51	52	51	56
Calcium			13.4	13.6	13.5	12.9	14	14
Magnesium			4.13	4.24	4.17	4.9	4	5
Potassium			1.91	2.00	1.9	2	2	2
Sodium	AO	200	31.9	31.8	38.4	33.7	38	26
Aluminum	OG	0.1	0.006	0.008	0.01	0.02	< 0.01	< 0.01
Barium	MAC	1	0.059	0.052	0.054	0.04	0.050	0.06
Beryllium			<0.001	<0.001	< 0.0001	< 0.0001	< 0.0005	< 0.0005
Boron	IMAC	5	0.012	0.012	< 0.005	0.011	< 0.01	< 0.01
Cadmium	MAC	0.005	<0.001	<0.001	< 0.000020	< 0.000014	< 0.0001	< 0.0001
Chromium	MAC	0.05	<0.003	<0.003	< 0.002	< 0.002	< 0.001	< 0.001
Cobalt			<0.001	<0.001	< 0.0001	< 0.0001	< 0.0002	< 0.0002
Copper	AO	1	<0.003	<0.003	< 0.002	< 0.002	< 0.001	< 0.001
Iron	AO	0.3	15.1	14.8	14.5	0.344	13.2	16.3
Lead	MAC	0.01	<0.002	<0.002	< 0.00002	< 0.00002	< 0.001	< 0.001
Manganese	AO	0.05	0.121	0.119	0.117	0.104	0.110	0.14
Molybdenum					0.0001	0.0001	< 0.005	< 0.005
Nickel			<0.003	<0.003	0.0003	0.0003	< 0.005	< 0.005
Silicon			7.52	7.23	7.64	7.46	8.00	7.8
Silver								
Strontium			0.054	0.052	0.051	0.056	0.054	0.064
Thallium			<0.006	<0.006	< 0.00005	< 0.00005	< 0.0001	< 0.0001
Titanium			<0.002	<0.002	< 0.005	< 0.005	< 0.01	< 0.01
Vanadium			0.002	0.002	0.003	0.0021	0.002	0.002
Zinc	AO	5	<0.005	<0.005	< 0.005	< 0.005	< 0.01	< 0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C			7.3		7.2	7.3	7.3	7.3
pH			6.9		6.9	7.3	7	6.9
Conductivity uS/cm			340		335	301	173	232

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-5 (Shallow)

Sample Date			Nov-08	Nov-08 QAQC	May-09	May-10	Jun-11	Oct-11
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	80	81	73	75	80	85
BOD			1	<1	1			
COD			13	15	<5			
Chloride	AO	250	11	12	7	5	5	10
Conductivity uS/cm			198	200	170	180	180	205
DOC	AO	5	1	1.1	1.3			
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols			<0.001	<0.001	<0.001			
Sulphate	AO	500	7	7	7			
Total Dissolved Solids	AO	500	129	130	111	117	117	133
Total Kjeldahl Nitrogen			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total phosphorous			0.04	0.12	0.09			
Hardness as CaCO3	OG	500	82	87	63	68	80	87
Calcium			23	25	17	19	22	25
Magnesium			6	6	5	5	6	6
Potassium			2	2	1	1	2	2
Sodium	AO	200	5	5	6	6	5	6
Aluminum	OG	0.1	0.02	0.03	0.01	0.01	<0.01	<0.01
Barium	MAC	1	0.05	0.05	0.03	0.03	0.03	0.04
Beryllium			<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005
Boron	IMAC	5	0.01	<0.01	<0.01	0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	<0.001	<0.001	<0.001	0.001	<0.001
Cobalt			0.0351	0.0029	0.0298	0.0038	0.0003	0.0166
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	<0.03	0.03	0.16	0.28	0.28	0.38
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.08	0.02	0.08	0.04	0.03	0.06
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			5.1	5.2	5.5	5.4	5.2	5.2
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.044	0.042	0.035	0.037	0.04	0.041
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			0.012	0.013	0.001	<0.001	<0.001	<0.001
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C					8.7	8.4	7.3	7.2
pH					7.8	8.5	6.9	7.7
Conductivity uS/cm					182	178	147	200

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-5 (Shallow)

Sample Date			Jun-12	Oct-12	Jun-13	Nov-13	Apr-14	Oct-14
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	81	86	82	89	90	86
BOD								
COD								
Chloride	AO	250	7	14	4	5	4.6	9.7
Conductivity uS/cm			188	217	181	199	195	201
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	< 0.10	< 0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	< 0.10	< 0.10
Phenols			<0.001	<0.001	<0.001	<0.001		
Sulphate	AO	500	9	8	7	7		
Total Dissolved Solids	AO	500	122	141	118	129	107	135
Total Kjeldahl Nitrogen			<0.10	0.12	0.12	<0.10	0.21	0.07
Total phosphorous								
Hardness as CaCO3	OG	500	63	85	80	90	91	89
Calcium			17	24	22	26	25.9	25
Magnesium			5	6	6	6	6.35	6.45
Potassium			1	2	1	1	1.6	1.6
Sodium	AO	200	5	6	4	5	5.1	5.8
Aluminum	OG	0.1	<0.01	<0.01	<0.01	<0.01	0.01	< 0.01
Barium	MAC	1	0.03	0.04	0.04	0.03	0.035	0.034
Beryllium			<0.0005	<0.0005	<0.0005	<0.0005	< 0.0001	< 0.0001
Boron	IMAC	5	<0.01	0.02	<0.01	<0.01	< 0.005	0.007
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002	< 0.00002
Chromium	MAC	0.05	<0.001	0.001	<0.001	<0.001	< 0.002	< 0.002
Cobalt			0.0106	0.0076	0.0006	0.0005	0.0018	0.0049
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	< 0.0001	< 0.002
Iron	AO	0.3	0.34	0.38	0.32	0.32	0.389	0.463
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	< 0.00002	0.00002
Manganese	AO	0.05	0.05	0.04	0.03	0.03	0.035	0.046
Molybdenum			<0.005	<0.005	<0.005	<0.005	0.0001	0.0006
Nickel			<0.005	<0.005	<0.005	<0.005	< 0.01	< 0.01
Silicon			5.7	4.8	5.3	5.5	5.36	5.49
Silver			<0.0001	<0.0001	<0.0001	<0.0001		
Strontium			0.042	0.048	0.041	0.039	0.048	0.046
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	< 0.00005	< 0.00005
Titanium			<0.01	<0.01	<0.01	<0.01	< 0.005	< 0.005
Vanadium			<0.001	<0.001	<0.001	<0.001	0.0009	0.0013
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	< 0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)							< 0.01	< 0.01
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C			8	6.9	7.9	7	7.3	7.8
pH			7.7	7.1	7.6	6.8	8.2	7.8
Conductivity uS/cm			166	218	145	1085	177	204

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-5 (Shallow)

Sample Date			Jun-15	Oct-15	May-16	Nov-16	Apr-17	Oct-17
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	88	88	96	99	94	86
BOD								
COD								
Chloride	AO	250	4.5	5.7	4.91	7.40	4.8	4.6
Conductivity uS/cm			193	196	208	214	201	186
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.1	< 0.1	<0.05	<0.05	< 0.1	< 0.05
N-NO3 (Nitrate)	MAC	10	< 0.1	< 0.1	<0.05	<0.05	0.2	< 0.05
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	118	124	100	126	108	99
Total Kjeldahl Nitrogen			0.2	< 0.05	<0.10	<0.10	0.24	< 0.1
Total phosphorous								
Hardness as CaCO3	OG	500	94	98	87.7	85.2	93	88
Calcium			26.5	26.9	24.7	24.4	26.2	24.5
Magnesium			6.73	7.48	6.32	5.90	6.74	6.51
Potassium			1.9	1.5	1.63	1.58	1.5	1.5
Sodium	AO	200	5.6	4.8	5.04	5.95	6.2	6.1
Aluminum	OG	0.1	< 0.01	< 0.01	<0.004	<0.004	0.02	0.03
Barium	MAC	1	0.035	0.039	0.037	0.035	0.038	0.038
Beryllium			< 0.0001	< 0.0001	<0.001	<0.001	< 0.0001	< 0.0001
Boron	IMAC	5	< 0.005	0.005	<0.010	<0.010	< 0.005	0.005
Cadmium	MAC	0.005	< 0.00002	< 0.00002	<0.001	<0.001	< 0.000020	< 0.000014
Chromium	MAC	0.05	< 0.002	< 0.002	<0.003	<0.003	< 0.002	< 0.002
Cobalt			0.0001	< 0.0001	<0.001	<0.001	< 0.0001	< 0.0001
Copper	AO	1	< 0.002	< 0.002	<0.003	<0.003	< 0.002	< 0.002
Iron	AO	0.3	0.288	0.472	0.428	0.387	0.191	0.37
Lead	MAC	0.01	< 0.00002	< 0.00002	<0.002	<0.002	< 0.00002	< 0.00002
Manganese	AO	0.05	0.03	0.04	0.029	0.031	0.034	0.03
Molybdenum			0.0001	0.0001			0.0001	< 0.0001
Nickel			< 0.01	< 0.01	<0.003	<0.003	0.0006	0.0005
Silicon			4.45	5.5	5.70	5.19	5.7	6.19
Silver								
Strontium			0.049	0.049	0.042	0.040	0.043	0.04
Thallium			< 0.00005	< 0.00005	<0.006	<0.006	< 0.00005	< 0.00005
Titanium			< 0.005	< 0.005	<0.002	<0.002	< 0.005	< 0.005
Vanadium			0.0009	0.0007	<0.002	<0.002	0.0008	0.0007
Zinc	AO	5	0.005	< 0.005	0.042	<0.005	< 0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			< 0.01	< 0.01				
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C			7.9	8	7.5	7.4	7.3	7.6
pH			7.5	7.2	7.2	7.2	7.6	8.2
Conductivity uS/cm			213	181	190	210	208	170

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 91-5 (Shallow)

Sample Date			May-18	Oct-18				
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	90	86				
BOD								
COD								
Chloride	AO	250	6	4				
Conductivity uS/cm			201	190				
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1		< 0.10				
N-NO3 (Nitrate)	MAC	10		< 0.10				
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	131	124				
Total Kjeldahl Nitrogen			1.4	< 0.8				
Total phosphorous								
Hardness as CaCO3	OG	500	96	70				
Calcium			27	20				
Magnesium			7	5				
Potassium			2	1				
Sodium	AO	200	5	6				
Aluminum	OG	0.1	< 0.01	< 0.01				
Barium	MAC	1	0.04	0.04				
Beryllium			< 0.0005	< 0.0005				
Boron	IMAC	5	< 0.01	< 0.01				
Cadmium	MAC	0.005	< 0.0001	< 0.0001				
Chromium	MAC	0.05	< 0.001	< 0.001				
Cobalt			< 0.0002	< 0.0002				
Copper	AO	1	< 0.001	< 0.001				
Iron	AO	0.3	0.43	0.41				
Lead	MAC	0.01	< 0.001	< 0.001				
Manganese	AO	0.05	0.03	0.003				
Molybdenum			< 0.005	< 0.005				
Nickel			< 0.005	< 0.005				
Silicon			6.1	6.1				
Silver								
Strontium			0.045	0.041				
Thallium			< 0.0001	< 0.0001				
Titanium			< 0.01	< 0.01				
Vanadium			< 0.001	< 0.001				
Zinc	AO	5	< 0.01	< 0.01				
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C			7.5	7.4				
pH			7	6.9				
Conductivity uS/cm			173	146				

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-3S

Sample Date			Sep-95	Aug-96	Nov-96	Jul-97	Nov-98	Jul-99
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	80	39	80	90	78	70
BOD								
COD			46					<3
Chloride	AO	250	0.7	0.6	<0.1	1	0.9	1.2
Conductivity us/cm				90	155	154	153	161
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1						<0.1
N-NO3 (Nitrate)	MAC	10	<0.1	0.9	0.1	<0.1	<0.1	0.2
Phenols			0.02	<0.001	<0.001	0.003	<0.001	0.002
Sulphate	AO	500	10	5	9	8	8	7
Total Dissolved Solids	AO	500		67	90	103	98	
Total Kjeldahl Nitrogen								0.38
Total phosphorous								1.2
Hardness as CaCO3	OG	500						74
Calcium			20.2	9.76	17.9	19.6	17.6	18.3
Magnesium			6.7	2.97	6.5	7.11	6.56	6.8
Potassium			2.3	4.1	1.3	5	2.2	44
Sodium	AO	200	3.06	1.1	2.4	2.6	2.4	2.6
Aluminum	OG	0.1	0.43	0.1	0.2	0.45	0.09	0.72
Barium	MAC	1	0.016	0.012	0.014	0.02	0.016	0.015
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	IMAC	5	<0.01	<0.01	<0.01	0.01	<0.01	0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.01	<0.0001	
Chromium	MAC	0.05	0.011	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt			<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Copper	AO	1	0.012	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	AO	0.3	0.968	0.18	0.53	1.5	0.25	1.15
Lead	MAC	0.01	0.0013	<0.0002	<0.0002	<0.1	<0.0002	0.0004
Manganese	AO	0.05	0.34	<0.01	0.02	0.08	0.03	0.02
Molybdenum			<0.02	<0.02	0.04	<0.02	<0.02	<0.02
Nickel			<0.02		<0.02	<0.02	<0.02	<0.02
Silicon			7.38	5.82	6.32	6.87	5.87	7.86
Silver			0.012	<0.01	<0.01	<0.01	<0.01	<0.01
Strontium			0.04	0.015	0.028	0.032	0.027	0.03
Thallium								
Titanium			0.024	<0.01	<0.01	0.02	<0.01	<0.05
Vanadium			0.01	0.005	<0.005	0.006	<0.005	<0.005
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025	<0.1	<0.1	<0.001	<0.1	<0.1	<0.001
Fluoride	MAC	1.5						
Mercury	MAC	0.001						<0.0001
N-NH3 (Ammonia)								0.01
Phosphorus			<0.1	0.2	<0.1	<0.1	<0.1	<0.1
pH (no units)	OG	6.5-8.5	7.75	8.38	8.07	8.1	8	7.65
Selenium	MAC	0.01						<0.001
Tin			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dissolved Reactive P								
Field Parameters								
Temperature °C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-3S

Sample Date			Nov-99	Jun-00	Oct-00	Jun-01	Jun-02	Nov-02
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	100	81	67	62	68	67
BOD								
COD								
Chloride	AO	250	1.1	1.1	1	1.2	1.4	1.4
Conductivity us/cm			150	150	146	146	145	154
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1						<0.1
N-NO3 (Nitrate)	MAC	10	0.1	<0.1	0.1			
Phenols			<0.001	0.003	<0.001	0.023	<0.001	<0.001
Sulphate	AO	500	6	6	7	7	6	7
Total Dissolved Solids	AO	500	100	102	88	130	78	106
Total Kjeldahl Nitrogen								
Total phosphorous						0.29		
Hardness as CaCO3	OG	500						
Calcium			25	17.5	17	17.8	19.2	18.9
Magnesium			6.04	6.23	6.5	5.92	6.38	6.61
Potassium			3.8	1.9	<0.4	<0.4	<0.4	1.6
Sodium	AO	200	3.1	2.3	2.3	1.9	2.3	2.7
Aluminum	OG	0.1	0.91	0.24	0.16	0.24	<0.01	0.04
Barium	MAC	1	0.025	0.01	0.01	0.005	0.008	0.01
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	IMAC	5	0.01	<0.01	<0.01	<0.01	0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.01	<0.01
Chromium	MAC	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt			<0.01		<0.01	<0.01	<0.01	0.01
Copper	AO	1	<0.01	<0.01	<0.01	<0.01		<0.01
Iron	AO	0.3	1.15	0.66	0.28	0.19	0.21	0.13
Lead	MAC	0.01	<0.0002	<0.0002	<0.0002	0.0002	<0.1	<0.1
Manganese	AO	0.05	0.06	0.01	0.01	<0.01	0.01	0.01
Molybdenum			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon			7.71	6.28	5.14	5.53	6.48	6.11
Silver			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Strontium			0.03	0.025	0.03	0.025	0.026	0.03
Thallium								
Titanium			0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			<0.05	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025	<0.1	<0.1	<0.1	<0.001	<0.1	<0.1
Fluoride	MAC	1.5				0.1		
Mercury	MAC	0.001						
N-NH3 (Ammonia)							<0.1	
Phosphorus			<0.01	<0.1	<0.1		<0.1	<0.1
pH (no units)	OG	6.5-8.5	8.04	7.99	7.92	7.63		8.1
Selenium	MAC	0.01						
Tin			<0.2	<0.2			<0.2	<0.2
Dissolved Reactive P								
Field Parameters								
Temperature °C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-3S

Sample Date			May-04	Sep-04	May-05	Nov-05	May-06	Oct-06
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	62	70	75	76	75	73
BOD					<1	<1		<1
COD			7	15	<5	<5	<5	<5
Chloride	AO	250	1.1	1.3	<1	2	2	1
Conductivity us/cm			148	159	152	154	153	156
DOC	AO	5	0.5	0.7	0.8	1.1	1.1	1.2
N-NO2 (Nitrite)	MAC	1			<0.10	<0.10		<0.10
N-NO3 (Nitrate)	MAC	10			<0.10	<0.10		<0.10
Phenols			<0.001	<0.001	<0.001	<0.001		<0.001
Sulphate	AO	500	6	7	7	7		8
Total Dissolved Solids	AO	500			99	100	100	101
Total Kjeldahl Nitrogen					<0.05	<0.05	<0.05	0.12
Total phosphorous			0.66	0.62	0.27	0.73		0.18
Hardness as CaCO3	OG	500	70	70	67	65		76
Calcium			17.6	17.2	17	16	17	19
Magnesium			6.36	6.59	6	6	6	7
Potassium			1.3	1.3	1	1	1	2
Sodium	AO	200	2.5	2.4	2	2	<2	<2
Aluminum	OG	0.1	0.015	0.006	<0.01	<0.01	<0.01	<0.01
Barium	MAC	1	0.009	0.008	<0.01	<0.01	<0.01	0.01
Beryllium			<0.001	<0.001	<0.001	<0.001		<0.001
Boron	IMAC	5	<0.005	<0.005	<0.01	<0.01	0.02	<0.01
Cadmium	MAC	0.005	<0.0001	<0.001	<0.0001	<0.0001		<0.0001
Chromium	MAC	0.05	<0.001	<0.001	<0.001	<0.001	0.001	<0.001
Cobalt			<0.005	<0.005	<0.0002	<0.0002	<0.0002	<0.0002
Copper	AO	1	<0.002	<0.002	<0.001	0.001	0.103	0.001
Iron	AO	0.3	0.103	0.033	0.06	0.15	0.09	0.16
Lead	MAC	0.01	0.0002	<0.0005	<0.001	<0.001		<0.001
Manganese	AO	0.05	0.008	0.003	0.01	0.01	<0.01	0.01
Molybdenum			<0.01	<0.01	<0.005	<0.005		<0.005
Nickel			<0.01	<0.01	<0.005	<0.005		<0.005
Silicon			6.05	5.6	7.2	6.9	5.8	7.5
Silver			<0.005	<0.005	<0.0001	<0.0001		<0.0001
Strontium			0.025	0.025	0.028	0.032	0.028	0.038
Thallium					<0.0001	<0.0001		<0.0001
Titanium			<0.005	<0.005	<0.01	<0.01		<0.01
Vanadium			<0.005	<0.005	<0.001	<0.001		0.001
Zinc	AO	5	<0.005	<0.005	<0.01	0.01	<0.01	<0.01
Arsenic	IMAC	0.025	<0.001	0.001				
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)							<0.02	
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01	<0.001	0.001				
Tin			<0.05	<0.05				
Dissolved Reactive P							0.06	
Field Parameters								
Temperature °C					8.1	6.7	9.1	8
pH					8.2	8.03	8.1	6.69
Conductivity us/cm					136	137	114	133

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-3S

Sample Date			May-07	Oct-07	May-08	Oct-08	May-09	Sep-09
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	74	73	72	71	79	75
BOD			<1	1	1	<1	1	2
COD			<5	<5	5	8	<5	<5
Chloride	AO	250	2	1	1	1	1	1
Conductivity us/cm			156	157	156	153	164	157
DOC	AO	5	1.4	1.2	1.1	1.4	1.2	1.5
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.1	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10		<0.10	<0.10	<0.10
Phenols			<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Sulphate	AO	500	7	6	6	6	6	7
Total Dissolved Solids	AO	500	101	102	101	100	107	102
Total Kjeldahl Nitrogen			0.3	<0.10	0.1	<0.10	<0.10	<0.10
Total phosphorous			0.13	0.1	0.03	0.23	0.05	0.91
Hardness as CaCO3	OG	500	76	79	72	76	83	76
Calcium			19	20	19	19	20	19
Magnesium			7	7	6	7	8	7
Potassium			1	1	1	1	1	1
Sodium	AO	200	2	<2	2	<2	3	3
Aluminum	OG	0.1	0.11	<0.01	<0.01	0.11	0.05	0.1
Barium	MAC	1	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
Beryllium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IMAC	5	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.004	<0.001	<0.001	0.002	<0.001	<0.001
Cobalt			0.0042	<0.0002	0.03	0.0114	0.0238	0.0198
Copper	AO	1	0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	0.49	0.13	0.2	0.29	0.23	0.22
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.02	<0.01	0.07	0.04	0.05	0.04
Molybdenum			<0.005	<0.005	0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			6.9	6.1	6.2	6.8	6.3	5.9
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.027	0.038	0.028	0.032	0.029	0.027
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			0.003	0.001	0.002	0.002	0.001	0.003
Zinc	AO	5	<0.01	0.02	<0.1	0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature °C			8.2	8.2			8.7	7.4
pH			6.96	7.22			8.6	8
Conductivity us/cm			134	118			177	134

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-3S

Sample Date			May-10	Oct-10	Jun-11	Oct-11	Jun-12	Oct-12
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	75	74	76	75	72	74
BOD								
COD								
Chloride	AO	250	1	<1	1	<1	<1	<1
Conductivity us/cm			156	152	148	147	144	148
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols							<0.001	<0.001
Sulphate	AO	500					5	5
Total Dissolved Solids	AO	500	101	99	96	96	94	96
Total Kjeldahl Nitrogen			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total phosphorous								
Hardness as CaCO3	OG	500	67	67	74	74	53	65
Calcium			17	17	18	18	13	16
Magnesium			6	6	7	7	5	6
Potassium			1	1	1	2	1	1
Sodium	AO	200	<2	<2	<2	2	<2	2
Aluminum	OG	0.1	0.03	0.03	0.03	0.02	0.03	<0.01
Barium	MAC	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Beryllium			<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IMAC	5	0.05	<0.01	<0.01	0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Cobalt			0.0105	0.0084	0.0084	0.0171	0.0017	0.0005
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	0.16	0.16	0.17	0.25	0.12	0.08
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.03	0.03	0.02	0.04	0.01	<0.01
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			5.2	5.5	5.7	5.6	6.1	5
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.029	0.027	0.031	0.028	0.028	0.027
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			0.003	0.002	0.002	0.002	0.002	0.002
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5				6.85		
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			9.3	6.8	7.9	7.3	8.4	6.8
pH			8.4	8.5	7.8	8.1	7.8	7.3
Conductivity us/cm			151	116	120	147	128	144

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-3S

Sample Date			Jun-13	Nov-13	Apr-14	Oct-14	Jun-15	Oct-15
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	70	75	71	71	69	70
BOD								
COD								
Chloride	AO	250	<1	1	0.8	0.9	1.1	0.9
Conductivity us/cm			145	156	149	150	146	144
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	< 0.10	< 0.10	< 0.1	< 0.1
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	< 0.10	< 0.10	< 0.1	< 0.1
Phenols			<0.001	<0.001				
Sulphate	AO	500	5	5				
Total Dissolved Solids	AO	500	94	101	77.2	76.9	91	86
Total Kjeldahl Nitrogen			<0.10	<0.10	0.21	0.05	0.1	< 0.05
Total phosphorous								
Hardness as CaCO3	OG	500	67	79	75	75	74	77
Calcium			17	20	19	18.2	18.2	18.5
Magnesium			6	7	6.75	6.59	7	7.51
Potassium			1	1	1.4	1.3	1.3	1.2
Sodium	AO	200	2	<2	2.4	2.3	2.3	2.1
Aluminum	OG	0.1	<0.01	0.02	0.02	0.02	0.02	< 0.01
Barium	MAC	1	<0.01	<0.01	0.009	0.008	0.008	0.009
Beryllium			<0.0005	<0.0005	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Boron	IMAC	5	<0.01	<0.01	< 0.005	0.006	< 0.005	0.006
Cadmium	MAC	0.005	<0.0001	<0.0001	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	MAC	0.05	<0.001	<0.001	< 0.002	< 0.002	< 0.002	< 0.002
Cobalt			0.0098	0.0026	0.0028	0.001	0.0002	< 0.0001
Copper	AO	1	<0.001	<0.001	0.0002	< 0.002	< 0.002	< 0.002
Iron	AO	0.3	0.18	0.16	0.085	0.102	0.101	0.134
Lead	MAC	0.01	<0.001	<0.001	0.00003	0.00006	< 0.00002	< 0.00002
Manganese	AO	0.05	0.02	0.01	0.013	0.013	0.008	0.009
Molybdenum			<0.005	<0.005	0.0002	< 0.0001	0.0001	0.0002
Nickel			<0.005	<0.005	< 0.01	< 0.01	< 0.01	< 0.01
Silicon			5.7	6.1	5.6	5.58	6	5.6
Silver			<0.0001	<0.0001				
Strontium			0.031	0.029	0.035	0.033	0.033	0.037
Thallium			<0.0001	<0.0001	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Titanium			<0.01	<0.01	< 0.005	< 0.005	< 0.005	< 0.005
Vanadium			0.001	0.001	0.0011	0.0016	0.0015	0.0012
Zinc	AO	5	<0.01	<0.01	< 0.005	< 0.005	< 0.005	0.007
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)					< 0.01	< 0.01	< 0.01	< 0.01
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^oC			9.2	7.6	7.6	7.4	8.1	7.7
pH			6.8	8.5	8.5	8	7.4	7.3
Conductivity us/cm			113	158	134	147	154	132

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-3S

Sample Date			May-16	Nov-16	Apr-17	Oct-17	May-18	Oct-18
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	75	73	73	73	69	72
BOD								
COD								
Chloride	AO	250	1.21	0.80	0.7	1.2	< 1	1
Conductivity us/cm			157	148	148	157	147	147
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.05	<0.05	< 0.1	< 0.05	< 0.10	< 0.10
N-NO3 (Nitrate)	MAC	10	<0.05	<0.05	< 0.1	< 0.05	< 0.10	< 0.10
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	72	96	79.8	81	96	96
Total Kjeldahl Nitrogen			<0.10	<0.10	< 0.05	< 0.1	1.7	< 0.8
Total phosphorous								
Hardness as CaCO3	OG	500	72.3	67.4		83	74	62
Calcium			18.3	17.0	20.3	20	18	15
Magnesium			6.46	6.07	7.02	7.95	7	6
Potassium			1.30	1.28	1.2	1.3	1	1
Sodium	AO	200	2.04	2.05	2.2	2.4	2	2
Aluminum	OG	0.1	0.024	0.017	0.02	0.02	< 0.01	< 0.01
Barium	MAC	1	0.009	0.009	0.01	0.009	< 0.01	<0.01
Beryllium			<0.001	<0.001	< 0.0001	< 0.0001	< 0.0005	< 0.0005
Boron	IMAC	5	<0.010	<0.010	0.023	0.008	< 0.01	< 0.01
Cadmium	MAC	0.005	<0.001	<0.001	< 0.000014	< 0.000014	< 0.0001	< 0.0001
Chromium	MAC	0.05	<0.003	<0.003	< 0.002	< 0.002	< 0.001	< 0.001
Cobalt			<0.001	<0.001	< 0.0001	< 0.0001	< 0.0002	< 0.0002
Copper	AO	1	<0.003	<0.003	< 0.002	< 0.002	< 0.001	< 0.001
Iron	AO	0.3	0.077	0.108	0.085	0.024	0.04	0.05
Lead	MAC	0.01	<0.002	<0.002	< 0.00002	< 0.00002	< 0.001	< 0.001
Manganese	AO	0.05	0.008	0.006	0.007	0.004	< 0.01	< 0.01
Molybdenum					0.0002	0.0001	< 0.005	< 0.005
Nickel			<0.003	<0.003	0.0006	0.0005	< 0.005	< 0.005
Silicon			5.91	5.80	6.07	6.27	5.7	5.9
Silver								
Strontium			0.031	0.025		0.032	0.025	0.028
Thallium			<0.006	<0.006	< 0.00005	< 0.00005	< 0.0001	< 0.0001
Titanium			<0.002	<0.002	< 0.005	< 0.005	< 0.01	< 0.01
Vanadium			<0.002	<0.002	0.0011	0.0018	0.001	0.001
Zinc	AO	5	0.007	<0.005	< 0.005	< 0.005	< 0.01	< 0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin					< 0.05			
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.5	6.5	6.8	7.5	7.5	7.3
pH			7.9	8	7.7	8.5	8	7.2
Conductivity us/cm			146	145	152	140	127	117

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-3D

Sample Date			Nov-08	May-09	Sep-09	May-10	Oct-10	Jun-11
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	75	75	76	73	75	79
BOD			1	2	<1			
COD			8	<5	<5			
Chloride	AO	250	14	12	12	13	12	12
Conductivity us/cm			222	210	214	213	210	207
DOC	AO	5	0.8	1	1			
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols			<0.001	<0.001	<0.001			
Sulphate	AO	500	14	13	12			
Total Dissolved Solids	AO	500	144	137	139	138	137	135
Total Kjeldahl Nitrogen			0.14	<0.10	<0.10	<0.10	0.36	<0.10
Total phosphorous			0.92	0.43	0.62			
Hardness as CaCO3	OG	500	80	90	81	84	84	93
Calcium			22	23	21	22	22	24
Magnesium			6	8	7	7	7	8
Potassium			3	3	4	3	2	3
Sodium	AO	200	9	6	7	5	4	6
Aluminum	OG	0.1	0.17	0.04	0.07	0.02	0.05	0.02
Barium	MAC	1	0.03	0.02	0.02	0.02	0.02	0.02
Beryllium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005
Boron	IMAC	5	0.01	<0.01	<0.01	0.04	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Cobalt			0.0147	0.0168	0.0004	0.0007	0.0002	<0.0002
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	0.09	0.05	0.05	0.04	0.07	0.03
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.05	0.05	0.02	0.02	0.02	0.02
Molybdenum			0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			10.5	9.5	9.3	8.2	9.5	8.8
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.186	0.108	0.087	0.073	0.069	0.07
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C				8.9	7.3	8.9	6.7	7.7
pH				8.8	8.3	8.4	8.5	8.2
Conductivity us/cm				223	181	215	159	170

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-3D

Sample Date			Oct-11	Jun-12	Oct-12	Jun-13	Nov-13	Apr-14
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	84	79	80	76	79	74
BOD								
COD								
Chloride	AO	250	12	12	11	11	10	8.3
Conductivity us/cm			221	213	216	208	217	208
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	< 0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	< 0.10
Phenols				<0.001	<0.001	<0.001	<0.001	
Sulphate	AO	500		14	13	14	14	
Total Dissolved Solids	AO	500	144	138	38	135	141	106
Total Kjeldahl Nitrogen			0.12	<0.10	<0.10	<0.10	<0.10	0.17
Total phosphorous								
Hardness as CaCO3	OG	500	86	75	91	86	95	94
Calcium			23	20	25	23	25	24.9
Magnesium			7	6	7	7	8	7.68
Potassium			3	2	3	3	3	2.8
Sodium	AO	200	6	5	5	5	5	5.6
Aluminum	OG	0.1	0.04	0.04	0.04	0.02	0.02	0.02
Barium	MAC	1	0.02	0.02	0.02	0.02	0.02	0.018
Beryllium			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	0.0002
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	<0.01	< 0.005
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002
Chromium	MAC	0.05	0.001	<0.001	<0.001	<0.001	<0.001	< 0.002
Cobalt			<0.0002	0.0003	<0.0002	0.0005	<0.0002	0.0002
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.0001
Iron	AO	0.3	0.06	0.04	0.05	0.04	0.04	0.029
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.00002
Manganese	AO	0.05	0.02	0.02	0.02	0.02	0.02	0.022
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	0.001
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	< 0.01
Silicon			9.4	10	8.7	9.5	9.6	9.68
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Strontium			0.069	0.067	0.067	0.073	0.062	0.074
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00005
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	< 0.005
Vanadium			<0.001	<0.001	<0.001	<0.001	<0.001	0.0005
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								< 0.01
Phosphorus								
pH (no units)	OG	6.5-8.5	7.15					
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.3	8.4	6.8	8.5	7.9	7.7
pH			8.3	8	7.4	7.1	8.6	8.5
Conductivity us/cm			216	186	213	167	216	186

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-3D

Sample Date			Oct-14	Jun-15	Oct-15	May-16	Nov-16	Apr-17
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	76	78	78	83	81	79
BOD								
COD								
Chloride	AO	250	8.2	7.8	7.5	9.52	7.22	7.5
Conductivity us/cm			197	210	202	215	206	198
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.10	< 0.1	< 0.1	<0.05	<0.05	< 0.1
N-NO3 (Nitrate)	MAC	10	< 0.10	< 0.1	< 0.1	<0.05	<0.05	< 0.1
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	107	137	121	110	136	109
Total Kjeldahl Nitrogen			0.05	0.1	< 0.05	<0.10	<0.10	< 0.05
Total phosphorous								
Hardness as CaCO3	OG	500	99	94	98	89.0	85.3	
Calcium			23.8	24.3	24.5	23.6	22.7	25.5
Magnesium			7.46	7.96	8.84	7.31	6.94	7.86
Potassium			2.8	2.8	2.7	2.77	2.72	2.7
Sodium	AO	200	5.3	5.3	5.4	4.91	4.90	5.3
Aluminum	OG	0.1	0.03	0.02	0.01	0.012	0.016	0.03
Barium	MAC	1	0.018	0.018	0.019	0.018	0.017	0.02
Beryllium			< 0.0001	< 0.0001	< 0.0001	<0.001	<0.001	< 0.0001
Boron	IMAC	5	0.006	< 0.005	0.007	<0.010	<0.010	0.022
Cadmium	MAC	0.005	0.00004	< 0.00002	< 0.00002	<0.001	<0.001	< 0.000014
Chromium	MAC	0.05	< 0.002	< 0.002	< 0.002	<0.003	<0.003	< 0.002
Cobalt			< 0.0001	< 0.0001	< 0.0001	<0.001	<0.001	< 0.0001
Copper	AO	1	< 0.002	< 0.002	< 0.002	<0.003	<0.003	< 0.002
Iron	AO	0.3	0.049	< 0.005	0.053	<0.010	<0.010	0.048
Lead	MAC	0.01	0.0001	< 0.00002	< 0.00002	<0.002	<0.002	< 0.00002
Manganese	AO	0.05	0.023	0.02	0.026	0.019	0.016	0.021
Molybdenum			0.0008	0.0007	0.001			0.0009
Nickel			< 0.01	< 0.01	< 0.01	<0.003	<0.003	0.0006
Silicon			9.62	10.2	9.8	9.90	9.83	10.6
Silver								
Strontium			0.071	0.074	0.074	0.064	0.053	
Thallium			< 0.00005	< 0.00005	< 0.00005	<0.006	<0.006	< 0.00005
Titanium			< 0.005	< 0.005	< 0.005	<0.002	<0.002	< 0.005
Vanadium			0.001	0.0007	0.0004	<0.002	<0.002	0.0004
Zinc	AO	5	< 0.005	< 0.005	< 0.005	<0.005	<0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			< 0.01	< 0.01	< 0.01			
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								< 0.05
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.5	8	7.7	7.5	6.3	6.9
pH			8.1	7.5	7.4	7.9	8.2	7.7
Conductivity us/cm			199	225	187	196	204	205

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-3D

Sample Date			Oct-17	May-18	Oct-18			
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	76	78	81			
BOD								
COD								
Chloride	AO	250	6.2	6	7			
Conductivity us/cm			199	205	206			
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.05	< 0.10	< 0.10			
N-NO3 (Nitrate)	MAC	10	< 0.05	< 0.10	< 0.10			
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	102	133	134			
Total Kjeldahl Nitrogen			< 0.1	1.5	< 0.8			
Total phosphorous								
Hardness as CaCO3	OG	500	92	95	81			
Calcium			23.7	25	21			
Magnesium			7.85	8	7			
Potassium			2.7	3	3			
Sodium	AO	200	5.4	5	5			
Aluminum	OG	0.1	0.03	< 0.01	< 0.01			
Barium	MAC	1	0.019	0.02	< 0.02			
Beryllium			< 0.0001	< 0.0005	< 0.0005			
Boron	IMAC	5	0.008	< 0.01	< 0.01			
Cadmium	MAC	0.005	< 0.000014	< 0.0001	< 0.0001			
Chromium	MAC	0.05	< 0.002	< 0.001	< 0.001			
Cobalt			< 0.0001	< 0.0002	< 0.0002			
Copper	AO	1	< 0.002	< 0.001	< 0.001			
Iron	AO	0.3	0.035	0.04	0.05			
Lead	MAC	0.01	< 0.00002	< 0.001	< 0.001			
Manganese	AO	0.05	0.02	0.02	0.02			
Molybdenum			0.0008	< 0.5	< 0.005			
Nickel			0.0004	< 0.005	< 0.005			
Silicon			10.4	9.9	10.2			
Silver								
Strontium			0.062	0.06	0.066			
Thallium			< 0.00005	< 0.0001	< 0.0001			
Titanium			< 0.005	< 0.01	< 0.01			
Vanadium			0.0002	< 0.001	< 0.001			
Zinc	AO	5	< 0.005	< 0.01	< 0.01			
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.6	7.5	7.4			
pH			8.6	8.2	7.6			
Conductivity us/cm			180	176	160			

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-4S

Sample Date			Sep-95	Aug-96	Nov-96	Jul-97	Nov-98	Jul-99
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	136	166	120	168	105	126
BOD								
COD			20					<3
Chloride	AO	250	6.5	0.6	<0.1	0.8	1	1.1
Conductivity us/cm				306	241	281	212	258
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1						<0.1
N-NO3 (Nitrate)	MAC	10	<0.1	<0.1	0.1	<0.1	<0.1	0.2
Phenols			0.019	0.002	<0.001	0.041	0.002	0.004
Sulphate	AO	500	5	5	6	5	6	5
Total Dissolved Solids	AO	500	164	180	135	188	124	
Total Kjeldahl Nitrogen								<0.05
Total phosphorous								0.15
Hardness as CaCO3	OG	500						136
Calcium			37	44.9	37.6	45.3	29.6	36.9
Magnesium			10.6	13.7	10.4	12.9	8	10.6
Potassium			1.56	7.2	1.1	<0.04	1.4	3.7
Sodium	AO	200	3.9	7.3	1.7	1.9	1.6	1.8
Aluminum	OG	0.1	<0.01	1.53	0.03	0.05	<0.01	0.03
Barium	MAC	1	0.03	0.067	0.035	0.039	0.027	0.035
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	IMAC	5	<0.01	<0.01	<0.01	0.01	<0.01	0.01
Cadmium	MAC	0.005	0.0001	<0.0001	<0.0001	<0.01	<0.0001	
Chromium	MAC	0.05	0.013	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt			0.014	0.01	<0.01	<0.01	<0.01	<0.01
Copper	AO	1	<0.010	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	AO	0.3	0.117	1.54	0.09	0.06	0.02	0.06
Lead	MAC	0.01	0.0018	<0.0002	<0.0002	<0.1	<0.0002	<0.0002
Manganese	AO	0.05	0.012	0.08	0.03	0.05	0.02	0.02
Molybdenum			<0.02	0.05	0.04	5	<0.02	<0.02
Nickel			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon			7.12	13.2	7.62	8.2	6.9	7.31
Silver			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Strontium			0.054	0.071	0.05	0.061	0.04	0.055
Thallium								
Titanium			<0.01	0.13	<0.01	<0.01	<0.01	<0.05
Vanadium			0.01	0.005	<0.005	0.007	0.005	<0.005
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025	<0.1	<0.1	<0.001	<0.1	<0.1	<0.001
Fluoride	MAC	1.5						
Mercury	MAC	0.001						<0.0001
N-NH3 (Ammonia)								<0.01
Phosphorus			<0.100	0.1	<0.1	<0.1	<0.1	<0.1
pH (no units)	OG	6.5-8.5	7.95	8.05	8.31	8.31	7.89	7.71
Selenium	MAC	0.01						<0.001
Tin			<0.2	<0.2	<0.2	<0.2	<0.2	<0.2
Dissolved Reactive P								
Field Parameters								
Temperature °C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-4S

Sample Date			Nov-99	Jun-00	Oct-00	Oct-00	Jun-01	Oct-01
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	114	176	155	160	173	167
BOD								
COD								
Chloride	AO	250	0.9	1	1	1	1.1	1.1
Conductivity us/cm			212	303	258	266	314	298
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1						
N-NO3 (Nitrate)	MAC	10	0.1	<0.1	<0.1	<0.1		
Phenols			<0.001	0.002	<0.001	<0.001	0.004	0.004
Sulphate	AO	500	5	4	4	4	4	3
Total Dissolved Solids	AO	500	126	174	150	158	188	179
Total Kjeldahl Nitrogen								
Total phosphorous							0.09	0.04
Hardness as CaCO3	OG	500						
Calcium			36.5	40.1	38.5	41.9	47.9	45.9
Magnesium			9.08	10.3	11.5	12.7	12.1	12.3
Potassium			<0.4	<0.4	<0.4	<0.4	<0.4	2.7
Sodium	AO	200	1.8	1.7	1.7	1.9	1.6	2.4
Aluminum	OG	0.1	0.01	0.09	0.24	0.26	0.55	0.08
Barium	MAC	1	0.03	0.03	0.035	0.035	0.035	0.045
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0006
Chromium	MAC	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt			0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	AO	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	AO	0.3	<0.02	0.1	0.08	0.07	0.04	0.58
Lead	MAC	0.01	<0.0002	<0.0002	<0.0002	0.0012	0.0002	<0.0012
Manganese	AO	0.05	0.04	0.02	0.02	0.02	0.03	0.1
Molybdenum			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon			7	7.06	6.02	6.01	7.12	7.78
Silver			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Strontium			0.05	0.05	0.055	0.06	0.065	0.06
Thallium								
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			<0.05	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025	<0.1	<0.1	<0.1	<0.1	0.001	<0.001
Fluoride	MAC	1.5					0.1	0.1
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus			<0.01	<0.1	<0.1	<0.1		
pH (no units)	OG	6.5-8.5	8.2	8.28	7.99	8	7.73	8.37
Selenium	MAC	0.01						
Tin			<0.2	<0.2	<0.2	<0.2		
Dissolved Reactive P								
Field Parameters								
Temperature ^oC								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-4S

Sample Date			Jun-02	Nov-02	May-04	Sep-04	May-05	Nov-05
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	161	41	184	198	173	124
BOD							<1	<1
COD					9	10	<5	<5
Chloride	AO	250	1.4	1.4	1.4	1.3	2	<1
Conductivity us/cm			303	101	201	347	320	240
DOC	AO	5			2.5	1.1	1.5	1.2
N-NO2 (Nitrite)	MAC	1		0.5			<0.10	<0.10
N-NO3 (Nitrate)	MAC	10					<0.10	<0.10
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate	AO	500	4	4	3	4	5	6
Total Dissolved Solids	AO	500	172	64			208	156
Total Kjeldahl Nitrogen							0.07	0.07
Total phosphorous					0.03	0.03	0.13	0.02
Hardness as CaCO3	OG	500			201	181	167	114
Calcium			55.9	11.8	55.1	47.8	47	31
Magnesium			14.2	2.9	15.3	14.8	12	9
Potassium			0.8	0.6	1.2	1	<1	<1
Sodium	AO	200	2	1.4	2.2	2.1	<2	<2
Aluminum	OG	0.1	<0.01	0.06	0.334	0.007	0.21	<0.01
Barium	MAC	1	0.047	0.005	0.052	0.04	0.04	0.03
Beryllium			<0.005	<0.005	<0.001	<0.001	<0.001	<0.001
Boron	IMAC	5	0.01	<0.01	<0.005	<0.005	<0.01	<0.01
Cadmium	MAC	0.005	<0.01	<0.01	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.01	<0.01	0.002	<0.001	0.002	<0.001
Cobalt			<0.01	<0.01	<0.005	<0.005	0.0003	<0.0002
Copper	AO	1	<0.01	<0.01	<0.002	<0.002	0.003	0.002
Iron	AO	0.3	0.02	<0.02	0.566	0.006	0.32	<0.03
Lead	MAC	0.01	<0.1	<0.1	0.0002	<0.0005	<0.001	<0.001
Manganese	AO	0.05	0.06	<0.01	0.044	0.01	0.03	0.02
Molybdenum			<0.02	<0.02	<0.01	<0.01	0.005	<0.005
Nickel			<0.02	<0.02	<0.01	<0.01	<0.005	<0.005
Silicon			8.32	5.65	8.2	7.32	8.8	8.2
Silver			<0.01	<0.01	<0.005	<0.005	<0.0001	<0.0001
Strontium			0.07	0.015	0.072	0.066	0.07	0.056
Thallium							<0.0001	<0.0001
Titanium			<0.01	<0.01	0.036	<0.005	0.02	<0.01
Vanadium			0.005	<0.005	<0.005	<0.005	0.005	0.001
Zinc	AO	5	<0.01	<0.01	0.01	0.005	<0.01	<0.01
Arsenic	IMAC	0.025	<0.1	<0.1	<0.001	0.001		
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			0.1					
Phosphorus			<0.1	<0.1				
pH (no units)	OG	6.5-8.5		8.05				
Selenium	MAC	0.01			<0.001	0.001		
Tin			<0.2	<0.2	<0.05	<0.05		
Dissolved Reactive P								
Field Parameters								
Temperature °C							8.8	6.5
pH							6.96	7.82
Conductivity us/cm							292	283

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-4S

Sample Date			May-06	Oct-06	May-07	Oct-07	May-08	Oct-08
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	174	158	169	135	152	139
BOD				<1	<1	1	<1	<1
COD			7	<5	<5	<5	5	8
Chloride	AO	250	<1	1	1	1	1	1
Conductivity us/cm			321	305	321	259	296	276
DOC	AO	5	1.7	1.2	1.9	1.4	1.5	1.4
N-NO2 (Nitrite)	MAC	1		<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10		0.1	<0.10	0.14	<0.10	<0.10
Phenols				<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate	AO	500		6	5	6	5	5
Total Dissolved Solids	AO	500	209	198	209	168	192	179
Total Kjeldahl Nitrogen			0.05	<0.05	0.18	0.11	<0.10	<0.10
Total phosphorous				0.24	0.05	0.07	0.02	0.03
Hardness as CaCO3	OG	500		159	171	147	154	149
Calcium			44	44	47	39	42	40
Magnesium			13	12	13	12	12	12
Potassium			<1	1	<1	<1	<1	<1
Sodium	AO	200	<2	<2	<2	<2	<2	<2
Aluminum	OG	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium	MAC	1	0.04	0.04	0.04	0.03	0.04	0.03
Beryllium				<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.001	<0.001	<0.001	0.001	<0.001	0.001
Cobalt			<0.0002	<0.0002	<0.0002	<0.0002	0.0338	0.0282
Copper	AO	1	0.023	0.046	0.003	0.003	<0.001	<0.001
Iron	AO	0.3	<0.03	<0.03	<0.03	<0.03	0.04	<0.03
Lead	MAC	0.01		<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.03	0.03	0.04	0.03	0.08	0.08
Molybdenum				<0.005	<0.005	<0.005	<0.005	<0.005
Nickel				<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			7.3	6	7.9	7.7	7.6	7.6
Silver				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.061	0.062	0.07	0.064	0.059	0.053
Thallium				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium				<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium				0.002	0.002	0.003	0.003	0.004
Zinc	AO	5	<0.01	0.01	<0.01	0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			<0.02					
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P			0.07					
Field Parameters								
Temperature °C			9.4	7.8	8.5	7.9		
pH			7.97	6.6	6.65	7.12		
Conductivity us/cm			235	246	275	201		

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-4S

Sample Date			May-09	Sep-09	May-10	Oct-10	Jun-11	Oct-11
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	150	138	149	139	180	147
BOD			2	1				
COD			<5	<5				
Chloride	AO	250	1	1	<1	1	<1	<1
Conductivity us/cm			287	267	290	265	319	271
DOC	AO	5	1.7	1.5				
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols			<0.001	<0.001				
Sulphate	AO	500	5	5				
Total Dissolved Solids	AO	500	187	174	189	172	207	176
Total Kjeldahl Nitrogen			<0.10	<0.10	<0.10	0.3	<0.10	<0.10
Total phosphorous			0.01	0.02				
Hardness as CaCO3	OG	500	149	133	152	131	161	140
Calcium			40	35	41	36	43	38
Magnesium			12	11	12	10	13	11
Potassium			1	<1	1	<1	1	<1
Sodium	AO	200	3	3	<2	<2	<2	3
Aluminum	OG	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium	MAC	1	0.04	0.03	0.04	0.03	0.04	0.03
Beryllium			<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005
Boron	IMAC	5	<0.01	<0.01	0.03	<0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	<0.001	<0.001	<0.001	0.002	0.001
Cobalt			0.0242	0.0158	0.0146	0.0181	0.0071	0.0127
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	<0.03	<0.03	<0.03	<0.03	<0.04	<0.03
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.07	0.05	0.05	0.05	0.04	0.04
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			7.6	7.9	7.1	7.4	7.6	6.8
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.058	0.056	0.056	0.05	0.067	0.048
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			0.002	0.002	0.002	0.002	0.002	0.002
Zinc	AO	5	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						8.03
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature °C			8.4	7.8	9	6.6	7.4	7.3
pH			8.2	8.5	8.2	8.4	8.1	7.9
Conductivity us/cm			309	223	278	201	244	268

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-4S

Sample Date			Jun-12	Oct-12	Jun-13	Nov-13	Apr-14	Oct-14
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	158	145	170	164	164	149
BOD								
COD								
Chloride	AO	250	<1	<1	<1	1	0.8	0.9
Conductivity us/cm			292	273	318	310	315	274
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	< 0.10	< 0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	< 0.10	< 0.10
Phenols			<0.001	<0.001	<0.001	<0.001		
Sulphate	AO	500	4	5	<3	4		
Total Dissolved Solids	AO	500	190	177	207	202	170	151
Total Kjeldahl Nitrogen			<0.10	<0.10	<0.10	<0.10	0.18	0.07
Total phosphorous								
Hardness as CaCO3	OG	500	126	143	168	166	186	164
Calcium			34	39	46	45	50.5	42.3
Magnesium			10	11	13	13	14.5	12.4
Potassium			<1	<1	1	<1	1	1
Sodium	AO	200	2	<2	2	<2	2.3	2.1
Aluminum	OG	0.1	<0.01	<0.01	<0.01	<0.01	0.02	0.01
Barium	MAC	1	0.04	0.03	0.05	0.04	0.042	0.036
Beryllium			<0.0005	<0.0005	<0.0005	<0.0005	< 0.0001	< 0.0001
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	< 0.005	0.005
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.001	<0.0001	< 0.00002	< 0.00002
Chromium	MAC	0.05	<0.001	<0.001	0.001	<0.001	< 0.002	< 0.002
Cobalt			0.0007	0.0073	0.009	0.0012	0.0021	0.002
Copper	AO	1	<0.001	<0.001	0.001	<0.001	0.0007	< 0.002
Iron	AO	0.3	<0.03	<0.03	<0.03	<0.03	< 0.005	< 0.005
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	< 0.00002	0.00002
Manganese	AO	0.05	0.03	0.04	0.06	0.03	0.054	0.039
Molybdenum			<0.005	<0.005	<0.005	<0.005	< 0.0001	< 0.0001
Nickel			<0.005	<0.005	<0.005	<0.005	< 0.01	< 0.01
Silicon			7.9	6.6	7.5	7.6	7.86	7.59
Silver			<0.0001	<0.0001	<0.0001	<0.0001		
Strontium			0.057	0.052	0.074	0.057	0.074	0.064
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	< 0.00005	< 0.00005
Titanium			<0.01	<0.01	<0.01	<0.01	< 0.005	< 0.005
Vanadium			0.003	0.002	0.002	0.002	0.0024	0.0033
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	< 0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)							< 0.01	< 0.01
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature °C			9.5	6.8	8.7	7.4	7.8	7.4
pH			7.7	7	7.3	8.2	8.2	7.6
Conductivity us/cm			252	258	248	294	274	273

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-4S

Sample Date			Jun-15	Oct-15	May-16	Nov-16	Apr-17	Oct-17
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	169	166	185	146	182	161
BOD								
COD								
Chloride	AO	250	0.9	0.8	1.22	0.79	0.7	0.7
Conductivity us/cm			318	305	350	278	330	307
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.1	< 0.1	<0.05	<0.05	< 0.1	< 0.05
N-NO3 (Nitrate)	MAC	10	< 0.1	< 0.1	<0.05	<0.05	< 0.1	< 0.05
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	207	201	178	168	186	162
Total Kjeldahl Nitrogen			0.2	< 0.05	0.11	<0.10	0.07	< 0.1
Total phosphorous								
Hardness as CaCO3	OG	500	179	187	183	140		168
Calcium			47.7	48.7	50.0	38.4	54.5	44.5
Magnesium			14.5	16	14.1	10.7	15.1	13.8
Potassium			1	1	1.06	0.92	1	0.9
Sodium	AO	200	2.1	2.3	2.06	1.87	2.2	2.2
Aluminum	OG	0.1	0.02	0.02	<0.004	0.014	0.04	0.03
Barium	MAC	1	0.041	0.046	0.045	0.036	0.054	0.042
Beryllium			< 0.0001	< 0.0001	<0.001	<0.001	< 0.0001	< 0.0001
Boron	IMAC	5	< 0.005	0.006	<0.010	<0.010	0.02	< 0.005
Cadmium	MAC	0.005	0.00003	< 0.00002	<0.001	<0.001	< 0.000014	< 0.000014
Chromium	MAC	0.05	< 0.002	0.003	<0.003	<0.003	< 0.002	< 0.002
Cobalt			0.0057	< 0.0001	<0.001	<0.001	0.0012	< 0.0001
Copper	AO	1	< 0.002	< 0.002	<0.003	<0.003	< 0.002	0.002
Iron	AO	0.3	< 0.005	0.018	<0.010	<0.010	< 0.005	< 0.005
Lead	MAC	0.01	< 0.00002	< 0.00002	<0.002	<0.002	< 0.00002	< 0.00002
Manganese	AO	0.05	0.058	0.06	0.051	0.050	0.063	0.054
Molybdenum			< 0.0001	< 0.0001			< 0.0001	< 0.0001
Nickel			< 0.01	< 0.01	<0.003	<0.003	0.0014	0.0009
Silicon			8.15	8.01	8.21	8.61	8.94	8.4
Silver								
Strontium			0.073	0.086	0.066	0.053		0.059
Thallium			< 0.00005	< 0.00005	<0.006	<0.006	< 0.00005	< 0.00005
Titanium			< 0.005	< 0.005	<0.002	<0.002	< 0.005	< 0.005
Vanadium			0.0024	0.0019	<0.002	<0.002	0.0018	0.0017
Zinc	AO	5	< 0.005	< 0.005	<0.005	<0.005	< 0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			< 0.01	< 0.01				
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin							< 0.05	
Dissolved Reactive P								
Field Parameters								
Temperature °C			9	7.5	7.8	6.6	6.8	7.5
pH			7.5	7.5	7.7	8	7.6	8.1
Conductivity us/cm			335	281	304	275	332	273

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-4S

Sample Date			May-18	Oct-18				
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	169	148				
BOD								
COD								
Chloride	AO	250	< 1	1				
Conductivity us/cm			324	286				
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.10	< 0.10				
N-NO3 (Nitrate)	MAC	10	< 0.10	< 0.10				
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	211	186				
Total Kjeldahl Nitrogen			1.6	< 0.8				
Total phosphorous								
Hardness as CaCO3	OG	500	185	135				
Calcium			51	36				
Magnesium			14	14				
Potassium			<1	< 1				
Sodium	AO	200	2	2				
Aluminum	OG	0.1	< 0.01	< 0.01				
Barium	MAC	1	0.04	0.04				
Beryllium			< 0.0005	< 0.0005				
Boron	IMAC	5	< 0.01	< 0.01				
Cadmium	MAC	0.005	< 0.0001	< 0.0001				
Chromium	MAC	0.05	< 0.001	< 0.001				
Cobalt			< 0.0002	< 0.0002				
Copper	AO	1	< 0.001	< 0.001				
Iron	AO	0.3	< 0.03	< 0.03				
Lead	MAC	0.01	< 0.001	< 0.001				
Manganese	AO	0.05	0.05	0.05				
Molybdenum			< 0.005	< 0.005				
Nickel			< 0.005	< 0.005				
Silicon			8.4	8.2				
Silver								
Strontium			0.061	0.058				
Thallium			< 0.0001	< 0.0001				
Titanium			< 0.01	< 0.01				
Vanadium			0.001	0.002				
Zinc	AO	5	< 0.01	< 0.01				
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.4	7.4				
pH			7.7	7.7				
Conductivity us/cm			282	218				

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-4D

Sample Date			Nov-08	May-09	Sep-09	May-10	Oct-10	Jun-11
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	53	43	40	39	38	41
BOD			2	1	<1			
COD			13	10	<5			
Chloride	AO	250	52	53	52	54	54	56
Conductivity us/cm			297	281	282	276	277	273
DOC	AO	5	2.5	3	3.3			
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols			<0.001	<0.001	<0.001			
Sulphate	AO	500	7	6	6			
Total Dissolved Solids	AO	500	193	183	183	179	180	177
Total Kjeldahl Nitrogen			0.22	0.13	<0.10	0.23	0.31	<0.10
Total phosphorous			2.69	0.66	0.91			
Hardness as CaCO3	OG	500	59	58	51	44	37	46
Calcium			17	15	14	11	10	12
Magnesium			4	5	4	4	3	4
Potassium			3	3	2	2	2	2
Sodium	AO	200	33	33	30	33	28	29
Aluminum	OG	0.1	0.62	0.2	0.17	0.26	0.38	0.78
Barium	MAC	1	0.06	0.05	0.05	0.05	0.05	0.06
Beryllium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005
Boron	IMAC	5	0.04	0.02	0.03	0.04	0.02	0.02
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.003	0.002	0.002	<0.001	0.002	0.004
Cobalt			0.0318	0.0023	0.0399	0.0006	0.0005	0.0007
Copper	AO	1	0.001	<0.001	<0.001	<0.001	<0.001	0.002
Iron	AO	0.3	7.81	9.46	9.4	9.72	9.67	9.74
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.22	0.11	0.16	0.1	0.1	0.1
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			9.8	8.3	8.7	7.6	8.1	8.4
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.083	0.07	0.072	0.062	0.058	0.061
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			0.02	0.02	0.01	0.02	0.03	0.05
Vanadium			0.005	0.004	0.005	0.006	0.005	0.005
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature °C				8.1	7.5	8.6	6.4	7.6
pH				7.5	7.7	7.6	7.9	7.5
Conductivity us/cm				327	266	299	227	236

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-4D

Sample Date			Oct-11	Jun-12	Jun-12 BH 95-7 QA/QC	Oct-12	Jun-13	Nov-13
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	43	36	36	36	31	33
BOD								
COD								
Chloride	AO	250	56	57	58	58	65	59
Conductivity us/cm			292	273	275	286	301	307
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols				<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate	AO	500		10	10	10	10	9
Total Dissolved Solids	AO	500	190	177	179	186	196	200
Total Kjeldahl Nitrogen			<0.10	<0.10	11	<0.10	<0.10	0.15
Total phosphorous								
Hardness as CaCO3	OG	500	51	35	35	51	58	58
Calcium			14	9	9	14	15	15
Magnesium			4	3	3	4	5	5
Potassium			2	2	2	2	2	2
Sodium	AO	200	33	25	26	30	32	33
Aluminum	OG	0.1	0.22	0.57	0.56	0.32	0.55	0.31
Barium	MAC	1	0.05	0.06	0.06	0.05	0.07	0.06
Beryllium			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IMAC	5	0.02	0.01	0.02	0.01	0.01	0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.002	0.003	0.003	0.002	0.002	0.001
Cobalt			0.0004	0.0005	0.0006	0.0004	0.0007	0.0003
Copper	AO	1	<0.001	0.001	0.001	<0.001	0.001	<0.001
Iron	AO	0.3	9.86	12	11.3	9.58	12.4	12.2
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.1	0.11	0.11	0.1	0.13	0.11
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			7.9	9	9	7.4	8.4	8.2
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.063	0.064	0.066	0.066	0.079	0.07
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			0.01	0.04	0.04	0.02	0.04	0.02
Vanadium			0.004	0.005	0.005	0.004	0.004	0.003
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.4	8.5		6.6	8.7	7.3
pH			6.8	6.8		6.5	7.3	7.2
Conductivity us/cm			304	263		310	248	294

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-4D

Sample Date			Apr-14	Apr-14 BH 07-4 QA/QC	Oct-14	Jun-15	Oct-15	May-16
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	30	30	31	31	31	32
BOD								
COD								
Chloride	AO	250	60.5	60.6	69.1	69.1	66.4	81.6
Conductivity us/cm			280	278	285	298	291	331
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.10	< 0.10	< 0.10	< 0.1	< 0.1	<0.05
N-NO3 (Nitrate)	MAC	10	< 0.10	< 0.10	< 0.10	< 0.1	< 0.1	<0.05
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	155	154	164	187	192	162
Total Kjeldahl Nitrogen			0.41	0.31	0.2	0.3	0.18	0.28
Total phosphorous								
Hardness as CaCO3	OG	500	60	59	68	61	63	60.9
Calcium			15.3	15.3	15.8	15.4	15.9	15.4
Magnesium			5.26	5.13	5.34	5.43	5.63	5.45
Potassium			2.6	2.5	2.5	2.4	2.2	2.52
Sodium	AO	200	29.3	29.2	28.1	30.3	29.9	32.5
Aluminum	OG	0.1	0.72	0.51	0.42	0.24	0.02	0.012
Barium	MAC	1	0.067	0.06	0.062	0.059	0.057	0.062
Beryllium			0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	<0.001
Boron	IMAC	5	0.041	0.017	0.019	0.012	0.023	0.013
Cadmium	MAC	0.005	0.00004	0.00004	< 0.00002	< 0.00002	< 0.00002	<0.001
Chromium	MAC	0.05	0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.003
Cobalt			0.0005	0.0008	0.0005	0.0002	< 0.0001	<0.001
Copper	AO	1	0.001	0.001	< 0.002	< 0.002	< 0.002	<0.003
Iron	AO	0.3	14.4	13.9	14.4	14.1	14.9	13.5
Lead	MAC	0.01	0.00047	0.00035	0.00042	0.00007	< 0.00002	<0.002
Manganese	AO	0.05	0.146	0.14	0.146	0.133	0.145	0.125
Molybdenum			0.0002	0.0002	< 0.0001	0.0002	0.0003	
Nickel			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.003
Silicon			8.69	8.44	8.29	8.61	7.93	8.02
Silver								
Strontium			0.087	0.085	0.087	0.086	0.082	0.076
Thallium			< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.006
Titanium			0.022	0.018	0.022	0.013	< 0.005	<0.002
Vanadium			0.004	0.0036	0.0046	0.0032	0.0025	0.002
Zinc	AO	5	< 0.005	< 0.005	< 0.005	< 0.005	0.009	<0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			0.08	0.09	0.11	0.07	0.11	
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.3		7.2	8.5	7.4	7.8
pH			7.6		7.2	6.9	7.3	7
Conductivity us/cm			277		319	362	293	337

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-4D

Sample Date			May-16 Dup 1	Nov-16	Apr-17	Oct-17	May-18	Oct-18
PARAMETER	Limit	ODWO/S	QA/QC					
Alkalinity (C_aCO3)	OG	30-500	30	33	37	35	37	38
BOD								
COD								
Chloride	AO	250	82.3	73.4	76.2	69.5	76	87
Conductivity us/cm			331	331	336	345	359	405
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.05	<0.05	< 0.1	< 0.05	< 0.10	< 0.10
N-NO3 (Nitrate)	MAC	10	<0.05	<0.05	< 0.1	< 0.05	< 0.10	< 0.10
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	174	214	184	162	233	263
Total Kjeldahl Nitrogen			0.25	<0.10	0.32	0.3	1.6	< 0.8
Total phosphorous								
Hardness as CaCO3	OG	500	60.1	61.2		53	58	56
Calcium			15.1	15.7	17.1	12.6	15	14
Magnesium			5.43	5.34	5.59	5.14	5	5
Potassium			2.56	2.55	2.4	2.5	2	3
Sodium	AO	200	32.2	32.4	36.3	42.8	45	45
Aluminum	OG	0.1	0.012	0.022	0.02	0.01	< 0.01	< 0.01
Barium	MAC	1	0.062	0.052	0.072	0.053	0.06	0.07
Beryllium			<0.001	<0.001	< 0.0001	< 0.0001	< 0.0005	< 0.0005
Boron	IMAC	5	0.012	0.010	0.029	0.012	< 0.01	< 0.01
Cadmium	MAC	0.005	<0.001	<0.001	< 0.000014	< 0.000014	< 0.0001	< 0.0001
Chromium	MAC	0.05	<0.003	<0.003	< 0.002	< 0.002	< 0.001	< 0.001
Cobalt			<0.001	<0.001	< 0.0001	< 0.0001	< 0.0002	< 0.0002
Copper	AO	1	<0.003	<0.003	< 0.002	< 0.002	< 0.001	< 0.001
Iron	AO	0.3	13.7	12.9	15.1	0.285	12.4	14.6
Lead	MAC	0.01	<0.002	<0.002	< 0.00002	0.00002	< 0.001	< 0.001
Manganese	AO	0.05	0.127	0.110	0.135	0.099	0.1	0.13
Molybdenum					0.0003	0.0002	< 0.005	< 0.005
Nickel			<0.003	<0.003	0.0005	0.0005	< 0.005	< 0.005
Silicon			8.32	8.06	8.28	7.68	7.8	7.9
Silver								
Strontium			0.075	0.070		0.07	0.072	0.083
Thallium			<0.006	<0.006	< 0.00005	< 0.00005	< 0.0001	< 0.0001
Titanium			<0.002	<0.002	< 0.005	< 0.005	< 0.01	< 0.01
Vanadium			0.002	<0.002	0.0023	0.0023	0.002	0.002
Zinc	AO	5	<0.005	<0.005	< 0.005	< 0.005	< 0.01	< 0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin					< 0.05			
Dissolved Reactive P								
Field Parameters								
Temperature °C				6.5	6.6	7.3	7.2	7.2
pH				7.3	7	7.3	7	7.5
Conductivity us/cm				358	374	339	323	332

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-5

Sample Date			Sep-95	Aug-96	Nov-96	Jul-97	Nov-98	Jul-99
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	42	77	40	44	40	40
BOD								
COD			30					<3
Chloride	AO	250	18	0.6	<0.1	0.8	0.9	0.9
Conductivity us/cm				160	86	89	85	89
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1						<0.1
N-NO3 (Nitrate)	MAC	10	0.8	<0.1	0.9	1	0.8	0.6
Phenols			0.026	0.022	<0.001	0.009	0.006	<0.001
Sulphate	AO	500	5	8	4	4	4	3
Total Dissolved Solids	AO	500	104	136	48			
Total Kjeldahl Nitrogen								0.06
Total phosphorous								0.46
Hardness as CaCO3	OG	500						40
Calcium			15	17.3	10.9	11	9.4	11
Magnesium			3.8	6.98	3.05	2.95	2.79	3.05
Potassium			1.4	5.8	0.7	<0.4	<0.4	1.5
Sodium	AO	200	5.6	2.1	1.2	1	1.1	1.2
Aluminum	OG	0.1	0.329	0.28	0.14	0.12	0.02	0.47
Barium	MAC	1	0.016	0.013	0.016	0.013	0.013	0.015
Beryllium			0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	IMAC	5	0.01	<0.01	<0.01	0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.01	<0.0001	
Chromium	MAC	0.05	0.011	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	AO	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	AO	0.3	0.397	0.71	0.15	0.12	0.04	0.43
Lead	MAC	0.01	<0.0002	0.0002	<0.0002	<0.1	<0.0002	<0.0002
Manganese	AO	0.05	0.01	0.02	<0.01	<0.01	<0.01	0.03
Molybdenum			<0.02	0.04	0.03	<0.02	<0.02	<0.02
Nickel			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon			6.13	6.53	6.01	6.07	5.6	6.76
Silver			<0.01	0.01	<0.01	<0.01	<0.01	<0.01
Strontium			0.024	0.031	0.014		0.015	0.015
Thallium								
Titanium			0.015	0.01	<0.01		51	<0.05
Vanadium			<0.01	0.007	<0.005		<0.005	<0.005
Zinc	AO	5	<0.01	<0.01	<0.01		0.04	<0.01
Arsenic	IMAC	0.025	0.1	<0.1	<0.001	<0.1	<0.1	<0.001
Fluoride	MAC	1.5						
Mercury	MAC	0.001						<0.0001
N-NH3 (Ammonia)								<0.01
Phosphorus			<0.1	0.1	<0.1	<0.1	<0.01	<0.10
pH (no units)	OG	6.5-8.5	7.93	7.96	7.82	8.66	8.63	8.03
Selenium	MAC	0.01						<0.001
Tin			<0.2	<0.2	0.2	<0.2	<0.2	<0.2
Dissolved Reactive P								
Field Parameters								
Temperature °C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-5

Sample Date			Nov-99	Jun-00	Oct-00	Jun-01	Oct-01	Jun-02
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	35	40	44	30	37	37
BOD								
COD								
Chloride	AO	250	0.8	0.5	0.7	0.9	0.5	1.6
Conductivity us/cm			79	83	83	80	83	82
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1						
N-NO3 (Nitrate)	MAC	10	0.6	0.4	0.4			
Phenols			0.007	0.001	<0.001	0.028	<0.001	<0.001
Sulphate	AO	500	3	4	4	4	3	4
Total Dissolved Solids	AO	500	70	64	58	52	50	50
Total Kjeldahl Nitrogen								
Total phosphorous						0.47	0.46	
Hardness as CaCO3	OG	500						
Calcium			9.74	9.62	14	9.42	11	11.3
Magnesium			2.51	2.56	2.89	2.5	2.9	2.82
Potassium			1.2	0.9	<0.4	<0.4	0.7	<0.4
Sodium	AO	200	1.5	1.1	1	0.7	1.1	1
Aluminum	OG	0.1	0.19	0.13	0.22	0.15	0.08	0.03
Barium	MAC	1	0.01	0.005	0.01	<0.005	0.01	0.007
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	IMAC	5	0.01	<0.01	<0.01	<0.01	<0.01	0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0006	<0.01
Chromium	MAC	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	AO	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	AO	0.3	0.15	0.1	0.11	0.04	0.04	0.05
Lead	MAC	0.01	<0.0002	<0.0002	0.0018	0.0022	<0.0012	<0.1
Manganese	AO	0.05	<0.01	<0.01	<0.01	<0.01	0.02	<0.01
Molybdenum			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon			5.58	5.9	4.98	5.14	5.87	6.06
Silver			0.04	<0.01	<0.01	<0.01	<0.01	<0.01
Strontium			0.01	0.01	0.015	0.01	0.015	0.012
Thallium								
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			<0.05	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025	<0.1	<0.1	<0.1	0.001	<0.001	<0.1
Fluoride	MAC	1.5				0.1	0.2	
Mercury	MAC	0.001						
N-NH3 (Ammonia)								0.6
Phosphorus			0.01	<0.1	<0.1			<0.1
pH (no units)	OG	6.5-8.5	7.45	7.74	7.96	7.25	7.8	
Selenium	MAC	0.01						
Tin			<0.2	<0.2	<0.2			<0.2
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-5

Sample Date			Nov-02	May-04	Sep-04	May-05	May-05	Nov-05
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	177	35	34	37	36	36
BOD						<1	<1	<1
COD				<2	8	<5	<5	<5
Chloride	AO	250	1.3	1.3	1.2	2	3	3
Conductivity us/cm			342	272	95	89	86	85
DOC	AO	5		<0.5	<0.5	<0.5	<0.5	0.5
N-NO2 (Nitrite)	MAC	1	<0.1			<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10				1.1	1.12	0.69
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate	AO	500	3	3	3	4	5	5
Total Dissolved Solids	AO	500	198			58	56	55
Total Kjeldahl Nitrogen						0.21	0.26	<0.05
Total phosphorous				0.37	0.46	0.35	0.35	0.21
Hardness as CaCO3	OG	500		38	38	40	40	40
Calcium			52.9	10.6	10.2	11	11	11
Magnesium			13.9	2.76	2.93	3	3	3
Potassium			0.8	0.5	0.4	<1	<1	<1
Sodium	AO	200	2.3	1.2	1.1	<2	2	2
Aluminum	OG	0.1	0.05	0.021	0.011	0.03	0.04	0.02
Barium	MAC	1	0.045	0.008	0.007	<0.01	0.01	0.01
Beryllium			<0.005	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IMAC	5	<0.01	<0.005	<0.005	<0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.01	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.01	0.002	0.001	0.002	0.002	0.002
Cobalt			<0.01	<0.005	<0.005	0.0002	<0.0002	<0.0002
Copper	AO	1	<0.01	<0.002	<0.002	<0.001	<0.001	0.003
Iron	AO	0.3	0.02	0.009	0.008	0.01	0.02	0.03
Lead	MAC	0.01	<0.1	<0.0002	<0.0005	0.002	<0.001	<0.001
Manganese	AO	0.05	0.05	0.001	<0.001	<0.01	<0.01	<0.01
Molybdenum			<0.02	<0.01	<0.01	<0.005	<0.005	<0.005
Nickel			<0.02	<0.01	<0.01	0.005	<0.005	<0.005
Silicon			7.94	5.78	5.46	7.6	7.5	6.5
Silver			<0.01	<0.005	<0.005	<0.0001	<0.0001	<0.0001
Strontium			0.075	0.011	0.012	0.013	0.013	0.017
Thallium						<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.005	<0.005	<0.01	<0.01	<0.01
Vanadium			< 0.005	<0.005	<0.005	0.004	0.004	0.004
Zinc	AO	5	<0.01	<0.005	<0.005	<0.01	0.01	0.01
Arsenic	IMAC	0.025	<0.1	<0.001	0.001			
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus			<0.1					
pH (no units)	OG	6.5-8.5	8.14					
Selenium	MAC	0.01		<0.001	<0.001			
Tin			<0.2	<0.05	<0.05			
Dissolved Reactive P								
Field Parameters								
Temperature °C						8.6		7.1
pH						8.04		5.54
Conductivity us/cm						78		71

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-5

Sample Date			May-06	Oct-06	May-07	Oct-07	May-08	Oct-08
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	41	38	41	38	39	39
BOD				<1	<1	2	<1	<1
COD			<5	<5	<5	<5	<5	5
Chloride	AO	250	2	2	1	<1	<1	1
Conductivity us/cm			95	89	88	85	87	85
DOC	AO	5	<0.5	<0.5	0.5	<0.5	<0.5	0.6
N-NO2 (Nitrite)	MAC	1		<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10		0.46	0.23	0.33	0.25	0.17
Phenols				<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate	AO	500		6	4	5	4	4
Total Dissolved Solids	AO	500	62	58	57	55	57	55
Total Kjeldahl Nitrogen			<0.05	0.06	0.31	2.8	<0.10	<0.10
Total phosphorous				0.37	0.26	0.6	0.06	0.13
Hardness as CaCO3	OG	500		40	40	42	42	49
Calcium			11	11	11	12	12	13
Magnesium			3	3	3	3	3	4
Potassium			<1	<1	<1	<1	<1	<1
Sodium	AO	200	2	2	2	2	2	2
Aluminum	OG	0.1	0.02	0.02	0.01	0.02	0.02	0.07
Barium	MAC	1	0.01	0.01	0.01	0.01	0.01	0.01
Beryllium				<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.002	0.002	0.001	0.002	0.001	0.003
Cobalt			<0.0002	<0.0002	<0.0002	<0.0002	0.0039	0.0256
Copper	AO	1	0.07	0.003	0.002	0.002	<0.001	<0.001
Iron	AO	0.3	0.03	0.03	0.03	0.03	0.03	0.05
Lead	MAC	0.01		<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.01	0.01	0.01	0.01	0.02	0.05
Molybdenum				<0.005	<0.005	<0.005	<0.005	<0.005
Nickel				<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			5.4	5.6	5.6	5.8	5.6	5.6
Silver				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.013	0.023	0.019	0.022	0.012	0.011
Thallium				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium				<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium				0.004	0.003	0.004	0.004	0.004
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			<0.02					
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P			0.07					
Field Parameters								
Temperature °C			11.6	7.8	8.5	8.2		
pH			8.5	7.13	7.22	7.64		
Conductivity us/cm			69	680	72	62		

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-5

Sample Date			May-09	Sep-09	May-10	May-10 QA/QC	Oct-10	Oct-10 QA/QC
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	42	41	38	38	35	35
BOD			<1	<1				
COD			<5	<5				
Chloride	AO	250	1	1	1	<1	1	<1
Conductivity us/cm			88	89	84	84	78	78
DOC	AO	5	0.6	0.8				
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	0.14	0.14
Phenols			<0.001	<0.001				
Sulphate	AO	500	4	4				
Total Dissolved Solids	AO	500	57	58	55	55	51	51
Total Kjeldahl Nitrogen			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total phosphorous			0.09	0.15				
Hardness as CaCO3	OG	500	42	42	37	37	35	28
Calcium			12	12	10	10	9	8
Magnesium			3	3	3	3	3	2
Potassium			<1	<1	<1	<1	<1	<1
Sodium	AO	200	2	2	2	<2	2	2
Aluminum	OG	0.1	0.06	0.13	0.05	0.08	0.09	0.08
Barium	MAC	1	0.01	0.01	0.01	<0.01	0.01	<0.01
Beryllium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IMAC	5	0.01	<0.01	0.02	0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.001	0.002	<0.001	<0.001	0.002	0.002
Cobalt			0.0392	0.0178	0.0069	0.0011	0.0021	0.0211
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	0.05	0.07	0.13	0.09	0.08	0.1
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.07	0.03	0.01	0.01	0.01	0.04
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			5.6	5.7	4.9	5	5.4	5.5
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.013	0.012	0.012	0.013	0.009	0.01
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			0.003	0.003	0.003	0.003	0.004	0.004
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature °C			8.7	7.7	10		6.7	
pH			9.1	7.6	8.4		8.1	
Conductivity us/cm			94	77	89		57	

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-5

Sample Date			Jun-11	Oct-11	Oct-11 QA/QC	Jun-12	Oct-12	Jun-13
PARAMETER	Limit	ODWO/S			BH 95-7			
Alkalinity (C_aCO3)	OG	30-500	44	48	51	51	42	51
BOD								
COD								
Chloride	AO	250	<1	<1	<1	<1	<1	<1
Conductivity us/cm			87	89	96	98	83	106
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	0.19	<0.10
Phenols						<0.001	<0.001	<0.001
Sulphate	AO	500				4	4	4
Total Dissolved Solids	AO	500	57	58	62	64	54	69
Total Kjeldahl Nitrogen			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total phosphorous								
Hardness as CaCO3	OG	500	42	49	49	35	40	51
Calcium			12	13	13	9	11	14
Magnesium			3	4	4	3	3	4
Potassium			<1	<1	<1	<1	<1	<1
Sodium	AO	200	2	3	2	3	2	2
Aluminum	OG	0.1	0.02	0.09	0.07	0.18	0.14	0.06
Barium	MAC	1	0.01	0.01	0.01	0.01	0.01	0.01
Beryllium			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.002	<0.001	<0.001	0.002	<0.001	0.002
Cobalt			0.0007	0.0017	0.0138	0.0089	0.0095	<0.001
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	0.03	0.08	0.07	0.13	0.09	0.04
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.01	0.01	0.03	0.02	0.02	0.01
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			5.2	5.5	5.4	6	5	5.5
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001
Strontium			0.013	0.014	0.013	0.014	0.012	0.017
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			0.003	0.003	0.003	0.004	0.004	0.003
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5		6.94	6.94			
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.9	7.7		8.9	7	8.9
pH			7.9	8.6		8.4	7	7.6
Conductivity us/cm			75	93		81	82	79

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-5

Sample Date			Nov-13	Apr-14	Oct-14	Jun-15	Jun-15 QA/QC BH 95-7	Oct-15
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	47	40	45	47	51	42
BOD								
COD								
Chloride	AO	250	<1		0.6	0.5	0.5	0.5
Conductivity us/cm			97	88	92	98	106	87
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	< 0.10	< 0.10	< 0.1	< 0.1	< 0.1
N-NO3 (Nitrate)	MAC	10	<0.10	0.2	0.2	0.1	0.1	0.1
Phenols			<0.001					
Sulphate	AO	500	4					
Total Dissolved Solids	AO	500	63		49.9	59	64	52
Total Kjeldahl Nitrogen			<0.10	0.12	0.06	0.1	0.1	< 0.05
Total phosphorous								
Hardness as CaCO3	OG	500	45	46	46	48	47	51
Calcium			13	12.8	12.4	13.1	12.8	13.5
Magnesium			3	3.4	3.29	3.78	3.62	4.06
Potassium			<1	0.6	0.6	0.5	0.5	0.5
Sodium	AO	200	2	1.4	1.5	1.4	1.4	1.4
Aluminum	OG	0.1	0.06	0.08	0.06	0.13	0.1	0.02
Barium	MAC	1	0.01	0.01	0.009	0.01	0.009	0.01
Beryllium			<0.0005	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Boron	IMAC	5	<0.01	< 0.005	0.005	< 0.005	< 0.005	0.007
Cadmium	MAC	0.005	<0.0001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	MAC	0.05	0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Cobalt			0.0035	0.0024	0.003	0.0009	0.0073	< 0.0001
Copper	AO	1	<0.001	0.0003	< 0.002	< 0.002	< 0.002	<0.002
Iron	AO	0.3	0.04	0.036	0.035	0.055	0.033	0.01
Lead	MAC	0.01	<0.001	0.00007	0.00006	< 0.00002	< 0.00002	<0.00002
Manganese	AO	0.05	0.01	0.007	0.01	0.001	0.017	0.001
Molybdenum			<0.005	< 0.0001	< 0.0001	0.0005	0.0002	< 0.0001
Nickel			<0.005	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Silicon			5.8	5.58	5.47	5.95	5.87	5.57
Silver			<0.0001					
Strontium			0.013	0.016	0.015	0.017	0.016	0.019
Thallium			<0.0001	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Titanium			<0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Vanadium			0.003	0.0029	0.0035	0.0032	0.0033	0.003
Zinc	AO	5	<0.01	< 0.005	< 0.005	< 0.005	< 0.005	0.007
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)				< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.6	7.8	7.5	8.3		7.7
pH			8.9	8.8	8.4	8.1		8.1
Conductivity us/cm			95	77	94	102		80

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-5

Sample Date			May-16	Nov-16	Nov-16 QA/QC	Apr-17	Oct-17	May-18
PARAMETER	Limit	ODWO/S			BH 95-8			
Alkalinity (C_aCO3)	OG	30-500	54	47	46	38	50	47
BOD								
COD								
Chloride	AO	250	0.41	0.26	0.25	< 0.5	< 0.5	< 1
Conductivity us/cm			108	93	91	79	108	100
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.05	<0.05	<0.05	< 0.1	< 0.05	< 0.10
N-NO3 (Nitrate)	MAC	10	0.06	< 0.05	0.06	< 0.1	0.19	< 0.1
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	50	68	68	42.4	53	65
Total Kjeldahl Nitrogen			< 0.1	< 0.1	< 0.1	< 0.05	< 0.1	< 0.05
Total phosphorous								
Hardness as CaCO3	OG	500	49.9	41.5	40.9		53	49
Calcium			13.8	11.5	11.3	11.8	14.5	13
Magnesium			3.74	3.1	3.07	3.08	4.18	4
Potassium			0.63	0.51	0.51	0.4	0.4	< 1
Sodium	AO	200	1.42	1.29	1.27	1.4	1.6	< 2
Aluminum	OG	0.1	0.011	0.019	0.017	0.01	0.02	< 0.01
Barium	MAC	1	0.011	0.009	0.009	0.009	0.011	< 0.01
Beryllium			<0.001	<0.001	<0.001	< 0.0001	< 0.0001	< 0.0005
Boron	IMAC	5	< 0.01	< 0.01	< 0.01	0.02	0.006	< 0.01
Cadmium	MAC	0.005	<0.001	<0.001	<0.001	< 0.000014	< 0.000014	< 0.0001
Chromium	MAC	0.05	< 0.003	< 0.003	< 0.003	0.002	< 0.002	0.001
Cobalt			< 0.001	< 0.001	< 0.001	< 0.0001	< 0.0001	< 0.0002
Copper	AO	1	<0.003	<0.003	<0.003	<0.002	<0.002	<0.001
Iron	AO	0.3	0.063	< 0.01	< 0.01	< 0.005	< 0.005	< 0.03
Lead	MAC	0.01	<0.002	<0.002	<0.002	<0.00002	<0.00002	<0.001
Manganese	AO	0.05	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001	< 0.01
Molybdenum						< 0.0001	< 0.0001	< 0.005
Nickel			<0.003	<0.003	<0.003	0.0003	0.0003	< 0.005
Silicon			5.72	5.93	5.78	6.01	5.86	5.9
Silver								
Strontium			0.015	0.012	0.012		0.016	0.013
Thallium			<0.006	<0.006	<0.006	< 0.00005	< 0.00005	< 0.0001
Titanium			<0.002	<0.002	<0.002	< 0.005	< 0.005	< 0.01
Vanadium			0.003	0.003	0.002	0.0029	0.0026	< 0.003
Zinc	AO	5	0.009	< 0.005	< 0.005	< 0.005	< 0.005	< 0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin						< 0.05		
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.7	6.9		7.1	7.4	7.8
pH			8.1	8.4		8.1	9.1	8.2
Conductivity us/cm			98	96		84	96	86

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Date			Oct-18	Oct-18 QA/QC			
PARAMETER	Limit	ODWO/S		BH 08-2			
Alkalinity (C_aCO3)	OG	30-500	47	52			
BOD							
COD							
Chloride	AO	250	2	< 1			
Conductivity us/cm			100	111			
DOC	AO	5					
N-NO2 (Nitrite)	MAC	1	< 0.10	< 0.0			
N-NO3 (Nitrate)	MAC	10	0.12	0.1			
Phenols							
Sulphate	AO	500					
Total Dissolved Solids	AO	500	65	72			
Total Kjeldahl Nitrogen			1.6	1			
Total phosphorous							
Hardness as CaCO3	OG	500	40	46			
Calcium			11	12			
Magnesium			3	4			
Potassium			< 1	< 1			
Sodium	AO	200	< 2	< 2			
Aluminum	OG	0.1	0.01	0.03			
Barium	MAC	1	0.01	0.01			
Beryllium			< 0.0005	< 0.0005			
Boron	IMAC	5	< 0.01	< 0.01			
Cadmium	MAC	0.005	< 0.0001	< 0.0001			
Chromium	MAC	0.05	0.001	0.001			
Cobalt			< 0.0002	< 0.0002			
Copper	AO	1	<0.001	<0.001			
Iron	AO	0.3	< 0.03	< 0.03			
Lead	MAC	0.01	<0.001	<0.001			
Manganese	AO	0.05	< 0.01	< 0.01			
Molybdenum			< 0.005	< 0.005			
Nickel			< 0.005	< 0.005			
Silicon			5.8	5.8			
Silver							
Strontium			0.017	0.018			
Thallium			< 0.01	< 0.0001			
Titanium			< 0.01	< 0.01			
Vanadium			0.003	0.003			
Zinc	AO	5	< 0.01	< 0.01			
Arsenic	IMAC	0.025					
Fluoride	MAC	1.5					
Mercury	MAC	0.001					
N-NH3 (Ammonia)							
Phosphorus							
pH (no units)	OG	6.5-8.5					
Selenium	MAC	0.01					
Tin							
Dissolved Reactive P							
Field Parameters							
Temperature ^{o}C			7.4				
pH			8.1				
Conductivity us/cm			80				

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Date			Sample Location 95-5					
PARAMETER	Limit	ODWO/S	MEDIAN (Last 10 Events) 95-5	MEDIAN (Last 10 Events) 91-2	MEDIAN Combined	MIN 95-5	Max 95-5	75th Percentile 95-5
Alkalinity (C_aCO3)	OG	30-500	47.0	54	50.50	30	177	#REF!
BOD						<1	2	#REF!
COD						< 2	30	#REF!
Chloride	AO	250	0.5	0.7	0.6	0.25	18	#REF!
Conductivity us/cm			96.5	138.0	117.25	78	342	#REF!
DOC	AO	5				< 0.5	1	#REF!
N-NO2 (Nitrite)	MAC	1						#REF!
N-NO3 (Nitrate)	MAC	10	0.1	0.00	0.05	< 0.05	1	#REF!
Phenols						< 0.001	0.028	#REF!
Sulphate	AO	500				3	8	#REF!
Total Dissolved Solids	AO	500	62.0	78	70	42	198	#REF!
Total Kjeldahl Nitrogen			0.1	0.10	0.11	< 0.05	3	#REF!
Total phosphorous						0.06	1	#REF!
Hardness as CaCO3	OG	500	46.0	56	51	28	53	#REF!
Calcium			12.6	16	14.2	8	53	#REF!
Magnesium			3.5	4	3.745	2	14	#REF!
Potassium			0.5	3	1.753	0.40	6	#REF!
Sodium	AO	200	1.4	5	3.1	0.7	6	#REF!
Aluminum	OG	0.1	0.020	0.020	0.0200	< 0.01	0.470	#REF!
Barium	MAC	1	0.010	0.021	0.0155	< 0.005	0.045	#REF!
Beryllium						< 0.0001	0.005	#REF!
Boron	IMAC	5	0.007	0.010	0.008	< 0.005	0.020	#REF!
Cadmium	MAC	0.005						#REF!
Chromium	MAC	0.05	< 0.002	0.002	0.002	< 0.001	0.011	#REF!
Cobalt			< 0.001	0.0002	0.0002	< 0.0002	0.039	#REF!
Copper	AO	1	0.0003	#NUM!	#NUM!	0.0003	0.070	#REF!
Iron	AO	0.3	0.036	0.0265	0.031	< 0.005	1	#REF!
Lead	MAC	0.01	0.000	0.0001	0.0000675	< 0.00002	0.002	#REF!
Manganese	AO	0.05	< 0.005	0.020	0.02	< 0.0001	0.070	#REF!
Molybdenum			< 0.0002	0.004	0.0037	< 0.0001	0.040	#REF!
Nickel						0.0003	0.005	#REF!
Silicon			5.8	9	7.6	4.9	7.9	#REF!
Silver						< 0.0001	0.040	#REF!
Strontium			0.016	0.09	0.0515	0.009	0.075	#REF!
Thallium								#REF!
Titanium						< 0.0002	51	#REF!
Vanadium			0.003			0.002	0.007	#REF!
Zinc	AO	5	< 0.005			< 0.005	0.040	#REF!
Arsenic	IMAC	0.025				< 0.001	0.100	#REF!
Fluoride	MAC	1.5				0.1	0.2	#REF!
Mercury	MAC	0.001				0.000	0.000	#REF!
N-NH3 (Ammonia)						0.60	0.60	#REF!
Phosphorus						0.010	0.100	#REF!
pH (no units)	OG	6.5-8.5				7	9	#REF!
Selenium	MAC	0.01						
Tin						0.20	0.20	#REF!
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-6

Sample Date			Aug-96	Nov-96	Jul-97	Nov-98	Jul-99	Nov-99
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	880	676	834	788	728	732
BOD								
COD							92	
Chloride	AO	250	93.5	89.2	84	89.3	81.2	75.8
Conductivity us/cm			1850	1680	1580	1660	1630	1565
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1					<0.1	
N-NO3 (Nitrate)	MAC	10	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Phenols			0.001	0.002	0.015	0.005	<0.001	<0.001
Sulphate	AO	500	8	78	82	88	88	67
Total Dissolved Solids	AO	500	1150	1006	1060	1030		1080
Total Kjeldahl Nitrogen							2.39	
Total phosphorous							2.19	
Hardness as CaCO3	OG	500					771	
Calcium			252	233	244	209	214	198
Magnesium			72.5	61.5	61	61.6	56.6	54.5
Potassium			14.6	6.9	10.6	5.3	6.1	7.1
Sodium	AO	200	57	64.5	78.8	67.7	66.2	74.9
Aluminum	OG	0.1	0.04	0.25	0.04	0.01	<0.01	0.04
Barium	MAC	1	1.12	0.88	0.95	0.755	0.99	0.725
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	IMAC	5	0.21	0.28	0.34	0.27	0.37	0.31
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.01	<0.0001		<0.0001
Chromium	MAC	0.05	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Cobalt			0.03	<0.01	0.03	<0.01	<0.01	0.02
Copper	AO	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	AO	0.3	24	18.6	19.8	2.28	21.4	0.12
Lead	MAC	0.01	<0.0002	<0.0002	<0.1	<0.0002	<0.0002	<0.0002
Manganese	AO	0.05	32.2	31	30	26	26.4	24.9
Molybdenum			0.16	0.16	0.18	<0.02	<0.02	<0.02
Nickel			<0.02	<0.02	0.02	<0.02	<0.02	<0.02
Silicon			22.5	22.7	22.9	20.5	22.6	19.4
Silver			0.02	<0.01	<0.01	<0.01	<0.01	0.02
Strontium			1.06	0.82	0.85	0.75	0.88	0.77
Thallium								
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			0.026	0.024	<0.005	<0.005	0.009	<0.05
Zinc	AO	5	<0.01	<0.01	<0.01	0.02	<0.01	<0.01
Arsenic	IMAC	0.025	<0.1	0.006	<0.1	<0.1	0.004	<0.1
Fluoride	MAC	1.5						
Mercury	MAC	0.001					<0.0001	
N-NH3 (Ammonia)							0.78	
Phosphorus			0.2	<0.1	0.4	<0.1	0.1	<0.01
pH (no units)	OG	6.5-8.5	6.89	8.03	6.98	6.7	6.62	7.83
Selenium	MAC	0.01					<0.001	
Tin			0.4	0.3	0.4	<0.2	<0.2	<0.2
Dissolved Reactive P								
Field Parameters								
Temperature °C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-6

Sample Date			Jun-00	Oct-00	Jun-01	Jun-01	Oct-01	Jun-02
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	770	788	640	610	497	669
BOD								
COD								
Chloride	AO	250	65.8	83.6	66.2	66.7	68.8	63.2
Conductivity us/cm			1483	1460	1300	1310	1170	1390
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1						
N-NO3 (Nitrate)	MAC	10	<0.1	<0.1				
Phenols			0.016	0.014	0.028	0.066	<0.001	0.002
Sulphate	AO	500	51	92	88	89	87	60
Total Dissolved Solids	AO	500	906	1030	846	846	700	818
Total Kjeldahl Nitrogen								
Total phosphorous					1.76	2.93	2.25	
Hardness as CaCO3	OG	500						
Calcium			198	200	177	177	151	196
Magnesium			50.7	64.5	47.4	47.7	47.7	50
Potassium			4.3	2.2	7.1	7.4	8.2	5.7
Sodium	AO	200	67	64.9	56.7	57.1	65.9	58.9
Aluminum	OG	0.1	0.32	0.59	1.37	1.45	0.07	0.15
Barium	MAC	1	0.92	0.955	0.89	0.895	0.865	1.02
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	IMAC	5	0.28	0.28	0.35	0.34	0.43	0.36
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0006	<0.01
Chromium	MAC	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt			<0.01	0.02	<0.01	<0.01	<0.01	0.01
Copper	AO	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	AO	0.3	22.1	20.9	20.2	20.2	20.4	27.5
Lead	MAC	0.01	<0.0002	<0.0002	0.0004	0.0009	<0.0012	<0.1
Manganese	AO	0.05	24.1	23.3	21.3	21.4	21	23.5
Molybdenum			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon			22.2	18.1	19.3	19.4	21.7	22.7
Silver			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Strontium			0.78	0.82	0.73	0.735	0.645	0.752
Thallium								
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			0.01	0.015	0.01	0.01	0.015	<0.005
Zinc	AO	5	0.07	<0.01	<0.01	<0.01	0.02	<0.01
Arsenic	IMAC	0.025	0.2	<0.1	0.008	0.008	0.007	<0.1
Fluoride	MAC	1.5			0.1	0.1	0.1	
Mercury	MAC	0.001						
N-NH3 (Ammonia)								<0.1
Phosphorus			<0.1	<0.1				0.2
pH (no units)	OG	6.5-8.5	7.41	6.88	6.62	6.79	8	
Selenium	MAC	0.01						
Tin			0.2	<0.2				0.2
Dissolved Reactive P								
Field Parameters								
Temperature °C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-6

Sample Date			May-04	May-06	May-07	May-08	May-09	May-10
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	609	544	560	504	442	411
BOD					2	6	2	
COD			88	66	70	58	58	
Chloride	AO	250	50.2	38	42	36	33	36
Conductivity us/cm			1360	1220	1350	1160	1080	1040
DOC	AO	5	25	24	30.2	23.9	18.5	
N-NO2 (Nitrite)	MAC	1	<0.1		<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	0.2		<0.10	<0.10	<0.10	<0.10
Phenols			<0.001		<0.001	<0.001	<0.001	
Sulphate	AO	500	73		140	102	118	
Total Dissolved Solids	AO	500	784	793	878	754	702	676
Total Kjeldahl Nitrogen			4.53	3.62	7.15	4.56	4.33	4.26
Total phosphorous			2.87		2.71	5.64	2.42	
Hardness as CaCO3	OG	500	610		589	521	450	440
Calcium			171	145	170	151	129	130
Magnesium			44.5	36	40	35	31	28
Potassium			12	12	13	13	12	12
Sodium	AO	200	58	42	50	41	40	35
Aluminum	OG	0.1	0.051	<0.01	<0.01	0.03	0.04	0.07
Barium	MAC	1	1.02	0.8	0.97	0.9	0.8	0.65
Beryllium			<0.001		<0.001	<0.001	<0.001	<0.001
Boron	IMAC	5	0.48	0.52	0.78	0.61	0.65	0.61
Cadmium	MAC	0.005	<0.0001		<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.005	0.005	0.006	0.007	0.006	0.004
Cobalt			<0.005	0.0059	0.0067	0.0345	0.0325	0.007
Copper	AO	1	<0.002	0.134	0.001	0.001	<0.001	0.001
Iron	AO	0.3	0.012	20.2	22.5	19.9	17.8	16.7
Lead	MAC	0.01	0.0006		<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	20.2	16.7	17.2	13.9	12.3	12.2
Molybdenum			<0.01		<0.005	<0.005	<0.005	<0.005
Nickel			<0.01		0.006	0.009	0.007	<0.005
Silicon			22	17.8	21.2	23.6	21	24
Silver			<0.005		<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.681	0.593	0.732	0.68	0.556	0.531
Thallium					0.0002	<0.0001	<0.0001	<0.0001
Titanium			<0.005		<0.01	<0.01	<0.01	<0.01
Vanadium			0.013		0.017	0.019	0.015	0.013
Zinc	AO	5	<0.005	0.01	0.02	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025	0.007					
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)				3.3				
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01	<0.001					
Tin			<0.05					
Dissolved Reactive P				0.12				
Field Parameters								
Temperature °C				10.6	10.1		9.7	11.2
pH				7.26	6.53		6.8	6.9
Conductivity us/cm				990	1221		1164	997

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-6

Sample Date			Jun-11	Oct-11	Jun-12	Oct-12	Jun-13	Nov-13
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	479	447	402	383	485	436
BOD								
COD								
Chloride	AO	250	34	35	32	32	30	33
Conductivity us/cm			1050	1070	1010	965	1050	1060
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols					<0.001	<0.001	<0.001	<0.001
Sulphate	AO	500			127	111	77	92
Total Dissolved Solids	AO	500	682	696	656	627	682	689
Total Kjeldahl Nitrogen			4.32	4.24	2.16	4.53	4.6	3.22
Total phosphorous								
Hardness as CaCO3	OG	500	419	464	367	418	481	482
Calcium			125	133	104	123	140	142
Magnesium			26	32	26	27	32	31
Potassium			12	13	11	12	13	14
Sodium	AO	200	30	35	29	32	34	38
Aluminum	OG	0.1	0.08	0.32	0.12	0.04	0.08	0.03
Barium	MAC	1	0.75	0.71	0.66	0.65	0.81	0.67
Beryllium			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IMAC	5	0.52	0.64	0.74	0.6	0.61	0.69
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.007	0.005	0.005	0.003	0.005	0.003
Cobalt			0.0126	0.0046	0.0158	0.0106	0.0117	0.004
Copper	AO	1	0.001	0.001	0.001	<0.001	0.001	<0.001
Iron	AO	0.3	18.9	17.6	15.6	13.3	18.5	17.1
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	13.4	10.4	10.8	9.1	11.6	9.77
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			24	18	18	16	19.2	17
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.561	0.506	0.494	0.47	0.557	0.486
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Vanadium			0.014	<0.005	<0.005	0.008	<0.005	0.007
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5		6.86				
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature °C			10.1	9.1	10.3	9.7	10.3	9.5
pH			7	6.6	6.5	6.5	6.6	6.8
Conductivity us/cm			849	1098	914	959	874	1085

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-6

Sample Date			Apr-14	Oct-14	Jun-15	Oct-15	May-16	Nov-16
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	373	387	395	350	407	393
BOD								
COD								
Chloride	AO	250	23.8	30.4	26.9	25.8	27	24
Conductivity us/cm			907	934	952	853	952	906
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.10	< 0.10	< 0.1	< 0.1	<0.25	<0.25
N-NO3 (Nitrate)	MAC	10	0.1	< 0.10	0.1	0.1	0.54	<0.25
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	565	591	647	580	530	544
Total Kjeldahl Nitrogen			5.32	5.02	5.1	4.89	4.97	5.55
Total phosphorous								
Hardness as CaCO3	OG	500	419	398	440	393	390	354
Calcium			122	123	128	111	113	105
Magnesium			27.6	28.1	29.1	27.8	26.2	22.4
Potassium			13.9	14	14.7	12.9	14.0	12.9
Sodium	AO	200	34.7	32.6	34.4	29.8	29.1	27.1
Aluminum	OG	0.1	0.1	0.08	0.13	0.03	0.010	0.007
Barium	MAC	1	0.638	0.66	0.66	0.606	0.601	0.543
Beryllium			< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.001	<0.001
Boron	IMAC	5	0.737	0.793	0.819	0.824	0.635	0.737
Cadmium	MAC	0.005	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.001	<0.001
Chromium	MAC	0.05	< 0.002	0.002	< 0.002	0.002	<0.003	<0.003
Cobalt			0.0046	0.0056	0.0086	0.0022	0.003	0.002
Copper	AO	1	0.0006	< 0.002	< 0.002	< 0.002	<0.003	<0.003
Iron	AO	0.3	15.4	16.8	15.7	15.2	13.9	12.2
Lead	MAC	0.01	0.00007	0.00007	0.00005	0.00004	<0.002	<0.002
Manganese	AO	0.05	9.82	10.3	10.3	10	9.03	7.99
Molybdenum			0.0003	0.0002	0.0002	0.0003		
Nickel			< 0.01	< 0.01	< 0.01	< 0.01	<0.003	<0.003
Silicon			18.7	18.3	15.3	18	18.1	15.9
Silver								
Strontium			0.498	0.508	0.525	0.445	0.443	0.383
Thallium			< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.006	<0.006
Titanium			< 0.005	< 0.005	< 0.005	< 0.005	<0.002	0.002
Vanadium			< 0.005	0.0096	0.0066	0.0048	0.004	0.003
Zinc	AO	5	< 0.005	< 0.005	< 0.005	0.007	0.008	<0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			3.8	4.22	4	3.85		
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature °C			10.3	9.8	10.5	10.1	10.7	10
pH			6.8	6.8	6.5	6.8	6.5	6.9
Conductivity us/cm			832	932	1039	770	872	872

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 95-6

Sample Date			Apr-17	Oct-17	May-18	Oct-18		
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	355	393	343	326		
BOD								
COD								
Chloride	AO	250	18.8	22.9	24	23		
Conductivity us/cm			797	943	873	819		
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.1	< 0.05	< 0.10	< 0.10		
N-NO3 (Nitrate)	MAC	10	0.2	< 0.05	< 0.10	< 0.10		
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	496	561	567	532		
Total Kjeldahl Nitrogen			4.91	5.3	4.7	5.8		
Total phosphorous					7			
Hardness as CaCO3	OG	500	359	442	405	306		
Calcium			105	127	121	88		
Magnesium			23.4	30.3	25	21		
Potassium			14.1	15.4	14	12		
Sodium	AO	200	28.3	33	31	26		
Aluminum	OG	0.1	0.06	0.08	< 0.01	< 0.01		
Barium	MAC	1	0.53	0.703	0.56	0.52		
Beryllium			< 0.0001	< 0.0001	< 0.0005	< 0.0005		
Boron	IMAC	5	0.772	0.958	0.74	0.78		
Cadmium	MAC	0.005	< 0.000020	0.000026	< 0.0001	< 0.0001		
Chromium	MAC	0.05	< 0.002	0.002	0.001	0.001		
Cobalt			0.0018	0.0023	0.0025	0.0021		
Copper	AO	1	< 0.002	< 0.002	< 0.001	< 0.001		
Iron	AO	0.3	11.5	15.7	10.8	10.6		
Lead	MAC	0.01	< 0.00002	0.00002	< 0.001	< 0.001		
Manganese	AO	0.05	7.86	9.82	8.04	7.18		
Molybdenum			0.0003	0.0002	< 0.005	<0.005		
Nickel			0.0032	0.0039	< 0.005	< 0.005		
Silicon			17.5	18.3	20.5			
Silver								
Strontium			0.379	0.476	< 0.401	< 0.401		
Thallium			< 0.00005	< 0.00005	< 0.0001	< 0.0001		
Titanium			< 0.005	< 0.005	< 0.01	< 0.01		
Vanadium			0.0047	0.0048	0.004	0.003		
Zinc	AO	5	< 0.005	< 0.005	< 0.01	< 0.01		
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature °C			10.1	9.8	10.2	10		
pH			6.5	6.9	6.6	6.9		
Conductivity us/cm			813	846	716	516		

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-1D

Sample Date			Aug-96	Nov-96	Jul-97	Nov-98	Jul-99	Nov-99
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	165	99	101	102	96	92
BOD								
COD							3	
Chloride	AO	250	27.4	1.0	1.3	2.2	2.2	2.2
Conductivity us/cm			321	201	194	212	209	194
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1					<0.1	
N-NO3 (Nitrate)	MAC	10	0.2	<0.1	<0.1	<0.1	<0.1	<0.1
Phenols			0.001	<0.001	0.056	0.006	0.025	<0.001
Sulphate	AO	500	10	8	8	10	9	9
Total Dissolved Solids	AO	500	258	113	130	140		132
Total Kjeldahl Nitrogen							0.11	
Total phosphorous							0.22	
Hardness as CaCO3	OG	500					105	
Calcium			41.9	29.8	27.2	28.4	27.1	27.6
Magnesium			12.40	9.16	8.90	8.88	8.89	8.33
Potassium			5.6	1.6	3.2	1.9	2.3	<0.005
Sodium	AO	200	15.8	2.1	1.9	2.1	2.1	2.7
Aluminum	OG	0.1	0.05	0.04	0.02	0.02	0.04	0.02
Barium	MAC	1	0.043	0.027	0.021	0.020	0.025	0.020
Beryllium			0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.01	<0.0001		<0.0001
Chromium	MAC	0.05	<0.01	<0.01	<0.01		<0.01	<0.01
Cobalt			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	AO	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	AO	0.3	0.23	0.22	0.12	0.05	0.18	0.04
Lead	MAC	0.01	<0.0002	<0.0002	<0.1	<0.0002	<0.0002	<0.0002
Manganese	AO	0.05	0.18	0.08	0.06	0.15	0.06	0.17
Molybdenum			0.07	0.05	0.04	<0.02	<0.02	<0.02
Nickel			<0.02	<0.02	<0.02	<0.02		<0.02
Silicon			3.77	7.92	8.33	7.66	8.03	7.90
Silver			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Strontium			0.267	0.043	0.041	0.040	0.040	0.046
Thallium								
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			<0.005	<0.005	0.005	<0.005	<0.005	<0.005
Zinc	AO	5	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025	<0.1	0.002	<0.1	<0.1	<0.001	<0.1
Fluoride	MAC	1.5						
Mercury	MAC	0.001					<0.0001	
N-NH3 (Ammonia)							<0.01	
Phosphorus			0.1	0.1	<0.1	<0.1	<0.1	<0.1
pH (no units)	OG	6.5-8.5	7.54	8.22	8	7.82	7.73	8.12
Selenium	MAC	0.01					<0.001	
Tin			<0.2	<0.2	<0.2	<0.02	<0.2	<0.2
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-1D

Sample Date			Jun-00	Oct-00	Jun-01	Oct-01	Jun-02	Nov-02
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	100	100	150	82	80	79
BOD								
COD								
Chloride	AO	250	2.2	2.6	2.6	2.6	2.6	2.5
Conductivity us/cm			199	207	183	184	185	190
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1						<0.1
N-NO3 (Nitrate)	MAC	10	<0.1	<0.1				
Phenols			0.002	0.002	0.011	<0.001	<0.001	<0.001
Sulphate	AO	500	9	10	11	12	10	11
Total Dissolved Solids	AO	500	120	126	120	70	110	116
Total Kjeldahl Nitrogen								
Total phosphorous					0.44	0.21		
Hardness as CaCO3	OG	500						
Calcium			27	25.7	24.8	24.2	26.8	25.7
Magnesium			8.01	8.56	7.33	7.65	7.83	7.77
Potassium			0.6	<0.4	0.8	<0.4	0.7	2
Sodium	AO	200	1.9	2.0	1.9	2.3	1.9	2.3
Aluminum	OG	0.1	0.08	0.17	0.27	0.05	<0.01	0.03
Barium	MAC	1	0.015	0.020	0.015	0.015	0.020	0.025
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0006	<0.01	<0.01
Chromium	MAC	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt			<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Copper	AO	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	AO	0.3	0.22	0.23	0.15	0.04	0.23	0.54
Lead	MAC	0.01	<0.0002	<0.0002	0.0005	<0.0012	<0.1	0.0014
Manganese	AO	0.05	0.05	0.05	0.04	0.01	0.12	0.09
Molybdenum			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon			7.85	6.50	7.09	7.92	7.82	7.37
Silver			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Strontium			0.040	0.040	0.035	0.030	0.037	0.040
Thallium								
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025	<0.1	<0.1	0.002	0.001	<0.1	<0.1
Fluoride	MAC	1.5			0.1	0.2		
Mercury	MAC	0.001						
N-NH3 (Ammonia)							<0.1	
Phosphorus			<0.1	<0.1			<0.1	<0.1
pH (no units)	OG	6.5-8.5	8.01	7.82	7.59	8.24		8.17
Selenium	MAC	0.01						
Tin			<0.2	<0.2			<0.2	<0.2
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-1D

Sample Date			May-04	Sep-04	May-05	Nov-05	May-06	Oct-06
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	65	74	79	79	80	80
BOD					<1	<1		<1
COD			3	2	<5	<5	<5	<5
Chloride	AO	250	2.4	2.5	2.0	2.0	1.0	1.0
Conductivity us/cm			65	185	173	173	174	176
DOC	AO	5	0.8	<0.5	0.5	0.8	0.6	<0.05
N-NO2 (Nitrite)	MAC	1			<0.10	<0.10		<0.10
N-NO3 (Nitrate)	MAC	10			<0.10	<0.10		<0.10
Phenols			<0.001	<0.001	<0.001	<0.001		<0.001
Sulphate	AO	500	10	11	11	11		10
Total Dissolved Solids	AO	500			112	112	113	114
Total Kjeldahl Nitrogen					<0.05	<0.05	<0.05	<0.05
Total phosphorous			0.07	0.08	0.28	0.1		0.17
Hardness as CaCO3	OG	500	84	82	84	75		84
Calcium			21.8	20.6	22	20	21	22
Magnesium			7.19	7.47	7.0	6.0	7.0	7.0
Potassium			1.7	1.6	1	1	2	2
Sodium	AO	200	2.1	2.0	<2	<2	2.0	<2
Aluminum	OG	0.1	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01
Barium	MAC	1	0.017	0.015	0.020	0.020	0.010	0.020
Beryllium			<0.001	<0.001	<0.001	<0.001		<0.001
Boron	IMAC	5	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Chromium	MAC	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt			<0.005	<0.005	0.0003	<0.0002	<0.0002	<0.0002
Copper	AO	1	<0.002	<0.002	<0.001	<0.001	0.06	<0.001
Iron	AO	0.3	0.065	0.072	0.08	0.07	0.07	0.07
Lead	MAC	0.01	0.0003	<0.0005	0.001	<0.001		<0.001
Manganese	AO	0.05	0.031	0.027	0.040	0.030	0.03	0.03
Molybdenum			<0.01	<0.01	<0.005	<0.005		<0.005
Nickel			<0.01	<0.01	<0.005	<0.005		<0.005
Silicon			7.41	7.23	9.00	8.20	6.90	7.60
Silver			<0.005	<0.005	<0.0001	<0.0001		<0.0001
Strontium			0.032	0.031	0.035	0.043	0.031	0.044
Thallium					<0.0001	<0.0001		<0.0001
Titanium			<0.005	<0.005	<0.01	<0.01		<0.01
Vanadium			<0.005	<0.005	<0.001	<0.001		<0.001
Zinc	AO	5	<0.005	<0.005	0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025	<0.001	0.002				
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)							0.03	
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01	<0.001	<0.001				
Tin			<0.05	<0.05				
Dissolved Reactive P							0.07	
Field Parameters								
Temperature ^{o}C					7.6	6.7	8.1	7.8
pH					7.21	8.22	8.05	7.04
Conductivity us/cm					157	153	133	140

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-1D

Sample Date			May-07	Oct-07	May-08	Oct-08	May-09	Sep-09
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	91	89	93	88	84	87
BOD			<1	<1	<1	<1	<1	1
COD			<5	<5	<5	8	<5	<5
Chloride	AO	250	1.0	1.0	1	1	1	1.0
Conductivity us/cm			192	185	193	185	175	182
DOC	AO	5	1.3	1.1	1.5	1.1	1.2	1.3
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate	AO	500	8	8	7	7	8	8
Total Dissolved Solids	AO	500	125	120	125	120	114	118
Total Kjeldahl Nitrogen			0.13	<0.10	<0.10	<0.10	<0.10	<0.10
Total phosphorous			0.19	0.11	0.04	0.05	0.03	0.04
Hardness as CaCO3	OG	500	95	95	95	90	93	88
Calcium			25	25	25	23	24	22
Magnesium			8.0	8.0	8	8	8	8.00
Potassium			1	2	2	2	2	2
Sodium	AO	200	<2	<2	<2	<2	3	<2
Aluminum	OG	0.1	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Barium	MAC	1	0.020	0.020	0.02	0.02	0.02	0.020
Beryllium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt			<0.0002	<0.0002	0.0332	0.0314	0.0277	0.0356
Copper	AO	1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	0.08	0.09	0.12	0.09	0.12	0.07
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.04	0.04	0.11	0.10	0.09	0.09
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			7.70	7.50	7.6	7.2	7.3	7.10
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.043	0.046	0.037	0.033	0.033	0.032
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			<0.001	<0.001	0.001	0.001	<0.001	<0.001
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.7	7.6			8	7.1
pH			7.04	7.3			8.2	7.5
Conductivity us/cm			166	143			199	160

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-1D

Sample Date			May-10	Oct-10	Jun-11	Oct-11	Jun-12	Oct-12
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	88	80	100	98	98	97
BOD								
COD								
Chloride	AO	250	<1	1	1	1	1	2.0
Conductivity us/cm			188	175	199	200	200	203
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols							<0.001	<0.001
Sulphate	AO	500					10	11
Total Dissolved Solids	AO	500	122	114	129	130	130	132
Total Kjeldahl Nitrogen			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total phosphorous								
Hardness as CaCO3	OG	500	90	75	102	95	76	100
Calcium			23	20	26	25	19	27
Magnesium			8	6	9	8	7	8.00
Potassium			2	1	2	2	1	2
Sodium	AO	200	<2	<2	<2	<2	2	2.0
Aluminum	OG	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium	MAC	1	0.02	0.02	0.02	0.02	0.02	0.020
Beryllium			<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IMAC	5	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	<0.001	0.001	<0.001	<0.001	<0.001
Cobalt			0.0091	<0.0179	0.0010	0.0154	0.0003	0.0081
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	0.22	0.10	0.13	0.13	0.11	0.11
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.06	0.06	0.05	0.07	0.05	0.05
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			6.6	6.9	6.7	6.8	7.7	6.50
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.035	0.032	0.038	0.037	0.038	0.038
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	AO	5	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5				7.09		
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			9.1	6.5	7.6	7	8.1	6.7
pH			7.8	7.8	7.3	7.6	7.4	7.0
Conductivity us/cm			190	132	162	203	174	200

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-1D

Sample Date			Oct-12	Jun-13	Jun-13	Nov-13	Nov-13	Apr-14
PARAMETER	Limit	ODWO/S	QA/QC		QA/QC		QA/QC	
Alkalinity (C_aCO3)	OG	30-500	95	98	97	99	103	91
BOD								
COD								
Chloride	AO	250	2.0	2	2	2	2	1.9
Conductivity us/cm			205	214	210	221	222	208
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	< 0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	< 0.10
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	
Sulphate	AO	500	11	11	12	12	13	
Total Dissolved Solids	AO	500	133	139	136	144	144	110
Total Kjeldahl Nitrogen			<0.10	<0.10	<0.10	<0.10	<0.13	0.14
Total phosphorous								
Hardness as CaCO3	OG	500	100	104	104	109	112	108
Calcium			27	27	27	29	30	28.3
Magnesium			8.00	9	9	9	9	9.17
Potassium			2	2	2	2	2	1.7
Sodium	AO	200	2.0	2.0	2	<2	<2	2.4
Aluminum	OG	0.1	<0.01	0.01	<0.01	<0.01	<0.01	0.02
Barium	MAC	1	0.020	0.02	0.02	0.02	0.02	0.020
Beryllium			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.0001
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	<0.01	< 0.005
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002
Chromium	MAC	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.002
Cobalt			0.0016	0.0013	0.0102	0.0004	0.0023	0.0016
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.002	< 0.0001
Iron	AO	0.3	0.1	0.12	0.12	0.10	0.1	0.11
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	0.00002
Manganese	AO	0.05	0.04	0.05	0.06	0.04	0.05	0.05
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	0.0003
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	< 0.01
Silicon			6.50	7.2	7.2	7.8	7.4	7.26
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	
Strontium			0.039	0.043	0.044	0.039	0.04	0.045
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00005
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	< 0.005
Vanadium			<0.001	<0.001	<0.001	<0.001	<0.001	0.0006
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								< 0.01
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C				9.3		8.3		7.4
pH				6.2		7.3		7.6
Conductivity us/cm				168		52		190

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-1D

Sample Date			Oct-14	Jun-15	Oct-15	Oct-15	May-16	Nov-16
PARAMETER	Limit	ODWO/S				QA/QC		
Alkalinity (C_aCO3)	OG	30-500	90	95	88	89	99	87
BOD								
COD								
Chloride	AO	250	2.1	1.7	1.9	1.9	2.03	1.59
Conductivity us/cm			195	211	195	200	218	195
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.10	< 0.1	< 0.1	< 0.1	<0.05	<0.05
N-NO3 (Nitrate)	MAC	10	< 0.10	< 0.1	< 0.1	< 0.1	<0.05	<0.05
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	108	129	117	126	110	126
Total Kjeldahl Nitrogen			0.05	< 0.1	< 0.05	< 0.05	<0.10	<0.10
Total phosphorous								
Hardness as CaCO3	OG	500	102	109	109	107	104	90.6
Calcium			26.8	28	27	26.1	27.0	23.6
Magnesium			8.8	9.53	10.1	10.1	8.77	7.70
Potassium			1.7	1.7	1.6	1.6	1.72	1.68
Sodium	AO	200	2.3	2.2	2.3	1.9	2.12	2.20
Aluminum	OG	0.1	0.01	< 0.01	0.01	< 0.01	<0.004	0.020
Barium	MAC	1	0.019	0.02	0.022	0.02	0.020	0.017
Beryllium			< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.001	<0.001
Boron	IMAC	5	0.008	< 0.005	0.007	0.006	<0.010	<0.010
Cadmium	MAC	0.005	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.001	<0.001
Chromium	MAC	0.05	< 0.002	< 0.002	0.002	< 0.002	<0.003	<0.003
Cobalt			0.003	0.0003	< 0.0001	< 0.0001	<0.001	<0.001
Copper	AO	1	< 0.002	< 0.002	< 0.002	< 0.002	<0.003	<0.003
Iron	AO	0.3	0.092	0.042	0.106	0.14	0.232	0.022
Lead	MAC	0.01	0.00009	< 0.00002	< 0.00002	< 0.00002	<0.002	<0.002
Manganese	AO	0.05	0.053	0.048	0.053	0.051	0.043	0.030
Molybdenum			0.0002	0.0003	0.0004	0.0004		
Nickel			< 0.01	< 0.01	< 0.01	< 0.01	<0.003	<0.003
Silicon			7.26	7.59	7.5	7.37	7.35	7.64
Silver								
Strontium			0.043	0.046	0.046	0.043	0.039	0.031
Thallium			< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.006	<0.006
Titanium			< 0.005	< 0.005	< 0.005	< 0.005	<0.002	<0.002
Vanadium			0.001	0.001	0.0005	0.0006	<0.002	<0.002
Zinc	AO	5	< 0.005	< 0.005	0.006	< 0.005	0.006	<0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			< 0.01	< 0.01	< 0.01	< 0.01		
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.3	8.6	7.2		7.4	6.4
pH			7.4	7.3	7.8		7.6	7.6
Conductivity us/cm			200	204	182		202	190

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-1D

Sample Date			Apr-17	Oct-17	May-18	Oct-18		
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	90	99	103	108		
BOD								
COD								
Chloride	AO	250	1.5	1.3	2	2		
Conductivity us/cm			193	212	219	222		
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.1	< 0.05	< 0.10	< 0.10		
N-NO3 (Nitrate)	MAC	10	< 0.1	< 0.05	< 0.10	< 0.10		
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	107	110	142	144		
Total Kjeldahl Nitrogen			< 0.05	< 0.1	< 0.8	0.9		
Total phosphorous								
Hardness as CaCO3	OG	500		112	116	97		
Calcium			27.8	28.5	30	24		
Magnesium			8.87	9.88	10	9		
Potassium			1.6	1.6	2	2		
Sodium	AO	200	2.3	2.4	2	2		
Aluminum	OG	0.1	0.03	0.03	< 0.01	< 0.01		
Barium	MAC	1	0.022	0.022	0.02	0.02		
Beryllium			< 0.0001	< 0.0001	< 0.0005	< 0.0005		
Boron	IMAC	5	0.022	0.005	< 0.01	< 0.01		
Cadmium	MAC	0.005	< 0.000014	< 0.000014	< 0.0001	< 0.0001		
Chromium	MAC	0.05	< 0.002	< 0.002	< 0.001	< 0.001		
Cobalt			< 0.0001	< 0.0001	< 0.0002	< 0.0002		
Copper	AO	1	< 0.002	< 0.002	< 0.001	< 0.001		
Iron	AO	0.3	0.102	0.103	0.11	0.11		
Lead	MAC	0.01	< 0.00002	< 0.00002	< 0.001	< 0.001		
Manganese	AO	0.05	0.042	0.049	0.04	0.04	0.050	
Molybdenum			0.0003	0.0002	< 0.005	< 0.005		
Nickel			0.0006	0.0005	< 0.005	< 0.005		
Silicon			7.99	5.11	7.7	7.8		
Silver								
Strontium				0.041	0.039	< 0.044		
Thallium			< 0.00005	< 0.00005	< 0.0001	< 0.01		
Titanium			< 0.005	< 0.005	< 0.01	< 0.0001		
Vanadium			0.0005	0.0005	< 0.001	< 0.001		
Zinc	AO	5	< 0.005	< 0.005	< 0.01	< 0.01		
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin			< 0.05					
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			6.8	7.3	7.3	7.4		
pH			7.5	8.2	7.3	7.7		
Conductivity us/cm			201	192	190	50		

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-1S

Sample Date			Aug-96	Nov-96	Jul-97	Nov-98	Jul-99	Nov-99
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	93	88	67	97	82	72
BOD								
COD							6	
Chloride	AO	250	6.7	0.5	1.2	1.3	0.9	0.9
Conductivity us/cm			211	187	125	193	177	149
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1					<0.1	
N-NO3 (Nitrate)	MAC	10	<0.1	<0.1	<0.1	<0.1	0.2	3
Phenols			0.001	<0.001	0.053	0.004	<0.001	0.005
Sulphate	AO	500	7	11	4	4	4	3
Total Dissolved Solids	AO	500	140	106	84	108		130
Total Kjeldahl Nitrogen							0.86	
Total phosphorous							3.23	
Hardness as CaCO3	OG	500					61	
Calcium			23.4	29.2	14.4	22.1	17	17.7
Magnesium			7.98	6.02	3.45	5.51	4.53	4.64
Potassium			2.8	1.6	<0.4	2.9	3	2.1
Sodium	AO	200	4.3	3.2	1.6	2.6	1.5	2.2
Aluminum	OG	0.1	0.29	0.07	0.04	0.02	0.12	0.16
Barium	MAC	1	0.043	0.029	0.006	0.020	0.010	0.020
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.01	<0.0001		<0.0001
Chromium	MAC	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	AO	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	AO	0.3	0.52	0.44	0.03	<0.02	0.2	0.14
Lead	MAC	0.01	0.00011	<0.0002	<0.1	<0.0002	<0.0002	<0.0002
Manganese	AO	0.05	0.05	0.55	<0.01	0.09	0.03	0.06
Molybdenum			0.04	0.05	<0.02	<0.02	<0.02	0.02
Nickel			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon			6.71	7.61	7.08	7.36	7.06	7.71
Silver			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Strontium			0.052	0.107	0.042	0.055	0.035	0.050
Thallium								
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			0.01	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	AO	5	<0.01	<0.01	<0.01	0.02	<0.01	<0.01
Arsenic	IMAC	0.025	<0.1	<0.001	<0.1	<0.01	<0.001	<0.1
Fluoride	MAC	1.5						
Mercury	MAC	0.001					<0.0001	
N-NH3 (Ammonia)							<0.01	
Phosphorus			0.2	<0.1	<0.1	<0.1	0.1	<0.01
pH (no units)	OG	6.5-8.5	7.8	8.17	8.16	7.09	7.38	7.98
Selenium	MAC	0.01					<0.001	
Tin			<0.2	<0.2	<0.2	<0.2	<0.2	<0.02
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-1S

Sample Date			Jun-00	Oct-00	Jun-01	Oct-01	Jun-02	Nov-02
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	76	70	51	20	40	35
BOD								
COD								
Chloride	AO	250	1.1	1.4	1.4	1.2	1.2	1.3
Conductivity us/cm			134	153	115	80	90	88
DOC	AO	5					0.033	
N-NO2 (Nitrite)	MAC	1						<0.1
N-NO3 (Nitrate)	MAC	10	<0.1	0.1				
Phenols			0.002	0.003	0.034	<0.001	<0.001	<0.001
Sulphate	AO	500	3	6	5	5	5	7
Total Dissolved Solids	AO	500	98	96	110	48	72	92
Total Kjeldahl Nitrogen								
Total phosphorous					1.04	0.56		
Hardness as CaCO3	OG	500						
Calcium			13.8	17	12.1	10.7	11.5	9.31
Magnesium			7.50	4.29	3.57	2.93	3.21	3
Potassium			<0.4	<0.4	<0.4	<0.4	<0.4	<0.4
Sodium	AO	200	1.3	5.0	1.2	1.7	1.3	1.9
Aluminum	OG	0.1	0.08	0.26	0.16	0.04	0.01	0.02
Barium	MAC	1	<0.005	0.010	<0.005	0.010	0.007	0.005
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0006	<0.01	<0.01
Chromium	MAC	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	AO	1	<0.01	<0.01	<0.01	<0.01		
Iron	AO	0.3	0.11	0.27	0.03	0.05	0.03	0.04
Lead	MAC	0.01	<0.0002	<0.0002	0.0002	<0.0012	<0.1	<0.1
Manganese	AO	0.05	<0.01	0.02	<0.01	<0.01	0.01	<0.01
Molybdenum			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Nickel			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon			6.46	6.18	5.71	7.17	6.56	7.69
Silver			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Strontium			0.035	0.040	0.035	0.035		0.04
Thallium								
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025	<0.1	<0.1	0.001	<0.001	<0.1	<0.1
Fluoride	MAC	1.5			0.1	0.1		
Mercury	MAC	0.001						
N-NH3 (Ammonia)							<0.1	
Phosphorus			<0.1	<0.1			<0.1	<0.1
pH (no units)	OG	6.5-8.5	7.81	7.69	6.82	7.7		7.84
Selenium	MAC	0.01						
Tin			<0.2	<0.2			<0.2	<0.2
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-1S

Sample Date			Aug-96	Nov-96	May-04	Sep-04	May-05	Nov-05
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	74		32	36	34	37
BOD							<1	<1
COD					<2	5	<5	<5
Chloride	AO	250	17.3	18.2	1.2	1.7	<1	3.0
Conductivity us/cm			225	2420	75	86	81	88
DOC	AO	5			<0.5	<0.5	<0.5	1.3
N-NO2 (Nitrite)	MAC	1					<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.1				<0.10	<0.10
Phenols			0.009		<0.001	<0.001	<0.001	<0.001
Sulphate	AO	500	12		4	7	8	7
Total Dissolved Solids	AO	500	148				53	57
Total Kjeldahl Nitrogen							<0.05	<0.05
Total phosphorous					0.5	0.35	0.2	0.69
Hardness as CaCO3	OG	500			31	33	37	35
Calcium			21.3		8.12	8.7	10	9
Magnesium			7.03		2.51	3.11	3.0	3.0
Potassium			7.9		0.6	0.8	<1	<1
Sodium	AO	200	9.8		1.7	2.0	<2	<2
Aluminum	OG	0.1	5.41		0.015	<0.005	<0.01	<0.01
Barium	MAC	1	0.316		0.007	0.007	<0.01	<0.01
Beryllium			<0.005		<0.001	<0.001	<0.001	<0.001
Boron	IMAC	5	<0.01		<0.005	<0.005	<0.01	<0.01
Cadmium	MAC	0.005	<0.001		<0.0001	<0.0001	<0.0001	<0.001
Chromium	MAC	0.05	<0.01		<0.001	<0.001	<0.001	0.002
Cobalt			<0.01		<0.005	<0.005	0.0002	<0.0002
Copper	AO	1	0.02		<0.002	<0.002	<0.001	0.003
Iron	AO	0.3	6.74		0.007	0.646	<0.01	<0.03
Lead	MAC	0.01	0.0074		0.0002	0.001	0.001	<0.001
Manganese	AO	0.05	0.17		0.002	0.002	<0.01	<0.01
Molybdenum			0.05		<0.01	<0.01	<0.005	<0.005
Nickel			<0.02		<0.01	<0.01	<0.005	<0.005
Silicon			14.00		6.79	7.78	8.60	9.70
Silver			<0.01		<0.005	<0.005	<0.0001	<0.0001
Strontium			0.145		0.035	0.034	0.038	0.043
Thallium							<0.0001	<0.0001
Titanium			0.35		<0.005	<0.005	<0.01	<0.01
Vanadium			0.021		<0.005	<0.005	<0.001	<0.001
Zinc	AO	5	0.032		<0.005	0.006	0.01	0.02
Arsenic	IMAC	0.025	<0.1		<0.001	0.001		
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus			0.2					
pH (no units)	OG	6.5-8.5	7.6	6.68				
Selenium	MAC	0.01			<0.001	<0.001		
Tin			<0.2		<0.05	<0.05		
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C							6.8	6.2
pH							8.08	8.15
Conductivity us/cm							67	76

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-1S

Sample Date			May-06	Oct-06	May-07	Oct-07	May-08	Oct-08
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	32	30	27	33	28	24
BOD				<1	<1	<1	2	<1
COD			<5	<5	<5	<5	<5	8
Chloride	AO	250	3.0	2.0	2.0	1.0	<1	1
Conductivity us/cm			74	80	71	80	62	59
DOC	AO	5	0.5	0.5	1.1	1.1	1.5	1.2
N-NO2 (Nitrite)	MAC	1		<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10		<0.10	<0.10	<0.10	<0.10	<0.10
Phenols				<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate	AO	500		9	9	7	5	6
Total Dissolved Solids	AO	500	48	52	46	52	40	38
Total Kjeldahl Nitrogen			<0.05	0.06	0.16	0.15	<0.10	0.16
Total phosphorous				0.09	0.1	0.06	0.06	0.25
Hardness as CaCO3	OG	500		35	26	35	28	26
Calcium			8	9	7	9	8	7
Magnesium			3.0	3.0	2.0	3.0	2	2
Potassium			<1	<1	<1	<1	<1	<1
Sodium	AO	200	<2	<2	<2	2.0	<2	<2
Aluminum	OG	0.1	<0.01	<0.01	<0.01	<0.01	0.02	0.11
Barium	MAC	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Beryllium				<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.001	<0.001	<0.001	<0.001	0.002	0.002
Cobalt			<0.0002	<0.0002	<0.002	<0.0002	0.0334	0.0285
Copper	AO	1	0.162	0.002	0.004	0.002	<0.001	<0.001
Iron	AO	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	0.12
Lead	MAC	0.01		<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	<0.01	<0.01	<0.01	<0.01	0.06	0.06
Molybdenum				<0.005	<0.005	<0.005	<0.005	<0.005
Nickel				<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			7.20	8.20	8.10	8.20	8.4	8.7
Silver				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.033	0.048	0.037	0.044	0.029	0.028
Thallium				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium				<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium				<0.001	<0.001	<0.001	<0.001	0.001
Zinc	AO	5	0.01	0.01	0.02	0.02	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			<0.02					
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P			0.06					
Field Parameters								
Temperature ^{o}C			7.5	8.5	6.9	8.3		
pH			8.21	7.21	7.12	7.38		
Conductivity us/cm			60	60	51	54		

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-1S

Sample Date			May-09	Sep-09	May-10	Oct-10	Jun-11	Oct-11
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	32	26	29	27	21	26
BOD			<1	<1				
COD			<5	<5				
Chloride	AO	250	1	1	2	1	<1	<1
Conductivity us/cm			74	63	60	58	47	54
DOC	AO	5	1	1.3				
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols			<0.001	<0.001				
Sulphate	AO	500	5	5				
Total Dissolved Solids	AO	500	48	41	39	38	31	35
Total Kjeldahl Nitrogen			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total phosphorous			0.06	0.07				
Hardness as CaCO3	OG	500	35	26	26	23	17	23
Calcium			9	7	7	6	5	6
Magnesium			3	2	2	2	1	2
Potassium			<1	<1	<1	<1	<1	<1
Sodium	AO	200	2	<2	<2	<2	<2	<2
Aluminum	OG	0.1	0.04	0.08	0.02	0.04	0.02	0.02
Barium	MAC	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Beryllium			<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.00001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt			0.0228	0.0208	0.0007	0.0203	0.0086	0.0085
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	0.05	0.07	0.21	0.09	0.07	0.07
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.04	0.03	<0.01	0.04	0.02	0.02
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			8.1	7.5	6.7	7.3	6.5	7
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.035	0.032	0.03	0.028	0.023	0.024
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			8	7.8	7.8	7.3	6.5	8.3
pH			7.1	7.4	7.1	7.7	7.4	6.5
Conductivity us/cm			71	53	60	43	35	48

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-1S

Sample Date			Jun-12	Oct-12	Jun-13	Nov-13	Apr-14	Oct-14
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	27	27	25	22	25	22
BOD								
COD								
Chloride	AO	250	<1	<1	<1	<1	0.8	0.9
Conductivity us/cm			58	58	56	52	60	53
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	< 0.10	< 0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	0.13	< 0.10	0.1
Phenols			<0.001	<0.001	<0.001	<0.001		
Sulphate	AO	500	5	5	4	5		
Total Dissolved Solids	AO	500	38	38	36	34	31.6	29.2
Total Kjeldahl Nitrogen			<0.10	<0.10	<0.10	<0.10	0.15	0.21
Total phosphorous								
Hardness as CaCO3	OG	500	21	26	21	23	28	22
Calcium			5	7	5	6	7.33	5.72
Magnesium			2	2	2	2	2.25	1.81
Potassium			<1	<1	<1	<1	0.5	0.5
Sodium	AO	200	2	<2	<2	<2	1.8	1.8
Aluminum	OG	0.1	0.04	0.02	0.01	0.02	0.02	< 0.01
Barium	MAC	1	<0.01	<0.01	<0.01	<0.01	0.006	0.006
Beryllium			<0.0005	<0.0005	<0.0005	<0.0005	< 0.0001	< 0.0001
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	< 0.005	< 0.005
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	0.00003	< 0.00002
Chromium	MAC	0.05	<0.001	<0.001	<0.001	<0.001	< 0.002	< 0.002
Cobalt			0.0072	0.0021	0.0038	0.0026	0.0014	0.0024
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	0.0002	< 0.002
Iron	AO	0.3	<0.03	<0.03	<0.03	<0.03	< 0.005	0.102
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	0.00003	< 0.00002
Manganese	AO	0.05	0.02	<0.01	<0.01	<0.01	0.005	0.013
Molybdenum			<0.005	<0.005	<0.005	<0.005	< 0.0001	< 0.0001
Nickel			<0.005	<0.005	<0.005	<0.005	< 0.01	< 0.01
Silicon			7.2	6.8	6.7	7.8	7.17	7.38
Silver			<0.0001	<0.0001	<0.0001	<0.0001		
Strontium			0.029	0.032	0.03	0.028	0.043	0.037
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	< 0.00005	< 0.00005
Titanium			<0.01	<0.01	<0.01	<0.01	< 0.005	< 0.005
Vanadium			<0.001	<0.001	<0.001	<0.001	0.0005	0.0004
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	< 0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)							< 0.01	0.01
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.6	7.3	9.3	8.3	6.8	7.9
pH			6.3	6.9	5.6	7.3	7.1	6.8
Conductivity us/cm			48	56	38	52	55	55

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-1S

Sample Date			Jun-15	Oct-15	May-16	Nov-16	Apr-17	May-18
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	22	19	26	23	23	< 5
BOD								
COD								
Chloride	AO	250	0.7	0.6	0.40	0.40	< 0.5	0.6
Conductivity us/cm			63	53	58	51	51	43
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.1	< 0.1	<0.05	<0.05	< 0.1	< 0.05
N-NO3 (Nitrate)	MAC	10	< 0.1	0.1	<0.05	<0.05	< 0.1	< 0.05
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	38	32	36	66	27	11
Total Kjeldahl Nitrogen			0.1	< 0.05	0.11	0.14	< 0.05	0.3
Total phosphorous								
Hardness as CaCO3	OG	500	26	25	22.4	19.0		11
Calcium			6.73	6.2	5.93	4.90	6.33	2.47
Magnesium			2.23	2.2	1.84	1.65	1.99	1.14
Potassium			0.5	0.5	0.45	0.42	0.3	0.4
Sodium	AO	200	1.8	1.8	1.44	1.52	1.6	1.7
Aluminum	OG	0.1	0.01	< 0.01	0.008	0.018	0.01	0.52
Barium	MAC	1	0.006	0.007	0.008	0.007	0.007	0.006
Beryllium			< 0.0001	< 0.0001	<0.001	<0.001	< 0.0001	< 0.0001
Boron	IMAC	5	< 0.005	< 0.005	<0.010	<0.010	0.018	< 0.005
Cadmium	MAC	0.005	< 0.00002	< 0.00002	<0.001	<0.001	< 0.000014	< 0.000014
Chromium	MAC	0.05	< 0.002	< 0.002	<0.003	<0.003	< 0.002	< 0.002
Cobalt			0.0005	< 0.0001	<0.001	<0.001	< 0.0001	< 0.0001
Copper	AO	1	< 0.002	< 0.002	<0.003	<0.003	< 0.002	< 0.002
Iron	AO	0.3	< 0.005	0.008	<0.010	0.084	< 0.005	0.521
Lead	MAC	0.01	< 0.00002	< 0.00002	<0.002	<0.002	< 0.00002	0.00003
Manganese	AO	0.05	0.003	0.005	0.003	0.006	0.003	0.009
Molybdenum			< 0.0001	< 0.0001			< 0.0001	< 0.0001
Nickel			< 0.01	< 0.01	<0.003	<0.003	0.0005	0.0005
Silicon			7.24	7.5	7.14	7.68	7.54	9.08
Silver								
Strontium			0.043	0.043	0.031	0.029		0.018
Thallium			< 0.00005	< 0.00005	<0.006	<0.006	< 0.00005	< 0.00005
Titanium			< 0.005	< 0.005	<0.002	<0.002	< 0.005	0.023
Vanadium			0.0006	0.0003	<0.002	<0.002	0.0003	0.0002
Zinc	AO	5	< 0.005	< 0.005	0.013	<0.005	< 0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			< 0.01	< 0.01				
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin							< 0.05	
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.3	7.7	6.7	7.1	6.2	8.0
pH			7	7.8	7.7	7.6	6.5	6.5
Conductivity us/cm			63	52	53	54	55	37

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-1S

Sample Date Oct-18

PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	25					
BOD								
COD								
Chloride	AO	250	< 1					
Conductivity us/cm			60					
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.10					
N-NO3 (Nitrate)	MAC	10	< 0.10					
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	39					
Total Kjeldahl Nitrogen			2.2					
Total phosphorous								
Hardness as CaCO3	OG	500	21					
Calcium			5					
Magnesium			2					
Potassium			< 1					
Sodium	AO	200	< 2					
Aluminum	OG	0.1	< 0.01					
Barium	MAC	1	< 0.01					
Beryllium			< 0.0005					
Boron	IMAC	5	< 0.01					
Cadmium	MAC	0.005	< 0.0001					
Chromium	MAC	0.05	< 0.001					
Cobalt			0.0002					
Copper	AO	1	0.004					
Iron	AO	0.3	0.05					
Lead	MAC	0.01	0.001					
Manganese	AO	0.05	0.03					
Molybdenum			< 0.005					
Nickel			< 0.005					
Silicon			7.9					
Silver								
Strontium			0.038					
Thallium			< 0.0001					
Titanium			< 0.01					
Vanadium			< 0.001					
Zinc	AO	5	< 0.02					
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			no data					
pH			no data					
Conductivity us/cm			no data					

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-2

Sample Date			May-07	Apr-17	Oct-17	May-18		
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	106	394	22	320		
BOD			<1					
COD			<5					
Chloride	AO	250	9.0	17.7	< 1	14		
Conductivity us/cm			293	803	48			
DOC	AO	5	5.2					
N-NO2 (Nitrite)	MAC	1	<0.10	< 0.1	< 0.10	< 0.10		
N-NO3 (Nitrate)	MAC	10	0.2	< 0.1	< 0.10	< 0.10		
Phenols			<0.001					
Sulphate	AO	500	34					
Total Dissolved Solids	AO	500	190	456	31	441		
Total Kjeldahl Nitrogen			0.36	2.1	< 0.8	1.7		
Total phosphorous			4.71					
Hardness as CaCO3	OG	500	134	390	18	354		
Calcium			37	118	4	107		
Magnesium			10.0	23	2.0	21		
Potassium			2	10.1	< 1	7		
Sodium	AO	200	9.0	32.5	< 2	21		
Aluminum	OG	0.1	<0.01	0.06	< 0.01	< 0.01		
Barium	MAC	1	0.040	0.199	< 0.01	0.13		
Beryllium			<0.001	< 0.0001	< 0.0005	< 0.0005		
Boron	IMAC	5	0.05	0.416	< 0.01	0.27		
Cadmium	MAC	0.005	<0.0001	0.000063	< 0.0001	< 0.0001		
Chromium	MAC	0.05	<0.001	< 0.002	< 0.001	< 0.001		
Cobalt			<0.0002	0.0009	< 0.0002	< 0.0005		
Copper	AO	1	0.003	0.008	< 0.001	0.003		
Iron	AO	0.3	<0.03	0.015	< 0.03	< 0.03		
Lead	MAC	0.01	<0.001	< 0.00002	< 0.001	< 0.001		
Manganese	AO	0.05	<0.01	2.15	< 0.01	0.29		
Molybdenum			<0.005	< 0.0001	< 0.005	< 0.005		
Nickel			<0.005	0.0059	< 0.005	< 0.005		
Silicon			6.50	10.8	7.30	8.5		
Silver			<0.0001					
Strontium			0.178	0.541	0.028	0.388		
Thallium			<0.0001	< 0.00005	< 0.0001	< 0.0001		
Titanium			<0.01	< 0.005	< 0.01	< 0.01		
Vanadium			0.001	0.0025	< 0.001	< 0.001		
Zinc	AO	5	0.01	< 0.005	< 0.01	< 0.01		
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			8.2	6.8	6.9	5.5		
pH			6.93	6.4	7	7.1		
Conductivity us/cm			259	804	43	564		

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-3

Sample Date			Aug-96	Nov-96	Jul-99	Nov-99	Jun-00	Jun-01
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	57	50	50	85	61	62
BOD								
COD					<3			
Chloride	AO	250	6.4	<0.1	1.0	1.1	1.0	1.1
Conductivity us/cm			146	130	141	148	139	133
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1			<0.1			
N-NO3 (Nitrate)	MAC	10	<0.1	<0.1	0.2	<0.1	<0.1	
Phenols			<0.001	0.003	<0.001	<0.001	<0.001	0.002
Sulphate	AO	500	11	14	12	13	12	13
Total Dissolved Solids	AO	500	102	71		110	84	98
Total Kjeldahl Nitrogen					0.09			
Total phosphorous					0.13			0.08
Hardness as CaCO3	OG	500			62			
Calcium			22	15.4	15.9	23.8	16.4	15.7
Magnesium			7.72	5.17	5.34	5.21	5.26	5.05
Potassium			8.4	1.6	4.2	2.6	1.2	0.4
Sodium	AO	200	13.0	2.2	2.2	2.9	2.1	1.7
Aluminum	OG	0.1	9.07	0.03	0.01	<0.01	0.06	0.19
Barium	MAC	1	0.125	0.015	0.015	0.035	0.010	0.010
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Boron	IMAC	5	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper	AO	1	0.05	<0.01	<0.01	<0.01	<0.01	<0.01
Iron	AO	0.3	8.02	0.1	0.1	0.12	0.11	0.05
Lead	MAC	0.01	0.0067	<0.0002	<0.0002	<0.0002	<0.0002	0.0002
Manganese	AO	0.05	0.10	0.01	<0.01	0.17	<0.01	<0.01
Molybdenum			0.04	0.02	<0.02	<0.02	<0.02	<0.02
Nickel			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon			37.00	6.03	5.74	4.98	5.83	5.13
Silver			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Strontium			0.078	0.027	0.025	0.040	0.030	0.030
Thallium								
Titanium			0.4	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			0.026	<0.005	<0.005	<0.05	<0.005	<0.005
Zinc	AO	5	0.02	<0.01	0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025	<0.1	0.001	<0.001	<0.1	<0.1	0.001
Fluoride	MAC	1.5						0.1
Mercury	MAC	0.001			<0.0001			
N-NH3 (Ammonia)					<0.01			
Phosphorus			0.3	<0.1	0.1	<0.01	<0.1	
pH (no units)	OG	6.5-8.5	8.01	8.01	7.8	7.90	7.9	7.59
Selenium	MAC	0.01			<0.001			
Tin			<0.2	<0.2	<0.2	<0.2	<0.2	
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-3

Sample Date			Jun-01	Oct-01	Jun-02	Jun-02	Nov-02	May-04
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	51	52	54	52	72	50
BOD								
COD								<2
Chloride	AO	250	1.1	1.2	1.2	1.2	1.2	1.2
Conductivity us/cm			132	139	134	135	176	134
DOC	AO	5						<0.5
N-NO2 (Nitrite)	MAC	1					<0.1	
N-NO3 (Nitrate)	MAC	10						
Phenols			0.008	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate	AO	500	12	12	13	12	13	12
Total Dissolved Solids	AO	500	86	83	94	80	92	
Total Kjeldahl Nitrogen								
Total phosphorous			0.07	0.1				0.03
Hardness as CaCO3	OG	500						62
Calcium			15.5	16.7	17.9	16.5	24.8	15.9
Magnesium			4.98	5.07	5.64	5.25	5.29	5.35
Potassium			1.2	2.6	<0.4	2	<0.4	2
Sodium	AO	200	1.9	2.2	2	2	2.4	2.3
Aluminum	OG	0.1	0.20	0.01	0.01	<0.01	0.04	<0.005
Barium	MAC	1	0.010	0.015	0.014	0.013	0.015	0.014
Beryllium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.001
Boron	IMAC	5	<0.01	0.01	<0.01	0.01	<0.01	<0.005
Cadmium	MAC	0.005	<0.0001	<0.0006	<0.01	<0.01	<0.01	<0.0001
Chromium	MAC	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.001
Cobalt			<0.01	<0.01	<0.01	<0.01	<0.01	<0.005
Copper	AO	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.002
Iron	AO	0.3	0.06	0.06	0.05	0.04	0.04	0.036
Lead	MAC	0.01	<0.0002	<0.0012	<0.1	<0.1	<0.1	<0.0002
Manganese	AO	0.05	<0.01	0.01	0.01	0.01	<0.01	0.006
Molybdenum			<0.02	<0.02	<0.02	<0.02	<0.02	<0.01
Nickel			<0.02	<0.02	<0.02	<0.02	<0.02	<0.01
Silicon			5.08	5.62	5.86	5.87	5.63	5.86
Silver			<0.01	<0.01	<0.01	<0.01	<0.01	<0.005
Strontium			0.030	0.025	0.028	0.027	0.03	0.027
Thallium								
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.005
Vanadium			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005
Arsenic	IMAC	0.025	0.002	0.001	<0.1	<0.1	<0.1	0.001
Fluoride	MAC	1.5	0.1	0.2				
Mercury	MAC	0.001						
N-NH3 (Ammonia)					<0.1	<0.1		
Phosphorus					<0.1	<0.1	<0.1	
pH (no units)	OG	6.5-8.5	7.61	7.81			8.15	
Selenium	MAC	0.01						0.001
Tin					<0.2	<0.2	<0.2	<0.5
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-3

Sample Date			May-04	Sep-04	May-05	Nov-05	May-06	Oct-06
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	51	48	58	57	56	55
BOD					<1	<1		<1
COD			<2	7	<5	<5	<5	<5
Chloride	AO	250	1.2	1.1	<1	<1	<1	<1
Conductivity us/cm			114	141	133	139	136	137
DOC	AO	5	<0.5	<0.5	0.9	0.9	0.5	<0.5
N-NO2 (Nitrite)	MAC	1	<0.1		<0.10	<0.10		<0.10
N-NO3 (Nitrate)	MAC	10	0.1		<0.10	<0.10		<0.10
Phenols			<0.001	<0.001	<0.001	<0.001		<0.001
Sulphate	AO	500	12	13	14	13		14
Total Dissolved Solids	AO	500	67		87	90	88	89
Total Kjeldahl Nitrogen			<0.05		0.09	0.05	0.08	<0.05
Total phosphorous			0.03	0.03		0.02		0.12
Hardness as CaCO3	OG	500	60	60	58	58		58
Calcium			15	14.9	15	15	15	15
Magnesium			5	5.46	5	5	5	5
Potassium			2	1.9	2	2	2	2
Sodium	AO	200	3	2.2	<2	<2	3	<2
Aluminum	OG	0.1	0.006	0.006	<0.01	<0.01	<0.01	<0.01
Barium	MAC	1	0.013	0.013	0.01	0.01	0.01	0.01
Beryllium			>0.001	<0.001	<0.001	<0.001		<0.001
Boron	IMAC	5	<0.005	<0.005	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Chromium	MAC	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt			<0.005	<0.005	0.0002	<0.0002	<0.0002	<0.0002
Copper	AO	1	<0.002	<0.002	0.001	<0.001	0.067	0.002
Iron	AO	0.3	0.035	0.036	0.05	0.04	0.03	0.04
Lead	MAC	0.01	0.0002	<0.0005	0.002	<0.001		<0.001
Manganese	AO	0.05	0.005	0.005	<0.01	<0.01	<0.01	<0.01
Molybdenum			<0.01	<0.01	<0.005	<0.005		<0.005
Nickel			<0.01	<0.01	<0.005	<0.005		
Silicon			5.83	5.72	7	6.7	5.5	6.9
Silver			<0.005	<0.005	<0.0001	<0.0001		<0.0001
Strontium			0.026	0.026	0.029	0.033	0.027	0.039
Thallium					<0.0001	<0.0001		<0.0001
Titanium			<0.005	<0.005	<0.01	<0.01		<0.01
Vanadium			<0.005	<0.005	<0.001	<0.001		<0.001
Zinc	AO	5	<0.005	<0.005	<0.01	<0.01	<0.01	0.01
Arsenic	IMAC	0.025	<0.001	0.001				
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)							0.02	
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01	<0.001	<0.001				
Tin				<0.5				
Dissolved Reactive P							0.05	
Field Parameters								
Temperature ^{o}C					8.3	6.6	9.3	7.7
pH					9.27	8.28	8.16	7.3
Conductivity us/cm					123	121	204	128

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-3

Sample Date			May-07	Oct-07	May-08	May-09	Sep-09	May-10
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	57	54	56	57	57	56
BOD			<1	<1	<1	3	<1	
COD			<5	<5	<5	5	<5	
Chloride	AO	250	<1	<1	<1	1	1	<1
Conductivity us/cm			140	135	140	140	141	141
DOC	AO	5	0.9	0.6	1.3	0.8	1.1	
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	
Sulphate	AO	500	13	14	12	13	13	
Total Dissolved Solids	AO	500	91	88	91	91	92	92
Total Kjeldahl Nitrogen			0.1	<0.10	<0.10	<0.10	<0.10	<0.10
Total phosphorous			0.03	0.14	0.01	0.03	0.07	
Hardness as CaCO3	OG	500	65	67	61	65	58	58
Calcium			16	17	16	16	15	15
Magnesium			6	6	5	6	5	5
Potassium			2	2	2	2	2	2
Sodium	AO	200	<2	2	<2	2	2	<2
Aluminum	OG	0.1	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Barium	MAC	1	0.01	0.01	0.01	0.01	0.01	0.01
Beryllium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IMAC	5	0.02	<0.01	<0.01	0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	0.005	<0.001	<0.001	<0.001	<0.001
Cobalt			<0.0002	0.0009	0.0279	0.0354	0.0212	0.0114
Copper	AO	1	<0.001	0.002	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	<0.03	0.16	0.07	0.04	0.03	0.05
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	<0.01	<0.01	0.06	0.06	0.04	0.02
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			6	5.9	5.7	5.7	5.6	5.1
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.028	0.039	0.029	0.029	0.029	0.030
Thallium			0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Zinc	AO	5	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			8.2	8		9.1	6.7	8.0
pH			7.43	7.29		8.7	8.5	8.7
Conductivity us/cm			118	115		152	124	140

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-3

Sample Date			Oct-10	Jun-11	Jun-12	Jun-13	Apr-14	Oct-14
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	57	62	62	62	56	58
BOD								
COD								
Chloride	AO	250	<1	<1	<1	<1	0.8	0.8
Conductivity us/cm			142	144	140	141	140	132
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	< 0.1	< 0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	< 0.10	< 0.10
Phenols					<0.001	<0.001		
Sulphate	AO	500			13	12		
Total Dissolved Solids	AO	500	92	94	91	92	71.9	71.6
Total Kjeldahl Nitrogen			<0.10	<0.10	<0.10	<0.10	0.15	< 0.05
Total phosphorous								
Hardness as CaCO3	OG	500	58	60	51	65	65	65
Calcium			15	16	12	16	16.7	15.8
Magnesium			5	5	5	6	5.76	5.54
Potassium			2	2	2	2	2	1.9
Sodium	AO	200	<2	2	3	2	2.6	2.4
Aluminum	OG	0.1	<0.10	<0.01	<0.01	<0.01	0.01	< 0.01
Barium	MAC	1	0.01	0.01	0.01	0.01	0.014	0.013
Beryllium			<0.001	<0.0005	<0.0005	<0.0005	< 0.0001	< 0.0001
Boron	IMAC	5	<0.01	<0.01	0.02	<0.01	< 0.005	0.007
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	0.00004	< 0.00002
Chromium	MAC	0.05	<0.001	<0.001	<0.001	<0.001	< 0.002	< 0.002
Cobalt			0.0003	0.0004	<0.0002	0.01	< 0.0001	< 0.0001
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	< 0.0001	< 0.002
Iron	AO	0.3	0.05	0.04	0.04	0.04	0.031	0.057
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	< 0.00002	< 0.00002
Manganese	AO	0.05	<0.01	<0.01	<0.01	0.02	0.005	0.007
Molybdenum			<0.005	<0.005	<0.005	<0.005	0.0007	0.0005
Nickel			<0.005	<0.005	<0.005	<0.005	< 0.01	< 0.01
Silicon			5.6	5	5.8	5.5	5.72	5.65
Silver			<0.0001	<0.0001	<0.0001	<0.0001		
Strontium			0.03	0.028	0.029	0.029	0.033	0.031
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	< 0.00005	< 0.00005
Titanium			<0.01	<0.01	<0.01	<0.01	< 0.005	< 0.005
Vanadium			<0.001	<0.001	<0.001	<0.001	0.0004	0.0004
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	< 0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)							< 0.01	< 0.01
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7	7.4	8.4	9.2	7.7	7.4
pH			8.3	8.2	7.9	6.7	8.4	7.9
Conductivity us/cm			107	113	123	113	126	132

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-3

Sample Date			Jun-15	Oct-15	May-16	Nov-16	Apr-17	Oct-17
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	59	58	62	98	59	57
BOD								
COD								
Chloride	AO	250	0.8	0.7	0.76	0.53	< 0.5	0.6
Conductivity us/cm			139	137	146	146	136	135
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.1	< 0.1	<0.05	<0.05	< 0.1	< 0.05
N-NO3 (Nitrate)	MAC	10	< 0.1	< 0.1	<0.05	<0.05	< 0.1	< 0.05
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	85	82	60	110	71.5	69
Total Kjeldahl Nitrogen			0.2	< 0.05	<0.10	<0.10	0.12	< 0.1
Total phosphorous								
Hardness as CaCO3	OG	500	66	70	61.7	57	65	65
Calcium			16.6	16.8	15.6	14.6	16.5	16.1
Magnesium			6.02	6.81	5.52	4.99	5.85	5.99
Potassium			2	1.8	1.94	1.83	1.9	1.8
Sodium	AO	200	2.6	2.3	2.29	2.24	2.4	2.5
Aluminum	OG	0.1	< 0.01	< 0.01	0.004	0.009	0.02	0.02
Barium	MAC	1	0.013	0.015	0.015	0.015	0.014	0.014
Beryllium			< 0.0001	< 0.0001	<0.001	<0.001	< 0.0001	< 0.0001
Boron	IMAC	5	< 0.005	0.005	<0.010	<0.010	< 0.005	< 0.005
Cadmium	MAC	0.005	< 0.00002	< 0.00002	<0.001	<0.001	< 0.000020	< 0.000014
Chromium	MAC	0.05	< 0.002	< 0.002	<0.003	<0.003	< 0.002	< 0.002
Cobalt			0.0007	< 0.0001	<0.001	<0.001	< 0.0001	< 0.0001
Copper	AO	1	< 0.002	< 0.002	<0.003	<0.003	< 0.002	< 0.002
Iron	AO	0.3	0.016	0.042	0.031	<0.010	0.043	0.04
Lead	MAC	0.01	< 0.00002	< 0.00002	<0.002	<0.002	< 0.00002	< 0.00002
Manganese	AO	0.05	0.004	0.006	0.005	0.004	0.005	0.005
Molybdenum			0.0005	0.0007			0.0006	0.0005
Nickel			< 0.01	< 0.01	<0.003	<0.003	0.0003	0.0003
Silicon			4.69	5.87	5.92	5.49	6.12	6.33
Silver								
Strontium			0.034	0.033	0.028	0.025	0.029	0.028
Thallium			< 0.00005	< 0.00005	<0.006	<0.006	< 0.00005	< 0.00005
Titanium			< 0.005	< 0.005	<0.002	<0.002	< 0.005	< 0.005
Vanadium			0.0006	0.0003	<0.002	<0.002	0.0006	0.0003
Zinc	AO	5	< 0.005	< 0.005	<0.005	<0.005	< 0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			< 0.01	< 0.01				
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			8	7.5	8.3	6.7	6.9	7.4
pH			7.2	7.9	7.4	8.2	7.4	8.2
Conductivity us/cm			152	126	132	136	138	120

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 96-3

Sample Date			May-18	Oct-18				
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	57	61				
BOD								
COD								
Chloride	AO	250	< 1	3				
Conductivity us/cm			137	142				
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.10	< 0.10				
N-NO3 (Nitrate)	MAC	10	< 0.10	< 0.10				
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	89	92				
Total Kjeldahl Nitrogen			< 0.8	< 0.8				
Total phosphorous								
Hardness as CaCO3	OG	500	65	56				
Calcium			16	14				
Magnesium			6	5				
Potassium			2	2				
Sodium	AO	200	2	2				
Aluminum	OG	0.1	< 0.01	< 0.01				
Barium	MAC	1	0.01	0.01				
Beryllium			< 0.0005	< 0.0005				
Boron	IMAC	5	< 0.01	< 0.01				
Cadmium	MAC	0.005	< 0.0001	< 0.0001				
Chromium	MAC	0.05	< 0.001	< 0.001				
Cobalt			< 0.0002	< 0.0002				
Copper	AO	1	< 0.001	< 0.001				
Iron	AO	0.3	0.04	0.04				
Lead	MAC	0.01	< 0.001	< 0.001				
Manganese	AO	0.05	< 0.01	< 0.01				
Molybdenum			< 0.005	< 0.005				
Nickel			< 0.005	< 0.005				
Silicon			6.4	6.2				
Silver								
Strontium			0.028	0.03				
Thallium			< 0.0001	< 0.0001				
Titanium			< 0.01	< 0.01				
Vanadium			< 0.001	< 0.001				
Zinc	AO	5	< 0.01	< 0.01				
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.4	7.2				
pH			7.1	6.8				
Conductivity us/cm			119	112				

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 03-01

PARAMETER	Limit	ODWO/S	May-04	May-09	Jun-11	Jun-15		
Alkalinity (C_aCO3)	OG	30-500	4	<5	7	No Sample		
BOD				2				
COD			192	70	2			
Chloride	AO	250	2.1	2.0				
Conductivity umhos/cm			56	45	44			
DOC	AO	5	240	29.1				
N-NO2 (Nitrite)	MAC	1	<0.1	<0.10	<0.10			
N-NO3 (Nitrate)	MAC	10	0.2	<0.10	<0.10			
Phenols			0.016	<0.001				
Sulphate	AO	500	12	9				
Total Dissolved Solids	AO	500	23	29	29			
Total Kjeldahl Nitrogen			4.77	0.92	2.16			
Total phosphorous			1	0.16				
Hardness	OG	500	4	12	23			
Calcium			1	3	6			
Magnesium			0.38	1	2			
Potassium			0.6	<1	<1			
Sodium	AO	200	24.0	<2	2			
Aluminum	OG	0.1	0.97	0.88	2.58			
Barium	MAC	1	0.040	0.020	0.04			
Beryllium			<0.001	<0.001	<0.0005			
Boron	IMAC	5	0.005	<0.01	<0.01			
Cadmium	MAC	0.005	0.0001	<0.0001	<0.0001			
Chromium	MAC	0.05	0.002	0.002	0.006			
Cobalt			<0.005	0.0194	0.0068			
Copper	AO	1	<0.002	0.001	0.003			
Iron	AO	0.3	1.74	2.58	7.78			
Lead	MAC	0.01	0.0009	<0.001	0.003			
Manganese	AO	0.05	0.03	0.18	0.16			
Molybdenum			<0.01	<0.005	<0.005			
Nickel			<0.01	<0.005	<0.005			
Silicon			6.02	6.10	7.70			
Silver			<0.005	<0.0001	<0.0001			
Strontium			0.032	0.024	0.033			
Thallium				<0.0001	<0.0001			
Titanium			0.006	<0.01	0.02			
Vanadium			<0.005	0.002	0.004			
Zinc	AO	5	0.018	<0.01	0.01			
Arsenic	IMAC	0.025	<0.001					
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01	<0.001					
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C				8.7	12.8			
pH				6.2	6.0			
Conductivity us/cm				58	47			

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-2D

PARAMETER	Limit	ODWO/S	Oct-07	May-08	May-09	Sep-09	May-10	Oct-10
Alkalinity (C_aCO3)	OG	30-500	354	397	432	481	450	467
BOD			2	1	3	2		
COD			51	66	60	66		
Chloride	AO	250	50	45	42	44	45	50
Conductivity us/cm			1010	1070	1160	1280	1240	1300
DOC	AO	5	18	22.8	20.6	20.6		
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols			<0.001	<0.001	<0.001	<0.001		
Sulphate	AO	500	123	118	159	182		
Total Dissolved Solids	AO	500	657	696	754	832	806	845
Total Kjeldahl Nitrogen			1.25	1.27	1.16	1.3	1.13	0.89
Total phosphorous			12.1	27.9	17.8	9.01		
Hardness as CaCO3		500	445	499	563	577	593	583
Calcium			127	142	161	165	173	166
Magnesium			31	35	39	40	39	41
Potassium			6	6	6	6	6	5
Sodium	AO	200	38	43	44	41	48	42
Aluminum	OG	0.1	0.02	1.6	0.1	0.28	0.13	0.13
Barium	MAC	1	0.51	0.5	0.57	0.5	0.44	0.42
Beryllium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IMAC	5	0.67	0.46	0.78	0.65	0.83	0.85
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.007	0.007	0.006	0.005	0.005	0.004
Cobalt			0.0032	0.0362	0.0194	0.0046	0.0054	0.0099
Copper	AO	1	0.002	0.006	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	26.4	25.7	22.9	21.9	23.3	19.6
Lead	MAC	0.01	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	10.9	8.59	9.95	9.81	10	10.6
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			0.06	0.016	0.007	0.006	0.007	<0.005
Silicon			13.8	16	16	14	20	15
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.652	0.568	0.612	0.633	0.588	0.654
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	0.05	<0.01	0.02	0.01	0.01
Vanadium			0.012	0.015	0.014	0.011	0.12	0.007
Zinc	AO	5	0.03	0.02	0.05	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			9		9.1	7.8	9	8.4
pH			6.64		6.9	7	6.9	7.1
Conductivity us/cm			848		1259	1090	1140	906

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-2D

PARAMETER	Limit	ODWO/S	Jun-11	Jun-12	Jun-13	Apr-14	Oct-14	Jun-15
Alkalinity (C_aCO3)	OG	30-500	367	415	390	381	348	381
BOD								
COD								
Chloride	AO	250	45	55	47	42.9	47.1	42.1
Conductivity us/cm			997	1100	1030	1100	944	1010
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	< 0.10	< 0.10	< 0.1
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	< 0.10	< 0.10	< 0.1
Phenols				<0.001	<0.001			
Sulphate	AO	500		128	112			
Total Dissolved Solids	AO	500	648	715	670	696	625	687
Total Kjeldahl Nitrogen			1.29	0.95	1.07	1.41	1.16	1.1
Total phosphorous								
Hardness as CaCO3		500	448	435	466	536	484	475
Calcium			130	123	134	154	136	135
Magnesium			30	31	32	36.9	33.3	33.1
Potassium			6	5	6	6.5	6.3	6.1
Sodium	AO	200	36	35	42	43.9	39.6	40.6
Aluminum	OG	0.1	<0.01	0.4	0.47	1	0.87	0.23
Barium	MAC	1	0.45	0.43	0.43	0.508	0.438	0.372
Beryllium			<0.0005	<0.0005	<0.0005	< 0.0001	< 0.0001	< 0.0001
Boron	IMAC	5	0.62	0.73	0.66	0.829	0.734	0.75
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	0.00003	< 0.00002	< 0.00002
Chromium	MAC	0.05	0.002	0.006	0.005	0.003	0.004	< 0.002
Cobalt			0.0022	0.0043	0.0052	0.0036	0.003	0.0027
Copper	AO	1	0.003	0.002	0.001	0.001	< 0.002	< 0.002
Iron	AO	0.3	<0.03	20.9	16.4	20.9	20	17.3
Lead	MAC	0.01	<0.001	<0.001	<0.001	0.00053	0.00054	0.00003
Manganese	AO	0.05	7.6	8.55	8.38	8.93	8.29	7.7
Molybdenum			<0.005	<0.005	<0.005	0.0003	0.0002	0.0003
Nickel			0.007	0.006	0.006	< 0.01	< 0.01	< 0.01
Silicon			11	17	15.2	15.1	14.7	15.2
Silver			<0.0001	<0.0001	<0.0001			
Strontium			0.497	0.547	0.533	0.601	0.546	0.558
Thallium			<0.0001	<0.0001	<0.0001	< 0.00005	< 0.00005	< 0.00005
Titanium			<0.01	0.03	0.04	0.033	0.045	0.009
Vanadium			0.004	<0.005	0.006	0.0093	0.0112	0.0064
Zinc	AO	5	<0.01	<0.01	<0.01	0.006	0.006	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)						0.46	0.49	0.51
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			9	9.3	9.5	8.4	8.5	9.2
pH			6.9	6.6	6.3	7	6.7	6.6
Conductivity us/cm			880	981	831	963	1091	1073

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-2D

PARAMETER	Limit	ODWO/S	Oct-15	Oct-15 QA/QC	May-16	Nov-16	Apr-17	Apr-17 BH 08-4 QA/QC
Alkalinity (C_aCO3)	OG	30-500	402	443	336	390	378	395
BOD								
COD								
Chloride	AO	250	47.5	48.1	43.2	47.3	43	43.3
Conductivity us/cm			1060	1140	919	979	1000	1030
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.1	< 0.1	<0.25	<0.25	< 0.1	< 0.1
N-NO3 (Nitrate)	MAC	10	< 0.1	< 0.1	<0.25	<0.25	< 0.1	0.3
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	721	787	500	530	631	641
Total Kjeldahl Nitrogen			1.15	1.84	1.14	1.09	1.75	1.55
Total phosphorous								
Hardness as CaCO3		500	547	544	372	394	488	477
Calcium			152	151	106	115	141	137
Magnesium			40.5	40.5	26.1	26.0	33	32.7
Potassium			6.3	6.3	6.17	5.58	6.9	6.8
Sodium	AO	200	43.4	43.2	36.8	34.9	45.3	44.7
Aluminum	OG	0.1	0.06	0.07	0.038	0.018	0.09	0.08
Barium	MAC	1	0.446	0.472	0.384	0.348	0.431	0.439
Beryllium			< 0.0001	< 0.0001	<0.001	<0.001	< 0.0001	< 0.0001
Boron	IMAC	5	1.01	0.997	0.662	0.759	0.971	0.962
Cadmium	MAC	0.005	< 0.00002	< 0.00002	<0.001	<0.001	< 0.000020	< 0.000020
Chromium	MAC	0.05	0.002	< 0.002	<0.003	<0.003	< 0.002	0.002
Cobalt			0.0031	0.0031	0.003	0.003	0.0024	0.0023
Copper	AO	1	< 0.002	< 0.002	<0.003	<0.003	< 0.002	< 0.002
Iron	AO	0.3	20.3	20.5	14.6	12.9	16	15.6
Lead	MAC	0.01	0.00002	< 0.00002	<0.002	<0.002	< 0.00002	< 0.00002
Manganese	AO	0.05	10.1	10	6.30	6.52	7.56	7.33
Molybdenum			0.0005	0.0005			0.0004	0.0005
Nickel			< 0.01	< 0.01	<0.003	<0.003	0.0058	0.0057
Silicon			14.3	14.2	13.9	12.6	13.7	13.6
Silver								
Strontium			0.64	0.635	0.452	0.447	0.519	0.515
Thallium			< 0.00005	< 0.00005	<0.006	<0.006	< 0.00005	< 0.00005
Titanium			< 0.005	< 0.005	<0.002	0.002	< 0.005	< 0.005
Vanadium			0.004	0.0042	0.003	0.002	0.005	0.005
Zinc	AO	5	0.007	< 0.005	<0.005	<0.005	< 0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			0.49	0.48				
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			8.6		8.9	8.5	8.5	
pH			6.9		6.6	7.1	6.5	
Conductivity us/cm			950		820	734	1010	

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-2D

PARAMETER	Limit	ODWO/S	Oct-17	May-18	Oct-18			
Alkalinity (C_aCO3)	OG	30-500	361	372	361			
BOD								
COD								
Chloride	AO	250	36.6	40	39			
Conductivity us/cm			931	975	941			
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.05	< 0.10	< 0.10			
N-NO3 (Nitrate)	MAC	10	< 0.05	< 0.10	< 0.10			
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	546	634	612			
Total Kjeldahl Nitrogen			2.2	2.1	4.2			
Total phosphorous								
Hardness as CaCO3		500	434	468	367			
Calcium			123	138	104			
Magnesium			30.8	30	26			
Potassium			6.7	7	6			
Sodium	AO	200	40.7	42	37			
Aluminum	OG	0.1	0.08	0.04	0.03			
Barium	MAC	1	0.441	0.4	0.42			
Beryllium			< 0.0001	< 0.0005	< 0.0005			
Boron	IMAC	5	0.915	0.72	0.89			
Cadmium	MAC	0.005	< 0.000014	< 0.0001	< 0.0001			
Chromium	MAC	0.05	< 0.002	0.001	0.001			
Cobalt			0.0023	0.0029	0.0027			
Copper	AO	1	< 0.002	< 0.001	< 0.001			
Iron	AO	0.3	13.9	12.2	13			
Lead	MAC	0.01	< 0.00002	< 0.001	< 0.001			
Manganese	AO	0.05	6.62	6.69	6.38			
Molybdenum			0.0004	< 0.005	< 0.005			
Nickel			0.005	< 0.005	< 0.005			
Silicon			14.6	19.1	13.4			
Silver								
Strontium			0.489	0.488	0.495			
Thallium			< 0.00005	< 0.0001	< 0.0001			
Titanium			< 0.005	< 0.01	< 0.01			
Vanadium			0.0034	0.003	0.002			
Zinc	AO	5	< 0.005	< 0.01	< 0.01			
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			8.7	8.8	8.8			
pH			7.0	6.9	6.8			
Conductivity us/cm			809	783	561			

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-2S

PARAMETER	Limit	ODWO/S	Oct-07	May-08	May-09	Sep-09	May-10	Oct-10
Alkalinity (C_aCO3)	OG	30-500	83	385	547	126	74	67
BOD			1	3	3	<1		
COD			16	32	33	<5		
Chloride	AO	250	14	34	30	10	3	3
Conductivity us/cm			212	859	1090	296	167	156
DOC	AO	5	7.6	12.8	10.2	2.7		
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	0.14	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols			<0.001	<0.001	<0.001	<0.001		
Sulphate	AO	500	10	44	37	14		
Total Dissolved Solids	AO	500	138	558	708	192	109	101
Total Kjeldahl Nitrogen			2.18	0.96	0.67	<0.10	0.18	<0.10
Total phosphorous			0.12	0.86	0.05	0.17		
Hardness as CaCO3		500	87	400	598	134	80	71
Calcium			25	114	172	37	22	20
Magnesium			6	28	41	10	6	5
Potassium			2	5	4	2	1	1
Sodium	AO	200	9	35	20	5	3	<2
Aluminum	OG	0.1	<0.01	<0.01	<0.01	0.02	0.01	0.04
Barium	MAC	1	0.07	0.37	0.39	0.08	0.04	0.04
Beryllium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IMAC	5	0.03	0.22	0.21	0.01	0.02	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	0.003	0.005	<0.001	<0.001	<0.001
Cobalt			<0.0002	0.0341	0.034	0.0155	0.0013	0.0007
Copper	AO	1	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	4.87	28.2	23.7	4.14	1.89	1.43
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.2	0.76	0.56	0.14	0.07	0.04
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	0.009	0.007	<0.005	<0.005	<0.005
Silicon			6.4	10.3	10.6	6	5.3	5.8
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.073	0.232	0.379	0.09	0.044	0.041
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.1	<0.01	<0.01	<0.01	<0.01
Vanadium			0.001	0.007	0.011	0.001	<0.001	<0.001
Zinc	AO	5	0.03	0.02	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			9.3		8.1	8.7	9.7	8.7
pH			7.08		7.1	7.6	7.8	8.2
Conductivity us/cm			174		1233	292	171	119

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-2S

PARAMETER	Limit	ODWO/S	Jun-11	Jun-12	Jun-13	Apr-14	Oct-14	Jun-15
Alkalinity (C_aCO3)	OG	30-500	193	225	90	142	89	88
BOD								
COD								
Chloride	AO	250	6	7	1	2.5	3.1	1.4
Conductivity us/cm			401	462	180	304	184	184
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	< 0.10	< 0.10	< 0.1
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	< 0.10	< 0.10	< 0.1
Phenols				<0.001	<0.001			
Sulphate	AO	500		25	5			
Total Dissolved Solids	AO	500	261	300	117	163	99.6	112
Total Kjeldahl Nitrogen			0.33	0.18	0.13	0.33	0.12	0.3
Total phosphorous								
Hardness as CaCO3		500	186	184	80	165	97	93
Calcium			53	49	22	46.3	26.5	25.6
Magnesium			13	15	6	11.9	6.73	7.02
Potassium			2	2	2	1.7	1.5	1.5
Sodium	AO	200	9	5	4	3.1	2.8	2.6
Aluminum	OG	0.1	0.01	0.02	0.02	0.04	0.04	0.05
Barium	MAC	1	0.09	0.11	0.05	0.066	0.036	0.042
Beryllium			<0.0005	<0.0005	<0.0005	< 0.0001	< 0.0001	< 0.0001
Boron	IMAC	5	0.06	0.05	0.02	0.013	0.008	0.03
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	< 0.00002	< 0.00002	< 0.00002
Chromium	MAC	0.05	<0.001	0.002	<0.001	< 0.002	< 0.002	< 0.002
Cobalt			0.0075	0.0079	0.0099	0.0024	0.0023	0.0002
Copper	AO	1	<0.001	<0.001	<0.001	0.0001	< 0.002	< 0.002
Iron	AO	0.3	3.48	3.26	2.56	2.06	0.972	1.38
Lead	MAC	0.01	<0.001	<0.001	<0.001	0.00003	0.00004	< 0.00002
Manganese	AO	0.05	0.11	0.12	0.09	0.076	0.045	0.06
Molybdenum			<0.005	<0.005	<0.005	< 0.0001	< 0.0001	< 0.0001
Nickel			<0.005	<0.005	<0.005	< 0.01	< 0.01	< 0.01
Silicon			6.7	6.9	6.9	6	5.86	6.23
Silver			<0.0001	<0.0001	<0.0001			
Strontium			0.102	0.124	0.048	0.092	0.054	0.055
Thallium			<0.0001	<0.0001	<0.0001	< 0.00005	< 0.00005	< 0.00005
Titanium			<0.01	<0.01	<0.01	< 0.005	< 0.005	< 0.005
Vanadium			0.001	0.002	<0.001	0.001	0.0009	0.0009
Zinc	AO	5	<0.01	<0.01	<0.01	< 0.005	< 0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)						0.02	0.04	0.07
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.7	8.9	8	7.7	8.8	8.7
pH			7.7	7.3	6.7	8	7	6.7
Conductivity us/cm			315	418	148	281	188	203

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-2S

PARAMETER	Limit	ODWO/S	Oct-15	May-16	Nov-16	Apr-17	Oct-17	May-18
Alkalinity (C_aCO3)	OG	30-500	88	253	186	133	72	344
BOD								
COD								
Chloride	AO	250	4.3	9.64	3.16	2.7	1.9	8
Conductivity us/cm			189	539	365	264	156	680
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.1	<0.05	<0.05	< 0.1	< 0.05	< 0.10
N-NO3 (Nitrate)	MAC	10	< 0.1	<0.05	<0.05	0.1	< 0.05	< 0.10
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	114	270	218	145	83	442
Total Kjeldahl Nitrogen			0.06	0.56	0.17	0.14	0.4	1.1
Total phosphorous								
Hardness as CaCO3		500	96	250	167	139	75	396
Calcium			25.7	69.8	47.4	39	21.4	114
Magnesium			7.73	18.5	11.9	10.2	5.25	27
Potassium			1.5	2.65	1.98	1.6	2.9	2
Sodium	AO	200	4	8.91	4.34	3	2.1	6
Aluminum	OG	0.1	0.03	0.012	0.016	0.03	0.03	< 0.01
Barium	MAC	1	0.039	0.171	0.073	0.063	0.05	0.13
Beryllium			< 0.0001	<0.001	<0.001	< 0.0001	< 0.0001	< 0.0005
Boron	IMAC	5	0.016	0.121	0.018	0.023	0.008	0.21
Cadmium	MAC	0.005	< 0.00002	<0.001	<0.001	< 0.000020	< 0.000014	
Chromium	MAC	0.05	< 0.002	<0.003	<0.003	< 0.002	< 0.002	< 0.001
Cobalt			< 0.0001	<0.001	<0.001	< 0.0001	< 0.0001	0.0003
Copper	AO	1	< 0.002	<0.003	<0.003	0.002	0.002	< 0.001
Iron	AO	0.3	1.21	9.47	2.72	2.24	2.58	3.27
Lead	MAC	0.01	< 0.00002	<0.002	<0.002	< 0.00002	< 0.00002	< 0.001
Manganese	AO	0.05	0.037	0.186	0.074	0.085	0.069	0.13
Molybdenum			< 0.0001			< 0.0001	< 0.0001	< 0.005
Nickel			< 0.01	<0.003	<0.003	0.001	0.0005	< 0.005
Silicon			6.17	8.64	5.62	6.06	6.11	6.8
Silver								
Strontium			0.057	0.166	0.086	0.071	0.046	0.174
Thallium			< 0.00005	<0.006	<0.006	< 0.00005	< 0.00005	< 0.0001
Titanium			< 0.005	<0.002	<0.002	< 0.005	< 0.005	< 0.01
Vanadium			0.0005	<0.002	<0.002	0.0008	0.0004	< 0.001
Zinc	AO	5	0.006	0.006	<0.005	< 0.005	< 0.005	< 0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			0.04					
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			8.6	8.3	8.1	7.9	8.6	7.6
pH			7.6	6.9	7.5	6.9	7.5	7.2
Conductivity us/cm			175	538	358	272	145	571

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-2S

Oct-18

PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	95					
BOD								
COD								
Chloride	AO	250	2					
Conductivity us/cm			175					
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.10					
N-NO3 (Nitrate)	MAC	10	< 0.10					
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	114					
Total Kjeldahl Nitrogen			< 0.8					
Total phosphorous								
Hardness as CaCO3		500	72					
Calcium			19					
Magnesium			6					
Potassium			2					
Sodium	AO	200	2					
Aluminum	OG	0.1	0.02					
Barium	MAC	1	0.04					
Beryllium			< 0.0005					
Boron	IMAC	5	0.03					
Cadmium	MAC	0.005	< 0.0001					
Chromium	MAC	0.05	< 0.001					
Cobalt			< 0.0002					
Copper	AO	1	0.004					
Iron	AO	0.3	1.45					
Lead	MAC	0.01	0.001					
Manganese	AO	0.05	0.04					
Molybdenum			< 0.005					
Nickel								
Silicon			6.3					
Silver								
Strontium			0.048					
Thallium			< 0.0001					
Titanium			< 0.01					
Vanadium			< 0.001					
Zinc	AO	5	0.02					
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			8.5					
pH			6.8					
Conductivity us/cm			136					

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-3D

PARAMETER	Limit	ODWO/S	Oct-07	May-08	Oct-08	May-09	May-09 Dup	Sep-09
Alkalinity (C_aCO3)	OG	30-500	494	385	382	314	319	421
BOD			9	5	3	8	12	8
COD			52	48	48	33	30	37
Chloride	AO	250	17	15	13	12	12	12
Conductivity us/cm			943	763	817	635	639	861
DOC	AO	5	19	17.2	13.5	10.4	9.8	14
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	0.11	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate	AO	500	5	3	7	9	9	4
Total Dissolved Solids	AO	500	613	496	531	413	415	560
Total Kjeldahl Nitrogen			4.42	5.79	0.45	9.24	7.22	4.13
Total phosphorous			0.15	6.2	0.14	0.12	0.34	0.14
Hardness as CaCO3		500	403	365	315	207	202	339
Calcium			125	115	98	63	61	101
Magnesium			22	19	17	12	12	21
Potassium			15	21	18	15	15	14
Sodium	AO	200	25	23	21	14	13	19
Aluminum	OG	0.1	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium	MAC	1	0.49	0.41	0.32	0.4	0.41	0.39
Beryllium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IMAC	5	0.23	0.17	0.2	0.17	0.17	0.18
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.008	0.006	0.006	0.005	0.004	0.006
Cobalt			0.0272	0.0621	0.0529	0.013	0.0395	0.0287
Copper	AO	1	0.004	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	65.3	55	49.1	46.4	45.3	56.9
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	6.6	6.21	5.15	4.18	4.23	4.69
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			19	22	24	23	20	19
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.487	0.472	0.442	0.435	0.408	0.391
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			0.008	0.008	0.011	0.009	0.005	0.008
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			8.6	7.5	7.6	7.9	7.8	7.7
pH			6.7	6.8	6.6	6.5	6.4	6.2
Conductivity us/cm			799	547	654	810	646	700

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-3D

PARAMETER	Limit	ODWO/S	May-10	Oct-10	Jun-11	Oct-11	Jun-12	Oct-12
Alkalinity (C_aCO3)	OG	30-500	355	327	339	354	325	329
BOD								
COD								
Chloride	AO	250	10	11	12	11	10	8
Conductivity us/cm			714	653	669	668	617	635
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols							<0.001	<0.001
Sulphate	AO	500					5	6
Total Dissolved Solids	AO	500	464	424	435	434	401	413
Total Kjeldahl Nitrogen			5.31	5.02	7.27	4.72	5.26	4.89
Total phosphorous								
Hardness as CaCO3		500	255	229	240	283	162	203
Calcium			79	72	73	87	50	63
Magnesium			14	12	14	16	9	11
Potassium			20	18	22	17	16	19
Sodium	AO	200	20	15	14	14	11	13
Aluminum	OG	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium	MAC	1	0.41	0.35	0.47	0.38	0.39	0.4
Beryllium			<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IMAC	5	0.19	0.15	0.15	0.15	0.13	0.12
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	0.004	0.007	0.003	0.005	0.004
Cobalt			0.02	0.0299	0.0204	0.0312	0.0258	0.0295
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	54.9	52.3	64.6	50.9	54.8	55.3
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	5.91	5.11	4.84	4.3	4.26	3.76
Molybdenum			<0.005	<0.005	0.0003	0.0004	0.0006	0.0005
Nickel			<0.005	<0.005	< 0.01	< 0.01	< 0.01	< 0.01
Silicon			20.8	19	19.5	19.8	19	18.9
Silver			<0.0001	<0.0001				
Strontium			0.369	0.311	0.314	0.313	0.391	0.383
Thallium			<0.0001	<0.0001	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Titanium			<0.01	<0.01	< 0.005	< 0.005	< 0.005	< 0.005
Vanadium			0.007	0.006	0.0052	0.0051	0.0125	0.0112
Zinc	AO	5	<0.01	<0.01	< 0.005	< 0.005	< 0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)					4.43	4.54	6.47	6.38
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			8.4		7.5		7.7	
pH			6.8		6.6		6.5	
Conductivity us/cm			555		541		797	

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-3D

PARAMETER	Limit	ODWO/S	Jun-13	Nov-13	Apr-14	Apr-14 BH 07-7 QA/QC	Oct-14	Oct-14 BH 07-4 QA/QC
Alkalinity (C_aCO3)	OG	30-500	307	276	254	257	364	353
BOD								
COD								
Chloride	AO	250	9	7	6.1	6.1	8.2	8.4
Conductivity us/cm			616	558	554	557	746	724
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	< 0.10	< 0.10	< 0.10	< 0.10
N-NO3 (Nitrate)	MAC	10	<0.10	0.11	< 0.10	< 0.10	< 0.10	< 0.10
Phenols			<0.001	<0.001				
Sulphate	AO	500	6	7				
Total Dissolved Solids	AO	500	400	363	322	384	501	486
Total Kjeldahl Nitrogen			4.91	4.27	6.12	5.65	6.66	7.26
Total phosphorous								
Hardness as CaCO3		500	208	231	215	216	231	229
Calcium			65	71	66.6	67.1	69.5	69
Magnesium			11	13	11.7	11.8	13.8	13.7
Potassium			20	19	15.6	15.6	21.5	21.3
Sodium	AO	200	11	12	10.9	10.9	12.6	12.4
Aluminum	OG	0.1	<0.01	<0.01	0.03	0.03	0.02	0.02
Barium	MAC	1	0.4	0.32	0.358	0.351	0.126	0.126
Beryllium			<0.0005	<0.0005	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Boron	IMAC	5	0.12	0.11	0.117	0.117	0.146	0.145
Cadmium	MAC	0.005	<0.0001	<0.0001	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	MAC	0.05	0.002	0.002	< 0.002	< 0.002	< 0.002	< 0.002
Cobalt			0.0181	0.018	0.0133	0.0122	0.0256	0.0236
Copper	AO	1	<0.001	<0.001	< 0.0001	< 0.0001	< 0.002	< 0.002
Iron	AO	0.3	57.9	45	44.4	43.6	1.95	1.69
Lead	MAC	0.01	<0.001	<0.001	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Manganese	AO	0.05	3.92	3.41	4	3.96	2.93	3
Molybdenum			0.0004	0.0007			0.0003	0.0003
Nickel			< 0.01	< 0.01	<0.003	<0.003	0.0026	0.0035
Silicon			18.4	21.7	20.0	18.6	17.9	18
Silver								
Strontium			0.413	0.383	0.356	0.291	0.25	0.29
Thallium			< 0.00005	< 0.00005	<0.006	<0.006	< 0.00005	< 0.00005
Titanium			< 0.005	< 0.005	<0.002	<0.002	< 0.005	< 0.005
Vanadium			0.007	0.0036	0.004	0.003	0.0034	0.0035
Zinc	AO	5	< 0.005	< 0.005	<0.005	0.006	< 0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			4.65	4.27				
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			8	7.7	7.9	7.4	7.1	7.5
pH			6.3	6.7	6.4	6.7	6	6.6
Conductivity us/cm			757	568	746	655	536	533

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-3D

PARAMETER	Limit	ODWO/S	Jun-15	Oct-15	May-16	Nov-16	Apr-17	Oct-17
Alkalinity (C_aCO3)	OG	30-500	330	279	312	299	235	261
BOD								
COD								
Chloride	AO	250	5.8	6	10.0	5.43	5.2	5.8
Conductivity us/cm			626	547	670	585	484	526
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.1	< 0.1	<0.10	<0.05	0.3	< 0.05
N-NO3 (Nitrate)	MAC	10	< 0.1	< 0.1	<0.10	<0.05	0.2	< 0.05
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	420	367	356	338	251	269
Total Kjeldahl Nitrogen			5.6	5.13	8.81	7.53	4.71	6.7
Total phosphorous								
Hardness as CaCO3		500	238	224	246	193	166	169
Calcium			73.2	67.2	77.6	60.5	50.6	50.3
Magnesium			13.3	13.7	12.8	10.2	9.58	10.6
Potassium			17.9	17.3	19.8	17.5	16.3	21.2
Sodium	AO	200	11.9	10.8	10.1	9.36	8.2	8.9
Aluminum	OG	0.1	0.02	0.02	0.005	0.005	0.04	0.03
Barium	MAC	1	0.361	0.33	0.430	0.339	0.274	0.185
Beryllium			< 0.0001	< 0.0001	<0.001	<0.001	< 0.0001	< 0.0001
Boron	IMAC	5	0.142	0.163	0.141	0.118	0.097	0.109
Cadmium	MAC	0.005	< 0.00002	< 0.00002	<0.001	<0.001	< 0.000020	< 0.000014
Chromium	MAC	0.05	< 0.002	< 0.002	<0.003	<0.003	< 0.002	< 0.002
Cobalt			0.0239	0.0203	0.025	0.021	0.0149	0.0169
Copper	AO	1	< 0.002	< 0.002	<0.003	<0.003	< 0.002	0.002
Iron	AO	0.3	59.6	62.4	65.2	55.2	4.81	8.38
Lead	MAC	0.01	< 0.00002	< 0.00002	<0.002	<0.002	< 0.00002	< 0.00002
Manganese	AO	0.05	4.22	4.51	4.99	3.59	2.99	2.69
Molybdenum			0.0004	0.0007			0.0003	0.0003
Nickel			< 0.01	< 0.01	<0.003	<0.003	0.0026	0.0035
Silicon			18.4	21.7	20.0	18.6	17.9	18
Silver								
Strontium			0.413	0.383	0.356	0.291	0.25	0.29
Thallium			< 0.00005	< 0.00005	<0.006	<0.006	< 0.00005	< 0.00005
Titanium			< 0.005	< 0.005	<0.002	<0.002	< 0.005	< 0.005
Vanadium			0.007	0.0036	0.004	0.003	0.0034	0.0035
Zinc	AO	5	< 0.005	< 0.005	<0.005	0.006	< 0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			4.65	4.27				
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			8	7.7	7.9	7.4	7.1	7.5
pH			6.3	6.7	6.4	6.7	6	6.6
Conductivity us/cm			757	568	746	655	536	533

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-3D

PARAMETER	Limit	ODWO/S	May-18	Oct-18				
Alkalinity (C_aCO3)	OG	30-500	314	261				
BOD								
COD								
Chloride	AO	250	7	7				
Conductivity us/cm			625	523				
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	< 0.10				
N-NO3 (Nitrate)	MAC	10	<0.10	< 0.10				
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	406	340				
Total Kjeldahl Nitrogen			1.3	5.7				
Total phosphorous								
Hardness as CaCO3		500	272	181				
Calcium			86	56				
Magnesium			14	10				
Potassium			13	14				
Sodium	AO	200	9	8				
Aluminum	OG	0.1	< 0.01	< 0.01				
Barium	MAC	1	0.32	0.32				
Beryllium			< 0.0005	< 0.0005				
Boron	IMAC	5	0.07	0.07				
Cadmium	MAC	0.005	< 0.0001	< 0.0001				
Chromium	MAC	0.05	0.001	0.001				
Cobalt			0.022	0.0183				
Copper	AO	1	< 0.001	< 0.001				
Iron	AO	0.3	47.7	44.5				
Lead	MAC	0.01	< 0.001	< 0.001				
Manganese	AO	0.05	3.81	3.08				
Molybdenum			< 0.0005	<0.005				
Nickel			< 0.005	< 0.005				
Silicon			25.2	7.6				
Silver								
Strontium			0.289	0.053				
Thallium			<0.0001	<0.0001				
Titanium			<0.01	<0.01				
Vanadium			0.003	0.004				
Zinc	AO	5	< 0.01	< 0.001				
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			8.2	7.5				
pH			6.51	6.5				
Conductivity us/cm			792	436				

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-3S

PARAMETER	Limit	ODWO/S	Oct-07	May-08	Oct-08	May-09	Sep-09	May-10
Alkalinity (C_aCO3)	OG	30-500	184	173	192	205	241	131
BOD			6	<1	1	1	<1	
COD			<5	5	8	25	<5	
Chloride	AO	250	4	2	2	12	3	2
Conductivity us/cm			391	354	393	410	466	272
DOC	AO	5	3.9	5	1.5	2.3	1.8	
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	0.17	<0.10	<0.10
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	
Sulphate	AO	500	18	12	14	9	17	
Total Dissolved Solids	AO	500	254	230	255	267	303	177
Total Kjeldahl Nitrogen			0.26	0.15	<0.10	<0.10	<0.10	<0.10
Total phosphorous			2.31	2.53	1.44	1.44	11	
Hardness as CaCO3		500	206	173	213	236	251	134
Calcium			56	48	59	65	69	37
Magnesium			16	13	16	18	19	10
Potassium			3	2	2	2	2	1
Sodium	AO	200	7	8	2	3	5	<2
Aluminum	OG	0.1	0.01	0.14	0.14	0.05	0.1	0.05
Barium	MAC	1	0.05	0.06	0.07	0.08	0.07	0.04
Beryllium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IMAC	5	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	0.003	0.003	0.002	0.003	<0.001
Cobalt			0.0034	0.0321	0.0315	0.0266	0.0375	0.0065
Copper	AO	1	0.007	0.005	0.003	0.002	0.003	0.003
Iron	AO	0.3	0.37	0.22	0.12	0.09	0.14	0.14
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.29	0.14	0.08	0.06	0.06	0.02
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			6.9	6.8	8.9	7.7	6.1	6.7
Silver			<0.0001	<0.0001	<0.0001	0.002	<0.0001	<0.0001
Strontium			0.05	0.069	0.099	0.053	0.048	0.057
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			0.004	0.004	0.005	0.005	0.005	0.004
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			8.2	7.3	7.7	7.9	7.2	8.3
pH			8.1	7.1	7.3	7.5	7.2	7.5
Conductivity us/cm			228	298	452	283	323	273

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-3S

PARAMETER	Limit	ODWO/S	Oct-10	Jun-11	Oct-11	Jun-12	Oct-12	Jun-13
Alkalinity (C_aCO3)	OG	30-500	157	194	215	167	174	181
BOD								
COD								
Chloride	AO	250	2	2	2	1	1	<1
Conductivity us/cm			318	378	413	319	335	350
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols						<0.001	<0.001	<0.001
Sulphate	AO	500				10	9	12
Total Dissolved Solids	AO	500	207	246	268	207	218	228
Total Kjeldahl Nitrogen			<0.10	<0.10	<0.10	0.18	<0.10	<0.10
Total phosphorous								
Hardness as CaCO3		500	159	197	246	136	164	185
Calcium			44	54	69	38	46	51
Magnesium			12	15	18	10	12	14
Potassium			1	1	2	1	1	1
Sodium	AO	200	<2	3	3	<2	2	2
Aluminum	OG	0.1	0.07	0.04	0.02	0.12	0.07	0.02
Barium	MAC	1	0.05	0.06	0.09	0.05	0.06	0.05
Beryllium			<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.002	0.004	0.002	0.003	0.002	<0.001
Cobalt			0.0199	0.0077	0.0142	0.0068	0.0098	0.0007
Copper	AO	1	0.002	0.002	0.001	0.003	0.001	<0.001
Iron	AO	0.3	0.09	0.1	0.07	0.13	0.05	<0.03
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.04	0.02	0.03	0.01	0.02	<0.01
Molybdenum			<0.005	0.0002	0.0002	< 0.0001	0.0001	
Nickel			<0.005	< 0.05	< 0.01	< 0.01	< 0.01	<0.003
Silicon			7.2	6.84	7.33	6.11	7.37	7.64
Silver			0.0002					
Strontium			0.049	0.056	0.053	0.055	0.059	0.054
Thallium			<0.0001	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.006
Titanium			<0.01	< 0.005	< 0.005	< 0.005	< 0.005	<0.002
Vanadium			0.004	0.0045	0.0052	0.0041	0.0042	0.003
Zinc	AO	5	<0.01	< 0.005	< 0.005	< 0.005	0.007	0.007
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)				< 0.01	< 0.01	< 0.01	< 0.01	
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C				7.2	7.9	7.8	7.4	7.5
pH				7.6	7.8	6.9	7.7	7.2
Conductivity us/cm				312	332	348	320	280

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-3S

PARAMETER	Limit	ODWO/S	Nov-13	Apr-14	Oct-14	Jun-15	Oct-15	May-16
Alkalinity (C_aCO3)	OG	30-500	187	173	180	165	183	151
BOD								
COD								
Chloride	AO	250	1	0.8	0.9	0.9	0.8	1.21
Conductivity us/cm			360	348	342	320	344	305
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	< 0.10	< 0.10	< 0.1	< 0.1	<0.05
N-NO3 (Nitrate)	MAC	10	<0.10	0.1	0.1	< 0.1	< 0.1	<0.05
Phenols			<0.001					
Sulphate	AO	500	10					
Total Dissolved Solids	AO	500	234	187	230	202	224	156
Total Kjeldahl Nitrogen			<0.10	0.13	0.17	0.2	< 0.05	0.11
Total phosphorous								
Hardness as CaCO3		500	195	196	182	178	205	151
Calcium			55	54.3	49.8	48.8	54.2	42.5
Magnesium			14	14.6	14.1	13.6	16.9	10.8
Potassium			1	1.5	1.4	1.4	1.4	1.28
Sodium	AO	200	<2	2.4	2.3	2.5	2.3	2.14
Aluminum	OG	0.1	0.03	0.06	0.1	0.03	0.02	0.009
Barium	MAC	1	0.05	0.056	0.053	0.049	0.062	0.046
Beryllium			<0.0005	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.001
Boron	IMAC	5	<0.01	< 0.005	0.006	< 0.005	0.005	<0.010
Cadmium	MAC	0.005	<0.0001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.001
Chromium	MAC	0.05	0.002	< 0.002	0.002	< 0.002	0.002	<0.003
Cobalt			0.0021	0.0018	0.0018	0.0002	< 0.0001	<0.001
Copper	AO	1	0.002	0.0024	< 0.002	< 0.002	< 0.002	<0.003
Iron	AO	0.3	<0.03	0.035	0.075	< 0.005	0.02	<0.010
Lead	MAC	0.01	<0.001	0.00005	0.00005	< 0.00002	< 0.00002	<0.002
Manganese	AO	0.05	<0.01	0.005	0.006	< 0.001	0.001	0.003
Molybdenum			<0.005	0.0002	0.0002	< 0.0001	0.0001	
Nickel			<0.005	< 0.05	< 0.01	< 0.01	< 0.01	<0.003
Silicon			7.2	6.84	7.33	6.11	7.37	7.64
Silver			0.0002					
Strontium			0.049	0.056	0.053	0.055	0.059	0.054
Thallium			<0.0001	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.006
Titanium			<0.01	< 0.005	< 0.005	< 0.005	< 0.005	<0.002
Vanadium			0.004	0.0045	0.0052	0.0041	0.0042	0.003
Zinc	AO	5	<0.01	< 0.005	< 0.005	< 0.005	0.007	0.007
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)				< 0.01	< 0.01	< 0.01	< 0.01	
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C				7.2	7.9	7.8	7.4	7.5
pH				7.6	7.8	6.9	7.7	7.2
Conductivity us/cm				312	332	348	320	280

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-3S

PARAMETER	Limit	ODWO/S	Nov-16	Apr-17	Oct-17	May-18	Oct-18	
Alkalinity (C_aCO3)	OG	30-500	166	164	194	180	191	
BOD								
COD								
Chloride	AO	250	0.76	2	0.9	1		
Conductivity us/cm			316	320	375	360	349	
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.05	0.1	< 0.05	< 0.10	< 0.10	
N-NO3 (Nitrate)	MAC	10	<0.05	0.2	< 0.05	< 0.10	< 0.10	
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	202	175	196	234	227	
Total Kjeldahl Nitrogen			<0.10	0.44	0.3	1.3	< 0.8	
Total phosphorous								
Hardness as CaCO3		500	152	178	192	204	163	
Calcium			42.6	48.9	51.8	57	44	
Magnesium			11.2	13.5	15.1	15	13	
Potassium			1.36	1.3	1.3	2	1	
Sodium	AO	200	2.08	2	2.8	2	2	
Aluminum	OG	0.1	0.005	0.04	0.02	< 0.01	< 0.01	
Barium	MAC	1	0.053	0.053	0.06	< 0.06	0.06	
Beryllium			<0.001	< 0.0001	< 0.0001	< 0.0005	< 0.0005	
Boron	IMAC	5	<0.010	< 0.005	< 0.005	< 0.01	< 0.01	
Cadmium	MAC	0.005	<0.001	< 0.000020	< 0.000014	< 0.0001	< 0.0001	
Chromium	MAC	0.05	<0.003	< 0.002	< 0.002	0.002	0.0002	
Cobalt			<0.001	< 0.0001	< 0.0001	0.001	< 0.0002	
Copper	AO	1	<0.003	< 0.002	< 0.002		< 0.001	
Iron	AO	0.3	<0.010	0.037	< 0.005	< 0.03	< 0.03	
Lead	MAC	0.01	<0.002	< 0.00002	< 0.00002	< 0.001	< 0.001	
Manganese	AO	0.05	<0.002	0.002	0.001	< 0.01	< 0.01	
Molybdenum				< 0.0001	< 0.0001	<0.005	<0.005	
Nickel			<0.003	0.0012	0.0011	0.006	<0.005	
Silicon			6.90	6.75	7.87	7.6	7.3	
Silver						<0.0001	0.0003	
Strontium			0.047	0.046	0.051	0.063	0.066	
Thallium			<0.006	< 0.00005	< 0.00005	<0.0001	<0.0001	
Titanium			<0.002	< 0.005	< 0.005	0.01	<0.01	
Vanadium			0.003	0.0041	0.0037	0.004	0.005	
Zinc	AO	5	<0.005	< 0.005	< 0.005	<0.01	<0.01	
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.6	7.3	7.3	7.1	7	
pH			7.7	7.3	7.8	7.3	7.7	
Conductivity us/cm			317	322	302	364	249	

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-FS

PARAMETER	Limit	ODWO/S	Oct-07	May-08	Oct-08	May-09	Sep-09	May-10
Alkalinity (C_aCO3)	OG	30-500	168	168	186	192	215	168
BOD			2	<1	<1	<1	1	
COD			6	<5	10	13	<5	
Chloride	AO	250	3	3	3	13	3	2
Conductivity us/cm			350	342	380	372	418	337
DOC	AO	5	7.3	4.3	2.4	2.7	2.2	
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols			<0.001	<0.001	<0.001	<0.001	<0.001	
Sulphate	AO	500	13	11	12	11	14	
Total Dissolved Solids	AO	500	228	222	247	242	272	219
Total Kjeldahl Nitrogen			0.74	0.16	0.19	0.15	<0.10	0.12
Total phosphorous			0.07	<0.05	0.82	1.24	29.3	
Hardness as CaCO3		500	176	183	194	187	211	166
Calcium			49	50	53	47	58	45
Magnesium			13	14	15	17	16	13
Potassium			4	3	3	3	3	2
Sodium	AO	200	5	<2	<2	4	3	<2
Aluminum	OG	0.1	8.26	0.31	0.25	0.24	0.11	0.11
Barium	MAC	1	0.68	0.06	0.07	0.06	0.07	0.06
Beryllium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IMAC	5	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005	0.0007	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.043	0.005	0.004	0.004	0.003	<0.001
Cobalt			0.0595	0.0375	0.0242	0.0308	0.0271	0.0071
Copper	AO	1	1.72	0.016	0.007	0.011	0.004	0.006
Iron	AO	0.3	51.2	0.64	0.28	0.48	0.18	0.37
Lead	MAC	0.01	0.006	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	1.79	0.13	0.06	0.06	0.04	0.02
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			7.5	7.2	7.2	8.4	6.3	7.2
Silver			0.0005	0.001	0.0002	0.0008	0.0007	0.001
Strontium			0.052	0.046	0.067	0.058	0.046	0.044
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	0.01	<0.01	0.02	<0.01	0.01
Vanadium			0.004	0.004	0.004	0.005	0.004	0.004
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.7	7.1	7.5	7.6	7	7.9
pH			7.7	7.3	7.5	7.4	6.9	7
Conductivity us/cm			248	246	394	307	310	229

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-FS

PARAMETER	Limit	ODWO/S	Oct-10	Jun-11	Oct-11	Jun-12	Oct-12	Jun-13
Alkalinity (C_aCO3)	OG	30-500	175	160	186	186	169	151
BOD								
COD								
Chloride	AO	250	2	1	1	1	2	<1
Conductivity us/cm			347	308	360	350	323	293
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols						<0.001	<0.001	<0.01
Sulphate	AO	500				11	9	8
Total Dissolved Solids	AO	500	226	200	234	228	210	190
Total Kjeldahl Nitrogen			<0.10	0.16	<0.10	<0.10	<0.10	<0.10
Total phosphorous								
Hardness as CaCO3		500	173	162	221	138	181	150
Calcium			48	45	62	37	51	42
Magnesium			13	12	16	11	13	11
Potassium			2	2	3	2	2	2
Sodium	AO	200	<2	2	2	2	<2	<2
Aluminum	OG	0.1	0.08	0.27	0.09	0.31	0.11	0.22
Barium	MAC	1	0.06	0.06	0.07	0.07	0.06	0.06
Beryllium			<0.001	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.002	0.006	0.003	0.005	0.002	0.002
Cobalt			0.0144	0.0087	0.0148	0.0106	0.0081	0.0102
Copper	AO	1	0.004	0.011	0.003	0.009	0.004	0.01
Iron	AO	0.3	0.15	0.56	0.17	0.46	0.12	0.46
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.03	0.02	0.03	0.03	0.01	0.02
Molybdenum			<0.005	0.0001	0.0003	0.0002	< 0.0001	
Nickel			<0.005	< 0.01	< 0.01	< 0.01	< 0.01	<0.003
Silicon			7.3	7.23	7.14	6.07	7.15	7.26
Silver			0.0005					
Strontium			0.048	0.05	0.05	0.057	0.051	0.057
Thallium			<0.0001	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.006
Titanium			<0.01	< 0.005	< 0.005	< 0.005	< 0.005	<0.002
Vanadium			0.003	0.004	0.0046	0.0047	0.0037	0.003
Zinc	AO	5	<0.01	< 0.005	< 0.005	< 0.005	0.007	0.006
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)				< 0.01	< 0.01	< 0.01	< 0.01	
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			6.6	7.2	7.7	7.3	7.7	7.3
pH			7.9	7.8	7	7.4	7.5	7.3
Conductivity us/cm			350	282	316	362	299	327

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-FS

PARAMETER	Limit	ODWO/S	Nov-13	Apr-14	Oct-14	Jun-15	Oct-15	May-16
Alkalinity (C_aCO3)	OG	30-500	183	156	170	174	163	184
BOD								
COD								
Chloride	AO	250	1	0.7	0.9	0.9	0.7	1.15
Conductivity us/cm			356	316	323	332	310	363
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	< 0.10	< 0.10	< 0.1	< 0.1	<0.05
N-NO3 (Nitrate)	MAC	10	<0.10	< 0.10	< 0.10	< 0.1	< 0.1	<0.05
Phenols			<0.001					
Sulphate	AO	500	8					
Total Dissolved Solids	AO	500	231	168	217	209	202	182
Total Kjeldahl Nitrogen			<0.10	0.16	0.11	0.4	0.83	0.12
Total phosphorous								
Hardness as CaCO3		500	195	177	172	186	181	176
Calcium			55	49.5	47.2	51.4	48.3	48.1
Magnesium			14	13	13	14	14.7	13.5
Potassium			2	2.4	2.2	2.3	2.2	2.34
Sodium	AO	200	<2	2.2	2.1	2.4	2	3.07
Aluminum	OG	0.1	0.07	0.15	0.09	0.17	0.02	0.013
Barium	MAC	1	0.07	0.06	0.056	0.061	0.062	0.057
Beryllium			<0.0005	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.001
Boron	IMAC	5	<0.01	< 0.005	0.005	< 0.005	< 0.005	<0.010
Cadmium	MAC	0.005	<0.0001	0.00003	< 0.00002	< 0.00002	< 0.00002	<0.001
Chromium	MAC	0.05	0.002	0.002	< 0.002	0.002	< 0.002	<0.003
Cobalt			0.0026	0.0011	0.0033	0.0013	< 0.0001	<0.001
Copper	AO	1	0.004	0.0056	0.002	0.003	< 0.002	<0.003
Iron	AO	0.3	0.14	0.144	0.126	0.161	0.027	<0.010
Lead	MAC	0.01	<0.001	0.00013	0.00006	0.00007	< 0.00002	<0.002
Manganese	AO	0.05	<0.01	0.005	0.01	0.002	< 0.001	<0.002
Molybdenum			<0.005	0.0001	0.0003	0.0002	< 0.0001	
Nickel			<0.005	< 0.01	< 0.01	< 0.01	< 0.01	<0.003
Silicon			7.3	7.23	7.14	6.07	7.15	7.26
Silver			0.0005					
Strontium			0.048	0.05	0.05	0.057	0.051	0.057
Thallium			<0.0001	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.006
Titanium			<0.01	< 0.005	< 0.005	< 0.005	< 0.005	<0.002
Vanadium			0.003	0.004	0.0046	0.0047	0.0037	0.003
Zinc	AO	5	<0.01	< 0.005	< 0.005	< 0.005	0.007	0.006
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)				< 0.01	< 0.01	< 0.01	< 0.01	
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			6.6	7.2	7.7	7.3	7.7	7.3
pH			7.9	7.8	7	7.4	7.5	7.3
Conductivity us/cm			350	282	316	362	299	327

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-FS

PARAMETER	Limit	ODWO/S	Nov-16	Apr-17	Oct-17	May-18	Oct-18	
Alkalinity (C_aCO3)	OG	30-500	198	189	210	236	209	
BOD								
COD								
Chloride	AO	250	0.89	2	0.8	2	2	
Conductivity us/cm			378	317	402	441	406	
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.05	0.2	< 0.05	< 0.10	< 0.10	
N-NO3 (Nitrate)	MAC	10	<0.05	0.2	< 0.05	< 0.10	< 0.10	
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	228	190	218	287	264	
Total Kjeldahl Nitrogen			<0.10	0.3	0.5	1.6	0.8	
Total phosphorous								
Hardness as CaCO3		500	201	178	229	251	194	
Calcium			56.2	49.4	62.4	71	53	
Magnesium			14.7	13.3	17.8	18	15	
Potassium			2.48	2.1	2.1	3	2	
Sodium	AO	200	2.35	1.9	2.8	2	3	
Aluminum	OG	0.1	0.013	0.04	0.04	< 0.01	< 0.01	
Barium	MAC	1	0.058	0.059	0.069	0.08	0.08	
Beryllium			<0.001	< 0.0001	< 0.0001	< 0.0005	< 0.0005	
Boron	IMAC	5	<0.010	< 0.005	< 0.005	< 0.01	< 0.01	
Cadmium	MAC	0.005	<0.001	< 0.000020	< 0.000014	< 0.0001	< 0.0001	
Chromium	MAC	0.05	<0.003	< 0.002	< 0.002	0.002	0.002	
Cobalt			<0.001	< 0.0001	< 0.0001	< 0.0002	< 0.0002	
Copper	AO	1	<0.003	0.002	< 0.002	< 0.001	0.002	
Iron	AO	0.3	<0.010	0.013	0.016	< 0.03	< 0.03	
Lead	MAC	0.01	<0.002	< 0.00002	< 0.00002	< 0.001	< 0.001	
Manganese	AO	0.05	<0.002	0.001	< 0.001	< 0.01	< 0.01	
Molybdenum				< 0.0001	< 0.0001	0.006	<0.005	
Nickel			<0.003	0.0012	0.0014	<0.005	<0.005	
Silicon			7.44	7.41	7.76	3.8	5.7	
Silver						<0.0001	<0.0001	
Strontium			0.051	0.044	0.061	0.263	0.303	
Thallium			<0.006	< 0.00005	< 0.00005	<0.0001	<0.0001	
Titanium			<0.002	< 0.005	< 0.005	<0.01	<0.01	
Vanadium			0.003	0.0038	0.0028	<0.001	<0.001	
Zinc	AO	5	<0.005	< 0.005	< 0.005	<0.01	<0.01	
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			6.4	7.3	7.0	7.1	7	
pH			7.2	6.9	7.8	7.3	7.5	
Conductivity us/cm			385	318	351	364	301	

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-FD

PARAMETER	Limit	ODWO/S	Nov-08	May-09	Sep-09	May-10	Oct-10	Jun-11
Alkalinity (C_aCO3)	OG	30-500	64	157	286	252	254	181
BOD			22	22	7			
COD			98	75	41			
Chloride	AO	250	15	3	11	10	11	8
Conductivity us/cm			388	568	578	513	506	360
DOC	AO	5	19.9	17.8	12.8			
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	0.12	<0.10
Phenols			0.017	0.003	<0.001			
Sulphate	AO	500	74	19	13			
Total Dissolved Solids	AO	500	252	369	376	333	329	234
Total Kjeldahl Nitrogen			2.42	1.97	1.98	1.88	1.72	1.49
Total phosphorous			17.1	6.53	5.35			
Hardness as CaCO3		500	104	113	192	166	181	110
Calcium			30	32	54	45	51	31
Magnesium			7	8	14	13	13	8
Potassium			6	8	10	9	8	8
Sodium	AO	200	16	48	37	41	20	28
Aluminum	OG	0.1	0.12	0.05	0.08	0.02	0.09	0.04
Barium	MAC	1	0.1	0.12	0.15	0.11	0.12	0.07
Beryllium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005
Boron	IMAC	5	0.07	0.07	0.07	0.08	0.09	0.06
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	<0.001	0.002	<0.001	<0.001	0.003
Cobalt			0.0502	0.0101	0.0331	0.003	0.0026	0.0082
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	23.2	61.7	19.6	3.95	5.1	1.85
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	3.06	3.67	2.44	0.55	0.66	0.26
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			3.1	5	4.6	2.4	4	2.1
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.119	0.193	0.19	0.192	0.121	0.11
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			<0.001	0.002	0.002	0.001	<0.001	<0.001
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.6	8		7		7
pH			7.8	7.7		7.1		8.6
Conductivity us/cm			285	281		334		239

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-FD

PARAMETER	Limit	ODWO/S	Oct-11	Jun-12	Jun-12 QA/QC	Oct-12	Jun-13	Nov-13
Alkalinity (C_aCO3)	OG	30-500	151	161	168	168	111	116
BOD								
COD								
Chloride	AO	250	6	7	7	7	5	5
Conductivity us/cm			292	313	326	335	226	241
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols				<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate	AO	500		<3	<3	<3	<3	<3
Total Dissolved Solids	AO	500	190	203	212	218	147	157
Total Kjeldahl Nitrogen			1.26	1.68	1.71	1.3	1.52	1.43
Total phosphorous								
Hardness as CaCO3		500	77	91	103	124	77	80
Calcium			21	25	28	35	21	22
Magnesium			6	7	8	9	6	6
Potassium			7	7	8	9	7	8
Sodium	AO	200	23	17	13	16	11	17
Aluminum	OG	0.1	0.04	0.02	0.02	0.02	0.02	0.02
Barium	MAC	1	0.07	0.09	0.08	0.07	0.04	0.04
Beryllium			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IMAC	5	0.06	0.06	0.06	0.06	0.05	0.05
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	0.002	0.002	<0.001	<0.001	<0.001
Cobalt			0.0152	0.0009	0.0092	0.0019	0.0116	0.0024
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	0.26	4.47	4.23	3.2	2.05	0.52
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.25	0.51	0.5	0.35	0.27	0.13
Molybdenum			0.002	0.0021	0.0045	0.0014	0.0026	
Nickel			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	<0.003
Silicon			2.06	2.24	2.11	2.88	2.42	2.34
Silver								
Strontium			0.154	0.157	0.085	0.125	0.119	0.160
Thallium			< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.006
Titanium			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	<0.002
Vanadium			0.0009	0.0007	0.0012	0.0007	0.0003	<0.002
Zinc	AO	5	< 0.005	< 0.005	< 0.005	< 0.005	0.006	0.009
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)			1.44	1.42	1.26	1.39	1.36	
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			7.4		7.8	8.2	7.7	7.9
pH			8.2		8.1	7.9	7.8	7.6
Conductivity us/cm			224		224	242	200	264

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-FD

PARAMETER	Limit	ODWO/S	Apr-14	Apr-14 BH 07-6 QA/QC	Oct-14	Jun-15	Oct-15	May-16
Alkalinity (C_aCO3)	OG	30-500	115	117	111	108	104	142
BOD								
COD								
Chloride	AO	250	4.9	4.9	5	4.9	4.6	5.21
Conductivity us/cm			247	250	219	219	215	289
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	< 0.10	< 0.10	< 0.10	< 0.1	< 0.1	<0.05
N-NO3 (Nitrate)	MAC	10	< 0.10	< 0.10	< 0.10	< 0.1	< 0.1	<0.05
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	132	133	147	134	134	122
Total Kjeldahl Nitrogen			1.97	2.06	1.59	2.1	1.64	2.01
Total phosphorous								
Hardness as CaCO3		500	94	95	54	78	77	111
Calcium			25.6	25.8	14.3	21.1	19.8	29.2
Magnesium			7.39	7.44	4.47	6.22	6.62	9.13
Potassium			8.3	8.3	5.8	7	6.7	7.76
Sodium	AO	200	13.2	12.8	22.4	8.2	12.9	8.14
Aluminum	OG	0.1	0.03	0.03	0.05	0.02	< 0.01	<0.004
Barium	MAC	1	0.044	0.047	0.017	0.045	0.042	0.056
Beryllium			< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.001
Boron	IMAC	5	0.047	0.047	0.047	0.038	0.056	0.044
Cadmium	MAC	0.005	0.00002	0.00002	< 0.00002	< 0.00002	< 0.00002	<0.001
Chromium	MAC	0.05	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.003
Cobalt			0.0021	0.0002	0.0044	0.0012	< 0.0001	<0.001
Copper	AO	1	0.0004	< 0.0001	0.002	< 0.002	< 0.002	<0.003
Iron	AO	0.3	0.849	0.917	0.096	1.22	0.579	1.25
Lead	MAC	0.01	0.00003	0.00002	0.00011	< 0.00002	< 0.00002	<0.002
Manganese	AO	0.05	0.174	0.184	0.079	0.216	0.166	0.221
Molybdenum				0.002	0.0015	< 0.005	< 0.005	
Nickel			<0.003	0.001	0.0008	< 0.005	< 0.005	<0.003
Silicon			2.64	2.42	2.65	2.4	2.4	2.34
Silver								
Strontium			0.113	0.124	0.104	0.12	0.141	0.160
Thallium			<0.006	< 0.00005	< 0.00005	< 0.0001	< 0.0001	<0.006
Titanium			<0.002	< 0.005	< 0.005	< 0.01	< 0.01	<0.002
Vanadium			<0.002	0.0006	0.0003	< 0.001	< 0.001	<0.002
Zinc	AO	5	<0.005	< 0.005	< 0.005	< 0.01	< 0.01	0.009
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C			6.7	7.5	7.8	8.2	7.7	7.9
pH			7.6	7.4	8.1	7.9	7.8	7.6
Conductivity us/cm			230	232	224	242	200	264

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 07-FD

PARAMETER	Limit	ODWO/S	Nov-16	Apr-17	Oct-17	May-18	Oct-18	
Alkalinity (C_aCO3)	OG	30-500	116	111	99	102	120	
BOD								
COD								
Chloride	AO	250	3.49	4.5	3.5	4	5	
Conductivity us/cm			233	225	201	216	245	
DOC	AO	5						
N-NO2 (Nitrite)	MAC	1	<0.05	0.1	< 0.05	< 0.10	< 0.10	
N-NO3 (Nitrate)	MAC	10	<0.05	< 0.1	< 0.05	< 0.10	< 0.10	
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	124	121	106	140	159	
Total Kjeldahl Nitrogen			1.75	2.06	1.7	3.1	2.3	
Total phosphorous								
Hardness as CaCO3		500	86.6	86	74	84	81	
Calcium			23.4	22.9	19.5	22	21	
Magnesium			6.84	6.93	6.15	7	7	
Potassium			6.64	7	6.4	6	6	
Sodium	AO	200	6.40	10.9	10	8	9	
Aluminum	OG	0.1	0.013	0.02	0.02	< 0.01	< 0.01	
Barium	MAC	1	0.034	0.036	0.041	0.04	0.04	
Beryllium			<0.001	< 0.0001	< 0.0001	< 0.0005	< 0.0005	
Boron	IMAC	5	0.040	0.041	0.042	0.03	0.04	
Cadmium	MAC	0.005	<0.001	< 0.000020	< 0.000014	< 0.0001	< 0.0001	
Chromium	MAC	0.05	<0.003	< 0.002	< 0.002	< 0.001	< 0.001	
Cobalt			<0.001	< 0.0001	< 0.0001	< 0.0002	< 0.0002	
Copper	AO	1	<0.003	< 0.002	0.002	< 0.001	< 0.001	
Iron	AO	0.3	0.470	0.64	0.539	0.48	0.59	
Lead	MAC	0.01	<0.002	< 0.00002	< 0.00002	< 0.001	< 0.001	
Manganese	AO	0.05	0.136	0.15	0.13	0.12	0.16	
Molybdenum				0.002	0.0015	< 0.005	< 0.005	
Nickel			<0.003	0.001	0.0008	< 0.005	< 0.005	
Silicon			2.64	2.42	2.65	2.4	20.4	
Silver								
Strontium			0.113	0.124	0.104	0.12	0.141	
Thallium			<0.006	< 0.00005	< 0.00005	< 0.0001	< 0.0001	
Titanium			<0.002	< 0.005	< 0.005	< 0.01	< 0.01	
Vanadium			<0.002	0.0006	0.0003	< 0.001	< 0.001	
Zinc	AO	5	<0.005	< 0.005	< 0.005	< 0.01	< 0.01	
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3 (Ammonia)								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{O}C			6.7	7.5	7.6	7.3	7.2	
pH			7.6	7.4	8.1	7.7	7.6	
Conductivity us/cm			230	232	151	183	186	

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 08-1D

PARAMETER	Limit	ODWO/S	Nov-08	May-09	Sep-09	May-10	Oct-10	Jun-11
Alkalinity (C_aCO3)	OG	30-500	142	107	105	92	93	92
BOD			6	1	2			
COD			8	8	<5			
Chloride	AO	250	16	19	17	16	21	20
Conductivity us/cm			334	293	278	258	260	258
DOC	AO	5	2.1	2	2.2			
N-NO2	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols			<0.001	<0.001	<0.001			
Sulphate	AO	500	9	11	9			
Total Dissolved Solids	AO	500	217	190	181	168	169	168
Total Kjeldahl Nitrogen			1.92	1.24	0.97	1.21	0.82	0.9
Total phosphorous			0.07	0.04	1.3			
Hardness as CaCO3	OG	500	133	114	102	88	93	95
Calcium			40	34	31	27	29	28
Magnesium			8	7	6	5	5	6
Potassium			6	5	5	4	4	4
Sodium	AO	200	8	7	8	7	7	8
Aluminum	OG	0.1	<0.01	0.01	<0.01	0.02	<0.01	0.04
Barium	MAC	1	0.12	0.07	0.07	0.06	0.06	0.05
Beryllium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005
Boron	IMAC	5	0.04	0.02	0.02	0.02	0.02	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Cobalt			0.0305	0.0122	0.0359	0.0004	0.019	0.0003
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	2.83	2.23	1.27	1.02	0.8	0.79
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	2.03	1.73	1.78	1.45	1.46	1.26
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			11.2	8.8	9.1	7.4	8.4	7.7
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.127	0.111	0.115	0.11	0.108	0.111
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			0.002	<0.001	0.002	0.001	<0.001	<0.001
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{U}C			9	9.1	7.7	8.5	7	7.6
pH			6.64	7.5	7.7	7.8	8.2	7.6
Conductivity us/cm			848	309	250	259	198	206

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 08-1D

PARAMETER	Limit	ODWO/S	Jun-11 QA/QC	Oct-11	Jun-12	Oct-12	Jun-13	Jun-13 Dup 08-2
Alkalinity (C_aCO3)	OG	30-500	93	99	87	91	99	100
BOD								
COD								
Chloride	AO	250	20	18	19	18	18	19
Conductivity us/cm			251	260	234	252	265	264
DOC	AO	5						
N-NO2	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols					<0.001	<0.001	<0.001	<0.001
Sulphate	AO	500			7	8	7	7
Total Dissolved Solids	AO	500	163	169	152	164	172	172
Total Kjeldahl Nitrogen			1	1.1	0.71	0.58	0.69	0.66
Total phosphorous								
Hardness as CaCO3	OG	500	88	97	76	90	100	100
Calcium			27	29	22	28	30	30
Magnesium			5	6	5	5	6	6
Potassium			4	4	3	4	3	3
Sodium	AO	200	8	9	7	8	9	9
Aluminum	OG	0.1	0.03	0.09	0.07	0.19	0.15	0.19
Barium	MAC	1	0.05	0.05	0.05	0.05	0.05	0.05
Beryllium			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IMAC	5	<0.01	0.01	0.01	0.01	0.02	0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	0.001	<0.001	0.001	<0.001	<0.001	<0.001
Cobalt			0.0003	0.0008	0.0101	0.0009	0.0007	0.0003
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	0.75	0.91	0.57	0.62	0.83	0.85
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	1.19	1.18	1.01	0.98	1.11	1.1
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			7.4	8	8.3	7	8.1	9
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.11	0.11	0.099	0.108	0.135	0.135
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{U}C				7.8	7.7	7	8.6	
pH				7.2	7.5	6.9	212	
Conductivity us/cm				260	210	247	7.3	

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 08-1D

PARAMETER	Limit	ODWO/S	Nov-13	Apr-14	Oct-14	Oct-14 BH 08-2 QA/QC	Jun-15	Oct-15
Alkalinity (C_aCO3)	OG	30-500	93	85	84	84	90	93
BOD								
COD								
Chloride	AO	250	21	18.1	18.3	18.1	17.1	16.8
Conductivity us/cm			264	248	231	232	240	248
DOC	AO	5						
N-NO2	MAC	1	<0.10	< 0.1	< 0.10	< 0.10	< 0.1	< 0.1
N-NO3	MAC	10	<0.10	< 0.10	< 0.10	< 0.10	< 0.1	< 0.1
Phenols			<0.001					
Sulphate	AO	500	7					
Total Dissolved Solids	AO	500	172	126	122	122	149	154
Total Kjeldahl Nitrogen			0.59	0.91	0.77	0.76	1	< 0.05
Total phosphorous								
Hardness as CaCO3	OG	500	95	97	103	101	97	96
Calcium			28	29	29.1	29.1	28.5	26.8
Magnesium			6	5.96	5.72	5.75	6.19	6.97
Potassium			3	3.6	3.6	3.6	3.4	3
Sodium	AO	200	12	8.8	6.5	6.5	9.8	11.5
Aluminum	OG	0.1	0.05	0.04	0.02	0.02	0.08	< 0.01
Barium	MAC	1	0.04	0.043	0.05	0.05	0.042	0.038
Beryllium			<0.0005	0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Boron	IMAC	5	0.01	0.011	0.014	0.014	0.009	0.014
Cadmium	MAC	0.005	<0.0001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Chromium	MAC	0.05	<0.001	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Cobalt			0.0003	0.0022	< 0.0001	0.0002	0.0002	< 0.0001
Copper	AO	1	<0.001	< 0.0001	< 0.002	< 0.002	< 0.002	< 0.002
Iron	AO	0.3	0.65	0.7	0.784	0.79	0.619	0.77
Lead	MAC	0.01	<0.001	0.00009	0.00013	< 0.00002	0.00004	< 0.00002
Manganese	AO	0.05	0.78	1.01	1.12	1.13	0.961	0.971
Molybdenum			<0.005	0.0008	0.0005	0.0006	0.0008	0.0012
Nickel			<0.005	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Silicon			8.1	7.76	7.76	7.82	6.61	7.58
Silver			<0.0001					
Strontium			0.109	0.135	0.134	0.134	0.145	0.138
Thallium			<0.0001	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Titanium			<0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Vanadium			<0.001	0.0007	0.0006	0.0008	0.0009	0.0004
Zinc	AO	5	<0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3				0.61	0.72	0.73	0.55	0.46
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{U}C			7.1	7.5	7.7		7.9	8.1
pH			7.9	7.7	7.7		7.2	7.6
Conductivity us/cm			264	222	240		264	227

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 08-1D

PARAMETER	Limit	ODWO/S	May-16	Nov-16	Apr-17	Apr-17 BH 08-2 QA/QC	Oct-17	Oct-17 BH 08-2 QA/QC
Alkalinity (C_aCO3)	OG	30-500	130	102	98	90	103	105
BOD								
COD								
Chloride	AO	250	19.0	18.5	14.9	14.7	14.2	13.9
Conductivity us/cm			316	258	252	240	261	268
DOC	AO	5						
N-NO2	MAC	1	<0.05	<0.05	< 0.1	< 0.1	< 0.05	< 0.05
N-NO3	MAC	10	<0.05	<0.05	< 0.1	< 0.1	< 0.05	< 0.05
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	160	146	127	124	133	133
Total Kjeldahl Nitrogen			0.90	0.71	1.03	0.94	0.8	0.8
Total phosphorous								
Hardness as CaCO3	OG	500	118	90.2	97	99	108	107
Calcium			34.3	26.6	28.9	29.7	32.2	31.7
Magnesium			7.95	5.77	6.08	6.09	6.8	6.84
Potassium			2.53	1.95	3.5	3.5	3.7	3.6
Sodium	AO	200	13.2	11.0	7.4	7.5	6.7	6.8
Aluminum	OG	0.1	<0.004	0.007	0.03	0.03	0.03	0.04
Barium	MAC	1	0.053	0.045	0.047	0.048	0.059	0.058
Beryllium			<0.001	<0.001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Boron	IMAC	5	0.018	0.015	0.012	0.01	0.016	0.016
Cadmium	MAC	0.005	<0.001	<0.001	< 0.000020	< 0.000020	< 0.000014	< 0.000014
Chromium	MAC	0.05	<0.003	<0.003	< 0.002	< 0.002	< 0.002	< 0.002
Cobalt			<0.001	<0.001	< 0.0001	< 0.0001	< 0.0001	< 0.0001
Copper	AO	1	<0.003	<0.003	< 0.002	< 0.002	< 0.002	0.002
Iron	AO	0.3	1.15	0.816	1.04	1.07	1.62	1.59
Lead	MAC	0.01	<0.002	<0.002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Manganese	AO	0.05	1.05	0.912	0.942	0.966	1.19	1.17
Molybdenum					0.0007	0.0007	0.0005	0.0005
Nickel			<0.003	<0.003	0.0007	0.0007	0.0007	0.0007
Silicon			8.40	7.50	8.03	8.05	8.85	8.86
Silver								
Strontium			0.163	0.117	0.128	0.129	0.14	0.14
Thallium			<0.006	<0.006	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Titanium			<0.002	<0.002	< 0.005	< 0.005	< 0.005	< 0.005
Vanadium			<0.002	<0.002	0.0006	0.0006	0.0003	0.0004
Zinc	AO	5	0.007	<0.005	< 0.005	< 0.005	< 0.005	< 0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{U}C			7.9	7.5	7.2		7.6	
pH			7.4	7.7	7.2		7.7	
Conductivity us/cm			286	250	257		231	

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 08-1D

PARAMETER	Limit	ODWO/S	May-18	May-18 BH08-3 QA/QC	Oct-18	Oct-18 BH08-3 QA/QC		
Alkalinity (C_aCO3)	OG	30-500	85	88	108	98		
BOD								
COD								
Chloride	AO	250	18	18	17	17		
Conductivity us/cm			242	244	256	258		
DOC	AO	5						
N-NO2	MAC	1	< 0.10	< 0.10	< 0.10	< 0.10		
N-NO3	MAC	10	< 0.10	< 0.10	< 0.10	< 0.10		
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	157	159	166	168		
Total Kjeldahl Nitrogen			1.8	2.3	1.3	1.1		
Total phosphorous								
Hardness as CaCO3	OG	500	100	95	87	85		
Calcium			30	< 28	25	24		
Magnesium			6	6	6	6		
Potassium			3	2	2	2		
Sodium	AO	200	9	13	11	12		
Aluminum	OG	0.1	< 0.01	< 0.01	< 0.01	< 0.01		
Barium	MAC	1	0.05		0.05	0.05		
Beryllium			< 0.0005	< 0.0005	< 0.0005	< 0.0005		
Boron	IMAC	5	< 0.01	< 0.01	0.01	0.01		
Cadmium	MAC	0.005	< 0.0001	< 0.0001	< 0.0001	< 0.0001		
Chromium	MAC	0.05	< 0.001	< 0.001	< 0.001	< 0.001		
Cobalt			< 0.0002	< 0.0002	< 0.0002	< 0.0002		
Copper	AO	1	< 0.001	< 0.001	< 0.001	< 0.001		
Iron	AO	0.3	1.17	1.14	1.33	1.33		
Lead	MAC	0.01	< 0.001	< 0.001	< 0.001	< 0.001		
Manganese	AO	0.05	0.92	0.94	0.93	0.93		
Molybdenum			< 0.004	< 0.005	< 0.005	< 0.005		
Nickel			< 0.005	< 0.005	< 0.005	< 0.005		
Silicon			< 7.9	7.9	8.2	8.2		
Silver								
Strontium			0.123	0.134	0.139	0.138		
Thallium			< 0.0001	< 0.0001	< 0.0001	< 0.0001		
Titanium			< 0.01	< 0.01	< 0.01	< 0.01		
Vanadium			< 0.001	< 0.001	< 0.001	< 0.001		
Zinc	AO	5	< 0.01	< 0.01	< 0.01	< 0.01		
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{U}C			7.4		7.4			
pH			7.2		7.6			
Conductivity us/cm			210		196			

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 08-1S

PARAMETER	Limit	ODWO/S	Nov-08	May-09	Sep-09	May-10	Oct-10	Jun-11
Alkalinity (C_aCO3)	OG	30-500	96	80	82	77	77	89
BOD			2	2	2			
COD			18	13	<5			
Chloride	AO	250	3	2	2	2	2	<1
Conductivity us/cm			263	178	174	166	165	181
DOC	AO	5	1.4	1.7	2.1			
N-NO2	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3	MAC	10	<0.10	<0.10	<0.10	<0.10	0.11	<0.10
Phenols			<0.001	<0.001	<0.001			
Sulphate	AO	500	33	11	9			
Total Dissolved Solids	AO	500	171	116	113	108	107	118
Total Kjeldahl Nitrogen			0.14	<0.10	<0.10	<0.10	<0.10	<0.10
Total phosphorous			0.7	0.56	0.56			
Hardness as CaCO3	OG	500	70	75	77	75	130	86
Calcium			18	20	21	20	34	23
Magnesium			6	6	6	6	11	7
Potassium			<1	<1	<1	<1	1	1
Sodium	AO	200	30	9	5	<2	8	2
Aluminum	OG	0.1	0.37	0.01	0.07	0.03	0.06	0.06
Barium	MAC	1	<0.01	0.01	0.01	0.02	0.01	0.02
Beryllium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005
Boron	IMAC	5	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Cobalt			0.0382	<0.0002	0.0075	0.0145	0.0121	0.0083
Copper	AO	1	<0.001	0.003	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	0.2	0.52	0.48	0.13	0.38	0.23
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.13	0.16	0.13	0.06	0.11	0.05
Molybdenum			0.006	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			6.8	4.7	5.1	4.7	4.8	5.2
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			0.09	0.084	0.059	0.043	0.051	0.051
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			0.002	<0.001	<0.001	0.001	<0.001	0.002
Zinc	AO	5	<0.01	0.02	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{U}C			9.3	8.7	8	8.3	7.6	7.5
pH			7.08	8.1	7.8	8.4	8.6	7.9
Conductivity us/cm			174	181	152	162	124	142

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 08-1S

PARAMETER	Limit	ODWO/S	Oct-11	Jun-12	Oct-12	Jun-13	Nov-13	Nov-13 QA/QC
Alkalinity (C_aCO3)	OG	30-500	98	94	97	97	98	98
BOD								
COD								
Chloride	AO	250	<1	<1	<1	<1	1	1
Conductivity us/cm			188	178	194	193	201	199
DOC	AO	5						
N-NO2	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols				<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate	AO	500		6	8	5	5	5
Total Dissolved Solids	AO	500	122	116	126	125	131	129
Total Kjeldahl Nitrogen			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total phosphorous								
Hardness as CaCO3	OG	500	89	72	85	94	99	99
Calcium			24	19	24	26	28	28
Magnesium			7	6	6	7	7	7
Potassium			1	<1	<1	1	1	1
Sodium	AO	200	3	4	7	2	3	3
Aluminum	OG	0.1	0.08	0.08	0.15	0.05	0.02	<0.01
Barium	MAC	1	0.02	0.02	0.001	0.02	0.02	0.02
Beryllium			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IMAC	5	<0.01	<0.01	<0.01	0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	0.0001	<0.001	<0.001	<0.001	<0.001
Cobalt			0.0129	0.0101	0.0102	0.001	0.0003	<0.0002
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	0.18	0.21	0.24	0.19	0.16	0.12
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	0.08	0.05	0.08	0.03	0.04	0.04
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			5.1	5.8	4.6	5.2	5.2	5.2
Silver			<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001
Strontium			0.052	0.049	0.06	0.057	0.053	0.052
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			0.001	0.002	<0.001	0.002	<0.001	<0.001
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{U}C			7.6	7.7	7	8.6	6.8	
pH			7.7	8.1	7.1	7.8	8.7	
Conductivity us/cm			184	159	187	156	198	

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 08-1S

PARAMETER	Limit	ODWO/S	Apr-14	Oct-14	Jun-15	Oct-15	May-16	Nov-16
Alkalinity (C_aCO3)	OG	30-500	94	93	89	91	102	109
BOD								
COD								
Chloride	AO	250	0.8	0.8	0.7	0.7	0.82	0.60
Conductivity us/cm			196	180	181	182	208	201
DOC	AO	5						
N-NO2	MAC	1	< 0.1	< 0.10	< 0.1	< 0.1	<0.05	<0.05
N-NO3	MAC	10	0.1	0.1	0.1	< 0.1	<0.05	<0.05
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	103	100	112	111	92	124
Total Kjeldahl Nitrogen			0.53	0.06	0.2	< 0.05	0.14	<0.10
Total phosphorous								
Hardness as CaCO3	OG	500	101	109	95	101	93.3	91.4
Calcium			27.7	25.7	25.9	26.4	25.4	25.3
Magnesium			7.65	7.17	7.39	8.45	7.26	6.85
Potassium			1.2	1.2	1.3	1.3	0.69	1.32
Sodium	AO	200	3	3.5	2.4	2	4.28	2.39
Aluminum	OG	0.1	0.03	0.04	0.02	< 0.01	0.049	0.009
Barium	MAC	1	0.018	0.018	0.02	0.022	0.025	0.023
Beryllium			< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.001	<0.001
Boron	IMAC	5	< 0.005	0.006	< 0.005	< 0.005	0.015	0.010
Cadmium	MAC	0.005	0.00003	< 0.00002	< 0.00002	< 0.00002	<0.001	<0.001
Chromium	MAC	0.05	< 0.002	< 0.002	< 0.002	< 0.002	<0.003	<0.003
Cobalt			0.0021	0.0035	0.0004	< 0.0001	<0.001	<0.001
Copper	AO	1	0.0002	< 0.002	< 0.002	< 0.002	<0.003	<0.003
Iron	AO	0.3	0.137	0.08	0.063	0.075	0.093	0.049
Lead	MAC	0.01	0.00006	0.00008	< 0.00002	< 0.00002	<0.002	<0.002
Manganese	AO	0.05	0.055	0.05	0.022	0.018	0.034	0.020
Molybdenum			0.0002	0.0004	0.0002	0.0001		
Nickel			< 0.01	< 0.01	< 0.01	< 0.01	<0.003	<0.003
Silicon			5.11	4.82	4.18	5.39	5.26	5.01
Silver								
Strontium			0.066	0.06	0.057	0.056	0.054	0.047
Thallium			< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.006	<0.006
Titanium			< 0.005	< 0.005	< 0.005	< 0.005	<0.002	<0.002
Vanadium			0.0012	0.0014	0.0017	0.0015	<0.002	<0.002
Zinc	AO	5	< 0.005	< 0.005	< 0.005	< 0.005	<0.005	<0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3			< 0.01	< 0.01	< 0.01	< 0.01		
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{U}C			7.4	7.5	7.9	8.1	7.8	7.4
pH			7.7	8	7.5	7.9	7.7	7.7
Conductivity us/cm			176	182	201	170	190	198

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Sample Location 08-1S

PARAMETER	Limit	ODWO/S	Apr-17	Oct-17	May-18	Oct-18		
Alkalinity (C_aCO3)	OG	30-500	94	89	88	97		
BOD								
COD								
Chloride	AO	250	< 0.5	0.6	< 1	1		
Conductivity us/cm			189	184	< 182	195		
DOC	AO	5						
N-NO2	MAC	1	0.1	< 0.05	< 0.10	< 0.10		
N-NO3	MAC	10	0.2	< 0.05	< 0.10	< 0.10		
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	102	95	118	127		
Total Kjeldahl Nitrogen			0.22	< 0.1	1.5	< 0.8		
Total phosphorous								
Hardness as CaCO3	OG	500	99	95	94	< 86		
Calcium			27.1	25.6	26			
Magnesium			7.57	7.61	7	7		
Potassium			1.2	1.2	1	1		
Sodium	AO	200	3	2.4	2	2		
Aluminum	OG	0.1	0.03	0.03	< 0.01	< 0.01		
Barium	MAC	1	0.021	0.022	0.02	0.03		
Beryllium			< 0.0001	< 0.0001	< 0.0005	< 0.0005		
Boron	IMAC	5	< 0.005	< 0.005	< 0.01	< 0.01		
Cadmium	MAC	0.005	< 0.000020	< 0.000014	< 0.0001	< 0.0001		
Chromium	MAC	0.05	< 0.002	< 0.002	< 0.001	< 0.001		
Cobalt			< 0.0001	< 0.0001	< 0.0002	< 0.0002		
Copper	AO	1	0.002	< 0.002	< 0.001	< 0.001		
Iron	AO	0.3	0.074	0.068	0.11	< 0.1		
Lead	MAC	0.01	< 0.00002	< 0.00002	< 0.001	< 0.001		
Manganese	AO	0.05	0.026	0.02	0.04	0.04		
Molybdenum			0.0004	0.0001	< 0.005	< 0.005		
Nickel			0.0006	0.0005	< 0.005	< 0.005		
Silicon			5.15	5.55	< 5.5	5.5		
Silver								
Strontium			0.053	0.047	0.049	0.055		
Thallium			< 0.00005	< 0.00005	< 0.0001	< 0.0001		
Titanium			< 0.005	< 0.005	< 0.01	< 0.01		
Vanadium			0.0013	0.0013	0.001	< 0.001		
Zinc	AO	5	< 0.005	< 0.005	< 0.01	< 0.01		
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{U}C			7.1	7.4	7.5	7.4		
pH			7.5	8.5	7	7.7		
Conductivity us/cm			196	166	157	151		

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
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Sample Location 1227

PARAMETER	Limit	ODWO/S	Apr-14	Oct-14	Jun-15	Oct-15	May-18	Oct-18
Alkalinity (C_aCO3)	OG	30-500	106	106	107	109	108	124
COD			< 5	< 5	< 5	< 5	< 5	< 5
Chloride	AO	250	1.5	1.5	1.4	1.5	1	2
Conductivity us/cm			232	222	230	229	236	239
DOC	AO	5	1.9	1.5	1.5	1.2	1.2	2
N-NO2	MAC	1	< 0.1	< 0.10	< 0.1	< 0.1	< 0.10	< 0.10
N-NO3	MAC	10	< 0.10	< 0.10	< 0.1	< 0.1	< 0.10	< 0.10
Phenols			< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sulphate	AO	500	10	10	10	10	9	10
Total Dissolved Solids	AO	500	130	119	143	153	153	155
Total Kjeldahl Nitrogen			< 0.05	0.09	< 0.05	< 0.05	< 0.8	1.1
Total phosphorous			< 0.01	< 0.01	< 0.01	< 0.01	0.01	0.005
Hardness as CaCO3	OG	500			57	61	56	56
Calcium			17.6	14.5	16.4	17.2	16	16
Magnesium			3.87	3.63	3.87	4.43	4	4
Potassium			0.7	0.6	0.6	0.6	< 1	< 1
Sodium	AO	200	33.6	25.8	31.5	30.8	33	31
Aluminum	OG	0.1						
Barium	MAC	1	0.013	0.011	0.012	0.014	0.01	0.01
Beryllium								
Boron	IMAC	5	0.073	0.058	0.064	0.085	0.06	0.07
Cadmium	MAC	0.005	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001
Chromium	MAC	0.05	< 0.0002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001
Cobalt								
Copper	AO	1	0.0055	0.0017	0.0054	< 0.002	0.004	0.001
Iron	AO	0.3	0.011	< 0.005	0.022	0.011	< 0.03	0.03
Lead	MAC	0.01	0.00012	0.00006	0.00005	0.00008	< 0.001	< 0.001
Manganese	AO	0.05	0.008	0.009	0.006	0.011	< 0.01	< 0.01
Nickel								
Silver								
Strontium								
Zinc	AO	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.01	< 0.01
Arsenic	IMAC	0.025	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.001	< 0.001
Mercury	MAC	0.001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001
N-NH3			< 0.01	0.02	< 0.01	0.05	0.1	0.14
pH (no units)	OG	6.5-8.5	8.21	8.21	7.54	7.85	8.32	8.22
VOCs								
Benzene ug/L			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene,1,4- ug/L			< 0.2	< 0.2	< 0.2	< 0.2	< 0.4	< 0.4
Dichloromethane ug/L			< 0.3	< 0.3	< 0.3	< 0.3	< 4.0	< 4.0
Toluene ug/L			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl Chloride ug/L			< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	<0.2
Dichloroethane-d4,1,2-(SS)			99.5	95	101	99	99	96
Toluene-d8 (SS)			110	117	99	101	90	96
Bromofluorobenzene,4(SS)			81.9	102	89	98	115	84
Field Parameters								
Temperature ^{U}C			8.7	8.5	9.5	12.3	9.7	10.4
pH			8.8	7.4	7.5	8.2	8.1	7.8
Conductivity us/cm			209	218	251	206	197	180

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
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Sample Location 1244

PARAMETER	Limit	ODWO/S	Apr-14	Oct-14	Jun-15	Oct-15	Oct-18	
Alkalinity (C_aCO3)	OG	30-500	51	42	53	39	51	
COD			6	< 5	< 5	< 5	< 5	
Chloride	AO	250	13.7	0.9	1.2	0.7	1	
Conductivity us/cm			182	104	127	99	120	
DOC	AO	5	3.8	1.5	1.2	0.5	1.4	
N-NO2	MAC	1	< 0.1	< 0.10	< 0.1	< 0.1	< 0.10	
N-NO3	MAC	10	1.1	0.1	0.1	0.1	< 0.10	
Phenols			< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	
Sulphate	AO	500	9	11	9	8	7	
Total Dissolved Solids	AO	500	94.4	56.9	77	59	78	
Total Kjeldahl Nitrogen			0.15	< 0.05	< 0.05	< 0.05	1.5	
Total phosphorous			0.03	0.01	0.02	0.01	0.015	
Hardness as CaCO3	OG	500	70	45	58	45	47	
Calcium			20.5	13.2	16.7	12.8	14	
Magnesium			4.56	2.94	3.87	3.17	3	
Potassium			1.2	0.9	1	1	< 1	
Sodium	AO	200	10.5	2.6	3.9	3.3	3	
Aluminum	OG	0.1						
Barium	MAC	1	0.008	0.006	0.006	0.007	< 0.01	
Beryllium								
Boron	IMAC	5	0.005	< 0.005	< 0.005	0.006	< 0.01	
Cadmium	MAC	0.005	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	
Chromium	MAC	0.05	< 0.0002	< 0.002	< 0.002	< 0.002	< 0.001	
Cobalt								
Copper	AO	1	0.0218	0.0194	0.0291	0.029	0.031	
Iron	AO	0.3	0.053	0.078	0.05	0.035	< 0.03	
Lead	MAC	0.01	0.00394	0.00125	0.00096	0.00076	< 0.001	
Manganese	AO	0.05	0.002	0.002	< 0.001	0.001	< 0.01	
Nickel								
Silver								
Strontium								
Zinc	AO	5	0.007	< 0.005	0.005	0.005	< 0.01	
Arsenic	IMAC	0.025	0.0002	< 0.0001	< 0.0001	< 0.0001	< 0.001	
Mercury	MAC	0.001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	
N-NH3			< 0.01	< 0.01	< 0.01	< 0.01	0.07	
pH (no units)	OG	6.5-8.5	7.7	7.32	7.17	7.23	7.57	
VOCs								
Benzene ug/L			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Dichlorobenzene,1,4- ug/L			< 0.2	< 0.2	< 0.2	< 0.2	< 0.4	
Dichloromethane ug/L			< 0.3	< 0.3	< 0.3	< 0.3	< 4.0	
Toluene ug/L			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Vinyl Chloride ug/L			< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Dichloroethane-d4,1,2-(SS)			101	96.5	106	98	96	
Toluene-d8 (SS)			105	117	97	101	96	
Bromofluorobenzene,4(SS)			81.8	106	90	98	119	
Field Parameters								
Temperature ^{o}C			7.6	9.1	8.9	8	10.5	
pH			8.2	6.7	7.2	7.2	7.9	
Conductivity us/cm			166	101	141	91	97	

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

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Sample Location 1235

PARAMETER	Limit	ODWO/S	Apr-14	Oct-14	Jun-15	Oct-15	May-18	Oct-18
Alkalinity (C_aCO3)	OG	30-500	42	47	51	46	112	51
COD			< 5	< 5	< 5	< 5	< 5	< 5
Chloride	AO	250	7.6	4.8	8.3	6.8	10	10
Conductivity us/cm			193	147	205	163	213	152
DOC	AO	5	1.1	1.1	1	0.6	0.9	1.3
N-NO2	MAC	1	0.1	< 0.10	< 0.1	< 0.1	< 0.10	< 0.10
N-NO3	MAC	10	8.2	2.5	6.8	3.9	10.2	1.52
Phenols			< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sulphate	AO	500	6	9	9	8	6	11
Total Dissolved Solids	AO	500	115	79.7	127	109	138	99
Total Kjeldahl Nitrogen			< 0.05	0.19	< 0.05	< 0.05	< 0.8	1
Total phosphorous			< 0.01	0.02	< 0.01	< 0.01	< 0.01	0.002
Hardness as CaCO3	OG	500	42	32	48	37	50	31
Calcium			11.7	9.06	13.7	10.1	15	9
Magnesium			3.1	2.17	3.41	2.81	3	2
Potassium			1.2	1	1.2	1	1	1
Sodium	AO	200	23.3	14.9	23.7	21.1	21	16
Aluminum	OG	0.1						
Barium	MAC	1	0.008	0.006	0.009	0.007	< 0.01	< 0.01
Beryllium								
Boron	IMAC	5	0.022	0.014	0.021	0.03	0.02	0.03
Cadmium	MAC	0.005	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001
Chromium	MAC	0.05	< 0.0002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001
Cobalt								
Copper	AO	1	0.0422	0.0404	0.141	0.062	0.061	0.089
Iron	AO	0.3	< 0.005	< 0.005	0.021	0.008	< 0.03	< 0.03
Lead	MAC	0.01	0.00045	0.00036	0.00052	0.00051	< 0.001	< 0.001
Manganese	AO	0.05	< 0.001	< 0.001	< 0.001	0.001	< 0.01	< 0.01
Nickel								
Silver								
Strontium								
Zinc	AO	5	0.009	0.006	0.058	0.009	< 0.01	0.01
Arsenic	IMAC	0.025	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.001	< 0.001
Mercury	MAC	0.001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001
N-NH3			< 0.01	< 0.01	< 0.01	< 0.01	0.11	0.08
pH (no units)	OG	6.5-8.5	7.41	7.08	6.92	7.02	7.4	7.34
VOCs								
Benzene ug/L			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene,1,4- ug/L			< 0.2	< 0.2	< 0.2	< 0.2	< 0.4	< 0.4
Dichloromethane ug/L			< 0.3	< 0.3	< 0.3	< 0.3	< 4.0	< 4.0
Toluene ug/L			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl Chloride ug/L			< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dichloroethane-d4,1,2-(SS)			100	99.5	101	100	99	98
Toluene-d8 (SS)			106	122	98	101	94	93
Bromofluorobenzene,4(SS)			83.3	104	89	98	112	85
Field Parameters								
Temperature ^{O}C			5.7	9.2	8.5	10.3	7.4	13.5
pH			7.6	6.7	7.3	7.6	7.4	7.5
Conductivity us/cm			173	143	226	150	180	115

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
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Sample Location 1236

PARAMETER	Limit	ODWO/S	Apr-14	Oct-14	Jun-15	Oct-15	May-18	Oct-18
Alkalinity (C_aCO3)	OG	30-500	29	28	26	26	36	33
COD			< 5	< 5	< 5	< 5	< 5	< 5
Chloride	AO	250	1.3	1.2	1.5	0.7	3	1
Conductivity us/cm			85	77	80	70	99	82
DOC	AO	5	1.5	0.9	1.1	0.6	1.2	1.3
N-NO2	MAC	1	< 0.10	< 0.10	< 0.1	< 0.1	< 0.10	< 0.10
N-NO3	MAC	10	0.8	0.3	0.8	0.1	0.84	< 0.10
Phenols			< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sulphate	AO	500	6	7	7	7	4	6
Total Dissolved Solids	AO	500	44.9	39.1	48	42	64	53
Total Kjeldahl Nitrogen			< 0.05	0.07	< 0.05	0.15	< 0.8	1
Total phosphorous			< 0.01	< 0.01	< 0.01	0.01	0.02	0.008
Hardness as CaCO3	OG	500	33	25	31	28	38	19
Calcium			10.1	7.25	9.26	7.67	12	6
Magnesium			1.93	1.72	2.03	2.03	2	1
Potassium			1	0.8	0.8	0.8	1	<1
Sodium	AO	200	3.6	3.1	3.4	3.3	3	3
Aluminum	OG	0.1						
Barium	MAC	1	0.005	0.003	0.004	0.004	< 0.01	< 0.01
Beryllium								
Boron	IMAC	5	< 0.005	< 0.005	< 0.005	0.006	<0.01	< 0.01
Cadmium	MAC	0.005	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001
Chromium	MAC	0.05	< 0.0002	< 0.002	< 0.002	< 0.002	< 0.001	< 0.001
Cobalt								
Copper	AO	1	0.0208	0.0355	0.0213	0.053	0.04	0.052
Iron	AO	0.3	< 0.005	< 0.005	< 0.005	< 0.005	< 0.03	< 0.03
Lead	MAC	0.01	0.00019	0.00016	0.00012	0.00034	< 0.001	< 0.001
Manganese	AO	0.05	< 0.001	< 0.001	< 0.001	< 0.001	< 0.01	< 0.01
Nickel								
Silver								
Strontium								
Zinc	AO	5	< 0.005	< 0.005	< 0.005	< 0.005	< 0.01	< 0.01
Arsenic	IMAC	0.025	< 0.0001	< 0.0001	< 0.0001	< 0.0001	< 0.001	< 0.001
Mercury	MAC	0.001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001
N-NH3			< 0.01	< 0.01	< 0.01	< 0.01	0.08	0.06
pH (no units)	OG	6.5-8.5	7.32	8.39	6.64	6.87	7.17	< 70
VOCs								
Benzene ug/L			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichlorobenzene,1,4- ug/L			< 0.2	< 0.2	< 0.2	< 0.2	< 0.4	< 0.1
Dichloromethane ug/L			< 0.3	< 0.3	< 0.3	< 0.3	< 4.0	< 4
Toluene ug/L			< 0.5	< 0.5	< 0.5	< 0.5	<0.5	< 0.5
Vinyl Chloride ug/L			< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Dichloroethane-d4,1,2-(SS)			98.6	96.6	102	101	100	108
Toluene-d8 (SS)			105	119	98	101	86	95
Bromofluorobenzene,4(SS)			76.2	99.9	90	97	115	87
Field Parameters								
Temperature ^{o}C			6.2	9.3	8.8	8.8	8.5	9
pH			7.8	6.8	6.9	7.1	7.6	7.9
Conductivity us/cm			75	71	90	6.3	84	55

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
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VOCs Trip Blank

PARAMETER	Limit	ODWO/S	Oct-14	Jun-15	Oct-15	May-18		
Alkalinity (C_aCO3)	OG	30-500						
COD								
Chloride	AO	250						
Conductivity us/cm								
DOC	AO	5						
N-NO2	MAC	1						
N-NO3	MAC	10						
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500						
Total Kjeldahl Nitrogen								
Total phosphorous								
Hardness as CaCO3	OG	500						
Calcium								
Magnesium								
Potassium								
Sodium	AO	200						
Aluminum	OG	0.1						
Barium	MAC	1						
Beryllium								
Boron	IMAC	5						
Cadmium	MAC	0.005						
Chromium	MAC	0.05						
Cobalt								
Copper	AO	1						
Iron	AO	0.3						
Lead	MAC	0.01						
Manganese	AO	0.05						
Nickel								
Silver								
Strontium								
Zinc	AO	5						
Arsenic	IMAC	0.025						
Mercury	MAC	0.001						
N-NH3								
pH (no units)	OG	6.5-8.5						
VOCs								
Benzene ug/L			< 0.5	<0.5	< 0.5	< 0.5	< 0.5	
Dichlorobenzene,1,4- ug/L			< 0.2	<0.2	< 0.2	< 0.4	< 0.4	
Dichloromethane ug/L			< 0.3	<0.3	< 0.3	< 4.0	< 4.0	
Toluene ug/L			< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	
Vinyl Chloride ug/L			< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	
Dichloroethane-d4,1,2-(SS)			97.4	101	102	100	101	
Toluene-d8 (SS)			118	98	100	91	93	
Bromofluorobenzene,4(SS)			101	97	98	115	121	
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted

Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

			Field Blank					
			Oct-11	Jun-12	Jun-12	Oct-12	Jun-13 BH 08-3	Nov-13
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	<5	<5	<5	<5	<5	<5
BOD								
COD								
Chloride	AO	250	<1	<1	<1	<1	<1	<1
Conductivity us/cm			<5	<5	<5	<5	<5	<5
DOC	AO	5						
N-NO2	MAC	1	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3	MAC	10	<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Phenols				<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate	AO	500		<1	<1	<3	<3	<3
Total Dissolved Solids	AO	500	<1	<1	<1	<1	<1	<1
Total Kjeldahl Nitrogen			<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
Total phosphorous								
Hardness as CaCO3	OG	500	<1	<1	<1	<1	<1	<1
Calcium			<1	<1	<1	<1	<1	<1
Magnesium			<1	<1	<1	<1	<1	<1
Potassium			<1	<1	<1	<1	<1	<1
Sodium	AO	200	<2	<2	<2	<2	<2	<2
Aluminum	OG	0.1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium	MAC	1	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Beryllium			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IMAC	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	MAC	0.005	<0.0001	<0.0001	<0..0001	<0.0001	<0.0001	<0.0001
Chromium	MAC	0.05	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Copper	AO	1	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	AO	0.3	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Lead	MAC	0.01	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese	AO	0.05	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Molybdenum			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon			<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
Silver			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium			<0.001	<0.001	<0..001	<0..001	<0..001	<0..001
Thallium			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	AO	5	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3								
Phosphorus								
pH (no units)	OG	6.5-8.5	5.49	5.49				
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

			Field Blank					
			Apr-14	Oct-14 BH 91-6	Jun-15 BH 95-8	Oct-15 BH 08-2	May-16 BH 07-4	Nov-16 BH 95-9
PARAMETER	Limit	ODWO/S						
Alkalinity (C_aCO3)	OG	30-500	< 5	< 5	< 5	< 5	<5	<5
BOD								
COD								
Chloride	AO	250	< 0.5	< 0.5	< 0.5	< 0.5	<0.10	<0.10
Conductivity us/cm			2	2	2	< 1	<2	<2
DOC	AO	5						
N-NO2	MAC	1	< 0.10	< 0.10	< 0.1	< 0.1	<0.05	<0.05
N-NO3	MAC	10	< 0.10	< 0.10	< 0.1	< 0.1	<0.05	<0.05
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	1.4	0.613	1	< 1	<20	<20
Total Kjeldahl Nitrogen			< 0.05	< 0.05	< 0.1	< 0.05	<0.10	<0.10
Total phosphorous								
Hardness as CaCO3	OG	500	< 1	10	< 1	< 1	<0.5	<0.5
Calcium			< 0.02	0.02	< 0.02	< 0.02	0.08	<0.05
Magnesium			< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05
Potassium			< 0.1	< 0.1	< 0.1	< 0.1	<0.05	<0.05
Sodium	AO	200	< 0.2	< 0.2	< 0.2	< 0.2	<0.05	<0.05
Aluminum	OG	0.1	< 0.01	< 0.01	< 0.01	< 0.01	<0.004	<0.004
Barium	MAC	1	< 0.001	< 0.001	< 0.001	< 0.001	<0.002	<0.002
Beryllium			< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.001	<0.001
Boron	IMAC	5	< 0.005	< 0.005	< 0.005	< 0.005	<0.010	<0.010
Cadmium	MAC	0.005	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.001	<0.001
Chromium	MAC	0.05	< 0.002	, 0.002	< 0.002	< 0.002	<0.003	<0.003
Cobalt			< 0.0001	< 0.0001	< 0.0001	< 0.0001	<0.001	<0.001
Copper	AO	1	< 0.0001	< 0.002	< 0.002	< 0.002	<0.003	<0.003
Iron	AO	0.3	< 0.005	< 0.005	< 0.005	< 0.005	<0.010	<0.010
Lead	MAC	0.01	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.002	<0.002
Manganese	AO	0.05	< 0.001	0.002	< 0.001	< 0.001	<0.002	<0.002
Molybdenum			< 0.0001	< 0.0001	< 0.0001	< 0.0001		
Nickel			< 0.01	< 0.01	< 0.01	< 0.01	<0.003	<0.003
Silicon			< 0.01	< 0.01	< 0.01	< 0.01	<0.05	<0.05
Silver								
Strontium			< 0.001	< 0.001	< 0.001	< 0.001	<0.005	<0.005
Thallium			< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.006	<0.006
Titanium			< 0.005	< 0.005	< 0.005	< 0.005	<0.002	<0.002
Vanadium			0.0002	< 0.0001	< 0.0001	< 0.0001	<0.002	<0.002
Zinc	AO	5	< 0.005	< 0.005	< 0.005	< 0.005	<0.005	<0.005
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3			< 0.01	< 0.01	< 0.01	< 0.01		
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF OVERBURDEN
INORGANIC ANALYSIS

Field Blank

PARAMETER	Limit	ODWO/S	Apr-17 BH 08-3	Oct-17 BH 08-3				
Alkalinity (C_aCO3)	OG	30-500	< 5	< 5				
BOD								
COD								
Chloride	AO	250	< 0.5	< 0.5				
Conductivity us/cm			1	1				
DOC	AO	5						
N-NO2	MAC	1	< 0.1	< 0.05				
N-NO3	MAC	10	< 0.1	< 0.05				
Phenols								
Sulphate	AO	500						
Total Dissolved Solids	AO	500	0.236	< 1				
Total Kjeldahl Nitrogen			0.16	< 0.1				
Total phosphorous								
Hardness as CaCO3	OG	500	< 1	< 1				
Calcium			< 0.02	0.02				
Magnesium			< 0.01	< 0.02				
Potassium			< 0.1	< 0.1				
Sodium	AO	200	< 0.2	< 0.2				
Aluminum	OG	0.1	< 0.01	< 0.01				
Barium	MAC	1	< 0.001	< 0.001				
Beryllium			< 0.0001	< 0.0001				
Boron	IMAC	5	< 0.005	< 0.005				
Cadmium	MAC	0.005	< 0.000020	< 0.000014				
Chromium	MAC	0.05	< 0.002	< 0.002				
Cobalt			< 0.0001	< 0.0001				
Copper	AO	1	< 0.002	< 0.002				
Iron	AO	0.3	< 0.005	< 0.005				
Lead	MAC	0.01	< 0.00002	< 0.00002				
Manganese	AO	0.05	< 0.001	< 0.001				
Molybdenum			< 0.0001	< 0.0001				
Nickel			< 0.0002	0.0002				
Silicon			< 0.01	< 0.01				
Silver								
Strontium			< 0.001	< 0.001				
Thallium			< 0.00005	< 0.00005				
Titanium			< 0.005	< 0.005				
Vanadium			< 0.0001	< 0.0001				
Zinc	AO	5	< 0.005	< 0.005				
Arsenic	IMAC	0.025						
Fluoride	MAC	1.5						
Mercury	MAC	0.001						
N-NH3								
Phosphorus								
pH (no units)	OG	6.5-8.5						
Selenium	MAC	0.01						
Tin								
Dissolved Reactive P								
Field Parameters								
Temperature ^{o}C								
pH								
Conductivity us/cm								

All concentrations in mg/L unless otherwise noted
Shaded values Exceed ODWS Criteria

MILLER'S ROAD WDS
Groundwater QA/QC
RPD Calculations

		BH95-4D	BH95-4D DUP 1		BH91-5D	BH91-5D DUP 2		BH95-5	BH95-5 BH 95-8		BH91-5D	BH91-5D BH 07-4		BH08-1D	BH08-1D 08-2	
Parameter	**ODWS/OG**	**May-16**	**May-16**	**RPD**	**May-16**	**May-16**	**RPD**	**Nov-16**	**Nov-16**	**RPD**	**Nov-16**	**Nov-16**	**RPD**	**Apr-17**	**Apr-17**	**RPD**
Alkalinity (C_aCO3)	30-500	32.00	30.00	6.45%	45.00	43.00	4.55%	47	46	2.15%	42	42	0.00%	98	90	8.51%
BOD				NC			NC			NC			NC			NC
COD				NC			NC			NC			NC			NC
Chloride	250	81.6	82.3	0.85%	66.0	65.9	0.15%	0.26	0.25	3.92%	64.7	63.5	1.87%	14.9	14.7	1.35%
Conductivity uS/cm		331.00	331.00	0.00%	304.00	304.00	0.00%	93	91	2.17%	307	309	0.65%	252	240	4.88%
DOC	5			NC			NC			NC			NC			NC
N-NO2 (Nitrite)	1	<0.05	<0.05	NC	<0.05	<0.05	NC	<0.05	<0.05	NC	<0.05	<0.05	NC	< 0.1	< 0.1	NC
N-NO3 (Nitrate)	10	<0.05	<0.05	NC	<0.05	<0.05	NC	<0.05	0.06	NC	<0.05	<0.05	NC	< 0.1	< 0.1	NC
Phenols				NC			NC			NC			NC			NC
Sulphate	500			NC			NC			NC			NC			NC
Total Dissolved Solids	500	162.00	174.00	7.14%	136.00	138.00	1.46%	68	68	0.00%	176	172	2.30%	127	124	2.39%
Total Kjeldahl Nitrogen		0.28	0.25	11.32%	0.25	0.24	4.08%	<0.10	<0.10	NC	0.28	0.20	33.33%	1.03	0.94	9.14%
Total phosphorous				NC			NC			NC			NC			NC
Hardness as CaCO3	500	60.9	60.1	1.32%	47.2	48.2	2.10%	41.5	40.9	1.46%	50.5	51.4	1.77%	97	99	2.04%
Calcium		15.4	15.1	1.97%	12.2	12.5	2.43%	11.5	11.3	1.75%	13.4	13.6	1.48%	28.9	29.7	2.73%
Magnesium		5.45	5.43	0.37%	4.07	4.12	1.22%	3.1	3.07	0.97%	4.13	4.24	2.63%	6.08	6.09	0.16%
Potassium		2.52	2.56	1.57%	2.08	2.08	0.00%	0.51	0.51	0.00%	1.91	2.00	4.60%	3.5	3.5	0.00%
Sodium	200	32.5	32.2	0.93%	35.2	34.4	2.30%	1.29	1.27	1.56%	31.9	31.8	0.31%	7.4	7.5	1.34%
Aluminum	0.1	0.012	0.012	0.00%	0.007	0.006	15.38%	0.019	0.017	11.11%	0.006	0.008	28.57%	0.03	0.03	0.00%
Barium	1	0.062	0.062	0.00%	0.052	0.054	3.77%	0.009	0.009	0.00%	0.059	0.052	12.61%	0.047	0.048	2.11%
Beryllium		<0.001	<0.001	NC	<0.001	<0.001	NC	<0.001	<0.001	NC	<0.001	<0.001	NC	< 0.0001	< 0.0001	NC
Boron	5	0.013	0.012	8.00%	0.011	<0.010	NC	<0.010	<0.010	NC	0.012	0.012	0.00%	0.012	0.01	18.18%
Cadmium	0.005	<0.001	<0.001	NC	<0.001	<0.001	NC	<0.001	<0.001	NC	<0.001	<0.001	NC	< 0.000020	< 0.000020	NC
Chromium	0.05	<0.003	<0.003	NC	<0.003	<0.003	NC	<0.003	<0.003	NC	<0.003	<0.003	NC	< 0.002	< 0.002	NC
Cobalt		<0.001	<0.001	NC	<0.001	<0.001	NC	<0.001	<0.001	NC	<0.001	<0.001	NC	< 0.0001	< 0.0001	NC
Copper	1	<0.003	<0.003	NC	<0.003	0.003	NC	<0.003	<0.003	NC	<0.003	<0.003	NC	< 0.002	< 0.002	NC
Iron	0.3	13.5	13.7	1.47%	13.9	14.0	0.72%	<0.010	<0.010	NC	15.1	14.8	2.01%	1.04	1.07	2.84%
Lead	0.01	<0.002	<0.002	NC	<0.002	<0.002	NC	<0.002	<0.002	NC	<0.002	<0.002	NC	< 0.00002	< 0.00002	NC
Manganese	0.05	0.125	0.127	1.59%	0.113	0.113	0.00%	<0.002	<0.002	NC	0.121	0.119	1.67%	0.942	0.966	2.52%
Molybdenum				NC			NC			NC			NC	0.0007	0.0007	0.00%
Nickel		<0.003	<0.003	NC	<0.003	<0.003	NC	<0.003	<0.003	NC	<0.003	<0.003	NC	0.0007	0.0007	0.00%
Silicon		8.02	8.32	3.67%	7.97	8.24	3.33%	5.93	5.78	2.56%	7.52	7.23	3.93%	8.03	8.05	0.25%
Silver				NC			NC			NC			NC			NC
Strontium		0.076	0.075	1.32%	0.049	0.051	4.00%	0.012	0.012	0.00%	0.054	0.052	3.77%	0.128	0.129	0.78%
Thallium		<0.006	<0.006	NC	<0.006	<0.006	NC	<0.006	<0.006	NC	<0.006	<0.006	NC	< 0.00005	< 0.00005	NC
Titanium		<0.002	<0.002	NC	0.002	0.002	0.00%	<0.002	<0.002	NC	<0.002	<0.002	NC	< 0.005	< 0.005	NC
Vanadium		0.002	0.002	0.00%	0.004	0.004	0.00%	0.003	0.002	40.00%	0.002	0.002	0.00%	0.0006	0.0006	0.00%
Zinc	5	<0.005	<0.005	NC	<0.005	<0.005	NC	<0.005	<0.005	NC	<0.005	<0.005	NC	< 0.005	< 0.005	NC
Average RPD				**2.67%**			**2.53%**			**4.83%**			**5.64%**			**2.96%**

NC = Not Calculated

RDP greater than 25%

RDP greater than 50%

All concentrations in mg/L unless otherwise noted

MILLER'S ROAD WDS
Groundwater QA/QC
RPD Calculations

		BH07-2D	BH07-2D 08-4		BH08-1D	BH08-1D 08-2		BH95-5	BH95-5 BH08-2		BH08-1D	BH08-1D BH08-3		BH95-5	BH08-1D BH08-2		BH08-1D	BH08-1D BH08-1D	
Parameter	**ODWS/OG**	**Apr-17**	**Apr-17**	**RPD**	**Oct-17**	**Oct-17**	**RPD**	May-18	May-18	**RPD**	May-18	May-18	**RPD**	Oct-18	Oct-18	**RPD**	Oct-18	Oct-18	**RPD**
Alkalinity (C_aCO3)	30-500	378	395	4.40%	103	105	1.92%	47	58	20.95%	85	88	3.47%	47	52	10.10%	108	98	9.71%
BOD				NC			NC			NC			NC			NC			NC
COD				NC			NC			NC			NC			NC			NC
Chloride	250	43	43.3	0.70%	14.2	13.9	2.14%	< 1	< 1	NC	18	18	0.00%	2	< 1	NC	17	17	0.00%
Conductivity uS/cm		1000	1030	2.96%	261	268	2.65%	100	95	5.13%	242	244	0.82%	100	111	10.43%	256	258	0.78%
DOC	5			NC			NC			NC			NC			NC			NC
N-NO2 (Nitrite)	1	< 0.1	< 0.1	NC	< 0.05	< 0.05	NC	< 0.10	< 0.10	NC	< 0.10	< 0.10	NC	< 0.10	< 0.0	NC	< 0.10	< 0.10	NC
N-NO3 (Nitrate)	10	< 0.1	0.3	NC	< 0.05	< 0.05	NC	< 0.10	0.1	NC	< 0.10	< 0.10	NC	0.12	0.1	NC	< 0.10	< 0.10	NC
Phenols				NC			NC			NC			NC			NC			NC
Sulphate	500			NC			NC			NC			NC			NC			NC
Total Dissolved Solids	500	631	641	1.57%	133	133	0.00%	65	62	4.72%	157	159	1.27%	65	72	10.22%	166	168	1.20%
Total Kjeldahl Nitrogen		1.75	1.55	12.12%	0.8	0.8	0.00%	< 0.8	0.9	NC	1.8	2.3	24.39%	1.6	1	46.15%	1.3	1.1	16.67%
Total phosphorous				NC			NC			NC			NC			NC			NC
Hardness as CaCO3	500	488	477	2.28%	108	107	0.93%	49	42	15.38%	100	95	5.13%	40	46	13.95%	87	85	2.33%
Calcium		141	137	2.88%	32.2	31.7	1.56%	13	12	8.00%	30	< 28	NC	11	12	NC	25	24	4.08%
Magnesium		33	32.7	0.91%	6.8	6.84	0.59%	4	3	28.57%	6	6	0.00%	3	4	28.57%	6	6	0.00%
Potassium		6.9	6.8	1.46%	3.7	3.6	2.74%	< 1	< 1	NC	3	2	40.00%	< 1	< 1	NC	2	2	0.00%
Sodium	200	45.3	44.7	1.33%	6.7	6.8	1.48%	< 2	< 2	NC	9	13	36.36%	< 2	< 2	NC	11	12	8.70%
Aluminum	0.1	0.09	0.08	11.76%	0.03	0.04	28.57%	< 0.01	< 0.01	NC	< 0.01	< 0.01	NC	0.01	0.03	100.00%	< 0.01	< 0.01	NC
Barium	1	0.431	0.439	1.84%	0.059	0.058	1.71%	< 0.01	< 0.01	NC	0.05		NC	0.01	0.01	0.00%	0.05	0.05	0.00%
Beryllium		< 0.0001	< 0.0001	NC	< 0.0001	< 0.0001	NC	< 0.0005	< 0.0005	NC	< 0.0005	< 0.0005	NC	< 0.0005	< 0.0005	NC	< 0.0005	< 0.0005	NC
Boron	5	0.971	0.962	0.93%	0.016	0.016	0.00%	< 0.01	< 0.01	NC	< 0.01	< 0.01	NC	< 0.01	< 0.01	NC	0.01	0.01	0.00%
Cadmium	0.005	< 0.000020	< 0.000020	NC	< 0.000014	< 0.000014	NC	< 0.0001	<0.0001	NC	< 0.0001	< 0.0001	NC	< 0.0001	< 0.0001	NC	< 0.0001	< 0.0001	NC
Chromium	0.05	< 0.002	0.002	NC	< 0.002	< 0.002	NC	0.001	0.001	0.00%	< 0.001	< 0.001	NC	0.001	0.001	NC	< 0.001	< 0.001	NC
Cobalt		0.0024	0.0023	4.26%	< 0.0001	< 0.0001	NC	< 0.0002		NC	< 0.0002	< 0.0002	NC	< 0.0002	< 0.0002	NC	< 0.0002	< 0.0002	NC
Copper	1	< 0.002	< 0.002	NC	< 0.002	0.002	NC	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC
Iron	0.3	16	15.6	2.53%	1.62	1.59	1.87%	< 0.03	< 0.03	NC	1.17	1.14	2.60%	< 0.03	< 0.03	NC	1.33	1.33	0.00%
Lead	0.01	< 0.00002	< 0.00002	NC	< 0.00002	< 0.00002	NC	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC
Manganese	0.05	7.56	7.33	3.09%	1.19	1.17	1.69%	< 0.01	< 0.01	NC	0.92	0.94	2.15%	< 0.01	< 0.01	NC	0.93	0.93	0.00%
Molybdenum		0.0004	0.0005	22.22%	0.0005	0.0005	0.00%	< 0.005	< 0.005	NC	< 0.004	< 0.005	NC	< 0.005	< 0.005	NC	< 0.005	< 0.005	NC
Nickel		0.0058	0.0057	1.74%	0.0007	0.0007	0.00%	< 0.005	< 0.005	NC	< 0.005	< 0.005	NC	< 0.005	< 0.005	NC	< 0.005	< 0.005	NC
Silicon		13.7	13.6	0.73%	8.85	8.86	0.11%	5.9	5.8	1.71%	< 7.9	7.9	NC	5.8	5.8	0.00%	8.2	8.2	0.00%
Silver				NC			NC			NC			NC			NC			NC
Strontium		0.519	0.515	0.77%	0.14	0.14	0.00%	0.013	0.014	7.41%	0.123	0.134	8.56%	0.017	0.018	5.71%	0.139	0.138	0.72%
Thallium		< 0.00005	< 0.00005	NC	< 0.00005	< 0.00005	NC	< 0.0001	< 0.0001	NC	< 0.0001	< 0.0001	NC	< 0.01	< 0.0001	NC	< 0.0001	< 0.0001	NC
Titanium		< 0.005	< 0.005	NC	< 0.005	< 0.005	NC	< 0.01	< 0.01	NC	< 0.01	< 0.01	NC	< 0.01	< 0.01	NC	< 0.01	< 0.01	NC
Vanadium		0.005	0.005	0.00%	0.0003	0.0004	28.57%	< 0.003	0.003	NC	< 0.001	< 0.001	NC	0.003	0.003	0.00%	< 0.001	< 0.001	NC
Zinc	5	< 0.005	< 0.005	NC	< 0.005	< 0.005	NC	< 0.01	< 0.03	NC	< 0.01	< 0.01	NC	< 0.01	< 0.01	NC	< 0.01	< 0.01	NC
Average RPD				**3.83%**			**3.83%**			**10.21%**			**10.40%**			**20.47%**			**2.76%**

NC = Not Calculated

RDP greater than 25%

RDP greater than 50%

All concentrations in mg/L unless otherwise noted

MILLERS ROAD WDS

REPORT OF ORGANIC ANALYSIS

PARAMETER	TYPE	LIMIT	UNITS	GUIDELINE ODWSOG	85-1 Sep-91	88-1D Sep-91	88-2S Sep-91		
1,1,1,2-tetrachloroethane	ug/L								
1,1,1-trichloroethane	ug/L				ND	1.4	1.4		
1,1,2,2-tetrachloroethane	ug/L				ND	ND	ND		
1,1,2-trichloroethane	ug/L				ND	ND	ND		
1,1-dichloroethane	ug/L								
1,1-dichloroethylene	ug/L	MAC	14		ND	ND	ND		
1,2-dibromoethane	ug/L				ND	ND	ND		
1,2-dichlorobenzene	ug/L	MAC	200						
1,2-dichloroethane	ug/L	IMAC	5						
1,2-dichloropropane	ug/L				ND	ND	ND		
1,3,5-trimethylbenzene	ug/L				ND	ND	ND		
1,3-dichlorobenzene	ug/L								
1,4-dichlorobenzene	ug/L	MAC	5						
1,2,4-Trichlorobenzene									
Benzene	ug/L	MAC	5		ND	ND	ND		
Bromodichloromethane	ug/L				ND	ND	ND		
Bromoform	ug/L				ND	ND	ND		
Bromomethane	ug/L				ND	ND	ND		
cis-1,2-Dichloroethylene	ug/L								
cis-1,3-Dichloropropylene	ug/L								
Carbon Tetrachloride	ug/L	MAC	5		ND	ND	ND		
Chloroethane	ug/L				ND	ND	ND		
Chloroform	ug/L				ND	ND	ND		
Chloromethane	ug/L				ND	ND	ND		
Dibromochloromethane	ug/L				ND	ND	ND		
Dichlorodifluromethane									
Dichloromethane	ug/L	MAC	50						
Ethylbenzene	ug/L	AO	1.6		ND	ND	ND		
m/p-xylene	ug/L				ND	ND	ND		
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80		ND	ND	ND		
o-xylene	ug/L				ND	ND	ND		
Styrene	ug/L				ND	ND	ND		
trans-1,2-Dichloroethylene	ug/L				ND	ND	ND		
trans-1,3-Dichloropropylene	ug/L				ND	ND	ND		
Tetrachloroethylene	ug/L	MAC	30		ND	ND	ND		
Toluene	ug/L	AO	24		ND	ND	ND		
Trichloroethylene	ug/L	MAC	5		ND	ND	ND		
Trichlorofluoromethane	ug/L				ND	ND	ND		
Vinyl Chloride	ug/L	MAC	2		ND	ND	ND		
cis+trans1,3-dichloropropene	ug/L								
Acetone	ug/L								
m/p,o Xylene	ug/L				ND	ND	ND		
Hexane	ug/L								
2-Hexanone									
Methyl Ethyl Ketone	ug/L								
Methyl Isobutyl Ketone	ug/L								
Methyl-t-butyl Ether	ug/L		15						
m-Dichlorobenzene	ug/L				ND	ND	ND		
o-Dichlorobenzene	ug/L				ND	ND	ND		
p-Dichlorobenzene	ug/L				ND	ND	ND		
VOC SURROGATES									
1,2-dichloroethane-d4	%								
4-bromofluorobenzene	%								
Toluene-d8	%								

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **88-3D**

REPORT OF ORGANIC ANALYSIS **ODWSOG**

PARAMETER	TYPE	LIMIT	UNITS	Sep-91	Oct-00	Oct-06	Oct-06	May-07
1,1,1,2-tetrachloroethane	ug/L					<0.5	<0.5	<0.5
1,1,1-trichloroethane	ug/L			<50		<0.4	<0.4	<0.4
1,1,2,2-tetrachloroethane	ug/L			<50	<0.6	<0.5	<0.5	<0.5
1,1,2-trichloroethane	ug/L			<50	<0.6	<0.4	<0.4	<0.4
1,1-dichloroethane	ug/L			<50	<0.5	0.8	0.8	0.8
1,1-dichloroethylene	ug/L	MAC	14	<50	<0.6	<0.5	<0.5	<0.5
1,2-dibromoethane	ug/L			<50	<1.0	<1.0	<1.0	<1.0
1,2-dichlorobenzene	ug/L	MAC	200			<0.4	0.5	0.7
1,2-dichloroethane	ug/L	IMAC	5	<100	<0.5	<0.5	<0.5	<0.5
1,2-dichloropropane	ug/L			<50	<0.7	<0.5	<0.5	<0.5
1,3,5-trimethylbenzene	ug/L			<50	5	<0.3	<0.3	<0.3
1,3-dichlorobenzene	ug/L					<0.4	<0.4	<0.4
1,4-dichlorobenzene	ug/L	MAC	5			2.1	3.0	3.2
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<50	<0.5	1.8	2.3	2.6
Bromodichloromethane	ug/L			<50	<0.4	<0.3	<0.3	<0.3
Bromoform	ug/L			<50	<0.8	<0.4	<0.4	<0.4
Bromomethane	ug/L			<200	<1.0	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	ug/L					6.8	7.1	18.4
cis-1,3-Dichloropropylene	ug/L					<0.2	<0.2	<0.2
Carbon Tetrachloride	ug/L	MAC	5	<100	<0.5	<0.5	<0.5	<0.5
Chloroethane	ug/L			<200	<1.0	<1.0	2.7	5.4
Chloroform	ug/L			<50	<0.6	<0.5	<0.5	<0.5
Chloromethane	ug/L			<200	<3.0	<1.0	<1.0	<1.0
Dibromochloromethane	ug/L			<50	<0.5	<0.3	<0.3	<0.3
Dichlorodifluromethane								
Dichloromethane	ug/L	MAC	50			<4.0	<4.0	<4.0
Ethylbenzene	ug/L	AO	1.6	<50	4	3.9	5.8	6.9
m/p-xylene	ug/L			<100	2	<1.0	<1.0	<1.0
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<50	<0.4	7.6	9.0	10.9
o-xylene	ug/L			<50	0.5	0.6	0.9	1.2
Styrene	ug/L			<50	<0.4	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	ug/L			<50	1	4.6	5.1	6.6
trans-1,3-Dichloropropylene	ug/L			<50	<0.5	<0.2	<0.2	<0.2
Tetrachloroethylene	ug/L	MAC	30	<50	<0.5	<0.3	<0.3	<0.3
Toluene	ug/L	AO	24	410	<0.5	0.5	0.7	0.9
Trichloroethylene	ug/L	MAC	5	<50	2.4	<0.3	<0.3	<0.3
Trichlorofluoromethane	ug/L			<50	<1.0	<0.5	<0.5	<0.5
Vinyl Chloride	ug/L	MAC	2	<200	<0.5	15.7	15.8	21.3
cis+trans1,3-dichloropropene	ug/L				<0.4			
Acetone	ug/L							
m/p,o Xylene	ug/L							
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L			<50	<0.4			
o-Dichlorobenzene	ug/L			<50	<0.4			
p-Dichlorobenzene	ug/L			<50	<0.4			
VOC SURROGATES								
1,2-dichloroethane-d4	%					107	97	
4-bromofluorobenzene	%					100	103	
Toluene-d8	%					104	105	

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **88-3S**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Oct-00 2004 Oct-06

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L				<0.6	<0.5		
1,1,1-trichloroethane	ug/L				<0.2	<0.4		
1,1,2,2-tetrachloroethane	ug/L			<0.6	<0.1	<0.5		
1,1,2-trichloroethane	ug/L			<0.6	<0.1	<0.4		
1,1-dichloroethane	ug/L			<0.5	<0.1	<0.4		
1,1-dichloroethylene	ug/L	MAC	14	<0.6		<0.5		
1,2-dibromoethane	ug/L			<1.0	<0.1	<1.0		
1,2-dichlorobenzene	ug/L	MAC	200		<0.1	<0.4		
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.1	<0.5		
1,2-dichloropropane	ug/L			<0.7	<0.1	<0.5		
1,3,5-trimethylbenzene	ug/L			<0.5		<0.3		
1,3-dichlorobenzene	ug/L				<0.1	<0.4		
1,4-dichlorobenzene	ug/L	MAC	5		<0.2	<0.4		
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<0.5	<0.5	<0.5		
Bromodichloromethane	ug/L			<0.4	<0.1	<0.3		
Bromoform	ug/L			<0.8	<0.1	<0.4		
Bromomethane	ug/L			<1.0	<2	<0.5		
cis-1,2-Dichloroethylene	ug/L					<0.4		
cis-1,3-Dichloropropylene	ug/L					<0.2		
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.2	<0.5		
Chloroethane	ug/L			<1.0		<1.0		
Chloroform	ug/L			<0.6	<0.3	<0.5		
Chloromethane	ug/L			<3.0		<1.0		
Dibromochloromethane	ug/L			<0.5	<0.1	<0.3		
Dichlorodifluromethane								
Dichloromethane	ug/L	MAC	50		<0.5	<4.0		
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.1	<0.5		
m/p-xylene	ug/L			<1.0	<1	<1.0		
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.4	<0.2	<0.2		
o-xylene	ug/L			<0.5	<0.5	<0.5		
Styrene	ug/L			<0.4	<0.7	<0.5		
trans-1,2-Dichloroethylene	ug/L			<1.0		<0.4		
trans-1,3-Dichloropropylene	ug/L			<0.5		<0.2		
Tetrachloroethylene	ug/L	MAC	30	<0.5	<0.4	<0.3		
Toluene	ug/L	AO	24	<0.5	<0.2	<0.5		
Trichloroethylene	ug/L	MAC	5	<0.4	<0.1	<0.3		
Trichlorofluoromethane	ug/L			<1.0		<0.5		
Vinyl Chloride	ug/L	MAC	2	<0.5	<0.2	<0.2		
cis+trans1,3-dichloropropene	ug/L			<0.4				
Acetone	ug/L							
m/p,o Xylene	ug/L							
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L			<0.4				
o-Dichlorobenzene	ug/L			<0.4				
p-Dichlorobenzene	ug/L			<0.4				
VOC SURROGATES								
1,2-dichloroethane-d4	%					112		
4-bromofluorobenzene	%					95		
Toluene-d8	%					102		

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **91-1**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Sep-91

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L							
1,1,1-trichloroethane	ug/L			ND				
1,1,2,2-tetrachloroethane	ug/L			ND				
1,1,2-trichloroethane	ug/L			ND				
1,1-dichloroethane	ug/L							
1,1-dichloroethylene	ug/L	MAC	14	ND				
1,2-dibromoethane	ug/L			ND				
1,2-dichlorobenzene	ug/L	MAC	200					
1,2-dichloroethane	ug/L	IMAC	5					
1,2-dichloropropane	ug/L			ND				
1,3,5-trimethylbenzene	ug/L			ND				
1,3-dichlorobenzene	ug/L							
1,4-dichlorobenzene	ug/L	MAC	5					
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	ND				
Bromodichloromethane	ug/L			ND				
Bromoform	ug/L			ND				
Bromomethane	ug/L			ND				
cis-1,2-Dichloroethylene	ug/L							
cis-1,3-Dichloropropylene	ug/L							
Carbon Tetrachloride	ug/L	MAC	5	ND				
Chloroethane	ug/L			ND				
Chloroform	ug/L			ND				
Chloromethane	ug/L			ND				
Dibromochloromethane	ug/L			ND				
Dichlorodifluromethane								
Dichloromethane	ug/L	MAC	50					
Ethylbenzene	ug/L	AO	1.6	ND				
m/p-xylene	ug/L			ND				
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	ND				
o-xylene	ug/L			ND				
Styrene	ug/L			ND				
trans-1,2-Dichloroethylene	ug/L			ND				
trans-1,3-Dichloropropylene	ug/L			ND				
Tetrachloroethylene	ug/L	MAC	30	ND				
Toluene	ug/L	AO	24	ND				
Trichloroethylene	ug/L	MAC	5	ND				
Trichlorofluoromethane	ug/L			ND				
Vinyl Chloride	ug/L	MAC	2	ND				
cis+trans1,3-dichloropropene	ug/L							
Acetone	ug/L							
m/p,o Xylene	ug/L			ND				
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L			ND				
o-Dichlorobenzene	ug/L			ND				
p-Dichlorobenzene	ug/L			ND				
VOC SURROGATES								
1,2-dichloroethane-d4	%							
4-bromofluorobenzene	%							
Toluene-d8	%							

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **91-2**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Sep-91 Oct-00

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L							
1,1,1-trichloroethane	ug/L			ND				
1,1,2,2-tetrachloroethane	ug/L			ND	<0.6			
1,1,2-trichloroethane	ug/L			ND	<0.6			
1,1-dichloroethane	ug/L				<0.5			
1,1-dichloroethylene	ug/L	MAC	14	ND	<0.6			
1,2-dibromoethane	ug/L			ND	<1.0			
1,2-dichlorobenzene	ug/L	MAC	200					
1,2-dichloroethane	ug/L	IMAC	5		<0.5			
1,2-dichloropropane	ug/L			ND	<0.7			
1,3,5-trimethylbenzene	ug/L			ND	<0.5			
1,3-dichlorobenzene	ug/L							
1,4-dichlorobenzene	ug/L	MAC	5					
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	ND	<0.5			
Bromodichloromethane	ug/L			ND	<0.4			
Bromoform	ug/L			ND	<0.8			
Bromomethane	ug/L			ND	<1.0			
cis-1,2-Dichloroethylene	ug/L							
cis-1,3-Dichloropropylene	ug/L							
Carbon Tetrachloride	ug/L	MAC	5	ND	<0.5			
Chloroethane	ug/L			ND	<1.0			
Chloroform	ug/L			ND	<0.6			
Chloromethane	ug/L			ND	<3.0			
Dibromochloromethane	ug/L			ND	<0.5			
Dichlorodifluromethane								
Dichloromethane	ug/L	MAC	50					
Ethylbenzene	ug/L	AO	1.6	ND	<0.5			
m/p-xylene	ug/L			ND	<1.0			
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	ND	<0.4			
o-xylene	ug/L			ND	<0.5			
Styrene	ug/L			ND	<0.4			
trans-1,2-Dichloroethylene	ug/L			ND	<1.0			
trans-1,3-Dichloropropylene	ug/L			ND	<0.5			
Tetrachloroethylene	ug/L	MAC	30	ND	<0.5			
Toluene	ug/L	AO	24	ND	<0.5			
Trichloroethylene	ug/L	MAC	5	ND	<0.4			
Trichlorofluoromethane	ug/L			ND	<1.0			
Vinyl Chloride	ug/L	MAC	2	ND	<0.5			
cis+trans1,3-dichloropropene	ug/L				<0.4			
Acetone	ug/L							
m/p,o Xylene	ug/L			ND				
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L			ND	<0.4			
o-Dichlorobenzene	ug/L			ND	<0.4			
p-Dichlorobenzene	ug/L			ND	<0.4			
VOC SURROGATES								
1,2-dichloroethane-d4	%							
4-bromofluorobenzene	%							
Toluene-d8	%							

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **91-3**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Sep-91 Oct-00

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L							
1,1,1-trichloroethane	ug/L			ND				
1,1,2,2-tetrachloroethane	ug/L			ND	<0.6			
1,1,2-trichloroethane	ug/L			ND	<0.6			
1,1-dichloroethane	ug/L				<0.5			
1,1-dichloroethylene	ug/L	MAC	14	ND	<0.6			
1,2-dibromoethane	ug/L			ND	<1.0			
1,2-dichlorobenzene	ug/L	MAC	200					
1,2-dichloroethane	ug/L	IMAC	5		<0.5			
1,2-dichloropropane	ug/L			ND	<0.7			
1,3,5-trimethylbenzene	ug/L			ND	<0.5			
1,3-dichlorobenzene	ug/L							
1,4-dichlorobenzene	ug/L	MAC	5					
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	ND	<0.5			
Bromodichloromethane	ug/L			ND	<0.4			
Bromoform	ug/L			ND	<0.8			
Bromomethane	ug/L			ND	<1.0			
cis-1,2-Dichloroethylene	ug/L							
cis-1,3-Dichloropropylene	ug/L							
Carbon Tetrachloride	ug/L	MAC	5	ND	<0.5			
Chloroethane	ug/L			ND	<1.0			
Chloroform	ug/L			ND	<0.6			
Chloromethane	ug/L			ND	<3.0			
Dibromochloromethane	ug/L			ND	<0.5			
Dichlorodifluromethane								
Dichloromethane	ug/L	MAC	50					
Ethylbenzene	ug/L	AO	1.6	ND	<0.5			
m/p-xylene	ug/L			ND	<1.0			
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	ND	<0.4			
o-xylene	ug/L			ND	<0.5			
Styrene	ug/L			ND	<0.4			
trans-1,2-Dichloroethylene	ug/L			ND	<1.0			
trans-1,3-Dichloropropylene	ug/L			ND	<0.5			
Tetrachloroethylene	ug/L	MAC	30	ND	<0.5			
Toluene	ug/L	AO	24	ND	<0.5			
Trichloroethylene	ug/L	MAC	5	ND	<0.4			
Trichlorofluoromethane	ug/L			ND	<1.0			
Vinyl Chloride	ug/L	MAC	2	ND	<0.5			
cis+trans1,3-dichloropropene	ug/L				<0.4			
Acetone	ug/L							
m/p,o Xylene	ug/L			ND				
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L			ND	<0.4			
o-Dichlorobenzene	ug/L			ND	<0.4			
p-Dichlorobenzene	ug/L			ND	<0.4			
VOC SURROGATES								
1,2-dichloroethane-d4	%							
4-bromofluorobenzene	%							
Toluene-d8	%							

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **91-5D**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Sep-91 Nov-07 Nov-08 May-09 Oct-11

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L				<0.5	<0.5	<0.5	<1
1,1,1-trichloroethane	ug/L			ND	<0.4	<0.4	<0.4	<0.8
1,1,2,2-tetrachloroethane	ug/L			ND	<0.5	<0.5	<0.5	<1
1,1,2-trichloroethane	ug/L			ND	<0.4	<0.4	<0.4	<0.8
1,1-dichloroethane	ug/L				<0.4	<0.4	<0.4	<0.8
1,1-dichloroethylene	ug/L	MAC	14	ND	<0.5	<0.5	<0.5	<1
1,2-dibromoethane	ug/L			ND	<1.0	<1.0	<1.0	<0.4
1,2-dichlorobenzene	ug/L	MAC	200		<0.4	<0.4	<0.4	<0.8
1,2-dichloroethane	ug/L	IMAC	5		<0.5	<0.5	<0.5	<0.4
1,2-dichloropropane	ug/L			ND	<0.5	<0.5	<0.5	<1
1,3,5-trimethylbenzene	ug/L			ND	<0.3	<0.3	<0.3	<0.6
1,3-dichlorobenzene	ug/L				<0.4	<0.4	<0.4	<0.8
1,4-dichlorobenzene	ug/L	MAC	5		<0.4	<0.4	<0.4	<0.8
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	ND	<0.5	<0.5	<0.5	<1
Bromodichloromethane	ug/L			ND	<0.3	<0.3	<0.3	<0.6
Bromoform	ug/L			ND	<0.4	<0.4	<0.4	<0.8
Bromomethane	ug/L			ND	<0.5	<0.5	<0.5	<1
cis-1,2-Dichloroethylene	ug/L				<0.4	<0.4	<0.4	<0.8
cis-1,3-Dichloropropylene	ug/L				<0.2	<0.2	<0.2	<0.4
Carbon Tetrachloride	ug/L	MAC	5	ND	<0.5	<0.5	<0.5	<1
Chloroethane	ug/L			-	<1.0	<1.0	<1.0	<0.4
Chloroform	ug/L			1.8	<0.5	<0.5	<0.5	<1
Chloromethane	ug/L			ND	<1.0	<1.0	<1.0	<0.4
Dibromochloromethane	ug/L			ND	<0.3	<0.3	<0.3	<0.6
Dichlorodifluromethane								<1
Dichloromethane	ug/L	MAC	50		<4.0	<4.0	<4.0	<8.0
Ethylbenzene	ug/L	AO	1.6	ND	<0.5	<0.5	<0.5	<1
m/p-xylene	ug/L			ND	<1.0	<1.0	<1.0	<1
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	ND	<0.2	<0.2	<0.2	<0.4
o-xylene	ug/L			ND	<0.5	<0.5	<0.5	<1
Styrene	ug/L			ND	<0.5	<0.5	<0.5	<1
trans-1,2-Dichloroethylene	ug/L			ND	<0.4	<0.4	<0.4	<0.8
trans-1,3-Dichloropropylene	ug/L			ND	<0.2	<0.2	<0.2	<0.4
Tetrachloroethylene	ug/L	MAC	30	ND	<0.3	<0.3	<0.3	<0.6
Toluene	ug/L	AO	24	4.2	<0.5	<0.5	<0.5	<1
Trichloroethylene	ug/L	MAC	5	ND	<0.3	<0.3	<0.3	<0.6
Trichlorofluoromethane	ug/L			ND	<0.5	<0.5	<0.5	<1
Vinyl Chloride	ug/L	MAC	2	ND	<0.2	<0.2	<0.2	<0.4
cis+trans1,3-dichloropropene	ug/L			ND				
Acetone	ug/L							
m/p,o Xylene	ug/L			ND				<1.0
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L			ND				
o-Dichlorobenzene	ug/L			ND				
p-Dichlorobenzene	ug/L			ND				
VOC SURROGATES								
1,2-dichloroethane-d4	%				103		109	109
4-bromofluorobenzene	%				95		84	116
Toluene-d8	%				101		112	99

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **91-5S**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Nov-08 Nov-08 May-09

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5		
1,1,1-trichloroethane	ug/L			<0.4	<0.4	<0.4		
1,1,2,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5		
1,1,2-trichloroethane	ug/L			<0.4	<0.4	<0.4		
1,1-dichloroethane	ug/L			<0.4	<0.4	<0.4		
1,1-dichloroethylene	ug/L	MAC	14	<0.5	<0.5	<0.5		
1,2-dibromoethane	ug/L			<1.0	<1.0	<1.0		
1,2-dichlorobenzene	ug/L	MAC	200	<0.4	<0.4	<0.4		
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.5	<0.5		
1,2-dichloropropane	ug/L			<0.5	<0.5	<0.5		
1,3,5-trimethylbenzene	ug/L			<0.3	<0.3	<0.3		
1,3-dichlorobenzene	ug/L			<0.4	<0.4	<0.4		
1,4-dichlorobenzene	ug/L	MAC	5	<0.4	<0.4	<0.4		
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<0.5	<0.5	<0.5		
Bromodichloromethane	ug/L			<0.3	<0.3	<0.3		
Bromoform	ug/L			<0.4	<0.4	<0.4		
Bromomethane	ug/L			<0.5	<0.5	<0.5		
cis-1,2-Dichloroethylene	ug/L			<0.4	<0.4	<0.4		
cis-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2		
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5	<0.5		
Chloroethane	ug/L			<1.0	<1.0	<1.0		
Chloroform	ug/L			<0.5	<0.5	<0.5		
Chloromethane	ug/L			<1.0	<1.0	<1.0		
Dibromochloromethane	ug/L			<0.3	<0.3	<0.3		
Dichlorodifluromethane								
Dichloromethane	ug/L	MAC	50	<4.0	<4.0	<4.0		
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.5	<0.5		
m/p-xylene	ug/L			<1.0	<1.0	<1.0		
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.2	<0.2	<0.2		
o-xylene	ug/L			<0.5	<0.5	<0.5		
Styrene	ug/L			<0.5	<0.5	<0.5		
trans-1,2-Dichloroethylene	ug/L			<0.4	<0.4	<0.4		
trans-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2		
Tetrachloroethylene	ug/L	MAC	30	<0.3	<0.3	<0.3		
Toluene	ug/L	AO	24	<0.5	<0.5	<0.5		
Trichloroethylene	ug/L	MAC	5	<0.3	<0.3	<0.3		
Trichlorofluoromethane	ug/L			<0.5	<0.5	<0.5		
Vinyl Chloride	ug/L	MAC	2	<0.2	<0.2	<0.2		
cis+trans1,3-dichloropropene	ug/L							
Acetone	ug/L							
m/p,o Xylene	ug/L							
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%					119		
4-bromofluorobenzene	%					89		
Toluene-d8	%					109		

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **95-3S**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Oct-00 Oct-06 May-07 Oct-07 May-08

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L				<0.5	<0.5	<0.5	<0.5
1,1,1-trichloroethane	ug/L				<0.4	<0.4	<0.4	<0.4
1,1,2,2-tetrachloroethane	ug/L			<0.6	<0.5	<0.5	<0.5	<0.5
1,1,2-trichloroethane	ug/L			<0.6	<0.4	<0.4	<0.4	<0.4
1,1-dichloroethane	ug/L			<0.5	<0.4	<0.4	<0.4	<0.4
1,1-dichloroethylene	ug/L	MAC	14	<0.6	<0.5	<0.5	<0.5	<0.5
1,2-dibromoethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichlorobenzene	ug/L	MAC	200		<0.4	<0.4	<0.4	<0.4
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dichloropropane	ug/L			<0.7	<0.5	<0.5	<0.5	<0.5
1,3,5-trimethylbenzene	ug/L			<0.5	<0.3	<0.3	<0.3	<0.3
1,3-dichlorobenzene	ug/L				<0.4	<0.4	<0.4	<0.4
1,4-dichlorobenzene	ug/L	MAC	5		<0.4	<0.4	<0.4	<0.4
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	ug/L			<0.4	<0.3	<0.3	<0.3	<0.3
Bromoform	ug/L			<0.8	<0.4	<0.4	<0.4	<0.4
Bromomethane	ug/L			<1.0	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	ug/L				<0.4	<0.4	<0.4	<0.4
cis-1,3-Dichloropropylene	ug/L				<0.2	<0.2	<0.2	<0.2
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	ug/L			<0.6	<0.5	<0.5	<0.5	<0.5
Chloromethane	ug/L			<3.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	ug/L			<0.5	<0.3	<0.3	<0.3	<0.3
Dichlorodifluromethane								
Dichloromethane	ug/L	MAC	50		<4.0	<4.0	<4.0	<4.0
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.5	<0.5	<0.5	<0.5
m/p-xylene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.4	<0.2	<0.2	<0.2	<0.2
o-xylene	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
Styrene	ug/L			<0.4	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	ug/L			<1.0	<0.4	<0.4	<0.4	<0.4
trans-1,3-Dichloropropylene	ug/L			<0.5	<0.2	<0.2	<0.2	<0.2
Tetrachloroethylene	ug/L	MAC	30	<0.5	<0.3	<0.3	<0.3	<0.3
Toluene	ug/L	AO	24	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	ug/L	MAC	5	<0.4	<0.3	<0.3	<0.3	<0.3
Trichlorofluoromethane	ug/L			<1.0	<0.5	<0.5	<0.5	<0.5
Vinyl Chloride	ug/L	MAC	2	<0.5	<0.2	<0.2	<0.2	<0.2
cis+trans1,3-dichloropropene	ug/L			<0.4				
Acetone	ug/L							
m/p,o Xylene	ug/L							
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L			<0.4				
o-Dichlorobenzene	ug/L			<0.4				
p-Dichlorobenzene	ug/L			<0.4				
VOC SURROGATES								
1,2-dichloroethane-d4	%				99			
4-bromofluorobenzene	%				102			
Toluene-d8	%				105			

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **95-3S**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Nov-08 May-09 Apr-14 Oct-14 Oct-17

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L			<0.5	<0.5	< 0.1	< 0.1	< 0.1
1,1,1-trichloroethane	ug/L			<0.4	<0.4	< 0.1	< 0.1	< 0.1
1,1,2,2-tetrachloroethane	ug/L			<0.5	<0.5	< 0.4	< 0.4	< 0.4
1,1,2-trichloroethane	ug/L			<0.4	<0.4	< 0.1	< 0.1	< 0.1
1,1-dichloroethane	ug/L			<0.4	<0.4	< 0.1	< 0.1	< 0.1
1,1-dichloroethylene	ug/L	MAC	14	<0.5	<0.5	< 0.1	< 0.1	< 0.1
1,2-dibromoethane	ug/L			<1.0	<1.0	< 0.1	< 0.1	
1,2-dichlorobenzene	ug/L	MAC	200	<0.4	<0.4	< 0.1	< 0.1	< 0.1
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.5	< 0.1	< 0.1	< 0.1
1,2-dichloropropane	ug/L			<0.5	<0.5	< 0.1	< 0.1	< 0.1
1,3,5-trimethylbenzene	ug/L			<0.3	<0.3			
1,3-dichlorobenzene	ug/L			<0.4	<0.4	< 0.1	< 0.1	< 0.1
1,4-dichlorobenzene	ug/L	MAC	5	<0.4	<0.4	< 0.2	< 0.2	< 0.2
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	ug/L			<0.3	<0.3	< 0.1	< 0.1	< 0.1
Bromoform	ug/L			<0.4	<0.4	< 0.1	< 0.1	< 0.1
Bromomethane	ug/L			<0.5	<0.5	< 0.3	< 0.3	< 0.3
cis-1,2-Dichloroethylene	ug/L			<0.4	<0.4	< 0.1	< 0.1	< 0.1
cis-1,3-Dichloropropylene	ug/L			<0.2	<0.2	< 0.1	< 0.1	< 0.1
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5	< 0.2	< 0.2	< 0.2
Chloroethane	ug/L			<1.0	<1.0			
Chloroform	ug/L			<0.5	<0.5	< 0.3	< 0.3	< 0.3
Chloromethane	ug/L			<1.0	<1.0			
Dibromochloromethane	ug/L			<0.3	<0.3	< 0.1	< 0.1	< 0.1
Dichlorodifluromethane						< 1	< 1	< 1
Dichloromethane	ug/L	MAC	50	<4.0	<4.0	< 0.3	< 0.3	< 0.3
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.5	< 0.5	< 0.5	< 0.5
m/p-xylene	ug/L			<1.0	<1.0	< 0.4	< 0.4	< 0.4
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.2	<0.2	< 0.2	< 0.2	< 0.2
o-xylene	ug/L			<0.5	<0.5	< 0.1	< 0.1	< 0.1
Styrene	ug/L			<0.5	<0.5	< 0.5	< 0.5	< 0.5
trans-1,2-Dichloroethylene	ug/L			<0.4	<0.4	< 0.1	< 0.1	< 0.1
trans-1,3-Dichloropropylene	ug/L			<0.2	<0.2	< 0.1	< 0.1	< 0.1
Tetrachloroethylene	ug/L	MAC	30	<0.3	<0.3	< 0.2	< 0.2	< 0.2
Toluene	ug/L	AO	24	<0.5	<0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	ug/L	MAC	5	<0.3	<0.3	< 0.1	< 0.1	< 0.1
Trichlorofluoromethane	ug/L			<0.5	<0.5	< 0.1	< 0.1	< 0.1
Vinyl Chloride	ug/L	MAC	2	<0.2	<0.2	< 0.2	< 0.2	< 0.2
cis+trans1,3-dichloropropene	ug/L					< 0.1	< 0.1	< 0.1
Acetone	ug/L					< 2	< 2	< 2
m/p,o Xylene	ug/L					< 0.4	< 0.4	< 0.4
Hexane	ug/L					< 1	< 1	< 1
2-Hexanone								
Methyl Ethyl Ketone	ug/L					< 1	< 1	< 1
Methyl Isobutyl Ketone	ug/L					< 1	< 1	< 1
Methyl-t-butyl Ether	ug/L		15			< 1	< 1	< 1
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							< 0.1
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%				106	98.4	96	102
4-bromofluorobenzene	%				91	83.7	107	116
Toluene-d8	%				118	100	114	95

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **95-3S**

REPORT OF ORGANIC ANALYSIS **ODWSOG** May-18 Oct-18

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L			< 0.5	< 0.5			
1,1,1-trichloroethane	ug/L			< 0.4	< 0.4			
1,1,2,2-tetrachloroethane	ug/L			< 0.5	< 0.5			
1,1,2-trichloroethane	ug/L			< 0.4	< 0.4			
1,1-dichloroethane	ug/L			< 0.4	< 0.4			
1,1-dichloroethylene	ug/L	MAC	14	< 0.5	< 0.5			
1,2-dibromoethane	ug/L			< 0.2	< 0.2			
1,2-dichlorobenzene	ug/L	MAC	200	< 0.4	< 0.2			
1,2-dichloroethane	ug/L	IMAC	5	< 0.2	< 0.2			
1,2-dichloropropane	ug/L			< 0.5	< 0.5			
1,3,5-trimethylbenzene	ug/L			< 0.3	< 0.3			
1,3-dichlorobenzene	ug/L			< 0.4	< 0.4			
1,4-dichlorobenzene	ug/L	MAC	5	< 0.4	< 0.4			
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	< 0.5	< 0.5			
Bromodichloromethane	ug/L			< 0.3	< 0.3			
Bromoform	ug/L			< 0.4	< 0.4			
Bromomethane	ug/L			< 0.5	< 0.5			
cis-1,2-Dichloroethylene	ug/L			< 0.4	< 0.4			
cis-1,3-Dichloropropylene	ug/L			< 0.2	< 0.2			
Carbon Tetrachloride	ug/L	MAC	5	< 0.2	< 0.2			
Chloroethane	ug/L			< 0.2	< 0.2			
Chloroform	ug/L			< 0.5	< 0.5			
Chloromethane	ug/L			< 0.2	< 0.2			
Dibromochloromethane	ug/L			< 0.3	< 0.3			
Dichlorodifluromethane				< 0.5	< 0.5			
Dichloromethane	ug/L	MAC	50	< 4.0	< 4.0			
Ethylbenzene	ug/L	AO	1.6	< 0.5	< 0.5			
m/p-xylene	ug/L			< 0.4	< 0.4			
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	< 0.5	< 0.5			
o-xylene	ug/L			< 0.4	< 0.4			
Styrene	ug/L			< 0.5	< 0.5			
trans-1,2-Dichloroethylene	ug/L			< 0.4	< 0.4			
trans-1,3-Dichloropropylene	ug/L			< 0.2	< 0.2			
Tetrachloroethylene	ug/L	MAC	30	< 0.3	< 0.3			
Toluene	ug/L	AO	24	< 0.5	< 0.5			
Trichloroethylene	ug/L	MAC	5	< 0.3	< 0.3			
Trichlorofluoromethane	ug/L			< 0.5	< 0.5			
Vinyl Chloride	ug/L	MAC	2	< 0.2	< 0.2			
cis+trans1,3-dichloropropene	ug/L							
Acetone	ug/L							
m/p,o Xylene	ug/L			< 0.5	< 0.5			
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%			100	105			
4-bromofluorobenzene	%			110	121			
Toluene-d8	%			90	92			

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **95-3D**

REPORT OF ORGANIC ANALYSIS **ODWSOG**

PARAMETER	TYPE	LIMIT	UNITS	Nov-08	May-09	Sep-09	Oct-11	Apr-14
1,1,1,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5	<0.5	< 0.1
1,1,1-trichloroethane	ug/L			<0.4	<0.4	<0.4	<0.4	< 0.1
1,1,2,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5	<0.5	< 0.4
1,1,2-trichloroethane	ug/L			<0.4	<0.4	<0.4	<0.4	< 0.1
1,1-dichloroethane	ug/L			<0.4	<0.4	<0.4	<0.4	< 0.1
1,1-dichloroethylene	ug/L	MAC	14	<0.5	<0.5	<0.5	<0.5	< 0.1
1,2-dibromoethane	ug/L			<1.0	<1.0	<1.0	<0.2	< 0.1
1,2-dichlorobenzene	ug/L	MAC	200	<0.4	<0.4	<0.4	<0.4	< 0.1
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.5	<0.5	<0.2	< 0.1
1,2-dichloropropane	ug/L			<0.5	<0.5	<0.5	<0.5	< 0.1
1,3,5-trimethylbenzene	ug/L			<0.3	<0.3	<0.3	<0.3	
1,3-dichlorobenzene	ug/L			<0.4	<0.4	<0.4	<0.4	< 0.1
1,4-dichlorobenzene	ug/L	MAC	5	<0.4	<0.4	<0.4	<0.4	< 0.2
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<0.5	<0.5	<0.5	<0.5	< 0.5
Bromodichloromethane	ug/L			<0.3	<0.3	<0.3	<0.3	< 0.1
Bromoform	ug/L			<0.4	<0.4	<0.4	<0.4	< 0.1
Bromomethane	ug/L			<0.5	<0.5	<0.5	<0.5	< 0.3
cis-1,2-Dichloroethylene	ug/L			<0.4	<0.4	<0.4	<0.4	< 0.1
cis-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2	<0.2	< 0.1
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5	<0.5	<0.5	< 0.2
Chloroethane	ug/L			<1.0	<1.0	<1.0	<0.2	
Chloroform	ug/L			3.4	<0.5	<0.5	<0.5	< 0.3
Chloromethane	ug/L			<1.0	<1.0	<1.0	<0.2	
Dibromochloromethane	ug/L			<0.3	<0.3	<0.3	<0.3	< 0.1
Dichlorodifluromethane							<0.5	< 1
Dichloromethane	ug/L	MAC	50	<4.0	<4.0	<4.0	<4.0	< 0.3
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.5	<0.5	<0.5	< 0.5
m/p-xylene	ug/L			<1.0	<1.0	<1.0	<0.5	< 0.4
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.2	<0.2	<0.2	<0.2	< 0.2
o-xylene	ug/L			<0.5	<0.5	<0.5	<0.5	< 0.1
Styrene	ug/L			<0.5	<0.5	<0.5	<0.5	< 0.5
trans-1,2-Dichloroethylene	ug/L			<0.4	<0.4	<0.4	<0.4	< 0.1
trans-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2	<0.2	< 0.1
Tetrachloroethylene	ug/L	MAC	30	<0.3	<0.3	<0.3	<0.3	< 0.2
Toluene	ug/L	AO	24	<0.5	<0.5	<0.5	<0.5	< 0.5
Trichloroethylene	ug/L	MAC	5	<0.3	<0.3	<0.3	<0.3	< 0.1
Trichlorofluoromethane	ug/L			<0.5	<0.5	<0.5	<0.5	< 0.1
Vinyl Chloride	ug/L	MAC	2	<0.2	<0.2	<0.2	<0.2	< 0.2
cis+trans1,3-dichloropropene	ug/L							< 0.1
Acetone	ug/L							< 2
m/p,o Xylene	ug/L						<1.0	< 0.4
Hexane	ug/L							< 1
2-Hexanone								
Methyl Ethyl Ketone	ug/L							< 1
Methyl Isobutyl Ketone	ug/L							< 1
Methyl-t-butyl Ether	ug/L		15					< 1
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%				111	94	109	96.5
4-bromofluorobenzene	%				91	91	109	79.5
Toluene-d8	%				115	108	100	99.9

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **95-3D**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Oct-14 Jun-15 May-16 Nov-16 Apr-17

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L			< 0.1	<0.1	<0.10	<0.10	< 0.1
1,1,1-trichloroethane	ug/L			< 0.1	<0.1	<0.30	<0.30	< 0.1
1,1,2,2-tetrachloroethane	ug/L			< 0.4	<0.4	<0.10	<0.10	< 0.4
1,1,2-trichloroethane	ug/L			< 0.1	<0.1	<0.20	<0.20	< 0.1
1,1-dichloroethane	ug/L			< 0.1	<0.1	<0.30	<0.30	< 0.1
1,1-dichloroethylene	ug/L	MAC	14	< 0.1	<0.1	<0.30	<0.30	< 0.1
1,2-dibromoethane	ug/L			< 0.1	<0.1	<0.10	<0.10	
1,2-dichlorobenzene	ug/L	MAC	200	< 0.1	<0.1	<0.10	<0.10	< 0.1
1,2-dichloroethane	ug/L	IMAC	5	< 0.1	<0.1	<0.20	<0.20	< 0.1
1,2-dichloropropane	ug/L			< 0.1	<0.1	<0.20	<0.20	< 0.1
1,3,5-trimethylbenzene	ug/L					<0.20	<0.20	
1,3-dichlorobenzene	ug/L			< 0.1	<0.1	<0.10	<0.10	< 0.1
1,4-dichlorobenzene	ug/L	MAC	5	< 0.2	<0.2	<0.10	<0.10	< 0.2
1,2,4-Trichlorobenzene						<0.30	<0.30	
Benzene	ug/L	MAC	5	< 0.5	<0.5	<0.20	<0.20	< 0.5
Bromodichloromethane	ug/L			< 0.1	<0.1	<0.20	<0.20	< 0.1
Bromoform	ug/L			< 0.1	<0.1	<0.10	<0.10	< 0.1
Bromomethane	ug/L			< 0.3	<0.3	<0.20	<0.20	< 0.3
cis-1,2-Dichloroethylene	ug/L			< 0.1	<0.1	<0.20	<0.20	< 0.1
cis-1,3-Dichloropropylene	ug/L			< 0.1	<0.1	<0.20	<0.20	< 0.1
Carbon Tetrachloride	ug/L	MAC	5	< 0.2	<0.2	<0.20	<0.20	< 0.2
Chloroethane	ug/L					<0.20	<0.20	
Chloroform	ug/L			< 0.3	<0.3	<0.20	<0.20	< 0.3
Chloromethane	ug/L				<0.1	<0.40	<0.40	
Dibromochloromethane	ug/L			< 0.1	<0.1	<0.10	<0.10	< 0.1
Dichlorodifluromethane				< 1	<1	<0.20	<0.20	< 1
Dichloromethane	ug/L	MAC	50	< 0.3	<0.3	<0.30	<0.30	< 0.3
Ethylbenzene	ug/L	AO	1.6	< 0.5	<0.5	<0.10	<0.10	< 0.5
m/p-xylene	ug/L			< 0.4	<0.4	<0.20	<0.20	< 0.4
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	< 0.2	<0.2	<0.10	<0.10	< 0.2
o-xylene	ug/L			< 0.1	<0.1	<0.10	<0.10	< 0.1
Styrene	ug/L			< 0.5	<0.5	<0.10	<0.10	< 0.5
trans-1,2-Dichloroethylene	ug/L			< 0.1	<0.1	<0.20	<0.20	< 0.1
trans-1,3-Dichloropropylene	ug/L			< 0.1	<0.1	<0.30	<0.30	< 0.1
Tetrachloroethylene	ug/L	MAC	30	< 0.2	<0.2	<0.20	<0.20	< 0.2
Toluene	ug/L	AO	24	< 0.5	<0.5	<0.20	<0.20	< 0.5
Trichloroethylene	ug/L	MAC	5	< 0.1	<0.1	<0.20	<0.20	< 0.1
Trichlorofluoromethane	ug/L			< 0.1	<0.1	<0.40	<0.40	< 0.1
Vinyl Chloride	ug/L	MAC	2	< 0.2	<0.2	<0.17	<0.17	< 0.2
cis+trans1,3-dichloropropene	ug/L			< 0.1	<0.1	<0.30	<0.30	< 0.1
Acetone	ug/L			< 2	<2	<1.0	<1.0	< 2
m/p,o Xylene	ug/L			< 0.4	<0.4	<0.20	<0.20	< 0.4
Hexane	ug/L			< 1	<1	<0.20	<0.20	< 1
2-Hexanone						<1.0	<1.0	
Methyl Ethyl Ketone	ug/L			< 1	<1	<1.0	<1.0	< 1
Methyl Isobutyl Ketone	ug/L			< 1	<1	<1.0	<1.0	< 1
Methyl-t-butyl Ether	ug/L		15	< 1	<1	<0.20	<0.20	< 1
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							
p-Dichlorobenzene	ug/L							< 0.1
VOC SURROGATES								
1,2-dichloroethane-d4	%			97	107	87		107
4-bromofluorobenzene	%			107	99	99	82	98
Toluene-d8	%			114	86		129	107

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **95-3D**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Oct-17 May-18 Oct-18

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L			< 0.1	< 0.5	< 0.5		
1,1,1-trichloroethane	ug/L			< 0.1	< 0.4	< 0.4		
1,1,2,2-tetrachloroethane	ug/L			< 0.4	< 0.5	< 0.5		
1,1,2-trichloroethane	ug/L			< 0.1	< 0.4	< 0.4		
1,1-dichloroethane	ug/L			< 0.1	< 0.4	< 0.4		
1,1-dichloroethylene	ug/L	MAC	14	< 0.1	< 0.5	<0.5		
1,2-dibromoethane	ug/L				< 0.2	< 0.2		
1,2-dichlorobenzene	ug/L	MAC	200	< 0.1	< 0.4	< 0.4		
1,2-dichloroethane	ug/L	IMAC	5	< 0.1	< 0.2	< 0.2		
1,2-dichloropropane	ug/L			< 0.1	< 0.5	< 0.5		
1,3,5-trimethylbenzene	ug/L				< 0.3	< 0.3		
1,3-dichlorobenzene	ug/L			< 0.1	< 0.4	< 0.4		
1,4-dichlorobenzene	ug/L	MAC	5	< 0.2	< 0.4	< 0.4		
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	< 0.5	< 0.5	< 0.5		
Bromodichloromethane	ug/L			< 0.1	< 0.3	< 0.3		
Bromoform	ug/L			< 0.1	< 0.4	< 0.4		
Bromomethane	ug/L			< 0.3	< 0.5	< 0.5		
cis-1,2-Dichloroethylene	ug/L			< 0.1	< 0.4	< 0.4		
cis-1,3-Dichloropropylene	ug/L			< 0.1	< 0.2	< 0.2		
Carbon Tetrachloride	ug/L	MAC	5	< 0.2	< 0.2	< 0.2		
Chloroethane	ug/L				< 0.2	< 0.2		
Chloroform	ug/L			< 0.3	< 0.5	< 0.5		
Chloromethane	ug/L				< 0.2	< 0.2		
Dibromochloromethane	ug/L			< 0.1	< 0.3	< 0.3		
Dichlorodifluromethane				< 1	< 0.5	< 0.5		
Dichloromethane	ug/L	MAC	50	< 0.3	< 4.0	< 4.0		
Ethylbenzene	ug/L	AO	1.6	< 0.5	< 0.5	< 0.5		
m/p-xylene	ug/L			< 0.4	< 0.4	< 0.4		
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	< 0.2	< 0.5	< 0.5		
o-xylene	ug/L			< 0.1	< 0.4	< 0.4		
Styrene	ug/L			< 0.5	< 0.5	< 0.5		
trans-1,2-Dichloroethylene	ug/L			< 0.1	< 0.4	< 0.4		
trans-1,3-Dichloropropylene	ug/L			< 0.1	< 0.2	< 0.2		
Tetrachloroethylene	ug/L	MAC	30	< 0.2	< 0.3	< 0.3		
Toluene	ug/L	AO	24	< 0.5	<0.5	< 0.5		
Trichloroethylene	ug/L	MAC	5	< 0.1	< 0.3	< 0.3		
Trichlorofluoromethane	ug/L			< 0.1	< 0.5	< 0.5		
Vinyl Chloride	ug/L	MAC	2	< 0.2	< 0.2	< 0.2		
cis+trans1,3-dichloropropene	ug/L			< 0.1				
Acetone	ug/L			< 2				
m/p,o Xylene	ug/L			< 0.4	< 0.5	< 0.5		
Hexane	ug/L			< 1				
2-Hexanone								
Methyl Ethyl Ketone	ug/L			< 1				
Methyl Isobutyl Ketone	ug/L			< 1				
Methyl-t-butyl Ether	ug/L		15	< 1				
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L			< 0.1				
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%			104	98	101		
4-bromofluorobenzene	%			115	112	123		
Toluene-d8	%			96	89	93		

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **95-4**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Oct-00 Oct-00 Oct-06 May-07 Oct-07

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L					<0.5	<0.5	<0.5
1,1,1-trichloroethane	ug/L					<0.4	<0.4	<0.4
1,1,2,2-tetrachloroethane	ug/L			<0.6	<0.6	<0.5	<0.5	<0.5
1,1,2-trichloroethane	ug/L			<0.6	<0.6	<0.4	<0.4	<0.4
1,1-dichloroethane	ug/L			<0.5	<0.5	<0.4	<0.4	<0.4
1,1-dichloroethylene	ug/L	MAC	14	<0.6	<0.6	<0.5	<0.5	<0.5
1,2-dibromoethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichlorobenzene	ug/L	MAC	200			<0.4	<0.4	<0.4
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dichloropropane	ug/L			<0.7	<0.7	<0.5	<0.5	<0.5
1,3,5-trimethylbenzene	ug/L			<0.5	<0.5	<0.3	<0.3	<0.3
1,3-dichlorobenzene	ug/L					<0.4	<0.4	<0.4
1,4-dichlorobenzene	ug/L	MAC	5			<0.4	<0.4	<0.4
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	ug/L			<0.4	<0.4	<0.3	<0.3	<0.3
Bromoform	ug/L			<0.8	<0.8	<0.4	<0.4	<0.4
Bromomethane	ug/L			<1.0	<1.0	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	ug/L					<0.4	<0.4	<0.4
cis-1,3-Dichloropropylene	ug/L					<0.2	<0.2	<0.2
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	ug/L			<0.6	<0.6	<0.5	<0.5	<0.5
Chloromethane	ug/L			<3.0	<3.0	<1.0	<1.0	<1.0
Dibromochloromethane	ug/L			<0.5	<0.5	<0.3	<0.3	<0.3
Dichlorodifluromethane								
Dichloromethane	ug/L	MAC	50			<4.0	<4.0	<4.0
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.5	<0.5	<0.5	<0.5
m/p-xylene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.4	<0.4	<0.2	<0.2	<0.2
o-xylene	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
Styrene	ug/L			<0.4	<0.4	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	ug/L			<1.0	<1.0	<0.4	<0.4	<0.4
trans-1,3-Dichloropropylene	ug/L			<0.5	<0.5	<0.2	<0.2	<0.2
Tetrachloroethylene	ug/L	MAC	30	<0.5	<0.5	<0.3	<0.3	<0.3
Toluene	ug/L	AO	24	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	ug/L	MAC	5	<0.4	<0.4	<0.3	<0.3	<0.3
Trichlorofluoromethane	ug/L			<1.0	<1.0	<0.5	<0.5	<0.5
Vinyl Chloride	ug/L	MAC	2	<0.5	<0.5	<0.2	<0.2	<0.2
cis+trans1,3-dichloropropene	ug/L			<0.4	<0.4			
Acetone	ug/L							
m/p,o Xylene	ug/L							
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L			<0.4	<0.4			
o-Dichlorobenzene	ug/L			<0.4	<0.4			
p-Dichlorobenzene	ug/L			<0.4	<0.4			
VOC SURROGATES								
1,2-dichloroethane-d4	%					95		
4-bromofluorobenzene	%					105		
Toluene-d8	%					110		

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **95-4**

REPORT OF ORGANIC ANALYSIS **ODWSOG** May-08 Nov-08 May-09

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5		
1,1,1-trichloroethane	ug/L			<0.4	<0.4	<0.4		
1,1,2,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5		
1,1,2-trichloroethane	ug/L			<0.4	<0.4	<0.4		
1,1-dichloroethane	ug/L			<0.4	<0.4	<0.4		
1,1-dichloroethylene	ug/L	MAC	14	<0.5	<0.5	<0.5		
1,2-dibromoethane	ug/L			<1.0	<1.0	<1.0		
1,2-dichlorobenzene	ug/L	MAC	200	<0.4	<0.4	<0.4		
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.5	<0.5		
1,2-dichloropropane	ug/L			<0.5	<0.5	<0.5		
1,3,5-trimethylbenzene	ug/L			<0.3	<0.3	<0.3		
1,3-dichlorobenzene	ug/L			<0.4	<0.4	<0.4		
1,4-dichlorobenzene	ug/L	MAC	5	<0.4	<0.4	<0.4		
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<0.5	<0.5	<0.5		
Bromodichloromethane	ug/L			<0.3	<0.3	<0.3		
Bromoform	ug/L			<0.4	<0.4	<0.4		
Bromomethane	ug/L			<0.5	<0.5	<0.5		
cis-1,2-Dichloroethylene	ug/L			<0.4	<0.4	<0.4		
cis-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2		
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5	<0.5		
Chloroethane	ug/L			<1.0	<1.0	<1.0		
Chloroform	ug/L			<0.5	<0.5	<0.5		
Chloromethane	ug/L			<1.0	<1.0	<1.0		
Dibromochloromethane	ug/L			<0.3	<0.3	<0.3		
Dichlorodifluromethane								
Dichloromethane	ug/L	MAC	50	<4.0	<4.0	<4.0		
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.5	<0.5		
m/p-xylene	ug/L			<1.0	<1.0	<1.0		
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.2	<0.2	<0.2		
o-xylene	ug/L			<0.5	<0.5	<0.5		
Styrene	ug/L			<0.5	<0.5	<0.5		
trans-1,2-Dichloroethylene	ug/L			<0.4	<0.4	<0.4		
trans-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2		
Tetrachloroethylene	ug/L	MAC	30	<0.3	<0.3	<0.3		
Toluene	ug/L	AO	24	<0.5	<0.5	<0.5		
Trichloroethylene	ug/L	MAC	5	<0.3	<0.3	<0.3		
Trichlorofluoromethane	ug/L			<0.5	<0.5	<0.5		
Vinyl Chloride	ug/L	MAC	2	<0.2	<0.2	<0.2		
cis+trans1,3-dichloropropene	ug/L							
Acetone	ug/L							
m/p,o Xylene	ug/L							
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%					119		
4-bromofluorobenzene	%					92		
Toluene-d8	%					114		

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **95-4D**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Nov-08 May-09 Sep-09 Oct-11

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5	<0.5	
1,1,1-trichloroethane	ug/L			<0.4	<0.4	<0.4	<0.4	
1,1,2,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5	<0.5	
1,1,2-trichloroethane	ug/L			<0.4	<0.4	<0.4	<0.4	
1,1-dichloroethane	ug/L			<0.4	<0.4	<0.4	<0.4	
1,1-dichloroethylene	ug/L	MAC	14	<0.5	<0.5	<0.5	<0.5	
1,2-dibromoethane	ug/L			<1.0	<1.0	<1.0	<0.2	
1,2-dichlorobenzene	ug/L	MAC	200	<0.4	<0.4	<0.4	<0.4	
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.5	<0.5	<0.2	
1,2-dichloropropane	ug/L			<0.5	<0.5	<0.5	<0.5	
1,3,5-trimethylbenzene	ug/L			<0.3	<0.3	<0.3	<0.3	
1,3-dichlorobenzene	ug/L			<0.4	<0.4	<0.4	<0.4	
1,4-dichlorobenzene	ug/L	MAC	5	<0.4	<0.4	<0.4	<0.4	
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<0.5	<0.5	<0.5	<0.5	
Bromodichloromethane	ug/L			<0.3	<0.3	<0.3	<0.3	
Bromoform	ug/L			<0.4	<0.4	<0.4	<0.4	
Bromomethane	ug/L			<0.5	<0.5	<0.5	<0.5	
cis-1,2-Dichloroethylene	ug/L			<0.4	<0.4	<0.4	<0.4	
cis-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2	<0.2	
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5	<0.5	<0.5	
Chloroethane	ug/L			<1.0	<1.0	<1.0	<0.2	
Chloroform	ug/L			0.7	0.8	<0.5	<0.5	
Chloromethane	ug/L			<1.0	<1.0	<1.0	<0.2	
Dibromochloromethane	ug/L			<0.3	<0.3	<0.3	<0.3	
Dichlorodifluromethane							<0.5	
Dichloromethane	ug/L	MAC	50	<4.0	<4.0	<4.0	<4.0	
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.5	<0.5	<0.5	
m/p-xylene	ug/L			<1.0	<1.0	<1.0	<0.5	
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.2	<0.2	<0.2	<0.2	
o-xylene	ug/L			<0.5	<0.5	<0.5	<0.5	
Styrene	ug/L			<0.5	<0.5	<0.5	<0.5	
trans-1,2-Dichloroethylene	ug/L			<0.4	<0.4	<0.4	<0.4	
trans-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2	<0.2	
Tetrachloroethylene	ug/L	MAC	30	<0.3	<0.3	<0.3	<0.3	
Toluene	ug/L	AO	24	<0.5	<0.5	<0.5	<0.5	
Trichloroethylene	ug/L	MAC	5	<0.3	<0.3	<0.3	<0.3	
Trichlorofluoromethane	ug/L			<0.5	<0.5	<0.5	<0.5	
Vinyl Chloride	ug/L	MAC	2	<0.2	<0.2	<0.2	<0.2	
cis+trans1,3-dichloropropene	ug/L							
Acetone	ug/L							
m/p,o Xylene	ug/L						<1.0	
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%				106	98	110	
4-bromofluorobenzene	%				90	92	114	
Toluene-d8	%				118	108	99	

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **95-5**

REPORT OF ORGANIC ANALYSIS **ODWSOG**

PARAMETER	TYPE	LIMIT	UNITS	Oct-00	Oct-06	May-07	May-07	May-08
1,1,1,2-tetrachloroethane	ug/L				<0.5	<0.5	<0.5	<0.5
1,1,1-trichloroethane	ug/L				<0.4	<0.4	<0.4	<0.4
1,1,2,2-tetrachloroethane	ug/L			<0.6	<0.5	<0.5	<0.5	<0.5
1,1,2-trichloroethane	ug/L			<0.6	<0.4	<0.4	<0.4	<0.4
1,1-dichloroethane	ug/L			<0.5	<0.4	<0.4	<0.4	<0.4
1,1-dichloroethylene	ug/L	MAC	14	<0.6	<0.5	<0.5	<0.5	<0.5
1,2-dibromoethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichlorobenzene	ug/L	MAC	200		<0.4	<0.4	<0.4	<0.4
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dichloropropane	ug/L			<0.7	<0.5	<0.5	<0.5	<0.5
1,3,5-trimethylbenzene	ug/L			<0.5	<0.3	<0.3	<0.3	<0.3
1,3-dichlorobenzene	ug/L				<0.4	<0.4	<0.4	<0.4
1,4-dichlorobenzene	ug/L	MAC	5		<0.4	<0.4	<0.4	<0.4
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	ug/L			<0.4	<0.3	<0.3	<0.3	<0.3
Bromoform	ug/L			<0.8	<0.4	<0.4	<0.4	<0.4
Bromomethane	ug/L			<1.0	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	ug/L				<0.4	<0.4	<0.4	<0.4
cis-1,3-Dichloropropylene	ug/L				<0.2	<0.2	<0.2	<0.2
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	ug/L			<0.6	<0.5	<0.5	<0.5	<0.5
Chloromethane	ug/L			<3.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	ug/L			<0.5	<0.3	<0.3	<0.3	<0.3
Dichlorodifluromethane								
Dichloromethane	ug/L	MAC	50		<4.0	<4.0	<4.0	<4.0
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.5	<0.5	<0.5	<0.5
m/p-xylene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.4	<0.2	<0.2	<0.2	<0.2
o-xylene	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
Styrene	ug/L			<0.4	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	ug/L			<1.0	<0.4	<0.4	<0.4	<0.4
trans-1,3-Dichloropropylene	ug/L			<0.5	<0.2	<0.2	<0.2	<0.2
Tetrachloroethylene	ug/L	MAC	30	<0.5	<0.3	<0.3	<0.3	<0.3
Toluene	ug/L	AO	24	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	ug/L	MAC	5	<0.4	<0.3	<0.3	<0.3	<0.3
Trichlorofluoromethane	ug/L			<1.0	<0.5	<0.5	<0.5	<0.5
Vinyl Chloride	ug/L	MAC	2	<0.5	<0.2	<0.2	<0.2	<0.2
cis+trans1,3-dichloropropene	ug/L			<0.4				
Acetone	ug/L							
m/p,o Xylene	ug/L							
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L			<0.4				
o-Dichlorobenzene	ug/L			<0.4				
p-Dichlorobenzene	ug/L			<0.4				
VOC SURROGATES								
1,2-dichloroethane-d4	%				96			
4-bromofluorobenzene	%				103			
Toluene-d8	%				105			

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **95-6**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Oct-00 2004 May-08 Oct-12 May-16

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L				<0.6	<0.5	<0.5	<0.10
1,1,1-trichloroethane	ug/L				<0.2	<0.4	<0.4	<0.30
1,1,2,2-tetrachloroethane	ug/L			<0.6	<0.1	<0.5	<0.5	<0.10
1,1,2-trichloroethane	ug/L			<0.6	<0.1	<0.4	<0.4	<0.20
1,1-dichloroethane	ug/L			0.5	1.3	0.8	<0.4	<0.30
1,1-dichloroethylene	ug/L	MAC	14	<0.6		<0.5	<0.5	<0.30
1,2-dibromoethane	ug/L			<1.0	<0.1	<1.0	<0.2	<0.10
1,2-dichlorobenzene	ug/L	MAC	200		<0.1	<0.4	<0.4	0.10
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.1	<0.5	<0.2	<0.20
1,2-dichloropropane	ug/L			<0.7	<0.1	<0.5	<0.5	<0.20
1,3,5-trimethylbenzene	ug/L			<0.5		<0.3	<0.3	<0.20
1,3-dichlorobenzene	ug/L				0.3	<0.4	<0.4	<0.10
1,4-dichlorobenzene	ug/L	MAC	5		2.2	1.4	0.9	0.80
1,2,4-Trichlorobenzene								<0.30
Benzene	ug/L	MAC	5	<0.5	1.4	1.4	0.6	0.69
Bromodichloromethane	ug/L			<0.4	<0.1	<0.3	<0.3	<0.20
Bromoform	ug/L			<0.8	<0.1	<0.4	<0.4	<0.10
Bromomethane	ug/L			<1.0	<2	<0.5	<0.5	<0.20
cis-1,2-Dichloroethylene	ug/L					11.5	2.6	2.3
cis-1,3-Dichloropropylene	ug/L					<0.2	<0.2	<0.20
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.2	<0.5	<0.5	<0.20
Chloroethane	ug/L			8		5.6	<0.2	2.4
Chloroform	ug/L			<0.6	<0.3	<0.5	<0.5	<0.20
Chloromethane	ug/L			<3.0		<1.0	<0.2	<0.40
Dibromochloromethane	ug/L			<0.5	<1	<0.3	<0.3	<0.10
Dichlorodifluromethane							<0.5	<0.20
Dichloromethane	ug/L	MAC	50		0.7	<4.0	<4.0	<0.30
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.1	<0.5	<0.5	<0.10
m/p-xylene	ug/L			<1.0	1	<1.0	<0.5	<0.20
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.4	3.1	4.0	3.9	3.8
o-xylene	ug/L			<0.5	0.5	<0.5	<0.5	<0.10
Styrene	ug/L			<0.4	<0.7	<0.5	<0.5	<0.10
trans-1,2-Dichloroethylene	ug/L			2		1.2	<0.4	<0.20
trans-1,3-Dichloropropylene	ug/L			<0.5		<0.2	<0.2	<0.30
Tetrachloroethylene	ug/L	MAC	30	<0.5	<0.4	<0.3	<0.3	<0.20
Toluene	ug/L	AO	24	<0.5	<0.2	<0.5	<0.5	<0.20
Trichloroethylene	ug/L	MAC	5	<0.4	<0.1	<0.3	<0.3	<0.20
Trichlorofluoromethane	ug/L			<1.0		<0.5	<0.5	<0.40
Vinyl Chloride	ug/L	MAC	2	<0.5	0.3	11.2	4.3	6.1
cis+trans1,3-dichloropropene	ug/L			<0.4				<0.30
Acetone	ug/L							<1.0
m/p,o Xylene	ug/L						<1	<0.20
Hexane	ug/L							<0.20
2-Hexanone								<1.0
Methyl Ethyl Ketone	ug/L							<1.0
Methyl Isobutyl Ketone	ug/L							<1.0
Methyl-t-butyl Ether	ug/L		15					<0.20
m-Dichlorobenzene	ug/L			<0.4				
o-Dichlorobenzene	ug/L			<0.4				
p-Dichlorobenzene	ug/L			<0.4				
VOC SURROGATES								
1,2-dichloroethane-d4	%						112	84
4-bromofluorobenzene	%						107	99
Toluene-d8	%						101	

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **95-6**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Apr-17 Oct-17 May-18 Oct-18

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L			< 0.1	< 0.1	< 0.5	< 0.5	
1,1,1-trichloroethane	ug/L			< 0.1	< 0.1	< 0.4	< 0.4	
1,1,2,2-tetrachloroethane	ug/L			< 0.4	< 0.4	< 0.5	< 0.5	
1,1,2-trichloroethane	ug/L			< 0.1	< 0.1	< 0.4	< 0.4	
1,1-dichloroethane	ug/L			< 0.1	0.3	< 0.4	< 0.4	
1,1-dichloroethylene	ug/L	MAC	14	< 0.1	< 0.1	< 0.5	< 0.5	
1,2-dibromoethane	ug/L			< 0.1		< 0.2	< 0.2	
1,2-dichlorobenzene	ug/L	MAC	200	< 0.1	0.4	< 0.4	< 0.4	
1,2-dichloroethane	ug/L	IMAC	5	< 0.1	< 0.1	< 0.2	< 0.2	
1,2-dichloropropane	ug/L			< 0.1	< 0.1	< 0.5	< 0.5	
1,3,5-trimethylbenzene	ug/L					< 0.3	< 0.3	
1,3-dichlorobenzene	ug/L			< 0.1	< 0.1	< 0.4	< 0.4	
1,4-dichlorobenzene	ug/L	MAC	5	< 0.2	2	0.7	0.7	
1,2,4-Trichlorobenzene						7		
Benzene	ug/L	MAC	5	< 0.5	0.6	< 0.5	< 0.5	
Bromodichloromethane	ug/L			< 0.1	< 0.1	< 0.3	< 0.3	
Bromoform	ug/L			< 0.1	< 0.1	< 0.4	< 0.4	
Bromomethane	ug/L			< 0.3	< 0.3	< 0.5	< 0.5	
cis-1,2-Dichloroethylene	ug/L			1.2	1.2	0.9	1.2	
cis-1,3-Dichloropropylene	ug/L			< 0.1	< 0.1	< 0.2	< 0.2	
Carbon Tetrachloride	ug/L	MAC	5	< 0.2	< 0.2	< 0.2	< 0.2	
Chloroethane	ug/L					< 0.2	< 0.2	
Chloroform	ug/L			< 0.3	< 0.3	< 0.5	< 0.5	
Chloromethane	ug/L					< 0.2	< 0.2	
Dibromochloromethane	ug/L			< 0.1	< 0.1	< 0.3	< 0.3	
Dichlorodifluromethane				< 1	< 1	< 0.5	< 0.5	
Dichloromethane	ug/L	MAC	50	< 0.3	< 0.3	< 4.0	< 4.0	
Ethylbenzene	ug/L	AO	1.6	< 0.5	< 0.5	< 0.5	< 0.5	
m/p-xylene	ug/L			< 0.4	< 0.4	< 0.4	< 0.4	
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	2.7	5.1	3.0	< 3.2	
o-xylene	ug/L			< 0.1	< 0.1	< 0.4	< 0.4	
Styrene	ug/L			< 0.5	< 0.5	< 0.5	< 0.5	
trans-1,2-Dichloroethylene	ug/L			< 0.1	< 0.1	< 0.4	< 0.4	
trans-1,3-Dichloropropylene	ug/L			< 0.1	< 0.1	< 0.2	< 0.2	
Tetrachloroethylene	ug/L	MAC	30	< 0.2	< 0.2	< 0.3	< 0.3	
Toluene	ug/L	AO	24	< 0.5	< 0.5	< 0.5	< 0.5	
Trichloroethylene	ug/L	MAC	5	< 0.1	< 0.1	< 0.3	< 0.3	
Trichlorofluoromethane	ug/L			< 0.1	< 0.1	< 0.5	< 0.5	
Vinyl Chloride	ug/L	MAC	2	< 0.2	2.9	2.3	2.1	
cis+trans1,3-dichloropropene	ug/L			< 0.1	< 0.1			
Acetone	ug/L			2	< 2			
m/p,o Xylene	ug/L			< 0.4	< 0.4	< 0.5	< 0.5	
Hexane	ug/L			< 1	< 1			
2-Hexanone								
Methyl Ethyl Ketone	ug/L			< 1	< 1			
Methyl Isobutyl Ketone	ug/L			< 1	< 1			
Methyl-t-butyl Ether	ug/L		15	< 1	< 1			
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L				< 0.1			
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%			106	102	99	104	
4-bromofluorobenzene	%			98	117	114	120	
Toluene-d8	%			106	92	89	96	

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **96-1D**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Oct-00 Nov-07 May-08 May-08 Nov-07

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L				<0.5	<0.5	<0.5	<0.5
1,1,1-trichloroethane	ug/L				<0.4	<0.4	<0.4	<0.4
1,1,2,2-tetrachloroethane	ug/L			<0.6	<0.5	<0.5	<0.5	<0.5
1,1,2-trichloroethane	ug/L			<0.6	<0.4	<0.4	<0.4	<0.4
1,1-dichloroethane	ug/L			<0.5	<0.4	<0.4	<0.4	<0.4
1,1-dichloroethylene	ug/L	MAC	14	<0.6	<0.5	<0.5	<0.5	<0.5
1,2-dibromoethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichlorobenzene	ug/L	MAC	200		<0.4	<0.4	<0.4	<0.4
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dichloropropane	ug/L			<0.7	<0.5	<0.5	<0.5	<0.5
1,3,5-trimethylbenzene	ug/L			<0.5	<0.3	<0.3	<0.3	<0.3
1,3-dichlorobenzene	ug/L				<0.4	<0.4	<0.4	<0.4
1,4-dichlorobenzene	ug/L	MAC	5		<0.4	<0.4	<0.4	<0.4
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	ug/L			<0.4	<0.3	<0.3	<0.3	<0.3
Bromoform	ug/L			<0.8	<0.4	<0.4	<0.4	<0.4
Bromomethane	ug/L			<1.0	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	ug/L				<0.4	<0.4	<0.4	<0.4
cis-1,3-Dichloropropylene	ug/L				<0.2	<0.2	<0.2	<0.2
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	ug/L			<0.6	<0.5	<0.5	<0.5	<0.5
Chloromethane	ug/L			<3.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	ug/L			<0.5	<0.3	<0.3	<0.3	<0.3
Dichlorodifluromethane								
Dichloromethane	ug/L	MAC	50		<4.0	<4.0	<4.0	<4.0
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.5	<0.5	<0.5	<0.5
m/p-xylene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.4	<0.2	<0.2	<0.2	<0.2
o-xylene	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
Styrene	ug/L			<0.4	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	ug/L			<1.0	<0.4	<0.4	<0.4	<0.4
trans-1,3-Dichloropropylene	ug/L			<0.5	<0.2	<0.2	<0.2	<0.2
Tetrachloroethylene	ug/L	MAC	30	<0.5	<0.3	<0.3	<0.3	<0.3
Toluene	ug/L	AO	24	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	ug/L	MAC	5	<0.4	<0.3	<0.3	<0.3	<0.3
Trichlorofluoromethane	ug/L			<1.0	<0.5	<0.5	<0.5	<0.5
Vinyl Chloride	ug/L	MAC	2	<0.5	<0.2	<0.2	<0.2	<0.2
cis+trans1,3-dichloropropene	ug/L			<0.4				
Acetone	ug/L							
m/p,o Xylene	ug/L							
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L			<0.4				
o-Dichlorobenzene	ug/L			<0.4				
p-Dichlorobenzene	ug/L			<0.4				
VOC SURROGATES								
1,2-dichloroethane-d4	%				103			94
4-bromofluorobenzene	%				99			96
Toluene-d8	%				103			105

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **96-1D**

REPORT OF ORGANIC ANALYSIS **ODWSOG**

PARAMETER	TYPE	LIMIT	UNITS	Apr-14	Oct-14	Jun-15	Oct-15 (95-3D)	May-16
1,1,1,2-tetrachloroethane	ug/L			< 0.1	< 0.1	<0.1	<0.1	<0.10
1,1,1-trichloroethane	ug/L			< 0.1	< 0.1	<0.1	<0.1	<0.30
1,1,2,2-tetrachloroethane	ug/L			< 0.4	< 0.4	<0.4	<0.4	<0.10
1,1,2-trichloroethane	ug/L			< 0.1	< 0.1	<0.1	<0.1	<0.20
1,1-dichloroethane	ug/L			< 0.1	< 0.1	<0.1	<0.1	<0.30
1,1-dichloroethylene	ug/L	MAC	14	< 0.1	< 0.1	<0.1	<0.1	<0.30
1,2-dibromoethane	ug/L			< 0.1	< 0.1	<0.1	<0.1	<0.10
1,2-dichlorobenzene	ug/L	MAC	200	< 0.1	< 0.1	<0.1	<0.1	<0.10
1,2-dichloroethane	ug/L	IMAC	5	< 0.1	< 0.1	<0.1	<0.1	<0.20
1,2-dichloropropane	ug/L			< 0.1	< 0.1	<0.1	<0.1	<0.20
1,3,5-trimethylbenzene	ug/L							<0.20
1,3-dichlorobenzene	ug/L			< 0.1	< 0.1	<0.1	<0.1	<0.10
1,4-dichlorobenzene	ug/L	MAC	5	< 0.2	< 0.2	<0.2	<0.2	<0.10
1,2,4-Trichlorobenzene								<0.30
Benzene	ug/L	MAC	5	< 0.5	< 0.5	<0.5	<0.5	<0.20
Bromodichloromethane	ug/L			< 0.1	< 0.1	<0.1	<0.1	<0.20
Bromoform	ug/L			< 0.1	< 0.1	<0.1	<0.1	<0.10
Bromomethane	ug/L			< 0.3	< 0.3	<0.3	<0.3	<0.20
cis-1,2-Dichloroethylene	ug/L			< 0.1	< 0.1	<0.1	<0.1	<0.20
cis-1,3-Dichloropropylene	ug/L			< 0.1	< 0.1	<0.1	<0.1	<0.20
Carbon Tetrachloride	ug/L	MAC	5	< 0.2	< 0.2	<0.2	<0.2	<0.20
Chloroethane	ug/L							<0.20
Chloroform	ug/L			< 0.3	< 0.3	<0.3	<0.3	<0.20
Chloromethane	ug/L					<0.1	<0.1	<0.40
Dibromochloromethane	ug/L			< 0.1	< 0.1	<0.1	<0.1	<0.10
Dichlorodifluromethane				< 1	< 1	<1	<1	<0.20
Dichloromethane	ug/L	MAC	50	< 0.3	< 0.3	<0.3	<0.3	<0.30
Ethylbenzene	ug/L	AO	1.6	< 0.5	< 0.5	<0.5	<0.5	<0.10
m/p-xylene	ug/L			< 0.4	< 0.4	<0.4	<0.4	<0.20
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	< 0.2	< 0.2	<0.2	<0.2	<0.10
o-xylene	ug/L			< 0.1	< 0.1	<0.1	<0.1	<0.10
Styrene	ug/L			< 0.5	< 0.5	<0.5	<0.5	<0.10
trans-1,2-Dichloroethylene	ug/L			< 0.1	< 0.1	<0.1	<0.1	<0.20
trans-1,3-Dichloropropylene	ug/L			< 0.1	< 0.1	<0.1	<0.1	<0.30
Tetrachloroethylene	ug/L	MAC	30	< 0.2	< 0.2	<0.2	<0.2	<0.20
Toluene	ug/L	AO	24	< 0.5	< 0.5	<0.5	<0.5	<0.20
Trichloroethylene	ug/L	MAC	5	< 0.1	< 0.1	<0.1	<0.1	<0.20
Trichlorofluoromethane	ug/L			< 0.1	< 0.1	<0.1	<0.1	<0.40
Vinyl Chloride	ug/L	MAC	2	< 0.2	< 0.2	<0.2	<0.2	<0.17
cis+trans1,3-dichloropropene	ug/L			< 0.1	< 0.1	<0.1	<0.1	<0.30
Acetone	ug/L			< 2	< 2	<2	<2	<1.0
m/p,o Xylene	ug/L			< 0.4	< 0.4	<0.4	<0.4	<0.20
Hexane	ug/L			< 1	< 1	<1	<1	<0.20
2-Hexanone								<1.0
Methyl Ethyl Ketone	ug/L			< 1	< 1	<1	<1	<1.0
Methyl Isobutyl Ketone	ug/L			< 1	< 1	<1	<1	<1.0
Methyl-t-butyl Ether	ug/L		15	< 1	< 1	<1	<1	<0.20
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%			98.0	98	107	107	83
4-bromofluorobenzene	%			81.8	108	99	99	99
Toluene-d8	%			102	117	87	86	

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS | **GUIDELINE** | **96-1D**

REPORT OF ORGANIC ANALYSIS | **ODWSOG**

PARAMETER	TYPE	LIMIT	UNITS	Nov-16	Apr-17	Oct-17	May-18	Oct-18
1,1,1,2-tetrachloroethane	ug/L			<0.10	< 0.1	< 0.1	< 0.5	< 0.5
1,1,1-trichloroethane	ug/L			<0.30	< 0.1	< 0.1	< 0.4	< 0.4
1,1,2,2-tetrachloroethane	ug/L			<0.10	< 0.4	< 0.4	< 0.5	< 0.5
1,1,2-trichloroethane	ug/L			<0.20	< 0.1	< 0.1	< 0.4	< 0.4
1,1-dichloroethane	ug/L			<0.30	< 0.1	< 0.1	< 0.4	< 0.4
1,1-dichloroethylene	ug/L	MAC	14	<0.30	< 0.1	< 0.1	<0.5	< 0.5
1,2-dibromoethane	ug/L			<0.10			< 0.2	< 0.2
1,2-dichlorobenzene	ug/L	MAC	200	<0.10	< 0.1	< 0.1	< 0.4	< 0.4
1,2-dichloroethane	ug/L	IMAC	5	<0.20	< 0.1	< 0.1	< 0.2	<0.2
1,2-dichloropropane	ug/L			<0.20	< 0.1	< 0.1	< 0.5	< 0.5
1,3,5-trimethylbenzene	ug/L			<0.20			< 0.3	< 0.3
1,3-dichlorobenzene	ug/L			<0.10	< 0.1	< 0.1	< 0.4	< 0.4
1,4-dichlorobenzene	ug/L	MAC	5	<0.10	< 0.2	< 0.2	< 0.4	< 0.4
1,2,4-Trichlorobenzene				<0.30				
Benzene	ug/L	MAC	5	<0.20	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	ug/L			<0.20	< 0.1	< 0.1	< 0.3	< 0.3
Bromoform	ug/L			<0.10	< 0.1	< 0.1	< 0.4	< 0.4
Bromomethane	ug/L			<0.20	< 0.3	< 0.3	< 0.5	< 0.5
cis-1,2-Dichloroethylene	ug/L			<0.20	< 0.1	< 0.1	< 0.4	< 0.4
cis-1,3-Dichloropropylene	ug/L			<0.20	< 0.1	< 0.1	< 0.2	< 0.2
Carbon Tetrachloride	ug/L	MAC	5	<0.20	< 0.2	< 0.2	< 0.2	< 0.2
Chloroethane	ug/L			<0.20			< 0.2	< 0.2
Chloroform	ug/L			<0.20	< 0.3	< 0.3	< 0.5	< 0.5
Chloromethane	ug/L			<0.40			< 0.2	< 0.2
Dibromochloromethane	ug/L			<0.10	< 0.1	< 0.1	< 0.3	< 0.3
Dichlorodifluromethane				<0.20	< 1	< 1	< 0.5	< 0.5
Dichloromethane	ug/L	MAC	50	<0.30	< 0.3	< 0.3	< 4.0	< 4.0
Ethylbenzene	ug/L	AO	1.6	<0.10	< 0.5	< 0.5	< 0.5	< 0.5
m/p-xylene	ug/L			<0.20	< 0.4	< 0.4	< 0.4	< 0.4
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.10	< 0.2	< 0.2	< 0.5	< 0.5
o-xylene	ug/L			<0.10	< 0.1	< 0.1	< 0.4	< 0.4
Styrene	ug/L			<0.10	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,2-Dichloroethylene	ug/L			<0.20	< 0.1	< 0.1	< 0.4	< 0.4
trans-1,3-Dichloropropylene	ug/L			<0.30	< 0.1	< 0.1	< 0.2	< 0.2
Tetrachloroethylene	ug/L	MAC	30	<0.20	< 0.2	< 0.2	< 0.3	< 0.3
Toluene	ug/L	AO	24	<0.20	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	ug/L	MAC	5	<0.20	< 0.1	< 0.1	< 0.3	< 0.3
Trichlorofluoromethane	ug/L			<0.40	< 0.1	< 0.1	< 0.5	< 0.5
Vinyl Chloride	ug/L	MAC	2	<0.17	< 0.2	< 0.2	< 0.2	< 0.2
cis+trans1,3-dichloropropene	ug/L			<0.30	< 0.1	< 0.1		
Acetone	ug/L			<1.0	< 2	< 2		
m/p,o Xylene	ug/L			<0.20	< 0.4	< 0.4	< 0.5	< 0.5
Hexane	ug/L			<0.20	< 1	< 1		
2-Hexanone				<1.0				
Methyl Ethyl Ketone	ug/L			<1.0	< 1	< 1		
Methyl Isobutyl Ketone	ug/L			<1.0	< 1	< 1		
Methyl-t-butyl Ether	ug/L		15	<0.20	< 1	< 1		
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L					< 0.1		
p-Dichlorobenzene	ug/L				< 0.1			
VOC SURROGATES								
1,2-dichloroethane-d4	%				107	103	102	103
4-bromofluorobenzene	%			85	100	115	110	123
Toluene-d8	%			130	106	96	90	96

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS | **GUIDELINE** | **96-1S**

REPORT OF ORGANIC ANALYSIS | **ODWSOG** | May-08 | Apr-14 | Oct-14 | Oct-17 | May-18

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L			<0.5	< 0.1	< 0.1	< 0.1	< 0.5
1,1,1-trichloroethane	ug/L			<0.4	< 0.1	< 0.1	< 0.1	< 0.4
1,1,2,2-tetrachloroethane	ug/L			<0.5	< 0.4	< 0.4	< 0.4	< 0.5
1,1,2-trichloroethane	ug/L			<0.4	< 0.1	< 0.1	< 0.1	< 0.4
1,1-dichloroethane	ug/L			<0.4	< 0.1	< 0.1	< 0.1	< 0.4
1,1-dichloroethylene	ug/L	MAC	14	<0.5	< 0.1	< 0.1	< 0.1	< 0.5
1,2-dibromoethane	ug/L			<1.0	< 0.1	< 0.1		< 0.2
1,2-dichlorobenzene	ug/L	MAC	200	<0.4	< 0.1	< 0.1	< 0.1	< 0.4
1,2-dichloroethane	ug/L	IMAC	5	<0.5	< 0.1	< 0.1	< 0.1	< 0.2
1,2-dichloropropane	ug/L			<0.5	< 0.1	< 0.1	< 0.1	< 0.5
1,3,5-trimethylbenzene	ug/L			<0.3				< 0.3
1,3-dichlorobenzene	ug/L			<0.4	< 0.1	< 0.1	< 0.1	< 0.4
1,4-dichlorobenzene	ug/L	MAC	5	<0.4	< 0.2	< 0.2	< 0.2	< 0.4
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane	ug/L			<0.3	< 0.1	< 0.1	< 0.1	< 0.3
Bromoform	ug/L			<0.4	< 0.1	< 0.1	< 0.1	< 0.4
Bromomethane	ug/L			<0.5	< 0.3	< 0.3	< 0.3	< 0.5
cis-1,2-Dichloroethylene	ug/L			<0.4	< 0.1	< 0.1	< 0.1	< 0.4
cis-1,3-Dichloropropylene	ug/L			<0.2	< 0.1	< 0.1	< 0.1	< 0.2
Carbon Tetrachloride	ug/L	MAC	5	<0.5	< 0.2	< 0.2	< 0.2	< 0.2
Chloroethane	ug/L			<1.0				< 0.2
Chloroform	ug/L			<0.5	< 0.3	< 0.3	< 0.3	< 0.5
Chloromethane	ug/L			<1.0				< 0.2
Dibromochloromethane	ug/L			<0.3	< 0.1	< 0.1	< 0.1	< 0.3
Dichlorodifluromethane					< 1	< 1	< 1	< 0.5
Dichloromethane	ug/L	MAC	50	<4.0	< 0.3	< 0.3	< 0.3	< 4.0
Ethylbenzene	ug/L	AO	1.6	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
m/p-xylene	ug/L			<1.0	< 0.4	< 0.4	< 0.4	< 0.4
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.2	< 0.2	< 0.2	< 0.2	< 0.5
o-xylene	ug/L			<0.5	< 0.1	< 0.1	< 0.1	< 0.4
Styrene	ug/L			<0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,2-Dichloroethylene	ug/L			<0.4	< 0.1	< 0.1	< 0.1	< 0.4
trans-1,3-Dichloropropylene	ug/L			<0.2	< 0.1	< 0.1	< 0.1	< 0.2
Tetrachloroethylene	ug/L	MAC	30	<0.3	< 0.2	< 0.2	< 0.2	< 0.3
Toluene	ug/L	AO	24	<0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene	ug/L	MAC	5	<0.3	< 0.1	< 0.1	< 0.1	< 0.3
Trichlorofluoromethane	ug/L			<0.5	< 0.1	< 0.1	< 0.1	< 0.5
Vinyl Chloride	ug/L	MAC	2	<0.2	< 0.2	< 0.2	< 0.2	< 0.2
cis+trans1,3-dichloropropene	ug/L				< 0.1	< 0.1	< 0.1	
Acetone	ug/L				< 2	< 2	< 2	
m/p,o Xylene	ug/L				< 0.4	< 0.4	< 0.4	< 0.5
Hexane	ug/L				< 1	< 1	< 1	
2-Hexanone								
Methyl Ethyl Ketone	ug/L				< 1	< 1	< 1	
Methyl Isobutyl Ketone	ug/L				< 1	< 1	< 1	
Methyl-t-butyl Ether	ug/L		15		< 1	< 1	< 1	
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L						< 0.1	
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%				99.6	94	104	95
4-bromofluorobenzene	%				85	110	115	114
Toluene-d8	%				105	117	94	96

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **96-1S**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Oct-18

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L			< 0.5				
1,1,1-trichloroethane	ug/L			< 0.4				
1,1,2,2-tetrachloroethane	ug/L			< 0.5				
1,1,2-trichloroethane	ug/L			< 0.4				
1,1-dichloroethane	ug/L			< 0.4				
1,1-dichloroethylene	ug/L	MAC	14	< 0.5				
1,2-dibromoethane	ug/L			< 0.2				
1,2-dichlorobenzene	ug/L	MAC	200	< 0.4				
1,2-dichloroethane	ug/L	IMAC	5	< 0.2				
1,2-dichloropropane	ug/L			< 0.5				
1,3,5-trimethylbenzene	ug/L			< 0.3				
1,3-dichlorobenzene	ug/L			< 0.4				
1,4-dichlorobenzene	ug/L	MAC	5	< 0.4				
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	< 0.5				
Bromodichloromethane	ug/L			< 0.3				
Bromoform	ug/L			< 0.4				
Bromomethane	ug/L			< 0.5				
cis-1,2-Dichloroethylene	ug/L			< 0.4				
cis-1,3-Dichloropropylene	ug/L			< 0.2				
Carbon Tetrachloride	ug/L	MAC	5	< 0.2				
Chloroethane	ug/L			< 0.2				
Chloroform	ug/L			< 0.5				
Chloromethane	ug/L			< 0.2				
Dibromochloromethane	ug/L			< 0.3				
Dichlorodifluromethane				< 0.5				
Dichloromethane	ug/L	MAC	50	< 4.0				
Ethylbenzene	ug/L	AO	1.6	< 0.5				
m/p-xylene	ug/L			< 0.4				
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	< 0.5				
o-xylene	ug/L			< 0.4				
Styrene	ug/L			< 0.5				
trans-1,2-Dichloroethylene	ug/L			< 0.4				
trans-1,3-Dichloropropylene	ug/L			< 0.2				
Tetrachloroethylene	ug/L	MAC	30	< 0.3				
Toluene	ug/L	AO	24	< 0.5				
Trichloroethylene	ug/L	MAC	5	< 0.3				
Trichlorofluoromethane	ug/L			< 0.5				
Vinyl Chloride	ug/L	MAC	2	< 0.2				
cis+trans1,3-dichloropropene	ug/L							
Acetone	ug/L							
m/p,o Xylene	ug/L			< 0.5				
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%			99				
4-bromofluorobenzene	%			116				
Toluene-d8	%			93				

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **07-F**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Oct-07 Nov-08 May-09

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5		
1,1,1-trichloroethane	ug/L			<0.4	<0.4	<0.4		
1,1,2,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5		
1,1,2-trichloroethane	ug/L			<0.4	<0.4	<0.4		
1,1-dichloroethane	ug/L			<0.4	<0.4	<0.4		
1,1-dichloroethylene	ug/L	MAC	14	<0.5	<0.5	<0.5		
1,2-dibromoethane	ug/L			<1.0	<1.0	<1.0		
1,2-dichlorobenzene	ug/L	MAC	200	<0.4	<0.4	<0.4		
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.5	<0.5		
1,2-dichloropropane	ug/L			<0.5	<0.5	<0.5		
1,3,5-trimethylbenzene	ug/L			<0.3	<0.3	<0.3		
1,3-dichlorobenzene	ug/L			<0.4	<0.4	<0.4		
1,4-dichlorobenzene	ug/L	MAC	5	<0.4	<0.4	<0.4		
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<0.5	<0.5	<0.5		
Bromodichloromethane	ug/L			<0.3	<0.3	<0.3		
Bromoform	ug/L			<0.4	<0.4	<0.4		
Bromomethane	ug/L			<0.5	<0.5	<0.5		
cis-1,2-Dichloroethylene	ug/L			<0.4	<0.4	<0.4		
cis-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2		
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5	<0.5		
Chloroethane	ug/L			<1.0	<1.0	<1.0		
Chloroform	ug/L			<0.5	<0.5	<0.5		
Chloromethane	ug/L			<1.0	<1.0	<1.0		
Dibromochloromethane	ug/L			<0.3	<0.3	<0.3		
Dichlorodifluromethane								
Dichloromethane	ug/L	MAC	50	<4.0	<4.0	<4.0		
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.5	<0.5		
m/p-xylene	ug/L			<1.0	<1.0	<1.0		
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.2	<0.2	<0.2		
o-xylene	ug/L			<0.5	<0.5	<0.5		
Styrene	ug/L			<0.5	<0.5	<0.5		
trans-1,2-Dichloroethylene	ug/L			<0.4	<0.4	<0.4		
trans-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2		
Tetrachloroethylene	ug/L	MAC	30	<0.3	<0.3	<0.3		
Toluene	ug/L	AO	24	<0.5	<0.5	<0.5		
Trichloroethylene	ug/L	MAC	5	<0.3	<0.3	<0.3		
Trichlorofluoromethane	ug/L			<0.5	<0.5	<0.5		
Vinyl Chloride	ug/L	MAC	2	<0.2	<0.2	<0.2		
cis+trans1,3-dichloropropene	ug/L							
Acetone	ug/L							
m/p,o Xylene	ug/L							
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%					115		
4-bromofluorobenzene	%					88		
Toluene-d8	%					111		

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **07-FD**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Nov-08 May-09 Sep-09 Oct-11

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5	<1	
1,1,1-trichloroethane	ug/L			<0.4	<0.4	<0.4	<0.8	
1,1,2,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5	<1	
1,1,2-trichloroethane	ug/L			<0.4	<0.4	<0.4	<0.8	
1,1-dichloroethane	ug/L			<0.4	1	<0.4	<0.8	
1,1-dichloroethylene	ug/L	MAC	14	<0.5	<0.5	<0.5	<1	
1,2-dibromoethane	ug/L			<1.0	<1.0	<1.0	<0.4	
1,2-dichlorobenzene	ug/L	MAC	200	<0.4	<0.4	<0.4	<0.8	
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.5	<0.5	<0.4	
1,2-dichloropropane	ug/L			<0.5	<0.5	<0.5	<1	
1,3,5-trimethylbenzene	ug/L			<0.3	<0.3	<0.3	<0.6	
1,3-dichlorobenzene	ug/L			<0.4	<0.4	<0.4	<0.8	
1,4-dichlorobenzene	ug/L	MAC	5	0.5	1	0.6	<0.8	
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<0.5	<0.5	1	<1	
Bromodichloromethane	ug/L			<0.3	<0.3	<0.3	<0.6	
Bromoform	ug/L			<0.4	<0.4	<0.4	<0.8	
Bromomethane	ug/L			<0.5	<0.5	<0.5	<1	
cis-1,2-Dichloroethylene	ug/L			47.1	123	61.0	<0.8	
cis-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2	<0.4	
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5	<0.5	<1	
Chloroethane	ug/L			<1.0	3	1	<0.4	
Chloroform	ug/L			0.9	<0.5	<0.5	<1	
Chloromethane	ug/L			<1.0	<1.0	<1.0	<0.4	
Dibromochloromethane	ug/L			<0.3	<0.3	<0.3	<0.6	
Dichlorodifluromethane							<1	
Dichloromethane	ug/L	MAC	50	<4.0	<4.0	9	<8.0	
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.5	<0.5	<1	
m/p-xylene	ug/L			<1.0	<1.0	2	<1	
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	2.0	3	3.5	2.7	
o-xylene	ug/L			0.5	1	0.9	<1	
Styrene	ug/L			<0.5	<0.5	<0.5	<1	
trans-1,2-Dichloroethylene	ug/L			<0.4	1	<0.4	<0.8	
trans-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2	<0.4	
Tetrachloroethylene	ug/L	MAC	30	<0.3	<0.3	<0.3	<0.6	
Toluene	ug/L	AO	24	1.4	<0.5	3.5	<1	
Trichloroethylene	ug/L	MAC	5	<0.3	<0.3	<0.3	<0.6	
Trichlorofluoromethane	ug/L			<0.5	<0.5	<0.5	<1	
Vinyl Chloride	ug/L	MAC	2	8.3	31	13.8	<0.4	
cis+trans1,3-dichloropropene	ug/L							
Acetone	ug/L							
m/p,o Xylene	ug/L						<1.0	
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%				96		103	
4-bromofluorobenzene	%				78		108	
Toluene-d8	%				108		99	

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **07-2S**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Sep-09 Sep-09

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L			<0.5	<0.5			
1,1,1-trichloroethane	ug/L			<0.4	<0.4			
1,1,2,2-tetrachloroethane	ug/L			<0.5	<0.5			
1,1,2-trichloroethane	ug/L			<0.4	<0.4			
1,1-dichloroethane	ug/L			<0.4	<0.4			
1,1-dichloroethylene	ug/L	MAC	14	<0.5	<0.5			
1,2-dibromoethane	ug/L			<1.0	<1.0			
1,2-dichlorobenzene	ug/L	MAC	200	<0.4	<0.4			
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.5			
1,2-dichloropropane	ug/L			<0.5	<0.5			
1,3,5-trimethylbenzene	ug/L			<0.3	<0.3			
1,3-dichlorobenzene	ug/L			<0.4	<0.4			
1,4-dichlorobenzene	ug/L	MAC	5	<0.4	0.8			
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<0.5	1			
Bromodichloromethane	ug/L			<0.3	<0.3			
Bromoform	ug/L			<0.4	<0.4			
Bromomethane	ug/L			<0.5	<0.5			
cis-1,2-Dichloroethylene	ug/L			<0.4	4.5			
cis-1,3-Dichloropropylene	ug/L			<0.2	<0.2			
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5			
Chloroethane	ug/L			<1.0	2			
Chloroform	ug/L			<0.5	<0.5			
Chloromethane	ug/L			<1.0	<1.0			
Dibromochloromethane	ug/L			<0.3	<0.3			
Dichlorodifluromethane								
Dichloromethane	ug/L	MAC	50	9	9			
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.5			
m/p-xylene	ug/L			<1.0	<1.0			
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.2	1.4			
o-xylene	ug/L			<0.5	<0.5			
Styrene	ug/L			<0.5	<0.5			
trans-1,2-Dichloroethylene	ug/L			<0.4	<0.4			
trans-1,3-Dichloropropylene	ug/L			<0.2	<0.2			
Tetrachloroethylene	ug/L	MAC	30	<0.3	<0.3			
Toluene	ug/L	AO	24	<0.5	<0.5			
Trichloroethylene	ug/L	MAC	5	<0.3	<0.3			
Trichlorofluoromethane	ug/L			<0.5	<0.5			
Vinyl Chloride	ug/L	MAC	2	<0.2	3.7			
cis+trans1,3-dichloropropene	ug/L							
Acetone	ug/L							
m/p,o Xylene	ug/L							
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%			111	117			
4-bromofluorobenzene	%			95	93			
Toluene-d8	%			105	107			

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS | **GUIDELINE** | **07-3D**

REPORT OF ORGANIC ANALYSIS | **ODWSOG**

PARAMETER	TYPE	LIMIT	UNITS	Oct-07	May-08	Nov-08	May-09	May-09 DUP
1,1,1,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-trichloroethane	ug/L			<0.4	<0.4	<0.4	<0.4	<0.4
1,1,2,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-trichloroethane	ug/L			<0.4	<0.4	<0.4	<0.4	<0.4
1,1-dichloroethane	ug/L			3.0	1	1.1	0.6	0.6
1,1-dichloroethylene	ug/L	MAC	14	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dibromoethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichlorobenzene	ug/L	MAC	200	0.6	<0.4	0.4	<0.4	<0.4
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dichloropropane	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
1,3,5-trimethylbenzene	ug/L			<0.3	<0.3	0.5	<0.3	<0.3
1,3-dichlorobenzene	ug/L			<0.4	<0.4	<0.4	<0.4	<0.4
1,4-dichlorobenzene	ug/L	MAC	5	4.4	2.5	3.8	1.5	1.6
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	3.3	1.5	2.6	1.5	1.5
Bromodichloromethane	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3
Bromoform	ug/L			<0.4	<0.4	<0.4	<0.4	<0.4
Bromomethane	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	ug/L			62.8	57	202	17	17
cis-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	ug/L			7.7	8.2	7.3	<1.0	4.1
Chloroform	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
Chloromethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3
Dichlorodifluromethane								
Dichloromethane	ug/L	MAC	50	<4.0	<4.0	<4.0	<4.0	<4.0
Ethylbenzene	ug/L	AO	1.6	1.8	1.4	1.1	2.1	2.1
m/p-xylene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	17.3	8.1	17.6	6.7	6.5
o-xylene	ug/L			2.8	1.4	2.5	1.5	1.5
Styrene	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	ug/L			3.0	3.6	2.2	3.6	3.6
trans-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2
Tetrachloroethylene	ug/L	MAC	30	<0.3	<0.3	<0.3	<0.3	<0.3
Toluene	ug/L	AO	24	3.7	0.9	2.4	1.1	0.9
Trichloroethylene	ug/L	MAC	5	<0.3	<0.3	<0.3	<0.3	<0.3
Trichlorofluoromethane	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
Vinyl Chloride	ug/L	MAC	2	75.0	46	123	22	22
cis+trans1,3-dichloropropene	ug/L							
Acetone	ug/L							
m/p,o Xylene	ug/L							
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%						112	103
4-bromofluorobenzene	%						86	82
Toluene-d8	%						105	112

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **07-3D**

REPORT OF ORGANIC ANALYSIS **ODWSOG**

PARAMETER	TYPE	LIMIT	UNITS	Sep-09	Oct-11	Oct-12	May-16	Apr-17
1,1,1,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5	<0.10	< 0.1
1,1,1-trichloroethane	ug/L			<0.4	<0.4	<0.4	<0.30	< 0.1
1,1,2,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5	<0.10	< 0.4
1,1,2-trichloroethane	ug/L			<0.4	<0.4	<0.4	<0.20	< 0.1
1,1-dichloroethane	ug/L			0.4	0	<0.4	0.51	< 0.1
1,1-dichloroethylene	ug/L	MAC	14	<0.5	<0.5	<0.5	<0.30	< 0.1
1,2-dibromoethane	ug/L			<1.0	<0.2	<0.2	<0.10	< 0.1
1,2-dichlorobenzene	ug/L	MAC	200	<0.4	<0.4	<0.4	0.43	< 0.1
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.2	<0.2	<0.20	< 0.1
1,2-dichloropropane	ug/L			<0.5	<0.5	<0.5	<0.20	< 0.1
1,3,5-trimethylbenzene	ug/L			<0.3	0	<0.3	<0.20	
1,3-dichlorobenzene	ug/L			<0.4	<0.4	<0.4	<0.10	< 0.1
1,4-dichlorobenzene	ug/L	MAC	5	2.1	2.7	2.7	3.2	< 0.2
1,2,4-Trichlorobenzene							<0.30	
Benzene	ug/L	MAC	5	1.3	<0.5	1.1	1.3	< 0.5
Bromodichloromethane	ug/L			<0.3	<0.3	<0.3	<0.20	< 0.1
Bromoform	ug/L			<0.4	<0.4	<0.4	<0.10	< 0.1
Bromomethane	ug/L			<0.5	<0.5	<0.5	<0.20	< 0.3
cis-1,2-Dichloroethylene	ug/L			159	126	<0.4	170	58.8
cis-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2	<0.20	< 0.1
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5	<0.5	<0.20	< 0.2
Chloroethane	ug/L			2.0	2.8	<0.2	2.1	
Chloroform	ug/L			<0.5	<0.5	<0.5	<0.20	< 0.3
Chloromethane	ug/L			<1.0	<0.2	<0.2	<0.40	
Dibromochloromethane	ug/L			<0.3	<0.3	<0.3	<0.10	< 0.1
Dichlorodifluromethane					<0.5	<0.5	0.36	< 1
Dichloromethane	ug/L	MAC	50	12	<4.0	<4.0	<0.30	< 0.3
Ethylbenzene	ug/L	AO	1.6	1.1	<0.5	<0.5	1.2	< 0.5
m/p-xylene	ug/L			<1.0	<0.5	<0.5	0.28	< 0.4
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	9.9	13.5	16.2	18	7.6
o-xylene	ug/L			1.0	1.0	0.9	0.76	< 0.1
Styrene	ug/L			<0.5	<0.5	<0.5	<0.10	< 0.5
trans-1,2-Dichloroethylene	ug/L			1.6	1.4	<0.4	2.0	0.7
trans-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2	<0.30	< 0.1
Tetrachloroethylene	ug/L	MAC	30	<0.3	<0.3	<0.3	<0.20	< 0.2
Toluene	ug/L	AO	24	1.4	0.7	0.7	0.68	< 0.5
Trichloroethylene	ug/L	MAC	5	<0.3	<0.3	<0.3	<0.20	< 0.1
Trichlorofluoromethane	ug/L			<0.5	<0.5	<0.5	<0.40	< 0.1
Vinyl Chloride	ug/L	MAC	2	93	62.7	42.7	63	19.8
cis+trans1,3-dichloropropene	ug/L						<0.30	< 0.1
Acetone	ug/L						<1.0	4
m/p,o Xylene	ug/L				1.0	<0.10	1.0	< 0.4
Hexane	ug/L						<0.20	< 1
2-Hexanone							<1.0	
Methyl Ethyl Ketone	ug/L						<1.0	< 1
Methyl Isobutyl Ketone	ug/L						<1.0	< 1
Methyl-t-butyl Ether	ug/L		15				<0.20	< 1
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%			95	105	108	118	107
4-bromofluorobenzene	%			95	102	104	93	98
Toluene-d8	%			107	99	99		106

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **07-3D**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Oct-17 May-18 Oct-18

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L			< 0.1	< 0.5	< 0.5		
1,1,1-trichloroethane	ug/L			< 0.1	< 0.4	< 0.4		
1,1,2,2-tetrachloroethane	ug/L			< 0.4	< 0.5	< 0.5		
1,1,2-trichloroethane	ug/L			< 0.1	< 0.4	< 0.4		
1,1-dichloroethane	ug/L			0.3	< 0.4	< 0.4		
1,1-dichloroethylene	ug/L	MAC	14	< 0.1	0.9	< 0.5		
1,2-dibromoethane	ug/L				< 0.2	< 0.2		
1,2-dichlorobenzene	ug/L	MAC	200	0.2	< 0.4	< 0.4		
1,2-dichloroethane	ug/L	IMAC	5	< 0.1	< 0.2	< 0.2		
1,2-dichloropropane	ug/L			< 0.1	< 0.5	< 0.5		
1,3,5-trimethylbenzene	ug/L				< 0.3	< 0.3		
1,3-dichlorobenzene	ug/L			< 0.1	< 0.4	< 0.4		
1,4-dichlorobenzene	ug/L	MAC	5	2.2	1.9	1.7		
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	0.6	1	0.7		
Bromodichloromethane	ug/L			< 0.1	< 0.3	< 0.3		
Bromoform	ug/L			< 0.1	< 0.4	< 0.4		
Bromomethane	ug/L			< 0.3	< 0.5	< 0.5		
cis-1,2-Dichloroethylene	ug/L			48.8	92.3	45.7		
cis-1,3-Dichloropropylene	ug/L			< 0.1	< 0.2	< 0.2		
Carbon Tetrachloride	ug/L	MAC	5	< 0.2	< 0.2	< 0.2		
Chloroethane	ug/L				< 0.2	< 0.2		
Chloroform	ug/L			< 0.3	< 0.5	< 0.5		
Chloromethane	ug/L				< 0.2	1		
Dibromochloromethane	ug/L			< 0.1	< 0.3	< 0.3		
Dichlorodifluromethane				< 1	< 0.5	< 0.3		
Dichloromethane	ug/L	MAC	50	< 0.3	< 4.0	< 4.0		
Ethylbenzene	ug/L	AO	1.6	< 0.5	< 0.5	< 0.5		
m/p-xylene	ug/L			< 0.4	< 0.4	< 0.4		
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	11.1	11.3	8.9		
o-xylene	ug/L			< 0.1	< 0.4	< 0.4		
Styrene	ug/L			< 0.5	< 0.5	< 0.5		
trans-1,2-Dichloroethylene	ug/L			0.5	0.9	0.5		
trans-1,3-Dichloropropylene	ug/L			< 0.1	< 0.2	< 0.2		
Tetrachloroethylene	ug/L	MAC	30	< 0.2	< 0.3	< 0.3		
Toluene	ug/L	AO	24	< 0.5	< 0.5	0.6		
Trichloroethylene	ug/L	MAC	5	< 0.1	< 0.3	0.4		
Trichlorofluoromethane	ug/L			< 0.1	< 0.5	< 0.5		
Vinyl Chloride	ug/L	MAC	2	25	33	14.9		
cis+trans1,3-dichloropropene	ug/L			< 0.1				
Acetone	ug/L			4				
m/p,o Xylene	ug/L			< 0.4	< 0.5	< 0.5		
Hexane	ug/L			< 1				
2-Hexanone								
Methyl Ethyl Ketone	ug/L			< 1				
Methyl Isobutyl Ketone	ug/L			< 1				
Methyl-t-butyl Ether	ug/L		15	< 1				
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L			< 0.1				
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%			102	102	97		
4-bromofluorobenzene	%			116	110	118		
Toluene-d8	%			93	89	92		

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **07-3S**

REPORT OF ORGANIC ANALYSIS **ODWSOG**

PARAMETER	TYPE	LIMIT	UNITS	Oct-07	May-08	Nov-08	May-09	Sep-09
1,1,1,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
1,1,1-trichloroethane	ug/L			<0.4	<0.4	<0.4	<0.4	<0.4
1,1,2,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
1,1,2-trichloroethane	ug/L			<0.4	<0.4	<0.4	<0.4	<0.4
1,1-dichloroethane	ug/L			<0.4	<0.4	<0.4	<0.4	<0.4
1,1-dichloroethylene	ug/L	MAC	14	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dibromoethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
1,2-dichlorobenzene	ug/L	MAC	200	<0.4	<0.4	<0.4	<0.4	<0.4
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.5	<0.5	<0.5	<0.5
1,2-dichloropropane	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
1,3,5-trimethylbenzene	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3
1,3-dichlorobenzene	ug/L			<0.4	<0.4	<0.4	<0.4	<0.4
1,4-dichlorobenzene	ug/L	MAC	5	<0.4	<0.4	<0.4	<0.4	<0.4
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<0.5	<0.5	<0.5	<0.5	<0.5
Bromodichloromethane	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3
Bromoform	ug/L			<0.4	<0.4	<0.4	<0.4	<0.4
Bromomethane	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
cis-1,2-Dichloroethylene	ug/L			<0.4	<0.4	<0.4	1	<0.4
cis-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5	<0.5	<0.5	<0.5
Chloroethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
Chloroform	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
Chloromethane	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
Dibromochloromethane	ug/L			<0.3	<0.3	<0.3	<0.3	<0.3
Dichlorodifluromethane								
Dichloromethane	ug/L	MAC	50	<4.0	<4.0	<4.0	<4.0	10
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.5	<0.5	<0.5	<0.5
m/p-xylene	ug/L			<1.0	<1.0	<1.0	<1.0	<1.0
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.2	<0.2	<0.2	<0.2	<0.2
o-xylene	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
Styrene	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
trans-1,2-Dichloroethylene	ug/L			<0.4	<0.4	<0.4	<0.4	<0.4
trans-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2	<0.2	<0.2
Tetrachloroethylene	ug/L	MAC	30	<0.3	<0.3	<0.3	<0.3	<0.3
Toluene	ug/L	AO	24	<0.5	<0.5	<0.5	<0.5	<0.5
Trichloroethylene	ug/L	MAC	5	<0.3	<0.3	<0.3	<0.3	<0.3
Trichlorofluoromethane	ug/L			<0.5	<0.5	<0.5	<0.5	<0.5
Vinyl Chloride	ug/L	MAC	2	<0.2	<0.2	<0.2	<0.2	<0.2
cis+trans1,3-dichloropropene	ug/L							
Acetone	ug/L							
m/p,o Xylene	ug/L							
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%						103	109
4-bromofluorobenzene	%						83	95
Toluene-d8	%						110	107

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **07-3S**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Oct-12 May-16 Apr-17 Oct-17 May-18

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L			<0.5	<0.10	< 0.1	< 0.1	< 0.5
1,1,1-trichloroethane	ug/L			<0.4	<0.30	< 0.1	< 0.1	< 0.4
1,1,2,2-tetrachloroethane	ug/L			<0.5	<0.10	< 0.4	< 0.4	< 0.5
1,1,2-trichloroethane	ug/L			<0.4	<0.20	< 0.1	< 0.1	< 0.4
1,1-dichloroethane	ug/L			<0.4	<0.30	< 0.1	< 0.1	< 0.4
1,1-dichloroethylene	ug/L	MAC	14	<0.5	<0.30	< 0.1	< 0.1	< 0.5
1,2-dibromoethane	ug/L			<0.2	<0.10	< 0.1		< 0.2
1,2-dichlorobenzene	ug/L	MAC	200	<0.4	<0.10	< 0.1	< 0.1	< 0.4
1,2-dichloroethane	ug/L	IMAC	5	<0.2	<0.20	< 0.1	< 0.1	< 0.2
1,2-dichloropropane	ug/L			<0.5	<0.20	< 0.1	< 0.1	< 0.5
1,3,5-trimethylbenzene	ug/L			<0.3	<0.20			< 0.3
1,3-dichlorobenzene	ug/L			<0.4	<0.10	< 0.1	< 0.1	< 0.4
1,4-dichlorobenzene	ug/L	MAC	5	<0.4	<0.10	< 0.2	< 0.2	< 0.4
1,2,4-Trichlorobenzene					<0.30			
Benzene	ug/L	MAC	5	<0.5	<0.20	< 0.5	< 0.5	< 0.5
Bromodichloromethane	ug/L			<0.3	<0.20	< 0.1	< 0.1	< 0.3
Bromoform	ug/L			<0.4	<0.10	< 0.1	< 0.1	< 0.4
Bromomethane	ug/L			<0.5	<0.20	< 0.3	< 0.3	< 0.5
cis-1,2-Dichloroethylene	ug/L			<0.4	<0.20	< 0.1	< 0.1	< 0.4
cis-1,3-Dichloropropylene	ug/L			<0.2	<0.20	< 0.1	< 0.1	< 0.2
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.20	< 0.2	< 0.2	< 0.2
Chloroethane	ug/L			<0.2	<0.20			< 0.2
Chloroform	ug/L			<0.5	<0.20	< 0.3	< 0.3	< 0.5
Chloromethane	ug/L			<0.2	<0.40			< 0.2
Dibromochloromethane	ug/L			<0.3	<0.10	< 0.1	< 0.1	< 0.3
Dichlorodifluromethane				<0.5	<0.20	< 1	< 1	< 0.5
Dichloromethane	ug/L	MAC	50	<4.0	<0.30	< 0.3	< 0.3	< 4.0
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.10	< 0.5	< 0.5	< 0.5
m/p-xylene	ug/L			<0.5	<0.20	< 0.4	< 0.4	< 0.4
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.2	<0.10	< 0.2	< 0.2	< 0.5
o-xylene	ug/L			<0.5	<0.10	< 0.1	< 0.1	< 0.4
Styrene	ug/L			<0.5	<0.10	< 0.5	< 0.5	< 0.5
trans-1,2-Dichloroethylene	ug/L			<0.4	<0.20	< 0.1	< 0.1	< 0.4
trans-1,3-Dichloropropylene	ug/L			<0.2	<0.30	< 0.1	< 0.1	< 0.2
Tetrachloroethylene	ug/L	MAC	30	<0.3	<0.20	< 0.2	< 0.2	< 0.3
Toluene	ug/L	AO	24	<0.5	<0.20	< 0.5	< 0.5	< 0.5
Trichloroethylene	ug/L	MAC	5	<0.3	<0.20	< 0.1	< 0.1	< 0.3
Trichlorofluoromethane	ug/L			<0.5	<0.40	< 0.1	< 0.1	< 0.5
Vinyl Chloride	ug/L	MAC	2	<0.2	<0.17	< 0.2	< 0.2	< 0.2
cis+trans1,3-dichloropropene	ug/L				<0.30	< 0.1	< 0.1	
Acetone	ug/L				<1.0	< 2	< 2	
m/p,o Xylene	ug/L			<1	<0.20	< 0.4	< 0.4	< 0.5
Hexane	ug/L				<0.20	< 1	< 1	
2-Hexanone					<1.0			
Methyl Ethyl Ketone	ug/L				<1.0	< 1	< 1	
Methyl Isobutyl Ketone	ug/L				<1.0	< 1	< 1	
Methyl-t-butyl Ether	ug/L		15		<0.20	< 1	< 1	
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L						< 0.1	
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%			114	86	106	102	104
4-bromofluorobenzene	%			112	102	96	116	115
Toluene-d8	%			99		107	94	89

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **07-3S**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Oct-18

PARAMETER	TYPE	LIMIT	UNITS				
1,1,1,2-tetrachloroethane	ug/L			< 0.5			
1,1,1-trichloroethane	ug/L			< 0.4			
1,1,2,2-tetrachloroethane	ug/L			< 0.5			
1,1,2-trichloroethane	ug/L			< 0.4			
1,1-dichloroethane	ug/L			< 0.4			
1,1-dichloroethylene	ug/L	MAC	14	< 0.5			
1,2-dibromoethane	ug/L			< 0.2			
1,2-dichlorobenzene	ug/L	MAC	200	< 0.4			
1,2-dichloroethane	ug/L	IMAC	5	< 0.2			
1,2-dichloropropane	ug/L			< 0.5			
1,3,5-trimethylbenzene	ug/L			< 0.3			
1,3-dichlorobenzene	ug/L			< 0.4			
1,4-dichlorobenzene	ug/L	MAC	5	< 0.4			
1,2,4-Trichlorobenzene							
Benzene	ug/L	MAC	5	< 0.5			
Bromodichloromethane	ug/L			< 0.3			
Bromoform	ug/L			< 0.4			
Bromomethane	ug/L			< 0.5			
cis-1,2-Dichloroethylene	ug/L			< 0.4			
cis-1,3-Dichloropropylene	ug/L			< 0.2			
Carbon Tetrachloride	ug/L	MAC	5	< 0.2			
Chloroethane	ug/L			< 0.2			
Chloroform	ug/L			< 0.5			
Chloromethane	ug/L			< 0.2			
Dibromochloromethane	ug/L			< 0.3			
Dichlorodifluromethane				< 0.5			
Dichloromethane	ug/L	MAC	50	< 4.0			
Ethylbenzene	ug/L	AO	1.6	< 0.5			
m/p-xylene	ug/L			< 0.4			
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	< 0.5			
o-xylene	ug/L			< 0.4			
Styrene	ug/L			< 0.5			
trans-1,2-Dichloroethylene	ug/L			< 0.4			
trans-1,3-Dichloropropylene	ug/L			< 0.2			
Tetrachloroethylene	ug/L	MAC	30	< 0.3			
Toluene	ug/L	AO	24	< 0.5			
Trichloroethylene	ug/L	MAC	5	< 0.3			
Trichlorofluoromethane	ug/L			< 0.5			
Vinyl Chloride	ug/L	MAC	2	< 0.2			
cis+trans1,3-dichloropropene	ug/L						
Acetone	ug/L						
m/p,o Xylene	ug/L			< 0.5			
Hexane	ug/L						
2-Hexanone							
Methyl Ethyl Ketone	ug/L						
Methyl Isobutyl Ketone	ug/L						
Methyl-t-butyl Ether	ug/L		15				
m-Dichlorobenzene	ug/L						
o-Dichlorobenzene	ug/L						
p-Dichlorobenzene	ug/L						
VOC SURROGATES							
1,2-dichloroethane-d4	%			100		112	109
4-bromofluorobenzene	%			89		95	110
Toluene-d8	%			95		105	99

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **08-1D**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Nov-08 May-09 Sep-09 Oct-11

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5	<1	
1,1,1-trichloroethane	ug/L			<0.4	<0.4	<0.4	<0.8	
1,1,2,2-tetrachloroethane	ug/L			<0.5	<0.5	<0.5	<1	
1,1,2-trichloroethane	ug/L			<0.4	<0.4	<0.4	<0.8	
1,1-dichloroethane	ug/L			<0.4	<0.4	<0.4	<0.8	
1,1-dichloroethylene	ug/L	MAC	14	<0.5	<0.5	<0.5	<1	
1,2-dibromoethane	ug/L			<1.0	<1.0	<1.0	<0.4	
1,2-dichlorobenzene	ug/L	MAC	200	<0.4	<0.4	<0.4	<0.8	
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.5	<0.5	<0.4	
1,2-dichloropropane	ug/L			<0.5	<0.5	<0.5	<1	
1,3,5-trimethylbenzene	ug/L			<0.3	<0.3	<0.3	<0.6	
1,3-dichlorobenzene	ug/L			<0.4	<0.4	<0.4	<0.8	
1,4-dichlorobenzene	ug/L	MAC	5	<0.4	<0.4	<0.4	<0.8	
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<0.5	<0.5	<0.5	<1	
Bromodichloromethane	ug/L			<0.3	<0.3	<0.3	<0.6	
Bromoform	ug/L			<0.4	<0.4	<0.4	<0.8	
Bromomethane	ug/L			<0.5	<0.5	<0.5	<1	
cis-1,2-Dichloroethylene	ug/L			6.7	1.1	0.6	<0.8	
cis-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2	<0.4	
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5	<0.5	<1	
Chloroethane	ug/L			<1.0	<1.0	<1.0	<0.4	
Chloroform	ug/L			<0.5	<0.5	<0.5	<1	
Chloromethane	ug/L			<1.0	<1.0	<1.0	<0.4	
Dibromochloromethane	ug/L			<0.3	<0.3	<0.3	<0.6	
Dichlorodifluromethane							<1	
Dichloromethane	ug/L	MAC	50	<4.0	<4.0	10	<8.0	
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.5	<0.5	<1	
m/p-xylene	ug/L			<1.0	<1.0	<1.0	<1	
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	1.6	<0.2	<0.2	<0.4	
o-xylene	ug/L			<0.5	<0.5	<0.5	<1	
Styrene	ug/L			<0.5	<0.5	<0.5	<1	
trans-1,2-Dichloroethylene	ug/L			0.5	<0.4	<0.4	<0.8	
trans-1,3-Dichloropropylene	ug/L			<0.2	<0.2	<0.2	<0.4	
Tetrachloroethylene	ug/L	MAC	30	<0.3	<0.3	<0.3	<0.6	
Toluene	ug/L	AO	24	<0.5	<0.5	<0.5	<1	
Trichloroethylene	ug/L	MAC	5	<0.3	<0.3	<0.3	<0.6	
Trichlorofluoromethane	ug/L			<0.5	<0.5	<0.5	<1	
Vinyl Chloride	ug/L	MAC	2	8.0	1.6	0.6	<0.4	
cis+trans1,3-dichloropropene	ug/L							
Acetone	ug/L							
m/p,o Xylene	ug/L						<1.0	
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%				107			
4-bromofluorobenzene	%				91			
Toluene-d8	%				116			

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **08-1S**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Nov-08 May-09

PARAMETER	TYPE	LIMIT	UNITS					
1,1,1,2-tetrachloroethane	ug/L			<0.5	<0.5			
1,1,1-trichloroethane	ug/L			<0.4	<0.4			
1,1,2,2-tetrachloroethane	ug/L			<0.5	<0.5			
1,1,2-trichloroethane	ug/L			<0.4	<0.4			
1,1-dichloroethane	ug/L			<0.4	<0.4			
1,1-dichloroethylene	ug/L	MAC	14	<0.5	<0.5			
1,2-dibromoethane	ug/L			<1.0	<1.0			
1,2-dichlorobenzene	ug/L	MAC	200	<0.4	<0.4			
1,2-dichloroethane	ug/L	IMAC	5	<0.5	<0.5			
1,2-dichloropropane	ug/L			<0.5	<0.5			
1,3,5-trimethylbenzene	ug/L			<0.3	<0.3			
1,3-dichlorobenzene	ug/L			<0.4	<0.4			
1,4-dichlorobenzene	ug/L	MAC	5	<0.4	<0.4			
1,2,4-Trichlorobenzene								
Benzene	ug/L	MAC	5	<0.5	<0.5			
Bromodichloromethane	ug/L			<0.3	<0.3			
Bromoform	ug/L			<0.4	<0.4			
Bromomethane	ug/L			<0.5	<0.5			
cis-1,2-Dichloroethylene	ug/L			<0.4	<0.4			
cis-1,3-Dichloropropylene	ug/L			<0.2	<0.2			
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5			
Chloroethane	ug/L			<1.0	<1.0			
Chloroform	ug/L			<0.5	<0.5			
Chloromethane	ug/L			<1.0	<1.0			
Dibromochloromethane	ug/L			<0.3	<0.3			
Dichlorodifluromethane								
Dichloromethane	ug/L	MAC	50	<4.0	<4.0			
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.5			
m/p-xylene	ug/L			<1.0	<1.0			
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.2	<0.2			
o-xylene	ug/L			<0.5	<0.5			
Styrene	ug/L			<0.5	<0.5			
trans-1,2-Dichloroethylene	ug/L			<0.4	<0.4			
trans-1,3-Dichloropropylene	ug/L			<0.2	<0.2			
Tetrachloroethylene	ug/L	MAC	30	<0.3	<0.3			
Toluene	ug/L	AO	24	<0.5	<0.5			
Trichloroethylene	ug/L	MAC	5	<0.3	<0.3			
Trichlorofluoromethane	ug/L			<0.5	<0.5			
Vinyl Chloride	ug/L	MAC	2	<0.2	<0.2			
cis+trans1,3-dichloropropene	ug/L							
Acetone	ug/L							
m/p,o Xylene	ug/L							
Hexane	ug/L							
2-Hexanone								
Methyl Ethyl Ketone	ug/L							
Methyl Isobutyl Ketone	ug/L							
Methyl-t-butyl Ether	ug/L		15					
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%			103	108	98.1	83	
4-bromofluorobenzene	%			102	111	83.1	101	85
Toluene-d8	%			100	101	106		95

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS

REPORT OF ORGANIC ANALYSIS

PARAMETER	TYPE	GUIDELINE LIMIT	UNITS	Trip Blank Oct-11	Oct-12	Apr-14	May-16	Nov-16
		ODWSOG						
1,1,1,2-tetrachloroethane	ug/L			<0.5	<0.5	< 0.1	<0.10	<0.10
1,1,1-trichloroethane	ug/L			<0.4	<0.4	< 0.1	<0.30	<0.30
1,1,2,2-tetrachloroethane	ug/L			<0.5	<0.5	< 0.4	<0.10	<0.10
1,1,2-trichloroethane	ug/L			<0.4	<0.4	< 0.1	<0.20	<0.20
1,1-dichloroethane	ug/L			<0.4	<0.4	< 0.1	<0.30	<0.30
1,1-dichloroethylene	ug/L	MAC	14	<0.5	<0.5	< 0.1	<0.30	<0.30
1,2-dibromoethane	ug/L			<0.2	<0.2	< 0.1	<0.10	<0.10
1,2-dichlorobenzene	ug/L	MAC	200	<0.4	<0.4	< 0.1	<0.10	<0.10
1,2-dichloroethane	ug/L	IMAC	5	<0.2	<0.2	< 0.1	<0.20	<0.20
1,2-dichloropropane	ug/L			<0.5	<0.5	< 0.1	<0.20	<0.20
1,3,5-trimethylbenzene	ug/L			<0.3	<0.3		<0.20	<0.20
1,3-dichlorobenzene	ug/L			<0.4	<0.4	< 0.1	<0.10	<0.10
1,4-dichlorobenzene	ug/L	MAC	5	<0.4	<0.4	< 0.2	<0.10	<0.10
1,2,4-Trichlorobenzene							<0.30	<0.30
Benzene	ug/L	MAC	5	<0.5	<0.5	< 0.5	<0.20	<0.20
Bromodichloromethane	ug/L			<0.3	<0.3	< 0.1	<0.20	<0.20
Bromoform	ug/L			<0.4	<0.4	< 0.1	<0.10	<0.10
Bromomethane	ug/L			<0.5	<0.5	< 0.3	<0.20	<0.20
cis-1,2-Dichloroethylene	ug/L			<0.4	<0.4	< 0.1	<0.20	<0.20
cis-1,3-Dichloropropylene	ug/L			<0.2	<0.2	< 0.1	<0.20	<0.20
Carbon Tetrachloride	ug/L	MAC	5	<0.5	<0.5	< 0.2	<0.20	<0.20
Chloroethane	ug/L			<0.2	<0.2		<0.20	<0.20
Chloroform	ug/L			<0.5	<0.5	< 0.3	<0.20	<0.20
Chloromethane	ug/L			<0.2	<0.2		<0.40	<0.40
Dibromochloromethane	ug/L			<0.3	<0.3	< 0.1	<0.10	<0.10
Dichlorodifluromethane				<0.5	<0.5	< 1	<0.20	<0.20
Dichloromethane	ug/L	MAC	50	<4.0	<4.0	< 0.3	<0.30	<0.30
Ethylbenzene	ug/L	AO	1.6	<0.5	<0.5	< 0.5	<0.10	<0.10
m/p-xylene	ug/L			<0.5	<0.5	< 0.4	<0.20	<0.20
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	<0.2	<0.2	< 0.2	<0.10	<0.10
o-xylene	ug/L			<0.5	<0.5	< 0.1	<0.10	<0.10
Styrene	ug/L			<0.5	<0.5	< 0.5	<0.10	<0.10
trans-1,2-Dichloroethylene	ug/L			<0.4	<0.4	< 0.1	<0.20	<0.20
trans-1,3-Dichloropropylene	ug/L			<0.2	<0.2	< 0.1	<0.30	<0.30
Tetrachloroethylene	ug/L	MAC	30	<0.3	<0.3	< 0.2	<0.20	<0.20
Toluene	ug/L	AO	24	<0.5	<0.5	< 0.5	<0.20	<0.20
Trichloroethylene	ug/L	MAC	5	<0.3	<0.3	< 0.1	<0.20	<0.20
Trichlorofluoromethane	ug/L			<0.5	<0.5	< 0.1	<0.40	<0.40
Vinyl Chloride	ug/L	MAC	2	<0.2	<0.2	< 0.2	<0.17	<0.17
cis+trans1,3-dichloropropene	ug/L					< 0.1	<0.30	<0.30
Acetone	ug/L					< 2	<1.0	<1.0
m/p,o Xylene	ug/L			<1.0	<1.0	< 0.4	<0.20	<0.20
Hexane	ug/L					< 1	<0.20	<0.20
2-Hexanone							<1.0	<1.0
Methyl Ethyl Ketone	ug/L					< 1	<1.0	<1.0
Methyl Isobutyl Ketone	ug/L					< 1	<1.0	<1.0
Methyl-t-butyl Ether	ug/L		15			< 1	<0.20	<0.20
m-Dichlorobenzene	ug/L							
o-Dichlorobenzene	ug/L							
p-Dichlorobenzene	ug/L							
VOC SURROGATES								
1,2-dichloroethane-d4	%			107	104	100		
4-bromofluorobenzene	%			98	116	115		
Toluene-d8	%			106	94	91		

Concentrations exceed MDL

Concentrations exceed ODWSOG

MILLERS ROAD WDS **GUIDELINE** **Trip Blank**

REPORT OF ORGANIC ANALYSIS **ODWSOG** Apr-17 Oct-17 May-18 Oct-18

PARAMETER	TYPE	LIMIT	UNITS						
1,1,1,2-tetrachloroethane	ug/L			< 0.1	< 0.1	< 0.5	< 0.5		
1,1,1-trichloroethane	ug/L			< 0.1	< 0.1	< 0.4	< 0.4		
1,1,2,2-tetrachloroethane	ug/L			< 0.4	< 0.4	< 0.5	< 0.5		
1,1,2-trichloroethane	ug/L			< 0.1	< 0.1	< 0.4	< 0.4		
1,1-dichloroethane	ug/L			< 0.1	< 0.1	< 0.4	< 0.4		
1,1-dichloroethylene	ug/L	MAC	14	< 0.1	< 0.1	< 0.5	< 0.5		
1,2-dibromoethane	ug/L			< 0.1		< 0.2	< 0.2		
1,2-dichlorobenzene	ug/L	MAC	200	< 0.1	< 0.1	< 0.4	< 0.4		
1,2-dichloroethane	ug/L	IMAC	5	< 0.1	< 0.1	< 0.2	< 0.2		
1,2-dichloropropane	ug/L			< 0.1	< 0.1	< 0.5	< 0.5		
1,3,5-trimethylbenzene	ug/L					< 0.3	< 0.3		
1,3-dichlorobenzene	ug/L			< 0.1	< 0.1	< 0.4	< 0.4		
1,4-dichlorobenzene	ug/L	MAC	5	< 0.2	< 0.2	< 0.4	< 0.4		
1,2,4-Trichlorobenzene									
Benzene	ug/L	MAC	5	< 0.5	< 0.5	< 0.5	< 0.5		
Bromodichloromethane	ug/L			< 0.1	< 0.1	< 0.3	< 0.3		
Bromoform	ug/L			< 0.1	< 0.1	< 0.4	< 0.4		
Bromomethane	ug/L			< 0.3	< 0.3	< 0.5	< 0.5		
cis-1,2-Dichloroethylene	ug/L			< 0.1	< 0.1	< 0.4	< 0.4		
cis-1,3-Dichloropropylene	ug/L			< 0.1	< 0.1	< 0.2	< 0.2		
Carbon Tetrachloride	ug/L	MAC	5	< 0.2	< 0.2	< 0.2	< 0.2		
Chloroethane	ug/L					< 0.2	< 0.2		
Chloroform	ug/L			< 0.3	< 0.3	< 0.5	< 0.5		
Chloromethane	ug/L					< 0.2	< 0.2		
Dibromochloromethane	ug/L			< 0.1	< 0.1	< 0.3	< 0.3		
Dichlorodifluromethane				< 1	< 1	< 0.5	< 0.5		
Dichloromethane	ug/L	MAC	50	< 0.3	< 0.3	< 4.0	< 4.0		
Ethylbenzene	ug/L	AO	1.6	< 0.5	< 0.5	< 0.5	< 0.5		
m/p-xylene	ug/L			< 0.4	< 0.4	< 0.4	< 0.4		
Monochlorobenzene (chlorobenzene)	ug/L	MAC	80	< 0.2	< 0.2	< 0.5	< 0.5		
o-xylene	ug/L			< 0.1	< 0.1	< 0.4	< 0.4		
Styrene	ug/L			< 0.5	< 0.5	< 0.5	< 0.5		
trans-1,2-Dichloroethylene	ug/L			< 0.1	< 0.1	< 0.4	< 0.4		
trans-1,3-Dichloropropylene	ug/L			< 0.1	< 0.1	< 0.2	< 0.2		
Tetrachloroethylene	ug/L	MAC	30	< 0.2	< 0.2	< 0.3	< 0.3		
Toluene	ug/L	AO	24	< 0.5	< 0.5	< 0.5	< 0.5		
Trichloroethylene	ug/L	MAC	5	< 0.1	< 0.1	< 0.3	< 0.3		
Trichlorofluoromethane	ug/L			< 0.1	< 0.1	< 0.5	< 0.5		
Vinyl Chloride	ug/L	MAC	2	< 0.2	< 0.2	< 0.2	< 0.2		
cis+trans1,3-dichloropropene	ug/L			< 0.1	< 0.1				
Acetone	ug/L			< 2	< 2				
m/p,o Xylene	ug/L			< 0.4	< 0.4	< 0.5	< 0.53		
Hexane	ug/L			< 1	< 1				
2-Hexanone									
Methyl Ethyl Ketone	ug/L			< 1	< 1				
Methyl Isobutyl Ketone	ug/L			< 1	< 1				
Methyl-t-butyl Ether	ug/L		15	< 1	< 1				
m-Dichlorobenzene	ug/L								
o-Dichlorobenzene	ug/L				< 0.1				
p-Dichlorobenzene	ug/L								
VOC SURROGATES									
1,2-dichloroethane-d4	%						101		
4-bromofluorobenzene	%						121		
Toluene-d8	%						93		

Concentrations exceed MDL

Concentrations exceed ODWSOG

Unionized Ammonia
Millers Road WDS
2018

Location	*Ammonia*	*pH*	*Temperature*	*pKa*	*f*	*Unionized Ammonia*
SW1 May 2018	0.12	7.5	6.3	9.85873364	0.004358823	0.0005231
SW1 July 2018	0.06	7.1	22.6	9.32036664	0.005984481	0.0003591
SW1 Oct 2018	0.2	8	10.7	9.70731521	0.019241845	0.0038484
SW2 May 2018	0.18	7.7	7.7	9.81004043	0.007701968	0.0013864
SW2 July 2018	0.05	7.4	12.1	9.6601162	0.00546392	0.0002732
SW2 Oct 2018	0.15	8	8.6	9.77899317	0.016362213	0.0024543
SW3 May 2018	0.75	7.6	9.8	9.73790406	0.007226799	0.0054201
SW3 July 2018	0.95	7.5	11.5	9.6802875	0.006559254	0.0062313
SW3 Oct 2018	0.21	7.8	8.8	9.7721207	0.010550497	0.0022156
SW4 May 2018	1.12	7.3	8.9	9.76868812	0.003387181	0.0037936
SW4 July 2018	1.15	7.4	10.7	9.70731521	0.004903992	0.0056396
SW4 Oct 2018	0.36	7.8	8.5	9.78243307	0.010305477	0.0037100
SW5 May 2018	0.94	7.5	9	9.76525797	0.00539996	0.0050760
SW5 July 2018	1	7.4	10.7	9.70731521	0.004903992	0.0049040
SW5 Oct 2018	0.36	7.9	8.5	9.78243307	0.0129393	0.0046581
SW6 May 2018	0.91	7.2	9.1	9.76183025	0.002735144	0.0024890
SW6 July 2018	0.87	7.4	10.6	9.71070439	0.004866057	0.0042335
SW6 Oct 2018	0.3	7.8	8.4	9.78587541	0.010224948	0.0030675
SW7 May 2018	0.14	7	5.8	9.87624252	0.001327946	0.0001859
SW7 July 2018	0.47	7.4	12.8	9.63669	0.005764996	0.0027095
SW7 Oct 2018	0.22	7.9	9.4	9.75156165	0.013879327	0.0030535

Millers Road WDS
Surface Water QA/QC
RPD Calculations

		SW 1	SW 1 DUP SW 8		SW 1	SW 1 DUP SW 8	
Parameter	**PWQO**	**Aug-16**	**Aug-16**	**RPD**	**Aug-17**	**Aug-17**	**RPD**
Alkalinity as CaCO3	a	17	20	16.22%	15	13	14.29%
BOD		<5	<5	NC	< 3	< 3	NC
Chloride		45.6	45.7	0.22%	18.7	18.8	0.53%
Conductivity				NC			NC
DOC		20.1	19.3	4.06%			NC
N-NH3 (Ammonia)		0.04	0.07	54.55%	< 0.01	< 0.01	NC
N-NH3 (unionized)	0.02	0.00042	0.00097	79.14%	-	-	NC
N-NO2 (Nitrite)		<0.05	<0.05	NC	< 0.05	< 0.05	NC
N-NO3 (Nitrate)		<0.05	<0.05	NC	< 0.05	< 0.05	NC
pH	6.5-8.5			NC			NC
Phenols	0.001	<0.001	0.001	NC	< 0.001	< 0.001	NC
Sulphate		1.56	1.57	0.64%			NC
TDS				NC			NC
Total phosphorous	0.03	0.06	0.04	40.00%	0.01	< 0.01	NC
Turbidity		2.2	1.9	14.63%	1.7	1.7	0.00%
Hardness as CaCO3		30.0	29.6	1.34%	23	23	0.00%
Calcium		7.42	7.29	1.77%	5.51	5.29	4.07%
Magnesium		2.79	2.77	0.72%	2.04	1.98	2.99%
Potassium		0.59	0.60	1.68%	0.5	0.5	0.00%
Sodium		21.8	22.1	1.37%	14.3	13.7	4.29%
Aluminum (dissolved)	0.075			NC	0.07	0.06	15.38%
Aluminum total				NC			NC
Barium		0.018	0.017	5.71%	0.011	0.011	0.00%
Beryllium	(b) 0.011	<0.001	<0.001	NC	< 0.002	< 0.002	NC
Boron	0.2	<0.010	<0.010	NC	0.006	0.006	0.00%
Cadmium	0.0002 c	<0.0001	<0.0001	NC	0.000096	0.000056	52.63%
Chromium	0.0099	<0.003	<0.003	NC	< 0.001	< 0.001	NC
Cobalt	0.0009	<0.0005	<0.0005	NC	0.0003	0.0003	0.00%
Copper	0.005 d	<0.002	<0.002	NC	0.0068	0.0053	24.79%
Iron	0.3	0.82	0.90	9.30%	1.19	1.14	4.29%
Lead	0.025 0.005	<0.001	<0.001	NC	0.00067	0.00049	31.03%
Manganese		0.061	0.061	0.00%	0.052	0.049	5.94%
Molybdenum	0.04	<0.002	<0.002	NC	0.0002	0.0001	66.67%
Nickel	0.025	<0.003	<0.003	NC	0.0022	0.0011	66.67%
Silicon		6.58	6.95	5.47%	6.5	6.28	3.44%
Silver	0.0001	<0.0001	<0.0001	NC	< 0.00002	< 0.00002	NC
Strontium		0.048	0.050	4.08%	0.037	0.035	5.56%
Thallium	0.0003	<0.0003	<0.0003	NC	< 0.00005	< 0.00005	NC
Titanium		0.002	0.003	40.00%	< 0.005	< 0.005	NC
Vanadium	0.006	<0.002	<0.002	NC	< 0.005	< 0.005	NC
Zinc	0.03 0.02	0.007	0.006	15.38%	0.006	0.005	18.18%
Arsenic	0.1 0.005			NC			NC
COD		48	49	2.06%	72	64	11.76%
Average RPD				**14.21%**			**14.46%**

NC = Not Calculated
RDP greater than 25%
RDP greater than 50%

Millers Road WDS
Surface Water QA/QC
RPD Calculations

		SW 1	SW 1 DUP SW 8		SW 1	SW 1 DUP SW 8		SW 1	SW 1 DUP SW 8	
Parameter	**PWQO**	May-18	May-18	**RPD**	Jul-18	Jul-18	**RPD**	Oct-18	Oct-18	**RPD**
Alkalinity as CaCO3	a	9	8	11.76%	22	16	31.58%	20	24	18.18%
BOD			< 1	NC	< 1	< 1	NC	< 1	< 1	NC
Chloride		< 1	10	NC	38	38	0.00%	43	42	2.35%
Conductivity				NC			NC			NC
DOC		8.1	8.9	9.41%	17.1	18.3	6.78%	16.3	16.2	0.62%
N-NH3 (Ammonia)		0.12	0.12	0.00%	0.06	0.07	15.38%	0.2	0.15	28.57%
N-NH3 (unionized)	0.02	< 0.02	< 0.02	NC	< 0.02	< 0.02	NC	< 0.2	< 0.02	NC
N-NO2 (Nitrite)		< 0.10	< 0.10	NC	< 0.10	< 0.10	NC	< 0.10	< 0.10	NC
N-NO3 (Nitrate)		< 0.10	< 0.10	NC	< 0.10	< 0.10	NC	< 0.10	< 0.10	NC
pH	6.5-8.5	7.08	6.99	1.28%	7.2	7.09	1.54%	7.17	7.31	1.93%
Phenols	0.001	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC
Sulphate		2	2	0.00%	2	2	0.00%	2	2	0.00%
TDS				NC			NC			NC
Total phosphorous	0.03	0.016	0.017	6.06%	0.024	0.023	4.26%	0.01	0.01	0.00%
Turbidity		0.6	0.6	0.00%	2.3	1.9	19.05%	0.8	1	22.22%
Hardness as CaCO3		5	5	0.00%	23	23	0.00%	23	23	0.00%
Calcium		2	2	0.00%	6	6	0.00%	6	6	0.00%
Magnesium		< 1	< 1	NC	2	2	0.00%	2	2	0.00%
Potassium		< 1	< 1	NC	< 1	< 1	NC	1	1	NC
Sodium		7	7	0.00%	19	21	10.00%	23	22	4.44%
Aluminum (dissolved)	0.075	0.06	0.06	0.00%	0.08	0.08	0.00%	0.06	0.06	0.00%
Aluminum total		0.06	0.06	0.00%			NC			NC
Barium		< 0.01	< 0.01	NC	0.01	0.01	NC	0.01	< 0.01	NC
Beryllium	(b) 0.011	< 0.0005	< 0.0005	NC	< 0.0005	< 0.0005	NC	< 0.0005	< 0.0005	NC
Boron	0.2		< 0.01	NC	< 0.01	< 0.01	NC	< 0.01	< 0.01	NC
Cadmium	0.0002 c	< 0.0001	< 0.0001	NC	< 0.0001	< 0.0001	NC	< 0.0001	< 0.0001	NC
Chromium	0.0099	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC
Cobalt	0.0009	< 0.0002	< 0.0002	NC	0.0003	0.0003	NC	< 0.0002	< 0.0002	NC
Copper	0.005 d	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC
Iron	0.3	0.29	0.29	0.00%	1.02	1.01	0.99%	0.66	0.66	0.00%
Lead	0.025 0.005	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC
Manganese		0.02	0.02	0.00%	0.06	0.06	0.00%	0.02	0.02	0.00%
Molybdenum	0.04	< 0.005	< 0.005	NC	< 0.005	< 0.005	NC	< 0.005	< 0.005	NC
Nickel	0.025	< 0.005	< 0.005	NC	< 0.005	< 0.005	NC	< 0.005	< 0.005	NC
Silicon		2.8	2.8	0.00%	3.4	3.2	6.06%	8	8	0.00%
Silver	0.0001	< 0.0001	< 0.0001	NC	< 0.0001	< 0.0001	NC	< 0.0001	< 0.0001	NC
Strontium		0.012	0.012	0.00%	0.039	0.039	0.00%	0.05	0.048	4.08%
Thallium	0.0003	< 0.0001	< 0.0001	NC	< 0.0001	< 0.0001	NC	< 0.0001	< 0.0001	NC
Titanium		< 0.01	< 0.01	NC	< 0.01	< 0.01	NC	< 0.01	< 0.01	NC
Vanadium	0.006	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC
Zinc	0.03 0.02		< 0.01	NC	< 0.01	< 0.01	NC	< 0.01	< 0.01	NC
Arsenic	0.1 0.005			NC			NC			NC
COD		30	25	18.18%	44	46	4.44%	33	35	5.88%
Average RPD				**2.75%**			**5.56%**			**4.90%**

NC = Not Calculated
RDP greater than 25%
RDP greater than 50%

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-1					
Sample Date					Aug-96	Nov-96	Nov-98	Jul-99	Oct-99	Nov-99
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			21	13	20	20	12	10
BOD					2	<1	<1	3	<1	<1
Chloride			120	180	21.8	22.8	29.4	22.5	31.6	17.8
Conductivity					125	129	154	148	162	106
DOC										
N-NH3 (Ammonia)					0.04	0.05	0.04			0.06
N-NH3 (unionized)	PWQO	0.02			<0.01	<0.01	<0.01	0.01	<0.01	<0.01
N-NO2 (Nitrite)					<0.1	<0.1	<0.01	<0.1	<0.1	<0.1
N-NO3 (Nitrate)			13		<0.1	0.3	0.01	0.2	0.2	0.2
pH	PWQO	6.5-8.5	6.5-9		6.62	7.10	6.89	6.44	6.14	6.76
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	0.021	0.04	0.011	0.001
Sulphate					21	6	4			
TDS										
Total phosphorous	IPWQO	0.03			0.05	0.15	0.02	0.05	0.03	0.07
Turbidity					3.3	0.9	1.6	2	1.1	0.9
Hardness as CaCO3					29	25	33	37	35	26
Calcium					6.96	6.01	8.42	9.23	9.24	6.40
Magnesium					2.87	2.44	2.96	3.25	2.93	2.33
Potassium					7.8	2.4		<0.04	<0.4	1.4
Sodium					10.8	14.6	15.7	14.1	17.3	12.8
Aluminum (dissolved)	IPWQO	0.075			0.01	0.14	0.10	0.17	0.16	0.14
Aluminum total	IPWQO									
Barium										
Beryllium	PWQO	(b) 0.011								
Boron	IPWQO	0.2	1.5	3.55						
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	0.0002	0.0011	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	IPWQO	0.0009						<0.0005	<0.0005	<0.0005
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0012	0.0025	0.0176	0.0022	<0.0005	<0.0005
Iron	PWQO	0.3	0.3		1.45	0.81	0.85	2.13	1.16	1.09
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.0002	0.0003	0.0002	<0.0002	<0.0002	<0.0002
Manganese					0.07	0.06	0.04			
Molybdenum	IPWQO	0.04								
Nickel	PWQO	0.025		0.025	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon										
Silver	PWQO	0.0001			<0.0001	0.0002	0.001	0.0001	<0.0001	<0.0001
Strontium										
Thallium	IPWQO	0.0003								
Titanium										
Vanadium	IPWQO	0.006								
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.01	<0.01	<0.01	0.01	0.01	<0.1
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15				<0.001	<0.001	<0.001
COD					55	55	59	80	81	73
Colour					130	124	94.4	139	132	130
Mercury	PWQO	0.0002			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Selenium	PWQO	0.1			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Tannin & Lignin										
TOC					21	21.9	21.2			
TKN					1.17	0.75	0.73	1.29	0.82	0.73
Sus. Solids					13	8	8	15	<1	2
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f					10	4	9	10
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-1					
Sample Date					Jun-00	Aug-00	Oct-00	Sep-01	Dec-01	Jun-02
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			13	55	29	12	11	8
BOD					<1	<1	<1	1	1	2
Chloride			120	180	14.0	15.1	30.7	35.8		18.2
Conductivity					98	116	156	150	158	103
DOC										
N-NH3 (Ammonia)					0.09	0.15	0.05	0.03	0.04	0.11
N-NH3 (unionized)	PWQO	0.02			<0.01	<0.01	<0.01			
N-NO2 (Nitrite)					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
N-NO3 (Nitrate)			13		0.1	0.2	0.2	<0.1	0.3	0.1
pH	PWQO	6.5-8.5	6.5-9		6.79	6.74	6.93	6.93	7.19	6.13
Phenols	IPWQO	0.001	0.004	0.961	0.022	0.006	0.006	<0.001	<0.001	<0.001
Sulphate									13	6
TDS										
Total phosphorous	IPWQO	0.03			0.04	0.04	0.02	0.01	0.01	0.03
Turbidity					1.6	9	1.5	1.9	1.6	1.9
Hardness as CaCO3					21	30	36	28	39	20
Calcium					5.39	7.3	8.55	6.76	9.81	4.91
Magnesium					1.88	2.85	3.46	2.73	3.44	1.83
Potassium					<0.4	2.3	0.4	0.6	2.3	0.9
Sodium					10.0	8.7	15.3	17.0	20.1	10.6
Aluminum (dissolved)	IPWQO	0.075			0.14	0.19	0.15	0.11	0.10	0.11
Aluminum total	IPWQO									
Barium									0.015	0.015
Beryllium	PWQO	(b) 0.011								
Boron	IPWQO	0.2	1.5	3.55						
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Chromium	PWQO	0.0099			<0.01	<0.01	<0.01	<0.01		<0.01
Cobalt	IPWQO	0.0009			<0.0005	0.0012	<0.0005	0.0014	0.0034	
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.0005	0.0024	<0.0005	0.0007	<0.0005	0.0011
Iron	PWQO	0.3	0.3		1.28	1.44	0.83	0.60	0.59	0.64
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.001	<0.0002	0.0024	<0.0002	<0.0002	0.0012
Manganese									0.03	0.02
Molybdenum	IPWQO	0.04								
Nickel	PWQO	0.025		0.025	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon										
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	0.0003	<0.0001
Strontium										
Thallium	IPWQO	0.0003								
Titanium										
Vanadium	IPWQO	0.006								
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	0.01		0.02
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.001	0.001	<0.001	<0.001	<0.001	<0.001
COD					61	19	34	26	39	51
Colour					128	43	85	58	79	87
Mercury	PWQO	0.0002			<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Selenium	PWQO	0.1			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Tannin & Lignin										
TOC									2	17.1
TKN					0.85	0.76	0.57	0.6	0.57	0.71
Sus. Solids					2	12	<1	2	15	17
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f				5				
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-1					
Sample Date					Aug-03	Oct-03	Mar-04	Jul-04	Sept-04	May-05
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			33	9	13	12	34	13
BOD					<1	1	2	<1	1	<1
Chloride			120	180	22.3	43.5	36.2	29	27.4	24
Conductivity					161	202	164	148	185	
DOC										
N-NH3 (Ammonia)					0.05	0.02	0.11	0.05	0.06	0.03
N-NH3 (unionized)	PWQO	0.02			<0.01	<0.01	<0.01	<0.01	<0.01	<0.02
N-NO2 (Nitrite)					<0.1	<0.1	<0.1	<0.1	<0.1	<0.10
N-NO3 (Nitrate)			13		0.4	0.2	0.3	0.1	0.6	<0.10
pH	PWQO	6.5-8.5	6.5-9		7.04	6.86	7.28	6.68	7.6	6.61
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	0.001	<0.001	<0.001
Sulphate							6	2	5	
TDS							80	65	86.1	
Total phosphorous	IPWQO	0.03			0.02	0.01	0.01	0.03	0.02	<0.01
Turbidity					3.9	1.1	2.1	2.7	2.3	1.1
Hardness as CaCO3					38	32	31	28	51	21
Calcium					9.2	8.11	7.88	7.18	12.7	5
Magnesium					3.7	2.95	2.82	2.42	4.67	2
Potassium					0.8	1.3	1.3	0.5	1.2	<1
Sodium					13.2	20.6	17.7	15.6	12.7	9
Aluminum (dissolved)	IPWQO	0.075			0.116	0.081	0.121	0.144	0.11	0.12
Aluminum total	IPWQO									
Barium					0.016					0.01
Beryllium	PWQO	(b) 0.011			<0.001	<0.001				<0.001
Boron	IPWQO	0.2	1.5	3.55	0.008	0.006				<0.01
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.003	0.0002	0.0009	<0.002	0.0009	<0.001
Cobalt	IPWQO	0.0009			0.0004	0.0001	0.0002	<0.001	0.0004	<0.0002
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.002	0.032	<0.002	<0.02	<0.002	<0.001
Iron	PWQO	0.3	0.3		1.5	0.578	0.62	1.05	0.987	0.51
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.0009	0.0019	0.0011	<0.005	<0.0005	<0.001
Manganese					0.085					0.03
Molybdenum	IPWQO	0.04			0.0013	<0.0001				<0.005
Nickel	PWQO	0.025		0.025	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005
Silicon					3	5				2.6
Silver	PWQO	0.0001			0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001
Strontium					0.054					0.031
Thallium	IPWQO	0.0003								<0.0001
Titanium										<0.01
Vanadium	IPWQO	0.006								<0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.024	0.005	0.008	0.01	0.007	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.03	0.005	0.001	<0.03	0.001	
COD					49	50	76	66	44	41
Colour							64	300	160	
Mercury	PWQO	0.0002				<0.0001	<0.0001	<0.0001		
Selenium	PWQO	0.1				<0.001	<0.001	<0.01	<0.001	
Tannin & Lignin										
TOC										
TKN							0.55	0.8	0.59	
Sus. Solids							3	4	3	
Field Parameters										
Discharge L/sec										42
pH										8.41
DO	PWQO	f			4.3					3.1
Conductivity		mg/l								86
Temperature										13.5

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-1					
Sample Date					Aug-05	Nov-05	May-06	Aug-06	Oct-06	May-07
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			27	11.8	11	33	16	9
BOD					<1	<1	<1	<1	<1	<1
Chloride			120	180	34	34	18	31	23	18
Conductivity							102	181	125	89
DOC							16.2	16.9	27.8	13.9
N-NH3 (Ammonia)					0.1	0.19	<0.02			<0.02
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02				<0.02
N-NO2 (Nitrite)					<0.10	<0.10		<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		0.17	<0.10		0.27	<0.10	<0.10
pH	PWQO	6.5-8.5	6.5-9		7.18	6.37				6.33
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001		<0.001	<0.001	<0.001
Sulphate								5	4	4
TDS							66	118	81	58
Total phosphorous	IPWQO	0.03			0.04	0.05	<0.01	0.03	0.01	<0.01
Turbidity					2.3	1.5				1.6
Hardness as CaCO3					37	30		44	23	21
Calcium					10	7	5	11	6	5
Magnesium					3	3	2	4	2	2
Potassium					<1	1	<1	<1	<1	1
Sodium					16	20	11	15	15	11
Aluminum (dissolved)	IPWQO	0.075			0.11	0.09	0.11	0.08	0.16	0.1
Aluminum total	IPWQO									
Barium					0.02	0.01	0.01	0.02	0.01	<0.01
Beryllium	PWQO	(b) 0.011			<0.001	<0.001		<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	IPWQO	0.0009			0.0003	<0.0002	<0.0002	0.0005	<0.0002	<0.0002
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	0.003	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		0.71	0.68	0.68	1.11	1	0.48
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001		<0.001	<0.001	<0.001
Manganese					0.05	0.02	0.03	0.18	0.03	0.03
Molybdenum	IPWQO	0.04			<0.005	<0.005		<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005		<0.005	<0.005	<0.005
Silicon					11	6	1.1	8	4.7	1.9
Silver	PWQO	0.0001			<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Strontium					0.052	0.042	0.032	0.058	0.035	0.023
Thallium	IPWQO	0.0003			<0.0001	<0.0001		<0.0001	<0.0001	0.0005
Titanium					<0.01	<0.01		<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006			<0.001	<0.001		<0.001	<0.001	<0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					40	59	39	44	68	68
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN							0.54	0.73	0.76	0.76
Sus. Solids										
Field Parameters										
Discharge L/sec					6		55	3	20	47
pH					7.98		8.01	7.93	8.09	8.06
DO	PWQO	f			4.58		4.96	2.84	9.4	7.31
Conductivity		mg/l			167		86	149	108	80
Temperature					19.5		17.3	18	10.9	14.9

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-1					
Sample Date					May-07	Aug-07	Aug-07	Oct-07	Oct-07	May-08
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			9	33	38	22	25	13
BOD					<1	<1	<1	2	3	1
Chloride			120	180	18	30	30	47	47	27
Conductivity					92	170	168	200	200	131
DOC					14.3	14.6	15	15.2	15.2	16.9
N-NH3 (Ammonia)					<0.02	0.07	0.08	0.02	0.02	0.05
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		<0.10	0.27	0.27	<0.10	<0.10	<0.10
pH	PWQO	6.5-8.5	6.5-9		6.39	7.4	7.35	6.83	6.87	6.93
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate					4	4	4	3	3	3
TDS					60	111	109	130	130	85
Total phosphorous	IPWQO	0.03			0.04	0.04	0.04	<0.02	<0.02	<0.01
Turbidity					1.2	2.6	2.6	2.0	2.3	1.2
Hardness as CaCO3					21	44	41	35	35	23
Calcium					5	11	10	9	9	6
Magnesium					2	4	4	3	3	2
Potassium					1	<1	<1	1	1	<1
Sodium					11	16	16	24	24	17
Aluminum (dissolved)	IPWQO	0.075			0.1	0.07	0.07	0.06	0.06	0.10
Aluminum total	IPWQO									
Barium					<0.01	0.01	0.01	0.02	0.02	0.01
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55	<0.01	0.01	0.01	<0.01	<0.01	<0.01
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			<0.001	0.001	0.001	<0.001	<0.001	0.001
Cobalt	IPWQO	0.0009			<0.0002	0.0002	0.0002	0.0002	0.0003	0.0002
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		0.48	0.86	0.88	0.64	0.65	0.69
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					0.03	0.07	0.07	0.06	0.06	0.04
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					1.8	6.3	6.5	5.6	5.7	1.3
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.024	0.052	0.051	0.056	0.056	0.033
Thallium	IPWQO	0.0003			0.0005	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006			<0.001	0.001	0.001	<0.001	<0.001	0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					68	68	68	68	68	
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN					0.76	0.76	0.76	0.76	0.76	
Sus. Solids										
Field Parameters										
Discharge L/sec						4		10		
pH						7.84		7.59		
DO	PWQO	f				5.72		4.81		
Conductivity		mg/l				135		159		
Temperature						15.0		12.5		

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-1					
Sample Date					May-08	Oct-08	May-09	May-09	Jul-09	Jul-09
PARAMETER	Limit	PWQO	CWQG	APV				QA/QC		QA/QC
Alkalinity as CaCO3	IPWQO	a			12	14	11	11	13	15
BOD					<1	<1	<1	<1	<1	<1
Chloride			120	180	27	28	17	17	27	27
Conductivity					131	138	93	93	137	139
DOC					17.2	20.3	13.9	14.1	20.0	19.4
N-NH3 (Ammonia)					0.04	<0.02	<0.02	<0.02	0.03	0.03
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
pH	PWQO	6.5-8.5	6.5-9		6.89	6.83	6.83	6.82	6.87	6.94
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate					3	3	5	4	<3	<3
TDS					85	90	61	61	89	90
Total phosphorous	IPWQO	0.03			0.03	0.01	0.02	0.02	0.06	0.02
Turbidity					1.2	1.8	1.7	1.1	1.0	1.0
Hardness as CaCO3					23	26	14	14	23	23
Calcium					6	7	4	4	6	6
Magnesium					2	2	1	1	2	2
Potassium					<1	1	<1	<1	<1	<1
Sodium					16	16	9	9	16	17
Aluminum (dissolved)	IPWQO	0.075			0.14	0.09	0.09	0.09	0.09	0.10
Aluminum total	IPWQO								0.11	0.12
Barium					0.01	0.01	<0.01	<0.01	0.01	0.01
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.001	0.001	0.001	0.001	<0.001	<0.001
Cobalt	IPWQO	0.0009			0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		0.70	0.59	0.48	0.48	0.89	0.90
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					0.04	0.02	0.03	0.03	0.03	0.03
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					1.3	5.0	1.2	1.2	4.6	4.8
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.034	0.038	0.027	0.027	0.041	0.040
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.05	<0.05	<0.01	<0.01
Vanadium	IPWQO	0.006			0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD										
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec							65.6	65.6	46.2	46.2
pH							7.7	7.7	7.7	7.7
DO	PWQO	f					8.47	8.47	5.2	5.2
Conductivity		mg/l					97	97	117	117
Temperature							16.6	16.6	23.0	23.0

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-1					
Sample Date					Sep-09	Sep-09	May-10	May-10	Aug-10	Aug-10
PARAMETER	Limit	PWQO	CWQG	APV		QA/QC		QA/QC		QA/QC
Alkalinity as CaCO3	IPWQO	a			21	17	14	15	27	27
BOD					<1	<1	<1	<1	<1	<1
Chloride			120	180	35	34	31	30	36	35
Conductivity					171	170				
DOC					18.5	18.0				
N-NH3 (Ammonia)					0.02	0.02	<0.02	<0.02	<0.02	<0.02
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		0.10	0.10	<0.10	<0.10	0.21	0.21
pH	PWQO	6.5-8.5	6.5-9		7.04	6.91	7.23	7.13	7.28	7.26
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate					2	8				
TDS					111	111				
Total phosphorous	IPWQO	0.03			0.02	0.02	0.02	0.04	0.01	0.01
Turbidity					2.0	1.8	1.7	1.9	1.9	2.0
Hardness as CaCO3					30	30				
Calcium					7	7	7	7	11	11
Magnesium					3	3	2	2	4	4
Potassium					1	1	1	1	<1	<1
Sodium					19	19	16	16	19	20
Aluminum (dissolved)	IPWQO	0.075			0.06	0.06	0.07	0.07	0.04	0.04
Aluminum total	IPWQO									
Barium					0.01	0.01	0.01	0.01	0.02	0.02
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55	<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.001	0.001	<0.001	<0.001	0.002	0.002
Cobalt	IPWQO	0.0009			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		0.76	0.69	0.48	0.58	0.63	0.26
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					0.03	0.03	0.03	0.04	0.02	0.02
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					6.9	7.0	1.4	1.5	6.0	6.1
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.045	0.045	0.038	0.040	0.058	0.058
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006			<0.001	<0.001	<0.001	<0.001	0.001	<0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD							43	43	35	30
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					21.1	21.1	11.3			4
pH					8.1	8.1	7.9			8.2
DO	PWQO	f			7.31	7.31	5.96			3.49
Conductivity		mg/l			147	147	142			138
Temperature					13.5	13.5	18.6			18.9

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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					Sample Location SW-1					
Sample Date					Oct-10	Oct-10	Jun-11	Jun-11	Aug-11	Aug-11
PARAMETER	Limit	PWQO	CWQG	APV		QA/QC		QA/QC		QA/QC
Alkalinity as CaCO3	IPWQO	a			35	33	12	13	24	25
BOD					<1	1	1	1	<1	<1
Chloride			120	180	28	27	20	20	25	25
Conductivity										
DOC										
N-NH3 (Ammonia)					0.05	0.06	<0.02	<0.02	0.04	0.04
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	0.02	0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		0.42	0.45	<0.10	<0.10	0.16	0.16
pH	PWQO	6.5-8.5	6.5-9		7.45	7.34	6.87	6.75	6.70	6.63
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate										
TDS										
Total phosphorous	IPWQO	0.03			0.01	0.01	<0.01	<0.01	<0.01	<0.01
Turbidity					2.4	2.5	2.3	1.9	1.4	1.3
Hardness as CaCO3										
Calcium					11	11	6	6	8	8
Magnesium					4	4	2	2	3	3
Potassium					1	1	<1	<1	<1	<1
Sodium					16	16	12	11	14	14
Aluminum (dissolved)	IPWQO	0.075			0.07	0.08	0.12	0.12	0.06	0.06
Aluminum total	IPWQO						0.12	0.12		
Barium					0.02	0.02	0.01	0.01	0.02	0.01
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.0005	<0.0005	<0.01	<0.0005
Boron	IPWQO	0.2	1.5	3.55	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.01	<0.0001
Chromium	PWQO	0.0099			0.001	<0.001	<0.001	<0.001	<0.05	0.002
Cobalt	IPWQO	0.0009			<0.0002	<0.0002	0.0002	0.0002	<0.01	<0.0002
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001
Iron	PWQO	0.3	0.3		0.76	0.73	0.98	1.03	1.00	0.77
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.01	<0.001
Manganese					0.03	0.03	0.05	0.05	0.04	0.03
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.01	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.01	<0.005
Silicon					7.4	7.8	1.4	1.4	7.0	6.8
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.01	<0.0001
Strontium					0.056	0.055	0.033	0.033	0.050	0.045
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.01	<0.0001
Titanium					<0.01	<0.01	<0.01	<0.01	<0.10	<0.01
Vanadium	IPWQO	0.006			<0.001	<0.001	<0.001	<0.001	<0.05	0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.05	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					35	35	60	60	62	62
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					2.5		24.8		7.0	
pH					8.1		7.1		6.7	
DO	PWQO	f			9.54		3.63		4.27	
Conductivity		mg/l			131		81		108	
Temperature					8.2		24.6		21.7	

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
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					Sample Location SW-1					
Sample Date					Oct-11	Oct-11	Jun-12	Aug-12	Aug-12	Oct-12
PARAMETER	Limit	PWQO	CWQG	APV					QA/QC	
Alkalinity as CaCO3	IPWQO	a			17	16	15	24	24	10
BOD					<1	<1	<1	3	3	2
Chloride			120	180	37	37	27	39	39	49
Conductivity										
DOC										
N-NH3 (Ammonia)					<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		<0.10	<0.10	<0.10	0.10	0.10	<0.10
pH	PWQO	6.5-8.5	6.5-9		6.36	6.29	6.56	6.85	6.80	6.51
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate										
TDS										
Total phosphorous	IPWQO	0.03			<0.01	0.01	0.02	0.02	0.01	0.02
Turbidity					0.9	0.9	1.1	1.5	1.5	1.2
Hardness as CaCO3							21	37	37	35
Calcium					7	7	5	10	10	9
Magnesium					3	2	2	3	3	3
Potassium					1	1	<1	<1	<1	1
Sodium					22	22	14	18	18	24
Aluminum (dissolved)	IPWQO	0.075			0.06	0.06	0.07	0.04	0.04	0.05
Aluminum total	IPWQO				0.07	0.07	0.080	0.04	0.04	0.08
Barium					0.01	0.01	0.01	0.02	0.02	0.02
Beryllium	PWQO	(b) 0.011			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IPWQO	0.2	1.5	3.55	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			<0.001	0.001	0.001	<0.001	<0.001	<0.001
Cobalt	IPWQO	0.0009			<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		0.56	0.57	0.56	0.56	0.55	0.48
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.01	<0.01	<0.001	<0.001	<0.001	<0.001
Manganese					0.02	0.02	0.04	0.03	0.03	0.02
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					5.8	5.7	1.9	7.2	7.2	6.4
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.043	0.043	0.038	0.058	0.056	0.052
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.10	<0.10	<0.01	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					42	42	38	29	30	37
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					6.0		41.0	8.0	8.0	54
pH					6.5		6.7	7.0	7.0	6.6
DO	PWQO	f			7.41		8.40	4.99	4.99	8.64
Conductivity		mg/l			162		114	157	157	210
Temperature					13.6		16.2	19.2	19.2	9.3

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-1					
Sample Date					Jun-13	Jun-13	Aug-13	Aug-13	Nov-13	Apr-14
PARAMETER	Limit	PWQO	CWQG	APV		QA/QC		QA/QC		
Alkalinity as CaCO3	IPWQO	a			13	12	20	17	12	6
BOD					<1	<1	1	1	<1	< 3
Chloride			120	180	20	20	30	30	21	12.1
Conductivity										
DOC										
N-NH3 (Ammonia)					<0.02	<0.02	0.02	0.03	<0.02	< 0.01
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	< 0.01
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	< 0.1
N-NO3 (Nitrate)			13		<0.10	<0.10	<0.10	<0.10	<0.10	0.1
pH	PWQO	6.5-8.5	6.5-9		6.77	6.64	6.88	6.75	6.66	
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001
Sulphate										
TDS										
Total phosphorous	IPWQO	0.03			<0.01	<0.01	0.02	0.01	<0.01	0.01
Turbidity					1.2	1.3	1.7	1.4	0.8	1.8
Hardness as CaCO3					23	23	30	30	23	12
Calcium					6	6	7	7	6	2.97
Magnesium					2	2	3	3	2	1.07
Potassium					<1	<1	<1	<1	<1	1
Sodium					12	10	18	18	30	9.1
Aluminum (dissolved)	IPWQO	0.075					0.08	0.08	0.08	0.007
Aluminum total	IPWQO				0.15	0.14	0.07	0.07	0.08	
Barium					0.01	0.01	0.01	0.01	<0.01	0.007
Beryllium	PWQO	(b) 0.011			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.002
Boron	IPWQO	0.2	1.5	3.55	<0.01	<0.01	<0.01	<0.01	<0.01	0.006
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002
Chromium	PWQO	0.0099			0.001	0.001	<0.001	<0.001	<0.001	0.0009
Cobalt	IPWQO	0.0009			0.0003	0.0003	<0.0002	<0.0002	<0.0002	< 0.0001
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	0.0004
Iron	PWQO	0.3	0.3		1.18	1.2	0.72	0.73	0.48	0.411
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.00019
Manganese					0.07	0.07	0.04	0.04	0.01	0.015
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	< 0.0001
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	< 0.0005
Silicon					2.5	2.5	5.7	5.6	5	2.9
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002
Strontium					0.037	0.035	0.048	0.048	0.027	0.02
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00005
Titanium					<0.01	<0.01	<0.01	<0.01	<0.01	< 0.005
Vanadium	IPWQO	0.006			<0.001	<0.001	<0.001	<0.001	<0.001	< 0.005
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.02	0.02	0.04	0.02	<0.01	0.012
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					57	58	50	46	44	33
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					39.2		14.43		33.2	93.1
pH					7.2		6.9		7.2	7
DO	PWQO	f			2.81		5.09		9.67	6.79
Conductivity		mg/l			107		142		115	65
Temperature					24.7		20.7		5	12.1

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-1					
Sample Date					Jul-14	Jul-14	Oct-14	Jun-15	Aug-15	Aug-15
PARAMETER	Limit	PWQO	CWQG	APV		QA/QC				QA/QC
Alkalinity as CaCO3	IPWQO	a			12	11	10	11	14	14
BOD					< 3	< 3	< 3	< 3	< 3	< 3
Chloride			120	180	29.1	29	22	26	40.4	40.3
Conductivity										
DOC										
N-NH3 (Ammonia)					< 0.01	< 0.01	< 0.01	< 0.01	0.02	< 0.01
N-NH3 (unionized)	PWQO	0.02			< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
N-NO2 (Nitrite)					< 0.10	< 0.10	< 0.10	< 0.1	< 0.1	< 0.1
N-NO3 (Nitrate)			13		0.1	0.1	0.1	0.1	0.1	0.1
pH	PWQO	6.5-8.5	6.5-9							
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	< 0.001	0.001	< 0.001	< 0.001	< 0.001
Sulphate										
TDS							51.8			
Total phosphorous	IPWQO	0.03			0.02	0.02	< 0.01	0.01	0.01	0.03
Turbidity					2.5	2.1	1.3	1.7	3.6	2.7
Hardness as CaCO3					25	25	18	19	34	35
Calcium					6.38	6.44	4.47	4.73	10.1	9.99
Magnesium					2.2	2.24	1.58	1.82	3.42	3.37
Potassium					0.3	0.3	1.01	0.5	0.8	0.8
Sodium					17.2	17.8	13.4	13.3	25.2	24.8
Aluminum (dissolved)	IPWQO	0.075			0.09	0.09	0.07	0.05	0.05	0.05
Aluminum total	IPWQO									
Barium					0.013	0.013	0.009	0.009	0.022	0.021
Beryllium	PWQO	(b) 0.011			< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	IPWQO	0.2	1.5	3.55	< 0.005	< 0.005	< 0.005	0.01	0.006	0.006
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	< 0.00002	< 0.00002	0.00002	< 0.00002	< 0.00002	0.00003
Chromium	PWQO	0.0099			< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Cobalt	IPWQO	0.0009			0.0002	0.0002	< 0.0001	0.0002	0.0001	0.0001
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0003	0.0004	0.0003	< 0.0001	0.0009	0.0009
Iron	PWQO	0.3	0.3		1.22	1.22	0.573	0.648	0.864	0.858
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.00035	0.00035	0.00023	0.00018	0.00064	0.00046
Manganese					0.036	0.035	0.01	0.044	0.039	0.038
Molybdenum	IPWQO	0.04			0.0001	< 0.0001	0.0001	< 0.0001	< 0.0001	< 0.0001
Nickel	PWQO	0.025		0.025	0.001	0.0006	< 0.0005	< 0.0005	0.0006	0.0006
Silicon					5.31	5.41	4.21	1.62	7.14	7.04
Silver	PWQO	0.0001			< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Strontium					0.044	0.045	0.03	0.031	0.066	0.065
Thallium	IPWQO	0.0003			< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Titanium					0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Vanadium	IPWQO	0.006			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.012	0.013	0.008	< 0.005	0.008	0.009
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					61	65	65	45	20	35
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					20.5		71.4	24.4	24.9	
pH					6.9		7.4	7.0	7.1	
DO	PWQO	f			7.07		9.62	6.65	6.65	
Conductivity		mg/l			127		108	134	160	
Temperature					19.9		8.2	22.3	21	

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-1					
Sample Date					Oct-15	May-16	Aug-16	Aug-16	Nov-16	Apr-17
PARAMETER	Limit	PWQO	CWQG	APV				QA/QC		
Alkalinity as CaCO3	IPWQO	a			10	9	17	20	15	< 5
BOD					< 3	<5	<5	<5	<5	< 3
Chloride			120	180	39.3	17.2	45.6	45.7	45.8	6.6
Conductivity										
DOC						13.3	20.1	19.3	13.0	
N-NH3 (Ammonia)					< 0.01	<0.02	0.04	0.07	0.04	0.04
N-NH3 (unionized)	PWQO	0.02			< 0.01	NR	0.00042	0.00097	0.00017	< 0.01
N-NO2 (Nitrite)					< 0.1	<0.05	<0.05	<0.05	<0.05	< 0.1
N-NO3 (Nitrate)			13		0.1	<0.05	<0.05	<0.05	<0.05	0.3
pH	PWQO	6.5-8.5	6.5-9							
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	<0.001	<0.001	0.001	<0.001	< 0.001
Sulphate						2.50	1.56	1.57	1.95	
TDS										
Total phosphorous	IPWQO	0.03			< 0.01	0.02	0.06	0.04	<0.01	< 0.01
Turbidity					0.9	1.0	2.2	1.9	1.9	1.1
Hardness as CaCO3					24	15.3	30.0	29.6	26.3	8
Calcium					5.82	3.78	7.42	7.29	6.53	2.21
Magnesium					2.26	1.42	2.79	2.77	2.42	0.78
Potassium					0.9	0.69	0.59	0.60	1.30	0.4
Sodium					19.2	9.47	21.8	22.1	21.3	5.9
Aluminum (dissolved)	IPWQO	0.075			0.06					0.08
Aluminum total	IPWQO									
Barium					0.012	0.010	0.018	0.017	0.012	0.005
Beryllium	PWQO	(b) 0.011			< 0.002	<0.001	<0.001	<0.001	<0.001	< 0.002
Boron	IPWQO	0.2	1.5	3.55	< 0.005	<0.010	<0.010	<0.010	<0.010	< 0.005
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	< 0.00002	<0.0001	<0.0001	<0.0001	<0.0001	< 0.000020
Chromium	PWQO	0.0099			< 0.002	<0.003	<0.003	<0.003	<0.003	< 0.001
Cobalt	IPWQO	0.0009			< 0.0001	<0.0005	<0.0005	<0.0005	<0.0005	< 0.0001
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0003	<0.002	<0.002	<0.002	<0.002	< 0.0001
Iron	PWQO	0.3	0.3		0.52	0.41	0.82	0.90	0.43	
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.00017	<0.001	<0.001	<0.001	<0.001	0.0001
Manganese					0.014	0.019	0.061	0.061	0.017	0.008
Molybdenum	IPWQO	0.04			< 0.0001	<0.002	<0.002	<0.002	<0.002	< 0.0001
Nickel	PWQO	0.025		0.025	< 0.0005	<0.003	<0.003	<0.003	<0.003	0.0003
Silicon					6.1	1.32	6.58	6.95	8.52	2.87
Silver	PWQO	0.0001			0.0003	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002
Strontium					0.038	0.027	0.048	0.050	0.036	0.013
Thallium	IPWQO	0.0003			< 0.00005	<0.0003	<0.0003	<0.0003	<0.0003	< 0.00005
Titanium					< 0.005	<0.002	0.002	0.003	<0.002	< 0.005
Vanadium	IPWQO	0.006			< 0.005	<0.002	<0.002	<0.002	<0.002	< 0.005
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.006	0.006	0.007	0.006	0.005	0.005
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					41	28	48	49	37	22
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					36.3	75.7			14.6	230
pH					7.6	6.6	6.7		7.5	6.4
DO	PWQO	f			9.24	9.86	5.48		10.57	12.25
Conductivity		mg/l			154	79	186		185	19
Temperature					11.7	13	22.9		3.4	4.8

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-1					
Sample Date					Aug-17	Aug-17 SW 8 QA/QC	Oct-17	May-18	May-18 SW 8 QA/QC	Jul-18
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			15	13	20	9	8	22
BOD					< 3	< 3	4		< 1	< 1
Chloride			120	180	18.7	18.8	21.4	< 1	10	38
Conductivity										
DOC								8.1	8.9	17.1
N-NH3 (Ammonia)					< 0.01	< 0.01	< 0.01	0.12	0.12	0.06
N-NH3 (unionized)	PWQO	0.02			-	-	< 0.01	< 0.02	< 0.02	< 0.02
N-NO2 (Nitrite)					< 0.05	< 0.05	< 0.05	< 0.10	< 0.10	< 0.10
N-NO3 (Nitrate)			13		< 0.05	< 0.05	< 0.05	< 0.10	< 0.10	< 0.10
pH	PWQO	6.5-8.5	6.5-9					7.08	6.99	7.2
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sulphate								2	2	2
TDS										
Total phosphorous	IPWQO	0.03			0.01	< 0.01	0.03	0.016	0.017	0.024
Turbidity					1.7	1.7	1.9	0.6	0.6	2.3
Hardness as CaCO3					23	23	25	5	5	23
Calcium					5.51	5.29	6.25	2	2	6
Magnesium					2.04	1.98	2.19	< 1	< 1	2
Potassium					0.5	0.5	1.1	< 1	< 1	< 1
Sodium					14.3	13.7	13.8	7	7	19
Aluminum (dissolved)	IPWQO	0.075			0.07	0.06	0.06	0.06	0.06	0.08
Aluminum total	IPWQO							0.06	0.06	
Barium					0.011	0.011	0.011	< 0.01	< 0.01	0.01
Beryllium	PWQO	(b) 0.011			< 0.002	< 0.002	< 0.002	< 0.0005	< 0.0005	< 0.0005
Boron	IPWQO	0.2	1.5	3.55	0.006	0.006	0.007		< 0.01	< 0.01
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	0.000096	0.000056	< 0.000014	< 0.0001	< 0.0001	< 0.0001
Chromium	PWQO	0.0099			< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001
Cobalt	IPWQO	0.0009			0.0003	0.0003	0.0002	< 0.0002	< 0.0002	0.0003
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0068	0.0053	0.0002	< 0.001	< 0.001	< 0.001
Iron	PWQO	0.3	0.3		1.19	1.14	1.04	0.29	0.29	1.02
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.00067	0.00049	0.0003	< 0.001	< 0.001	< 0.001
Manganese					0.052	0.049	0.051	0.02	0.02	0.06
Molybdenum	IPWQO	0.04			0.0002	0.0001	< 0.0001	< 0.005	< 0.005	< 0.005
Nickel	PWQO	0.025		0.025	0.0022	0.0011	0.0003	< 0.005	< 0.005	< 0.005
Silicon					6.5	6.28	6.72	2.8	2.8	3.4
Silver	PWQO	0.0001			< 0.00002	< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001
Strontium					0.037	0.035	0.037	0.012	0.012	0.039
Thallium	IPWQO	0.0003			< 0.00005	< 0.00005	< 0.00005	< 0.0001	< 0.0001	< 0.0001
Titanium					< 0.005	< 0.005	< 0.005	< 0.01	< 0.01	< 0.01
Vanadium	IPWQO	0.006			< 0.005	< 0.005	< 0.005	< 0.001	< 0.001	< 0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.006	0.005	< 0.005		< 0.01	< 0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					72	64	60	30	25	44
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					33		37.8	182.9		66.33
pH					--		7	7.5		7.1
DO	PWQO	f			--		6.25	5.49		7.16
Conductivity		mg/l			--		109	47		118
Temperature					--		15.4	6.3		22.6

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

				Sample Location SW-1						
Sample Date					Jul-18 SW 8	Oct-18	Oct-18 SW 8			
PARAMETER	Limit	PWQO	CWQG	APV	QA/QC		QA/QC			
Alkalinity as CaCO3	IPWQO	a			16	20	24			
BOD					< 1	< 1	< 1			
Chloride			120	180	38	43	42			
Conductivity										
DOC					18.3	16.3	16.2			
N-NH3 (Ammonia)					0.07	0.2	0.15			
N-NH3 (unionized)	PWQO	0.02			< 0.02	< 0.2	< 0.02			
N-NO2 (Nitrite)					< 0.10	< 0.10	< 0.10			
N-NO3 (Nitrate)			13		< 0.10	< 0.10	< 0.10			
pH	PWQO	6.5-8.5	6.5-9		7.09	7.17	7.31			
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	< 0.001	< 0.001			
Sulphate					2	2	2			
TDS										
Total phosphorous	IPWQO	0.03			0.023	0.01	0.01			
Turbidity					1.9	0.8	1			
Hardness as CaCO3					23	23	23			
Calcium					6	6	6			
Magnesium					2	2	2			
Potassium					< 1	1	1			
Sodium					21	23	22			
Aluminum (dissolved)	IPWQO	0.075			0.08	0.06	0.06			
Aluminum total	IPWQO									
Barium					0.01	0.01	< 0.01			
Beryllium	PWQO	(b) 0.011			< 0.0005	< 0.0005	< 0.0005			
Boron	IPWQO	0.2	1.5	3.55	< 0.01	< 0.01	< 0.01			
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	< 0.0001	< 0.0001	< 0.0001			
Chromium	PWQO	0.0099			< 0.001	< 0.001	< 0.001			
Cobalt	IPWQO	0.0009			0.0003	< 0.0002	< 0.0002			
Copper	PWQO IPWQO	0.005 d	d	0.0069	< 0.001	< 0.001	< 0.001			
Iron	PWQO	0.3	0.3		1.01	0.66	0.66			
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	< 0.001	< 0.001	< 0.001			
Manganese					0.06	0.02	0.02			
Molybdenum	IPWQO	0.04			< 0.005	< 0.005	< 0.005			
Nickel	PWQO	0.025		0.025	< 0.005	< 0.005	< 0.005			
Silicon					3.2	8	8			
Silver	PWQO	0.0001			< 0.0001	< 0.0001	< 0.0001			
Strontium					0.039	0.05	0.048			
Thallium	IPWQO	0.0003			< 0.0001	< 0.0001	< 0.0001			
Titanium					< 0.01	< 0.01	< 0.01			
Vanadium	IPWQO	0.006			< 0.001	< 0.001	< 0.001			
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	< 0.01	< 0.01	< 0.01			
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					46	33	35			
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec						11.71				
pH						8				
DO	PWQO	f				8.4				
Conductivity		mg/l				148				
Temperature						10.7				

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-2					
Sample Date					Aug-96	Nov-96	Nov-98	Jul-99	Oct-99	Nov-99
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			216	141	260	148	229	164
BOD					40	2	<1	2	<1	<1
Chloride			120	180	9.4	25.6	8.0	15.4	7.9	10.1
Conductivity					447	392	427	360	466	349
DOC										
N-NH3 (Ammonia)					0.1	0.17	0.01			<0.01
N-NH3 (unionized)	PWQO	0.02			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N-NO2 (Nitrite)					<0.1	<0.1	<0.01	<0.1	<0.1	<0.1
N-NO3 (Nitrate)			13		<0.1	<0.1	<0.1	0.2	<0.1	0.1
pH	PWQO	6.5-8.5	6.5-9		7.62	8.31	7.04	7.54	7.44	8.20
Phenols	IPWQO	0.001	0.004	0.961	0.013	<0.001	0.037	0.003	0.021	<0.001
Sulphate					10	24	13			
TDS										
Total phosphorous	IPWQO	0.03			1.55	0.27	0.26	0.02	<0.01	0.05
Turbidity					<200	106	60	2.9	3.3	7.3
Hardness as CaCO3					186	155	271	172	248	202
Calcium					68.90	46.20	88.80	52.00	78.90	63.40
Magnesium					11.10	9.56	11.70	10.10	12.20	10.40
Potassium					8.5	8.8		<0.04	<0.4	2.0
Sodium					9.4	16.1	7.4	8.1	8.4	8.3
Aluminum (dissolved)	IPWQO	0.075			0.19	<0.01	0.51	0.07	0.23	0.10
Aluminum total	IPWQO									
Barium										
Beryllium	PWQO	(b) 0.011								
Boron	IPWQO	0.2	1.5	3.55						
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	0.0002	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	IPWQO	0.0009						<0.0005	0.0005	0.0007
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0123	0.0022	0.0257	<0.0005	<0.0005	0.0008
Iron	PWQO	0.3	0.3		44.50	14.50	45.10	9.43	1.87	6.48
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.0142	0.0003	0.0008	<0.0002	<0.0002	<0.0002
Manganese					3.28	1.77	3.09			
Molybdenum	IPWQO	0.04								
Nickel	PWQO	0.025		0.025	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon										
Silver	PWQO	0.0001			0.0002	0.0004	0.0008	0.0005	0.0003	<0.0001
Strontium										
Thallium	IPWQO	0.0003								
Titanium										
Vanadium	IPWQO	0.006								
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.13	<0.01	0.12	0.02	0.01	0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15				0.002	<0.001	<0.001
COD					90	15	7	16	10	6
Colour					6	2	<1	6	7	6
Mercury	PWQO	0.0002			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Selenium	PWQO	0.1			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Tannin & Lignin										
TOC					9.4	4.9	5.9			
TKN					3.82	0.61	0.84	0.21	0.1	0.27
Sus. Solids					427	38	80	80	3	26
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f					7	9	9	9
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-2					
Sample Date					Jun-00	Aug-00	Oct-00	Sep-01	Dec-01	Jun-02
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			151	210	202	182	163	282
BOD					<1	<1	<1	1	1	1
Chloride			120	180	13.4	7.6	7.2	6.1		18.8
Conductivity					336	375	376	352	352	648
DOC										
N-NH3 (Ammonia)					0.03	0.01	<0.01	0.02	<0.01	0.49
N-NH3 (unionized)	PWQO	0.02			<0.01	<0.01	<0.01			
N-NO2 (Nitrite)					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
N-NO3 (Nitrate)			13		0.1	0.1	0.1	0.1	0.1	<0.1
pH	PWQO	6.5-8.5	6.5-9		8.17	7.82	7.76	8.43	8.50	7.31
Phenols	IPWQO	0.001	0.004	0.961	0.005	0.004	0.001	<0.001	<0.001	0.003
Sulphate									11	29
TDS										
Total phosphorous	IPWQO	0.03			0.02	0.08	0.01	0.01	0.02	0.02
Turbidity					3.2	16.5	2.4	2	12.3	86
Hardness as CaCO3					158	198	184	205	208	307
Calcium					48.7	63.3	56.90	66.00	65.00	61.40
Magnesium					8.74	9.61	10.10	9.67	11.20	13.20
Potassium					1.9	5.5	<0.4	1.6	1.7	3.5
Sodium					8.0	6.6	6.3	6.5	8.1	13.0
Aluminum (dissolved)	IPWQO	0.075			0.14	0.31	0.28	0.40	0.16	<0.01
Aluminum total	IPWQO									
Barium									0.05	0.09
Beryllium	PWQO	(b) 0.011								
Boron	IPWQO	0.2	1.5	3.55						
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	IPWQO	0.0009			0.0005	0.0023	<0.0005	0.0018	0.0023	
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0009	0.0024	<0.0005	0.0012	<0.0005	0.0043
Iron	PWQO	0.3	0.3		3.16	3.09	0.69	4.57	1.67	3.74
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.0002	0.0002	<0.0002	0.0006	<0.0002	0.0005
Manganese									0.46	1.56
Molybdenum	IPWQO	0.04								
Nickel	PWQO	0.025		0.025	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon										
Silver	PWQO	0.0001			<0.0001	0.0001	<0.0001	0.0001	0.0001	<0.0001
Strontium										
Thallium	IPWQO	0.0003								
Titanium										
Vanadium	IPWQO	0.006								
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.02	0.01	<0.01	0.03	<0.01	0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.001	0.002	<0.001	0.001	<0.001	<0.001
COD					<3	8	3	<3	6	24
Colour					8	3	5	4	3	4
Mercury	PWQO	0.0002			<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Selenium	PWQO	0.1			<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Tannin & Lignin										
TOC									5	7
TKN					0.2	0.84	0.22	0.18	0.19	0.68
Sus. Solids					5	25	11	16	18	31
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f				8				
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-2					
Sample Date					Aug-03	Oct-03	Mar-04	Jul-04	Sept-04	May-05
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			36	154	118	143	147	143
BOD					<1	<1	2	<1	1	<1
Chloride			120	180	12.3	16.4	16	20.9	19.6	22
Conductivity					139	404	305	411	356	
DOC										
N-NH3 (Ammonia)					0.04	0.08	0.03	0.15	<0.01	0.05
N-NH3 (unionized)	PWQO	0.02			<0.01	<0.01	<0.01	<0.01	<0.01	<0.02
N-NO2 (Nitrite)					<0.1	<0.1	<0.1	<0.1	<0.1	<0.10
N-NO3 (Nitrate)			13		0.3	0.3	0.2	0.1	0.2	<0.10
pH	PWQO	6.5-8.5	6.5-9		7.34	8.1	6.72	7.92	8.33	7.73
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate					6	14	10	29	11	
TDS							158	197	181	
Total phosphorous	IPWQO	0.03			0.01	0.01	0.03	0.02	0.02	0.03
Turbidity					1.8	3.8	15	6.5	4.8	4.9
Hardness as CaCO3					43	158	128	170	137	147
Calcium					11	46.9	38.1	50.7	40.2	44
Magnesium					3.76	9.95	8.1	10.4	8.96	9
Potassium					0.9	4.9	3	3.9	3.7	3
Sodium					8.6	10.5	8.7	11.3	9.6	9
Aluminum (dissolved)	IPWQO	0.075			0.051	0.011	0.143	0.095	0.044	<0.01
Aluminum total	IPWQO									
Barium					0.012					0.06
Beryllium	PWQO	(b) 0.011			<0.001	<0.001				<0.001
Boron	IPWQO	0.2	1.5	3.55	0.006	0.064				0.03
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.003	0.0002	0.0011	<0.002	0.0003	<0.001
Cobalt	IPWQO	0.0009			0.0001	0.0005	0.0003	<0.001	0.0003	0.0005
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.002	0.016	<0.002	<0.02	<0.002	<0.001
Iron	PWQO	0.3	0.3		0.648	0.752	5.72	0.887	2.92	1.26
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.0009	0.0011	0.0014	<0.005	<0.0005	<0.001
Manganese					0.032					0.5
Molybdenum	IPWQO	0.04			0.0014	0.0002				<0.005
Nickel	PWQO	0.025		0.025	<0.01	<0.01	<0.01	<0.01	<0.01	<0.005
Silicon								16		9.6
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.001	<0.0001	<0.0001
Strontium					0.049					0.118
Thallium	IPWQO	0.0003								<0.0001
Titanium										<0.01
Vanadium	IPWQO	0.006				<0.005				<0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.005	<0.005	0.008	<0.005	0.006	0.02
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.03	0.001	0.001	<0.03	0.001	
COD					29	<2	8	6	7	<5
Colour							2	5	6	
Mercury	PWQO	0.0002				<0.0001	<0.0001	<0.0001		
Selenium	PWQO	0.1				<0.001	<0.001	<0.01	<0.001	
Tannin & Lignin										
TOC										
TKN							0.21	0.26	0.1	
Sus. Solids							23	7	8	
Field Parameters										
Discharge L/sec										0.5
pH										8.06
DO	PWQO	f			7.9					0
Conductivity		mg/l								330
Temperature										8.8

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-2					
Sample Date					Aug-05	Nov-05	May-06	Aug-06	Oct-06	May-07
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			197	158	196	183	181	225
BOD					<1	<1	<1	<1	<1	<1
Chloride			120	180	14	13	10	14	12	10
Conductivity							467	409	388	466
DOC							2.9	2.8	3.2	3
N-NH3 (Ammonia)					0.04	0.06	<0.02			<0.20
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02				<0.02
N-NO2 (Nitrite)					<0.10	<0.10		<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		<0.10	<0.10		<0.10	<0.10	<0.10
pH	PWQO	6.5-8.5	6.5-9		8.08	8.08				7.87
Phenols	IPWQO	0.001	0.004	0.961		<0.001		<0.001	<0.001	<0.001
Sulphate								13	14	11
TDS							304	266	252	303
Total phosphorous	IPWQO	0.03			0.03	0.04	0.03	0.09	0.11	0.05
Turbidity					1.5	5.5				2.1
Hardness as CaCO3					199	165		187	203	239
Calcium					65	53	71	60	65	76
Magnesium					9	8	9	9	10	12
Potassium					3	3	3	3	3	3
Sodium					8	8	8	8	9	10
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Aluminum total	IPWQO									
Barium					0.06	0.05	0.07	0.11	0.14	0.06
Beryllium	PWQO	(b) 0.011			<0.001	<0.001		<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55	0.09	0.04	0.05	0.04	0.04	0.05
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Cobalt	IPWQO	0.0009			0.0002	<0.0002	0.0003	0.0003	0.0003	0.0002
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	0.001	<0.001
Iron	PWQO	0.3	0.3		0.29	0.79	1.54	3.46	4.36	0.51
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001		<0.001	<0.001	<0.001
Manganese					0.4	0.97	0.56	1.15	1.37	0.28
Molybdenum	IPWQO	0.04			<0.005	<0.005		<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005		<0.005	<0.005	<0.005
Silicon					14.3	9.3	8	10.1	9.1	10.0
Silver	PWQO	0.0001			<0.0001	<0.0001		<0.0001	<0.0001	<0.0001
Strontium					0.158	0.136	0.19	0.143	0.136	0.172
Thallium	IPWQO	0.0003			<0.0001	<0.0001		<0.0001	<0.0001	0.0005
Titanium					<0.01	<0.01		<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006			0.002	<0.001		0.002	0.001	<0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	0.01	0.02	0.04	0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					7	<5	<5	<5	5	5
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN							0.22	0.23	<0.05	<0.05
Sus. Solids										
Field Parameters										
Discharge L/sec					1	0.25	0.1	0.1	0.05	2.0
pH					7.68	8.34	7.48	7.67	7.61	7.35
DO	PWQO	f			4.08	6.99	4.5	5.82	12.03	5.93
Conductivity		mg/l			402	338	347	332	326	391
Temperature					11.8	3.5	11.6	11.7	9.4	12.0

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-2					
Sample Date					Aug-07	Oct-07	May-08	Oct-08	May-09	Jul-09
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			159	161	222	239	209	200
BOD					<1	2	1	<1	<1	<1
Chloride			120	180	12	10	12	12	11	9
Conductivity					386	375	518	494	463	431
DOC					2.7	2.8	3.0	4.4	2.8	3.2
N-NH3 (Ammonia)					0.09	<0.02	0.03	<0.02	<0.02	<0.02
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
pH	PWQO	6.5-8.5	6.5-9		8.17	8.01	8.08	7.88	8.10	8.10
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate					24	16	35	7	24	17
TDS					251	244	337	321	301	280
Total phosphorous	IPWQO	0.03			1.75	<0.02	0.01	0.02	<0.01	0.01
Turbidity					>100	8.9	2.1	6.0	0.5	0.3
Hardness as CaCO3					183	177	250	242	232	218
Calcium					60	56	82	77	78	71
Magnesium					8	9	11	12	9	10
Potassium					3	3	4	3	3	3
Sodium					9	10	10	10	7	10
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aluminum total	IPWQO									<0.01
Barium					0.09	0.07	0.07	0.07	0.05	0.05
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55	0.05	0.04	0.05	0.06	0.08	0.05
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.001	<0.001	0.002	0.002	<0.001	<0.001
Cobalt	IPWQO	0.0009			0.0003	0.0002	0.0004	0.0004	0.0003	<0.0002
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		3.45	1.47	0.60	2.08	0.06	0.49
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					1.43	0.48	0.53	1.12	0.01	0.24
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					9.8	8.7	8.8	10.8	7.2	8.3
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.169	0.159	0.227	0.197	0.200	0.189
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.01	<0.01	<0.05	<0.01
Vanadium	IPWQO	0.006			0.002	<0.001	0.004	0.003	<0.001	0.002
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.03	0.01	0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					5	5				
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN					<0.05	<0.05				
Sus. Solids										
Field Parameters										
Discharge L/sec					2.0	1.0			2.0	1.0
pH					7.54	7.37			8.0	7.9
DO	PWQO	f			6.71	6.24			8.49	6.68
Conductivity		mg/l			307	293			490	369
Temperature					12.1	9.0			11.5	11.3

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-2					
Sample Date					Sep-09	May-10	Aug-10	Oct-10	Jun-11	Aug-11
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			187	210	195	190	217	198
BOD					<1	<1	<1	<1	<1	<1
Chloride			120	180	8	8	9	9	9	9
Conductivity					392					
DOC					2.9					
N-NH3 (Ammonia)					<0.02	<0.02	<0.02	<0.02	<0.02	0.03
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		<0.10	<0.10	<0.10	0.10	<0.10	<0.10
pH	PWQO	6.5-8.5	6.5-9		7.87	8.29	7.99	8.18	8.16	8.03
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate					12					
TDS					255					
Total phosphorous	IPWQO	0.03			0.01	<0.01	<0.01	<0.01	0.01	<0.01
Turbidity					3.8	0.8	2.3	1.3	6.9	3.5
Hardness as CaCO3					172					
Calcium					54	68	62	66	67	61
Magnesium					9	10	9	9	10	9
Potassium					3	3	3	3	3	4
Sodium					10	11	10	10	8	10
Aluminum (dissolved)	IPWQO	0.075				<0.01	<0.01	<0.01	<0.01	<0.01
Aluminum total	IPWQO				<0.01				0.01	
Barium					0.05	0.05	0.05	0.04	0.08	0.07
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.001	<0.001	<0.0005	<0.0005
Boron	IPWQO	0.2	1.5	3.55	0.04	0.05	0.04	0.05	0.05	0.05
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			<0.001	<0.001	0.004	0.002	<0.001	<0.001
Cobalt	IPWQO	0.0009			<0.0002	0.0002	0.0002	<0.0002	0.0002	0.0002
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		0.24	0.49	0.38	0.12	1.66	1.02
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					0.40	0.16	0.25	0.11	0.65	0.56
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					8.6	7.8	8.2	8.4	7.6	7.9
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.162	0.169	0.159	0.152	0.180	0.170
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006			0.001	<0.001	0.002	<0.001	0.001	0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD						<5	<5	10	<5	8
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					N/M	0.5	0.5	0.5	1.0	0.5
pH					8.0	8.1	7.9	8.1	8.0	7.5
DO	PWQO	f			7.13	5.53	3.42	11.93	5.07	6.56
Conductivity		mg/l			338	411	292	289	343	325
Temperature					9.2	11.3	12.5	8.3	11.1	11.5

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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					Sample Location SW-2					
Sample Date					Oct-11	Jun-12	Aug-12	Oct-12	Jun-13	Aug-13
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			193	202	193	190	217	200
BOD					<1	<1	2	2	<1	1
Chloride			120	180	9	7	7	7	8	8
Conductivity										
DOC										
N-NH3 (Ammonia)					<0.02	<0.02	<0.02	0.02	<0.02	0.03
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		0.20	<0.10	<0.10	<0.10	<0.10	<0.10
pH	PWQO	6.5-8.5	6.5-9		7.81	7.88	7.98	7.91	8.02	7.98
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate										
TDS										
Total phosphorous	IPWQO	0.03			<0.01	0.01	<0.01	<0.01	0.01	0.01
Turbidity					0.9	1.7	2.8	4.7	0.6	9.6
Hardness as CaCO3						172	175	187	228	30
Calcium					61	54	57	60	75	7
Magnesium					9	9	8	9	10	3
Potassium					3	3	3	4	4	<1
Sodium					10	8	8	9	7	18
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01	<0.01	<0.01		<0.01
Aluminum total	IPWQO				<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium					0.06	0.07	0.06	0.06	0.07	0.06
Beryllium	PWQO	(b) 0.011			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IPWQO	0.2	1.5	3.55	0.04	0.05	0.05	0.05	0.05	0.07
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			<0.001	0.002	<0.001	0.001	0.001	<0.001
Cobalt	IPWQO	0.0009			0.0002	0.0003	0.0002	0.0002	0.0002	0.0003
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		0.35	1.23	0.83	0.78	0.64	1.04
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					0.34	0.52	0.32	0.37	0.34	0.39
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					7.8	9.0	7.8	7.4	8.0	7.1
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.001	<0.0001	<0.0001	<0.0001
Strontium					0.162	0.167	0.143	0.141	0.188	0.169
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006			<0.001	0.003	<0.001	<0.001	<0.001	0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					5	<5	<5	<5	<5	8
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					0.8	0.5	1.5	1.0	0.9	1
pH					7.5	7.6	7.5	7.1	8.1	7.7
DO	PWQO	f			6.94	7.98	6.30	6.86	2.57	6.42
Conductivity		mg/l			388	342	323	382	444	387
Temperature					9.9	9.1	10.7	9.1	11.2	10.9

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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					Sample Location SW-2					
Sample Date					Nov-13	Apr-14	Jul-14	Oct-14	Jun-15	Aug-15
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			189	178	180	169	185	176
BOD					2	< 3	< 3	< 3	7	< 3
Chloride			120	180	7	6.3	6.1	6.8	6.3	6.2
Conductivity										
DOC										
N-NH3 (Ammonia)					0.04	< 0.01	< 0.01	0.06	< 0.01	0.01
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.01	< 0.01	< 0.01	< 0.01	< 0.01
N-NO2 (Nitrite)					<0.10	< 0.1	< 0.10	< 0.10	< 0.1	< 0.1
N-NO3 (Nitrate)			13		<0.10	0.1	< 0.10	0.1	0.1	0.1
pH	PWQO	6.5-8.5	6.5-9		8.06					
Phenols	IPWQO	0.001	0.004	0.961	<0.001	< 0.001	< 0.001	0.001	< 0.001	< 0.001
Sulphate										
TDS								202		
Total phosphorous	IPWQO	0.03			<0.01	0.01	0.01	0.01	< 0.01	< 0.01
Turbidity					7.2	4	2.2	15.1	2.6	2.7
Hardness as CaCO3					201	218	207	183	169	198
Calcium					64	69.8	59.4	58	53.1	64.4
Magnesium					10	10.5	9.28	9.28	8.91	10.6
Potassium					4	4	3.5	4.1	2.8	4.2
Sodium					8	7.5	6.4	8.1	5.7	8.5
Aluminum (dissolved)	IPWQO	0.075			<0.01	0.02	0.02	0.01	0.01	0.02
Aluminum total	IPWQO				<0.01					
Barium					0.06	0.067	0.053	0.063	0.049	0.06
Beryllium	PWQO	(b) 0.011			<0.0005	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002
Boron	IPWQO	0.2	1.5	3.55	0.05	0.06	0.052	< 0.005	0.05	0.062
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	< 0.00002	< 0.00002	< 0.00002	0.00019	< 0.00002
Chromium	PWQO	0.0099			<0.001	< 0.0002	< 0.002	< 0.002	< 0.002	0.002
Cobalt	IPWQO	0.0009			0.0002	0.0001	< 0.0001	0.0007	0.0003	< 0.0001
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	0.0003	0.0001	0.0007	0.0015	< 0.0001
Iron	PWQO	0.3	0.3		0.9	1.97	0.245	2.18	0.727	0.429
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	0.00012	0.00008	0.00015	0.00082	< 0.00002
Manganese					0.33	0.526	0.136	0.453	0.314	0.396
Molybdenum	IPWQO	0.04			<0.005	0.0002	0.0003	0.0009	0.0003	0.0004
Nickel	PWQO	0.025		0.025	<0.005	0.0014	0.0021	0.0368	0.0028	0.0012
Silicon					8.4	8.39	7.31	7.48	6.01	8.62
Silver	PWQO	0.0001			<0.0001	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002
Strontium					0.143	0.19	0.176	0.159	0.139	0.176
Thallium	IPWQO	0.0003			<0.0001	< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Titanium					<0.01	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Vanadium	IPWQO	0.006			<0.001	< 0.005	< 0.005	< 0.005	< 0.005	< 0.005
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	0.011	0.009	0.009	< 0.005	< 0.005
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					<5	< 5	< 5	10	6	< 5
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					1	0.5	1.2	1	1.4	0.5
pH					7.9	8.1	8.1	7.7	7.7	7.5
DO	PWQO	f			10.66	5.8	5.85	6.82	6.42	8.22
Conductivity		mg/l			408	342	372	355	422	337
Temperature					8	13.5	10.8	8	10	11

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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INORGANIC ANALYSIS

					Sample Location SW-2					
Sample Date					Oct-15	May-16	Aug-16	Nov-16	Apr-17	Aug-17
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			162	170	148	170	176	180
BOD					< 3	<5	<5	<5	< 3	< 3
Chloride			120	180	6.4	7.07	9.00	8.36	5.9	6.8
Conductivity										
DOC						2.6	2.0	2.7		
N-NH3 (Ammonia)					0.01	<0.02	0.07	0.10	< 0.01	< 0.01
N-NH3 (unionized)	PWQO	0.02			< 0.01	NR	0.0068	0.0064	< 0.01	-
N-NO2 (Nitrite)					< 0.1	<0.05	<0.05	<0.05	0.2	< 0.05
N-NO3 (Nitrate)			13		0.1	<0.05	<0.05	0.06	0.3	< 0.05
pH	PWQO	6.5-8.5	6.5-9							
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	<0.001	<0.001	<0.001	< 0.001	< 0.001
Sulphate						21.2	9.96	8.67		
TDS										
Total phosphorous	IPWQO	0.03			< 0.01	0.04	0.02	0.01	< 0.01	< 0.01
Turbidity					5.8	<0.5	15.4	100.00	1.9	4.1
Hardness as CaCO3					146	185	148	165	194	195
Calcium					45.3	58.8	46.1	51.6	56.5	55.8
Magnesium					7.92	9.17	7.93	8.79	9.6	9.8
Potassium					3.2	3.26	3.31	4.32	3.6	3.5
Sodium					6.7	5.48	6.83	6.97	5.8	7.6
Aluminum (dissolved)	IPWQO	0.075			0.02				0.04	0.02
Aluminum total	IPWQO									
Barium					0.046	0.067	0.080	0.056	0.051	0.064
Beryllium	PWQO	(b) 0.011			< 0.002	<0.001	<0.001	<0.001	< 0.002	< 0.002
Boron	IPWQO	0.2	1.5	3.55	0.043	0.049	0.042	0.039	0.047	0.064
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	< 0.00002	<0.0001	<0.0001	<0.0001	< 0.000020	< 0.000014
Chromium	PWQO	0.0099			< 0.002	<0.003	<0.003	<0.003	< 0.001	< 0.001
Cobalt	IPWQO	0.0009			0.0001	<0.0005	<0.0005	<0.0005	0.0001	0.0002
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0006	<0.002	<0.002	<0.002	< 0.0001	0.0002
Iron	PWQO	0.3	0.3		0.189	2.09	3.71	2.48	0.987	0.964
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.00006	<0.001	<0.001	<0.001	0.00003	0.00004
Manganese					0.269	0.576	0.976	0.623	0.407	0.361
Molybdenum	IPWQO	0.04			0.0002	<0.002	<0.002	<0.002	0.0002	0.0002
Nickel	PWQO	0.025		0.025	0.0022	<0.003	<0.003	<0.003	0.0019	0.0016
Silicon					6.7	6.82	7.29	7.36	6.88	7.87
Silver	PWQO	0.0001			0.00011	<0.0001	<0.0001	<0.0001	< 0.00002	< 0.00002
Strontium					0.124	0.161	0.118	0.099	0.127	0.159
Thallium	IPWQO	0.0003			< 0.00005	<0.0003	<0.0003	<0.0003	< 0.00005	< 0.00005
Titanium					< 0.005	<0.002	<0.002	<0.002	< 0.005	< 0.005
Vanadium	IPWQO	0.006			< 0.005	<0.002	<0.002	<0.002	< 0.005	< 0.005
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.008	0.008	0.014	0.006	< 0.005	0.009
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					< 5	<5	<5	<5	< 5	6
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					0.5	1.3	1	0.75	1	1
pH					7.8	7.7	7.4	7.8	7.3	--
DO	PWQO	f			8.15	10.42	5.66	9.64	9.58	4.32
Conductivity		mg/l			312	356	344	355	382	--
Temperature					8.8	9.3	10.8	5.9	6	--

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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					Sample Location SW-2					
Sample Date					Oct-17	May-18	Jul-18	Oct-18		
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			180	179	216	185		
BOD					< 3	< 1	< 1	< 1		
Chloride			120	180	7.4	6	8	7		
Conductivity										
DOC						1.8	2.8	7.6		
N-NH3 (Ammonia)					< 0.01	0.18	0.05	0.15		
N-NH3 (unionized)	PWQO	0.02			< 0.01	< 0.02	< 0.02	< 0.02		
N-NO2 (Nitrite)					< 0.05	< 0.10	< 0.10	< 0.10		
N-NO3 (Nitrate)			13		< 0.05	< 0.10	< 0.10	< 0.10		
pH	PWQO	6.5-8.5	6.5-9			8.17	8.03	8.07		
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	< 0.001	< 0.001	< 0.001		
Sulphate						10		8		
TDS										
Total phosphorous	IPWQO	0.03			0.07	0.01	0.008	0.003		
Turbidity					26.5	1.7	1	0.5		
Hardness as CaCO3					204	206	192	167		
Calcium					63.8	66	62	52		
Magnesium					10.8	10	9	9		
Potassium					3.9	4	4	4		
Sodium					8.5	6	7	7		
Aluminum (dissolved)	IPWQO	0.075			0.05	< 0.01	< 0.01	< 0.01		
Aluminum total	IPWQO					< 0.01				
Barium					0.095	0.05	0.07	0.06		
Beryllium	PWQO	(b) 0.011			< 0.002	< 0.0005	< 0.0005	< 0.0005		
Boron	IPWQO	0.2	1.5	3.55	0.055	0.04	0.08	0.04		
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	0.000014	< 0.0001	< 0.0001	< 0.0001		
Chromium	PWQO	0.0099			< 0.001	< 0.001	< 0.001	< 0.001		
Cobalt	IPWQO	0.0009			< 0.0001	< 0.0002	< 0.0002	< 0.0002		
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0005	< 0.001	< 0.001	< 0.001		
Iron	PWQO	0.3	0.3		5.8	0.83	0.81	0.19		
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.00034	< 0.001	< 0.001	< 0.001		
Manganese					0.972	0.25	0.36	0.27		
Molybdenum	IPWQO	0.04			0.0002	< 0.005	< 0.005	< 0.005		
Nickel	PWQO	0.025		0.025	0.0015	< 0.005	< 0.005	< 0.005		
Silicon					8.31	7.2	7.3	7.6		
Silver	PWQO	0.0001			< 0.00002	< 0.0001	< 0.0001	< 0.0001		
Strontium					0.182	< 0.150	0.179	0.158		
Thallium	IPWQO	0.0003			< 0.00005	< 0.0001	< 0.0001	< 0.0001		
Titanium					< 0.005	< 0.01	< 0.01	< 0.01		
Vanadium	IPWQO	0.006			< 0.005	< 0.001	< 0.001	< 0.001		
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.072	< 0.01	< 0.01	< 0.01		
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					10	12	13	< 5		
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids							13			
Field Parameters										
Discharge L/sec					0.5	0.4	0.3	1		
pH					7.9	7.7	7.4	8		
DO	PWQO	f			6.75	5.8	6.32	11		
Conductivity		mg/l			341	325	322	299		
Temperature					10.2	7.7	12.1	8.6		

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-3					
Sample Date					Nov-98	Jul-99	Oct-99	Nov-99	Jun-00	Aug-00
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			170	156	l.s	144	407	200
BOD					<1	<1	<1	<1	<1	<1
Chloride			120	180	17.0	16.6	17.9	17.2	28.6	17.9
Conductivity					344	393	365	347	907	387
DOC										
N-NH3 (Ammonia)					<0.01			0.04	1.23	0.1
N-NH3 (unionized)	PWQO	0.02			<0.01	<0.01	<0.01	<0.01	0.04	<0.01
N-NO2 (Nitrite)					<0.01	<0.1	<0.1	<0.1	<0.1	<0.1
N-NO3 (Nitrate)			13		0.01	0.2	0.2	0.2	0.2	0.2
pH	PWQO	6.5-8.5	6.5-9		7.38	7.61	l.s.	8.26	8.17	7.81
Phenols	IPWQO	0.001	0.004	0.961	0.024	<0.001	0.002	<0.001	0.011	0.001
Sulphate					14					
TDS										
Total phosphorous	IPWQO	0.03			0.01	0.01	<0.01	0.02	0.08	0.02
Turbidity					8	1	0.9	4.8	2.7	16.4
Hardness as CaCO3					184	178	190	177	440	186
Calcium					56.80	51.60	58.70	52.40	126.00	55.3
Magnesium					9.96	11.10	10.30	11.10	30.50	11.60
Potassium						<0.04	0.5	4.2	11.2	7.7
Sodium					10.0	11.1	13.4	12.0	31.6	11.9
Aluminum (dissolved)	IPWQO	0.075			0.04	<0.01	0.15	0.12	0.30	0.25
Aluminum total	IPWQO									
Barium										
Beryllium	PWQO	(b) 0.011								
Boron	IPWQO	0.2	1.5	3.55						
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			<0.01	<0.01	0.01	<0.01	<0.01	<0.01
Cobalt	IPWQO	0.0009				<0.0005	<0.0005	<0.0005	0.0023	0.0014
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0037	0.0005	0.001	0.0006	0.0253	0.0011
Iron	PWQO	0.3	0.3		1.74	1.09	0.73	2.15	9.52	2.44
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.0125	<0.0002	<0.0002	<0.0002	0.0003	<0.0002
Manganese					0.53					
Molybdenum	IPWQO	0.04								
Nickel	PWQO	0.025		0.025	<0.02	<0.02	<0.02	<0.02	0.02	<0.02
Silicon										
Silver	PWQO	0.0001			0.0009	0.0005	0.0002	<0.0001	<0.0001	<0.0001
Strontium										
Thallium	IPWQO	0.0003								
Titanium										
Vanadium	IPWQO	0.006								
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.02	<0.01	<0.01	<0.01	0.06	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15		<0.001	<0.001	<0.001	0.001	0.001
COD					<3	4	13	5	32	<3
Colour					<1	6	5	5	47	6
Mercury	PWQO	0.0002			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Selenium	PWQO	0.1			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Tannin & Lignin										
TOC					3.6					
TKN					0.21	0.27	0.07	0.28	2.02	0.38
Sus. Solids					7	9	<1	12	25	13
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f			10	9	8	11		10
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-3					
Sample Date					Oct-00	Sep-01	Dec-01	Jun-02	Aug-03	Oct-03
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			168	131	123	143	38	203
BOD					<1	<1	1	<1	<1	<1
Chloride			120	180	17.8	16.6		16.2	11.5	21.9
Conductivity					366	308	301	373	139	519
DOC										
N-NH3 (Ammonia)					0.15	0.02	0.02	0.21	<0.01	0.19
N-NH3 (unionized)	PWQO	0.02			<0.01				<0.01	<0.1
N-NO2 (Nitrite)					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
N-NO3 (Nitrate)			13		0.1	0.1	0.2	0.2	0.3	0.2
pH	PWQO	6.5-8.5	6.5-9		7.94	8.32	8.40	7.80	7.29	7.97
Phenols	IPWQO	0.001	0.004	0.961	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate							11	17	6	27
TDS										
Total phosphorous	IPWQO	0.03			0.02	<0.01	<0.01	0.02	0.01	0.02
Turbidity					2.4	3.1	4.1	9.8	1.9	37
Hardness as CaCO3					166	149	168	173	45	210
Calcium					46.80	45.40	50.40	101.00	11.5	61.3
Magnesium					12.00	8.57	10.30	21.40	3.9	13.7
Potassium					<0.4	1.6	3.8	5.6	1	5.6
Sodium					11.6	8.9	11.1	20.1	8.6	15.7
Aluminum (dissolved)	IPWQO	0.075			0.29	0.08	0.17	<0.01	0.052	0.019
Aluminum total	IPWQO									
Barium							0.05	0.235	0.012	
Beryllium	PWQO	(b) 0.011							<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55					0.006	0.135
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001
Chromium	PWQO	0.0099			<0.01	<0.01	<0.01	<0.01	0.002	<0.002
Cobalt	IPWQO	0.0009			<0.0005	0.0008	0.0021		0.0002	<0.001
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.0005	0.0011	<0.0005	0.0025	<0.002	0.08
Iron	PWQO	0.3	0.3		0.86	0.97	1.06	10.40	0.593	3.85
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.0002	<0.0002	0.0004	0.001	0.001	<0.005
Manganese							0.41	2.94	0.029	
Molybdenum	IPWQO	0.04							0.0018	<0.001
Nickel	PWQO	0.025		0.025	<0.02	<0.02	<0.02	<0.02	<0.01	<0.01
Silicon										
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.001
Strontium										
Thallium	IPWQO	0.0003								
Titanium										
Vanadium	IPWQO	0.006								<0.005
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	0.02	<0.005	<0.005
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.001	<0.001	0.001	<0.001	<0.03	0.002
COD					9	<3	<3	9	24	8
Colour					8	8	3	2		
Mercury	PWQO	0.0002			<0.0001	<0.0001		<0.0001		<0.0001
Selenium	PWQO	0.1			<0.001	<0.001	<0.001	0.001		<0.001
Tannin & Lignin										
TOC							3	3.2		
TKN					0.31	0.14	0.17	0.42		
Sus. Solids					2	4	4	29		
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f				9			8.1	
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-3					
Sample Date					Mar-04	Jul-04	Sept-04	May-05	Aug-05	Nov-05
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			190	177	189	161	145	148
BOD					1	1	1	<1	<1	<1
Chloride			120	180	22.1	24.1	20.8	21	21	19
Conductivity					462	507	461			
DOC										
N-NH3 (Ammonia)					0.23	0.28	0.13	0.09	0.09	0.14
N-NH3 (unionized)	PWQO	0.02			<0.01	<0.01	<0.01	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.1	<0.1	<0.1	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		0.3	0.2	0.2	0.1	<0.10	<0.10
pH	PWQO	6.5-8.5	6.5-9		6.95	7.76	7.72	7.98	8.07	8.15
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate					27	25				
TDS					261	245	244			
Total phosphorous	IPWQO	0.03			0.04	0.15	<0.01	0.04	0.03	0.05
Turbidity					42	92	10.1	4.9	2.4	7.1
Hardness as CaCO3					204	204	189	161	147	154
Calcium					59.2	59.9	53.6	48	44	45
Magnesium					13.6	13.2	13.4	10	9	10
Potassium					5.4	5.4	5.5	4	3	4
Sodium					14.4	14.8	13.6	12	10	11
Aluminum (dissolved)	IPWQO	0.075			0.163	0.508	0.04	0.05	0.01	<0.01
Aluminum total	IPWQO									
Barium								0.07	0.05	0.05
Beryllium	PWQO	(b) 0.011						<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55				0.07	0.08	0.05
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.0011	<0.002	0.0004	<0.001	0.001	<0.001
Cobalt	IPWQO	0.0009			0.0005	<0.001	0.0003	0.0004	<0.0002	<0.0002
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.002	<0.02	<0.002	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		9.57	0.515	2.52	2.02	0.49	1.45
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.0016	<0.005	<0.0005	<0.001	<0.001	<0.001
Manganese								0.52	0.27	0.57
Molybdenum	IPWQO	0.04						<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
Silicon							26	10.5	13.3	8.9
Silver	PWQO	0.0001			<0.0001	<0.001	<0.0001		<0.0001	<0.0001
Strontium								0.167	0.114	0.119
Thallium	IPWQO	0.0003						<0.0001	<0.0001	<0.0001
Titanium								<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006						0.001	0.002	0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.007	0.024	0.007	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.001	<0.03	0.001			
COD					28	21	20	<5	<5	<5
Colour					5	4	6			
Mercury	PWQO	0.0002			<0.0001	<0.0001				
Selenium	PWQO	0.1			<0.001	<0.01	<0.001			
Tannin & Lignin										
TOC										
TKN					0.59	1.16	0.31			
Sus. Solids					29	86	4			
Field Parameters										
Discharge L/sec								6	3.5	4.5
pH								8.07	7.75	8.37
DO	PWQO	f						3.55	7.05	10.32
Conductivity		mg/l						371	324	338
Temperature								12.8	11.3	3.3

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-3					
Sample Date					May-06	Aug-06	Oct-06	May-07	Aug-07	Oct-07
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			187	141	150	162	175	165
BOD					<1	<1	<1	<1	1	2
Chloride			120	180	21	21	20	20	21	21
Conductivity					454	354	364	411	439	418
DOC					6.2	2.6	3.2	3.8	4.9	4.1
N-NH3 (Ammonia)					0.25			0.12	0.24	0.18
N-NH3 (unionized)	PWQO	0.02						<0.02	<0.02	<0.02
N-NO2 (Nitrite)						<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13			<0.10	0.11	<0.10	<0.10	0.16
pH	PWQO	6.5-8.5	6.5-9					7.82	8.17	7.99
Phenols	IPWQO	0.001	0.004	0.961		<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate						10	13	19	17	17
TDS					295	230	237	267	285	272
Total phosphorous	IPWQO	0.03			0.10	0.01	0.02	0.29	0.02	<0.02
Turbidity								8.5	8.7	2
Hardness as CaCO3						142	164	184	194	178
Calcium					55	42	49	54	58	53
Magnesium					12	9	10	12	12	11
Potassium					5	3	5	5	5	6
Sodium					14	11	13	15	15	15
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01	0.07	<0.01	<0.01	<0.01
Aluminum total	IPWQO									
Barium					0.21	0.05	0.05	0.08	0.08	0.08
Beryllium	PWQO	(b) 0.011				<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55	0.11	0.05	0.06	0.11	0.18	0.13
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.002	<0.001	<0.001	0.001	0.002	<0.001
Cobalt	IPWQO	0.0009			0.0011	<0.0002	<0.0002	0.0003	0.0004	0.0003
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		19	0.69	0.47	2.00	1.86	1.17
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002		<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					3.28	0.42	0.38	0.67	1.04	0.96
Molybdenum	IPWQO	0.04				<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025		<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					9.3	9.3	8.1	9.0	9.5	8.7
Silver	PWQO	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.200	0.121	0.118	0.139	0.16	0.166
Thallium	IPWQO	0.0003				<0.0001	<0.0001	0.0004	<0.0001	<0.0001
Titanium						<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006				0.001	<0.001	0.002	0.003	0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					11	5	<5	<5	<5	<5
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN					0.93	0.16	0.18	0.18	0.18	0.18
Sus. Solids										
Field Parameters										
Discharge L/sec					3	7	5.5	9	10	7
pH					6.89	7.72	7.58	7.34	7.5	7.34
DO	PWQO	f			6.81	8.43	12.03	8.11	8.96	6.92
Conductivity		mg/l			290	336	310	365	349	330
Temperature					12.4	10.8	8.8	9.9	10	8.8

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-3					
Sample Date					May-08	Oct-08	May-09	Jul-09	Sep-09	May-10
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			155	166	175	152	151	162
BOD					<1	<1	<1	<1	<1	<1
Chloride			120	180	20	20	20	18	18	19
Conductivity					392	410	429	373	364	
DOC					2.4	3.2	3.8	2.7	2.8	
N-NH3 (Ammonia)					0.05	0.08	0.13	0.06	0.04	0.17
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		<0.10	0.18	0.19	0.12	0.10	0.1
pH	PWQO	6.5-8.5	6.5-9		8.01	8.01	8.07	8.08	7.93	8.23
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate					15	15	19	13	11	
TDS					255	267	279	242	237	
Total phosphorous	IPWQO	0.03			0.01	<0.01	<0.01	<0.01	0.01	0.01
Turbidity					2.8	8.7	1.3	1.4	3.8	4
Hardness as CaCO3					166	173	181	164	144	
Calcium					50	51	56	49	43	50
Magnesium					10	11	10	10	9	11
Potassium					4	5	5	5	5	5
Sodium					13	15	13	14	14	15
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01	<0.01	<0.01		<0.01
Aluminum total	IPWQO							<0.01	<0.01	
Barium					0.06	0.07	0.07	0.05	0.05	0.06
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55	0.04	0.10	0.20	0.07	0.06	0.1
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.001	0.002	<0.001	<0.001	<0.001	<0.001
Cobalt	IPWQO	0.0009			0.0003	0.0003	0.0004	<0.0002	<0.0002	<0.0002
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		1.12	1.53	0.87	0.14	0.73	0.96
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					0.40	0.73	0.53	0.31	0.45	0.35
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					7.7	8.3	7.4	7.6	8.0	7.0
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.139	0.143	0.164	0.135	0.134	0.144
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.05	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006			0.003	0.003	0.001	0.002	0.002	0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD										<5
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec							8.0	4.6	4.2	4.0
pH							8.0	7.9	8.1	8.1
DO	PWQO	f					9.17	7.83	8.79	6.29
Conductivity		mg/l					445	323	323	378
Temperature							11.9	11.5	9.1	9.8

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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INORGANIC ANALYSIS

					Sample Location SW-3					
Sample Date					Aug-10	Oct-10	Jun-11	Aug-11	Oct-11	Jun-12
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			154	149	177	150	150	176
BOD					<1	<1	<1	1	<1	<1
Chloride			120	180	18	18	19	17	18	19
Conductivity										
DOC										
N-NH3 (Ammonia)					0.02	0.03	0.19	0.07	0.04	0.21
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	0.12	<0.10
N-NO3 (Nitrate)			13		0.12	0.11	<0.10	0.10	1.89	0.18
pH	PWQO	6.5-8.5	6.5-9		8.01	8.14	8.20	8.03	7.70	7.89
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate										
TDS										
Total phosphorous	IPWQO	0.03			0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Turbidity					6.6	4.8	8.0	1.5	1.4	1.9
Hardness as CaCO3										154
Calcium					45	48	49	42	44	45
Magnesium					9	9	10	9	9	10
Potassium					5	4	5	4	4	5
Sodium					14	13	14	13	12	15
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aluminum total	IPWQO						<0.01		<0.01	<0.01
Barium					0.06	0.05	0.06	0.05	0.06	0.07
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IPWQO	0.2	1.5	3.55	0.06	0.06	0.10	0.05	0.06	0.11
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.004	0.002	<0.001	0.001	<0.001	0.002
Cobalt	IPWQO	0.0009			0.0002	<0.0002	0.0002	<0.0002	<0.0002	0.0003
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		1.47	0.80	1.23	0.86	1.10	1.24
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					0.49	0.37	0.40	0.30	0.40	0.60
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					7.7	7.6	7.2	7.2	7.4	8.2
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.140	0.127	0.146	0.120	0.128	0.160
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006			0.002	0.001	0.001	0.001	0.001	0.003
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					8	10	5	10	5	7
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					5.0	3	6.0	6.7	7.5	3.5
pH					8.0	8.1	8.0	7.7	7.6	7.7
DO	PWQO	f			3.64	12.13	4.67	8.38	8.45	9.64
Conductivity		mg/l			274	254	326	273	341	363
Temperature					11.0	7.2	10.9	10.9	9.5	9.4

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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					Sample Location SW-3					
Sample Date					Aug-12	Oct-12	Jun-13	Aug-13	Nov-13	Apr-14
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			155	158	154	160	154	168
BOD					2	1	<1	1	<1	< 3
Chloride			120	180	17	17	16	17	17	16.5
Conductivity										
DOC										
N-NH3 (Ammonia)					0.07	0.04	0.04	0.21	0.07	0.2
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	< 0.01
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	< 0.10
N-NO3 (Nitrate)			13		0.11	0.14	0.14	0.18	0.27	0.4
pH	PWQO	6.5-8.5	6.5-9		7.97	7.97	8.03	7.97	8.24	
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001
Sulphate										
TDS										
Total phosphorous	IPWQO	0.03			<0.01	<0.01	0.02	<0.01	0.01	0.01
Turbidity					5.8	1.2	1.6	3.8	2.8	5
Hardness as CaCO3					148	157	155	144	159	186
Calcium					46	48	49	41	49	56.5
Magnesium					8	9	8	10	49	10.9
Potassium					4	5	5	5	9	6.5
Sodium					12	13	11	12	13	14.9
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01		<0.01	<0.01	0.02
Aluminum total	IPWQO				<0.01	<0.01	0.01	<0.01	<0.01	
Barium					0.06	0.06	0.06	0.06	0.06	0.08
Beryllium	PWQO	(b) 0.011			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.002
Boron	IPWQO	0.2	1.5	3.55	0.07	0.08	0.07	0.1	0.07	0.175
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002
Chromium	PWQO	0.0099			<0.001	<0.001	0.001	<0.001	<0.001	< 0.0002
Cobalt	IPWQO	0.0009			<0.0001	<0.0002	<0.0002	0.0002	<0.0002	0.0002
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	0.0004
Iron	PWQO	0.3	0.3		1.09	0.43	1.25	0.7	0.52	1.57
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.00022
Manganese					0.43	0.35	0.28	0.35	0.25	0.436
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	0.0002
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	0.0014
Silicon					7.3	6.7	7.6	6.8	8	8.12
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002
Strontium					0.137	0.142	0.141	0.146	0.131	0.189
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00005
Titanium					<0.01	<0.01	<0.01	<0.01	<0.01	< 0.005
Vanadium	IPWQO	0.006			<0.001	<0.001	<0.001	<0.001	<0.001	< 0.005
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					<5	<5	<5	5	<5	< 5
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					1.9	4.5	3	3.5	3	11.3
pH					7.6	7.2	8.1	7.9	8	8
DO	PWQO	f			6.76	8.46	3.35	7.32	9.26	6.94
Conductivity		mg/l			311	363	366	357	386	377
Temperature					10.7	8.9	12.2	11	7.2	11.3

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-3					
Sample Date					Jul-14	Oct-14	Jun-15	Aug-15	Oct-15	May-16
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			165	149	166	153	147	175
BOD					< 3	< 3	5	5	< 3	<5
Chloride			120	180	16.3	15.6	16.2	15.8	15.6	18.3
Conductivity										
DOC										3.2
N-NH3 (Ammonia)					0.37	0.19	0.34	0.1	0.06	0.39
N-NH3 (unionized)	PWQO	0.02			0.02	< 0.01	0.01	< 0.01	< 0.01	0.021
N-NO2 (Nitrite)					< 0.10	< 0.10	< 0.1	< 0.1	< 0.1	<0.05
N-NO3 (Nitrate)			13		< 0.10	0.4	0.3	0.3	0.3	0.31
pH	PWQO	6.5-8.5	6.5-9							
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	, 0.001	< 0.001	< 0.001	< 0.001	<0.001
Sulphate										14.9
TDS						199				
Total phosphorous	IPWQO	0.03			0.02	< 0.01	< 0.01	< 0.01	< 0.01	0.03
Turbidity					19.7	9.7	6	2.6	1.9	5.8
Hardness as CaCO3					189	163	156	170	133	169
Calcium					51.7	49.4	46.6	54.1	39.4	50.5
Magnesium					10	9.61	9.62	10.9	8.37	10.3
Potassium					5.9	6	4.9	6.3	4.6	5.73
Sodium					14	13.3	12.8	16.1	11.8	12.3
Aluminum (dissolved)	IPWQO	0.075			0.08	0.01	0.01	0.01	0.01	
Aluminum total	IPWQO									
Barium					0.09	0.069	0.067	0.081	0.055	0.073
Beryllium	PWQO	(b) 0.011			< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.001
Boron	IPWQO	0.2	1.5	3.55	0.191	0.061	0.168	0.158	0.094	0.181
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	0.00002	0.00004	< 0.00002	< 0.00002	< 0.00002	<0.0001
Chromium	PWQO	0.0099			< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.003
Cobalt	IPWQO	0.0009			0.001	< 0.0001	0.0003	< 0.0001	0.0002	<0.0005
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0023	0.0003	< 0.0001	0.0007	0.0003	<0.002
Iron	PWQO	0.3	0.3		3.65	0.867	1.22	0.812	0.646	1.22
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.00037	0.00018	0.00014	0.00032	0.00008	<0.001
Manganese					0.781	0.458	0.412	0.355	0.256	0.403
Molybdenum	IPWQO	0.04			0.008	0.0007	0.0002	0.0003	0.0003	<0.002
Nickel	PWQO	0.025		0.025	0.0285	0.001	0.0014	0.0016	0.002	<0.003
Silicon					7.99	7.11	6.67	8.62	6.75	7.45
Silver	PWQO	0.0001			0.00002	< 0.00002	< 0.00002	< 0.00002	0.00016	<0.0001
Strontium					0.178	0.163	0.149	0.176	0.123	0.158
Thallium	IPWQO	0.0003			< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.0003
Titanium					0.008	< 0.005	< 0.005	< 0.005	< 0.005	0.002
Vanadium	IPWQO	0.006			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	<0.002
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.011	0.007	< 0.005	0.007	0.014	0.006
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					7	11	9	< 5	< 5	<5
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					4.6	5	4.8	7.63	3.25	6
pH					8	7.8	7.8	7.5	7.9	7.9
DO	PWQO	f			9.83	9.62	9.12	9.29	10.18	11.08
Conductivity		mg/l			358	339	431	336	324	372
Temperature					10.6	7.9	11.2	11.5	8.7	9.9

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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INORGANIC ANALYSIS

					Sample Location SW-3					
Sample Date					Aug-16	Nov-16	Apr-17	Aug-17	Oct-17	May-18
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			166	143	136	131	154	174
BOD					<5	<5	< 3	< 3	< 3	< 1
Chloride			120	180	18.8	18.0	14.2	14.3	16.2	18
Conductivity										
DOC					3.0	2.7				< 0.5
N-NH3 (Ammonia)					0.45	0.16	0.1	0.07	0.27	0.75
N-NH3 (unionized)	PWQO	0.02			0.099	0.0087	< 0.01	-	0.02	0.04
N-NO2 (Nitrite)					<0.05	<0.05	0.2	< 0.05	< 0.05	< 0.10
N-NO3 (Nitrate)			13		0.25	0.25	0.4	0.19	0.26	0.28
pH	PWQO	6.5-8.5	6.5-9							8.14
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	< 0.001	< 0.001	< 0.001	0.001
Sulphate					10.7	9.30				15
TDS										
Total phosphorous	IPWQO	0.03			0.01	0.01	< 0.01	< 0.01	0.02	0.014
Turbidity					5.8	11.8	3.2	8.3	5.9	9.1
Hardness as CaCO3					154	139	147	145	150	193
Calcium					46.7	42.1	42.1	40.1	45.2	59
Magnesium					9.08	8.31	8.75	8.56	9.01	11
Potassium					6.16	4.98	4.3	3.9	5.4	7
Sodium					13.7	11.7	11.4	11.4	12.5	16
Aluminum (dissolved)	IPWQO	0.075					0.03	0.01	0.03	< 0.01
Aluminum total	IPWQO									0.09
Barium					0.074	0.059	0.052	0.06	0.068	0.11
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	< 0.002	< 0.002	< 0.002	< 0.0005
Boron	IPWQO	0.2	1.5	3.55	0.141	0.093	0.095	0.079	0.148	0.26
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	< 0.000020	< 0.000014	< 0.000014	< 0.0001
Chromium	PWQO	0.0099			<0.003	<0.003	< 0.001	< 0.001	< 0.001	< 0.001
Cobalt	IPWQO	0.0009			<0.0005	<0.0005	0.0001	0.0002	< 0.0001	0.0005
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.002	<0.002	0.0018	0.0002	0.0003	< 0.001
Iron	PWQO	0.3	0.3		0.90	2.22	1.02	1.05	1.16	4.35
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	0.00011	0.00012	0.00009	< 0.001
Manganese					0.370	0.464	0.257	0.283	0.363	0.76
Molybdenum	IPWQO	0.04			<0.002	<0.002	0.0002	0.0002	0.0002	< 0.005
Nickel	PWQO	0.025		0.025	<0.003	<0.003	0.0015	0.001	0.001	< 0.005
Silicon					7.88	8.27	7.17	7.72	7.43	7.7
Silver	PWQO	0.0001			<0.0001	<0.0001	< 0.00002	< 0.00002	< 0.00002	< 0.0001
Strontium					0.140	0.109	0.107	0.119	0.131	0.160
Thallium	IPWQO	0.0003			<0.0003	<0.0003	< 0.00005	< 0.00005	< 0.00005	< 0.0001
Titanium					<0.002	<0.002	< 0.005	< 0.005	< 0.005	< 0.01
Vanadium	IPWQO	0.006			<0.002	<0.002	< 0.005	< 0.005	< 0.005	0.002
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.005	0.005	0.007	0.005	< 0.005	< 0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					<5	<5	< 5	6	11	12
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					3.78	4.4	4.7	5.45	4.7	4.6
pH					7.5	7.9	7.5	--	7.9	7.6
DO	PWQO	f			9.46	10.6	11.71	5.06	6.85	6.2
Conductivity		mg/l			403	348	338	--	351	373
Temperature					12.1	5.7	6	--	10.6	9.8

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
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Sample Date					Jul-18	Oct-18				
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			185	160				
BOD					1	< 1				
Chloride			120	180	21	19				
Conductivity										
DOC					4.3	7.1				
N-NH3 (Ammonia)					0.95	0.21				
N-NH3 (unionized)	PWQO	0.02			0.04	< 0.02				
N-NO2 (Nitrite)					< 0.10	< 0.10				
N-NO3 (Nitrate)			13		0.32	0.29				
pH	PWQO	6.5-8.5	6.5-9		8.03	8.02				
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	< 0.001				
Sulphate					17	9				
TDS										
Total phosphorous	IPWQO	0.03			0.01	0.015				
Turbidity					9.2	2.2				
Hardness as CaCO3					174	139				
Calcium					53	41				
Magnesium					10	9				
Potassium					6	5				
Sodium					19	13				
Aluminum (dissolved)	IPWQO	0.075			< 0.01	0.03				
Aluminum total	IPWQO									
Barium					0.1	0.08				
Beryllium	PWQO	(b) 0.011			< 0.0005	< 0.0005				
Boron	IPWQO	0.2	1.5	3.55	0.29	0.1				
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	< 0.0001	< 0.0001				
Chromium	PWQO	0.0099			< 0.001	< 0.001				
Cobalt	IPWQO	0.0009			0.0003	0.0002				
Copper	PWQO IPWQO	0.005 d	d	0.0069	< 0.001	< 0.001				
Iron	PWQO	0.3	0.3		2.42	2.77				
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	< 0.001	< 0.001				
Manganese					0.67	0.55				
Molybdenum	IPWQO	0.04			< 0.005	< 0.005				
Nickel	PWQO	0.025		0.025	< 0.005	< 0.005				
Silicon					7.7	7.6				
Silver	PWQO	0.0001			< 0.0001	< 0.0001				
Strontium					0.179	0.132				
Thallium	IPWQO	0.0003			< 0.0001	< 0.0001				
Titanium					< 0.01	< 0.01				
Vanadium	IPWQO	0.006			< 0.001	0.001				
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	< 0.01	< 0.01				
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					17	< 5				
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					5.3	4.2				
pH					7.5	7.8				
DO	PWQO	f			11.78	11				
Conductivity		mg/l			337	314				
Temperature					11.5	8.8				

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-4					
Sample Date					Nov-98	Jul-99	Oct-99	Nov-99	Jun-00	Aug-00
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			230	194	141	180	204	183
BOD					<1	<1	<1	<1	<1	<1
Chloride			120	180	21.9	18.7	18.3	19.2	16.7	17.3
Conductivity					497	486	474	416	463	397
DOC										
N-NH3 (Ammonia)					0.05			0.06	0.08	0.05
N-NH3 (unionized)	PWQO	0.02			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N-NO2 (Nitrite)					<0.01	<0.1	<0.1	<0.1	<0.1	<0.1
N-NO3 (Nitrate)			13		0.01	0.2	0.2	0.2	0.2	0.2
pH	PWQO	6.5-8.5	6.5-9		7.31	7.66	7.76	8.16	8.29	7.78
Phenols	IPWQO	0.001	0.004	0.961	<.001	<0.001	0.027	<0.001	0.006	0.004
Sulphate					33					
TDS										
Total phosphorous	IPWQO	0.03			0.09	0.02	<0.01	0.01	0.02	0.1
Turbidity					94	2.1	3.9	3.8	8.2	96
Hardness as CaCO3					283	228	217	224	216	189
Calcium					84	65.3	62.7	64.1	63	55.4
Magnesium					17.6	15.5	14.5	15.4	14.3	12.4
Potassium						0.6	0.4	5.1	3.5	7.1
Sodium					14.8	14.3	14.5	14.7	13.8	12.2
Aluminum (dissolved)	IPWQO	0.075			0.12	0.04	0.12	0.05	0.14	0.37
Aluminum total	IPWQO									
Barium										
Beryllium	PWQO	(b) 0.011								
Boron	IPWQO	0.2	1.5	3.55						
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	IPWQO	0.0009				0.0006	0.0008	0.0006	0.0006	0.002
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0038	0.0013	0.0005	0.0006	<0.0005	0.0026
Iron	PWQO	0.3	0.3		19.7	3.02	1.14	3.22	2.07	19.8
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0009
Manganese					2.63					
Molybdenum	IPWQO	0.04								
Nickel	PWQO	0.025		0.025	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon										
Silver	PWQO	0.0001			0.0009	0.0003	0.0002	<0.0001	<0.0001	0.0001
Strontium										
Thallium	IPWQO	0.0003								
Titanium										
Vanadium	IPWQO	0.006								
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<.01	<0.01	<0.01	<0.01	0.03	0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15		<0.001	<0.001	<0.001	<0.001	<0.001
COD					<3	15	10	6	10	4
Colour					<1	10	12	12	14	12
Mercury	PWQO	0.0002			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Selenium	PWQO	0.1			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Tannin & Lignin										
TOC					7					
TKN					0.63	0.33	0.19	0.3	0.35	0.66
Sus. Solids					66	18	2	7	7	86
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f			8	10	8	11		11
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-4					
Sample Date					Oct-00	Sep-01	Dec-01	Jun-02	Aug-03	Oct-03
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			200	180	167	164	32	180
BOD					<1	<1	1	<1	<1	<1
Chloride			120	180	19.2	18.2		17.3	11.9	17.2
Conductivity					427	422	414	432	140	446
DOC										
N-NH3 (Ammonia)					0.1	0.11	0.11	0.2	<0.01	<0.005
N-NH3 (unionized)	PWQO	0.02			<0.01				<0.01	
N-NO2 (Nitrite)					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
N-NO3 (Nitrate)			13		0.2	0.1	0.2	0.2	0.3	0.2
pH	PWQO	6.5-8.5	6.5-9		7.77	8.4	8.5	7.72	7.42	7.91
Phenols	IPWQO	0.001	0.004	0.961	0.053	<0.001	<0.001	<0.001	<0.001	0.02
Sulphate							26	26	6	25
TDS										
Total phosphorous	IPWQO	0.03			0.02	<0.01	0.02	0.08	0.01	<0.01
Turbidity					5.1	7.1	23	17.7	1.8	22
Hardness as CaCO3					200	210	252	198	45	185
Calcium					54.5	61.7	72.5	61	11.6	53.6
Magnesium					15.6	13.5	17.2	13.1	3.9	12.3
Potassium					<0.4	5.7	3.3	5.8	1	5
Sodium					13.7	13.4	17.1	12.7	8.5	13.2
Aluminum (dissolved)	IPWQO	0.075			0.42	0.04	0.26	0.11	0.129	0.025
Aluminum total	IPWQO									
Barium							0.11	0.095	0.015	
Beryllium	PWQO	(b) 0.011							<0.001	0.081
Boron	IPWQO	0.2	1.5	3.55					0.006	0.109
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.001
Chromium	PWQO	0.0099			0.01	<0.01	<0.01	<0.01	0.003	<0.002
Cobalt	IPWQO	0.0009			<0.0005	0.0011	0.0027		0.0005	<0.001
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.0005	0.0005	0.0006	0.0033	<0.002	0.05
Iron	PWQO	0.3	0.3		4.68	2.11	4.51	4.58	0.985	3.56
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.0002	<0.0002	0.0009	0.0009	0.0011	<0.005
Manganese							2.14	1.68	0.117	
Molybdenum	IPWQO	0.04							0.0022	<0.001
Nickel	PWQO	0.025		0.025	<0.02	<0.02	<0.02	<0.02	<0.01	<0.01
Silicon										
Silver	PWQO	0.0001			<0.0001	<0.0001	0.0001	<0.0001	<0.0001	<0.001
Strontium										
Thallium	IPWQO	0.0003								
Titanium										
Vanadium	IPWQO	0.006								<0.005
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	0.01	0.005	<0.005
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.001	0.001	<0.001	0.001	<0.03	0.002
COD					<3	5	6	14	26	8
Colour					16	17	4	4		
Mercury	PWQO	0.0002			<0.0001	<0.0001		<0.0001		<0.0001
Selenium	PWQO	0.1			<0.001	<0.001	<0.001	0.001		<0.001
Tannin & Lignin										
TOC							7	5.2		
TKN					0.33	0.36	0.38	0.48		
Sus. Solids					8	7	19	139		
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f				10			8.9	<0.001
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-4					
Sample Date					Mar-04	Jul-04	Sept-04	May-05	Aug-05	Nov-05
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			156	170	189	187	186	184
BOD					1	<1	1	<1	<1	<1
Chloride			120	180	16	21.7	20.7	22	22	21
Conductivity					389	495	463			
DOC										
N-NH3 (Ammonia)					0.13	0.22	0.1	0.16	0.32	
N-NH3 (unionized)	PWQO	0.02			<0.01	<0.01	<0.01	<0.02	<0.02	
N-NO2 (Nitrite)					<0.1	<0.1	<0.1	<0.10	<0.10	
N-NO3 (Nitrate)			13		0.3	0.2	0.2	0.12	0.15	
pH	PWQO	6.5-8.5	6.5-9		7.03	7.65	8.31	7.96	7.9	8.09
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<<0.001
Sulphate					24		26			
TDS					216		246			
Total phosphorous	IPWQO	0.03			0.06	0.11	0.02	0.03	0.06	0.07
Turbidity					36	62	13	14.3	10	14.2
Hardness as CaCO3					174	205	193	193	189	198
Calcium					49.7	60.1	54.6	56	56	58
Magnesium					12.1	13.4	13.7	13	12	13
Potassium					4.6	4.9	5.5	5	5	5
Sodium					11.8	13.9	13.7	15	15	15
Aluminum (dissolved)	IPWQO	0.075			0.456	0.329	0.088	0.06	0.01	<0.01
Aluminum total	IPWQO									
Barium								0.1	0.09	0.08
Beryllium	PWQO	(b) 0.011						<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55				0.12	0.22	0.14
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.0016	<0.002	0.0003	<0.001	0.002	0.001
Cobalt	IPWQO	0.0009			0.0005	<0.001	0.0003	0.0005	0.0003	0.0003
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.002	<0.02	<0.002	0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		7.51	0.534	3.11	3.05	1.59	2.5
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.0015	<0.005	<0.0005	<0.001	<0.001	<0.001
Manganese								1.37	1.01	1.49
Molybdenum	IPWQO	0.04						<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.01	<0.01	<0.01	<0.005	<0.05	<0.005
Silicon						30			14.3	9.8
Silver	PWQO	0.0001			<0.0001	<0.001	<0.0001		<0.0001	<0.0001
Strontium									0.138	0.198
Thallium	IPWQO	0.0003							<0.0001	<0.0001
Titanium									<0.01	<0.01
Vanadium	IPWQO	0.006							0.003	0.002
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.007	0.011	<0.005		<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.001	<0.03	0.001			
COD					22	19	12	8	8	12
Colour					6	13	5			
Mercury	PWQO	0.0002			<0.0001	<0.0001				
Selenium	PWQO	0.1			<0.001	<0.01	0.001			
Tannin & Lignin										
TOC										
TKN					0.52	0.89	0.29			
Sus. Solids					43	66	12			
Field Parameters										
Discharge L/sec								7	6.9	10
pH								7.91	11.2	8.31
DO	PWQO	f						4.12	7.68	10.51
Conductivity		mg/l						441	424	432
Temperature								12.2	11.2	3.7

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-4					
Sample Date					May-06	Aug-06	Oct-06	May-07	Aug-07	Oct-07
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			188	177	179	187	198	187
BOD					<1	<1	<1	<1	<1	3
Chloride			120	180	21	21	20	21	22	22
Conductivity					474	462	464	487	511	516
DOC					5.2	5.3	7	6.3	6.9	7.3
N-NH3 (Ammonia)					0.29			0.32	0.42	0.38
N-NH3 (unionized)	PWQO	0.02						<0.02	<0.02	<0.02
N-NO2 (Nitrite)						<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13			0.13	0.12	0.12	0.1	0.19
pH	PWQO	6.5-8.5	6.5-9					7.77	8.06	7.86
Phenols	IPWQO	0.001	0.004	0.961		<0.001	<0.001	<0.001	<0.001	0.001
Sulphate						29	26	34	34	34
TDS					308	300	302	317	332	335
Total phosphorous	IPWQO	0.03			0.02	0.02	0.03	0.29	0.03	<0.02
Turbidity								21.1	16.6	11.5
Hardness as CaCO3						179	205	212	222	220
Calcium					57	52	59	62	66	65
Magnesium					14	12	14	14	14	14
Potassium					5	5	6	6	6	7
Sodium					16	15	16	17	18	19
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aluminum total	IPWQO									
Barium					0.07	0.09	0.08	0.1	0.1	0.11
Beryllium	PWQO	(b) 0.011				<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55	0.16	0.15	0.15	0.21	0.28	0.27
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.001	<0.001	<0.001	0.002	0.002	0.001
Cobalt	IPWQO	0.0009			0.0004	0.0003	0.0003	0.0004	0.0004	0.0004
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		1.26	2.26	1.58	4.11	2.93	3.26
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002		<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					1.39	1.33	1.46	1.5	1.65	1.85
Molybdenum	IPWQO	0.04				<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025		<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					8.3	9.9	8.6	9.9	9.8	9.1
Silver	PWQO	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.138	0.187	0.158	0.204	0.169	0.186
Thallium	IPWQO	0.0003				<0.0001	<0.0001	0.0006	<0.0001	<0.0001
Titanium						<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006				0.002	0.002	0.004	0.004	0.003
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					8	14	7	13	13	13
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN					0.5	0.36	0.4	0.39	0.39	0.39
Sus. Solids										
Field Parameters										
Discharge L/sec					5.2	10	6	11	11	8
pH					6.87	7.63	7.55	7.32	7.41	7.28
DO	PWQO	f			7.63	8.85	12.11	8.37	9.3	6.99
Conductivity		mg/l			360	369	382	427	402	413
Temperature					13.7	10.7	8.7	9.5	9.9	8.7

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-4					
Sample Date					May-08	Oct-08	May-09	Jul-09	Sep-09	May-10
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			202	191	187	196	200	197
BOD					<1	<1	<1	2	2	<1
Chloride			120	180	21	20	20	18	19	20
Conductivity					507	491	499	497	494	
DOC					6.3	5.4	5.8	5.7	6.1	
N-NH3 (Ammonia)					0.46	0.36	0.35	0.4	0.38	0.49
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		0.13	0.18	0.21	0.19	0.16	0.19
pH	PWQO	6.5-8.5	6.5-9		7.93	7.87	7.95	8.01	7.85	8.16
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate					37	32	35	35	31	
TDS					330	319	324	323	321	
Total phosphorous	IPWQO	0.03			0.02	<0.01	0.02	0.01	0.01	0.01
Turbidity					10.9	11.9	7.6	7.9	11.9	15.4
Hardness as CaCO3					233	210	222	217	196	
Calcium					67	61	69	64	57	63
Magnesium					16	14	12	14	13	14
Potassium					6	6	5	7	7	7
Sodium					18	18	15	18	17	18
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01	<0.01	0.01	0.01	<0.01
Aluminum total	IPWQO							<0.01		
Barium					0.11	0.09	0.09	0.1	0.09	0.09
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55	0.23	0.22	0.34	0.24	0.2	0.24
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.002	0.002	0.001	0.001	0.001	<0.001
Cobalt	IPWQO	0.0009			0.0007	0.0003	0.0005	0.0004	0.0003	0.0004
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		3.09	1.79	2.2	3.73	2.25	2.9
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					1.69	1.44	1.29	1.31	1.35	1.29
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					9	8.8	7.7	8.2	8.6	8.3
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.16	0.176	0.206	0.209	0.207	0.207
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.05	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006			0.004	0.004	0.002	0.003	0.003	0.002
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD										13
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec							8.3	7.9	7.5	7.3
pH							7.6	7.8	7.9	7.9
DO	PWQO	f					9.85	8.38	8.99	6.94
Conductivity		mg/l					531	429	432	478
Temperature							10.2	11.5	8.9	9

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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					Sample Location SW-4					
Sample Date					Aug-10	Oct-10	Jun-11	Aug-11	Oct-11	Jun-12
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			193	190	192	187	188	202
BOD					<1	<1	1	1	<1	<1
Chloride			120	180	20	20	20	18	20	21
Conductivity										
DOC										
N-NH3 (Ammonia)					0.35	0.45	0.39	0.41	0.36	0.55
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		0.15	0.14	<0.10	0.2	0.18	0.19
pH	PWQO	6.5-8.5	6.5-9		7.9	8.04	8.01	7.99	7.66	7.81
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate										
TDS										
Total phosphorous	IPWQO	0.03			<0.01	<0.001	<0.01	<0.01	<0.01	0.01
Turbidity					16.7	15.4	7.2	6.9	5.9	9.5
Hardness as CaCO3										170
Calcium					60	63	57	53	57	50
Magnesium					13	13	12	11	12	11
Potassium					7	6	6	6	6	6
Sodium					18	17	15	16	15	20
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aluminum total	IPWQO						0.01		<0.01	0.01
Barium					0.09	0.08	0.08	0.09	0.08	0.1
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IPWQO	0.2	1.5	3.55	0.19	0.2	0.17	0.16	0.16	0.23
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.005	0.002	<0.001	0.002	<0.001	0.002
Cobalt	IPWQO	0.0009			0.0003	0.0003	0.0003	0.0003	0.0003	0.0004
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		2.45	2.26	2	1.83	1.59	2.61
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					1.29	1.16	0.87	0.94	1.03	1.3
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					8.3	8.3	7.4	7.7	7.7	8.8
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.206	0.201	0.18	0.181	0.189	0.204
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006			0.003	0.002	0.002	0.003	0.002	0.004
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					8	20	10	15	10	15
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					7	5.8	5.5	7.71	9.11	4
pH					7.8	8.1	7.9	7.6	7.7	7.6
DO	PWQO	f			3.72	12.3	3.49	8.63	8.93	9.82
Conductivity		mg/l			357	352	368	355	447	432
Temperature					10.3	7.4	10.3	10.6	9.4	9.1

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

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					Sample Location SW-4					
Sample Date					Aug-12	Oct-12	Jun-13	Aug-13	Nov-13	Apr-14
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			204	197	181	178	183	179
BOD					2	1	<1	2	<1	< 3
Chloride			120	180	21	20	16	18	17	16.4
Conductivity										
DOC										
N-NH3 (Ammonia)					0.6	0.55	0.43	0.47	0.49	0.57
N-NH3 (unionized)	PWQO	0.02			0.02	0.02	<0.02	<0.02	<0.02	< 0.01
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	< 0.10
N-NO3 (Nitrate)			13		0.2	0.18	0.19	0.22	0.28	0.3
pH	PWQO	6.5-8.5	6.5-9		7.83	7.85	7.91	7.86	8.16	
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001
Sulphate										
TDS										
Total phosphorous	IPWQO	0.03			0.01	<0.01	0.02	0.01	0.01	0.03
Turbidity					15.3	5.3	6.3	11.3	10.1	19.8
Hardness as CaCO3					197	204	190	167	197	206
Calcium					59	62	58	47	59	61.7
Magnesium					12	12	11	12	12	12.5
Potassium					6	7	7	6	7	7
Sodium					18	18	14	15	18	17.3
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01		<0.01	<0.01	0.03
Aluminum total	IPWQO				<0.01	<0.01	0.01	<0.01	0.01	
Barium					0.1	0.1	0.09	0.09	0.08	0.112
Beryllium	PWQO	(b) 0.011			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.002
Boron	IPWQO	0.2	1.5	3.55	0.25	0.27	0.2	0.22	0.18	0.267
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002
Chromium	PWQO	0.0099			0.002	<0.001	0.002	<0.001	<0.001	0.0003
Cobalt	IPWQO	0.0009			0.0004	0.0004	0.0003	0.0003	0.0003	0.0003
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	0.002
Iron	PWQO	0.3	0.3		2.98	1.33	1.73	1.92	1.48	5.46
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.0135
Manganese					1.27	1.19	0.79	0.9	0.79	1.1
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	0.0003
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	0.0019
Silicon					8.7	7.2	8.3	7.3	8.7	8.6
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002
Strontium					0.204	0.203	0.182	0.181	0.172	0.225
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00005
Titanium					<0.01	<0.01	<0.01	<0.01	<0.01	< 0.005
Vanadium	IPWQO	0.006			0.002	0.002	0.001	0.002	0.001	< 0.005
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	0.014
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					12	8	<5	9	8	9
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					8.6	6.5	7.7	7.8	7.1	8.3
pH					7.4	7	8	7.6	7.7	7.7
DO	PWQO	f			6.87	8.47	3.03	7.55	10.03	7.1
Conductivity		mg/l			424	480	442	414	465	115
Temperature					10.4	9	11.3	10.2	7.4	10

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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					Sample Location SW-4					
Sample Date					Jul-14	Oct-14	Jun-15	Aug-15	Oct-15	May-16
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			175	177	190	186	185	178
BOD					< 3	< 3	7	< 3	< 3	<5
Chloride			120	180	16.2	16.8	17.4	17.4	17.5	19.2
Conductivity										
DOC										4.7
N-NH3 (Ammonia)					0.65	0.61	0.77	0.62	0.7	0.72
N-NH3 (unionized)	PWQO	0.02			0.04	0.03	0.02	< 0.01	< 0.01	0.036
N-NO2 (Nitrite)					< 0.10	< 0.10	< 0.1	< 0.1	< 0.1	<0.05
N-NO3 (Nitrate)			13		0.3	0.3	0.3	0.3	0.3	0.31
pH	PWQO	6.5-8.5	6.5-9							
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001
Sulphate										25.1
TDS						240				
Total phosphorous	IPWQO	0.03			0.05	< 0.01	< 0.01	< 0.01	< 0.01	0.03
Turbidity					19.8	10.2	12.4	10.8	5	6.8
Hardness as CaCO3					201	184	186	211	169	186
Calcium					60.5	54.8	54.5	63.9	49.5	55
Magnesium					12.7	11.3	12	13.6	11	11.7
Potassium					7	6.6	6	7.7	6.1	6.65
Sodium					16.6	15.5	16	20	15.6	14.3
Aluminum (dissolved)	IPWQO	0.075			0.02	0.02	0.02	0.02	0.02	
Aluminum total	IPWQO									
Barium					0.109	0.086	0.087	0.108	0.089	0.082
Beryllium	PWQO	(b) 0.011			< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.001
Boron	IPWQO	0.2	1.5	3.55	0.294	0.165	0.296	0.321	0.258	0.255
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	0.00002	< 0.00002	< 0.00002	0.00003	< 0.00002	<0.0001
Chromium	PWQO	0.0099			0.006	< 0.002	< 0.002	< 0.002	< 0.002	<0.003
Cobalt	IPWQO	0.0009			0.0007	< 0.0001	0.0004	0.0002	0.0003	<0.0005
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0048	0.0004	< 0.0001	0.0097	0.0004	<0.002
Iron	PWQO	0.3	0.3		4.24	1.55	2.22	2.42	1.41	1.80
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.00053	0.00003	0.00008	0.00065	0.00002	<0.001
Manganese					1.05	0.948	0.938	1.09	0.878	0.744
Molybdenum	IPWQO	0.04			0.0004	0.0004	0.0003	0.0003	0.0004	<0.002
Nickel	PWQO	0.025		0.025	0.0031	0.0015	0.0018	0.0015	0.0027	<0.003
Silicon					10	7.32	7.34	9.17	7.45	7.73
Silver	PWQO	0.0001			0.00003	< 0.00002	< 0.00002	< 0.00002	0.00014	<0.0001
Strontium					0.218	0.196	0.19	0.234	0.177	0.186
Thallium	IPWQO	0.0003			< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.0003
Titanium					0.051	< 0.005	< 0.005	< 0.005	< 0.005	<0.002
Vanadium	IPWQO	0.006			0.01	< 0.005	< 0.005	< 0.005	< 0.005	<0.002
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.011	0.006	< 0.005	0.017	< 0.005	<0.005
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					13	13	12	< 5	10	<5
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					7.99	7.2	8.7	17.91	5.7	9.3
pH					8.1	7.6	7.4	7.2	7.5	7.4
DO	PWQO	f			10.71	9.4	9.32	9.42	9.89	11.08
Conductivity		mg/l			420	430	506	419	411	412
Temperature					9.8	7.8	10	10.7	8.3	9.5

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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					Sample Location SW-4					
Sample Date					Aug-16	Nov-16	Apr-17	Aug-17	Oct-17	May-18
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			170	181	203	195	176	194
BOD					<5	<5	3	< 3	< 3	1
Chloride			120	180	18.6	20.0	15.2	14.2	15.4	18
Conductivity										
DOC					4.5	4.7				4.9
N-NH3 (Ammonia)					0.82	0.76	0.89	0.86	0.72	1.12
N-NH3 (unionized)	PWQO	0.02			0.079	0.055	0.05	-	0.04	0.05
N-NO2 (Nitrite)					<0.05	<0.05	< 0.1	< 0.05	< 0.05	< 0.10
N-NO3 (Nitrate)			13		0.31	0.32	0.6	0.34	0.4	0.36
pH	PWQO	6.5-8.5	6.5-9							8.06
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	< 0.001	< 0.001	< 0.001	0.001
Sulphate					25.9	21.4				25
TDS										
Total phosphorous	IPWQO	0.03			0.01	0.01	0.01	< 0.01	0.02	0.013
Turbidity					10.5	20.4	11.5	13.8	13.3	12.5
Hardness as CaCO3					175	179	200	192	176	221
Calcium					52.2	53.4	57.1	49.6	52.1	67
Magnesium					10.9	11.0	12.3	11.1	11.1	13
Potassium					6.71	6.89	7.2	6.7	6.9	8
Sodium					15.6	15.7	17.7	15.1	14.7	20
Aluminum (dissolved)	IPWQO	0.075					0.04	0.02	0.04	< 0.01
Aluminum total	IPWQO									0.03
Barium					0.089	0.080	0.098	0.088	0.089	0.10
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	< 0.002	< 0.002	< 0.002	< 0.0005
Boron	IPWQO	0.2	1.5	3.55	0.225	0.246	0.383	0.305	0.278	0.36
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	< 0.000020	< 0.000014	< 0.000014	< 0.0001
Chromium	PWQO	0.0099			<0.003	<0.003	< 0.001	< 0.001	< 0.001	< 0.001
Cobalt	IPWQO	0.0009			<0.0005	<0.0005	0.0005	0.0003	< 0.0001	0.0005
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.002	<0.002	0.0005	0.0002	0.0004	< 0.001
Iron	PWQO	0.3	0.3		1.81	2.86	4.71	1.59	2.33	2.32
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	0.00034	0.00028	0.00008	< 0.001
Manganese					0.732	0.903	1.05	0.704	0.738	0.88
Molybdenum	IPWQO	0.04			<0.002	<0.002	0.0003	0.0003	0.0003	< 0.005
Nickel	PWQO	0.025		0.025	<0.003	<0.003	0.0024	0.0016	0.0014	< 0.005
Silicon					8.04	8.76	8.62	8.24	8.17	8.3
Silver	PWQO	0.0001			<0.0001	<0.0001	< 0.00002	< 0.00002	< 0.00002	< 0.0001
Strontium					0.171	0.161	0.176	0.174	0.167	0.192
Thallium	IPWQO	0.0003			<0.0003	<0.0003	< 0.00005	< 0.00005	< 0.00005	< 0.0001
Titanium					<0.002	<0.002	0.006	< 0.005	< 0.005	< 0.01
Vanadium	IPWQO	0.006			<0.002	<0.002	< 0.005	< 0.005	< 0.005	0.002
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.005	<0.005	0.009	< 0.005	< 0.005	< 0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					8	<5	12	13	15	14
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					7.5	7.5	9.09	9.41	8.8	8.5
pH					7.2	7.7	7.2	--	7.7	7.3
DO	PWQO	f			9.43	9.73	10.89	4.85	6.9	5.79
Conductivity		mg/l			461	440	472	--	389	416
Temperature					11.1	6	6.2	--	10.3	8.9

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

Sample Date					Jul-18	Oct-18				
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			198	192				
BOD					2	1				
Chloride			120	180	20	18				
Conductivity										
DOC					5.6	10.2				
N-NH3 (Ammonia)					1.15	0.36				
N-NH3 (unionized)	PWQO	0.02			0.03	< 0.02				
N-NO2 (Nitrite)					< 0.10	< 0.10				
N-NO3 (Nitrate)			13		0.35	< 0.37				
pH	PWQO	6.5-8.5	6.5-9		7.88	7.94				
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	< 0.001				
Sulphate					29	23				
TDS										
Total phosphorous	IPWQO	0.03			0.013	0.007				
Turbidity					12.1	7.3				
Hardness as CaCO3					188	182				
Calcium					57	53				
Magnesium					11	12				
Potassium					6	7				
Sodium					18	16				
Aluminum (dissolved)	IPWQO	0.075			0.01					
Aluminum total	IPWQO					< 0.01				
Barium					0.11	0.1				
Beryllium	PWQO	(b) 0.011			< 0.0005	< 0.0005				
Boron	IPWQO	0.2	1.5	3.55	0.41	0.31				
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	< 0.0001	< 0.0001				
Chromium	PWQO	0.0099			< 0.001	< 0.001				
Cobalt	IPWQO	0.0009			0.0004	0.0003				
Copper	PWQO IPWQO	0.005 d	d	0.0069	< 0.001	< 0.001				
Iron	PWQO	0.3	0.3		2.8	1.6				
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	< 0.001	< 0.001				
Manganese					0.99	0.9				
Molybdenum	IPWQO	0.04			< 0.005	< 0.005				
Nickel	PWQO	0.025		0.025	< 0.005	< 0.005				
Silicon					8.1	8.3				
Silver	PWQO	0.0001			< 0.0001	< 0.0001				
Strontium					0.204	0.207				
Thallium	IPWQO	0.0003			< 0.0001	< 0.0001				
Titanium					< 0.01	< 0.01				
Vanadium	IPWQO	0.006			0.001	0.001				
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	< 0.01	< 0.01				
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					21	< 5				
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					8.1	7.27				
pH					7.4	7.8				
DO	PWQO	f			12.32	11.9				
Conductivity		mg/l			372	352				
Temperature					10.7	8.5				

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-5					
Sample Date					Nov-98	Jul-99	Oct-99	Nov-99	Jun-00	Aug-00
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			230	182	213	170	199	191
BOD					9	<1	<1	<1	<1	<1
Chloride			120	180	21.3	17.2	20.3	19.2	16.8	16.6
Conductivity					490	485	479	406	459	384
DOC										
N-NH3 (Ammonia)					0.09			0.04	0.08	0.03
N-NH3 (unionized)	PWQO	0.02			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N-NO2 (Nitrite)					<0.01	<0.1	<0.1	<0.1	<0.1	<0.1
N-NO3 (Nitrate)			13		0.01	0.2	0.2	0.2	0.2	0.2
pH	PWQO	6.5-8.5	6.5-9		7.6	7.7	7.61	8.26	8.23	7.64
Phenols	IPWQO	0.001	0.004	0.961	0.037	0.003	0.002	<0.001	0.005	0.005
Sulphate					34					
TDS										
Total phosphorous	IPWQO	0.03			<0.01	0.03	<0.01	0.01	0.02	0.1
Turbidity					11.4	1.9	1.2	2.2	5.1	143
Hardness as CaCO3					276	220	214	217	218	182
Calcium					81.9	62.5	61.6	61.9	63.8	53.2
Magnesium					17.2	15.2	14.3	14.9	14.3	11.9
Potassium						1.6	0.9	5.3	3.4	4.3
Sodium					14.6	14	14.2	14.4	13.9	11.7
Aluminum (dissolved)	IPWQO	0.075			0.04	0.06	0.02	0.04	0.15	0.33
Aluminum total	IPWQO									
Barium										
Beryllium	PWQO	(b) 0.011								
Boron	IPWQO	0.2	1.5	3.55						
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Chromium	PWQO	0.0099			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	IPWQO	0.0009				0.001	0.0005	0.0005	0.0006	0.0026
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0033	<0.0005	<0.0005	<0.0005	<0.0005	0.0043
Iron	PWQO	0.3	0.3		2.2	2.58	0.59	1.25	2.38	14.9
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0027
Manganese					1.61					
Molybdenum	IPWQO	0.04								
Nickel	PWQO	0.025		0.025	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon										
Silver	PWQO	0.0001			0.0013	0.0004	0.0002	<0.0001	<0.0001	0.0002
Strontium										
Thallium	IPWQO	0.0003								
Titanium										
Vanadium	IPWQO	0.006								
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.01	<0.01	<0.01	<0.01	0.03	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15		<0.001	<0.001	<0.001	0.001	<0.001
COD					11	17	13	10	10	8
Colour					<1	10	5	8	11	14
Mercury	PWQO	0.0002			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Selenium	PWQO	0.1			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Tannin & Lignin										
TOC					5.9					
TKN					0.34	0.33	0.07	0.26	0.36	0.75
Sus. Solids					2	32	<1	6	11	19
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f			9	10	9	11		11
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-5					
Sample Date					Oct-00	Sep-01	Dec-01	Jun-02	Aug-03	Oct-03
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			200	177	169	167	38	176
BOD					<1	1	1	<1	<1	<1
Chloride			120	180	19.1	17.9		17	12	17.2
Conductivity					426	409	412	421	139	439
DOC										
N-NH3 (Ammonia)					0.06	0.09	0.09	0.16	<0.01	0.03
N-NH3 (unionized)	PWQO	0.02			<0.01				<0.01	<0.01
N-NO2 (Nitrite)					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
N-NO3 (Nitrate)			13		0.2	0.2	0.2	0.2	0.3	0.2
pH	PWQO	6.5-8.5	6.5-9		7.97	8.43	8.54	7.92	7.47	8
Phenols	IPWQO	0.001	0.004	0.961	0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate							26	26	6	25
TDS										
Total phosphorous	IPWQO	0.03			0.01	0.01	0.03	0.11	0.01	0.04
Turbidity					2.9	7.8	30	17.8	1.9	4.3
Hardness as CaCO3					195	210	228	197	44	187
Calcium					53.5	61.6	65.4	60.7	11.4	54.1
Magnesium					15	13.6	15.6	13.2	3.81	12.5
Potassium					1.1	3.9	4	6	1	5
Sodium					13.2	13.3	15.6	13	8.5	13.3
Aluminum (dissolved)	IPWQO	0.075			0.32	0.04	0.34	0.03	0.061	0.013
Aluminum total	IPWQO									
Barium							0.095	0.09	0.012	
Beryllium	PWQO	(b) 0.011							<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55					0.006	0.108
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			<0.01	<0.01	<0.01	<0.01	0.003	<0.0002
Cobalt	IPWQO	0.0009			<0.0005	0.0012	0.0031		0.0001	0.0002
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.0005	0.005	0.0007	0.003	<0.002	0.014
Iron	PWQO	0.3	0.3		0.81	1.55	6.67	3.73	0.613	0.819
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.0002	0.0002	0.0003	0.0007	0.0008	<0.0005
Manganese							1.67	1.56	0.029	
Molybdenum	IPWQO	0.04							0.0014	0.0001
Nickel	PWQO	0.025		0.025	<0.02	<0.02	<0.02	<0.02	<0.01	<0.01
Silicon										
Silver	PWQO	0.0001			<0.0001	0.0001	0.0001	0.0001	<0.0001	<0.0001
Strontium										
Thallium	IPWQO	0.0003								
Titanium										
Vanadium	IPWQO	0.006								<0.005
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	0.01	<0.005	<0.005
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.001	<0.001	0.001	0.002	<0.03	0.002
COD					3	3	12	14	29	7
Colour					12	12	4	4		
Mercury	PWQO	0.0002			<0.0001	<0.0001		<0.0001		<0.0001
Selenium	PWQO	0.1			<0.001	<0.001	<0.001	0.003		<0.001
Tannin & Lignin										
TOC							7	4.9		
TKN					0.3	0.31	0.41	0.38		
Sus. Solids					<1	7	20	36		
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f				11			8.4	
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-5					
Sample Date					Mar-04	Jul-04	Sept-04	May-05	Aug-05	Nov-05
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			147	165	183	185	184	181
BOD					3	1	6	<1	<1	<1
Chloride			120	180	15	21	20.5	22	22	20
Conductivity					382	492	448			
DOC										
N-NH3 (Ammonia)					0.12	0.2	0.12	0.14	0.16	0.17
N-NH3 (unionized)	PWQO	0.02			<0.01	<0.01	<0.01	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.1	<0.1	<0.1	<0.1	<0.10	<0.10
N-NO3 (Nitrate)			13		0.3	0.2	0.3	<0.10	0.18	0.16
pH	PWQO	6.5-8.5	6.5-9		7.16	7.7	7.7	8.03	8.09	8.15
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate					23		26			
TDS					201	238	242			
Total phosphorous	IPWQO	0.03			0.2	0.09	0.68	0.02	0.05	0.09
Turbidity					120	88	136	10.7	7.2	6.5
Hardness as CaCO3					174	203	195	188	192	196
Calcium					49.8	59.3	54.6	54	57	57
Magnesium					12	13.3	14.3	13	12	13
Potassium					4.5	4.8	5.4	5	5	5
Sodium					11.2	13.8	14.6	14	15	15
Aluminum (dissolved)	IPWQO	0.075			1.24	0.281	2.17	0.1	0.01	0.02
Aluminum total	IPWQO									
Barium								0.1	0.08	0.07
Beryllium	PWQO	(b) 0.011						<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55				0.12	0.21	0.14
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.001	<0.001	<0.0001		<0.0001
Chromium	PWQO	0.0099			0.0027	<0.002	<0.002	0.002	0.002	0.001
Cobalt	IPWQO	0.0009			0.0007	<0.001	<0.001	0.0005	0.0003	0.0003
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.002	<0.02	0.038	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		28.2	0.446	0.845	2.27	1.05	1.38
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.0044	<0.005	<0.005	<0.001		<0.001
Manganese								1.17	0.86	1.28
Molybdenum	IPWQO	0.04						<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
Silicon						30		6.7	13.7	9.4
Silver	PWQO	0.0001			<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium								0.197	0.145	0.188
Thallium	IPWQO	0.0003						<0.0001	<0.0001	<0.0001
Titanium								<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006						0.002	0.003	0.002
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.021	0.01	0.081	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.003	<0.03	0.01			
COD					55	19	94	9	9	10
Colour					7	6	42			
Mercury	PWQO	0.0002			<0.0001	<0.0001				
Selenium	PWQO	0.1			<0.001	<0.01	0.001			
Tannin & Lignin										
TOC										
TKN					1.15	0.72	3.53			
Sus. Solids					160	48	811			
Field Parameters										
Discharge L/sec								7.5	6.5	11
pH								7.85	7.6	8.28
DO	PWQO	f						4.85	8.75	11.12
Conductivity		mg/l						429	420	424
Temperature								12.5	10.8	3.1

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-5					
Sample Date					May-06	Aug-06	Oct-06	May-07	Aug-07	Oct-07
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			185	175	176	184	196	195
BOD					<1	<1	<1	<1	<1	2
Chloride			120	180	21	21	20	20	22	22
Conductivity					468	456	451	482	504	509
DOC					5.6	5.5	6.1	6.2	6.9	7.3
N-NH3 (Ammonia)					0.22			0.32	0.23	0.32
N-NH3 (unionized)	PWQO	0.02						<0.02	<0.02	<0.02
N-NO2 (Nitrite)						<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13			0.16	0.17	0.14	0.13	0.22
pH	PWQO	6.5-8.5	6.5-9					7.91	8.14	8.02
Phenols	IPWQO	0.001	0.004	0.961		<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate						29	29	33	34	34
TDS					304	296	293	313	328	331
Total phosphorous	IPWQO	0.03			0.04	0.03	0.03	0.18	0.12	<0.02
Turbidity								15.2	14.5	10.1
Hardness as CaCO3						184	207	210	222	27
Calcium					55	54	60	61	66	66
Magnesium					13	12	14	14	14	15
Potassium					5	5	6	6	6	7
Sodium					15	15	16	17	18	19
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aluminum total	IPWQO									
Barium					0.09	0.08	0.07	0.09	0.09	0.1
Beryllium	PWQO	(b) 0.011				<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55	0.16	0.15	0.15	0.2	0.27	0.27
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.001	<0.001	<0.001	0.001	0.002	0.001
Cobalt	IPWQO	0.0009			0.0004	0.0003	0.0003	0.0004	0.0004	0.0004
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	0.003	<0.001
Iron	PWQO	0.3	0.3		2.71	1.87	0.72	2.95	0.51	2.04
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002		<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					1.45	1.18	1.18	0.33	1.49	1.66
Molybdenum	IPWQO	0.04				<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025		<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					8.2	9.7	8.3	9.5	9.4	9
Silver	PWQO	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.192	0.151	0.159	0.1387	0.202	0.191
Thallium	IPWQO	0.0003				<0.0001	<0.0001	0.0006	<0.0001	<0.0001
Titanium						<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006				0.002	0.001	0.003	0.002	0.003
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					9	13	13	13	13	13
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN					0.44	0.32	0.39	0.39	0.39	0.39
Sus. Solids										
Field Parameters										
Discharge L/sec					5.5	10	7	11	11	8
pH					6.87	7.7	7.63	7.21	7.46	7.34
DO	PWQO	f			8.42	9.39	12.91	8.85	9.75	7.67
Conductivity		mg/l			345	367	375	419	398	404
Temperature					12.4	11	8.8	9	9.9	8.8

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-5					
Sample Date					May-08	Oct-08	May-09	Jul-09	Sep-09	May-10
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			200	189	194	193	198	193
BOD					<1	<1	2	2	2	2
Chloride			120	180	21	20	20	18	19	20
Conductivity					502	485	493	490	485	
DOC					6.2	5.2	5.7	5.6	6.2	
N-NH3 (Ammonia)					0.4	0.3	0.3	0.33	0.34	0.42
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		0.19	0.21	0.26	0.23	0.21	0.31
pH	PWQO	6.5-8.5	6.5-9		8.05	8.02	8.09	8.12	7.99	8.22
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate					37	32	34	34	31	
TDS					326	315	320	319	315	
Total phosphorous	IPWQO	0.03			0.03	0.01	0.01	<0.01	<0.01	0.08
Turbidity					9.6	6.6	10	6.7	8.1	20.9
Hardness as CaCO3					233	207	216	217	187	
Calcium					67	60	65	64	55	57
Magnesium					16	14	13	14	12	13
Potassium					6	6	5	7	6	6
Sodium					19	17	17	18	17	17
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01	<0.01	<0.01		<0.01
Aluminum total	IPWQO							<0.01	<0.01	
Barium					0.11	0.08	0.08	0.08	0.08	0.1
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55	0.2	0.23	0.32	0.24	0.19	0.24
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Chromium	PWQO	0.0099			0.002	0.002	0.001	0.001	0.001	<0.001
Cobalt	IPWQO	0.0009			0.0006	0.0003	0.0005	0.0003	0.0003	0.0004
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		2.97	1.28	1.72	1.57	1.89	5.13
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					1.54	1.3	1.13	1.28	1.31	1.34
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					8.5	8.9	7.4	8.2	8.4	8.3
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.15	0.178	0.196	0.212	0.205	0.204
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.05	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006			0.004	0.003	0.002	0.002	0.003	0.003
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD										13
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec							8	8	8.8	8
pH							8	8	8.2	8.1
DO	PWQO	f					10.4	8.77	9.63	7.38
Conductivity		mg/l					523	423	425	471
Temperature							9.5	11.4	8.9	8.6

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
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					Sample Location SW-5					
Sample Date					Aug-10	Oct-10	Jun-11	Aug-11	Oct-11	May-12
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			193	187	188	184	187	199
BOD					<1	<1	1	3	<1	1
Chloride			120	180	20	20	19	18	20	21
Conductivity										
DOC										
N-NH3 (Ammonia)					0.31	0.38	0.34	0.34	0.31	0.49
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		0.19	0.17	<0.10	0.27	0.23	0.24
pH	PWQO	6.5-8.5	6.5-9		8.05	8.17	8.09	8.11	7.89	7.98
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate										
TDS										
Total phosphorous	IPWQO	0.03			<0.01	0.01	<0.01	<0.01	0.01	0.01
Turbidity					11.1	6.5	10.8	7.4	2.4	4.6
Hardness as CaCO3										170
Calcium					62	65	55	54	56	50
Magnesium					14	13	12	12	12	11
Potassium					7	6	6	6	6	6
Sodium					18	17	15	16	15	18
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aluminum total	IPWQO						0.01		<0.01	0.02
Barium					0.09	0.08	0.08	0.08	0.07	0.1
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IPWQO	0.2	1.5	3.55	0.18	0.2	0.17	0.16	0.15	0.23
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.002	0.002	<0.001	0.002	<0.001	0.002
Cobalt	IPWQO	0.0009			0.0003	0.0003	0.0003	0.0003	0.0002	0.0004
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		2.02	1.21	1.54	1.83	0.82	2.56
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					1.22	1.07	0.81	0.86	0.82	1.23
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					9.4	8.5	7.5	8	7.5	8.9
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.212	0.208	0.186	0.177	0.179	0.199
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006			0.002	0.002	0.002	0.002	0.002	0.004
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					8	25	10	10	8	17
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					7	4.1	8.02	7.9	7.83	4.5
pH					8.1	8.3	8.1	7.9	7.7	7.9
DO	PWQO	f			3.45	13.05	3.44	9.31	9.77	10.24
Conductivity		mg/l			352	347	362	350	439	425
Temperature					10.3	7.1	10.4	10.9	9.4	9.1

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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					Sample Location SW-5					
Sample Date					Aug-12	Oct-12	Jun-13	Aug-13	Nov-13	Apr-14
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			201	194	179	177	177	177
BOD					3	1	<1	2	2	< 3
Chloride			120	180	20	19	17	17	17	16.1
Conductivity										
DOC										
N-NH3 (Ammonia)					0.53	0.45	0.37	0.4	0.39	0.49
N-NH3 (unionized)	PWQO	0.02			0.02	<0.02	<0.02	<0.02	<0.02	< 0.01
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	< 0.10
N-NO3 (Nitrate)			13		0.29	0.25	0.26	0.3	0.35	0.4
pH	PWQO	6.5-8.5	6.5-9		8.01	8.05	8.03	8.01	8.23	
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001
Sulphate										
TDS										
Total phosphorous	IPWQO	0.03			0.03	<0.01	0.01	0.01	<0.01	0.01
Turbidity					16.5	2.2	6.4	8.8	5.8	10
Hardness as CaCO3					199	202	190	167	194	268
Calcium					60	61	58	47	58	79.9
Magnesium					12	12	11	12	12	16.6
Potassium					6	7	6	6	7	9.2
Sodium					17	18	13	16	16	22.7
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01		<0.01	0.01	0.03
Aluminum total	IPWQO				0.03	<0.01	0.02	<0.01	<0.01	
Barium					0.12	0.09	0.08	0.08	0.07	0.123
Beryllium	PWQO	(b) 0.011			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.002
Boron	IPWQO	0.2	1.5	3.55	0.24	0.26	0.2	0.21	0.18	0.342
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002
Chromium	PWQO	0.0099			0.001	<0.001	0.002	<0.001	<0.001	< 0.0002
Cobalt	IPWQO	0.0009			0.0004	0.0004	0.0003	0.0003	0.0003	0.0003
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	0.0008
Iron	PWQO	0.3	0.3		7.19	0.67	1.58	1.32	0.89	3.1
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.00017
Manganese					1.28	1.02	0.73	0.75	0.66	1.13
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	0.0004
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	0.0021
Silicon					8.7	7.1	8.2	7.2	8.4	11
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002
Strontium					0.204	0.204	0.179	0.184	0.176	0.293
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00005
Titanium					<0.01	<0.01	<0.01	<0.01	<0.01	0.006
Vanadium	IPWQO	0.006			0.003	0.002	0.001	0.002	0.001	< 0.005
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	0.011
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					17	11	<5	10	7	7
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					7.5	8.1	9.1	8.6	8.8	7.7
pH					7.8	7.2	8	8	8	8
DO	PWQO	f			7.15	9.09	2.46	8.11	10.23	7.49
Conductivity		mg/l			418	471	434	411	457	408
Temperature					10.7	9.1	11.8	10	7.2	9.8

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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					Sample Location SW-5					
Sample Date					Jul-14	Oct-14	Jun-15	Aug-15	Oct-15	May-16
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			176	175	186	182	181	174
BOD					< 3	5	5	< 3	< 3	<5
Chloride			120	180	16.1	16.6	17.3	17.1	17.2	18.7
Conductivity										
DOC										4.6
N-NH3 (Ammonia)					0.53	0.47	0.65	0.47	0.56	0.62
N-NH3 (unionized)	PWQO	0.02			0.03	0.02	0.03	< 0.01	< 0.01	0.032
N-NO2 (Nitrite)					< 0.10	< 0.10	< 0.1	< 0.1	< 0.1	<0.05
N-NO3 (Nitrate)			13		0.3	0.4	0.4	0.4	0.4	0.44
pH	PWQO	6.5-8.5	6.5-9							
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001
Sulphate										24.9
TDS						243				
Total phosphorous	IPWQO	0.03			0.02	< 0.01	< 0.01	< 0.01	< 0.01	0.02
Turbidity					19.1	3.8	11.3	10.4	3.3	6.4
Hardness as CaCO3					203	194	172	210	177	184
Calcium					62.2	57.9	50.4	64	51.7	54.7
Magnesium					12.9	12	11.1	13.6	11.6	11.6
Potassium					7.1	6.9	5.5	7.6	6.4	6.60
Sodium					17.1	16.3	14.8	19.9	16.3	14.1
Aluminum (dissolved)	IPWQO	0.075			0.02	0.02	0.01	0.02	0.02	
Aluminum total	IPWQO									
Barium					0.099	0.083	0.077	0.106	0.083	0.079
Beryllium	PWQO	(b) 0.011			< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.001
Boron	IPWQO	0.2	1.5	3.55	0.302	0.175	0.271	0.318	0.267	0.252
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	< 0.00002	< 0.00002	< 0.00002	< 0.00002	< 0.00002	<0.0001
Chromium	PWQO	0.0099			< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.003
Cobalt	IPWQO	0.0009			0.0004	< 0.0001	0.0004	0.0002	0.0003	<0.0005
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0018	0.0003	< 0.0001	0.0008	0.0004	<0.002
Iron	PWQO	0.3	0.3		2.72	0.823	1.72	2.52	0.929	1.72
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.00025	0.00003	0.00011	0.00032	0.00003	<0.001
Manganese					0.937	0.811	0.782	0.982	0.779	0.675
Molybdenum	IPWQO	0.04			0.0003	0.0004	0.0003	0.0003	0.0004	<0.002
Nickel	PWQO	0.025		0.025	0.0026	0.0013	0.002	0.0014	0.0027	<0.003
Silicon					9.43	7.69	6.73	9.15	7.77	7.66
Silver	PWQO	0.0001			< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00017	<0.0001
Strontium					0.224	0.206	0.175	0.234	0.18	0.179
Thallium	IPWQO	0.0003			< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.0003
Titanium					0.017	< 0.005	< 0.005	< 0.005	< 0.005	<0.002
Vanadium	IPWQO	0.006			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	<0.002
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.009	0.006	< 0.005	0.006	< 0.005	<0.005
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					11	17	14	< 5	9	<5
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					7.99	8.7	8.74	8.13	4.4	9.1
pH					8.1	7.8	7.6	7.5	7.7	7.9
DO	PWQO	f			10.71	10.48	10.17	10.45	10.93	11.53
Conductivity		mg/l			420	423	499	412	404	406
Temperature					9.8	7.4	9.7	10.8	8.2	7.6

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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					Sample Location SW-5					
Sample Date					Aug-16	Nov-16	Apr-17	Aug-17	Oct-17	May-18
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			171	181	179	170	170	188
BOD					<5	<5	< 3	< 3	3	4
Chloride			120	180	18.4	19.9	14.9	14	15	18
Conductivity										
DOC					4.5	4.5				5.0
N-NH3 (Ammonia)					0.62	0.64	0.79	0.74	0.49	0.94
N-NH3 (unionized)	PWQO	0.02			0.058	0.043	< 0.01	-	0.03	0.05
N-NO2 (Nitrite)					<0.05	<0.05	< 0.1	< 0.05	< 0.05	< 0.10
N-NO3 (Nitrate)			13		0.43	0.44	0.7	0.45	0.61	0.5
pH	PWQO	6.5-8.5	6.5-9							8.14
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	< 0.001	< 0.001	< 0.001	0.001
Sulphate					25.8	21.4				24
TDS										
Total phosphorous	IPWQO	0.03			0.02	<0.01	< 0.01	< 0.01	0.03	0.003
Turbidity					8.3	6.6	5.2	9.4	20.6	9.6
Hardness as CaCO3					174	178	198	190	197	216
Calcium					51.9	53.4	57.3	51.4	58.7	65
Magnesium					10.8	10.9	12.2	11.4	12.3	13
Potassium					6.76	6.77	7.1	6.9	7.2	8
Sodium					15.6	15.7	17.3	15.4	15.9	19
Aluminum (dissolved)	IPWQO	0.075					0.04	0.02	0.03	< 0.01
Aluminum total	IPWQO									0.04
Barium					0.085	0.070	0.085	0.088	0.106	0.10
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	< 0.002	< 0.002	< 0.002	< 0.0005
Boron	IPWQO	0.2	1.5	3.55	0.223	0.241	0.373	0.309	0.282	0.35
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	< 0.000020	< 0.000014	< 0.000014	< 0.0001
Chromium	PWQO	0.0099			<0.003	<0.003	< 0.001	< 0.001	< 0.001	< 0.001
Cobalt	IPWQO	0.0009			<0.0005	<0.0005	0.0004	0.0003	< 0.0001	0.0004
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.002	<0.002	0.0003	0.0003	0.0004	< 0.001
Iron	PWQO	0.3	0.3		1.83	0.86	2.13	1.39	3.53	2.29
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	0.00009	0.00003	0.00013	< 0.001
Manganese					0.672	0.686	0.761	0.627	0.677	0.76
Molybdenum	IPWQO	0.04			<0.002	<0.002	0.0003	0.0003	0.0003	< 0.005
Nickel	PWQO	0.025		0.025	<0.003	<0.003	0.0024	0.0016	0.0012	< 0.005
Silicon					8.21	8.52	8.36	8.42	8.35	8.1
Silver	PWQO	0.0001			<0.0001	<0.0001	< 0.00002	< 0.00002	< 0.00002	< 0.0001
Strontium					0.168	0.157	0.171	0.178	0.205	0.188
Thallium	IPWQO	0.0003			<0.0003	<0.0003	< 0.00005	< 0.00005	< 0.00005	< 0.0001
Titanium					<0.002	<0.002	< 0.005	< 0.005	< 0.005	< 0.01
Vanadium	IPWQO	0.006			<0.002	<0.002	< 0.005	< 0.005	< 0.005	0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.005	<0.005	0.013	0.005	0.028	< 0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					8	<5	6	14	15	6
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					6.57	6.45	9.06	7.98	8.0	8.8
pH					7.3	7.9	7.3	--	8.0	7.5
DO	PWQO	f			10.33	10.52	12.35	5.23	7.2	5.99
Conductivity		mg/l			455	435	459	--	380	405
Temperature					11.4	5.7	6.3	--	10.7	9.0

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
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Sample Date					Jul-18	Oct-18				
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			192	188				
BOD					5	< 1				
Chloride			120	180	20	18				
Conductivity										
DOC					5.6	11.1				
N-NH3 (Ammonia)					1	0.39				
N-NH3 (unionized)	PWQO	0.02			0.03	< 0.02				
N-NO2 (Nitrite)					< 0.10	< 0.10				
N-NO3 (Nitrate)			13		0.83	0.52				
pH	PWQO	6.5-8.5	6.5-9		7.88	8.04				
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	< 0.001				
Sulphate					29	23				
TDS										
Total phosphorous	IPWQO	0.03			0.013	0.008				
Turbidity					28.5	5.9				
Hardness as CaCO3					188	178				
Calcium					57	53				
Magnesium					11	11				
Potassium					6	7				
Sodium					19	16				
Aluminum (dissolved)	IPWQO	0.075			0.02					
Aluminum total	IPWQO					0.01				
Barium					0.11	0.1				
Beryllium	PWQO	(b) 0.011			< 0.0005	< 0.0005				
Boron	IPWQO	0.2	1.5	3.55	0.4	0.3				
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	< 0.0001	< 0.0001				
Chromium	PWQO	0.0099			< 0.001	< 0.001				
Cobalt	IPWQO	0.0009			0.0004	0.0003				
Copper	PWQO IPWQO	0.005 d	d	0.0069	< 0.001	< 0.001				
Iron	PWQO	0.3	0.3		2.89	1.81				
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	< 0.001	0.009				
Manganese					0.9	0.81				
Molybdenum	IPWQO	0.04			< 0.005	< 0.005				
Nickel	PWQO	0.025		0.025	< 0.005	< 0.005				
Silicon					8	8.3				
Silver	PWQO	0.0001			< 0.0001	< 0.0001				
Strontium					0.205	0.204				
Thallium	IPWQO	0.0003			< 0.0001	< 0.0001				
Titanium					< 0.01	< 0.01				
Vanadium	IPWQO	0.006			0.001	< 0.001				
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	< 0.01	< 0.01				
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					18	< 5				
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					7.4	4.35				
pH					7.4	7.9				
DO	PWQO	f			12.58	11.9				
Conductivity		mg/l			365	349				
Temperature					10.7	8.5				

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-6					
Sample Date					Nov-98	Jul-99	Oct-99	Nov-99	Jun-00	Aug-00
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			220	114	181	166	197	166
BOD					<1	<1	<1	<1	<1	<1
Chloride			120	180	19.9	23.3	20.2	18.9	16.2	15.7
Conductivity					481	338	461	421	456	366
DOC										
N-NH3 (Ammonia)					0.05			0.02	0.05	0.03
N-NH3 (unionized)	PWQO	0.02			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N-NO2 (Nitrite)					<0.01	0.6	<0.1	<0.1	<0.1	<0.1
N-NO3 (Nitrate)			13		0.01	0.3	0.2	0.2	0.2	0.3
pH	PWQO	6.5-8.5	6.5-9		7.71	7.6	7.71	8.4	8.32	7.7
Phenols	IPWQO	0.001	0.004	0.961	0.178	<0.001	0.006	<0.001	0.005	0.013
Sulphate					35					
TDS										
Total phosphorous	IPWQO	0.03			0.03	0.02	<0.01	0.01	0.06	0.15
Turbidity					16.4	2.5	0.8	1.4	8.1	146
Hardness as CaCO3					282	141	213	222	218	174
Calcium					81.6	39.3	61.1	63.1	64	51.1
Magnesium					17.2	10.2	14.2	15.3	14.2	11.2
Potassium						<0.04	2.4	4.6	4.3	5.5
Sodium					14.5	12.4	13.8	14.6	13.5	11.2
Aluminum (dissolved)	IPWQO	0.075			0.1	0.06	0.05	0.05	0.39	0.41
Aluminum total	IPWQO									
Barium										
Beryllium	PWQO	(b) 0.011								
Boron	IPWQO	0.2	1.5	3.55						
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0001
Chromium	PWQO	0.0099			<0.01	<0.01	<0.01	<0.01	0.01	<0.01
Cobalt	IPWQO	0.0009				0.0006	0.0005	0.0005	0.0011	0.0027
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0019	0.0026	<0.0005	0.0006	0.0013	0.0043
Iron	PWQO	0.3	0.3		3	0.88	0.25	1.3	9.56	19
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.0002	<0.0002	<0.0002	<0.0002	0.0009	0.0025
Manganese					1.27					
Molybdenum	IPWQO	0.04								
Nickel	PWQO	0.025		0.025	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon										
Silver	PWQO	0.0001			0.001	0.0005	0.0002	<0.0001	<0.0001	0.0002
Strontium										
Thallium	IPWQO	0.0003								
Titanium										
Vanadium	IPWQO	0.006								
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	0.01	<0.01	<0.01	0.03	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15		<0.001	<0.001	<0.001	0.001	0.004
COD					<3	30	18	9	17	13
Colour					1.1	50	5	5	11	19
Mercury	PWQO	0.0002			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Selenium	PWQO	0.1			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Tannin & Lignin										
TOC					6.3					
TKN					0.4	0.51	0.05	0.23	0.61	1.11
Sus. Solids					15	10	2	3	26	136
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f			11	9	9	11		10
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-6					
Sample Date					Oct-00	Sep-01	Dec-01	Jun-02	Aug-03	Oct-03
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			193	176	172	164	39	175
BOD					<1	1	1	<1	<1	<1
Chloride			120	180	18.8	17.6		16.8	11.5	17.2
Conductivity					420	412	399	426	138	430
DOC										
N-NH3 (Ammonia)					0.04	0.06	0.06	0.12	<0.01	0.06
N-NH3 (unionized)	PWQO	0.02			<0.01				<0.01	<0.01
N-NO2 (Nitrite)					<0.1	<0.1	<0.1	0.1	<0.1	<0.1
N-NO3 (Nitrate)			13		0.2	0.2	0.2	0.2	0.2	0.2
pH	PWQO	6.5-8.5	6.5-9		7.99	8.45	8.53	8.02	7.52	8.04
Phenols	IPWQO	0.001	0.004	0.961	0.002	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate							26	26	6	25
TDS										
Total phosphorous	IPWQO	0.03			0.02	<0.01	0.02	0.04	0.01	0.01
Turbidity					1.7	3.8	10.8	16.8	1.7	2.3
Hardness as CaCO3					192	203	231	197	45	181
Calcium					52.3	59.3	66.4	59.6	11.6	52.5
Magnesium					15	13.4	15.8	13.2	3.91	12.2
Potassium					<0.4	2.9	3.1	4.6	1	4.9
Sodium					13.1	13.3	15.5	12.7	8.7	12.8
Aluminum (dissolved)	IPWQO	0.075			0.34	0.04	0.24	0.09	0.061	0.013
Aluminum total	IPWQO									
Barium							0.08	0.09	0.012	
Beryllium	PWQO	(b) 0.011							<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55					0.006	0.105
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.01	<0.01	<0.01	<0.01	0.002	0.0002
Cobalt	IPWQO	0.0009			<0.0005	0.0013	0.0019		0.0001	0.0003
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.0005	0.0005	0.0005	0.0031	<0.002	0.024
Iron	PWQO	0.3	0.3		0.6	1.22	3.13	3.88	0.578	0.389
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.0002	<0.0002	<0.0002	0.0009	0.0008	0.0006
Manganese							1.29	1.47	0.018	
Molybdenum	IPWQO	0.04							0.0014	0.0003
Nickel	PWQO	0.025		0.025	<0.02	<0.02	<0.02	<0.02	<0.01	<0.01
Silicon										
Silver	PWQO	0.0001			<0.0001	0.0001	0.0002	<0.0001	<0.0001	<0.0001
Strontium									0.051	
Thallium	IPWQO	0.0003								
Titanium										
Vanadium	IPWQO	0.006								<0.005
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	0.01	<0.005	<0.005
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.001	<0.001	0.001	0.001	<0.03	0.002
COD					<3	3	<3	15	25	15
Colour					10	5	4	4		
Mercury	PWQO	0.0002			<0.0001	<0.0001		<0.0001		<0.0001
Selenium	PWQO	0.1			<0.001	<0.001	<0.001	0.001		
Tannin & Lignin										
TOC							7	5.1		
TKN					0.29	0.34	0.33	0.39		
Sus. Solids					4	5	25	27		
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f				10			8.5	
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-6					
Sample Date					Mar-04	Jul-04	Sept-04	May-05	Aug-05	Nov-05
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			142	162	184	181	183	178
BOD					2	1	1	<1	<1	<1
Chloride			120	180	16	20.9	20.1	21	21	21
Conductivity					367	477	453			
DOC										
N-NH3 (Ammonia)					0.09	0.15	0.05	0.1	0.43	0.15
N-NH3 (unionized)	PWQO	0.02			<0.01	<0.01	<0.01	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.1	<0.1	<0.1	<0.1	0.1	<0.10
N-NO3 (Nitrate)			13		0.3	0.2	0.3	<0.1	0.21	0.18
pH	PWQO	6.5-8.5	6.5-9		7.25	7.91	8.37	8.04	8.18	8.16
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate					24	29	26			
TDS					198	231	244			
Total phosphorous	IPWQO	0.03			0.12	0.11	0.02	0.03	0.04	0.04
Turbidity					91	91	6.4		7.1	7.7
Hardness as CaCO3					167	194	191	191	189	196
Calcium					47.9	56	54	55	56	57
Magnesium					11.5	13.1	13.5	13	12	13
Potassium					4.5	4.7	5.5	5	5	5
Sodium					10.9	13.5	13.4	15	15	15
Aluminum (dissolved)	IPWQO	0.075			0.842	0.426	0.14	0.06	0.02	<0.01
Aluminum total	IPWQO									
Barium								0.09	0.07	0.07
Beryllium	PWQO	(b) 0.011						<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55				0.11	0.21	0.14
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.0022	<0.002	0.0002	0.002	0.001	0.001
Cobalt	IPWQO	0.0009			0.0006	<0.001	0.0002	0.0004	0.0002	0.003
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.002	<0.02	<0.002	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		15.8	0.498	5.22	2.53	1.09	1.13
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.0027	<0.005	<0.0005	<0.001	<0.001	
Manganese								0.96	0.67	1.05
Molybdenum	IPWQO	0.04						<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.01	<0.01	<0.01	<0.005	<0.005	<0.005
Silicon									13	9.1
Silver	PWQO	0.0001			<0.0001	<0.001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium								0.189	0.144	0.161
Thallium	IPWQO	0.0003							<0.0001	<0.0001
Titanium									<0.01	<0.01
Vanadium	IPWQO	0.006						0.003	0.003	0.002
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.015	0.013	<0.005	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	0.002	<0.03	0.001			
COD					42	16	14	11	12	14
Colour					7	12	8			
Mercury	PWQO	0.0002			<0.0001	<0.0001				
Selenium	PWQO	0.1			<0.001	<0.01	<0.001			
Tannin & Lignin										
TOC										
TKN					0.86	0.87	0.5	11.5		
Sus. Solids					100	92	15			
Field Parameters										
Discharge L/sec								9	5	12
pH								7.78	7.55	8.42
DO	PWQO	f						4.8	9.35	11.55
Conductivity		mg/l						424	417	418
Temperature								13	12.8	2.9

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-6					
Sample Date					May-06	Aug-06	Oct-06	May-07	Aug-07	Oct-07
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			182	172	174	181	194	188
BOD					<1	<1	<1	<1	1	3
Chloride			120	180	20	20	20	20	21	22
Conductivity					461	449	444	475	498	498
DOC							7.6	6.2	6.8	7.5
N-NH3 (Ammonia)					0.4			0.26	0.31	0.24
N-NH3 (unionized)	PWQO	0.02						<0.02	<0.02	<0.02
N-NO2 (Nitrite)						<0.1	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13			0.19	0.19	0.17	0.19	0.25
pH	PWQO	6.5-8.5	6.5-9					7.92	8.24	8.05
Phenols	IPWQO	0.001	0.004	0.961		<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate						29	28	33	34	32
TDS					300	292	289	309	324	324
Total phosphorous	IPWQO	0.03			0.04	0.02	0.03	0.2	0.18	0.02
Turbidity								12.3	13.1	5.5
Hardness as CaCO3						184	207	210	220	215
Calcium					55	54	60	61	65	63
Magnesium					13	12	14	14	14	14
Potassium					5	5	6	6	6	7
Sodium					15	15	16	17	18	18
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aluminum total	IPWQO									
Barium					0.08	0.08	0.07	0.09	0.09	0.09
Beryllium	PWQO	(b) 0.011				<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55	0.15	0.15	0.14	0.2	0.26	0.25
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021		<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.001	<0.001	<0.001	0.002	0.002	0.002
Cobalt	IPWQO	0.0009			0.0005	0.0003	0.0002	0.0005	0.0004	0.0004
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		2.84	1.73	0.31	3.24	1.82	1.52
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002		<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					1.4	1.02	0.8	1.34	1.35	1.42
Molybdenum	IPWQO	0.04				<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025		<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					8.2	9.8	8	9.6	9.5	8.7
Silver	PWQO	0.0001				<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.185	0.152	0.151	0.136	0.176	0.189
Thallium	IPWQO	0.0003				0.0002	<0.0001	0.0004	<0.0001	<0.0001
Titanium						<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006				0.002	0.001	0.003	0.004	0.002
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					9	14	11	11	11	11
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN					0.47	0.28	0.33	0.33	0.33	0.33
Sus. Solids										
Field Parameters										
Discharge L/sec					3.8	9	7	14	13	8
pH					6.91	7.67	7.7	7.33	7.35	7.41
DO	PWQO	f			8.46	9.63	12.79	9.21	9.66	7.6
Conductivity		mg/l			358	373	375	403	389	385
Temperature					12.5	11.4	8.8	8.8	10.4	9

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
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					Sample Location SW-6					
Sample Date					May-08	Oct-08	May-09	Jul-09	Sep-09	May-10
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			196	185	190	190	193	190
BOD					<1	<1	<1	3	<1	1
Chloride			120	180	21	20	19	18	18	19
Conductivity					494	482	483	483	477	
DOC					6.1	5.4	5.6	5.8	5.8	
N-NH3 (Ammonia)					0.34	0.22	0.25	0.28	0.28	0.35
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	0.04
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		0.21	0.25	0.29	0.44	0.28	0.27
pH	PWQO	6.5-8.5	6.5-9		8.12	8.05	8.12	8.15	8.03	8.26
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate					37	32	34	32	31	
TDS					321	313	314	314	310	
Total phosphorous	IPWQO	0.03			0.01	<0.01	0.01	<0.01	0.01	0.02
Turbidity					10.7	2.6	8.1	2.9	7	10.6
Hardness as CaCO3					224	207	187	208	196	
Calcium					65	60	55	62	57	59
Magnesium					15	14	12	13	13	13
Potassium					6	6	5	7	7	6
Sodium					18	17	16	17	17	17
Aluminum (dissolved)	IPWQO	0.075			0.03	<0.01	<0.01	<0.01		<0.01
Aluminum total	IPWQO							<0.01	<0.01	
Barium					0.1	0.07	0.07	0.08	0.07	0.08
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55	0.22	0.21	0.33	0.23	0.2	0.24
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.002	0.002	0.001	0.001	0.001	<0.001
Cobalt	IPWQO	0.0009			0.0006	0.0003	0.0004	0.0003	0.0003	0.0003
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		2.28	0.38	1.52	1.55	0.85	2.49
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					1.39	1	0.94	0.95	0.99	1
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					8.6	8.5	7.4	8.3	8.1	8.1
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.161	0.185	0.192	0.209	0.197	0.208
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.05	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006			0.004	0.003	0.002	0.003	0.002	0.002
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD										13
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec							8	7.1	6.6	7
pH							8.3	8	8.3	8.3
DO	PWQO	f					10.64	8.65	9.54	7.45
Conductivity		mg/l					515	417	418	466
Temperature							8.3	11.7	9.1	8.3

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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					Sample Location SW-6					
Sample Date					Aug-10	Oct-10	Jun-11	Aug-11	Oct-11	Jun-12
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			189	184	186	182	185	197
BOD					1	<1	1	5	<1	1
Chloride			120	180	19	20	19	18	19	21
Conductivity										
DOC										
N-NH3 (Ammonia)					0.24	0.3	0.28	0.33	0.24	0.44
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		0.24	0.22	<0.10	0.34	0.28	0.28
pH	PWQO	6.5-8.5	6.5-9		8.09	8.21	8.09	8.15	7.93	8.01
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate										
TDS										
Total phosphorous	IPWQO	0.03			<0.01	<0.01	<0.01	<0.01	<0.01	0.02
Turbidity					9.8	2	7.6	4	1.7	3.4
Hardness as CaCO3										177
Calcium					59	65	53	55	59	51
Magnesium					13	13	12	12	12	12
Potassium					6	6	6	6	6	6
Sodium					17	17	14	17	16	18
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Aluminum total	IPWQO						0.01		<0.01	0.02
Barium					0.08	0.07	0.07	0.08	0.07	0.1
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IPWQO	0.2	1.5	3.55	0.18	0.19	0.18	0.16	0.15	0.23
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.002	0.002	<0.001	0.002	<0.001	0.003
Cobalt	IPWQO	0.0009			0.0003	0.0002	0.0003	0.0003	0.0002	0.0004
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		1.62	0.45	1.43	1.52	0.49	2.55
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					1	0.84	0.7	0.74	0.7	1.12
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					8.7	7.9	7.6	7.7	7.6	9.1
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.2	0.186	0.178	0.175	0.182	0.205
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006			0.002	0.001	0.002	0.002	0.001	0.004
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					8	15	8	12	10	7
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					9	5.4	9.14	8.7	8.29	4.5
pH					8.1	8.4	8.2	7.9	7.6	8
DO	PWQO	f			2.37	13.5	2.98	9.27	9.49	10.26
Conductivity		mg/l			348	343	359	346	435	419
Temperature					10.4	6.4	10.4	10.8	9.4	9

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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					Sample Location SW-6					
Sample Date					Aug-12	Oct-12	Jun-13	Aug-13	Nov-13	Apr-14
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			201	191	175	174	173	173
BOD					1	1	1	2	1	< 3
Chloride			120	180	20	19	17	17	17	15.9
Conductivity										
DOC										
N-NH3 (Ammonia)					0.47	0.37	0.33	0.36	0.33	0.4
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	0.01
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	0.2
N-NO3 (Nitrate)			13		0.33	0.28	0.29	0.34	0.4	0.5
pH	PWQO	6.5-8.5	6.5-9		8.1	8.09	8.1	8.05	8.22	
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	< 0.001
Sulphate										
TDS										
Total phosphorous	IPWQO	0.03			<0.01	<0.01	<0.01	0.01	<0.01	0.02
Turbidity					8	1.7	7.5	8.5	2.4	8.7
Hardness as CaCO3					197	199	188	164	192	273
Calcium					59	60	57	46	57	81.3
Magnesium					12	12	11	12	12	17.1
Potassium					6	7	6	6	6	9.5
Sodium					17	17	13	15	16	23.4
Aluminum (dissolved)	IPWQO	0.075			<0.01	<0.01		<0.01	0.03	0.02
Aluminum total	IPWQO				0.01	<0.01	0.02	<0.01	<0.01	
Barium					0.1	0.09	0.08	0.08	0.08	0.123
Beryllium	PWQO	(b) 0.011			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	< 0.002
Boron	IPWQO	0.2	1.5	3.55	0.24	0.26	0.19	0.21	0.18	0.35
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002
Chromium	PWQO	0.0099			0.001	<0.001	0.002	<0.001	<0.001	0.0003
Cobalt	IPWQO	0.0009			0.0004	0.0004	0.0003	0.0003	0.0003	0.0003
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	0.0008
Iron	PWQO	0.3	0.3		1.92	0.47	1.42	1.24	1.73	3.39
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	0.00021
Manganese					1.1	0.83	0.62	0.67	0.65	0.989
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	0.0003
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	0.0017
Silicon					8.4	7	8.2	7.2	8.3	11.4
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00002
Strontium					0.202	0.196	0.188	0.181	0.17	0.294
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	< 0.00005
Titanium					<0.01	<0.01	<0.01	<0.01	<0.01	0.006
Vanadium	IPWQO	0.006			0.0021	0.001	0.001	0.002	0.002	< 0.005
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					8	15	<5	6	9	9
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					7.2	8.9	8.3	7.8	6.1	9
pH					7.9	7.2	8	8.2	8.2	8.2
DO	PWQO	f			6.93	8.7	2.11	8.09	10.22	7.64
Conductivity		mg/l			414	466	431	406	452	402
Temperature					10.9	9.2	12.3	10	7	9.1

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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					Sample Location SW-6					
Sample Date					Jul-14	Oct-14	Jun-15	Aug-15	Oct-15	May-16
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			173	181	183	178	178	170
BOD					< 3	< 3	10	3	< 3	<5
Chloride			120	180	15.7	16.4	16.7	16.2	17.1	18.6
Conductivity										
DOC										4.6
N-NH3 (Ammonia)					0.43	0.39	0.55	0.3	0.45	0.55
N-NH3 (unionized)	PWQO	0.02			0.03	0.02	0.01	0.01	0.01	0.024
N-NO2 (Nitrite)					< 0.10	< 0.10	< 0.1	< 0.1	< 0.1	<0.05
N-NO3 (Nitrate)			13		0.4	0.5	0.4	0.5	0.5	0.56
pH	PWQO	6.5-8.5	6.5-9							
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	<0.001
Sulphate										24.6
TDS						231				
Total phosphorous	IPWQO	0.03			0.01	< 0.01	0.01	< 0.01	< 0.01	0.03
Turbidity					10.1	2.3	12.9	15.5	1.8	8.6
Hardness as CaCO3					205	176	193	207	177	182
Calcium					58.8	52.2	56.7	63.1	51.7	53.9
Magnesium					12.3	11	12.5	13.4	11.6	11.6
Potassium					6.7	6.2	6.1	7.5	6.3	6.47
Sodium					16.3	14.7	16.4	19.4	16.2	14.0
Aluminum (dissolved)	IPWQO	0.075			0.02	0.01	0.02	0.02	0.02	
Aluminum total	IPWQO									
Barium					0.087	0.07	0.085	0.103	0.073	0.075
Beryllium	PWQO	(b) 0.011			< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	<0.001
Boron	IPWQO	0.2	1.5	3.55	0.288	0.15	0.302	0.313	0.265	0.249
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	< 0.00002	< 0.00002	< 0.00002	0.00003	< 0.00002	<0.0001
Chromium	PWQO	0.0099			0.003	< 0.002	< 0.002	< 0.002	< 0.002	<0.003
Cobalt	IPWQO	0.0009			0.0003	< 0.0001	0.0003	0.0002	0.0003	<0.0005
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0004	0.0003	< 0.0001	0.0008	0.0005	<0.002
Iron	PWQO	0.3	0.3		2.06	0.407	2.41	3.27	0.538	1.87
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.00007	0.00003	0.00013	0.0003	0.00003	<0.001
Manganese					0.777	0.552	0.77	0.816	0.601	0.577
Molybdenum	IPWQO	0.04			0.0004	0.0005	0.0002	0.0003	0.0004	<0.002
Nickel	PWQO	0.025		0.025	0.0025	0.0013	0.0017	0.0014	0.0031	<0.003
Silicon					8.67	6.91	7.64	9.1	7.69	7.82
Silver	PWQO	0.0001			< 0.00002	< 0.00002	< 0.00002	< 0.00002	0.00027	<0.0001
Strontium					0.212	0.185	0.196	0.228	0.178	0.177
Thallium	IPWQO	0.0003			< 0.00005	< 0.00005	< 0.00005	< 0.00005	< 0.00005	<0.0003
Titanium					< 0.005	< 0.005	0.007	< 0.005	< 0.005	0.002
Vanadium	IPWQO	0.006			< 0.005	< 0.005	< 0.005	< 0.005	< 0.005	<0.002
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.011	0.006	0.006	0.008	< 0.005	<0.005
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					9	13	14	< 5	5	<5
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					10.2	7.88	9.86	8.2	6.76	9.4
pH					8.2	7.6	7.6	7.5	7.7	7.9
DO	PWQO	f			10.79	10.43	9.92	10.39	10.94	11.83
Conductivity		mg/l			415	418	493	406	400	402
Temperature					9.8	7.2	9.8	11.1	8	7.3

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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					Sample Location SW-6					
Sample Date					Aug-16	Nov-16	Apr-17	Aug-17	Oct-17	May-18
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			166	179	172	167	162	184
BOD					<5	<5	3	< 3	5	3
Chloride			120	180	18.2	19.7	14.5	13.9	14.4	17
Conductivity										
DOC					4.4	4.5				4.8
N-NH3 (Ammonia)					0.52	0.51	0.61	0.53	0.25	0.91
N-NH3 (unionized)	PWQO	0.02			0.050	0.041	0.04	-	0.02	0.04
N-NO2 (Nitrite)					<0.05	<0.05	< 0.1	< 0.05	< 0.05	< 0.10
N-NO3 (Nitrate)			13		0.53	0.54	0.7	0.57	0.86	0.62
pH	PWQO	6.5-8.5	6.5-9							8.11
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	< 0.001	< 0.001	< 0.001	0.001
Sulphate					25.7	21.3				24
TDS										
Total phosphorous	IPWQO	0.03			0.01	<0.01	< 0.01	0.01	0.06	0.008
Turbidity					10.2	3.0	4.5	10.2	51.2	9.2
Hardness as CaCO3					174	177	194	188	182	213
Calcium					52.0	53.0	51.7	50.8	54.1	64
Magnesium					10.8	10.8	11.4	11.2	11.3	13
Potassium					6.59	6.65	6.4	6.8	6.9	8
Sodium					15.3	15.4	15.9	15.2	14.4	20
Aluminum (dissolved)	IPWQO	0.075					0.04	0.01	0.01	< 0.01
Aluminum total	IPWQO									0.04
Barium					0.082	0.062	0.073	0.082	0.112	0.09
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	< 0.002	< 0.002	< 0.002	< 0.0005
Boron	IPWQO	0.2	1.5	3.55	0.213	0.232	0.342	0.305	0.252	0.35
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	< 0.000020	< 0.000014	< 0.000014	< 0.0001
Chromium	PWQO	0.0099			<0.003	<0.003	< 0.001	< 0.001	< 0.001	< 0.001
Cobalt	IPWQO	0.0009			<0.0005	<0.0005	0.0003	0.0003	0.0001	0.0004
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.002	<0.002	0.0003	0.0003	0.0007	< 0.001
Iron	PWQO	0.3	0.3		1.56	0.40	1.97	1.45	7.44	2.30
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	0.00008	0.00005	0.0003	< 0.001
Manganese					0.511	0.415	0.57	0.488	0.628	0.63
Molybdenum	IPWQO	0.04			<0.002	<0.002	0.0003	0.0002	0.0003	< 0.005
Nickel	PWQO	0.025		0.025	<0.003	<0.003	0.0023	0.0015	0.0013	< 0.005
Silicon					8.24	8.11	7.85	8.38	7.98	8.1
Silver	PWQO	0.0001			<0.0001	<0.0001	< 0.00002	< 0.00002	< 0.00002	< 0.0001
Strontium					0.168	0.144	0.157	0.176	0.194	0.192
Thallium	IPWQO	0.0003			<0.0003	<0.0003	< 0.00005	< 0.00005	< 0.00005	< 0.0001
Titanium					<0.002	<0.002	< 0.005	< 0.005	0.005	< 0.01
Vanadium	IPWQO	0.006			<0.002	<0.002	< 0.005	< 0.005	< 0.005	0.002
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.009	<0.005	< 0.005	< 0.005	0.028	< 0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					8	<5	9	7	21	15
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					7.01	7.61	9.5	9.5	8.1	9.0
pH					7.2	8.2	7.4	--	8.1	7.2
DO	PWQO	f			10.33	10.7	12.84	5.33	6.85	6.04
Conductivity		mg/l			450	430	445	--	362	398
Temperature					11.6	5.4	5.8	--	11.1	9.1

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-6					
Sample Date					Jul-18	Oct-18				
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			203	184				
BOD					3	2				
Chloride			120	180	20	18				
Conductivity										
DOC					5.5	9.8				
N-NH3 (Ammonia)					0.87	0.3				
N-NH3 (unionized)	PWQO	0.02			0.04	< 0.02				
N-NO2 (Nitrite)					< 0.10	< 0.10				
N-NO3 (Nitrate)			13		0.62	0.6				
pH	PWQO	6.5-8.5	6.5-9		8.03	8.11				
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	< 0.001				
Sulphate					29	22				
TDS										
Total phosphorous	IPWQO	0.03			0.009	0.005				
Turbidity					10.8	5.1				
Hardness as CaCO3					188	175				
Calcium					57	52				
Magnesium					11	11				
Potassium					6	7				
Sodium					15	15				
Aluminum (dissolved)	IPWQO	0.075								
Aluminum total	IPWQO				0.01	< 0.01				
Barium					0.1	0.09				
Beryllium	PWQO	(b) 0.011			< 0.0005	< 0.0005				
Boron	IPWQO	0.2	1.5	3.55	0.4	0.31				
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	< 0.0001	< 0.0001				
Chromium	PWQO	0.0099			< 0.001	< 0.001				
Cobalt	IPWQO	0.0009			0.0003	0.0003				
Copper	PWQO IPWQO	0.005 d	d	0.0069	< 0.001	< 0.001				
Iron	PWQO	0.3	0.3		2.26	0.98				
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	< 0.001	< 0.001				
Manganese					0.72	0.63				
Molybdenum	IPWQO	0.04			< 0.005	< 0.005				
Nickel	PWQO	0.025		0.025	< 0.005	< 0.005				
Silicon					7.9	8.2				
Silver	PWQO	0.0001			< 0.0001	< 0.0001				
Strontium					0.203	0.205				
Thallium	IPWQO	0.0003			< 0.0001	< 0.0001				
Titanium					< 0.01	< 0.01				
Vanadium	IPWQO	0.006			0.001	< 0.001				
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	< 0.01	< 0.01				
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					21	< 5				
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					6.8	8.76				
pH					7.4	7.8				
DO	PWQO	f			12.83	11.9				
Conductivity		mg/l			366	345				
Temperature					10.6	8.4				

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-7					
Sample Date					Aug-96	Nov-96	Nov-98	Jul-99	Oct-99	Nov-99
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			111	308	190	118	175	60
BOD					<1	2	<1	<1	<1	<1
Chloride			120	180	19.7	23.8	21.6	17	20.2	17
Conductivity					314	506	420	339	454	201
DOC										
N-NH3 (Ammonia)					0.03	0.05	0.04			0.03
N-NH3 (unionized)	PWQO	0.02			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N-NO2 (Nitrite)					<0.1	<0.1	<0.01	<0.1	0.5	<0.1
N-NO3 (Nitrate)			13		0.1	0.2	0.01	0.3	0.3	0.2
pH	PWQO	6.5-8.5	6.5-9		7.81	8.51	7.64	7.62	7.74	7.94
Phenols	IPWQO	0.001	0.004	0.961	0.006	<0.001	0.051	<0.001	0.008	<0.001
Sulphate					17	29	28			
TDS										
Total phosphorous	IPWQO	0.03			0.06	0.22	0.01	0.02	<0.01	0.01
Turbidity					2.8	2.1	2	2.2	0.7	1
Hardness as CaCO3					126	218	233	152	215	78
Calcium					34.8	62.3	81.8	43	61.9	21.6
Magnesium					9.3	14.9	6.8	10.6	14.4	5.69
Potassium					4.9	6.5		<0.04	1.8	2.5
Sodium					10.2	14.8	13.5	12.8	14	12
Aluminum (dissolved)	IPWQO	0.075			0.05	0.1	0.11	0.04	0.33	0.07
Aluminum total	IPWQO									
Barium										
Beryllium	PWQO	(b) 0.011								
Boron	IPWQO	0.2	1.5	3.55						
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	IPWQO	0.0009						<0.0005	0.0009	<0.0005
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.00015	0.001	0.0028	0.0022	0.0011	<0.0005
Iron	PWQO	0.3	0.3		0.74	0.8	1.49	0.88	0.28	0.67
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.0002	0.0005	<0.0002	<0.0002	<0.0002	<0.0002
Manganese					0.49	1.11	0.59			
Molybdenum	IPWQO	0.04								
Nickel	PWQO	0.025		0.025	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon										
Silver	PWQO	0.0001			<0.0001	0.0001	0.001	0.0002	0.0002	<0.0001
Strontium										
Thallium	IPWQO	0.0003								
Titanium										
Vanadium	IPWQO	0.006								
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	0.07	<0.01	0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15				<0.001	<0.001	<0.001
COD					23	10	19	27	14	46
Colour					50	4	10.2	47	6	88
Mercury	PWQO	0.0002			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Selenium	PWQO	0.1				<0.001	<0.001	<0.001	<0.001	<0.001
Tannin & Lignin										
TOC					9	5.2	13.4			
TKN					0.51	0.34	0.47	0.43	1.09	0.54
Sus. Solids					4	10	11	11	<1	<1
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f					10	9	8	11
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-7					
Sample Date					Jun-00	Aug-00	Oct-00	Sep-01	Dec-01	Jun-02
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			112	139	122	92	64	75
BOD					<1	<1	<1	1	1	<1
Chloride			120	180	13.1	12.8	18.8	23.3		13
Conductivity					288	309	298	248	194	228
DOC										
N-NH3 (Ammonia)					0.05	0.01	0.02	0.03	0.03	0.09
N-NH3 (unionized)	PWQO	0.02			<0.01	<0.01	<0.01			
N-NO2 (Nitrite)					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
N-NO3 (Nitrate)			13		0.2	0.3	0.2	0.2	0.3	0.2
pH	PWQO	6.5-8.5	6.5-9		8.07	7.72	7.92	7.34	7.99	7.61
Phenols	IPWQO	0.001	0.004	0.961	0.009	0.019	0.005	<0.001	<0.001	<0.001
Sulphate									15	14
TDS										
Total phosphorous	IPWQO	0.03			0.03	0.14	0.01	0.01	0.01	0.02
Turbidity					2.3	>200	1.1	2.8	2.4	4.2
Hardness as CaCO3					125	145	125	121	69	92
Calcium					36.1	42.2	34.1	35.1	18.7	29
Magnesium					8.49	9.62	9.65	8.14	5.52	6.84
Potassium					3.1	3.6	<0.4	1.6	0.7	1.4
Sodium					10.5	9.9	12.5	13.1	19.2	9.7
Aluminum (dissolved)	IPWQO	0.075			0.2	0.55	0.24	0.05	0.04	0.1
Aluminum total	IPWQO									
Barium									0.02	0.035
Beryllium	PWQO	(b) 0.011								
Boron	IPWQO	0.2	1.5	3.55						
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	0.0001	<0.0001	<0.0001	<0.0001	0.0001
Chromium	PWQO	0.0099			0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Cobalt	IPWQO	0.0009			<0.0005	0.0022	<0.0005	0.0007	0.0041	
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.001	0.004	0.036	0.0009	0.0005	0.0018
Iron	PWQO	0.3	0.3		1.26	33.7	0.31	0.74	0.62	0.82
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.0002	0.0017	<0.0002	<0.0002	<0.0002	0.0008
Manganese									0.17	0.37
Molybdenum	IPWQO	0.04								
Nickel	PWQO	0.025		0.025	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Silicon										
Silver	PWQO	0.0001			<0.0001	0.0002	<0.0001	<0.0001	0.0004	0.02
Strontium										
Thallium	IPWQO	0.0003								
Titanium										
Vanadium	IPWQO	0.006								
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.02	0.02	<0.01	<0.01	<0.01	0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.001	0.004	<0.001	<0.001	<0.001	<0.001
COD					23	28	8	15	35	30
Colour					42	29	32	32	66	32
Mercury	PWQO	0.0002			<0.0001	<0.0001	<0.0001	<0.0001		<0.0001
Selenium	PWQO	0.1			<0.001	<0.001	<0.001	<0.001	<0.001	0.001
Tannin & Lignin										
TOC									21	9.2
TKN					0.55	0.95	0.28	0.42	0.5	0.4
Sus. Solids					9	21	<1	1	8	21
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f				10		10		
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-7					
Sample Date					Aug-03	Oct-03	Oct-03	Mar-04	Jul-04	Sept-04
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			39	38	9	39	44	136
BOD								2	<1	1
Chloride			120	180	11.7	35.6	44.1	25	20.7	17.5
Conductivity					141	230	191	200	201	358
DOC										
N-NH3 (Ammonia)					0.07	0.03	0.01	0.08	0.04	0.02
N-NH3 (unionized)	PWQO	0.02			<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
N-NO2 (Nitrite)					<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
N-NO3 (Nitrate)			13		0.2	0.2	0.2	0.4	0.1	0.3
pH	PWQO	6.5-8.5	6.5-9		7.4	7.63	6.9	7.26	7.45	8.32
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate					6	8	4	9	7	
TDS								95	90	183
Total phosphorous	IPWQO	0.03			0.02	0.02	0.02	0.04	0.04	0.01
Turbidity					5.5	1.8	1.1	13	4.8	8.3
Hardness as CaCO3					44	61	33	58	61	143
Calcium					11.3	16.5	8.18	15.7	17	39.7
Magnesium					3.81	4.86	2.99	4.63	4.6	10.6
Potassium					1	2	1.4	1.9	1.3	4
Sodium					8.4	18.5	20.9	14.4	12.9	11.7
Aluminum (dissolved)	IPWQO	0.075			0.074	0.072	0.083	0.438	0.204	0.051
Aluminum total	IPWQO									
Barium					0.012					
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.001			
Boron	IPWQO	0.2	1.5	3.55	0.006	0.023	0.005			
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001
Chromium	PWQO	0.0099			0.003	0.0001	0.0001	0.0013	<0.002	0.0211
Cobalt	IPWQO	0.0009			0.0002	0.0004	0.0005	0.0003	<0.001	0.0003
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.002	0.018	0.028	<0.002	<0.02	<0.002
Iron	PWQO	0.3	0.3		0.618	0.563	0.59	1.4	0.763	1.42
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.0009	0.0008.	0.0009	0.0011	<0.005	<0.0005
Manganese					0.033					
Molybdenum	IPWQO	0.04			0.0013	<0.0001	<0.0001			
Nickel	PWQO	0.025		0.025	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silicon										19
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.001	<0.0001
Strontium										
Thallium	IPWQO	0.0003								
Titanium										
Vanadium	IPWQO	0.006				<0.005	<0.005			
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.005	0.005	0.008	0.006	0.02	<0.005
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15	<0.03	0.001	0.002	0.001	<0.03	<0.001
COD					26	48	62	39	52	17
Colour								47	210	38
Mercury	PWQO	0.0002				<0.0001	<0.0001	<0.0001	<0.0001	
Selenium	PWQO	0.1				<0.001	<0.001	<0.001	<0.01	<0.001
Tannin & Lignin										
TOC										
TKN								0.48	0.65	0.25
Sus. Solids									5	6
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f			8.5					
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-7					
Sample Date					May-05	Aug-05	Nov-05	May-06	Aug-06	Oct-06
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			68	151	46	45	42	48
BOD					<1	<1	4	<1	<1	<1
Chloride			120	180	33	22	30	18	22	21
Conductivity								171	168	182
DOC								12.8	12	29.4
N-NH3 (Ammonia)					0.12	0.13	0.05	0.13		
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02			
N-NO2 (Nitrite)					<0.10	<0.10	<0.10		<0.10	<0.10
N-NO3 (Nitrate)			13		<0.10	0.22	<0.10			0.11
pH	PWQO	6.5-8.5	6.5-9		7.76	8.09	7.68			
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001		<0.001	0.002
Sulphate									6	8
TDS								111	109	118
Total phosphorous	IPWQO	0.03			0.04	0.05	0.03	0.02	0.03	0.03
Turbidity					5.1	7	2.2			
Hardness as CaCO3					68	163	61		46	66
Calcium					19	47	16	15	12	18
Magnesium					5	11	5	4	4	5
Potassium					2	4	2	2	1	2
Sodium					10	15	17	12	12	15
Aluminum (dissolved)	IPWQO	0.075			0.13	0.02	0.08	0.08	0.06	0.12
Aluminum total	IPWQO									
Barium					0.04	0.06	0.02	0.02	0.02	0.02
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.001		<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55	0.04	0.17	0.02	0.03	0.01	0.01
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001		<0.0001	<0.0001
Chromium	PWQO	0.0099			0.001	0.002	0.001	<0.001	0.001	<0.001
Cobalt	IPWQO	0.0009			0.0003	0.0002	<0.0002	<0.0002	0.0003	<0.0002
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		1.45	0.53	0.61	0.81	1.15	0.91
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001		<0.001	<0.001
Manganese					0.42	0.51	0.16	0.16	0.14	0.1
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005		<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005		<0.005	<0.005
Silicon					4.3	12.7	6.7	2.7	8.6	4.9
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001		<0.0001	<0.0001
Strontium					0.086	0.13	0.062	0.052	0.057	0.045
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001		<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.01		<0.01	<0.01
Vanadium	IPWQO	0.006			0.001	0.002	<0.001		0.002	<0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					22	18	43	34	31	59
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN								0.53	0.4	0.74
Sus. Solids										
Field Parameters										
Discharge L/sec					32	15	46	51	0.5	
pH					8.06	7.52	8.96	6.93	7.7	8.44
DO	PWQO	f			4.65	9.7	12.29	8.8	6.06	11.69
Conductivity		mg/l			198	347	187	200	147	173
Temperature					11.9	13	2.8	14.9	16.7	9.7

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-7					
Sample Date					May-07	Aug-07	Oct-07	May-08	Oct-08	May-09
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			37	150	103	48	76	91
BOD					<1	<1	3	1	<1	<1
Chloride			120	180	16	21	25	23	23	15
Conductivity					143	406	326	192	258	263
DOC					12.1	7.3	9.5	14.2	12.4	7.7
N-NH3 (Ammonia)					0.05	0.23	0.23	0.08	0.07	0.16
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		<0.10	0.19	0.2	<0.10	0.14	0.18
pH	PWQO	6.5-8.5	6.5-9		6.82	8.21	7.92	7.65	7.82	7.95
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate					8	26	17	45	13	16
TDS					93	264	212	125	168	171
Total phosphorous	IPWQO	0.03			<0.01	0.14	<0.02	0.02	0.01	0.01
Turbidity					3.2	10.7	4.2	1.7	2.1	4.4
Hardness as CaCO3					49	170	124	66	94	97
Calcium					13	50	35	18	26	29
Magnesium					4	11	9	5	7	6
Potassium					2	5	4	2	3	3
Sodium					11	15	17	15	16	11
Aluminum (dissolved)	IPWQO	0.075			0.08	0.01	0.02	0.11	0.05	0.04
Aluminum total	IPWQO									
Barium					0.02	0.07	0.05	0.02	0.03	0.04
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Boron	IPWQO	0.2	1.5	3.55	0.03	0.2	0.12	0.03	0.08	0.14
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			<0.001	0.002	0.002	0.003	0.002	<0.001
Cobalt	IPWQO	0.0009			<0.0002	0.0003	0.0002	0.0002	<0.0002	0.0003
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		0.75	1.56	1.17	0.82	0.51	0.8
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					0.18	0.61	0.61	0.24	0.38	0.4
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					3.5	7.7	7.7	3.4	6.8	5.1
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.042	0.119	0.119	0.059	0.091	0.092
Thallium	IPWQO	0.0003			0.0003	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.01	<0.01	<0.01	<0.05
Vanadium	IPWQO	0.006			0.001	0.002	0.002	0.002	0.001	0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					59	59	59			
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN					0.74	0.74	0.74			
Sus. Solids										
Field Parameters										
Discharge L/sec					55	20	15			22.7
pH					7.96	7.64	8.02			8.2
DO	PWQO	f			9.18	10.04	7.9			10.95
Conductivity		mg/l			121	304	252			295
Temperature					9.4	10.6	10			7.7

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-7					
Sample Date					Jul-09	Sep-09	May-10	Aug-10	Oct-10	Jun-11
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			40	68	86	114	125	58
BOD					<1	<1	<1	<1	1	17
Chloride			120	180	24	26	23	22	19	17
Conductivity					182	246				
DOC					16.3	13.2				
N-NH3 (Ammonia)					0.04	0.07	0.12	0.08	0.17	0.07
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		<0.10	0.11	0.14	0.21	0.22	<0.10
pH	PWQO	6.5-8.5	6.5-9		7.64	7.72	8.03	7.97	8.14	7.55
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.005
Sulphate					6	10				
TDS					118	160				
Total phosphorous	IPWQO	0.03			0.02	0.03	0.03	0.01	<0.01	<0.01
Turbidity					1.4	3.5	5.6	6.5	2.3	5.6
Hardness as CaCO3					49	77				
Calcium					13	21	26	35	44	17
Magnesium					4	6	7	8	10	4
Potassium					2	3	3	3	4	2
Sodium					16	17	14	16	15	11
Aluminum (dissolved)	IPWQO	0.075			0.12		0.03	0.01	0.02	0.08
Aluminum total	IPWQO				0.08	0.04				0.09
Barium					0.02	0.03	0.04	0.05	0.04	0.02
Beryllium	PWQO	(b) 0.011			<0.001	<0.001	<0.001	<0.001	<0.001	<0.0005
Boron	IPWQO	0.2	1.5	3.55	0.04	0.06	0.09	0.09	0.12	0.04
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.001	0.001	<0.001	0.002	0.003	<0.001
Cobalt	IPWQO	0.0009			<0.0002	0.0002	<0.0002	0.0002	<0.0002	0.0002
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		0.91	0.89	0.98	1	0.38	0.95
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					0.14	0.31	0.37	0.52	0.49	0.17
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					5.6	7.3	4.7	8.7	8	3.6
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.06	0.088	0.092	0.135	0.138	0.069
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006			0.001	0.002	0.001	0.001	0.001	0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD							25	13	25	45
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					68.4	33.9	15.1	17	6.7	39.9
pH					7.8	8.4	8.3	8.4	8.6	8
DO	PWQO	f			7.45	9.19	7.3	1.93	14.13	1.52
Conductivity		mg/l			164	217	262	244	258	148
Temperature					18.5	11.1	10.8	12.9	5.3	17.4

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-7					
Sample Date					Aug-11	Oct-11	Jun-12	Aug-12	Oct-12	Jun-13
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			96	114	81	107	37	45
BOD					3	<1	2	<1	1	12
Chloride			120	180	20	22	20	26	42	18
Conductivity										
DOC										
N-NH3 (Ammonia)					0.13	0.11	0.12	0.19	0.04	0.07
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
N-NO2 (Nitrite)					<0.10	<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)			13		0.21	0.2	0.2	0.25	<0.10	<0.10
pH	PWQO	6.5-8.5	6.5-9		7.76	7.93	7.5	7.89	7.05	7.58
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Sulphate										
TDS										
Total phosphorous	IPWQO	0.03			0.01	<0.01	0.02	0.01	0.02	0.01
Turbidity					3.2	1.4	5.4	4	2.3	2.3
Hardness as CaCO3							75	111	54	52
Calcium					27	33	20	33	15	16
Magnesium					7	8	6	7	4	3
Potassium					3	4	2	3	2	1
Sodium					14	14	13	16	21	12
Aluminum (dissolved)	IPWQO	0.075			0.03	0.02	0.03	0.02	0.04	
Aluminum total	IPWQO					0.03	0.09	0.03	0.1	0.14
Barium					0.04	0.04	0.04	0.05	0.03	0.03
Beryllium	PWQO	(b) 0.011			<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Boron	IPWQO	0.2	1.5	3.55	0.07	0.08	0.09	0.11	0.03	0.05
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	PWQO	0.0099			0.002	<0.001	0.008	0.001	<0.001	0.002
Cobalt	IPWQO	0.0009			0.0003	<0.0002	0.0004	0.0003	0.0002	0.0003
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	PWQO	0.3	0.3		0.86	0.42	1.68	0.91	0.53	1.22
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Manganese					0.32	0.33	0.38	0.43	0.12	0.17
Molybdenum	IPWQO	0.04			<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Nickel	PWQO	0.025		0.025	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Silicon					7.4	7.4	6.4	8.4	6.4	4.1
Silver	PWQO	0.0001			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Strontium					0.099	0.122	0.094	0.122	0.07	0.067
Thallium	IPWQO	0.0003			<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Titanium					<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Vanadium	IPWQO	0.006			0.001	0.001	0.003	0.001	0.001	0.001
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	<0.01	<0.01	<0.01	0.01
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					30	15	20	20	35	48
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					17.49	13.28	29	14	59.9	59.1
pH					7.7	6.7	8	7.7	6.8	7.9
DO	PWQO	f			8.83	9.33	9.96	6.71	8.88	1.7
Conductivity		mg/l			213	302	215	271	234	173
Temperature					14.5	10.4	11.7	13.3	8.5	20.2

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-7					
Sample Date					Aug-13	Nov-13	Apr-14	Jul-14	Oct-14	Jun-15
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			87	53	31	60	38	56
BOD					1	<1	< 3	< 3	< 3	9
Chloride			120	180	23	18	11.5	22.5	19.4	21.8
Conductivity										
DOC										
N-NH3 (Ammonia)					0.13	0.07	0.02	0.11	0.05	0.09
N-NH3 (unionized)	PWQO	0.02			<0.02	<0.02	< 0.01	< 0.01	< 0.01	< 0.01
N-NO2 (Nitrite)					<0.10	<0.10	0.1	< 0.10	< 0.10	< 0.1
N-NO3 (Nitrate)			13		0.2	0.12	0.2	0.2	0.2	0.2
pH	PWQO	6.5-8.5	6.5-9		7.79	7.86				
Phenols	IPWQO	0.001	0.004	0.961	<0.001	<0.001	< 0.001	< 0.001	< 0.001	< 0.001
Sulphate										
TDS									86.9	
Total phosphorous	IPWQO	0.03			0.01	<0.01	0.02	0.02	< 0.01	0.02
Turbidity					4	1.5	3.3	4.3	1.1	3.8
Hardness as CaCO3					89	59	53	77	58	60
Calcium					24	17	14.9	22.2	17.1	16.5
Magnesium					7	4	3.85	5.46	3.8	4.45
Potassium					3	2	2.3	2.2	2.1	1.8
Sodium					15	14	13.1	16.5	14.3	13.2
Aluminum (dissolved)	IPWQO	0.075			0.03	0.06	0.06	0.06	0.06	0.04
Aluminum total	IPWQO				0.04	0.06				
Barium					0.04	0.02	0.029	0.033	0.028	0.025
Beryllium	PWQO	(b) 0.011			<0.0005	<0.0005	< 0.002	< 0.002	< 0.002	< 0.002
Boron	IPWQO	0.2	1.5	3.55	0.08	0.04	0.049	0.081	< 0.005	0.076
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	<0.0001	<0.0001	< 0.00002	< 0.00002	< 0.00002	0.00008
Chromium	PWQO	0.0099			<0.001	<0.001	0.0004	< 0.002	0.006	< 0.002
Cobalt	IPWQO	0.0009			<0.0002	0.0002	0.0002	0.0002	0.0002	0.0003
Copper	PWQO IPWQO	0.005 d	d	0.0069	<0.001	<0.001	0.0008	0.0004	0.0006	0.0018
Iron	PWQO	0.3	0.3		0.8	0.44	1.49	1.35	0.507	0.927
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	<0.001	<0.001	0.00032	0.00025	0.00014	0.00117
Manganese					0.28	0.12	0.245	0.232	0.12	0.184
Molybdenum	IPWQO	0.04			<0.005	<0.005	0.0001	0.0002	0.0006	0.0002
Nickel	PWQO	0.025		0.025	<0.005	<0.005	0.0006	0.001	0.0087	0.0026
Silicon					6.6	6.1	5.81	6.89	5.3	3.47
Silver	PWQO	0.0001			<0.0001	<0.0001	< 0.00002	< 0.00002	< 0.00002	0.00002
Strontium					0.101	0.058	0.068	0.097	0.075	0.072
Thallium	IPWQO	0.0003			<0.0001	<0.0001	< 0.00005	< 0.00005	< 0.00005	< 0.00005
Titanium					<0.01	<0.01	0.016	< 0.005	0.006	0.015
Vanadium	IPWQO	0.006			0.001	<0.001	< 0.005	< 0.005	< 0.005	< 0.005
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	<0.01	<0.01	0.014	0.012	0.055	< 0.005
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					24	34	31	38	48	36
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					24	36.4	80	22	54.3	32.31
pH					8.5	8.1	8.1	8.1	7.4	7.4
DO	PWQO	f			7.68	10.79	7.44	9.68	10.99	9.04
Conductivity		mg/l			248	193	109	205	158	224
Temperature					13.3	5.3	7.2	14.4	7.1	15.3

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

					Sample Location SW-7					
Sample Date					Aug-15	Oct-15	May-16	Aug-16	Nov-16	Apr-17
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			86	42	31	137	66	11
BOD					< 3	< 3	<5	<5	<5	< 3
Chloride			120	180	18	32.7	15.9	16.1	34.1	6.5
Conductivity										
DOC							11.2	4.3	10.0	
N-NH3 (Ammonia)					0.13	0.06	0.05	0.31	0.17	0.05
N-NH3 (unionized)	PWQO	0.02			< 0.01	< 0.01	0.00016	0.029	0.0062	< 0.01
N-NO2 (Nitrite)					< 0.1	< 0.1	<0.05	<0.05	<0.05	< 0.1
N-NO3 (Nitrate)			13		0.3	0.2	0.07	0.52	0.17	0.3
pH	PWQO	6.5-8.5	6.5-9							
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	< 0.001	<0.001	<0.001	<0.001	< 0.001
Sulphate							5.53	19.5	8.24	
TDS										
Total phosphorous	IPWQO	0.03			0.02	< 0.01	0.02	0.01	0.01	< 0.01
Turbidity					10.6	1.8	2.8	7.4	2.7	1.4
Hardness as CaCO3					106	51	37.5	133	71.7	16
Calcium					32.5	13.7	10.3	39.0	20.4	4.21
Magnesium					7.95	3.98	2.85	8.69	5.04	1.26
Potassium					4	1.8	1.43	4.95	2.87	0.6
Sodium					17	17.9	9.02	13.0	18.0	5.7
Aluminum (dissolved)	IPWQO	0.075			0.04	0.05				0.09
Aluminum total	IPWQO									
Barium					0.058	0.029	0.017	0.056	0.027	0.008
Beryllium	PWQO	(b) 0.011			< 0.002	< 0.002	<0.001	<0.001	<0.001	< 0.002
Boron	IPWQO	0.2	1.5	3.55	0.125	0.049	0.037	0.138	0.068	0.018
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	0.00004	< 0.00002	<0.0001	<0.0001	<0.0001	< 0.000020
Chromium	PWQO	0.0099			< 0.002	< 0.002	<0.003	<0.003	<0.003	< 0.001
Cobalt	IPWQO	0.0009			0.0002	0.0001	<0.0005	<0.0005	<0.0005	0.0001
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.001	0.0005	<0.002	<0.002	<0.002	< 0.0001
Iron	PWQO	0.3	0.3		2.57	0.568	0.55	0.94	0.36	0.417
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.00064	0.00021	<0.001	<0.001	<0.001	0.00017
Manganese					0.367	0.108	0.084	0.299	0.125	0.036
Molybdenum	IPWQO	0.04			0.0002	0.0002	<0.002	<0.002	<0.002	< 0.0001
Nickel	PWQO	0.025		0.025	0.0011	0.001	<0.003	<0.003	<0.003	0.0005
Silicon					8.38	6.63	2.59	7.78	8.02	3.17
Silver	PWQO	0.0001			< 0.00002	0.00046	<0.0001	<0.0001	<0.0001	< 0.00002
Strontium					0.135	0.061	0.045	0.126	0.067	0.018
Thallium	IPWQO	0.0003			< 0.00005	< 0.00005	<0.0003	<0.0003	<0.0003	< 0.00005
Titanium					0.007	< 0.005	0.003	<0.002	<0.002	< 0.005
Vanadium	IPWQO	0.006			< 0.005	< 0.005	<0.002	<0.002	<0.002	< 0.005
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.018	< 0.005	0.005	<0.005	<0.005	0.005
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					6	39	12	<5	220	25
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					18.15	39.6	91.5	11.38	16.93	184.03
pH					7.4	8	8.2	6.8	8.2	7.1
DO	PWQO	f			8.98	11.06	11.53	9.67	11.98	14.05
Conductivity		mg/l			238	195	122	359	257	63
Temperature					14.6	9.8	8.8	12.7	4	4

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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					Sample Location SW-7					
Sample Date					Aug-17	Oct-17	May-18	Jul-18	Oct-18	
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			58	66	22	120	74	
BOD					< 3	5	2	< 1	< 1	
Chloride			120	180	16.2	16.3	9	20	31	
Conductivity										
DOC							8.0	7.3	12.5	
N-NH3 (Ammonia)					0.11	0.03	0.14	0.47	0.22	
N-NH3 (unionized)	PWQO	0.02			-	< 0.01	< 0.02	< 0.02	< 0.02	
N-NO2 (Nitrite)					< 0.05	< 0.05	< 0.10	< 0.10	< 0.10	
N-NO3 (Nitrate)			13		0.25	0.31	< 0.10	0.48	0.23	
pH	PWQO	6.5-8.5	6.5-9				7.48	7.93	7.81	
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	
Sulphate							3	17	9	
TDS										
Total phosphorous	IPWQO	0.03			0.02	0.07	0.018	0.01	0.008	
Turbidity					5.1	66.4	1	6.8	1.5	
Hardness as CaCO3					69	92	17	118	80	
Calcium					17.3	26.6	5	34	22	
Magnesium					4.51	6.31	1	8	6	
Potassium					2	3	1	4	3	
Sodium					13	13.6	7	15	20	
Aluminum (dissolved)	IPWQO	0.075			0.05	0.04	0.05	0.03	0.04	
Aluminum total	IPWQO						0.09			
Barium					0.028	0.081	0.01	0.06	0.04	
Beryllium	PWQO	(b) 0.011			< 0.002	< 0.002	< 0.0005	< 0.0005	< 0.0005	
Boron	IPWQO	0.2	1.5	3.55	0.075	0.094	0.02	0.21	0.1	
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	0.000081	0.000063	< 0.0001	< 0.0001	< 0.0001	
Chromium	PWQO	0.0099			0.001	0.001	< 0.001	< 0.001	< 0.001	
Cobalt	IPWQO	0.0009			0.0003	0.0002	< 0.0002	0.0002	< 0.0002	
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0082	0.0089	< 0.001	< 0.001	< 0.001	
Iron	PWQO	0.3	0.3		1.09	9.96	0.42	1.34	0.72	
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	0.00055	0.00094	< 0.001	< 0.001	< 0.001	
Manganese					0.136	0.438	0.05	0.37	0.2	
Molybdenum	IPWQO	0.04			0.0003	0.0002	< 0.005	< 0.005	< 0.005	
Nickel	PWQO	0.025		0.025	0.0031	0.0022	< 0.005	< 0.005	< 0.005	
Silicon					6.92	7.88	3.4	7.2	8.2	
Silver	PWQO	0.0001			< 0.00002	< 0.00002	< 0.0001	< 0.0001	< 0.0001	
Strontium					0.071	0.117	0.024	0.13	0.096	
Thallium	IPWQO	0.0003			< 0.00005	< 0.00005	< 0.0001	< 0.0001	< 0.0001	
Titanium					< 0.005	0.009	< 0.01	0.01	< 0.01	
Vanadium	IPWQO	0.006			< 0.005	< 0.005	< 0.001	< 0.001	< 0.001	
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.007	0.028	< 0.01	< 0.01	< 0.01	
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					50	50	21	24	26	
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec					49	45.2	143.8	14.86	27.78	
pH					--	7.9	7	7.4	7.9	
DO	PWQO	f			6.4	7.5	5.99	11.65	11	
Conductivity		mg/l			--	186	68	257	207	
Temperature					25	13.4	5.8	12.8	9.4	

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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					Field Blanks					
Sample Date					Aug-15	Aug-17				
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			< 5	< 5				
BOD					< 3	< 3				
Chloride			120	180	< 0.5	< 0.5				
Conductivity										
DOC										
N-NH3 (Ammonia)					< 0.01	< 0.01				
N-NH3 (unionized)	PWQO	0.02			< 0.01	-				
N-NO2 (Nitrite)					< 0.1	< 0.05				
N-NO3 (Nitrate)			13		< 0.1	< 0.05				
pH	PWQO	6.5-8.5	6.5-9							
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	< 0.001				
Sulphate										
TDS										
Total phosphorous	IPWQO	0.03			< 0.01	< 0.01				
Turbidity					0.2	0.2				
Hardness as CaCO3					< 1	< 1				
Calcium					< 0.02	< 0.02				
Magnesium					< 0.01	< 0.01				
Potassium					< 0.1	< 0.1				
Sodium					< 0.2	< 0.2				
Aluminum (dissolved)	IPWQO	0.075			< 0.01	< 0.01				
Aluminum total	IPWQO									
Barium					< 0.001	< 0.001				
Beryllium	PWQO	(b) 0.011			< 0.002	< 0.002				
Boron	IPWQO	0.2	1.5	3.55	< 0.005	< 0.005				
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	< 0.00002	< 0.000014				
Chromium	PWQO	0.0099			< 0.002	< 0.001				
Cobalt	IPWQO	0.0009			< 0.0001	< 0.0001				
Copper	PWQO IPWQO	0.005 d	d	0.0069	< 0.0001	< 0.0001				
Iron	PWQO	0.3	0.3		< 0.005	< 0.005				
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	< 0.00002	< 0.00002				
Manganese					< 0.001	< 0.001				
Molybdenum	IPWQO	0.04			< 0.0001	< 0.0001				
Nickel	PWQO	0.025		0.025	< 0.0005	< 0.0002				
Silicon					< 0.01	< 0.01				
Silver	PWQO	0.0001			< 0.00002	< 0.00002				
Strontium					< 0.001	< 0.001				
Thallium	IPWQO	0.0003			< 0.00005	< 0.00005				
Titanium					< 0.005	< 0.005				
Vanadium	IPWQO	0.006			< 0.005	< 0.005				
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	< 0.005	< 0.005				
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15						
COD					< 5	< 5				
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f								
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
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					Surface Water Statistics Summary					
Sample Date					**SW1**	**SW1**	**SW1**	**SW1**		
PARAMETER	Limit	PWQO	CWQG	APV	Median (Last 10 Events)	75th Percentile	MIN	MAX		
Alkalinity as CaCO3	IPWQO	a			15	21	< 5	55		
BOD					< 3	2.25	< 1	< 5		
Chloride			120	180	29.7	35.85	< 1	49		
Conductivity						166	89	202		
DOC					14.8	18.35	8.1	27.8		
N-NH3 (Ammonia)					0.04	0.05	< 0.01	0.2		
N-NH3 (unionized)	PWQO	0.02			< 0.01	0.02	0.00017	0.2		
N-NO2 (Nitrite)					0.075	< 0.1	0.01	< 0.1		
N-NO3 (Nitrate)			13		0.075	0.1625	< 0.01	0.6		
pH	PWQO	6.5-8.5	6.5-9		7.17	7.0975	6.13	7.6		
Phenols	IPWQO	0.001	0.004	0.961	< 0.001	0.001	< 0.001	0.04		
Sulphate					2.00	4.5	1.56	21		
TDS						110.5	51.8	130		
Total phosphorous	IPWQO	0.03			0.013	0.03	< 0.01	0.15		
Turbidity					1.4	2	0.6	9		
Hardness as CaCO3					23	33.25	5	51		
Calcium					5.91	8.55	2	12.7		
Magnesium					2.02	3	0.78	4.67		
Potassium					0.95	1	< 0.04	7.8		
Sodium					16.65	19	5.9	30		
Aluminum (dissolved)	IPWQO	0.075			0.06	0.11	0.007	0.19		
Aluminum total	IPWQO				0.06	0.12	0.04	0.15		
Barium					0.0105	0.0155	0.005	0.022		
Beryllium	PWQO	(b) 0.011			< 0.001	< 0.001	< 0.0005	< 0.01		
Boron	IPWQO	0.2	1.5	3.55	< 0.01	< 0.01	< 0.005	0.01		
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021	< 0.0001	< 0.0001	< 0.000014	0.01		
Chromium	PWQO	0.0099			< 0.001	< 0.002	0.0002	0.05		
Cobalt	IPWQO	0.0009			0.00025	0.0003	< 0.0001	< 0.01		
Copper	PWQO IPWQO	0.005 d	d	0.0069	< 0.001	< 0.001	< 0.0001	0.032		
Iron	PWQO	0.3	0.3		0.74	1	0.26	2.13		
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	< 0.001	< 0.001	0.0001	0.01		
Manganese					0.02	0.05	0.008	0.18		
Molybdenum	IPWQO	0.04			< 0.002	< 0.005	< 0.0001	< 0.01		
Nickel	PWQO	0.025		0.025	< 0.003	< 0.005	0.0003	< 0.02		
Silicon					6.3	6.685	1.1	11		
Silver	PWQO	0.0001			< 0.0001	< 0.0001	< 0.00002	< 0.01		
Strontium					0.037	0.05	0.012	0.066		
Thallium	IPWQO	0.0003			< 0.0001	< 0.0001	< 0.00005	< 0.01		
Titanium					< 0.005	< 0.01	< 0.002	< 0.1		
Vanadium	IPWQO	0.006			< 0.002	< 0.002	< 0.001	0.05		
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.006	< 0.01	< 0.005	< 0.05		
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15		< 0.001	< 0.001	< 0.03		
COD					39	61.25	19	81		
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f								
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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Sample Date					Surface Water Statistics Summary SW2	SW2	SW2	SW2		
PARAMETER	Limit	PWQO	CWQG	APV	Median (Last 10 Events)	75th Percentile	MIN	MAX		
Alkalinity as CaCO3	IPWQO	a			177.5	201.5	36	282		
BOD					< 3	2	< 1	40		
Chloride			120	180	7.035	12	5.9	25.6		
Conductivity						451	139	648		
DOC					2.65	3	1.8	7.6		
N-NH3 (Ammonia)					0.035	0.05	< 0.01	0.49		
N-NH3 (unionized)	PWQO	0.02			< 0.01	< 0.02	0.0064	< 0.02		
N-NO2 (Nitrite)					0.075	< 0.1	< 0.01	0.2		
N-NO3 (Nitrate)			13		0.08	0.1	< 0.05	0.3		
pH	PWQO	6.5-8.5	6.5-9			8.13	6.72	8.5		
Phenols	IPWQO	0.001	0.004	0.961		< 0.001	< 0.001	0.037		
Sulphate					9.96	21.2	6	35		
TDS						302	158	337		
Total phosphorous	IPWQO	0.03			< 0.01	0.03	< 0.003	1.75		
Turbidity					3	7.2	0.3	106		
Hardness as CaCO3					188.5	205.5	30	307		
Calcium					56.15	66	7	88.8		
Magnesium					9.085	10.075	3	13.2		
Potassium					3.75	4	< 0.04	8.8		
Sodium					6.9	10	5.48	18		
Aluminum (dissolved)	IPWQO	0.075			0.02	0.05	< 0.01	0.51		
Aluminum total	IPWQO					< 0.01	< 0.01	0.01		
Barium					0.062	0.07	0.012	0.14		
Beryllium	PWQO	(b) 0.011								
Boron	IPWQO	0.2	1.5	3.55	0.045	0.051	< 0.005	0.09		
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021		< 0.0001	0.000014	< 0.001		
Chromium	PWQO	0.0099			< 0.001	0.003	< 0.0002	< 0.01		
Cobalt	IPWQO	0.0009				0.0005	< 0.0001	0.0023		
Copper	PWQO IPWQO	0.005 d	d	0.0069	< 0.001	0.00115	< 0.0001	0.0257		
Iron	PWQO	0.3	0.3		0.9755	3.0475	0.06	45.1		
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002		< 0.001	< 0.00002	0.0142		
Manganese					0.384	0.6365	0.007	3.28		
Molybdenum	IPWQO	0.04				< 0.005	0.0002	< 0.005		
Nickel	PWQO	0.025		0.025	< 0.003	< 0.01	0.0012	0.0368		
Silicon					7.295	8.775	6.01	16		
Silver	PWQO	0.0001				< 0.0001	< 0.00002	< 0.001		
Strontium					0.154	0.176	0.049	0.227		
Thallium	IPWQO	0.0003				< 0.0001	< 0.00005	0.0005		
Titanium						< 0.01	< 0.002	< 0.05		
Vanadium	IPWQO	0.006				0.004	< 0.001	< 0.005		
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89		0.01	< 0.005	0.13		
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15		0.00175	< 0.001	< 0.03		
COD					< 5	8	< 2	90		
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f								
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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Sample Date					Surface Water Statistics Summary SW3 Median (Last 10 Events)	SW3 75th Percentile	SW3 MIN	SW3 MAX		
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			157	172	38	407		
BOD					< 3	1.25	< 1	5		
Chloride			120	180	18	20	11.5	28.6		
Conductivity						436.5	139	907		
DOC					3.1	4.1	< 0.5	7.1		
N-NH3 (Ammonia)					0.24	0.21	< 0.01	1.23		
N-NH3 (unionized)	PWQO	0.02			0.02	0.02	0.0087	0.1		
N-NO2 (Nitrite)						< 0.1	< 0.01	0.2		
N-NO3 (Nitrate)			13			0.265	0.01	1.89		
pH	PWQO	6.5-8.5	6.5-9			8.14	6.95	8.4		
Phenols	IPWQO	0.001	0.004	0.961		< 0.001	< 0.001	0.024		
Sulphate					12.8	17	6	27		
TDS						269.5	199	295		
Total phosphorous	IPWQO	0.03			0.01	0.02	< 0.01	0.29		
Turbidity					5.85	8.5	0.9	92		
Hardness as CaCO3					148.5	184	45	440		
Calcium					43.65	54.025	11.5	126		
Magnesium					9.005	11.025	3.9	49		
Potassium					5.2	5.55	< 0.04	11.2		
Sodium					12.4	14.5	8.6	31.6		
Aluminum (dissolved)	IPWQO	0.075			0.01	0.045	< 0.01	0.508		
Aluminum total	IPWQO					< 0.01	< 0.01	0.09		
Barium					0.0705	0.0755	0.012	0.235		
Beryllium	PWQO	(b) 0.011								
Boron	IPWQO	0.2	1.5	3.55	0.1205	0.138	0.006	0.29		
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021		< 0.0001	< 0.000014	< 0.001		
Chromium	PWQO	0.0099				0.00225	0.0004	0.01		
Cobalt	IPWQO	0.0009				0.0005	< 0.0001	0.0023		
Copper	PWQO IPWQO	0.005 d	d	0.0069		0.0011	< 0.0001	0.08		
Iron	PWQO	0.3	0.3		1.19	2.005	0.14	19		
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002		0.001	0.00008	0.0125		
Manganese					0.3865	0.55	0.029	3.28		
Molybdenum	IPWQO	0.04				< 0.005	0.0002	0.008		
Nickel	PWQO	0.025		0.025		< 0.01	< 0.001	0.0285		
Silicon					7.65	8.2925	6.67	26		
Silver	PWQO	0.0001				< 0.0001	< 0.00002	< 0.001		
Strontium					0.1315	0.16	0.107	0.2		
Thallium	IPWQO	0.0003				< 0.0001	< 0.00005	0.0004		
Titanium						< 0.01	< 0.002	< 0.05		
Vanadium	IPWQO	0.006				0.003	< 0.001	< 0.005		
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89		< 0.01	< 0.005	0.06		
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15		0.001	< 0.001	0.03		
COD					< 5	9.5	< 3	32		
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f								
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted
Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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Sample Date					Surface Water Statistics Summary SW4 Median (Last 10 Events)	SW4 75th Percentile	SW4 MIN	SW4 MAX		
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			188.5	194.25	32	230		
BOD					< 3	2	< 1	7		
Chloride			120	180	18	20.35	11.9	22		
Conductivity						494.75	140	516		
DOC					4.8	6.3	4.5	10.2		
N-NH3 (Ammonia)					0.79	0.605	< 0.005	1.15		
N-NH3 (unionized)	PWQO	0.02			0.04	< 0.02	< 0.01	0.079		
N-NO2 (Nitrite)										
N-NO3 (Nitrate)			13		0.345	0.3	0.01	0.6		
pH	PWQO	6.5-8.5	6.5-9			8.04	7.03	8.5		
Phenols	IPWQO	0.001	0.004	0.961		0.001	< 0.001	0.053		
Sulphate					25.05	33.5	6	37		
TDS						323.75	216	335		
Total phosphorous	IPWQO	0.03			0.01	0.0225	< 0.001	0.29		
Turbidity					11.8	15.4	1.8	96		
Hardness as CaCO3					184	212	45	283		
Calcium					53.2	62.775	11.6	84		
Magnesium					11.1	14	3.9	17.6		
Potassium					6.8	7	0.4	8		
Sodium					15.65	17.775	8.5	20		
Aluminum (dissolved)	IPWQO	0.075			0.02	0.045	< 0.01	0.456		
Aluminum total	IPWQO					0.01	< 0.01	0.03		
Barium					0.089	0.1	0.015	0.112		
Beryllium	PWQO	(b) 0.011				< 0.001	0.0005	0.081		
Boron	IPWQO	0.2	1.5	3.55	0.2915	0.274	0.006	0.41		
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021		< 0.0001	< 0.000014	< 0.001		
Chromium	PWQO	0.0099				0.003	0.0003	0.01		
Cobalt	IPWQO	0.0009				0.0005	< 0.0001	0.0027		
Copper	PWQO IPWQO	0.005 d	d	0.0069		0.001475	< 0.0001	0.05		
Iron	PWQO	0.3	0.3		2.065	3.1375	0.534	19.8		
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002		< 0.001	0.00002	0.0135		
Manganese					0.879	1.37	0.117	2.63		
Molybdenum	IPWQO	0.04				< 0.005	0.0003	< 0.005		
Nickel	PWQO	0.025		0.025	0.003	< 0.01	0.0014	< 0.02		
Silicon					8.205	8.8	7.2	30		
Silver	PWQO	0.0001				< 0.0001	< 0.00002	< 0.001		
Strontium					0.1765	0.204	0.138	0.234		
Thallium	IPWQO	0.0003				< 0.0001	< 0.00005	0.0006		
Titanium						< 0.01	< 0.002	0.051		
Vanadium	IPWQO	0.006				0.00425	0.001	0.01		
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89		< 0.01	< 0.005	0.03		
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15		< 0.001	< 0.001	< 0.03		
COD					11	13	< 3	26		
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f								
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted
Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
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Sample Date					Surface Water Statistics Summary SW5 Median (Last 10 Events)	SW5 75th Percentile	SW5 MIN	SW5 MAX		
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			180	193	38	230		
BOD					3.5	3	< 1	9		
Chloride			120	180	18	20	12	22		
Conductivity						488.75	139	509		
DOC					4.8	6.2	4.5	11.1		
N-NH3 (Ammonia)					0.63	0.48	< 0.01	0.94		
N-NH3 (unionized)	PWQO	0.02			0.032	< 0.02	< 0.01	1		
N-NO2 (Nitrite)										
N-NO3 (Nitrate)			13		0.475	0.4	0.01	0.83		
pH	PWQO	6.5-8.5	6.5-9			8.12	7.16	8.54		
Phenols	IPWQO	0.001	0.004	0.961		< 0.001	< 0.001	0.037		
Sulphate					24.45	33.5	6	37		
TDS						319.5	201	331		
Total phosphorous	IPWQO	0.03			< 0.01	0.03	0.003	0.68		
Turbidity					7.45	11.4	1.2	143		
Hardness as CaCO3					186	210	27	276		
Calcium					54.05	62.05	11.4	81.9		
Magnesium					11.5	14	3.81	17.2		
Potassium					6.835	6.835	0.9	9.2		
Sodium					15.95	17	8.5	22.7		
Aluminum (dissolved)	IPWQO	0.075			0.02	0.04	< 0.01	2.17		
Aluminum total	IPWQO					0.02	< 0.01	0.04		
Barium					0.0865	0.1	0.012	0.123		
Beryllium	PWQO	(b) 0.011				< 0.001	< 0.0005	< 0.002		
Boron	IPWQO	0.2	1.5	3.55	0.291	0.2705	0.006	0.4		
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021		< 0.0001	< 0.000014	< 0.001		
Chromium	PWQO	0.0099				0.002775	< 0.0002	< 0.01		
Cobalt	IPWQO	0.0009				0.0005	< 0.0001	0.0031		
Copper	PWQO IPWQO	0.005 d	d	0.0069		0.0012	< 0.0001	0.038		
Iron	PWQO	0.3	0.3		1.82	2.565	0.446	28.2		
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002		< 0.001	0.00003	0.009		
Manganese					0.723	1.28	0.029	1.67		
Molybdenum	IPWQO	0.04				0.005	0.0001	< 0.005		
Nickel	PWQO	0.025		0.025		< 0.01	0.0012	0.02		
Silicon					8.255	8.975	6.7	30		
Silver	PWQO	0.0001				< 0.0001	< 0.00002	0.0013		
Strontium					0.1795	0.204	0.1387	0.293		
Thallium	IPWQO	0.0003				< 0.0001	< 0.00005	0.0006		
Titanium						< 0.01	< 0.002	< 0.05		
Vanadium	IPWQO	0.006				0.004	0.001	< 0.005		
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.0075	< 0.01	< 0.005	0.081		
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15		0.00875	< 0.001	< 0.03		
COD					7	14	3	94		
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f								
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted
Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
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Sample Date					Surface Water Statistics Summary SW6 Median (Last 10 Events)	SW6 75th Percentile	SW6 MIN	SW6 MAX		
PARAMETER	Limit	PWQO	CWQG	APV						
Alkalinity as CaCO3	IPWQO	a			175	188.25	39	220		
BOD					3	3	< 1	10		
Chloride			120	180	17.55	20	11.5	23.3		
Conductivity						480	138	498		
DOC					4.7	6.5	4.4	9.8		
N-NH3 (Ammonia)					0.525	0.4075	< 0.01	0.91		
N-NH3 (unionized)	PWQO	0.02			0.04	< 0.02	< 0.01	0.05		
N-NO2 (Nitrite)						< 0.1	< 0.01	0.6		
N-NO3 (Nitrate)			13		0.585	0.43	0.01	0.86		
pH	PWQO	6.5-8.5	6.5-9			8.16	7.25	8.53		
Phenols	IPWQO	0.001	0.004	0.961		< 0.001	< 0.001	0.178		
Sulphate					24.3	32	6	37		
TDS						314	198	324		
Total phosphorous	IPWQO	0.03			< 0.01	0.03	0.005	0.2		
Turbidity					8.9	10.625	0.8	146		
Hardness as CaCO3					182	207	45	282		
Calcium					52.5	60.25	11.6	81.6		
Magnesium					11.25	13.425	3.91	17.2		
Potassium					6.62	6.435	< 0.04	9.5		
Sodium					15.25	17	8.7	23.4		
Aluminum (dissolved)	IPWQO	0.075			0.01	0.05	< 0.01	0.842		
Aluminum total	IPWQO					< 0.01	< 0.01	0.04		
Barium					0.082	0.09	0.012	0.123		
Beryllium	PWQO	(b) 0.011				< 0.001	0	0		
Boron	IPWQO	0.2	1.5	3.55	0.285	0.2625	0.006	0.4		
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021		< 0.0001	< 0.000014	< 0.001		
Chromium	PWQO	0.0099				0.003	0.0002	0.01		
Cobalt	IPWQO	0.0009				0.0005	< 0.0001	0.003		
Copper	PWQO IPWQO	0.005 d	d	0.0069		< 0.001	< 0.0001	0.024		
Iron	PWQO	0.3	0.3		1.715	2.5	0.25	19		
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	< 0.001	< 0.001	0.00003	< 0.005		
Manganese					0.589	1.02	0.018	1.47		
Molybdenum	IPWQO	0.04				< 0.005	0.0002	< 0.005		
Nickel	PWQO	0.025		0.025		< 0.01	0.0013	< 0.02		
Silicon					8.04	8.6775	6.91	13		
Silver	PWQO	0.0001				< 0.0001	< 0.00002	0.001		
Strontium					0.1775	0.19675	0.051	0.294		
Thallium	IPWQO	0.0003				< 0.0001	< 0.00005	0.0004		
Titanium					< 0.005	< 0.01	< 0.002	< 0.05		
Vanadium	IPWQO	0.006				0.004	0.001	< 0.005		
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.007	< 0.01	< 0.005	0.03		
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15		0.002	< 0.001	< 0.03		
COD					7.5	14.5	< 3	42		
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f								
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted

Shaded values exceed ODWS Criteria

MILLER'S ROAD WDS
REPORT OF SURFACE WATER
INORGANIC ANALYSIS

Sample Date					Surface Water Statistics Summary **SW7**	**SW7**	**SW7**	**SW7**		
PARAMETER	Limit	PWQO	CWQG	APV	Median (Last 10 Events)	75th Percentile	MIN	MAX		
Alkalinity as CaCO3	IPWQO	a			62	111.5	9	308		
BOD					< 3	< 3	< 1	17		
Chloride			120	180	16.25	23.225	6.5	44.1		
Conductivity						314	141	506		
DOC					9	12.8	4.3	29.4		
N-NH3 (Ammonia)					0.125	0.13	0.01	0.47		
N-NH3 (unionized)	PWQO	0.02			< 0.01	< 0.02	0.00016	0.029		
N-NO2 (Nitrite)						< 0.1	< 0.01	0.5		
N-NO3 (Nitrate)			13		0.24	0.22	0.01	0.52		
pH	PWQO	6.5-8.5	6.5-9			7.9325	6.82	8.51		
Phenols	IPWQO	0.001	0.004	0.961		< 0.001	< 0.001	0.051		
Sulphate					8.62	17	4	45		
TDS						169.5	86.9	264		
Total phosphorous	IPWQO	0.03			0.01	0.025	0.008	0.22		
Turbidity					2.75	5.1	0.7	66.4		
Hardness as CaCO3					70.35	121.75	16	233		
Calcium					18.85	34.45	4.21	81.8		
Magnesium					4.775	8	1.26	14.9		
Potassium					2.435	3	< 0.04	6.5		
Sodium					13.3	16	5.7	21		
Aluminum (dissolved)	IPWQO	0.075			0.05	0.08825	0.01	0.55		
Aluminum total	IPWQO				0.09	0.09	0.03	0.14		
Barium					0.0285	0.04	0.008	0.081		
Beryllium	PWQO	(b) 0.011				< 0.001	< 0.0005	< 0.002		
Boron	IPWQO	0.2	1.5	3.55	0.0715	0.092	0.005	0.21		
Cadmium	PWQO IPWQO	0.0002 c	based on hardness	0.00021		< 0.0001	< 0.00002	< 0.001		
Chromium	PWQO	0.0099			< 0.001	0.0045	< 0.0001	0.0211		
Cobalt	IPWQO	0.0009				0.0004	0.0001	< 0.005		
Copper	PWQO IPWQO	0.005 d	d	0.0069	0.0015	0.0019	< 0.0001	0.036		
Iron	PWQO	0.3	0.3		0.644	1.16	0.28	33.7		
Lead	PWQO IPWQO	0.025 0.005	based on hardness	0.002	< 0.001	< 0.001	< 0.00014	< 0.005		
Manganese					0.1305	0.39	0.033	1.11		
Molybdenum	IPWQO	0.04				< 0.005	< 0.0001	< 0.005		
Nickel	PWQO	0.025		0.025	< 0.003	< 0.01	0.0005	< 0.02		
Silicon					7.06	7.76	2.59	19		
Silver	PWQO	0.0001			< 0.0001	< 0.0001	< 0.00002	0.02		
Strontium					0.069	0.117	0.018	0.138		
Thallium	IPWQO	0.0003				< 0.0001	< 0.00005	< 0.0003		
Titanium					< 0.005	< 0.01	< 0.002	< 0.05		
Vanadium	IPWQO	0.006				0.0045	< 0.001	< 0.005		
Zinc	PWQO IPWQO	0.03 0.02	0.03	0.89	0.006	< 0.01	< 0.005	0.07		
Arsenic	PWQO IPWQO	0.1 0.005	0.005	0.15		0.0015	< 0.001	< 0.03		
COD					25.5	44.5	< 5	220		
Colour										
Mercury	PWQO	0.0002								
Selenium	PWQO	0.1								
Tannin & Lignin										
TOC										
TKN										
Sus. Solids										
Field Parameters										
Discharge L/sec										
pH										
DO	PWQO	f								
Conductivity		mg/l								
Temperature										

All concentrations in mg/L unless otherwise noted
Shaded values exceed ODWS Criteria

Unionized Ammonia
Millers Road WDS
2018

Location	*Ammonia*	*pH*	*Temperature*	*pKa*	*f*	*Unionized Ammonia*
SW1 May 2018	0.12	7.5	6.3	9.85873364	0.004358823	0.0005231
SW1 July 2018	0.06	7.1	22.6	9.32036664	0.005984481	0.0003591
SW1 Oct 2018	0.2	8	10.7	9.70731521	0.019241845	0.0038484
SW2 May 2018	0.18	7.7	7.7	9.81004043	0.007701968	0.0013864
SW2 July 2018	0.05	7.4	12.1	9.6601162	0.00546392	0.0002732
SW2 Oct 2018	0.15	8	8.6	9.77899317	0.016362213	0.0024543
SW3 May 2018	0.75	7.6	9.8	9.73790406	0.007226799	0.0054201
SW3 July 2018	0.95	7.5	11.5	9.6802875	0.006559254	0.0062313
SW3 Oct 2018	0.21	7.8	8.8	9.7721207	0.010550497	0.0022156
SW4 May 2018	1.12	7.3	8.9	9.76868812	0.003387181	0.0037936
SW4 July 2018	1.15	7.4	10.7	9.70731521	0.004903992	0.0056396
SW4 Oct 2018	0.36	7.8	8.5	9.78243307	0.010305477	0.0037100
SW5 May 2018	0.94	7.5	9	9.76525797	0.00539996	0.0050760
SW5 July 2018	1	7.4	10.7	9.70731521	0.004903992	0.0049040
SW5 Oct 2018	0.36	7.9	8.5	9.78243307	0.0129393	0.0046581
SW6 May 2018	0.91	7.2	9.1	9.76183025	0.002735144	0.0024890
SW6 July 2018	0.87	7.4	10.6	9.71070439	0.004866057	0.0042335
SW6 Oct 2018	0.3	7.8	8.4	9.78587541	0.010224948	0.0030675
SW7 May 2018	0.14	7	5.8	9.87624252	0.001327946	0.0001859
SW7 July 2018	0.47	7.4	12.8	9.63669	0.005764996	0.0027095
SW7 Oct 2018	0.22	7.9	9.4	9.75156165	0.013879327	0.0030535

Millers Road WDS
Surface Water QA/QC
RPD Calculations

		SW 1	SW 1 DUP SW 8		SW 1	SW 1 DUP SW 8	
Parameter	**PWQO**	**Aug-16**	**Aug-16**	**RPD**	**Aug-17**	**Aug-17**	**RPD**
Alkalinity as CaCO3	a	17	20	16.22%	15	13	14.29%
BOD		<5	<5	NC	< 3	< 3	NC
Chloride		45.6	45.7	0.22%	18.7	18.8	0.53%
Conductivity				NC			NC
DOC		20.1	19.3	4.06%			NC
N-NH3 (Ammonia)		0.04	0.07	54.55%	< 0.01	< 0.01	NC
N-NH3 (unionized)	0.02	0.00042	0.00097	79.14%	-	-	NC
N-NO2 (Nitrite)		<0.05	<0.05	NC	< 0.05	< 0.05	NC
N-NO3 (Nitrate)		<0.05	<0.05	NC	< 0.05	< 0.05	NC
pH	6.5-8.5			NC			NC
Phenols	0.001	<0.001	0.001	NC	< 0.001	< 0.001	NC
Sulphate		1.56	1.57	0.64%			NC
TDS				NC			NC
Total phosphorous	0.03	0.06	0.04	40.00%	0.01	< 0.01	NC
Turbidity		2.2	1.9	14.63%	1.7	1.7	0.00%
Hardness as CaCO3		30.0	29.6	1.34%	23	23	0.00%
Calcium		7.42	7.29	1.77%	5.51	5.29	4.07%
Magnesium		2.79	2.77	0.72%	2.04	1.98	2.99%
Potassium		0.59	0.60	1.68%	0.5	0.5	0.00%
Sodium		21.8	22.1	1.37%	14.3	13.7	4.29%
Aluminum (dissolved)	0.075			NC	0.07	0.06	15.38%
Aluminum total				NC			NC
Barium		0.018	0.017	5.71%	0.011	0.011	0.00%
Beryllium	(b) 0.011	<0.001	<0.001	NC	< 0.002	< 0.002	NC
Boron	0.2	<0.010	<0.010	NC	0.006	0.006	0.00%
Cadmium	0.0002 c	<0.0001	<0.0001	NC	0.000096	0.000056	52.63%
Chromium	0.0099	<0.003	<0.003	NC	< 0.001	< 0.001	NC
Cobalt	0.0009	<0.0005	<0.0005	NC	0.0003	0.0003	0.00%
Copper	0.005 d	<0.002	<0.002	NC	0.0068	0.0053	24.79%
Iron	0.3	0.82	0.90	9.30%	1.19	1.14	4.29%
Lead	0.025 0.005	<0.001	<0.001	NC	0.00067	0.00049	31.03%
Manganese		0.061	0.061	0.00%	0.052	0.049	5.94%
Molybdenum	0.04	<0.002	<0.002	NC	0.0002	0.0001	66.67%
Nickel	0.025	<0.003	<0.003	NC	0.0022	0.0011	66.67%
Silicon		6.58	6.95	5.47%	6.5	6.28	3.44%
Silver	0.0001	<0.0001	<0.0001	NC	< 0.00002	< 0.00002	NC
Strontium		0.048	0.050	4.08%	0.037	0.035	5.56%
Thallium	0.0003	<0.0003	<0.0003	NC	< 0.00005	< 0.00005	NC
Titanium		0.002	0.003	40.00%	< 0.005	< 0.005	NC
Vanadium	0.006	<0.002	<0.002	NC	< 0.005	< 0.005	NC
Zinc	0.03 0.02	0.007	0.006	15.38%	0.006	0.005	18.18%
Arsenic	0.1 0.005			NC			NC
COD		48	49	2.06%	72	64	11.76%
Average RPD				**14.21%**			**14.46%**

NC = Not Calculated
RDP greater than 25%
RDP greater than 50%

Millers Road WDS
Surface Water QA/QC
RPD Calculations

		SW 1	SW 1 DUP SW 8		SW 1	SW 1 DUP SW 8		SW 1	SW 1 DUP SW 8	
Parameter	**PWQO**	May-18	May-18	**RPD**	Jul-18	Jul-18	**RPD**	Oct-18	Oct-18	**RPD**
Alkalinity as CaCO3	a	9	8	11.76%	22	16	31.58%	20	24	18.18%
BOD			< 1	NC	< 1	< 1	NC	< 1	< 1	NC
Chloride		< 1	10	NC	38	38	0.00%	43	42	2.35%
Conductivity				NC			NC			NC
DOC		8.1	8.9	9.41%	17.1	18.3	6.78%	16.3	16.2	0.62%
N-NH3 (Ammonia)		0.12	0.12	0.00%	0.06	0.07	15.38%	0.2	0.15	28.57%
N-NH3 (unionized)	0.02	< 0.02	< 0.02	NC	< 0.02	< 0.02	NC	< 0.2	< 0.02	NC
N-NO2 (Nitrite)		< 0.10	< 0.10	NC	< 0.10	< 0.10	NC	< 0.10	< 0.10	NC
N-NO3 (Nitrate)		< 0.10	< 0.10	NC	< 0.10	< 0.10	NC	< 0.10	< 0.10	NC
pH	6.5-8.5	7.08	6.99	1.28%	7.2	7.09	1.54%	7.17	7.31	1.93%
Phenols	0.001	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC
Sulphate		2	2	0.00%	2	2	0.00%	2	2	0.00%
TDS				NC			NC			NC
Total phosphorous	0.03	0.016	0.017	6.06%	0.024	0.023	4.26%	0.01	0.01	0.00%
Turbidity		0.6	0.6	0.00%	2.3	1.9	19.05%	0.8	1	22.22%
Hardness as CaCO3		5	5	0.00%	23	23	0.00%	23	23	0.00%
Calcium		2	2	0.00%	6	6	0.00%	6	6	0.00%
Magnesium		< 1	< 1	NC	2	2	0.00%	2	2	0.00%
Potassium		< 1	< 1	NC	< 1	< 1	NC	1	1	NC
Sodium		7	7	0.00%	19	21	10.00%	23	22	4.44%
Aluminum (dissolved)	0.075	0.06	0.06	0.00%	0.08	0.08	0.00%	0.06	0.06	0.00%
Aluminum total		0.06	0.06	0.00%			NC			NC
Barium		< 0.01	< 0.01	NC	0.01	0.01	NC	0.01	< 0.01	NC
Beryllium	(b) 0.011	< 0.0005	< 0.0005	NC	< 0.0005	< 0.0005	NC	< 0.0005	< 0.0005	NC
Boron	0.2		< 0.01	NC	< 0.01	< 0.01	NC	< 0.01	< 0.01	NC
Cadmium	0.0002 c	< 0.0001	< 0.0001	NC	< 0.0001	< 0.0001	NC	< 0.0001	< 0.0001	NC
Chromium	0.0099	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC
Cobalt	0.0009	< 0.0002	< 0.0002	NC	0.0003	0.0003	NC	< 0.0002	< 0.0002	NC
Copper	0.005 d	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC
Iron	0.3	0.29	0.29	0.00%	1.02	1.01	0.99%	0.66	0.66	0.00%
Lead	0.025 0.005	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC
Manganese		0.02	0.02	0.00%	0.06	0.06	0.00%	0.02	0.02	0.00%
Molybdenum	0.04	< 0.005	< 0.005	NC	< 0.005	< 0.005	NC	< 0.005	< 0.005	NC
Nickel	0.025	< 0.005	< 0.005	NC	< 0.005	< 0.005	NC	< 0.005	< 0.005	NC
Silicon		2.8	2.8	0.00%	3.4	3.2	6.06%	8	8	0.00%
Silver	0.0001	< 0.0001	< 0.0001	NC	< 0.0001	< 0.0001	NC	< 0.0001	< 0.0001	NC
Strontium		0.012	0.012	0.00%	0.039	0.039	0.00%	0.05	0.048	4.08%
Thallium	0.0003	< 0.0001	< 0.0001	NC	< 0.0001	< 0.0001	NC	< 0.0001	< 0.0001	NC
Titanium		< 0.01	< 0.01	NC	< 0.01	< 0.01	NC	< 0.01	< 0.01	NC
Vanadium	0.006	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC	< 0.001	< 0.001	NC
Zinc	0.03 0.02		< 0.01	NC	< 0.01	< 0.01	NC	< 0.01	< 0.01	NC
Arsenic	0.1 0.005			NC			NC			NC
COD		30	25	18.18%	44	46	4.44%	33	35	5.88%
Average RPD				**2.75%**			**5.56%**			**4.90%**

NC = Not Calculated
RDP greater than 25%
RDP greater than 50%

Millers Road Waste Disposal Site
Record of Water Levels

Monitoring Well	Reference Mark	Reference Elevation	Nov-98		Nov-99		Jun-00		May-05	
			Static	Elevation	Static	Elevation	Static	Elevation	Static	Elevation
85-Z	T/Plastic	127.75	6.22	**121.53**	6.19	**121.56**	5.9	**121.85**	Compromised	
85-A	T/Plastic	128.4	6.01	**122.39**	6	**122.4**	5.67	**122.73**	5.52	**122.88**
85-B	T/Plastic	129.87	6.64	**123.23**	6.65	**123.22**	6.195	**123.675**	5.98	**123.89**
85-C	T/Plastic	129.44	6.53	**122.91**	6.6	**122.84**	6.165	**123.275**	6.04	**123.4**
85-D	T/Plastic	132.25	9.72	**122.53**	9.76	**122.49**	9.345	**122.905**	9.2	**123.05**
85-E	T/Plastic	131.5	Not Located		Not Located		Not Located		Not Located	
85-F	T/Plastic	131.13	Dry		Dry		Dry		Dry	
85-Y	T/Plastic	129.75	6.935	**122.815**	6.995	**122.755**	6.575	**123.175**	Compromised	
88-1-S	T/Plastic	130.34	Decomissioned		Decomissioned		Decomissioned		Decomissioned	
88-1-D	T/Plastic	130.33	Decomissioned		Decomissioned		Decomissioned		Decomissioned	
88-2-S	T/Plastic	133.1	10.47	**122.63**	10.51	**122.59**	10.08	**123.02**	10.29	**122.81**
88-2-D	T/Plastic	133.09	10.385	**122.705**	10.405	**122.685**	9.99	**123.1**	9.92	**123.17**
88-3-S	T/Plastic	129.96	6.3	**123.66**	6.41	**123.55**	5.915	**124.045**	6.08	**123.88**
88-3-D	T/Plastic	129.98	6.355	**123.625**	6.38	**123.6**	5.87	**124.11**	5.71	**124.27**
89-1-S	T/Plastic	128.4	7.55	**120.85**	7.56	**120.84**	7.62	**120.78**	7.18	**121.22**
89-1-D	T/Plastic	128.32	7.06	**121.26**	7.07	**121.25**	6.75	**121.57**	7.02	**121.3**
89-2-S	T/Plastic	128.54	7.4	**121.14**	7.4	**121.14**	7.095	**121.445**	Not Measured	
89-2-D	T/Plastic	128.54	7.35	**121.19**	7.36	**121.18**	7.05	**121.49**	Not Measured	
91-1	T/Plastic	128.234	6.1	**122.134**	5.925	**122.309**	5.645	**122.589**	5.54	**122.694**
91-2	T/Plastic	129.769	9.855	**119.914**	9.785	**119.984**	9.625	**120.144**	9.82	**119.949**
91-3	T/Plastic	118.05	9.02	**109.03**	8.95	**109.1**	8.89	**109.16**	8.91	**109.14**
91-4	T/Plastic	127.97					6.93	**121.04**	6.48	**121.49**
91-5 S	T/Plastic	129.161								
91-5 D	T/Plastic	129.558	6.08	**123.478**	6.115	**123.443**	5.62	**123.938**	5.48	**124.078**
95-1	O/G	129.022								
95-2	O/G	134.144								
95-3-S	T/Plastic	129.066	5.715	**123.351**	5.715	**123.351**	5.27	**123.796**	5.12	**123.946**
95-3 D		129.053								
95-4 S	T/Plastic	129.846	6.135	**123.711**	6.62	**123.226**	5.66	**124.186**	5.5	**124.346**
95-4 D		129.864								
95-5	T/Plastic	129.391	5.455	**123.936**	5.935	**123.456**	4.935	**124.456**	4.76	**124.631**
95-6	T/Plastic	126.988	4.96	**122.028**	4.98	**122.008**	4.61	**122.378**	4.45	**122.538**
96-1-S	T/Plastic	128.353	5.005	**123.348**	4.53	**123.823**	4.04	**124.313**	3.82	**124.533**
96-1-D	T/Plastic	128.327	4.57	**123.757**	4.605	**123.722**	4.09	**124.237**	3.93	**124.397**
96-2	T/Plastic		Not Measured		Not Measured		4.525		4.44	
96-3	T/Plastic	129.98	7.045	**122.935**	7.07	**122.91**	6.62	**123.36**	6.5	**123.48**
03-1	T/Plastic									
07-2S	T/Plastic	123.68								
07-2D	T/Plastic	123.96								
07-F S	T/Plastic	130.26								
07-F D	T/Plastic	130.986								
07-3S	T/Plastic	129.63								
07-3D	T/Plastic	129.76								
08-1S	T/Plastic	129.845								
08-1D	T/Plastic	129.858								

Millers Road Waste Disposal Site
Record of Water Levels

Monitoring Well	Reference Mark	Reference Elevation	Nov-05		May-06		Oct-06		May-07	
			Static	Elevation	Static	Elevation	Static	Elevation	Static	Elevation
85-Z	T/Plastic	127.75	Compromised		Compromised		Compromised		Compromised	
85-A	T/Plastic	128.4	6.03	**122.37**	5.40	**123.00**	5.73	**122.67**	5.27	**123.13**
85-B	T/Plastic	129.87	6.71	**123.16**	5.93	**123.94**	6.43	**123.44**	5.68	**124.19**
85-C	T/Plastic	129.44	6.61	**122.83**	5.94	**123.50**	6.03	**123.41**	5.47	**123.97**
85-D	T/Plastic	132.25	9.75	**122.50**	9.08	**123.17**	9.42	**122.83**	9.42	**122.83**
85-E	T/Plastic	131.5	Not Located		Not Located		Not Located		Not Located	
85-F	T/Plastic	131.13	Dry		Dry		Dry		Decommissioned	
85-Y	T/Plastic	129.75	Compromised		Compromised		Compromised		Compromised	
88-1-S	T/Plastic	130.34	Decomissioned		Decomissioned		Decomissioned		Decomissioned	
88-1-D	T/Plastic	130.33	Decomissioned		Decomissioned		Decomissioned		Decomissioned	
88-2-S	T/Plastic	133.1	10.50	**122.60**	9.83	**123.27**	10.17	**122.93**	9.64	**123.46**
88-2-D	T/Plastic	133.09	10.40	**122.69**	9.74	**123.35**	9.94	**123.15**	9.54	**123.55**
88-3-S	T/Plastic	129.96	6.40	**123.56**			5.99	**123.97**	5.35	**124.61**
88-3-D	T/Plastic	129.98	6.40	**123.58**	5.60	**124.38**	5.99	**123.99**	5.35	**124.63**
89-1-S	T/Plastic	128.4	7.20	**121.20**	7.08	**121.32**	7.35	**121.06**	7.00	**121.40**
89-1-D	T/Plastic	128.32	7.04	**121.28**	6.54	**121.78**	6.81	**121.51**	6.45	**121.87**
89-2-S	T/Plastic	128.54	Not Measured		Not Measured		Not Measured		Not Measured	
89-2-D	T/Plastic	128.54	Not Measured		Not Measured		Not Measured		Not Measured	
91-1	T/Plastic	128.234	6.05	**122.18**	5.46	**122.77**	5.78	**122.45**	5.36	**122.87**
91-2	T/Plastic	129.769	9.81	**119.96**	9.44	**120.33**	9.63	**120.14**	9.39	**120.38**
91-3	T/Plastic	118.05	8.99	**109.06**	8.79	**109.26**	8.89	**109.16**	8.82	**109.23**
91-4	T/Plastic	127.97	7.18	**120.79**	6.77	**121.20**	Dry		5.90	**122.07**
91-5 S	T/Plastic	129.161								
91-5 D	T/Plastic	129.558	6.13	**123.43**	5.37	**124.19**	5.74	**123.82**	5.13	**124.43**
95-1	O/G	129.022								
95-2	O/G	134.144								
95-3-S	T/Plastic	129.066	5.77	**123.30**	5.03	**124.04**	5.38	**123.69**	4.83	**124.24**
95-3 D		129.053								
95-4 S	T/Plastic	129.846	6.18	**123.67**	5.42	**124.43**	5.78	**124.07**	5.14	**124.71**
95-4 D		129.864								
95-5	T/Plastic	129.391	5.51	**123.88**	4.69	**124.70**	5.06	**124.33**	4.39	**125.00**
95-6	T/Plastic	126.988	4.95	**122.04**	4.36	**122.63**	4.69	**122.30**	4.15	**122.84**
96-1-S	T/Plastic	128.353	4.53	**123.82**	3.77	**124.58**	4.13	**124.22**	3.46	**124.89**
96-1-D	T/Plastic	128.327	4.62	**123.71**	3.85	**124.48**	4.21	**124.12**	3.57	**124.76**
96-2	T/Plastic		Dry		Dry		4.49		4.20	
96-3	T/Plastic	129.98	7.08	**122.90**	6.39	**123.59**	6.75	**123.23**	6.18	**123.80**
03-1	T/Plastic								1.20	
07-2S	T/Plastic	123.68								
07-2D	T/Plastic	123.96								
07-F S	T/Plastic	130.26								
07-F D	T/Plastic	130.986								
07-3S	T/Plastic	129.63								
07-3D	T/Plastic	129.76								
08-1S	T/Plastic	129.845								
08-1D	T/Plastic	129.858								

Millers Road Waste Disposal Site
Record of Water Levels

Monitoring Well	Reference Mark	Reference Elevation	Oct-07		Nov-07		May-08		Oct-08	
			Static	Elevation	Static	Elevation	Static	Elevation	Static	Elevation
85-Z	T/Plastic	127.75	Compromised		Compromised		Compromised		Compromised	
85-A	T/Plastic	128.4	5.65	**122.75**	Not Measured		5.16	**123.24**	5.46	**122.94**
85-B	T/Plastic	129.87	6.23	**123.64**	6.17	**123.70**	5.57	**124.30**	5.97	**123.90**
85-C	T/Plastic	129.44	5.95	**123.49**	Not Measured		5.37	**124.07**	5.73	**123.71**
85-D	T/Plastic	132.25	9.35	**122.90**	Not Measured		Destroyed		Destroyed	
85-E	T/Plastic	131.5	Not Located		Not Located		Not Located		Not Located	
85-F	T/Plastic	131.13	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
85-Y	T/Plastic	129.75	Compromised		Compromised		Compromised		Compromised	
88-1-S	T/Plastic	130.34	Decomissioned		Decomissioned		Decomissioned		Decomissioned	
88-1-D	T/Plastic	130.33	Decomissioned		Decomissioned		Decomissioned		Decomissioned	
88-2-S	T/Plastic	133.1	10.08	**123.02**	Not Measured		9.55	**123.55**	9.90	**123.20**
88-2-D	T/Plastic	133.09	10.00	**123.09**	Not Measured		9.47	**123.62**	9.82	**123.27**
88-3-S	T/Plastic	129.96	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
88-3-D	T/Plastic	129.98	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
89-1-S	T/Plastic	128.4	7.32	**121.08**	Not Measured		6.91	**121.49**	7.17	**121.23**
89-1-D	T/Plastic	128.32	6.75	**121.57**	Not Measured		6.35	**121.97**	6.62	**121.70**
89-2-S	T/Plastic	128.54	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
89-2-D	T/Plastic	128.54	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
91-1	T/Plastic	128.234	5.83	**122.40**	Not Measured		5.35	**122.88**	5.59	**122.64**
91-2	T/Plastic	129.769	9.68	**120.09**	Not Measured		9.37	**120.40**	9.55	**120.22**
91-3	T/Plastic	118.05	8.97	**109.08**	Not Measured		8.72	**109.33**	8.87	**109.18**
91-4	T/Plastic	127.97	7.16	**120.81**	Not Measured		6.36	**121.61**	7.17	**120.80**
91-5 S	T/Plastic	129.161								
91-5 D	T/Plastic	129.558	5.64	**123.92**	5.74	**123.82**	5.03	**124.53**	5.43	**124.13**
95-1	O/G	129.022								
95-2	O/G	134.144								
95-3-S	T/Plastic	129.066	5.33	**123.74**	Not Measured		4.74	**124.33**	5.12	**123.95**
95-3 D		129.053								
95-4 S	T/Plastic	129.846	5.69	**124.16**	Not Measured		5.06	**124.79**	5.47	**124.38**
95-4 D		129.864								
95-5	T/Plastic	129.391	4.99	**124.40**	Not Measured		4.32	**125.07**	4.75	**124.64**
95-6	T/Plastic	126.988	4.63	**122.36**	Not Measured		4.12	**122.87**	4.46	**122.53**
96-1-S	T/Plastic	128.353	4.06	**124.29**	4.15	**124.20**	3.42	**124.93**	3.83	**124.52**
96-1-D	T/Plastic	128.327	4.13	**124.20**	4.22	**124.11**	3.51	**124.82**	3.90	**124.43**
96-2	T/Plastic		Dry		Not Measured		Dry		Dry	
96-3	T/Plastic	129.98	6.64	**123.34**	Not Measured		6.07	**123.91**	6.43	**123.55**
03-1	T/Plastic		DRY		Not Measured		1.33		1.50	
07-2S	T/Plastic	123.68	2.41	**121.27**	Not Measured		2.04	**121.64**	2.28	**121.40**
07-2D	T/Plastic	123.96	5.41	**118.55**	Not Measured		4.80	**119.16**	5.02	**118.94**
07-F S	T/Plastic	130.26	7.12	**123.14**	Not Measured		6.50	**123.76**	6.90	**123.36**
07-F D	T/Plastic	130.986								
07-3S	T/Plastic	129.63	5.55	**124.08**	Not Measured		4.92	**124.71**	5.33	**124.30**
07-3D	T/Plastic	129.76	5.67	**124.09**	Not Measured		5.04	**124.72**	5.46	**124.30**
08-1S	T/Plastic	129.845								
08-1D	T/Plastic	129.858								

Millers Road Waste Disposal Site
Record of Water Levels

Monitoring Well	Reference Mark	Reference Elevation	Nov-08		May-09		Sep-09		May-10	
			Static	Elevation	Static	Elevation	Static	Elevation	Static	Elevation
85-Z	T/Plastic	127.75	Compromised		Compromised		Compromised		Compromised	
85-A	T/Plastic	128.4	Not Measured		5.12	**123.28**	Not Measured		5.46	**122.94**
85-B	T/Plastic	129.87	Not Measured		5.50	**124.37**	Not Measured		5.98	**123.89**
85-C	T/Plastic	129.44	Not Measured		5.29	**124.15**	Not Measured		5.73	**123.71**
85-D	T/Plastic	132.25	Destroyed		8.74	**123.51**	9.28	**122.97**	Not Located	
85-E	T/Plastic	131.5	Not Located		Not Located		Not Located		Not Located	
85-F	T/Plastic	131.13	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
85-Y	T/Plastic	129.75	Compromised		Compromised		Compromised		Compromised	
88-1-S	T/Plastic	130.34	Decomissioned		Decomissioned		Decomissioned		Decomissioned	
88-1-D	T/Plastic	130.33	Decomissioned		Decomissioned		Decomissioned		Decomissioned	
88-2-S	T/Plastic	133.1	Not Measured		9.47	**123.63**	10.08	**123.02**	9.81	**123.29**
88-2-D	T/Plastic	133.09	Not Measured		9.39	**123.70**	10.02	**123.07**	9.89	**123.20**
88-3-S	T/Plastic	129.96	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
88-3-D	T/Plastic	129.98	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
89-1-S	T/Plastic	128.4	Not Measured		6.85	**121.55**	7.28	**121.12**	7.13	**121.27**
89-1-D	T/Plastic	128.32	Not Measured		6.29	**122.03**	6.74	**121.58**	6.58	**121.74**
89-2-S	T/Plastic	128.54	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
89-2-D	T/Plastic	128.54	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
91-1	T/Plastic	128.234	Not Measured		5.27	**122.96**	5.81	**122.42**	5.54	**122.69**
91-2	T/Plastic	129.769	Not Measured		9.32	**120.45**	9.67	**120.10**	9.51	**120.26**
91-3	T/Plastic	118.05	Not Measured		8.69	**109.36**	8.92	**109.13**	8.83	**109.22**
91-4	T/Plastic	127.97	Not Measured		6.14	**121.83**			Dry	
91-5 S	T/Plastic	129.161	5.16	**124.00**	4.53	**124.63**	5.16	**124.00**	5.06	**124.10**
91-5 D	T/Plastic	129.558	5.54	**124.02**	4.92	**124.64**	5.54	**124.02**	5.45	**124.11**
95-1	O/G	129.022								
95-2	O/G	134.144								
95-3-S	T/Plastic	129.066	5.24	**123.83**	4.65	**124.42**	5.24	**123.83**	5.11	**123.96**
95-3 D		129.053	5.3	**123.75**	4.75	**124.30**	5.3	**123.75**	5.19	**123.86**
95-4 S	T/Plastic	129.846	5.57	**124.28**	4.96	**124.89**	5.57	**124.28**	5.49	**124.36**
95-4 D		129.864	5.64	**124.22**	5.02	**124.84**	5.64	**124.22**	5.55	**124.31**
95-5	T/Plastic	129.391	Not Measured		4.20	**125.19**	4.99	**124.40**	4.77	**124.62**
95-6	T/Plastic	126.988	Not Measured		4.05	**122.94**			4.42	**122.57**
96-1-S	T/Plastic	128.353	Not Measured		3.37	**124.98**	4.06	**124.29**	3.85	**124.50**
96-1-D	T/Plastic	128.327	Not Measured		3.40	**124.93**	4.12	**124.21**	3.93	**124.40**
96-2	T/Plastic		Not Measured		Dry		Dry		Dry	
96-3	T/Plastic	129.98	Not Measured		5.99	**123.99**	6.63	**123.35**	6.45	**123.53**
03-1	T/Plastic		Not Measured		1.28	**-1.28**	Dry		Dry	
07-2S	T/Plastic	123.68	Not Measured		1.99	**121.69**	2.38	**121.30**	2.2	**121.48**
07-2D	T/Plastic	123.96	Not Measured		4.51	**119.45**	4.77	**119.19**	5.32	**118.64**
07-F S	T/Plastic	130.26	7.01	**123.25**	6.38	**123.88**	7.01	**123.25**	6.91	**123.35**
07-F D	T/Plastic	130.986	6.78	**124.21**	6.14	**124.85**	6.78	**124.21**	6.68	**124.31**
07-3S	T/Plastic	129.63	5.43	**124.20**	4.80	**124.83**	5.43	**124.20**	5.35	**124.28**
07-3D	T/Plastic	129.76	5.56	**124.20**	4.95	**124.81**	5.56	**124.20**	5.48	**124.28**
08-1S	T/Plastic	129.845	5.67	**124.18**	5.05	**124.80**	5.67	**124.18**	5.57	**124.28**
08-1D	T/Plastic	129.858	5.62	**124.24**	4.99	**124.87**	5.62	**124.24**	5.54	**124.32**

Millers Road Waste Disposal Site
Record of Water Levels

Monitoring Well	Reference Mark	Reference Elevation	Oct-10		Jun-11		Oct-11		Jun-12	
			Static	Elevation	Static	Elevation	Static	Elevation	Static	Elevation
85-Z	T/Plastic	127.75	Compromised		Compromised		Compromised		Compromised	
85-A	T/Plastic	128.4	5.94	**122.46**	5.21	**123.19**	5.47	**122.93**	5.44	**122.96**
85-B	T/Plastic	129.87	6.54	**123.33**	5.66	**124.21**	5.98	**123.89**	5.96	**123.91**
85-C	T/Plastic	129.44	6.27	**123.17**	5.43	**124.01**	5.74	**123.70**	5.71	**123.73**
85-D	T/Plastic	132.25	9.66	**122.59**	8.85	**123.40**	Not Located		Not Located	
85-E	T/Plastic	131.5	Not Located		Not Located		Not Located		Not Located	
85-F	T/Plastic	131.13	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
85-Y	T/Plastic	129.75	Compromised		Compromised		Compromised		Compromised	
88-1-S	T/Plastic	130.34	Decomissioned		Decomissioned		Decomissioned		Decomissioned	
88-1-D	T/Plastic	130.33	Decomissioned		Decomissioned		Decomissioned		Decomissioned	
88-2-S	T/Plastic	133.1	10.04	**123.06**	9.61	**123.49**	9.9	**123.20**	9.88	**123.22**
88-2-D	T/Plastic	133.09	10.34	**122.75**	9.53	**123.56**	9.84	**123.25**	9.80	**123.29**
88-3-S	T/Plastic	129.96	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
88-3-D	T/Plastic	129.98	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
89-1-S	T/Plastic	128.4	7.49	**120.91**	6.92	**121.48**	7.17	**121.23**	7.12	**121.28**
89-1-D	T/Plastic	128.32	6.98	**121.34**	6.39	**121.93**	6.62	**121.70**	6.58	**121.74**
89-2-S	T/Plastic	128.54	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
89-2-D	T/Plastic	128.54	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
91-1	T/Plastic	128.234	5.98	**122.25**	5.35	**116.78**	5.64	**122.59**	5.56	**122.67**
91-2	T/Plastic	129.769	9.78	**119.99**	9.36	**110.55**	9.56	**120.21**	9.53	**120.24**
91-3	T/Plastic	118.05	8.94	**109.11**	8.71	**100.32**	8.9	**109.15**	8.91	**109.14**
91-4	T/Plastic	127.97	Dry		6.13	**121.84**	Dry		Dry	
91-5 S	T/Plastic	129.161	5.62	**123.54**	4.71	**124.45**	5.05	**124.11**	5.03	**124.13**
91-5 D	T/Plastic	129.558	6.02	**123.54**	5.10	**124.46**	5.45	**124.11**	5.44	**124.12**
95-1	O/G	129.022								
95-2	O/G	134.144								
95-3-S	T/Plastic	129.066	5.68	**123.39**	4.80	**124.27**	5.14	**123.93**	5.12	**123.95**
95-3 D		129.053	5.75	**123.30**	4.89	**124.16**	5.22	**123.83**	5.20	**123.85**
95-4 S	T/Plastic	129.846	6.08	**123.77**	5.14	**124.71**	5.48	**124.37**	5.47	**124.38**
95-4 D		129.864	6.15	**123.71**	5.20	**124.66**	5.54	**124.32**	5.54	**124.32**
95-5	T/Plastic	129.391	5.41	**123.98**	4.41	**124.98**	4.77	**124.62**	4.78	**124.61**
95-6	T/Plastic	126.988	4.87	**122.12**	4.13	**122.86**	4.47	**122.52**	4.38	**122.61**
96-1-S	T/Plastic	128.353	4.45	**123.90**	3.49	**124.86**	3.86	**124.49**	5.47	**122.88**
96-1-D	T/Plastic	128.327	4.52	**123.81**	3.58	**124.75**	3.92	**124.41**	3.91	**124.42**
96-2	T/Plastic		Dry		Dry		Dry		Dry	
96-3	T/Plastic	129.98	6.98	**123.00**	6.16	**123.82**	6.44	**123.54**	6.43	**123.55**
03-1	T/Plastic		Dry		1.33		Dry		Dry	
07-2S	T/Plastic	123.68	2.54	**121.14**	2.02	**121.66**	2.29	**121.39**	2.20	**121.48**
07-2D	T/Plastic	123.96	5.86	**118.10**	5.23	**118.73**	4.75	**119.21**	4.51	**119.45**
07-F S	T/Plastic	130.26	7.52	**122.74**	6.57	**123.69**	6.91	**123.35**	6.90	**123.36**
07-F D	T/Plastic	130.986	7.26	**123.73**	6.33	**124.66**	6.67	**124.32**	6.67	**124.32**
07-3S	T/Plastic	129.63	5.94	**123.69**	5.00	**124.63**	5.35	**124.28**	5.33	**124.30**
07-3D	T/Plastic	129.76	6.07	**123.69**	5.12	**124.64**	5.47	**124.29**	5.46	**124.30**
08-1S	T/Plastic	129.845	6.17	**123.68**	5.24	**124.61**	5.37	**124.48**	5.56	**124.29**
08-1D	T/Plastic	129.858	6.14	**123.72**	5.19	**124.67**	5.54	**124.32**	5.53	**124.33**

Millers Road Waste Disposal Site
Record of Water Levels

Monitoring Well	Reference Mark	Reference Elevation	Oct-12		Jun-13		Nov-13		Apr-14	
			Static	Elevation	Static	Elevation	Static	Elevation	Static	Elevation
85-Z	T/Plastic	127.75	Compromised		Compromised		Compromised		Compromised	
85-A	T/Plastic	128.4	5.99	**122.41**	5.28	**123.12**	5.65	**122.75**	5.60	**122.80**
85-B	T/Plastic	129.87	6.6	**123.27**	5.77	**124.10**	6.19	**123.68**	6.08	**123.79**
85-C	T/Plastic	129.44	6.32	**123.12**	5.52	**123.92**	5.94	**123.50**	5.84	**123.60**
85-D	T/Plastic	132.25	Not Located		8.94	**123.31**	9.34	**122.91**	9.22	**123.03**
85-E	T/Plastic	131.5	Not Located		Not Located		Not Located		Not Located	
85-F	T/Plastic	131.13	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
85-Y	T/Plastic	129.75	Compromised		Compromised		Compromised		Compromised	
88-1-S	T/Plastic	130.34	Decomissioned		Decomissioned		Decommissioned		Decommissioned	
88-1-D	T/Plastic	130.33	Decomissioned		Decomissioned		Decommissioned		Decommissioned	
88-2-S	T/Plastic	133.1	10.46	**122.64**	9.69	**123.41**	10.1	**123.00**	10.00	**123.10**
88-2-D	T/Plastic	133.09	10.38	**122.71**	9.61	**123.48**	10.02	**123.07**	9.90	**123.19**
88-3-S	T/Plastic	129.96	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
88-3-D	T/Plastic	129.98	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
89-1-S	T/Plastic	128.4	7.51	**120.89**	6.99	**121.41**	7.3	**121.10**	7.22	**121.18**
89-1-D	T/Plastic	128.32	6.99	**121.33**	6.43	**121.89**	7.25	**121.07**	6.68	**121.64**
89-2-S	T/Plastic	128.54	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
89-2-D	T/Plastic	128.54	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
91-1	T/Plastic	128.234	6.05	**122.18**	5.39	**122.84**	5.61	**122.62**	5.50	**122.73**
91-2	T/Plastic	129.769	9.83	**119.94**	9.42	**120.35**	9.59	**120.18**	9.50	**120.27**
91-3	T/Plastic	118.05	9.02	**109.03**	8.81	**109.24**	8.94	**109.11**	8.91	**109.14**
91-4	T/Plastic	127.97	Dry		6.56	**121.41**	Dry		5.81	**122.16**
91-5 S	T/Plastic	129.161	5.69	**123.47**	4.81	**124.35**	5.23	**123.93**	5.11	**124.05**
91-5 D	T/Plastic	129.558	6.09	**123.47**	5.22	**124.34**	5.65	**123.91**	5.52	**124.04**
95-1	O/G	129.022								
95-2	O/G	134.144								
95-3-S	T/Plastic	129.066	5.74	**123.33**	4.89	**124.18**	5.31	**123.76**	5.16	**123.91**
95-3 D		129.053	5.80	**123.25**	4.98	**124.07**	5.39	**123.66**	5.27	**123.78**
95-4 S	T/Plastic	129.846	6.14	**123.71**	5.25	**124.60**	5.68	**124.17**	5.53	**124.32**
95-4 D		129.864	6.21	**123.65**	5.32	**124.54**	5.75	**124.11**	5.59	**124.27**
95-5	T/Plastic	129.391	5.47	**123.92**	4.52	**124.87**	4.97	**124.42**	4.78	**124.61**
95-6	T/Plastic	126.988	4.90	**122.09**	4.22	**122.77**	4.61	**122.38**	4.40	**122.59**
96-1-S	T/Plastic	128.353	4.45	**123.90**	3.63	**124.72**	5.57	**122.78**	3.81	**124.54**
96-1-D	T/Plastic	128.327	4.59	**123.74**	3.69	**124.64**	4.12	**124.21**	3.96	**124.37**
96-2	T/Plastic		Dry		Dry		Dry		4.28	
96-3	T/Plastic	129.98	7.04	**122.94**	6.23	**123.75**	6.85	**123.13**	6.55	**123.43**
03-1	T/Plastic		Dry		1.29		1.3		1.12	
07-2S	T/Plastic	123.68	2.54	**121.14**	2.07	**121.61**	2.39	**121.29**	2.18	**121.50**
07-2D	T/Plastic	123.96	5.87	**118.09**	5.37	**118.59**	5.7	**118.26**	5.41	**118.55**
07-F S	T/Plastic	130.26	7.57	**122.69**	6.67	**123.59**	7.13	**123.13**	6.97	**123.29**
07-F D	T/Plastic	130.986	7.33	**123.66**	6.44	**124.55**	6.89	**124.10**	6.72	**124.27**
07-3S	T/Plastic	129.63	6.01	**123.62**	5.10	**124.53**	5.50	**124.13**	5.40	**124.23**
07-3D	T/Plastic	129.76	6.13	**123.63**	5.23	**124.53**	5.69	**124.07**	5.52	**124.24**
08-1S	T/Plastic	129.845	6.23	**123.62**	5.34	**124.51**	5.79	**124.06**	5.63	**124.22**
08-1D	T/Plastic	129.858	6.21	**123.65**	5.3	**124.56**	5.75	**124.11**	5.58	**124.28**

Millers Road Waste Disposal Site
Record of Water Levels

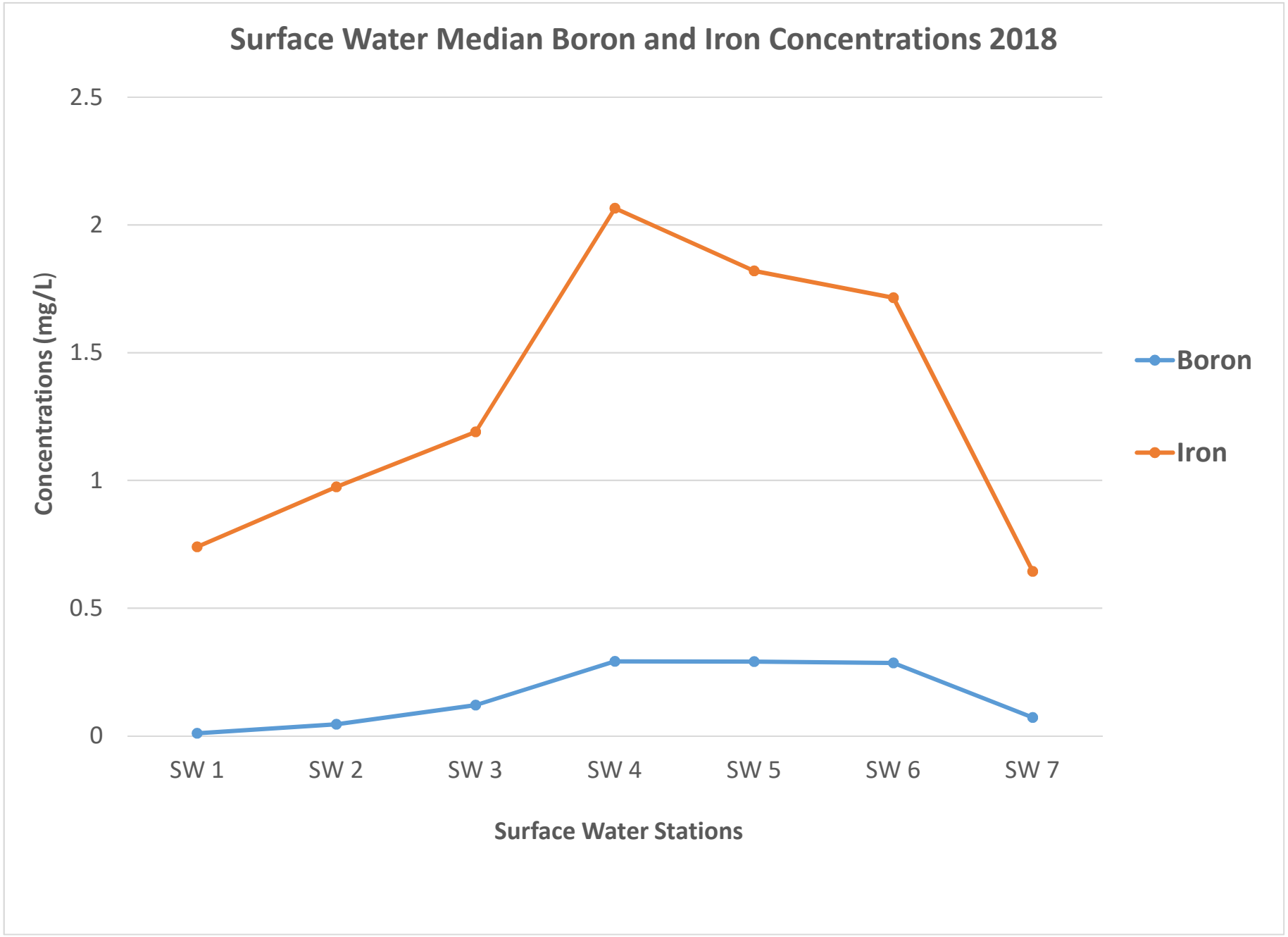
Monitoring Well	Reference Mark	Reference Elevation	Oct-14		Jun-15		Oct-15		May-16	
			Static	Elevation	Static	Elevation	Static	Elevation	Static	Elevation
85-Z	T/Plastic	127.75	Compromised		Compromised		Compromised		Compromised	
85-A	T/Plastic	128.4	5.62	**122.78**	5.42	**122.98**	5.83	**122.57**	5.21	**123.19**
85-B	T/Plastic	129.87	6.15	**123.72**	5.91	**123.96**	6.41	**123.46**	5.40	**124.47**
85-C	T/Plastic	129.44	5.91	**123.53**	5.66	**123.78**	6.14	**123.30**	5.19	**124.25**
85-D	T/Plastic	132.25	9.32	**122.93**	9.08	**123.17**	9.46	**122.79**	8.63	**123.62**
85-E	T/Plastic	131.5	Not Located		Not Located		Not Located		Not Located	
85-F	T/Plastic	131.13	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
85-Y	T/Plastic	129.75	Compromised		Compromised		Compromised		Compromised	
88-1-S	T/Plastic	130.34	Decommissioned		Decommissioned		Decommissioned		Decomissioned	
88-1-D	T/Plastic	130.33	Decommissioned		Decommissioned		Decommissioned		Decomissioned	
88-2-S	T/Plastic	133.1	10.07	**123.03**	9.83	**123.27**	10.27	**122.83**	9.39	**123.71**
88-2-D	T/Plastic	133.09	9.98	**123.11**	9.77	**123.32**	10.23	**122.86**	9.29	**123.80**
88-3-S	T/Plastic	129.96	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
88-3-D	T/Plastic	129.98	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
89-1-S	T/Plastic	128.4	7.27	**121.13**	7.07	**121.33**	7.41	**120.99**	6.73	**121.67**
89-1-D	T/Plastic	128.32	6.72	**121.60**	6.51	**121.81**	6.87	**121.45**	6.22	**122.10**
89-2-S	T/Plastic	128.54	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
89-2-D	T/Plastic	128.54	Decommissioned		Decommissioned		Decommissioned		Decommissioned	
91-1	T/Plastic	128.234	5.64	**122.59**	5.52	**122.71**	5.94	**122.29**	5.20	**123.03**
91-2	T/Plastic	129.769	9.58	**120.19**	9.50	**120.27**	9.76	**120.01**	9.25	**120.52**
91-3	T/Plastic	118.05	8.93	**109.12**	8.95	**109.10**	9.06	**108.99**	8.77	**109.28**
91-4	T/Plastic	127.97	7.18	**120.79**	Dry		Dry		6.14	**121.83**
91-5 S	T/Plastic	129.161	5.91	**123.25**	4.98	**124.18**	5.50	**123.66**	4.43	**124.73**
91-5 D	T/Plastic	129.558	5.60	**123.96**	5.40	**124.16**	5.91	**123.65**	4.85	**124.71**
95-1	O/G	129.022								
95-2	O/G	134.144								
95-3-S	T/Plastic	129.066	5.28	**123.79**	5.06	**124.01**	5.57	**123.50**	4.55	**124.52**
95-3 D		129.053	5.36	**123.69**	5.14	**123.91**	5.63	**123.42**	4.65	**124.40**
95-4 S	T/Plastic	129.846	5.63	**124.22**	5.42	**124.43**	5.97	**123.88**	4.86	**124.99**
95-4 D		129.864	5.69	**124.17**	5.47	**124.39**	6.01	**123.85**	4.92	**124.94**
95-5	T/Plastic	129.391	4.91	**124.48**	4.70	**124.69**	5.25	**124.14**	4.09	**125.30**
95-6	T/Plastic	126.988	4.57	**122.42**	4.35	**122.64**	4.77	**122.22**	3.97	**123.02**
96-1-S	T/Plastic	128.353	4.47	**123.88**	3.79	**124.56**	4.31	**124.04**	3.23	**125.12**
96-1-D	T/Plastic	128.327	4.06	**124.27**	3.85	**124.48**	4.37	**123.96**	3.28	**125.05**
96-2	T/Plastic		Dry		Dry		Dry		4.44	
96-3	T/Plastic	129.98	6.59	**123.39**	6.38	**123.60**	6.85	**123.13**	5.88	**124.10**
03-1	T/Plastic		Dry		Destroyed		Destroyed		Destroyed	
07-2S	T/Plastic	123.68	2.32	**121.36**	2.13	**121.55**	2.43	**121.25**	1.92	**121.76**
07-2D	T/Plastic	123.96	5.72	**118.24**	5.58	**118.38**	5.93	**118.03**	5.26	**118.70**
07-F S	T/Plastic	130.26	7.06	**123.20**	6.86	**123.40**	7.38	**122.88**	6.28	**123.98**
07-F D	T/Plastic	130.986	6.84	**124.15**	6.63	**124.36**	7.14	**123.85**	6.04	**124.95**
07-3S	T/Plastic	129.63	5.50	**124.13**	5.28	**124.35**	5.80	**123.83**	4.72	**124.91**
07-3D	T/Plastic	129.76	5.63	**124.13**	5.41	**124.35**	5.94	**123.82**	4.85	**124.91**
08-1S	T/Plastic	129.845	5.73	**124.12**	5.52	**124.33**	6.03	**123.82**	4.95	**124.90**
08-1D	T/Plastic	129.858	5.70	**124.16**	5.43	**124.43**	6.01	**123.85**	4.91	**124.95**

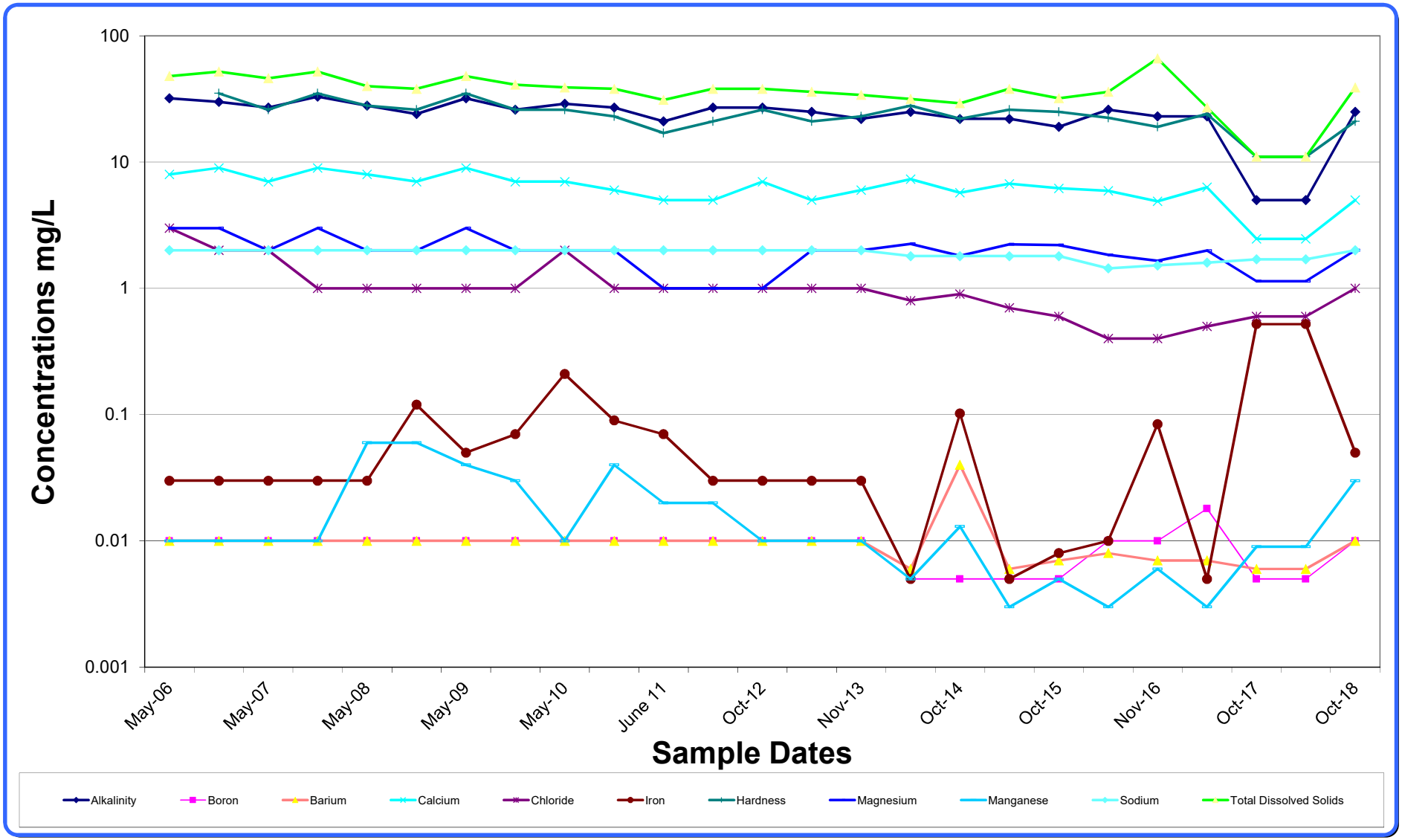
Millers Road Waste Disposal Site
Record of Water Levels

Monitoring Well	Reference Mark	Reference Elevation	Nov-16		Apr-17		Oct-17		May-18		Oct-18	
			Static	Elevation	Static	Elevation	Static	Elevation	Static	Elevation	Static	Elevation
85-Z	T/Plastic	127.75	Compromised		Compromised		Compromised		Compromised		Compromised	
85-A	T/Plastic	128.4	5.81	**122.59**	5.73	**122.67**	5.24	**123.16**	5.37	**123.03**	5.61	**122.79**
85-B	T/Plastic	129.87	6.37	**123.50**	6.20	**123.67**	5.67	**124.20**	5.79	**124.08**	6.12	**123.75**
85-C	T/Plastic	129.44	6.11	**123.33**	5.94	**123.50**	5.44	**124.00**	5.56	**123.88**	5.88	**123.56**
85-D	T/Plastic	132.25	9.45	**122.80**	9.29	**122.96**	8.90	**123.35**	8.96	**123.29**	9.30	**122.95**
85-E	T/Plastic	131.5	Not Located		Not Located		Not Located		Not Located		Not Located	
85-F	T/Plastic	131.13	Decommissioned		Decommissioned		Decommissioned		Decommissioned		Decommissioned	
85-Y	T/Plastic	129.75	Compromised		Compromised		Compromised		Compromised		Compromised	
88-1-S	T/Plastic	130.34	Decomissioned		Decomissioned		Decomissioned		Decomissioned		Decomissioned	
88-1-D	T/Plastic	130.33	Decomissioned		Decomissioned		Decomissioned		Decomissioned		Decomissioned	
88-2-S	T/Plastic	133.1	10.24	**122.86**	10.05	**123.05**	9.57	**123.53**	9.72	**123.38**	10.04	**123.06**
88-2-D	T/Plastic	133.09	10.16	**122.93**	9.98	**123.11**	9.64	**123.45**	9.64	**123.45**	9.97	**123.12**
88-3-S	T/Plastic	129.96	Decommissioned		Decommissioned		Decommissioned		Decommissioned		Decommissioned	
88-3-D	T/Plastic	129.98	Decommissioned		Decommissioned		Decommissioned		Decommissioned		Decommissioned	
89-1-S	T/Plastic	128.4	7.39	**121.01**	7.29	**121.11**	7.00	**121.40**	7.06	**121.34**	7.26	**121.14**
89-1-D	T/Plastic	128.32	6.89	**121.43**	6.72	**121.60**	6.43	**121.89**	6.51	**121.81**	6.71	**121.61**
89-2-S	T/Plastic	128.54	Decommissioned		Decommissioned		Decommissioned		Decommissioned		Decommissioned	
89-2-D	T/Plastic	128.54	Decommissioned		Decommissioned		Decommissioned		Decommissioned		Decommissioned	
91-1	T/Plastic	128.234	5.95	**122.28**	5.54	**122.69**	5.46	**122.77**	5.35	**122.88**	5.79	**122.44**
91-2	T/Plastic	129.769	9.79	**119.98**	9.51	**120.26**	9.47	**120.30**	9.39	**120.38**	9.67	**120.10**
91-3	T/Plastic	118.05	9.06	**108.99**	8.94	**109.11**	8.87	**109.18**	8.87	**109.18**	8.99	**109.06**
91-4	T/Plastic	127.97	Dry		5.71	**122.26**	Dry		5.74	**122.23**	Dry	
91-5 S	T/Plastic	129.161	5.44	**123.72**	5.23	**123.93**	4.71	**124.45**	4.80	**124.36**	5.18	**123.98**
91-5 D	T/Plastic	129.558	5.84	**123.72**	5.64	**123.92**	5.13	**124.43**	5.22	**124.34**	5.59	**123.97**
95-1	O/G	129.022										
95-2	O/G	134.144										
95-3-S	T/Plastic	129.066	5.47	**123.60**	5.33	**123.74**	4.85	**124.22**	4.91	**124.16**	5.28	**123.79**
95-3 D		129.053	5.60	**123.45**	5.40	**123.65**	4.93	**124.12**	4.99	**124.06**	5.35	**123.70**
95-4 S	T/Plastic	129.846	5.87	**123.98**	5.69	**124.16**	5.14	**124.71**	5.20	**124.65**	5.61	**124.24**
95-4 D		129.864	5.92	**123.94**	5.74	**124.12**	5.19	**124.67**	5.26	**124.60**	5.69	**124.17**
95-5	T/Plastic	129.391	5.57	**123.82**	4.91	**124.48**	4.40	**124.99**	4.43	**124.96**	4.90	**124.49**
95-6	T/Plastic	126.988	4.32	**122.67**	4.36	**122.63**	4.24	**122.75**	4.14	**122.85**	4.58	**122.41**
96-1-S	T/Plastic	128.353	4.24	**124.11**	4.01	**124.34**	3.43	**124.92**	3.46	**124.89**	3.96	**124.39**
96-1-D	T/Plastic	128.327	4.31	**124.02**	4.11	**124.22**	3.57	**124.76**	3.64	**124.69**	4.04	**124.29**
96-2	T/Plastic		Dry		3.58	**-3.58**	Dry		3.89	**-3.89**	Dry	
96-3	T/Plastic	129.98	6.80	**123.18**	6.64	**123.34**	6.15	**123.83**	6.25	**116.69**	6.58	**123.40**
03-1	T/Plastic		Destroyed		Destroyed		Destroyed		Destroyed		Destroyed	
07-2S	T/Plastic	123.68	2.44	**121.24**	2.16	**121.52**	2.14	**121.54**	2.05	**121.63**	2.34	**121.34**
07-2D	T/Plastic	123.96	5.67	**118.29**	5.42	**118.54**	5.40	**118.56**	5.23	**118.73**	5.78	**118.18**
07-F S	T/Plastic	130.26	7.31	**122.95**	7.08	**123.18**	6.57	**123.69**	6.65	**123.61**	7.05	**123.21**
07-F D	T/Plastic	130.986	7.07	**123.92**	6.84	**124.15**	6.33	**124.66**	6.41	**124.58**	6.81	**124.18**
07-3S	T/Plastic	129.63	5.75	**123.88**	5.52	**124.11**	5.01	**124.62**	5.07	**124.56**	5.48	**124.15**
07-3D	T/Plastic	129.76	5.84	**123.92**	5.65	**124.11**	5.14	**124.62**	5.20	**124.56**	5.61	**124.15**
08-1S	T/Plastic	129.845	5.96	**123.89**	5.75	**124.10**	5.23	**124.62**	5.31	**124.54**	5.70	**124.15**
08-1D	T/Plastic	129.858	5.94	**123.92**	5.69	**124.17**	5.19	**124.67**	5.26	**124.60**	5.67	**124.19**

Appendix I

Chemical Trends

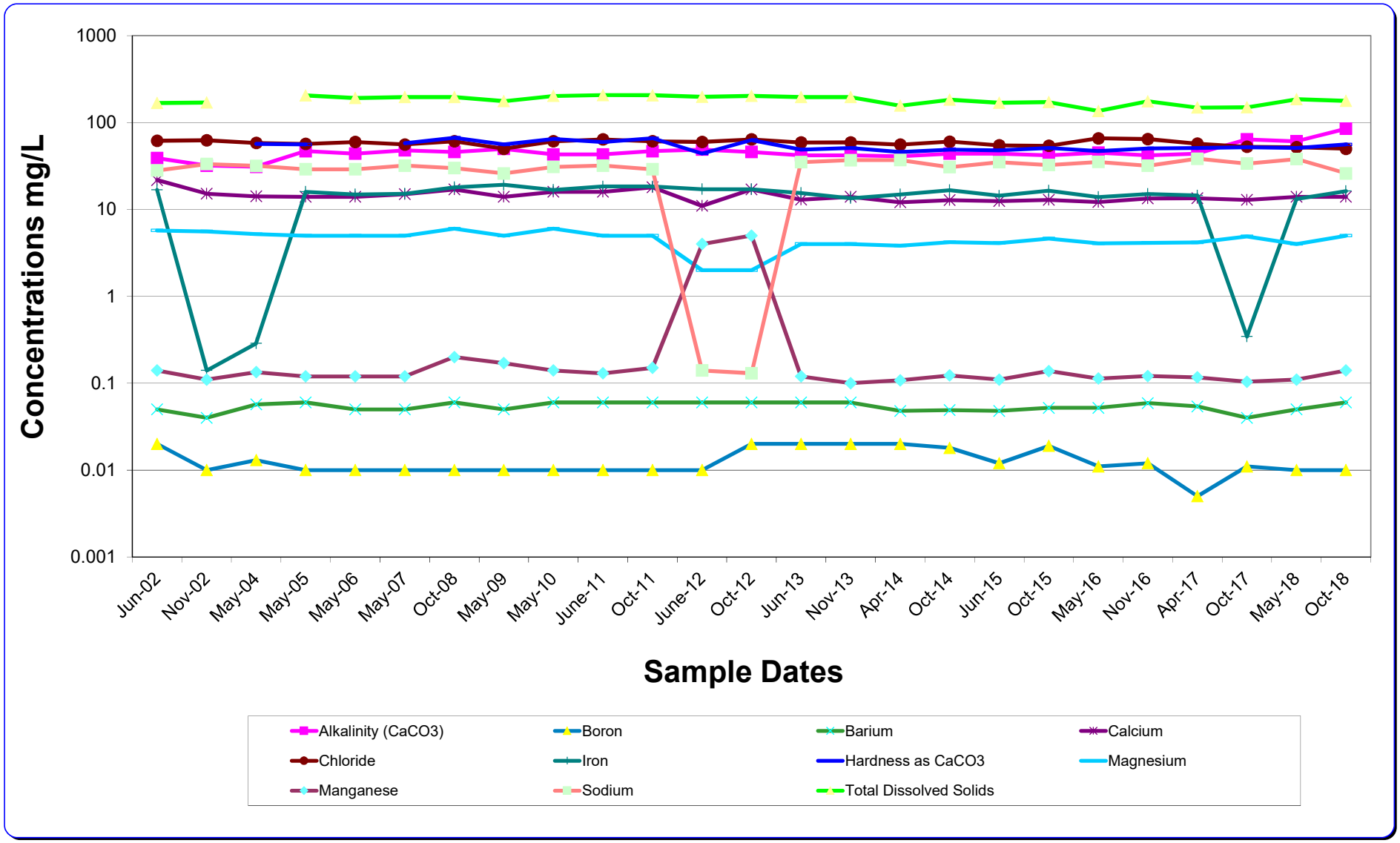

Surface Water Median Boron and Iron Concentrations 2018
2.5
2
1.5
1
0.5
0
Concentrations (mg/L)
SW 1
SW 2
SW 3
SW 4
SW 5
SW 6
SW 7
Surface Water Stations
Boron
Iron



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Millers Road WDS
Monitoring Well 96-1 Shallow
Historical Trend (2006 - 2018)

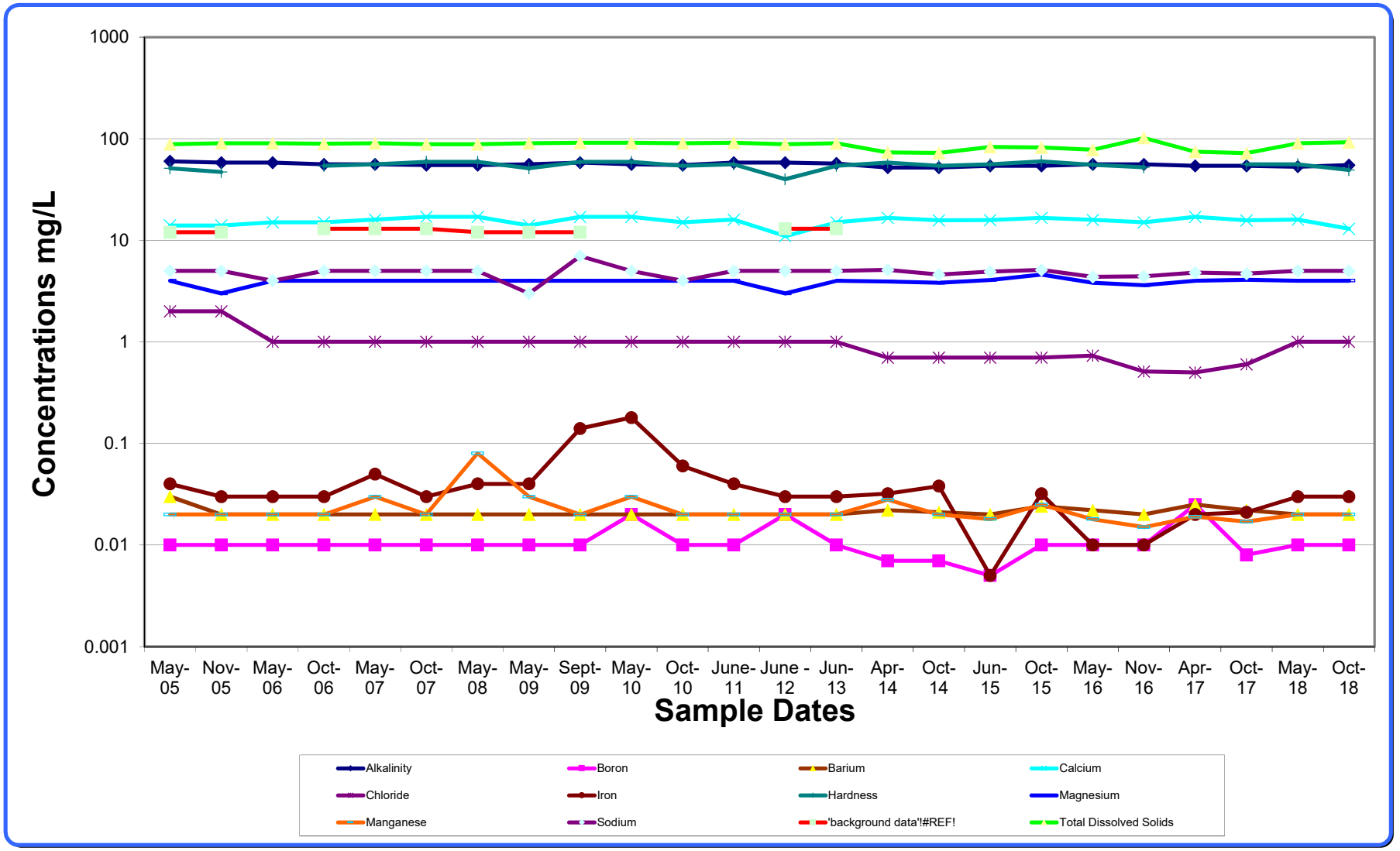
PROJECT NUMBER	**17-6015C**
DATE	**May-19**



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Millers Road WDS
Monitoring Well 91-5 Deep
Historical Trend (2002 - 2018)

PROJECT NUMBER	17-6015C
DATE	May-19

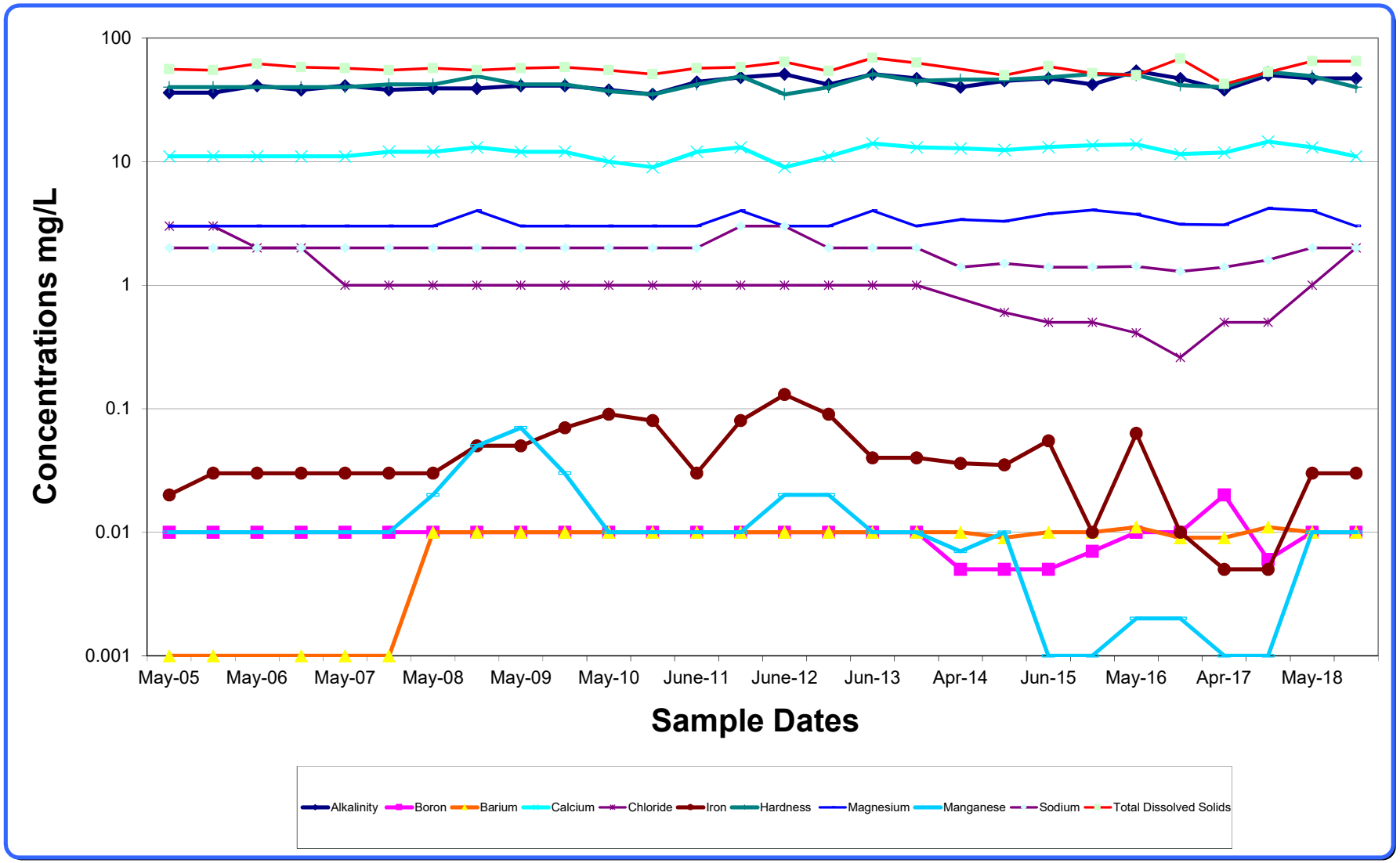


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Millers Road WDS
Monitoring Well 91-2
Historical Trend (2005-2018)

PROJECT NUMBER	17-6015C
DATE	May-19
PLOT DATE	May 21 2019

DRAWN BY	AS
CHECKED BY	AB

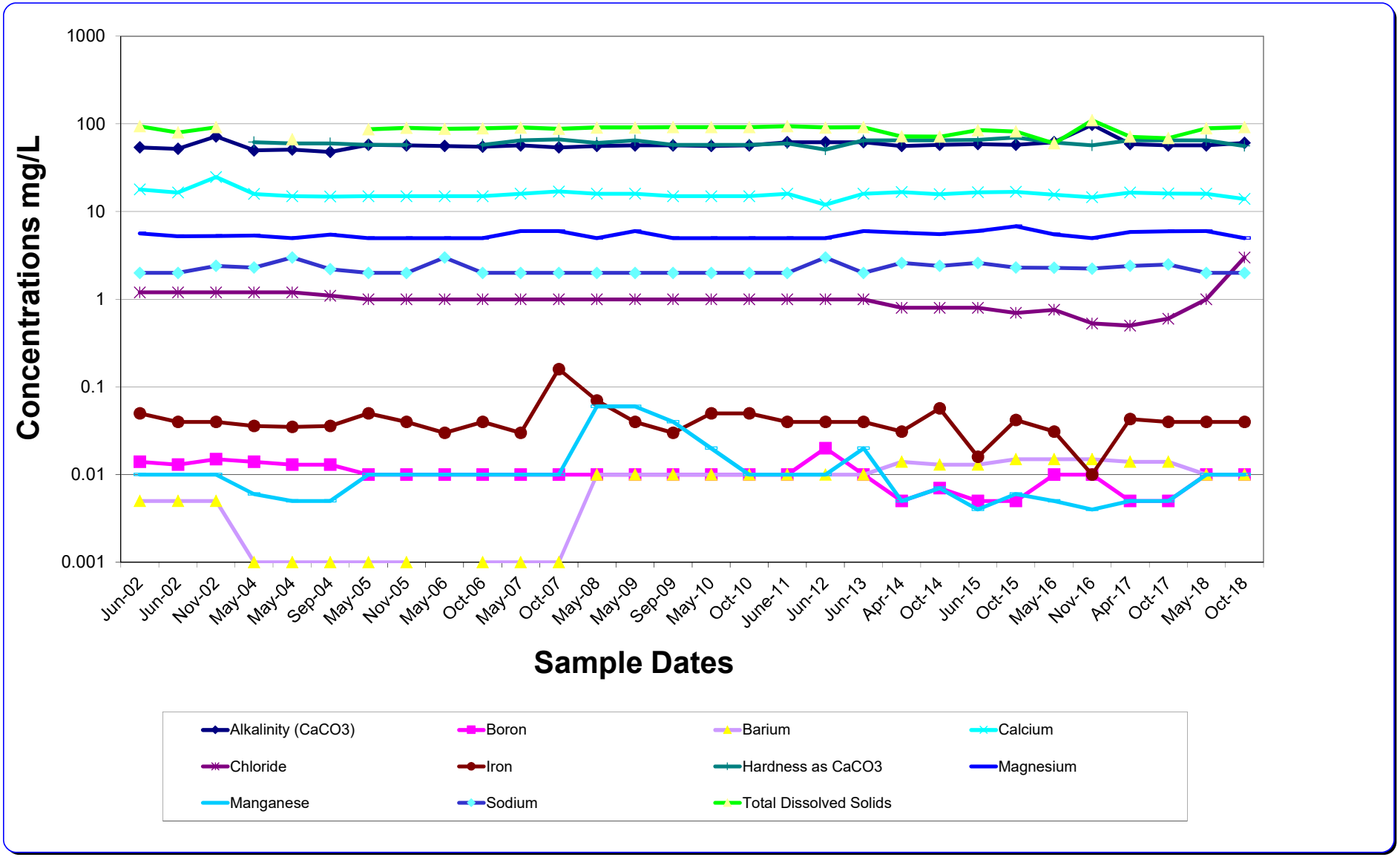


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Millers Road WDS
Monitoring Well 95-5
Historical Trend (2005-2018)

PROJECT NUMBER	17-6015A
DATE	May-19
PLOT DATE	21-May-19

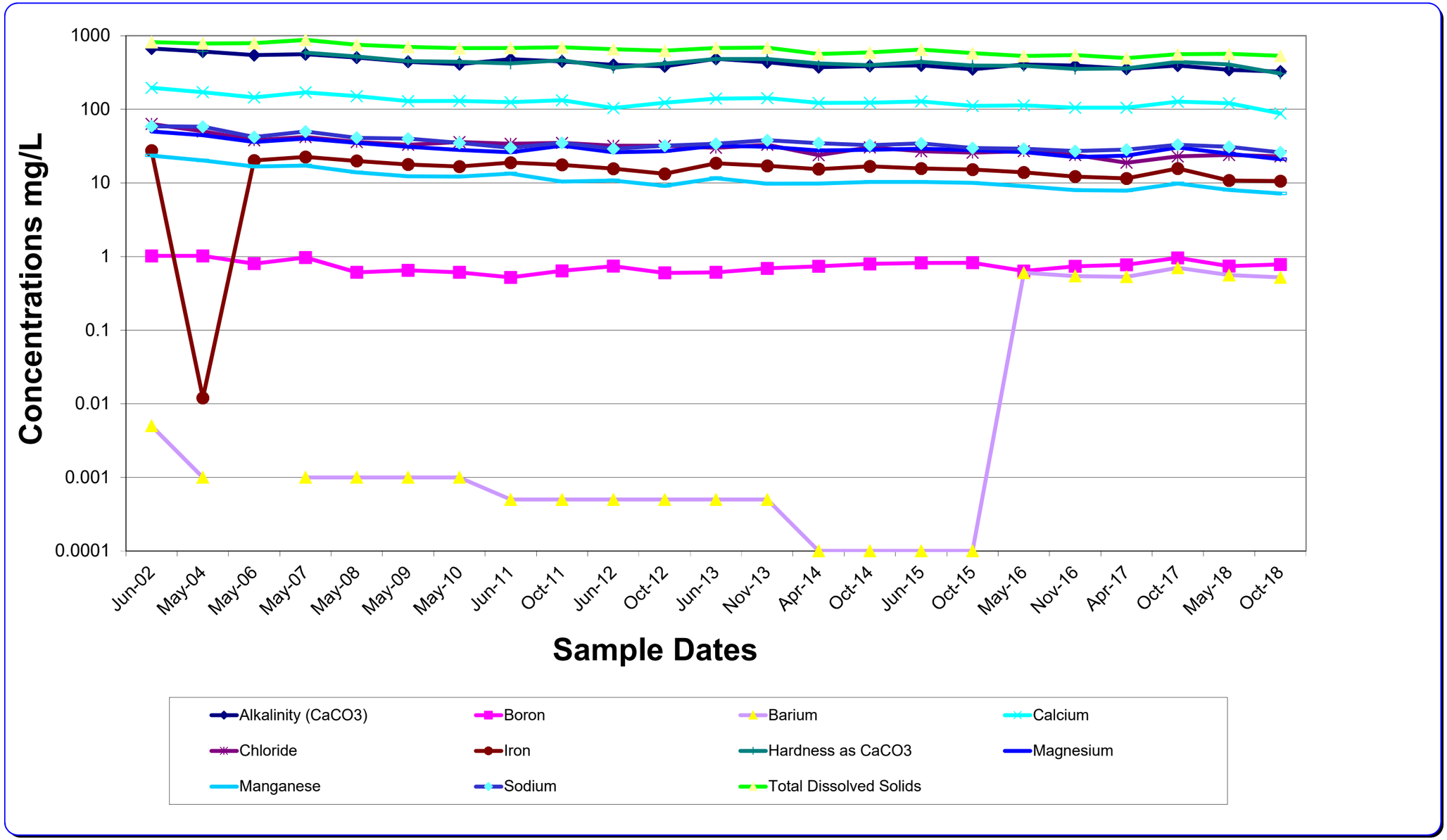
DRAWN BY	AS
CHECKED BY	AB



Jp2g Consultants Inc.
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Millers Road WDS
Monitoring Well 96-3
Historical Trend (2002 - 2018)

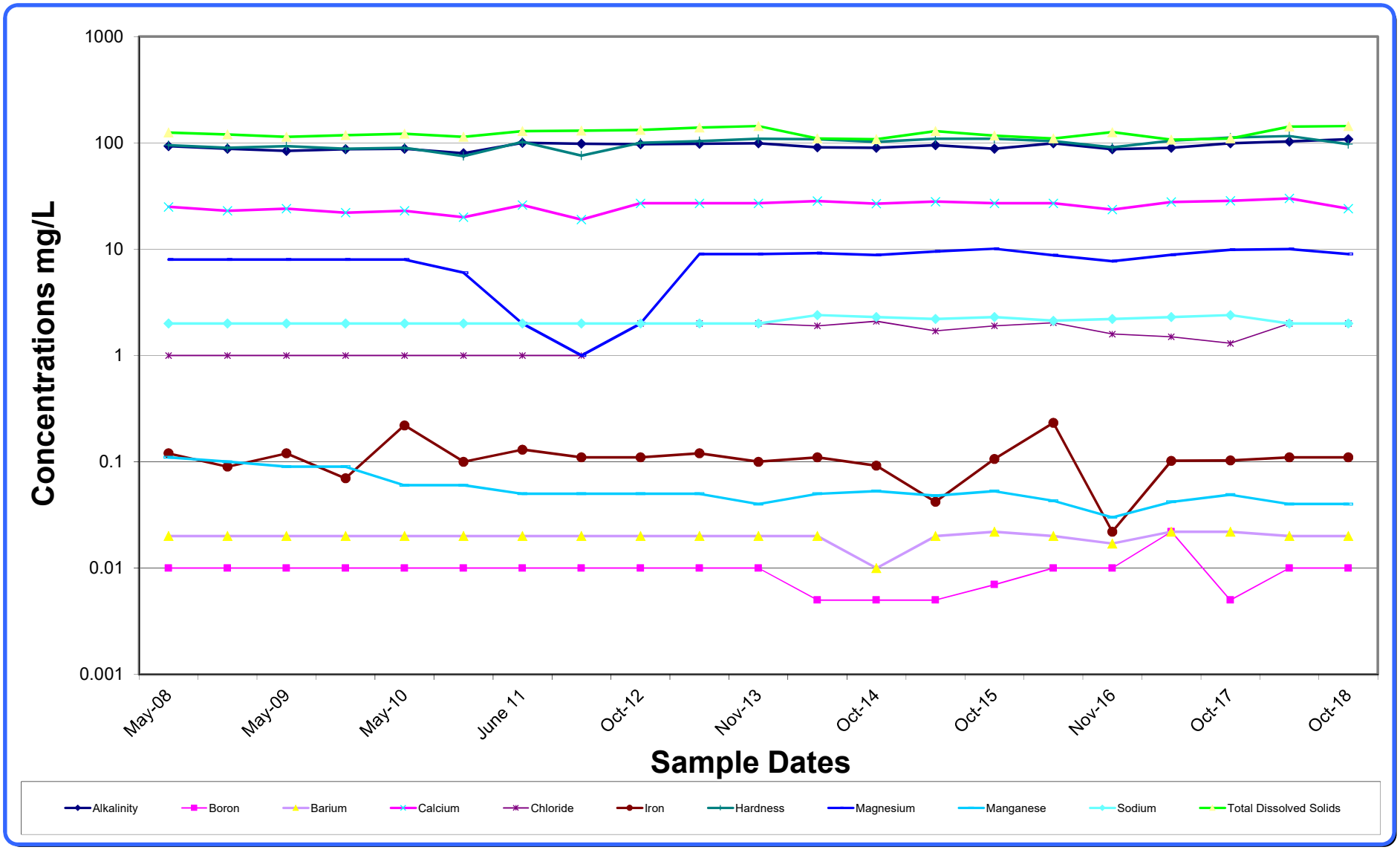
PROJECT NUMBER	**17-6015C**
DATE	**May-19**



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Millers Road WDS
Monitoring Well 95-6
Historical Trend (2002 - 2018)

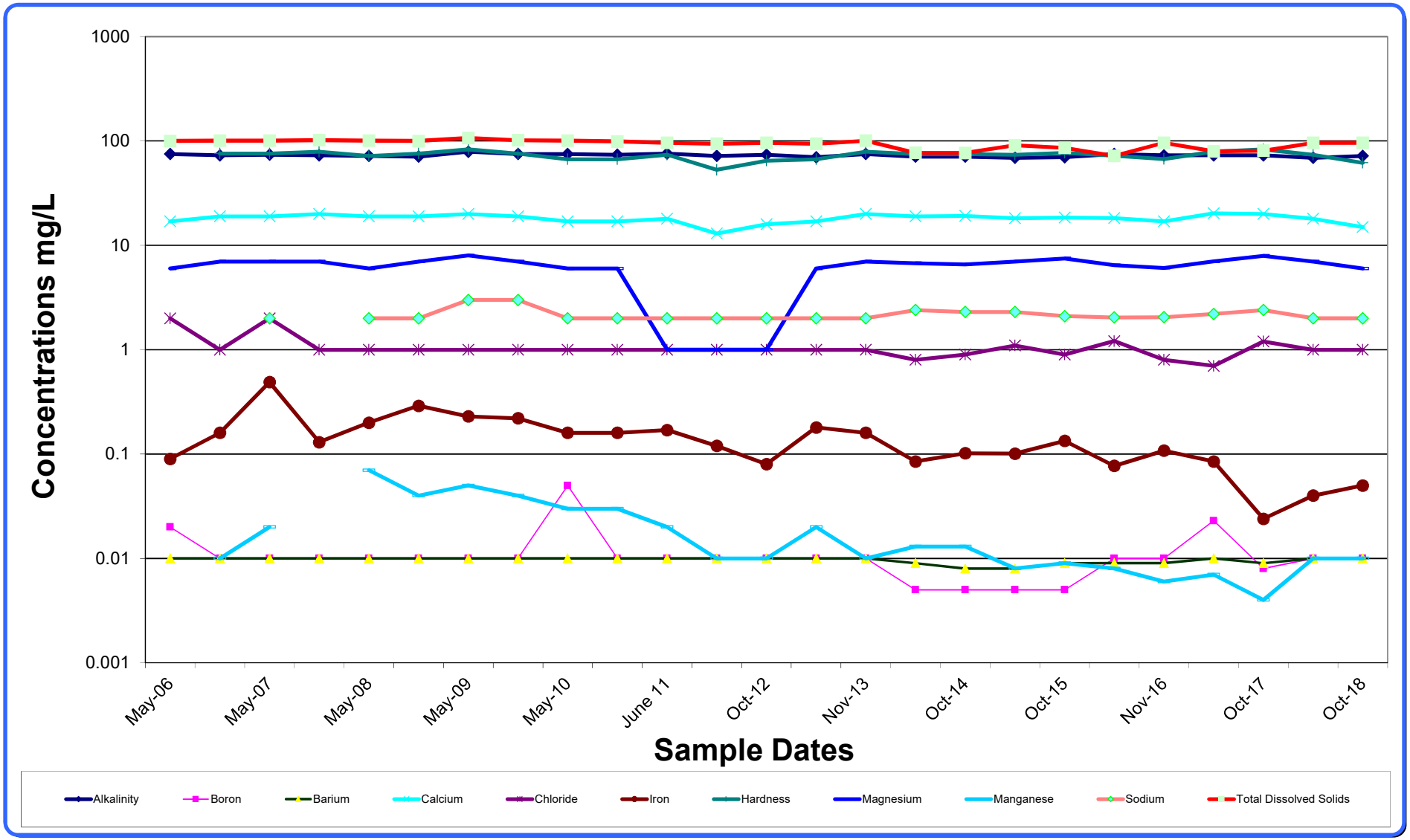
PROJECT NUMBER	17-6015C
DATE	May-19



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Millers Road WDS
Monitoring Well 96-1 Deep
Historical Trend (2008 - 2018)

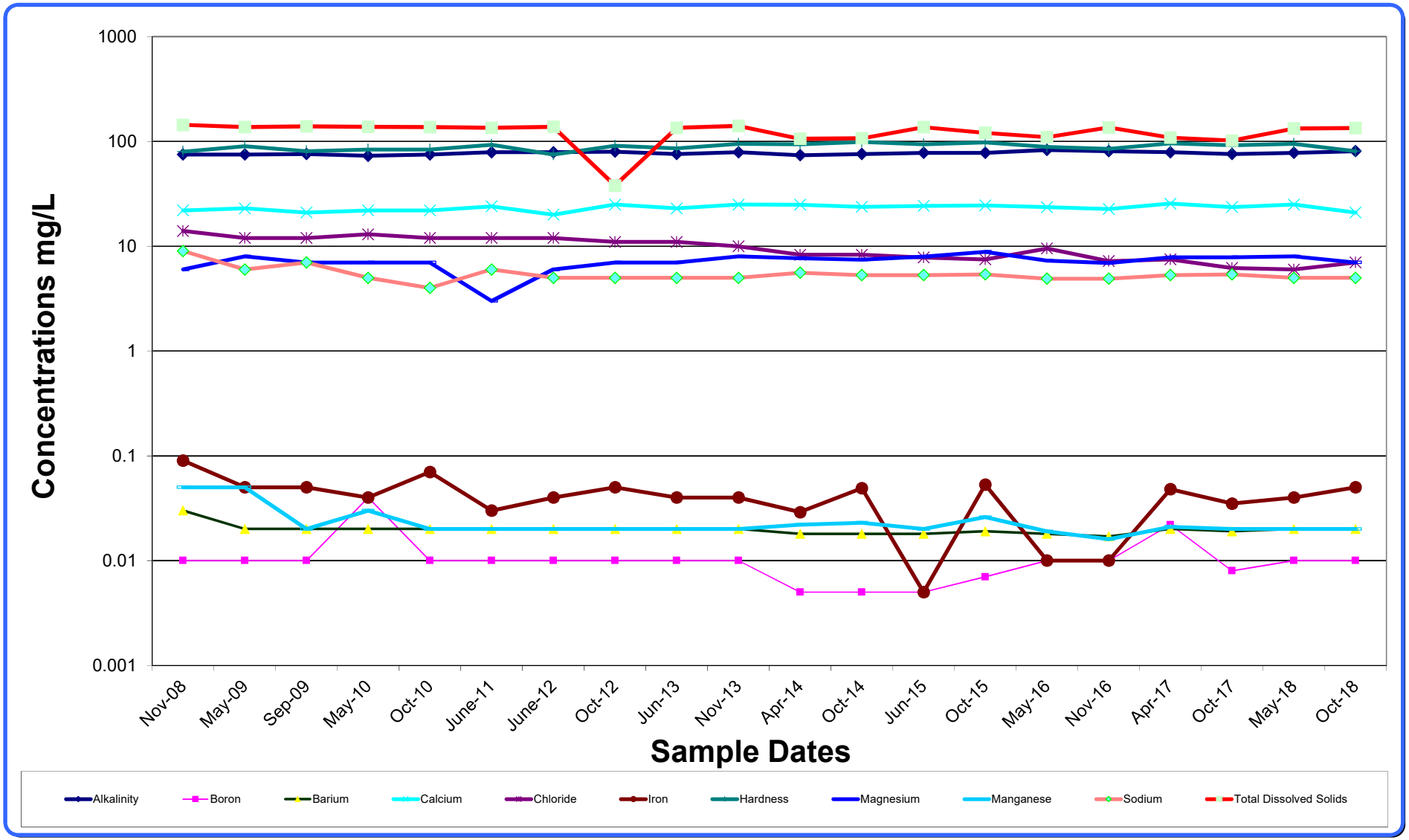
PROJECT NUMBER	**17-6015C**
DATE	**May-19**



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Millers Road WDS
Monitoring Well 95-3 Shallow
Historical Trend (2006 - 2018)

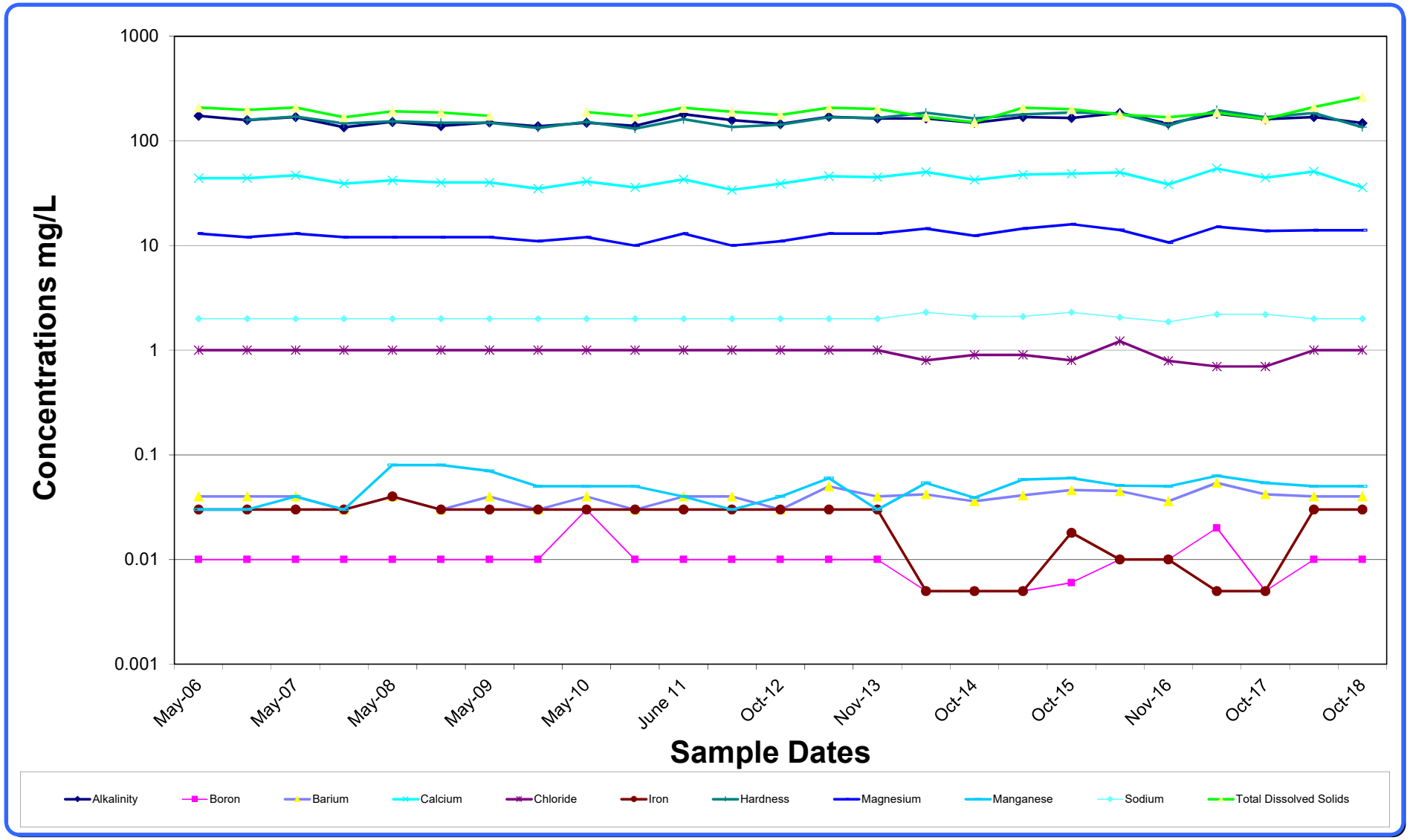
PROJECT NUMBER	**17-6015C**
DATE	**May-19**



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Millers Road WDS
Monitoring Well 95-3 Deep
Historical Trend (2008 - 2018)

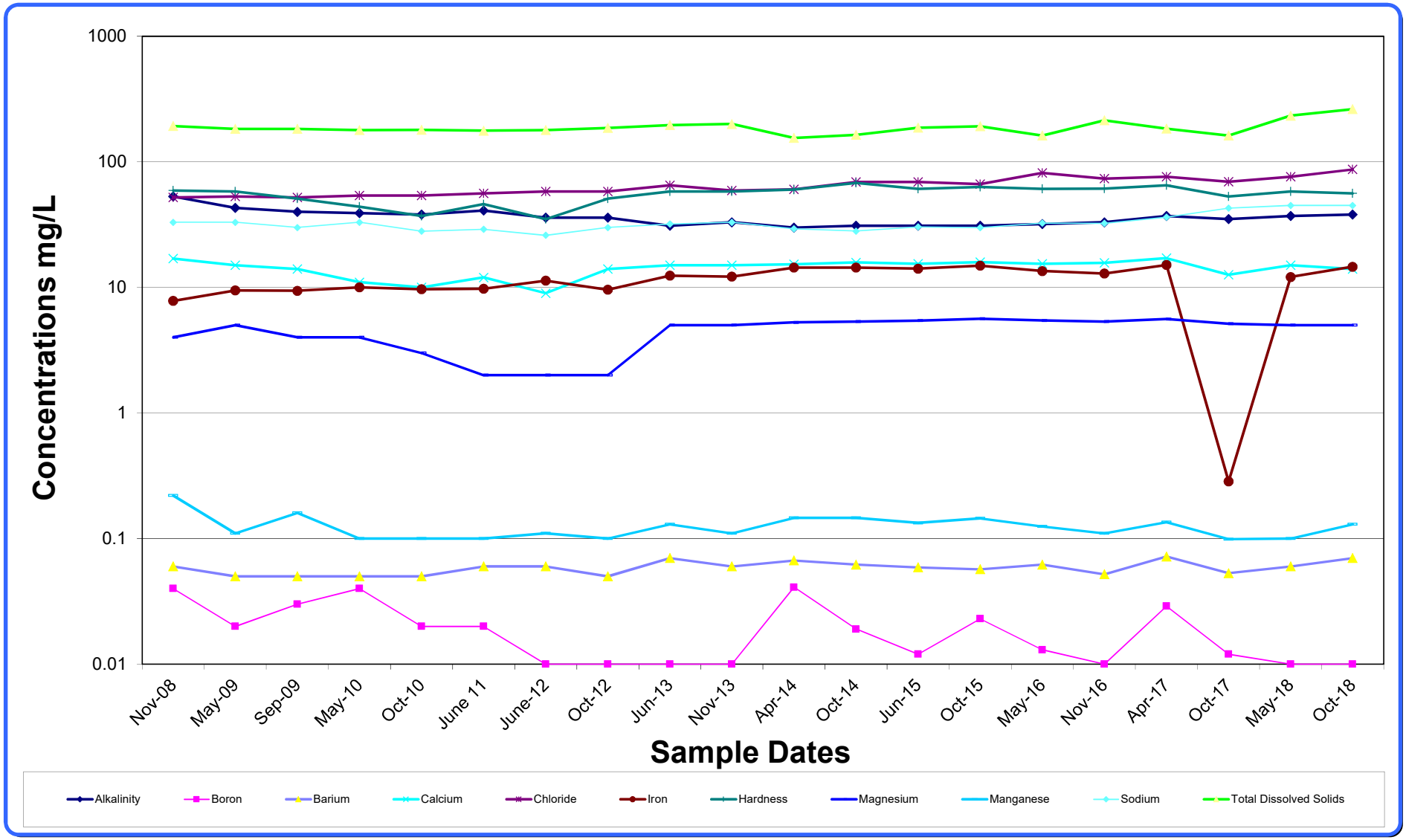
PROJECT NUMBER	17-6015C
DATE	May-19



Jp2g Consultants Inc.
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Millers Road WDS
Monitoring Well 95-4 Shallow
Historical Trend (2006 - 2018)

PROJECT NUMBER	**17-6015C**
DATE	**May-19**



Jp2g Consultants Inc.
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Millers Road WDS
Monitoring Well 95-4 Deep
Historical Trend (2008 - 2018)

PROJECT NUMBER	17-6015C
DATE	20189-05-01