



## Township of Douro-Dummer Revised Agenda for a Regular Meeting of Council

Tuesday, May 5, 2020, 5:00 p.m.

Douro-Dummer YouTube Channel

[https://www.youtube.com/channel/UCPpzm-uRBZRDjB89o2X6R\\_A](https://www.youtube.com/channel/UCPpzm-uRBZRDjB89o2X6R_A)

**Please note**, that Council may, by general consensus, change the order of the agenda, without prior notification, in order to expedite the efficiency of conducting business

### Meetings During COVID-19

Council met on April 2, 2020 and amended the Township Procedure By-Law to permit meetings to be held electronically, under the authority of the Municipal Emergency Act, 2020, in order to function during the pandemic.

During the COVID-19 pandemic, regular meetings of Council are being held electronically. Meetings will be recorded and live-streamed on the Township YouTube channel.

Please contact the Clerk if you require an alternative method to virtually attend the meeting. [crystal@dourodummer.on.ca](mailto:crystal@dourodummer.on.ca) or 705-652-8392 x205

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	Pages
1. Moment of Silent Reflection	
2. Disclosure of Pecuniary Interest:	
3. Adoption of Agenda: May 5, 2020	
4. Adoption of Minutes:	
*4.1 Special - March 6, 2020	1
4.2 Regular - April 21, 2020	3
5. Business arising out of previous minutes:	
6. Delegations, Petitions or Presentations:	

6.1	Petition - Request to ban fishing at Crowes and McCracken Landing Wharves	9
6.2	6:00 p.m. Public Meeting - 2020 Budget	11
	Darlene Heffernan, Treasurer - Presentation of the 2020 Budget, including the proposed tax rate.	
6.2.1	2020 Capital Items – Managers Comments, Treasurer-2020-09	219
6.2.2	Written Comments Received	227
	Comments submitted regarding the proposed 2020 Budget	
6.2.3	Memo regarding Comments from Public on 2020 Budget, C.A.O.-2020-17	242
7.	Other Business and Staff Reports:	
7.1	Transfer Station and Landfill Water Monitoring - 2019, C.A.O.-2020-14	244
7.2	Report to Council – Surface Treatment 2020, Public Works-2020-02	933
7.3	2019 Development Charges Financial Statement, Treasurer-2020-08	1045
7.4	2019 Council Remuneration Statement, Treasurer-2020-10	1048
7.5	Policy – Years of Service Recognition, Clerk/Planning-2020-20	1049
8.	Committee Minutes and Other Reports:	
8.1	Deputy Mayor Moher – Update on County Council Matters	
8.2	Departmental Reports – C.A.O., Clerk's/Planning, Building Services, Finance, Fire, Parks and Recreation and Public Works Departments	
8.2.1	Administration Monthly Report - March and April 2020, C.A.O.-2020-15	1056
8.2.2	Clerk-Planning - March-April 2020, Clerk/Planning-2020-13	1057
8.2.3	Finance Department Report January-April 2020, Treasurer-2020-11	1059
8.2.4	March and April Fire Report, Fire 2020-	1060



8.2.5	Parks and Recreation Monthly Report, Recreation Facilities-2020-04	1062
8.2.6	Public Works Update, Public Works-2020-03	1063
9.	By-laws:	
9.1	By-law 2020-26 - 2020 Tax Rate By-law	1065
	To provide for the adoption of tax rates and to further provide for penalty and interest in default of payment for 2020	
10.	Correspondence – Action Items:	
10.1	Township of Mapleton	1068
	A Resolution to Request the Province of Ontario Review the Farm Property Class Tax Rate Programme in Light of Economic Competitiveness Concerns between Rural and Urban Municipalities	
10.2	Township of Armour	1079
	A Resolution regarding the need to make substantial investments in high-speed internet connectivity in the rural areas of Ontario	
11.	Correspondence/Information Items: None	
12.	Accounts: None	
13.	Notices of Motion:	
14.	New Business:	
15.	Closed Session: None	
16.	Rise from Closed Session with or without a Report: N/A	
17.	Confirming By-law - By-law 2020-27	1082
	To confirm the proceedings of the special and regular electronic meetings of Council held on the 5th day of May, 2020	
18.	Adjournment	

## **Minutes of the Special Meeting of Council of the Township of Douro-Dummer**

**March 6, 2020, 9:00 AM  
Large Boardroom - Lower Level  
894 South Street  
Warsaw, ON K0L 3A0**

**Present:** Mayor - J. Murray Jones  
Deputy Mayor - Karl Moher  
Councillor - Shelagh Landsmann  
Councillor - Heather Watson  
Councillor - Thomas Watt

**Staff:** Temporary C.A.O./Deputy Clerk – Martina Chait-Hartwig  
Fire Chief – Chuck Pedersen

**Absent:** Clerk/Planning Coordinator - Crystal McMillan

**Guests:** HR Consultant – Nicole Zenner

1. Reason(s) for Special Meeting:

The Mayor called the meeting to order at 9:00 a.m. and stated the reasons for the Special Meeting is regarding personal matters about an identifiable individual, including municipal or local board employees (Personnel).

2. Disclosure of Pecuniary Interest:

The Mayor reminded members of Council of their obligation to declare any pecuniary interest they might have. None were declared.

3. Adoption of Agenda: Special Meeting - March 6, 2020

4. Closed Session: Personal matters about an identifiable individual, including municipal or local board employees (Personnel)

**Resolution Number 133-2020**

Moved by Councillor Landsmann

Seconded by Councillor Watt

That Council go into closed session regarding personal matters about identifiable individuals and Labour relations or employee negotiations. (9:01 a.m.) Carried

5. Rise from Closed Session with or without a Report**Resolution Number 134-2020**

Moved by Deputy Mayor Moher

Seconded by Councillor Watt

That Council come out of closed session with a report, that the hiring process for a Temporary Manager of Public works be delayed to allow time to offer a fourth candidate a meeting with the hiring committee. (11:54 a.m.)

A recorded vote was requested by Deputy Mayor Moher. The roll was called by the Deputy Clerk and the vote was as follows:

<b>Recorded</b>	<b>For</b>	<b>Against</b>
Dummer Ward Councillor	<b>X</b>	<b>0</b>
Douro Ward Councillor	<b>0</b>	<b>X</b>
Councillor at Large	<b>X</b>	<b>0</b>
Deputy Mayor	<b>X</b>	<b>0</b>
Mayor	<b>X</b>	<b>0</b>
<b>Results</b>	<b>4</b>	<b>1</b>

Carried

6. Adjournment**Resolution Number 135-2020**

Moved by Councillor Watson

Seconded by Councillor Watt

That this meeting adjourn (11:57 a.m.).

Carried

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 Mayor, J. Murray Jones

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 Deputy Clerk, Martina Chait-Hartwig

## Minutes of the Regular Meeting of Council of the Township of Douro-Dummer

**April 21, 2020, 5:00 PM**

**Douro-Dummer Township YouTube Channel**

**[https://www.youtube.com/channel/UCPpzm-uRBZRDjB89o2X6R\\_A](https://www.youtube.com/channel/UCPpzm-uRBZRDjB89o2X6R_A)**

**Present:** Mayor - J. Murray Jones  
 Deputy Mayor - Karl Moher  
 Councillor, Douro Ward - Heather Watson  
 Councillor, Dummer Ward - Shelagh Landsmann  
 Councillor at Large - Thomas Watt

**Staff Present** Temporary C.A.O. - Martina Chait-Hartwig  
 Clerk/Planning Coordinator - Crystal McMillan  
 Treasurer – Darlene Heffernan

1. Moment of Silent Reflection

The Mayor called the meeting to order at 5:02 p.m. and called for a moment of silence for the recent tragedy in Nova Scotia.

2. Disclosure of Pecuniary Interest:

The Mayor reminded members of Council of their obligation to declare any pecuniary interest they might have. None were declared.

3. Adoption of Agenda: April 21, 2020

**Resolution Number 149-2020**

Moved by: Councillor Watson

Seconded by: Councillor Landsmann

That the agenda for the Regular Council Meeting, dated April 21, 2020, be adopted, as circulated.

Carried

4. Adoption of Minutes:

4.1 Special – March 2, 2020

4.2 Special – March 3, 2020

- 4.3 Regular – March 3, 2020
- 4.4 Emergency – March 16, 2020
- 4.5 Special – April 2, 2020

**Resolution Number 150-2020**

Moved by: Councillor Watt

Seconded by: Councillor Landsmann

That the minutes from the Special Meetings held on March 2, 2020 and March 3, 2020, the minutes from the Regular Council Meeting held on March 3, 2020, the minutes from the Emergency Meeting held on March 26, 2020 and the minutes from the Special Meeting held on April 2, 2020, all be received and adopted, as circulated. Carried

5. Business arising out of previous minutes:

5.1 Municipal Services Update – Covid-19 Pandemic, C.A.O.-2020-13

**Resolution Number 151-2020**

Moved by: Deputy Mayor Moher

Seconded by: Councillor Watt

That the C.A.O.-2020-13 report, dated April 14, 2020, regarding Municipal Services Update – Covid-19 Pandemic be received for information. Carried

6. Delegations, Petitions or Presentations: None

7. Other Business and Staff Reports:

7.1 Lakefield Triathlon and Peterborough Pirates Triathlon Clubs – Request for Road Closure, C.A.O.-2020-07

**Resolution Number 152-2020**

Moved by: Deputy Mayor Moher

Seconded by: Councillor Landsmann

That the C.A.O.2020-07 report, dated March 9, 2020, regarding a request from the Lakefield Triathlon and Peterborough Pirates Triathlon Club be received and that pending the status of the current emergency situation, Council grant permission for this event provided all public notification is done as per the Clubs commitments. Carried

7.2 Financial Statements - Ending March 31, 2020, Treasurer-2020-05

**Resolution Number 153-2020**

Moved by: Councillor Watson

Seconded by: Councillor Watt

That the Treasurer 2020-05 report, dated April 10, 2020, regarding the Financial Statements for the period ending March 31, 2020 be received for information. Carried

8. Committee Minutes and Other Reports:

8.1 Deputy Mayor Moher – Update on County Council Matters

8.2 Historical Committee Minutes from 2019

**Resolution Number 154-2020**

Moved by: Councillor Watt

Seconded by: Councillor Landsmann

That the verbal report from Deputy Mayor Moher regarding an update on County Council matters be received and that the Historical Committee Minutes from March 21, 2019, April 25, 2019, May 16, 2019, June 20, 2019, September 19, 2019, October 17, 2019, November 21, 2019 and December 13, 2019, all be received and approved. Carried

9. By-laws: None

10. Correspondence – Action Items:

10.1 Baker Tilly KDN LLP - 2019 Douro-Dummer Audit Planning Report

**Resolution Number 155-2020**

Moved by: Deputy Mayor Moher

Seconded by: Councillor Watson

That the Audit Planning letter from Baker Tilly KND L.L.P., for the year ending December 31, 2019, be received and that the Mayor and Deputy Mayor be directed to sign the letter on behalf of Council. Carried

## 10.2 Town of Midland

### **Resolution Number 156-2020**

Moved by: Deputy Mayor Moher

Seconded by: Councillor Landsmann

That the Resolution from the Town of Midland regarding requesting that the Federal Government direct payment of Federal Funds to municipalities to waive property taxes for the year 2020 to alleviate the suffering from COVID-19 Pandemic be received. Carried

## 11. Correspondence/Information Items:

11.1 Delegation of Powers/Duties Report, Clerk/Planning-2020-19

11.2 Ministry of Municipal Affairs and Housing

11.3 Delegation of Powers-Duties - Treasurer-2020-03

11.4 Solicitor General and Ministry of Municipal Affairs and Housing

11.5 Ministry of Municipal Affairs and Housing

11.6 2020 Budget Electronic Public Meeting - Tuesday, May 5, 2020 at 6:00 p.m.

### **Resolution Number 157-2020**

Moved by: Councillor Watt

Seconded by: Councillor Landsmann

That Correspondence/Information Items 11.1 through 11.6 all be received.

Carried

### **Resolution Number 158-2020**

Moved by: Councillor Watson

Seconded by: Councillor Landsmann

That the Public Meeting for the 2020 Budget set for May 5, 2020 at 6:00 p.m. continue as outlined in the Notice with suggestions from staff on possible postponement of some items. Carried

12. Accounts: to April 15, 2020

**Resolution Number 159-2020**

Moved by: Councillor Watt

Seconded by: Councillor Watson

That Council receives and approves payment of all of the accounts, dated to April 15, 2020, and included in the agenda package. Carried

13. Notices of Motion:

- 13.1 Deputy Mayor Moher - Policy for construction of low-level decks in Douro-Dummer

**Resolution Number 160-2020**

Moved by: Deputy Mayor Moher

Seconded by: Councillor Watt

That the Notice of Motion regarding a policy for construction of low-level Decks in Douro-Dummer made by Deputy Mayor Moher be deferred to the first meeting in October 2020. Carried

14. New Business: None

15. Closed Session: None

16. Rise from Closed Session with or without a Report: N/A

17. Confirming By-law - By-law 2020-25

Moved by: Councillor Landsmann

Seconded by: Councillor Watson

That By-law Number 2020-25, being a By-law to confirm the proceedings of the special meeting of Council held on the 6th day of March, 2020 held in the Municipal Building and the proceedings of the regular electronic meeting of Council held on the 21st day of April, 2020, be passed in open Council and that the Mayor and the Clerk be directed to sign same and affix the Corporate Seal thereto. Carried



18. Adjournment

**Resolution Number 161-2020**

Moved by: Deputy Mayor Moher

Seconded by: Councillor Watt

That this meeting adjourn at 5:40 p.m.

Carried

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Mayor, J. Murray Jones

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Clerk, Crystal McMillan

## Forwarded Conversation

Subject: Petition re Fishing at Crowe's and McCracken's Landings

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From: Jim Patterson <[REDACTED]>  
Date: Sun, Apr 19, 2020 at 5:41 PM  
To: Gloria & Carl Edwards <[REDACTED]>, Maryl Appleton <[REDACTED]>, Glenn Hunter <[REDACTED]>, Lynda & Len Marsh <[REDACTED]>, Ryan Guthrie <[REDACTED]>, [REDACTED], Bob & Sue Anderson <[REDACTED]>, [REDACTED], John Ireland <[REDACTED]>, Elizabeth Hyde <[REDACTED]>, JULIAN POPE <[REDACTED]>, Leonard Minty <[REDACTED]>, Mark Anderson <[REDACTED]>, Dawn Berney <[REDACTED]>, Mike Coros <[REDACTED]>, Nancy Bell-Dorfman <[REDACTED]>, Elda Pirie <[REDACTED]>, Jane Greenwood <[REDACTED]>, Brent Whetung <[REDACTED]>, Dave Lush <[REDACTED]>, Tognotti Brenda <[REDACTED]>, Rick Hulsebosch <[REDACTED]>, <suzannecoros@[REDACTED]>, Judy Patterson <[REDACTED]>, Jim Patterson <[REDACTED]>, Ethan Craig <[REDACTED]>, [REDACTED], [REDACTED], George Craig <[REDACTED]>, Derri Knox <[REDACTED]>, Donna Rork <[REDACTED]>, Tanya Craig, Davi Hulsebosch, Chris Geggie, Susan Hunter, Leslie Whetung, Lois Whetung, and Andrew Rork.  
Cc: Martina Chait <MartinaC@dourodummer.on.ca>, J. Murray Jones <jjones@dourodummer.on.ca>, Crystal McMillan <crystal@dourodummer.on.ca>

The email was sent to Douro-Dummer township and there is one final step for us to make it official. Normally they would require signatures for a petition, but it is understood that collecting signatures with social distancing is difficult and unsafe. So we need to show in one file that you are each on-board with the petition:

- please reply to this email asap ... your reply means YES!
- if you have changed your mind, let us know and we will delete you from the petition.

Thanks ... we have already made progress on this file and stay tuned for the township's response and action.

### **TOTAL BAN ON FISHING FROM CROWES AND MCCRACKENS LANDINGS**

*Historically, wharves at both Crowes and McCrackens landings have been a point of access for tax-paying cottagers and islanders.*

***The recent influx of anglers on the wharves on a daily basis, makes it, at times, impossible for boaters to dock.***

***The number of fish removed from the lake on a daily basis is staggering.***

***The amount of garbage left by the anglers is overwhelming.***

***The summer swimming program instructors are forced to scan the wharves daily for fishhooks to ensure safety for the kids in lessons.***

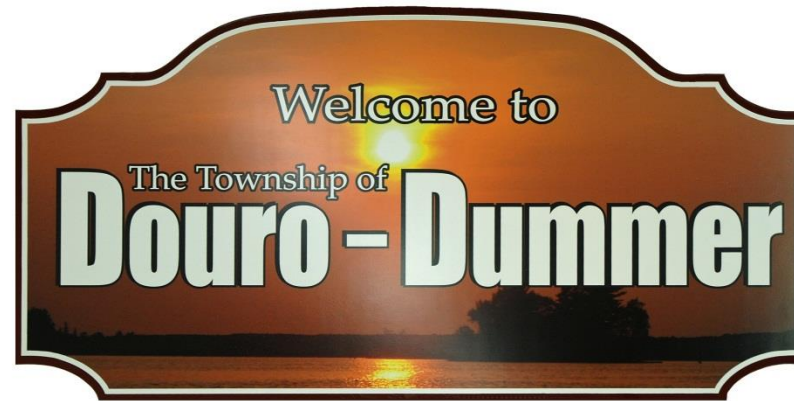
***With the recent Covid19 virus, a temporary ban at the wharves has been established.***

***Now is the time to ban fishing from the wharves permanently.***

***Robert Knox***

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# TOWNSHIP OF DOURO-DUMMER 2020 BUDGET



Presented to Council  
May 5<sup>th</sup> , 2020  
6:00 p.m.

# Agenda

1. Capital Projects – 25 Year Forecast
  2. Public Works
  3. Emergency Services
  4. Library
  5. Parks & Recreation
  6. Administration – Town Hall
  7. By-Law Enforcement – Building
  8. Miscellaneous Items
  9. Levy Requirement
- Council Direction/Comments

# 2020 Budget Challenges

1. Changes in maintenance policy necessitated a substantial increase in these budgets including gravel allocations. \$60,166

2. Sanding/Salting Budget: We have been overbudget in the past few years therefore in 2020 we have increased this budget by \$79,221

3. Changes in gravel allocation to 3" created the necessity to revamp the entire roads budget and 10 year forecast.

# 2020 Budget Challenges cont'd

4. Due to gravel challenges in 2019 several 2019 projects needed to be brought forward to 2020 and the reduction of gravel to 3" necessitated that each project be repriced which again created a large amount of work to determine the gravel roads 2020 budget as well as the 10 year forecast.

5. There are several 2019 Parks & Recreation projects that were moved to 2020.

# 2020 Budget Challenges cont'd

6. Both Community Centre's and the Parks have a large capital requirement.

7. Increase in full time labour for 5 new full time employees which also increased the benefit and deduction budget.

8. Lowered staff labour for LTD, Deputy Clerk Position and C.A.O position



# 2020 Budget Challenges con'td

9. Due to some shifting of items on the 25 year forecast additional allocations have been made to the roads capital (\$2,990,000) and to the balance of assets not on 25 year forecast (\$650,000). I've extended the allocations to 2039. This did not affect the reserve allocation to the Capital Project/Purchases Reserve therefore did not affect the levy requirement. This is a great budgeting tool to plan for the replacement and improvement of all the Townships assets in the future.

# Tangible Capital Assets

TCA – Tangible Capital Assets > \$5,000

This presentation is to present the 2020 proposed capital projects and purchases as well as the proposed operating budget.

# 2020 Capital Items from 25 Year Forecast

AMP Phase I Road Deficit	\$ 208,615
AMP Phase II	\$ 47,355
Office Redecoration	\$ 20,000
Postage Meter	\$ 6,000
Photo Copier	\$ 10,000
Roads Truck #15	\$ 300,000

# 2020 Capital Items from 25 Year Forecast cont'd

Fire Rescue Van #5 Stn #5	\$ 270,000
Fire Chief Truck	\$ 50,000
Tanker Stn #1 – Donwood	\$ 275,000
Pumper Stn #2 Douro	\$ <u>375,000</u>
Funded through Reserves	\$1,566,970

# Public Works Capital

## FROM 2019 –Surface Treated Roads

Daleview Road – Sect 79 – .7 km

County Rd 4 to Division Rd

Preparation & Gravel Work

Double Coat

Total Project \$307,876

Douglas Road – Sect 54 – 2 km

Rock Rd to Fourth Line Rd S Dummer

Reconstruction & Prep Work \$78,916

# Public Works Capital

## 2020 – Surface Treated

Canal Road – Sect 167 – .7 km

From County Road 4 to north limit

Double Coat \$25,550

Ironwood Dr – Sect 206 – .4 km

From County Road 4 to south limit plus turnaround

Single Coat \$ 9,125

Rock Road – Sect 53 – 1.7 km

From South Street to Douglas Road

Reconstruction & Prep Work \$48,277

# Public Works Capital

## 2020 – Surface Treated cont'd

Strickland St. Sect 98 – .4km

From Highway 28 to Westerly 500m (Lakefield limits) – Selwyn is doing the work \$90,626

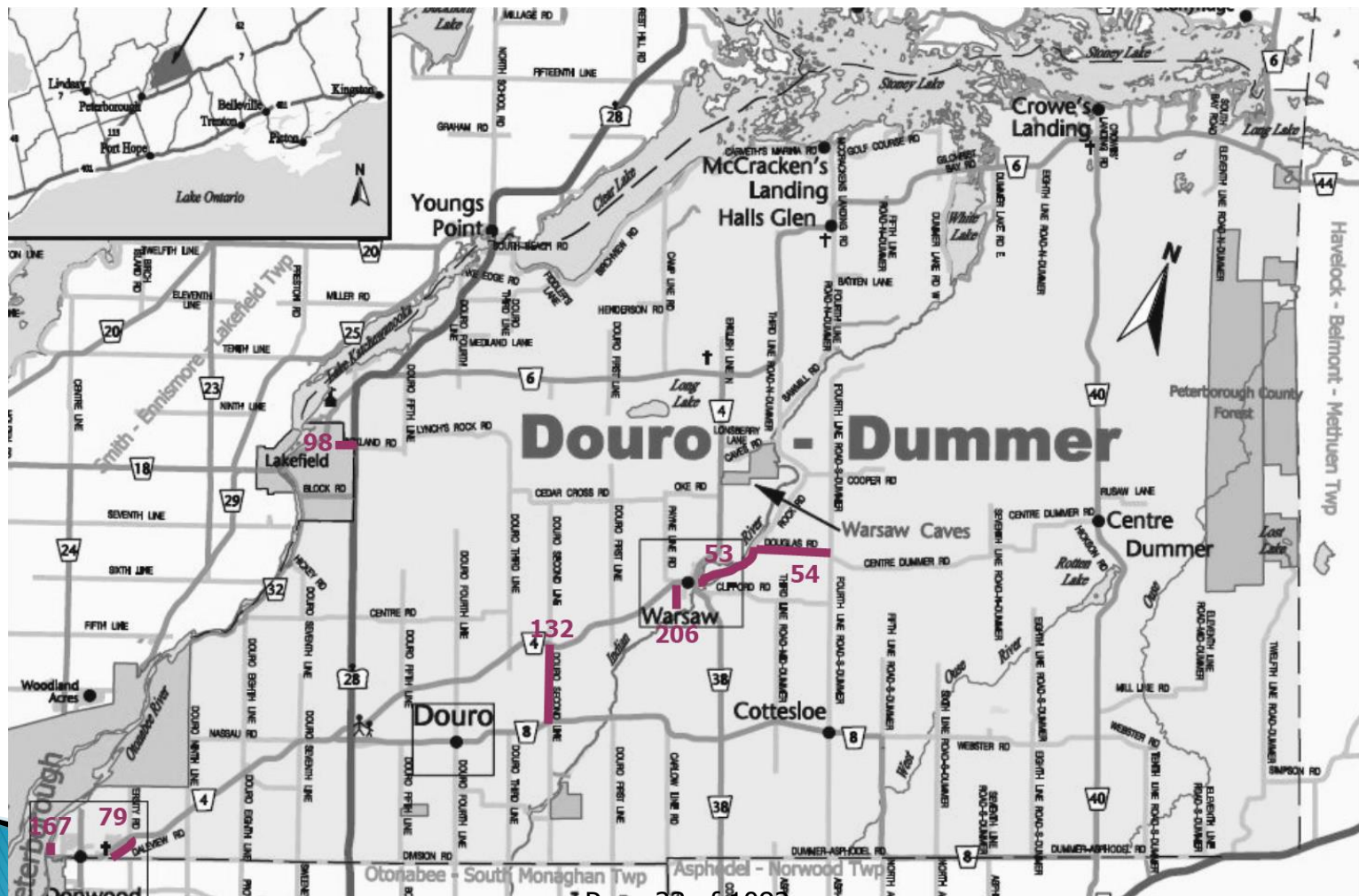
Douro Second Line – Sect 132 –

From County Rd 4 to County Rd 8

Box Culvert \$41,000



# Surface Treatment Projects 2019 Brought Forward & New 2020





# Public Works Capital

## From 2019 Gravel Roads

Centre Road – Sect 134 – 2.9 Km

Douro 5<sup>th</sup> Line to Douro 3<sup>rd</sup> Line

3" Gravel	\$ 29,680
Purchase Surcharge (PS)	\$ 4,682
<u>License Surcharge (LS)</u>	<u>\$ 2,163</u>
Total Project	\$ 36,525

Douro Fifth Line – Sect 138 – 1.8 km

Centre Rd to County Rd 4

3"Gravel	\$ 17,578
Purchase Surcharge (PS)	\$ 2,201
<u>License Surcharge (LS)</u>	<u>\$ 1,017</u>
Total Project	\$ 20,796

# Public Works Capital

## From 2019 Gravel Roads cont'd

Rusaw Lane – Sect 56 – 1.4 km

County Rd 40 to East Limit

3" Gravel	\$15,857
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Purchase Surcharge (PS)	\$ 2,233
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<u>License Surcharge (LS)</u>	<u>\$ 1,031</u>
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Total Project	\$19,121
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Douro Seventh Line – Sect 142 – 1.2 km

Centre Rd to Hickey Rd

3" Gravel	\$12,331
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Purchase Surcharge (PS)	\$ 1,914
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<u>License Surcharge (LS)</u>	<u>\$ 884</u>
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Total Project	\$15,129
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# Public Works Capital

## From 2019 Gravel Roads cont'd

Hickey Road – Sect 141 – .5 km

3" Gravel	\$ 6,015
Purchase Surcharge (PS)	\$ 798
<u>License Surcharge (LS)</u>	<u>\$ 368</u>
Total Project	\$ 7,181

Douro Eighth Line– Sect 143 – 3.9 km

County Rd 32 to County Rd 4

Gravel 3"	\$47,848
Purchase Surcharge (PS)	\$ 7,709
<u>License Surcharge (LS)</u>	<u>\$ 3,561</u>
Total Project	\$59,118

# Public Works Capital

## From 2019 Gravel Roads cont'd

Oke Road – Sect 50 – 1.4 km

Gravel 3"	\$14,648
Purchase Surcharge (PS)	\$ 2,363
<u>License Surcharge (LS)</u>	<u>\$ 1,091</u>
Total Project	\$18,102

Douro Fourth Line – Sect 151 – 1.8 km

Division Rd to Cooney Island Rd

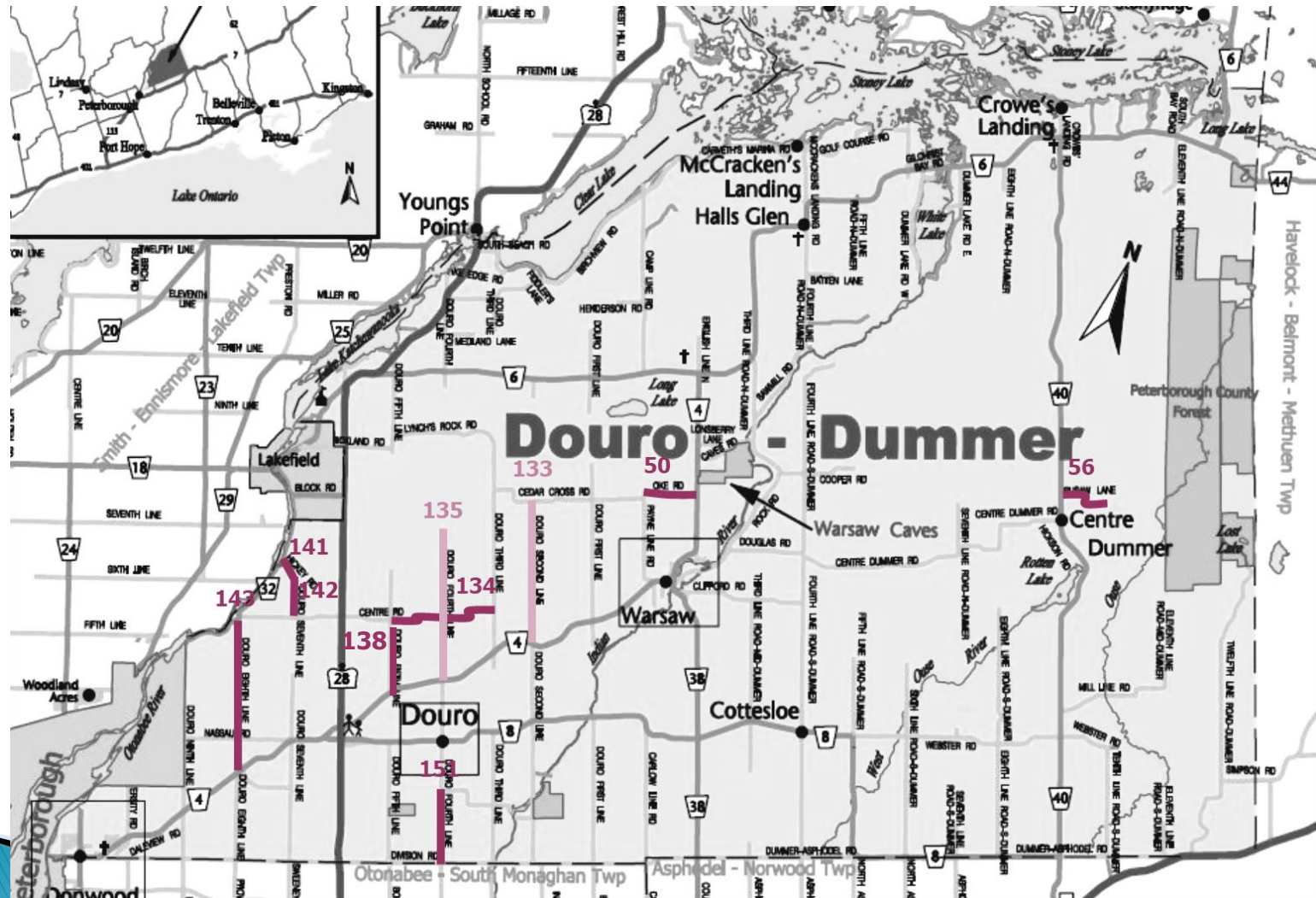
Gravel 3"	\$15,836
Purchase Surcharge (PS)	\$ 2,871
<u>License Surcharge (LS)</u>	<u>\$ 1,326</u>
Total Project	\$20,033

# Public Works Capital

## From 2019 Gravel Roads cont'd

Douro4th Line – Sect.135	
Ditching and 2 Culverts	\$12,000
Douro 2 <sup>nd</sup> Line – Sect.133	
Ditching and 2 Culverts	\$14,674
Indacom Dr. – Sect. 212	\$18,185
Purchase Surcharge (PS)	\$ 1,104
License Surcharge (LS)	\$ 410
Total Project	\$19,799
Transfer from reserves RE: Sale of Property	\$(19,799)

# 2019 Gravel Road Projects Brought Forward



# Public Works Capital

## 2020 Gravel Roads

Payne Line – Sect 51 – 2 km

From Oke Rd to County Road 4

3" Gravel	\$24,268
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Purchase Surcharge (PS)	\$ 3,375
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<u>License Surcharge (LS)</u>	<u>\$ 1,559</u>
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Total Project	\$29,200
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Hickson Road – Sect 173 – .4km

From County Rd 40 to West limit

Brushing	\$ 4,569
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3" Gravel	\$ 5,545
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Purchase Surcharge (PS)	\$ 675
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<u>License Surcharge (LS)</u>	<u>\$ 312</u>
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Total Project	\$11,370
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# Public Works Capital

## 2020 Gravel cont'd

Oke Road – Sect 50 – 1.4 km

County Rd 4 to Payne Line

Ditching	\$32,657
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Brushing	\$12,121
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Culverts	\$ 8,321
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Total Project	\$53,098
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Douro Third Line – Sect 171 – .4 km

From County Rd 4 to South Limit

3" Gravel	\$5,395
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Purchase Surcharge (PS)	\$ 675
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License Surcharge (LS)	\$ 312
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Total Project	\$6,382
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# Public Works Capital

## 2020 Gravel cont'd

Douro Third Line – Sect 127 – 5.3 klm

From Lynch's Rock Rd to County Rd 4

3" Gravel	\$56,023
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Purchase Surcharge (PS)	\$ 8,945
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<u>License Surcharge (LS)</u>	<u>\$ 4,132</u>
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Total Project	\$69,100
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Douro Ninth Line – Sect 147 – 2.4 klm

From County Road 32 to County Rd 4

3" Gravel	\$41,748
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Purchase Surcharge (PS)	\$ 4,362
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<u>License Surcharge (LS)</u>	<u>\$ 2,015</u>
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Total Project	\$48,125
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# Public Works Capital

## 2020 Gravel cont'd

Douro First Line – sect 129 – .3 klm

From Cedar Cross Rd to North Limit

3" Gravel	\$ 3,948
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Purchase Surcharge (PS)	\$ 506
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<u>License Surcharge (LS)</u>	<u>\$ 234</u>
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Total Project	\$ 4,688
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Douro First Line – Sect 130 – 3.1 klm

From Cedar Cross Rd to County Rd 4

3 " Gravel	\$30,077
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Purchase Surcharge (PS)	\$ 4,746
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<u>License Surcharge (LS)</u>	<u>\$ 2,193</u>
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Total Project	\$37,016
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# Public Works Capital

## 2020 Gravel cont'd

Douro First Line – Sect 131 – .7 klm

From County Rd 4 to South Limit

3 “ Gravel	\$ 8,292
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Purchase Surcharge (PS)	\$ 1,181
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<u>License Surcharge (LS)</u>	<u>\$ 546</u>
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Total Project	\$10,019
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Centre Road – Sect 140 – 2.7 klm

From Highway 28 to County Road 32

3” Gravel	\$28,653
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Purchase Surcharge (PS)	\$ 4,360
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<u>License Surcharge (LS)</u>	<u>\$ 2,014</u>
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Total Project	\$35,027
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# Public Works Capital

## 2020 Gravel cont'd

Cooney Island Road – Sect 153 – 2.5 klm

From Douro Fourth Line to East Limit

Brushing	\$ 4,745
Ditching	\$11,075
3" Gravel	\$26,831
Purchase Surcharge (PS)	\$ 4,037
<u>License Surcharge (LS)</u>	<u>\$ 1,865</u>
Total Project	\$48,552

# Public Works Capital

## 2020 Gravel cont'd

Douro Fifth Line – Sect 138 – 1.8 km

Centre Rd to County Rd 4

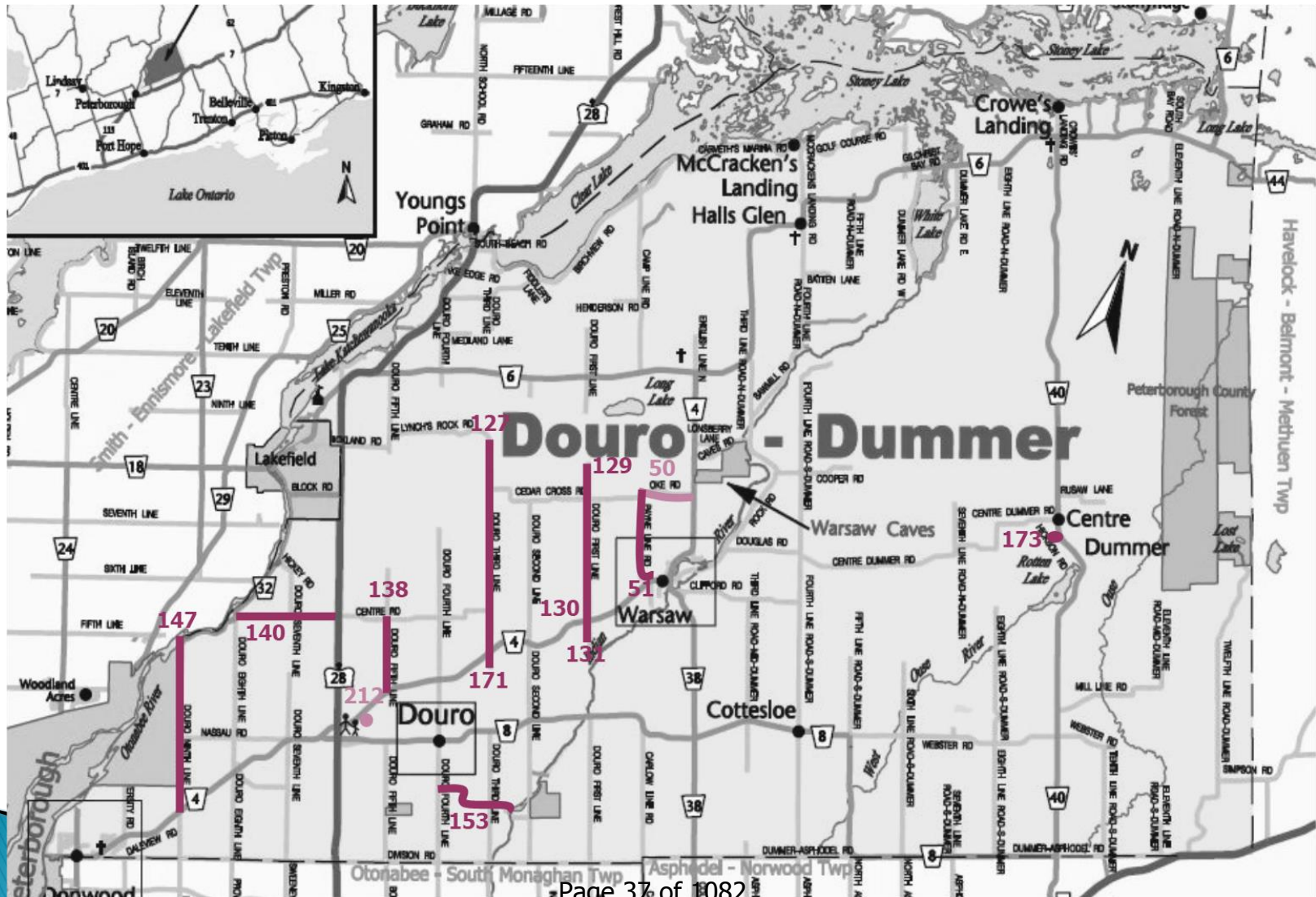
3"Gravel	\$ 14,236
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Purchase Surcharge (PS)	\$ 2,201
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<u>License Surcharge (LS)</u>	<u>\$ 1,017</u>
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Total Project	\$ 17,454
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# 2020 Gravel Road Projects



# Gravel Pit – Licensing

Over the next 7 years the Township will be applying for licensing to crush and extract gravel from the County Rd38 gravel pit.

Rough estimate: \$250,000

In an effort to address this future expense part of the 2020 gravel budget includes a licensing surcharge of 0.85 cents per tonne. This is based on a ten year time frame and the tonnes that will be used in the 2020 budget. This surcharge will be transferred to a licensing reserve – 2020 – \$32,700



# Gravel Pit – Purchase

In order to prepare financially for the pit purchase part of the 2020 gravel budget includes a purchase surcharge of \$1.84 per tonne. This is based on 30,000 tonne per year for 20 years using an annual loan payment example of \$115,200. This purchase surcharge will be transferred to a pit purchase reserve – 2020 – \$70,786



# Total Public Works Road Capital Work

- ▶ To summarize the 2020 Road Capital work:

Surface Treated Roads:	\$601,360
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2019 Gravel Projects Brought	
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Forward:	\$242,478
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2020 New Gravel Projects:	\$371,351
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<b>Total Road Project Capital:</b>	<b>\$1,215,189</b>
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# Public Works Capital

<b>Truck</b>	<b>\$300,000</b>
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<b>GPS Hardware</b>	<b>\$ 41,500</b>
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<b>Fuel Pumps– Douro &amp; Warsaw</b>	<b>\$ 50,000</b>
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# Public Works Capital Funding

**Funded with: Gas Tax \$231,354, Capital Reserve \$508,615, Construction Reserves \$219,799, OCIF Funding \$92,490, Development Charges \$150,000, Efficiency Funding \$41,500, Taxes \$392,285**

# Emergency Services Capital

Fire Nozzles	\$ 20,000
Extrication Tool	\$ 17,000
3 Sets Bunker Gear	\$ 9,000
Rescue Van #5 – Mini Pumper (2018) (Awarded Dec 2019)	\$275,000
Tanker	\$275,000
Pumper	\$375,000
Medi 4	\$ 50,000
Communication Upgrades	\$ 73,000
Donwood Fire Hall Furnace	<u>\$ 10,000</u>
Total Capital	\$1,104,000

**Funded with DC \$5,000, Capital Reserves \$975,000, Fire Reserves \$10,000, Amp Phase II Reserve \$10,000, Funding \$73,000, Taxes \$31,000**

# Emergency Services Capital

## Fire Hall #5 – Project

In 2019 we spent \$58,790 and collected \$33,097 in donations. Therefore \$25,693 of tax dollars were used.

In 2020 we have budgeted \$42,000 expense and estimated an additional \$20,000 in donations. This will bring the total tax dollars for the FH #5 project to \$47,693.

These figures are very preliminary.

# Library Capital

Books (Including E-Books)	\$14,000
Book return Box, Circulation desk, public access station	\$ 3,527
Computer	\$ 1,000
New chairs – 2	\$ 500
Flooring in adult fiction area	\$ 5,000
Accessibility Plan – Ramp	<u>\$61,734</u>
Total	\$85,761

**Funded with DC \$14,000, Annual Grant  
14,307, Reserves \$46,491 Taxes \$10,963**

# Parks and Recreation – From 2019 Budget

From Master Plan Recommendations:

Additional Staff Time –	\$18,500
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Parks, Douro CC, Warsaw CC

Community Board	\$ 3,000
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Douro Painting Walls/Bleachers	\$19,500
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Douro Tables & Chairs	<u>\$14,730</u>
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Total 2019 Capital	\$55,730
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Parks Reserves \$11,600, Douro CC Reserves  
\$34,230, Parkland Reserve \$7,000, Taxes  
\$2,900

# Douro CC Capital

Wall Preparation	\$ 5,000
2 <sup>nd</sup> Desiccant Dehumidifier	\$40,000
Exterior Doors/frames	\$10,000
Compressor Overhauls (50 & 30 HP)	\$20,000
Brine Filter	\$ 4,000
Replace Rubber Flooring (Dressing Room & Hallway)	\$33,000
Insulate Furnace Duct Work	<u>\$ 7,000</u>
Total	\$119,000

Funded with Amp Phase II Capital Reserves  
\$12,000, Gas Tax Reserve \$100,000, Funding  
\$7,000



# Warsaw CC Capital

Glycol Loop	\$30,000
Painting Ice surface area/stands	\$20,000
Exterior Doors/frames	\$ 8,000
Compressor Overhauls (50HP)	\$12,000
Replace Flooring, Dressing Rooms, Hallway & Lobby	<u>\$58,000</u>
Total	\$128,000

**Funded with AMP Phase II Reserves \$16,355,  
Gas Tax Reserve \$111,645**

# Parks

Tile Drain and Infield Clay South

Diamond \$50,000

Picnic Tables \$ 9,000

Parks & Recreation Master Plan

Implementation – Promotion,

Workshops, etc. \$ 6,500

Clintonia Park \$90,000

Total \$155,500

Funded from DC \$10,000, Trillium Funding

\$90,000, AMP Phase II Reserve \$9,000, Taxes

\$46,500

# Administration/Council/Town Hall

Postage Meter (moved from 2017)	\$ 6,000
Paint Town Hall	\$20,000
Photocopier (moved from 2018)	\$10,000
Web Site Update	\$50,000
Agenda Software	\$17,000
Council Chamber Audio Update	\$15,000
Live Streaming of Council Meetings	\$16,000
Service Delivery Review	<u>\$64,410</u>
Total	\$198,410

Funded with Capital Reserves \$36,000,  
Efficiency Funding \$162,410

# By-Law Enforcement – Building

Truck	\$45,000
Modernize Building Department Website	\$ 8,000

Sustainability in New Construction Project with corresponding FCM (Federation of Canadian Municipalities) funding.

Funded from Building Reserves \$45,000 and Efficiency Funding \$8,000

# Miscellaneous Items

Historical Committee – Lime Kiln	\$ 8,000
Wayfinding Program	\$12,250
Warsaw Sun Project	\$ 5,000
Sidewalks in Warsaw (Approx)	\$27,500
Township Hamlet Signs	<u>\$11,546</u>
Total	\$64,296

Funded with Funding \$32,500, Reserves  
\$11,546, Taxes \$20,250

# Budgeted Levy Requirement

2019 Budgeted Requirement from Tax

Levy: \$5,014,779

2020 Estimated Requirement from Tax

Levy: \$5,486,499

Increase for 2020: \$ 471,720

This is a required levy percent increase of 9.41% which equals a 3.76% residential tax rate increase. The municipal tax levy increase is the amount of money that needs to be collected from property taxes and does not reflect the change to property tax rates.

# Increased Residential Household Cost for Municipal Taxes

On each \$100,000 of assessment this would equal a \$12.97 yearly increase over 2019.

On a home assessed at \$250,000 the residential tax increase would be \$32.43.

# 2020 Budget Challenges

Just to reiterate the challenges with the 2020 budget process:

1. Changes in the road maintenance policy necessitated a substantial increase in these budgets: Approximate Increase \$50,000
2. Sanding/Salting Budget: We have been overbudget in the past few years therefore in 2020 we have increased this budget by \$100,000
3. Changes in gravel allocation to 3" created the necessity to revamp the entire roads budget and 10 year forecast.
4. Increase in full time labour which also increased the benefit and deduction budget.



# 2020 Budget Challenges

5. Due to gravel challenges in 2019 several 2019 projects needed to be brought forward to 2020 and the reduction of gravel to 3" necessitated that each project be repriced which again created a large amount of work to determine the gravel roads 2020 budget as well as the 10 year forecast.
6. There were several 2019 Parks & Recreation projects that are moved to 2020.
7. Both Community Centre's and the Parks have a large capital requirement.
8. With the exception of the Capital Projects/Purchases reserve, the proposed budget is not addressing the depleting reserves.

# 2020 Budget Challenges

- ▶ All of the above challenges except the depleting reserves were addressed in the 2020 budget. With the proposed increase in the tax levy the Township is able to complete a huge amount of roads projects, address necessary capital work in the Parks & Recreation department, encompass the increase in labour and benefit costs, and increase the sanding/salting and maintenance budgets.

# Council Comments / Discussion

Motion to Direct Staff to prepare the 2020 Tax By-law.

Revised Dec 2019 lowered st budget for 2020 which caused more road to be shuffled in future years.						
		<div>Douro-Dummer Roads Department 10 Year Hard-Topping Projection</div> <div>This is a working document and is subject to change under the Surface Treatment Policy</div> <div>Pricing for Surface Treatment based on \$18, 250 per single surface treatment/km, \$36,500 for double treatment/km</div> <div>Total approximate construcion price/km (for surface treatment, gravel, brushing, ditching): \$97,000/km from 2020 forward</div>				
	Water related		Pay Special Attention	Finals for the Year		
Year	Road Length (km)	Road Name	Road Section	Road Description	Total Cost	Comments
2020	0.7	Daleview Drive	79	From County Road 4 to Division Road	307876	Reconstruction and double surface treatment - reduce cost by 2019 engineering expense
2020	2.0	Douglas Road	54	From Rock Road to the 4th Line Road S Dummer	78916	Reconstruction
2020	n/a	Douro 2nd Line	132	From County Road 4 to County Road 8	41000	Culvert K (box culvert), deck condition survey (\$10,000) and rehabilitation to structure (\$31,000)
2020	0.4	Strickland Street	98	From Highway 28 to Westerly 500m (Lakefield Limits)	90626	Shared Cost with SEL \$ 181251.50 Split
2020	0.4	Ironwood Drive	206	From County Road 4 to South Limit	9125	Single Coat of Surface Treatment (0.4km plus turn around=0.5km)
2020	1.7	Rock Road	53	From South Street to Douglas Road	48267	Reconstruction - prep for surface treatment
2020	0.7	Canal Road	167	From County Road 4 to North Limit	25550	Double Surface Treatment
2020	2020 Total				601360	
2021	1.3	White Lake Road East	10	From County Road 6 to South Limit	\$ 78,650.00	Reconstruction (according to our Surface treatment policy - traffic counts) - currently a gravel road
2021	3.4	Douro Eigth Line	143	From County Road 32 to County Road 4	\$ 142,350.00	Double Surface Treatment (3" gravel put on in 2020) high traffic count road
2021	2.0	Douglas Road	54	From Rock Road to the 4th Line Road S Dummer	\$ 73,000.00	Double Surface treatment
2021	1.8	Cooper Road	63	From Fouth Line Road South Dummer to Caves Road	\$ 79,804.29	Reconstruction & prep for surface Treatment
2021	1.7	Rock Road	53	From South Street to Douglas Road	\$ 62,050.00	Double Surface Treatment
2021	1.3	Indacom Drive	212	From County Road 4 to Douro Community Centre	\$ 51,450.00	Double Surface Treatment (\$47,450) and asphalt entrance (\$4000)
2021	0.5	Plati Avenue	81	From Kinsdale Drive to Television Road	\$ 9,125.00	Single Surface Treatment
2021	0.2	Hillview Avenue	90	Donwood Drive to Orchard Crescent	\$ 3,650.00	Single Surface Treatment
2021	0.4	Orchard Crescent	91	Donwood Drive to Hillview Avenue	\$ 7,300.00	Single Surface Treatment
2021	0.4	Maryvale Road	92	From County Road 4 to North Limit	\$ 7,300.00	Single Surface Treatment
2021	0.5	Donwood Drive	89	From County Road 4 to Hillview Avenue	\$ 9,125.00	Single Surface Treatment
2021	0.6	Kinsdale Drive	84	From Parkhill Road to North Limit	\$ 10,950.00	Single Surface Treatment
2021	0.4	Clinton Avenue	82	From Plati Avenue to Gifford Drive	\$ 7,300.00	Single Surface Treatment
2021	0.3	Coral Dive	86	From Television Road to the East Limit	\$ 5,475.00	Single Surface Treatment

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2021	0.5	Gifford Drive	83	Fom Television Road to Kinsdale Drive	\$ 9,125.00	Single Surface Treatment
2021	0.1	Roxton Street	85	From Kinsdale Drive to East Limit	\$ 1,825.00	Single Surface Treatment
2021	0.2	Banks Street	40	From County Road 8 to East Limit	\$ 3,650.00	Single Surface Treatment
2021	0.2	English Line	44	From Water Street to East Limit (River Lane)	\$ 3,650.00	Single Surface Treatment
2021	0.2	Water Street	45	From Ford Street to Mill Street	\$ 3,650.00	Single Surface Treatment
2021	0.1	Mill Street	46	From West Limit to Peterborough Street	\$ 1,825.00	Single Surface Treatment
2021	0.2	Church Street	48	From Mill Street to West Street	\$ 3,650.00	Single Surface Treatment
2021	0.2	West Street	49	From County Road 4 to West Limit	\$ 3,650.00	Single Surface Treatment
2021	0.2	Hilliard Way	105	From Highway 28 to West Limit	\$ 3,650.00	Single Surface Treatment
2021	1.6	Douro Fourth Line	118	From County Road 6 to Highway 28	\$ 29,200.00	Single Surface Treatment
2021	1.7	McCraken's Landing	1	From County Road 6 to North Limit	\$ 31,025.00	Single Surface Treatment
2021	2021 Total				\$642,429.29	
2022	3.2	4th Line Road S Dummer	37	From Clifford Road to County Road 8	\$ 310,400.00	As per to Council's decision, this road will be grandfathered and remain surface treated
2022	0.8	Division Road	95	From County Road 4 to Burnham Line 10 (Tenth Line)	\$ 50,144.25	Reconstruction and Double Surface Treatment (shared cost w/ OSM)Total project cost \$100,288
2022	5.3	Division Road	13	Highway 28 to Indian River	\$ 71,500.00	1.3 km of road (From Douro Fourth Line to Douro Fifth Line) - double surface treatment \$45,500 - gravel \$26,000
2022	1.8	Cooper Road	63	From Fouth Line Road South Dummer to Caves Road	\$ 65,700.00	Double Surface Treatment
2022	0.4	Douro Third Line	110	From South Beach Road to Rishor Avenue	\$ 7,300.00	Single Surface Treatment
2022	3.1	4th Line Road N Dummer	69	From Sawmill Road to North Limit	\$ 241,800.00	Reconstruction and Double Coat of Surface Treatment
2022	0.3	Thelgar Road	108	From Highway 28 to West Limit	\$ 5,475.00	Single Surface Treatment
2022	0.3	Old Highway 28	170	From South Beach Road to North Limit	\$ 5,475.00	Single Surface Treatment
2022	0.6	South Beach Road	109	From Highway 28 to East Limit	\$ 10,950.00	Single Surface Treatment
2022	1.6	Caves Road	65	From County Road 4 to Cooper Road	\$ 58,400.00	Reconstruction and Double Coat of Surface Treatment
2022	0.3	Bradfield Road	162	From County Road 4 to 300m South	\$ 10,950.00	Double Surface Treatment
2022	1.9	Douro Eight Line	160	From Division Road to the North Limit	\$ 184,300.00	Reconstruction and Double SurfaceTreatment - currently is a gravel road - policy and traffic counts convert
2022	0.2	Douro Eight Line	161	From County Road 4 to 400 m South	\$ 7,300.00	Construction and Double Surface Treatment
2022	0.9	Crowe's Landing Road	76	From County Road 6 to North Limit	\$ 16,425.00	Single Surface Treatment
2022	1.3	White Lake Road East	10	From County Road 6 to South Limit	\$ 126,100.00	Double Coat Surface Treatment (according to our Surface treatment policy - traffic counts) - currently a gravel road
2022	n/a	Centre Road	134	From Douro 3rd Line to Douro 5th Line	\$ 15,000.00	Culvert H: Box culvert repair estimate
2022	0.5	Payne Line Road	52	From County Road 4 to Westerly to end of Surface Treatment	\$ 48,500.00	Reconstruction and Double Coat of Surface Treatment
2022	0.2	Crowe's Landing Road	210	From Ninth Line Dummer to Stoney Lake	\$ 3,650.00	Single Surface Treatment
2022	2022 Total				\$1,239,369.25	
2023	3.3	Dummer-Asphodel Road	16	County Road 38 to 400m East of Fourth Line of Dummer	\$ 27,225.00	SingleCoat Surface Treatment shared with AN -Total cost 54,450

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2023	1.1	Dummer-Asphodel Road	17	Bridge to County Road 8	\$ 9,075.00	SingleCoat Surface Treatment - shared with AN - Total cost 18,150
2023	5.2	Birchview Road	2	From McCracken's Landing to Campline Road	\$ 94,900.00	Single Surface Treatment
2023	6.4	Birchview Road	112	From Highway 28 to Campline Road	\$ 116,800.00	Single Surface Treatment
2023	0.2	Ayotte Crescent	144	From Douro Eighth Line Easterly to Limit	\$ 17,500.00	single coat surface treatment - wide cul de sac - 1 km of road
2023		Hickey Road	141	From Douro 7th Line to County Road 32	\$ 74,000.00	Install guide rail post and upgarde end treatments for Culvert E
2023	0.8	Douro Eight Line	143	County Road 4 to Nassau	\$ 37,471.00	Prep work for Surface treatment in 2017
2023	1.2	Douro Seventh Line	157	From County Road 4 South Limit (Bradfield Road)	\$ 116,400.00	As per to Council's decision, this road will be grandfathered and remain surface treated
2023	2	Fourth Line Road South Dummer	59	From Centre Line Dummer Road to Cooper Road	\$ 194,000.00	Double surface treatment according to traffic counts- currently gravel
2023	1.2	4th Line Road S Dummer	58	From Clifford Road to Centre Dummer Road	\$ 116,400.00	Double surface treatment according to traffic counts- currently gravel
2023		2023 Total			\$803,771.00	
2024	3.3	Dummer-Asphodel Road	16	County Road 38 to 400m East of Fourth Line of Dummer	\$ 63,185.00	Double Surface Treatment - DD Cost
2024	1.1	Dummer-Asphodel Road	17	Bridge to County Road 8	\$ 21,062.00	Double Surface Treatment - DD Cost
2024	0.2	Ayotte Crescent	144	From Douro Eighth Line Easterly to Limit	\$ 14,000.00	Double Surface Treatment
2024	2.3	Sawmill Road	68	From Third Line Road Dummer to Fouth Line Road Dummer	\$ 85,875.00	Double Surface Treatment
2024	2.2	Golf Course Road	5	From McCrackens Landing Road to Barnes Road	\$ 59,500.00	1.7 km of road - Double Coat Surface Treatment
2024	0.8	Douro Eight Line	143	County Road 4 to Nassau	\$ 28,000.00	Double Surface Treatment
2024	1.2	Douro 9th Line Road	164	From County Road 4 to Division Road	\$ 64,752.72	Gravel and Double Coat Surface Treatment
2024	2	Clifford Road	39	From Third Line Road South Dummer to South Street	\$ 78,487.44	Brushing, Ditching, Gravel - prep for surface treatment in 2018
2024	1.0	South Bay Road	74	From County Road 6 to North Limit	\$ 66,301.49	Gravel, Ditching and Double Surface Treatment
2024	4.0	Douro Third Line (section 1.3 suface treated?)	127	From Lynch's Rock Road to County Road 4	\$ 388,000.00	Construction and Double Surface Treatment (according to surface treatment policy - traffic counts) - currently a gravel road
2024		2024 Total			\$869,163.65	
2025	2	Rock Road	66	Cooper Rd to Douglas	\$ 33,000.00	Single Surface Treatment
2025	0.5	Rock Road	67	From Douglas Road to Rock Road	\$ 8,250.00	Single Surface Treatment
2025	2.7	Camp Line	3	From Birchview Road to Henderson Road	\$ 47,250.00	Single Surface Treatment
2025	1.8	Camp Line	4	From Henderson Road To County Road 6	\$ 31,500.00	Single Surface Treatment
2025	0.4	Landfill Road	176	From County Road 6 to Transfer Station	\$ 38,800.00	Construcion and Double Coat surface treatment - currently gravel
2025	2.3	Sawmill Road	68	From Third Line Road Dummer to Fouth Line Road Dummer	\$ 40,250.00	Single Surface Treatment
2025	0.8	Douro Eight Line	143	County Road 4 to Nassau	\$ 14,000.00	Single Surface Treatment
2025	3.3	Clifford Road	38 & 39	From Fouth Line Road South Dummer to Third Line Road South Dummer		
2025	1.2	Stickland Street	122	From Third Line Road South Dummer to South Street	\$ 57,750.00	Single Surface Treatment
2025	2.1	Third Line Dummer	64	Highway 28 to Douro 5th Line	\$ 19,800.00	Single Surface Treatment
				From Caves Road to County Road 6	\$ 73,500.00	Double coat surface treatment, prep work done in 2017
2025	2	Clifford Road	39	From Third Line Road South Dummer to South Street	\$ 70,000.00	Double Surface Treatment



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2025	2	Douro 2nd Line	132	County Road 4 to County Road 8	\$ 57,500.00	Single Coat of Surface Treatment and Patching work
2025	5.3	Division Road	13	Highway 28 to Indian River	\$ 90,583.00	1.3 km of road (From Indian River Line to Douro Third Line) - reconstruction and double surface treatment; 4 km from Douro Third to Douro Fifth Brushing
2025					\$ 35,150.00	Project moved from 2017 budget
2025	2.7	Division Road	14	From Indian River to Carlow Line	\$ 49,275.00	Single Surface Treatment
2025	5.3	Division Road	13	Highway 28 to Indian River	\$ 30,500.00	1.4 km of road (Douro Third Line to Douro Fourth Line) Brush road
2025	0.2	Valleyview Avenue	88	From Highland Avenue to County Road 4	\$ 18,413.00	Ditching and double surface treatment
2025	0.1	Galloway Drive	179	From McCrackens Landing to the West Limit	\$ 1,750.00	Single Surface Treatment
2025	0.2	Highland Avenue	87	From County Road 4 to North Limit	\$ 18,701.00	Ditching and double surface treatment
2025	0.1	Little Lane	205	From County Road 6 to North Limit	\$ 4,635.00	Construction and Double coat surface treatment
2025	1.3	Gilchrist Bay Road	8	From County Road 6 to County Road 6	\$ 50,758.00	Construction and Double coat surface treatment
2025	0.1	Edgewood Avenue	93	From County Road 4 to South Limit	\$ 1,650.00	Single Surface Treatment
2025	0.1	McNab Avenue	94	From County Road 4 to South Limit	\$ 1,650.00	Single Surface Treatment
2025	7.9	Centre Dummer Road	55	From Fourth Line Road S Dummer to County Road 40	\$ 47,450.00	Double Surface Treatment - small section of road surface treated (1.3 km) and is grandfathered as per Council
2025	1.3	Mill Line Road	26	From County Road 40 to Bridge	\$ 47,450.00	Double Surface Treatment - is grandfathered as per Council
2025		Indacom Drive	212	From County Road 4 to the Douro Community Centre	\$ 24,368.00	Project moved from 2017
2025	2025 Total				\$ 913,933.00	
2026	0.7	Daleview Drive	79	From County Road 4 to Division Road	\$ 11,550.00	Single Surface Treatment
2026	0.2	Valleyview Avenue	88	From Highland Avenue to County Road 4	\$ 3,500.00	Single Surface Treatment
2026	0.2	Highland Avenue	87	From County Road 4 to North Limit	\$ 3,500.00	Single Surface Treatment
2026	1.8	Cooper Road	63	From Fouth Line Road South Dummer to Caves Road	\$ 29,700.00	Single Surface Treatment
2026	1.3	Gilchrist Bay Road	8	From County Road 6 to County Road 6	\$ 21,450.00	Single Surface Treatment
2026	0.1	Little Lane	205	From County Road 6 to North Limit	\$ 1,750.00	Single Surface Treatment
2026	0.3	Douro 5th Line	121	Lynch Rock Rd to Strickland Rd	\$ 4,950.00	Single Surface Treatment
2026	5.3	Division Road	13	Highway 28 to Indian River	\$ 22,750.00	1.3 km of road (From Douro Fourth Line to Douro Fifth Line) - Single Surface Treatment
2026	1.5	Douro Fourth Line	136	From County Road 4 to County Road 8	\$ 26,250.00	Single Surface Treatment
2026	1.8	Douro Fourth Line	151	From Division Road to Cooney Island Road	\$174,600.00	Construction and Double Surface Treatment -currently a gravel road
2026	5.3	Division Road	13	Highway 28 to Indian River	\$ 30,500.00	1.4 km of road (Douro Third Line to Douro Fourth Line) single coat \$24,500 - patch treatment \$6,000
2026	1.2	Douro Fourth Line	152	From Cooney Island Road to County Road 8	\$ 21,000.00	Single Surface Treatment
2026	3.6	Douro 2nd Line	150	From Division Road to County Road 8	\$ 65,700.00	Single Surface Treatment
2026	0.7	Canal Road	167	From County Road 4 to North Limit	\$ 52,500.00	Construction and Double Surface Treatment
2026	0.6	Lonsberry Lane	166	From County Road 4 to East Limit	\$ 10,500.00	Single Surface Treatment

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2026	1.4	Dummer-Asphodel Road	15	County Road 38 to Carlow Line	\$ 12,250.00	Single Coat - split with AN -Total Cost \$25,400
2026	5.6	Webster Road	29	From County Road 40 to County Road 8 (Fifth Line Road South Dummer)	\$ 98,000.00	Single Surface Treatment
2026	2.9	Nassau Road	146	From West Limit (City Peterborough) to County Road 4	\$ 50,750.00	Single Surface Treatment
2026	0.5	Stenner Road	100	From Highway 28 to North Limit	\$ 8,750.00	Single Surface Treatment
2026	0.8	Moodie Drive	102	From Stenner Road to East Limit	\$ 14,000.00	Single Surface Treatment
2026	2.7	White Lake Road West	12	From County Road 6 to South Limit	\$ 44,550.00	Single Surface Treatment
2026	2.7	White Lake Road West	12	From County Road 6 to South Limit	\$ 49,275.00	Single Surface Treatment
2026	2026 Total				\$ 757,775.00	
2027	2.8	Lynch's Rock Road	126	From Douro Fifth Line to Douro Third Line	\$ 51,100.00	Single Surface Treatment
2027	1.3	Douro Third Line	127	From Lynch's Rock Road to County Road 4	\$ 23,725.00	Single Surface Treatment
2027	0.4	Strickland Street	98	From Highway 28 to Westerly 500m (Lakefield Limits)	\$ 3,650.00	Single Surface Treatment - shared with SEL \$7,300
2027	2.0	Douglas Road	54	From Rock Road to the 4th Line Road S Dummer	\$ 36,500.00	Single Surface Treatment
2027	3.4	Douro Eigth Line	143	From County Road 32 to County Road 4	\$ 62,050.00	Single Surface Treatment
2027	0.8	Division Road	95	From County Road 4 to Burnham Line 10 (Tenth Line)	\$ 7,300.00	Single Surface Treatment - shared with OSM \$14,600
2027	1.7	Rock Road	53	From South Street to Douglas Road	\$ 31,025.00	Single Surface Treatment
2027	0.8	Division Road	95	From County Road 4 to Burnham Line 10 (Tenth Line)	\$ 14,600.00	Single Surface Treatment
2027	0.7	Daleview Road	79	From County Road 4 to Division Road	\$ 12,775.00	Single Surface Treatment
2027	0.7	Canal Road	167	From County Road 4 to North Limit	\$ 12,775.00	Single Surface Treatment
2027	2027 Total				\$255,500.00	
2028	1.3	Indacom Drive	212	From County Road 4 to Douro Community Centre	\$ 23,725.00	Single Surface Treatment
2028	1.8	Cooper Road	63	From Fouth Line Road South Dummer to Caves Road	\$ 32,850.00	Single Surface Treatment
2028	5.3	Division Road	13	Highway 28 to Indian River	\$ 48,363.00	Single Surface Treatment - shared with OSM \$96,725
2028	3.1	4th Line Road N Dummer	69	From Sawmill Road to North Limit	\$ 56,575.00	Single Surface Treatment
2028	2028 Total				\$488,188.00	
2029	3.6	Douro 2nd Line	150	From Division Road to County Road 8	\$ 65,700.00	Single Surface Treatment
2029	0.6	Lonsberry Lane	166	From County Road 4 to East Limit	\$ 10,950.00	Single Surface Treatment
2029	1.6	Caves Road	65	From County Road 4 to Cooper Road	\$ 29,200.00	Single Surface Treatment
2029	0.3	Bradfield Road	162	From County Road 4 to 300m South	\$ 5,475.00	Single Surface Treatment
2029	1.9	Douro Eight Line	160	From Division Road to the North Limit	\$ 34,675.00	Single Surface Treatment
2029	0.2	Douro Eight Line	161	From County Road 4 to 400 m South	\$ 3,650.00	Single Surface Treatment
2029	1.3	White Lake Road East	10	From County Road 6 to South Limit	\$ 23,725.00	Single Surface Treatment
2029	0.5	Payne Line Road	52	From County Road 4 to Westerly to end of Surface Treatment	\$ 9,125.00	Single Surface Treatment
2029	0.6	Lonsberry Lane	166	From County Road 4 to East Limit	\$ 14,600.00	Single Surface Treatment
2029	3.6	Douro 2nd Line	150	From Division Road to County Road 8	\$ 65,700.00	Single Surface Treatment
2029	2029 Total				\$262,800.00	
2030	0.4	Ironwood Drive	206	From County Road 4 to South Limit	\$ 9,125.00	Single Coat of Surface Treatment (0.4km plus turn around=0.5km)



		<div>Douro-Dummer Roads Department 10 Year Hard-Topping Projection</div> <div>This is a working document and is subject to change under the Surface Treatment Policy</div> <div>Pricing for Surface Treatment based on \$18, 250 per single surface treatment/km, \$36,500 for double treatment/km</div> <div>Total approximate construcion price/km (for surface treatment, gravel, brushing, ditching): \$97,000/km from 2020 forward</div>				
2030	4.2	Douro Ninth Line Road	147	From County Road 32 to County Road 4	\$153,300.00	Double Surface Treatment, Currently gravel road, surface treatment due to traffic counts
2030	1.9	Douro Seventh Line Road	158	From Division Road to County Road 4	\$69,350.00	Double Surface Treatment, Currently gravel road, surface treatment due to traffic counts
2030	3.6	Eight Line Road South Dummer	19	From Webster Road to North Limit	\$349,200.00	Double Surface Treatment and reconstruction, Currently gravel road, surface treatment due to traffic counts
2030	2.9	Eighth Line Road South Dummer	201	From Webster Road to County Road 8	\$ 281,300.00	Double Surface Treatment and reconstruction, Currently gravel road, surface treatment due to traffic counts
2030	12.6	2030 Total			\$862,275.00	
		Roads Maintained by Other Municipalities				
	4.2	Division Road	96	From Burnham Line 10 to Douro Seventh Line		Maintained by OSM
	1.3	Division Road	97	From Douro Seventh Line to Highway 28		Maintained by OSM
	0.3	Division/Boundary	208	From Eleventh Line Dummer to East End		Maintained by AN
		Hot Mix Asphalt				
	0.5	Eleventh Line S Dummer	23	From Asphodel Dummer Road to North Limit of Asphalt		
	0.2	Ford Street	43	From East of Water Street to Peterborough Street		
	1.2	Eleventh Line N Dummer	73	From County Road 6 to South Limit		
	0.1	Block Road	123	From Highway 28 to East Limit		2013
	1.3	Television Road	211	Television Road		Microsurfacing done in 2015 (15 year life) - \$58,500 proceeds from University - 2030
	2.8	Dummer-Asphodel Road	21	From County Road 40 to Eleventh Line S Dummer		2013
		Year 1	Double Coat			
		Year 7	Single Coat			
		10 Years	Single Coat			

CAPITAL PROJECT BUDGET BY YEAR						
8-Dec-19	GL #	Service Life		Relacement	Asset ID	
2020						
Road Deficit (4.16% of 2019 Levy)			\$208,615			
AMP Phase II (1.3% of 2019 Levy)			\$47,355			
Town Hall Painting (2010)		10	\$20,000	2030	FNSH-A0003	
Postage Meter - (2012)		7	\$6,000	2024	PSTG-A0001	
Photocopier (2013)		7	\$10,000	2025	PNTR-A0001	
#15 Truck Roads (2019)			\$300,000			
Rescue Van #5 @ Stn #5 - Lake (1999)	022	20	\$275,000	2038	VANS-A0005, TNKR-	
Fire Chief Truck		10	\$50,000	2030	TRCK-A0012 NEW	
Tanker @ Stn #1 Donwood (2000)	023	20	\$275,000	2040	TNKR-A0002	
Pumper @ STN #2 Douro (2000)	009	20	\$375,000	2040	PMPR-A0004	
				\$1,566,970		
2021						
Road Deficit (4.16% of 2020 Levy)			\$208,615			
AMP Phase II (1.3% of 2020 Levy)			\$87,548			
Office Painting (2010)		10	\$20,000			
Landfill/Transfer Station			\$100,000			
Backhoe (2011) JD	010	10	\$150,000	2031	BACK-A0001	
Rescue #4 @ Stn #4 Warsaw(2001)	016	20	\$170,000	2041	VANS-A0002	
Wayfinding Implementation			\$30,000			
Office/Town Hall Painting (2010)		10	\$30,000	2030	FNSH-A0003	
Back Dam (ORCA 90% of \$300,000 if no funding)			\$45,000			
Software Build(2018)		3	\$10,000	2024	SOFT-A0001	
Douro Ice Resurfacer (2010)		10	\$85,000	2035	RSFC-A0001	
#20 Truck Roads (2007)	003	10	\$300,000	2031	DPTK-A0006	
Public Works Facility (2019)			\$3,000,000			
Back Dam (ORCA 90% of \$300,000 if no funding)			\$90,000			
Grader Champion (2000)			\$450,000			
				\$4,776,163		
2022						
Road Deficit (4.16% of 2021 Levy)			\$208,615			
AMP Phase II (1.3% of 2021 Levy)			\$65,192			
#19 Roads Truck 4WD (2007) 1 Ton	024	10	\$80,000	2032	TRCK-A0004	
2 Fire Pontoon Boats (2012)		10	\$26,500	2032	BOAT-A0004,A0003	
SCBA Packs with Bottles (22) plus 40 Bottles		15	\$183,000	2037	SCBA-A0001,2,3,4,5,6	
Loader JD 2007	006	15	\$200,000	2037	LODR-A0001	
Back Dam (ORCA 90% of \$300,000 if no funding)			\$45,000			
Sweeper - 2007		15	\$20,000	2037	SWPR-A0001	
Ice Resurfacer - 2012 Warsaw		10	\$85,000	2037	RSFC-A0002	
Mower - Parks MOWR-A0001(2012)		10	\$14,000	2032	MOWR-A0002	

Zoning By-Law (with in 2 years of OP)		5	\$80,000		2029			
				\$1,007,307				
2023								
Road Deficit (4.16% of 2022 Levy)			\$208,615					
AMP Phase II (1.3% of 2022 Levy)			\$65,192					
Generator - Used for Emergencies (2003)		20	\$69,000		2038	GNTR-A0002		
JD Ditching Machine (2014) Excavator		10	\$286,000		2033	HHOE-A0001		
Back Dam (ORCA 90% of \$300,000 if no funding)			\$45,000					
Council iPads/Notebook		4	\$10,000		Term of Council			
Grader Volvo -2007		20	\$450,000		2042	GRDR-A0002		
				\$1,133,807				
2024								
Road Deficit (4.16% of 2023 Levy)			\$208,615					
AMP Phase II (1.3% of 2023 Levy)			\$65,192					
Sotware Upgrade		3	\$10,000		2027	SOFT-A0001		
Pumper#1 @ STN #1 Donwood (2004)	020	20	\$350,000		2044	PMPR-A0005		
Brush Head (2014 - rebuilt)		5	\$15,000		2024	BHED-A0001-2		
Website (2020)		4	\$20,000		2028			
				\$668,807				
2025								
Roads Capial			\$200,000			This in additional to AMP report		
AMP Phase II (1.3% of 2024 Levy)			\$65,192					
Bunker Gear (18 sets) - 2015		10	\$42,000		2035	BKGR-A0001,2 4,5		
#22 Truck-Roads - 2010	019	10	\$300,000		2035	TRCK-A0006 sb DPTK		
Fire Chief Truck (2020)	021	5	\$45,000		2030	TRCK-A0013 NEW		
Rescue Trck #4 - Was Fire Chief 1/2 Ton Truck (2020)		5	Move to Warsaw FH			TRCK-A0012		
Computers/Laptops (2019)		5	\$40,000		2030	HARD A0012, LPTP A0003		
Computer Server (2020)		5	\$25,000		2030	SRVR-A0001		
Tractor - Roads (2000)		10	\$68,000		2030	TCTR-A0001		
				\$785,192				
2026								
Roads Capial			\$200,000			This in additional to AMP report		
AMP Phase II (1.3% of 2025 Levy)			\$65,192					
Bunker Gear ( 28 sets) - 2016		10	\$65,000		2036	BKGR-A0001,2 4,5		
Packer Wheelbuddy - 2006		20	\$15,000		2046	PCKR-A0003		
Bush Hog - 2006		20	\$25,000		2046	BHOG-A0001		
Wayfinding sign replacement		5	\$15,000					
Pumper #4 @ Stn #4 Warsaw	024	20	\$350,000		2046	PMPR-A0006		
				\$735,192				
2027								
Roads Capial			\$200,000			This in additional to AMP report		
Balance of Assets not on 25 year forecast			\$50,000			This in additional to AMP report		

Landfill/Transfer Station			\$100,000					
#23 Roads Truck (2011)	025	10	\$300,000		2037	TRCK-A0009 sb DPTK		
Postage Meter (2020)		7	\$8,000		2029	PSTG-A0001		
Computer Software Upgrade- entire program (2018)		10	\$100,000		2038	SOFT-A0002		
Photocopier - (2020)		7	\$10,000		2030	PNTR-A0001		
Council iPads/Notebook		4	\$10,000		Term of Council			
				\$778,000				
2028								
Roads Captial			\$200,000			This in additional to AMP report		
Balance of Assets not on 25 year forecast			\$50,000			This in additional to AMP report		
Website(2024)		4	\$20,000		2032			
Bunker Gear - 3 sets		10	\$7,500		2038	BKGR-A0001,2 4,5		
				\$277,500				
2029								
Roads Captial			\$200,000			This in additional to AMP report		
Balance of Assets not on 25 year forecast			\$50,000			This in additional to AMP report		
#25 Truck Rds (2015)		10	\$300,000		2039	TRCK-A0012 -sb DPTK		
Brush Head (2024)		5	\$15,000		2033	BHED-A0001		
Dump Truck (2019)		10	\$300,000		2038	Was DPTK-A0005		
Zoning By-Law (with in 2 years of OP)		5	\$80,000		2034			
Chipper (2009)		20	\$46,000		2049	CHPR-A0001		
				\$991,000				
2030								
Roads Captial			\$200,000			This in additional to AMP report		
Balance of Assets not on 25 year forecast			\$50,000			This in additional to AMP report		
Fire Chief 1/2 Ton Truck (2020)		5	\$50,000		2035			
Resuce Trck #4 - Was Fire Chief 1/2 Ton Truck (2025)		5	Move to Warsaw FH			TRCK-A0006		
Tractor Roads (2020)		10	\$68,000		2040	TCTR-A0001		
Computer Server (2025)		5	\$25,000		2035	SRVR-A0001		
Software Build		3	\$10,000		2033	SOFT-A0001		
Medi #1 @ Stn #1 - Donwood (2015)	010	15	\$40,000		2045	VANS-A0001		
Computers/Laptops (2025)		5	\$40,000		2035	HARD A0012, LPTP A0003		
				\$483,000				
2031								
Roads Captial			\$200,000			This in additional to AMP report		
Balance of Assets not on 25 year forecast			\$50,000			This in additional to AMP report		
#27 Truck Roads (2017)	003	10	\$300,000		2041	DPTK-A000		
Backhoe (2021) JD	010	10	\$130,000		2041	BACK-A0001		
Wayfinding sign replacement		5	\$15,000		2056	FLST-A0001		
Douro Ice Resurfacer (2021)		10	\$85,000		2035	RSFC-A0001		
Council iPads/Notebook		4	\$10,000		Term of Council			

Filing System - Upstairs (2006) FLST-A0001		25	\$13,000	\$803,000				
2032								
Roads Capital			\$200,000			This in additional to AMP report		
Balance of Assets not on 25 year forecast			\$50,000			This in additional to AMP report		
Medi #5 @ Stn # 5 Lake (2017)	011	15	\$40,000		2047	VANS-A0003		
Water Tank for Roads Vehicle - 2012		20	\$30,000		2052	TANK-A0002		
2 Fire Pontoon Boats (2022)		10	\$26,500		2042	BOAT-A0004,A0003		
#19 Roads Truck 4WD (2022)	024	10	\$80,000		2042	was TRCK-A0019		
Website (2028)		4	\$20,000		2036			
Ice Resurfacers - 2022 Warsaw		10	\$85,000		2037	RSFC-A0002		
Pumper #3 Stn 3 Pine Grove (2012)		20	\$350,000		2052	PMPR-A0008		
Mower - Parks MOWR-A0001(2022)		10	\$14,000		2042	MOWR-A0002		
				\$895,500				
2033								
Roads Capital			\$200,000			This in additional to AMP report		
Balance of Assets not on 25 year forecast			\$50,000			This in additional to AMP report		
Ditching Machine (2023)	021	10	\$286,000		2042	HHOE-A0001		
Software Build		3	\$10,000		2036	SOFT-A0001		
4 Water UV Systems		15	\$15,000		2048	WTSY-A0003-4-WTEQ-A0002		
				\$561,000				
2034								
Roads Capital			\$200,000			This in additional to AMP report		
Balance of Assets not on 25 year forecast			\$50,000			This in additional to AMP report		
Zoning By-Law (with in 2 years of OP)		5	\$80,000		2039			
Postage Meter (2027)		7	\$8,000		2034	PSTG-A0001		
Photo Copier (2027)		7	\$10,000		2035	PNTR-A0001		
Brush Head		5	\$15,000		2039	BHED-A0001		
				\$363,000				
2035								
Roads Capital			\$200,000			This in additional to AMP report		
Balance of Assets not on 25 year forecast			\$50,000			This in additional to AMP report		
Bunker Gear (18 sets) - 2025		10	\$45,000		2045	BKGR-A0001,2 4,5		
Filing System Upstairs (2010)		25	\$10,000		2060	FLST-A0002		
Truck Rds - 2025		10	\$300,000		2045	DPTK-A000		
Computers/Laptops (2030)		5	\$40,000		2040	HARD A0012, LPTP A0003		
Computer Server (2030)		5	\$25,000		2040	SRVR-A0001		
Fire Chief 1/2 Ton Truck		5	\$50,000		2035	TRCK-A0014 NEW		
Council iPads/Notebook		4	\$10,000		Term of Council			

Resuce Trck #4 - Was Fire Chief 1/2 Ton Truck (2030)		5				TRCK-A0013		
				\$730,000				
2036								
Roads Capital			\$200,000			This in additional to AMP report		
Balance of Assets not on 25 year forecast			\$50,000			This in additional to AMP report		
Bunker Gear ( 28 sets) - 2026		10	\$70,000		2046	BKGR-A0001,2 4,5		
Software Build		3	\$10,000		2041	SOFT-A0001		
Website(2032)		4	\$20,000		2040			
Filing System Downstairs (2012)		25	\$55,000		2061	FLST-A0003		
				\$405,000				
2037								
Roads Capital			\$200,000			This in additional to AMP report		
Balance of Assets not on 25 year forecast			\$50,000			This in additional to AMP report		
Roads Truck (2027)	025	10	\$300,000		2047	DPTK-A000 - was TRCK-A0009		
Sweeper (2017)		15	\$15,000		2052	SWPR-A0001		
Loader (2022)		15	\$200,000		2052	LODR-A0001		
Sotware Build		3	\$10,000		2039			
Street Lights - 80 units		25	\$100,000		2062	STLT-A0001		
SCBA Packs with Bottles (22) plus 40 Bottles		15	\$183,000		2037	was SCBA-A0001,2,3,4,5,6		
Tanker #4 @ Stn #4 Warsaw (2017)	017	20	\$320,000		2056	TNKR-A0001		
				\$1,378,000				
2038								
Roads Capital			\$200,000			This in additional to AMP report	189000	
Balance of Assets not on 25 year forecast			\$50,000			This in additional to AMP report		
Official Plan - (2028)		5	\$50,000		2043			
Photo Copier - (2028)		5	\$10,000		2043	PNTR-A0001		
Generator - Used for Emergencies (2003)		20	\$69,000		2058	GNTR-A0002		
Bunker Gear - 3 sets		10	\$7,500		2038	BKGR-A0001,2 4,5		
				\$386,500				
2039								
Roads Capital			\$190,000			This in additional to AMP report		
Balance of Assets not on 25 year forecast			\$50,000			This in additional to AMP report		
Truck Rds (2029)		10	\$300,000		2049	DPTK-A000 was TRCK-A0012		
Software Build		3	\$10,000		2042			
Zoning By-Law (with in 2 years of OP)		5	\$80,000		2044			
Brush Head		5	\$15,000		2044	BHED-A0001		

				\$645,000				
2040								
Website(2036)		4	\$20,000		2044			
Tractor - Roads (2020)		10	\$68,000		2050	TCTR-A0001		
Fire Chief Truck 1/2 Ton		5	\$50,000		2045	TRCK-A0015 NEW		
Pumper @ Stn #2 Douro		20	\$350,000		2060	PMPR-A0004		
Computer Server (2035)		5	\$25,000		2045	SRVR-A0001		
Office/Town Hall Painting (2030)		10	\$40,000		2050	FNSH-A0003		
Tanker @ Stn #1, Donwood (2020)		20	\$350,000		2057	TNKR-A0002		
Stn #5 - Lake (2018) Mini Pumper	022	20	\$350,000		2059	TNKR-		
Computers/Laptops (2035)		5	\$40,000		2045	HARD A0012, LPTP A0003		
				\$1,293,000				
						2990000		
2041						650000		
Rescue #4 @ Stn #4 Warsaw(2021)	016	20	\$170,000		2061	VANS-A0002		
Truck Roads (2021)	003	10	\$300,000		2051	DPTK-A000		
Douro Ice Resurfacer (2025)		15	\$82,000		2055	RSFC-A0001		
Backhoe (2021) JD	010	10	\$150,000		2051	BACK-A0001		
Postage Meter (2034)		7	\$8,000		2034	PSTG-A0001		
Photo Copier (2034)		7	\$10,000		2035	PNTR-A0001		
				\$720,000				
2042								
Grader -(2022)		20	\$450,000		2057	GRDR-A0002		
Douro CC Roof		25	\$40,000		2067	ROOF-A0003		
Ice Resurfacer - 2012 Warsaw		15	\$89,000		2057	RSFC-A0002		
2 Fire Pontoon Boats (2022)		10	\$26,500		2052	BOAT-A0004,A0003		
Roads Truck 4WD (2022)	024	10	\$80,000		2052	TRCK-A000		
Grader Volvo -2022		20	\$450,000		2042	was GRDR-A0002		
Software Build		3	\$10,000		2045			
Ditching Machine (2023)	021	10	\$286,000		2052	HHOE-A0001		
				\$1,431,500				
2043								
Council iPads/Notebook		4	\$10,000		Term of Council			
Official Plan - (2038)		5	\$50,000		2048			
				\$60,000				
2044								

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**Overview:**

The following information is provided in response to the following Resolution:

**Resolution Number 158-2020**Moved by: Councillor WatsonSeconded by: Councillor Landsmann

That the Public Meeting for the 2020 Budget set for May 5, 2020 at 6:00 p.m. continue as outlined in the Notice with suggestions from staff on possible postponement of some items. Carried

**Conclusion:**

**Roads Capital – Jake Condon, Acting Manager of Public Works**

Tandem Truck - \$300,000 – Funded with Reserves

The following are some points to support the replacement of truck #15 and the purchase of a new tandem.

- The tandem truck is a 2005 which is the oldest truck in the fleet.
- The truck has been deferred in the past due to budget restraints. The recommended lifecycle of a tandem truck is 10 years as you will see it is now 5 years past the recommended service life cycle.
- We have a truck and other pieces equipment due to be replaced next year, if we defer we will possibly be deferring another truck or equipment causing a snowball effect in the coming years.
- It is my recommendation to replace the tandem prior to it requiring expensive repairs and while still having a good opportunity to retain resale value.

Mesh/GPS Project – \$41,500 – Funded with Modernization Funding - Harold, Jake, Vanessa and Darlene have been working on this project for over a year. We have purchased I-pads for the roads staff and are now working with MESH to finalize the asset data.

Fuel Pumps - \$50,000 – Funded with OCIF Funding - Public Works has the same concerns in the case of an extended emergency event, will we be able to access fuel during this time and will there be enough fuel to go around to all the different agencies.

For operations, we typically fuel equipment and vehicles at the start of the day or the end of the day at the Warsaw garage. If we have to drive to County PW Depot in Douro daily to do so, this will add to travel costs and wages.

The start and end times for our jobs will also be affected to allow for refueling, basically shortening the work completed daily.

Periodically we leave equipment on the jobsite and refuel using our portable tanks. When the operator is driven to the jobsite in the next morning it is refueled, this would add extra travel time and wages.

We are based out of Warsaw, it is not a good use of resources to be travelling out of our way daily to refuel.

Fuel Pumps: - Chuck Pederson, Fire Chief

A couple questions I have for the County conversations is the capacity to supply PW and Fire during a long-term emergency event, including the potential to provide fuel to Hydro One in the event of an ice storm or tornado event where other sources are not available due to the conditions. Would we get bumped because we are secondary if push came to shove?

Operationally for Stony Lake Fire Station to drive to County PW in Douro to get fuel adds 45 minutes to their time. Where all calls are minimum 1 hour, this would most certainly be bumped to two hours pay. This also takes primary fire apparatus out of its response zone and if we get a fire call when vehicles are 20+ minutes away, this is not a good response plan. Warsaw Fire Station is the busiest fire station with the greatest number of vehicles and this will add 20 minutes to their fuel trips.

Travel costs and response risk needs to be considered before a decision such as this is made

Contact has been made with county representatives to set up a time to discuss this fuel pump topic but that hasn't taken place yet due to COVID-19.

### **Clerk/Planning Department Capital - Crystal McMillan Clerk/Planning Coordinator**

- Audio equipment for Council Chambers -\$15,000 – This has already been ordered (will be sending an email to get an update on when it can be installed). This project was approved under the modernization funding so it does not really impact the budget
- Hamlet/Welcome signs - \$11,546 – Funded with reserves - ordering/installing is complete. This item was carried forward from previous years – the signs were ordered at the end of 2019 and the Public Works Department installed them early 2020. Whatever money left in the budget (if any) would normally be used to purchase more signs, however we do not have to order any this year if there is no money left in the budget or if this is an item that Council would like to flag to defer to another year.

**Building Department: Brian Fawcett, Building Official**

- 1) Building permit website upgrades are underway and nearing completion – can not be deferred
- 2) Vehicle Purchase agreement to purchase has been approved and the purchase is underway – can not be deferred

**Fire Department: Chuck Pederson, Fire Chief**

Apparatus - Rescue Van #5 – Mini Pumper (2018) \$275,000 (Awarded Dec 2019), Tanker \$275,000,

Pumper \$375,000, Medi 4 \$50,000

I have 4 fire vehicles being replaced, one was awarded in December, three others are being worked on to tender. The tanker and pumper need to be replaced to maintain our tanker shuttle accreditation requirements and these vehicles need replacement due to operational performance concerns. The pick-up truck is due to keep the cycle of replacement spread out between Chiefs truck and Station 4 truck as one impacts the other - if any apparatus has to be deferred, it should be pick-up truck. If the new tanker doesn't arrive in 2020 due to build time, we will be able to put it in 2021 budget.

Extrication tools \$17,000 – These have already been ordered - this is a single combination tool to replace a set that is 20 years old and way behind the times with advanced metals in today's vehicles.

Fire Nozzles \$20,000 - testing of replacement nozzles are being done now and the reason for the replacement are due to standards with newer home construction and furnishings that our attack line nozzles do not meet the minimum flow rates for. I would recommend replacement of these as soon as possible.

Communications \$73,000 – Funded with Modernization Funding - Portable radios are all in service now, mobile radios have been purchased and most have been installed - with the exception of one waiting for installation and others on hold due to vehicle replacements as well as station base radios waiting for installation. iPads are purchased, mounts and installation are waiting for installation

Donwood Fire Hall Furnace \$10,000 – Funded with AMP II Reserve - I was planning on replacing the Donwood Fire Hall furnace for a couple reasons, the main one being that it hangs from the ceiling above the tanker and a new tanker will not fit in the space with the furnace in that location - this is also why more money is needed as we will have to change some duct-work too. The second reason is for efficiency - the furnace is quite old and uses oil. We already have natural gas to the building for the generator, so it would be much more efficient to switch to Natural gas

### **Parks & Recreation: Vicki Halim, Manager Parks & Recreation**

Given the closure of our Community Centres, Parks and playgrounds COVID-19 has had an impact on the community, the staff, and the revenue to the municipality. The Department offers some suggestions for deferring our original Capital Budget requests during these times.

We may not have parks and facilities used for months so there should also be consideration to proceed with projects as there is opportunity to do so without the restrictions of rentals/bookings to work around.

As indicated on the spreadsheet, the Department feels it is essential to move forward on the mechanical projects as these are necessary and overdue operational items.

- Dehumidifier Douro CC \$40,000
- Compressors Douro CC \$20,000, Warsaw CC \$12,000
- Brine Filter Douro CC \$4,000
- Glycol Loop Warsaw CC \$30,000

Our current provider, CIMCO would be able to complete these projects with the allowance of 1-2 people at our facilities.

Painting: Douro \$24,500, Warsaw \$20,000 - The Department would like to proceed with cosmetic improvements but focusing on one facility. Staff has started working on interior painting of the lobby and dressing rooms, and sanding and staining of benches at the Douro Community Centre. We would like to continue with hiring a contractor to paint the inside of the arena facilities in the stands, as this is a carried over project that was not completed.

Flooring: Douro CC \$33,000, Warsaw CC \$58,000 - We would also like to move forward on the replacing of the flooring at Douro CC at this available time. Again, the Department would like to focus on one facility, and is willing to defer the Painting and Flooring at the Warsaw Community Centre at this time. This would allow for the Township to stagger the facility improvements for less impact in one year. The Warsaw Flooring was funded with Gas Tax. If this project is delayed until 2021, the Gas Tax Funding could be used for the Tile Drainage Project.

Tile Drainage \$50,000 - Should the Parks not open up for the duration of the summer, Staff feel that right now, this season would give the best opportunity to undertake the tile drain and infield clay project. As noted above Gas Tax Funding could be used for this project if the Warsaw CC flooring is postponed. Less money would need to be used from tax dollars. This would give us an opportunity to put more into reserves as Council seemed to be comfortable with the suggested tax rate increase.

Rec Master Plan - \$18,500 (From 2018), \$6,500 - The Capital Projects in reference to the Rec MasterPlan, could also be deferred until the Committee regroups and prioritizes moving forward on such items. If this money is left in the budget it will be available to the Committee when it is possible to continue with the project.

**PARKS & RECREATION 2020 CAPITAL**

<b>REQUESTS</b>	<b>YEAR</b>	<b>AMOUNT</b>	<b>Impact due to COVID-19</b>
Community Board /with map of Facilities	Carried over from 2018	\$3,000	Master Plan project - willing to defer for now
Additional Staff Time	Carried over from 2019	\$18,500	Willing to defer, reassess with committee
Painting Walls/Bleachers	Carried over from 2019	\$19,500	Important to move forwards on
Tables & Chairs	Carried over from 2019	\$14,730	Replace only as needed, later in the year
<b>DOURO CC</b>			
Additional funds for prep work on walls	2020 Requests	\$5,000	Needed addit. Funds to complete
2nd Desiccant Dehumidifier	2020 Requests	\$40,000	Important to move forwards on - Operational
Exterior Doors/frames	2020 Requests	\$10,000	Important to move forwards on, Noted as H&S concern
Compressor overhauls (50hp & 30hp)	2020 Requests	\$20,000	Important to move forwards on - Operational
Brine Filter	2020 Requests	\$4,000	Important to move forwards on - Operational
Replace Rubber Flooring, Dressing Rm/Hallway	2020 Requests	\$33,000	Would like to proceed
<b>WARSAW CC</b>			
Glycol loop	2020 Requests	\$30,000	Important to move forwards on - Operational
Interior painting of ice surface/stands	2020 Requests	\$20,000	Willing to defer
Exterior Doors/frames	2020 Requests	\$8,000	Important to move forwards on, Noted as H&S concern
Compressor overhauls (50hp)	2020 Requests	\$12,000	Important to move forwards on - Operational
Replace Flooring, Dressing Rm/Hallway/Lobby	2020 Requests	\$58,000	Willing to defer
<b>PARKS</b>			
Tile drain and infield clay South Diamond	2020 Requests	\$50,000	Would like to proceed



Picnic Tables	2020 Requests	\$9,000	Willing to defer, should parks continue to be closed
Parks & Rec Master Plan - implementation	2020 Requests	\$6,500	Willing to defer, reassess with committee
<b>\$361,230</b>			

**Library:**

Ramp: \$61,734 - The largest items in the Library capital budget is the ramp through the accessibility plan. This is a funded project. The funds are to be spent by the end of May.

**Miscellaneous Items: Darlene Heffernan, Treasurer**

Historical Committee – Lime Kiln \$8,000 Funded with Tax Dollars – This project is close to being complete. If we delay this will we need to put more in the 2021 budget in order to complete this project.

Wayfinding Program \$12,250 Wayfinding Project – This project has been deferred by Peterborough and the Kawarthas Economic Development (PKED) but they hope to run it in 2021. This money can be put into reserves to be prepared for 2021.

Warsaw Sun Project- \$5,000 Warsaw SUN Program – These funds have already been provided in 2019, the funds came from the Mainstreet Grant program administered by AMO on behalf of the Province, the Warsaw SUN Project will be expanding in 2020 to include the Warsaw Back Dam Park for an additional rain garden.

Sidewalks in Warsaw (Approx.) \$27,500 - The funds for this project is from the Mainstreet Grant program administered by AMO on behalf of the Province, this work needs to be completed by October 31 of 2020.

**Administration: Martina Chait-Hartwig, Acting C.A.O., Darlene Heffernan - Treasurer**

Postage Meter (moved from 2017) \$6,000 – Funded with Reserves - This item will continue to be moved forward until such a time as the machine shows signs of failure. It is essential that we have a working postage meter to allow for mail to be sent including notices and tax bills.

Photocopier – (moved from 2018) \$10,000 – Funded with Reserves - This machine is vital to the operation of the Township and the procurement of a new machine needs to go forward. The current machine experiences numerous issues and is no longer meeting the needs of the corporation.

Paint Town Hall – \$10,000 - Funded with Reserves - Council reduced this project for 2020 to just the painting of the Townhall. At this time the Townhall is not looking it's

best and a repairs to the walls and a new coat of paint will refresh the space and encourage rentals. It is a perfect time to get this job completed when it doesn't have to be scheduled around bookings.

Website Update – \$50,000 – Funded with Efficiency Funding - This project cannot be deferred, the Covid-19 pandemic has shown how important a Township website is to distribute information to the public and local businesses. Our current site does not provide us the features we need such as the ability to create on demand pop-up messages, digital newsletter subscriptions, new pages within the website and many others. Further, the site will be out of compliance with accessibility regulations in January 2021

### **Recommendation:**

That the Treasurer-2020-09 report, dated April 28, 2020 regarding 2020 Capital Items – Managers Comments be received and that Council continue with passing of the proposed budget which includes a 3.76% residential tax rate increase.

Reasons to continue with budgeted Capital Purchases/Projects:

- There are several capital projects that have been moved forward from 2018 & 2019.
- Managers have started quite a few capital projects.
- Most of the capital purchases/projects are funded without tax dollars.
- Leaving Capital Purchases/Projects in the 2020 budget will ensure the money is available when we can move forward. If for some reason a purchase/project cannot be completed in 2020 the funds will be moved to 2021.
- Making changes that affect the proposed tax rate increase would mean delaying the passing of the 2020 budget. The tax rate by-law would need to be changed. All rates would have to be changed in Diamond. This would delay the ability to input the Township tax rates into OPTA which will delay the freezing of the tax rates, which will delay the process for all Township's. The due dates for the Township's final tax bills are June 30<sup>th</sup> and September 30<sup>th</sup>. We would need to start the billing process mid-May in order to have the bills in the mail in time for the June 30<sup>th</sup> due date.

### **Financial Impact:**

The proposed budget will provide a \$5,486,499 levy.

### **Strategic Plan Applicability:**

This recommendation is consistent with the adopted Strategic Plan Goals for every department of the Township:

- Infrastructure
- Recreation and Culture

- Effective Administration
- Public Works
- Economic Development and Community Promotion
- Environmental

**Sustainability Plan Applicability:**

Not applicable.

RECEIVED APR 27 2020

RECEIVED APR 27 2020

CRYSTAL McMILLAN TOWNSHIP CLERK

DOURO DUMMER TOWNSHIP

RE - DALEVIEW ROAD

Dear Crystal,

As residents of Daleview Road for over 60 years we have enjoyed residing here, and had been proud to call this street "home". However, with the state of our road for the past years we have been very disappointed and almost ashamed when friend and family member ask "Why is your road so bad?" With all respect, what are you doing with our tax dollars? Our road is probably the worst maintained in the Donwood area. In that regard we are strongly requesting that as Daleview Road is in the budget as a project to be resurfaced that it be accomplished this year. We understand that the "Covid-19" may make this more difficult, but please try to give us a top priority. We know that all the homeowners will be happy to call our street "home" once more.

Thank you for your consideration.

Be safe and healthy

Ken and Lois

*The Broadhursts*



First, I hope everyone is safe and healthy with this pandemic that we are facing!

With regards to the issue of Daleview Rd. rebuild, I am a resident at [REDACTED] Daleview, Steve & Connie Carveth. We have endured this problem for 2+ yrs now. We feel that we need this issue addressed, for over this time we have put up with a pothole and dusty enviroment. During the summer we cannot enjoy sitting out in front of our houses because of the dust, we cannot use our clothes lines due to the dust, and choose not to clean the outside of house windows or our vehicles or in that fact anything due to the dust.

The potholes are another issue, winter time it is terrible and cannot be graded and summer we could have it graded every week ( but its not)

We know its a trying time right now but as residents of Daleview we have put up with this for a long time. I do not want to go into details but we had a tar\stone surface for years until it was removed for some unknown

reason. At that time we assumed they were going to resurface the road, but then other issues came into play and so we are where we are now.

One important fact that I would like to inform you, ever since this pandemic hit, the traffic load has decreased dramatically which would explain why our road has stood up so well since the last time it was graded approx. 1-2 months ago

One of the reasons we need this road completed is due to the amount of traffic that goes through here on a daily basis.

As a resident all we ever wanted was to have a new surface put back on to replace the 1 they removed.

We know things have changed due to the pandemic but we feel Daleview Road needs to be done this year as a whole project. With less traffic that would mean less disruptions for other drivers that use this as a through way.

I am sure most residents feel the same.

**From:** Marie Crawford <[REDACTED]>  
**Sent:** Sunday, April 26, 2020 1:27 PM  
**To:** Crystal McMillan <crystal@dourodummer.on.ca>  
**Subject:** Daleview Road

Hi Crystal,

We live on Daleiview Road and have been dealing with a continuous cycle of potholes since we bought our home in Oct of 2018.

We have never reached out to anyone about this issue but were told by our neighbors that our road was supposed to be paved in July of 2019. That date came and went so we were hopeful that our road was scheduled to be paved this summer and we would finally have a road in decent condition.

We were speaking with another neighbor recently and she mentioned that not only was our road not scheduled to be paved this year, the tender process had not even begun. As we understand, the lack of a tender means there could potentially be too little time now to have the process completed and road work done for this year.

As tax-paying citizens who have been waiting too long for a safe road already, we feel it is time to make the repairs and paving of Daleview Road a priority. We have been on this pothole cycle for too long - we deserve a decent road asap.

Sincerely, Marie Crawford and Gary Titus [REDACTED]

**From:** ardie <[REDACTED]>  
**Sent:** Monday, April 27, 2020 11:44 AM  
**To:** Crystal McMillan <crystal@dourodummer.on.ca>  
**Subject:** Daleview Rd re-alignment

Our biggest concern is the constant dust from the gravel that was installed last summer. We do not have A/C so opening the windows is a must. As a result the house is constantly full of dust and grit.

Counsellor Heather Watson listens to our concerns; but obviously doesn't control the work to be done on our street.

At the last road meeting at the fire hall, Deputy Mayor Karl Moher stated that this work would be done and it would be done right. What is the time line for this project?

I have cut the grass and weeds on the dividing bank from 780 to 796 for the past 30 years. There was also a row of small trees which provided shade. This was reduced to a row of stumps which are now producing sucker growth and large thorns.

We are concerned that this work will be delayed due to Covid 19 or the reallocation of the funds for this project to other areas.

Valera Jacob and Greg Nelson







On Thu, Apr 23, 2020 at 10:29 PM David M. MacRae < > wrote:

Dear Ms. Watson,

We too hope that you and your family are well in these unusual times. Thank you also for sending out the notes on the capital budget matters (**ref: Capital Budget Docs [posted online](#)**).

Having read the notes, I was struck by the absence of any mention of the White Lake Road East (WLRE) rebuild in the capital plan.

However, I do note that the 10-year plan for D-D roads (Revised Dec 2019) that is on the Twp website at <https://tinyurl.com/y83c5wqh> (and attached here) reflects the intention expressed in Resolution Number 280-2019 passed on Aug 6, 2019 (see below). That resolution called for consideration of moving the rebuild of WLRE forward to 2021, with completion of the surface treatment on 2022 as part of the budget deliberations.

The 10-year plan on the Twp website now confirms that WLRE will be subject to a proper road-bed rebuild in preparation for a Double Surface Treatment in 2021, and a Double Surface Treatment to be completed in 2022. Based upon the intention expressed in the aforementioned Resolution, and the subsequent revision of the 10-year plan attached here, I assume that we may now count on that plan being carried out.

Are you able to confirm this for us please? May we request that this item be included on the Agenda for formal confirmation at the May 5<sup>th</sup> 2020 Council Meeting?

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For those copied on this note, I have set out the history of Council deliberations and relevant Resolutions that relate to WLRE, along with some questions that should best be considered for clarification in the upcoming May 5th meeting.

### **Special Council Minutes, April 30, 2019**

David MacRae, was in attendance to make a presentation regarding the poor condition of White Lake Road East and to present a petition to Council requesting that White Lake Road East be rebuilt and a hard top surface be applied.

*Note added here: This petition augmented previous representations to members of the Twp staff and Councilor Landsmann regarding the inequity of treatment Golf Course Rd with respect to upgrading the latter to "Semi-Urban" based upon the number of properties per km when WLRE has a property count almost 4 times as great as GCR considering those properties dependent on WLRE for access.*

### **Council Minutes – June 4, 2019**

Report to Council – Petition to Add Surface Treatment to White Lake Road East

Resolution Number 210-2019 Moved by: Deputy Mayor Moher  
Councillor Landsmann

Seconded by:

That the report to Council, dated May 29, 2019, regarding the petition from White Lake Road East residents be deferred until the study of gravel roads is complete and presented to Council for review and analysis and further that a report with recommendations be brought back to Council on this issue in two to three months' time. **Carried**

### **Council Minutes – June 18, 2019**

David MacRae – Petition (*presentation copy attached here*) regarding White Lake Road East (WLRE)

Resolution Number 233-2019  
Landsmann

Moved by: Councillor Watson Seconded by: Councillor

That the presentation from David MacRae regarding a petition to request a hard top surface for White Lake Road East (WLRE) within 18 months, be received. **Carried**

### **Council Minutes – Aug 6, 2019**

Report to Council – Update to Road Maintenance Schedule for White Lake Road East

Resolution Number 279-2019  
Landsmann

Moved by: Councillor Watson

Seconded by: Councillor

That Council receive the report regarding the road maintenance schedule for White Lake Road East, dated July 30, 2019, and move to defer until after the special meeting on roads taking place on Thursday August 8, 2019. **Defeated**

- The referenced report (to my knowledge) was not made available for review prior to the meeting, and, unless I am mistaken, has never been published in an accessible form.
- No mention of White Lake Road East is made in the minutes of the Aug 8, 2019 meeting. Nor was it discussed while I was present.
- The Report is alleged to be available but can no longer be found here:  
<http://www.dourodummer.on.ca/wp-content/uploads/2019/08/7m-Other-White-Lake-Road-East-2.pdf>
- Is the latter report the above-mentioned “study of gravel roads”?

Resolution Number 280-2019  
Councillor Watt

Moved by: Deputy Mayor Moher

Seconded by:

That the report to Council, dated July 30, 2019, regarding the updated road maintenance schedule for White Lake Road East be received, that the Township of Douro-Dummer maintain its revised schedule to upgrade White Lake Road East to a surface treated road in 2022 and that the issue be brought up at capital budget time to see if it is possible to move up to 2021 instead. **Carried**

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**The additional comments and questions are the following:**

1. Referring to Resolution Number 210-2019 June 4, 2019 (above),
  - a. Where can the report on the “study of gravel roads” be seen?
2. I draw your attention to the potential downsides of a reduction in gravel application that now appears to be the adopted standard going forward. See the note to David Clifford of Sept 3, 2019 attached. Any consideration of gravel reduction flies in the face of the real-world knowledge and recommended maintenance standards for gravel roads such as WLRE. Reports submitted to the Twp, and even available online <https://aors.on.ca/?s=douro+dummer>, show that such knowledge has been communicated to the Public Works department by consultants contracted to the Twp. The question is whether the learning has been captured in subsequent decision-making.
  - a. While making decisions, does the Twp keep in mind the results of such quantitative studies towards which we the tax-payers have contributed?
3. I would be curious as to who is leading the charge regarding road projects. During the meeting on August 8<sup>th</sup>, the Mayor made it very clear that an advisory committee on roads was to be set up. At some time after the meeting, it was announced that David Clifford was stepping down, and that Harold Nelson was to retire. It would be interesting to know how that has affected planning, and in particular, how the needs of other roads like WLRE are now being carefully considered.
  - a. Is there still a regular schedule of the planned road committee meetings that were deemed to be absolutely essential in the above Aug 8<sup>th</sup> meeting discussions?
  - b. Who is on that committee?
  - c. Are minutes issued and available?

Thank you for your help with these matters,

Regards,

David MacRae

-----  
David M. MacRae

home  
cell

April 25 2020

Council of Douro Dummer Township,

Once again I find myself writing to the council due to the poor conditions of the road that I live on.

I am certainly supporting the Daleview Rd. project.

Truthfully, I don't expect that the road will ever be back in a satisfactory condition as it was when I moved in .....in 1998.

But really, I am hoping that in this crucial time of the Covid 19 virus that something can be done with the DUST on the road. As you know the virus does attack the lungs and as a medical professional I can assure you that breathing in dust day after day does not improve the lung health of the folks on this road.

To say nothing of the fact that our shrubs and houses are covered in dust. It is not worth washing our windows because they are covered in dust in a few hours. Also not able to hang out wash due to dust.

I implore you to do something ....I think we have been asking for a solution to this problem for a long enough time. We even voted in a new councillor in hopes that the issue would be worked on. This has been to no avail.

Please let me know what one must do to be listened to ....no not listened to.....we've done that....to get someone's attention.

We have issues with potholes, speed, DUST, and blatant disregard for our comfort and health.

I know that we are dealing with many issues at this time but some attention to the dust on this road cannot be such a big deal.

Thank you,

Susan Malan

**From:** Angela Oran [REDACTED] >  
**Sent:** Monday, April 27, 2020 1:37 PM  
**To:** Crystal McMillan <crystal@dourodummer.on.ca>  
**Subject:** Daleview Road project

Hi There

Please include these into virtual meeting which you will be having as comments.

My biggest concern is the holes on the road which do get fixed often. This does not really ever help the situation.

Also top concern is the dust, Vehicles use Daleview as a short cut and drive quite fast down the road causing dust. Front windows can never be left open and no point in ever washing your vehicle.

I also can't imagine this is healthy for people to be ingesting.

Thank you

Angela Oran  
[REDACTED]  
[REDACTED]

**From:** marjanpost < >  
**Sent:** April 23, 2020 2:12 PM  
**To:** Crystal McMillan <crystal@dourodummer.on.ca>  
**Subject:** FW: RE: Fwd: Daleview Road

Sent from my Samsung Galaxy smartphone.

----- Original message -----

**From:** marjanpost < >  
**Date:** 2020-04-22 7:09 p.m. (GMT-05:00)  
**To:** Leah L Thomson < >  
**Subject:** RE: Fwd: Daleview Road

Hi Heather

I so agree with Leah's letter. We have been here more than 30 years and the road hasn't been driveable for many many years. We have had many visitors who have commented about the bad condition of the road, and have asked "When are they finally going to fix your road?". It is especially bad after a rain fall, full with potholes, and of course bad for the shocks. It would be so appreciated if we can finally have a drivable road. Thank you for all your doing.

Marianne Posthumus

From: Leah L Thomson < >  
Sent: April 23, 2020 11:59 AM  
To: Crystal McMillan <crystal@dourodummer.on.ca>  
Subject: Attention Township Council

Dear Ms McMillan,

After attending last council meeting, virtually, I was especially concerned about the comment of Deputy Mayor Moher and the ultimate discussion around his comment concerning the budget to be discussed at the May 5 meeting. My primary concern lies around the Daleview Road project. If items have to be cut or delayed because of added costs of the Covid-19 or other unforeseen, I have two arguments as to why Daleview needs immediate attention and should not be cut this year.

The first is quite obvious...each year delayed adds a rise in prices for everything so the best bang for the township buck would be to have the need work done at 2020 prices.

The second reason is that because the road is so badly degraded and no major repairs done in over 40 years, sending a grader and a load of dirt does not solve the pothole problem for more than a couple of days or until the next rain. I am sure that if you look back on the books as to the costs of sending that grader, driver, load of dirt, the dump truck, driver and whatever else it took each time, those bandage fixes cost more than what it costs to fix the road properly.

I ask the council to stop this idiosyncratic hemorrhage of taxpayers' dollars and get this road done according to the engineering plans discussed at our last Daleview meeting!

Thank you.

Leah Thomson

Daleview



**From:** Andrew Waite <[REDACTED]>  
**Sent:** Friday, April 24, 2020 1:14 PM  
**To:** Crystal McMillan <crystal@dourodummer.on.ca>  
**Subject:** Daleview Rd. Project

Hi Crystal. I bought here in Fall of 2010. What I like about the area is it's location, closeness to highways, nice size lot and the Green Space Park behind my house. I am also fortunate to have good neighbors. HERES MY STORY.

Back then, the Rd. was paved but was in need of repair and water drainage issues needed to be addressed. I have a slope off the road, to my driveway sloping badly to the carport and garage. The water drains off the road and down my driveway as well as gravel, sand and a lot of water. Previous owner had a small drain (too small) but when rains were heavier the rain which came off the road, down my driveway in the garage and in the basement. I spent over \$3,000.00 and had a better drainage system installed. When it rains the gravel and sand from the road come down the driveway and in my drain. I worry about flooding because of the improper road water drainage not implemented. Every year we are told the road is getting resurfaced Next year the next year and so on. The road needs resurfacing and this would also stop the sand/gravel from coming down my laneway and clogging my drain and flooding. Also, if proper water drainage was installed at the top of my driveway, I would have a lot less of a chance of the road water adding to more water causing my drain to back up and water entering my house. I am waiting every year to see if the road will be done so I can fix my driveway. I was told by Vandibor paving better to wait till the roads done 1st. Because of the bad dip at the road end of my driveway when VanDeBor reconstructs the dip and slope before the Roads resurfaced 1st. When the Roads worked on I was told they would have to dig up what Vandebore did because legally Douro owns 12 ft. Down my laneway. Also, I stand to loose approximately \$2,500.00 when the townships digs up part of the driveway I had Vandebore construct. Harold couldn't guarantee they wouldn't come 12 feet down my laneway and returning my driveway the same way as I payed Vandebore for the reconstruction. Around 2017? I went out for a while and when I returned, the road was no longer asphalt, it was gravel. I couldn't believe what had happened. Lots of dust and potholes. Were not like the usual gravel road in the rural where most homes are far enough away from all the dust, our home are close. You can't open the windows. The road is .7 kms long, with 35 homes, yearly taxes of approximately \$72,000.00. I don't see any reason with the amount of yearly taxes payed out that we are asking too much in getting our road brought back to where it should be. Thanks for allowing me to voice my concerns.

**From:** Dave Conroy - The Little Building Company <[dave@littlebuildingcompany.ca](mailto:dave@littlebuildingcompany.ca)>  
**Sent:** April 28, 2020 11:32 AM  
**To:** Crystal McMillan <[crystal@dourodummer.on.ca](mailto:crystal@dourodummer.on.ca)>  
**Subject:** Indacom Drive

Hi Crystal,

I wanted to get this email in before the budget meeting just so council knows where we and Cathy from The Kawartha Buttertart Factory stand in terms of our vision for Indacom Drive.

We are going to continue to make improvements to our site and driveway in the hopes that we are putting our best foot forward for our clients and as representatives of our township and county.

We have a contract in place to plant 500 trees this spring and we have grand visions of a nicely landscaped property as a gateway to Douro-Dummer.

In line with this vision, we hope that the township will show continued support for this industrial park by planting trees along the sides of Indacom Drive and one day having a nicely finished road top.

I hope that the township shares our vision for this industrial park and can commit to this vision with the necessary budget.

Thank you,

Dave

Dave Conroy

The Little Building Company

705 874-1040 (office)

705 868-7484 (mobile)

[littlebuildingcompany.ca](http://littlebuildingcompany.ca)



**THE  
LITTLE BUILDING  
COMPANY™**  
PETERBOROUGH ONT

This memo is in response to comment received from the public regarding Daleview Road, Indacom Drive and White Lake Road East. Staff will also be available during the budget meeting to answer any questions that Council may have.

#### Daleview Road

This is a project to reconstruct Daleview Road. The design work as well as some brushing was completed in support of this project in 2019. Staff are working with our engineering firm D.M. Wills to prepare a tender for the reconstruction of the road and the application of a double coat of surface treatment.

#### Indacom Drive

In 2020 gravel will be applied to Indacom Drive to prepare it for future surface treatment and entrance work. In 2021 as per the 10 year Hard-Topping Projections, a double coat of surface treatment will be applied along with an asphalt entrance at the intersection with County Road 4. During this work, the sides of the road along with the ditches will have top soil applied with a mix of grass seed.

#### White Lake Road East

Council passed the following Resolutions:

August 6, 2020

##### **Resolution Number 280-2019**

Moved by: Deputy Mayor Moher

Seconded by: Councillor Watt

That the report to Council, dated July 30, 2019, regarding the updated road maintenance schedule for White Lake Road East be received, that the Township of Douro-Dummer maintain its revised schedule to upgrade White Lake Road East to a surface treated road in 2022 and that the issue be brought up at capital budget time to see if it is possible to move up to 2021 instead. Carried

September 3, 2019

##### **Resolution Number 329-2019**

Moved by: Deputy Mayor Moher

Seconded by: Councillor Landsmann

That Council receive the Memo regarding notes from the Special Council meeting on road issues keep on August 8, 2019, that Council approves of reducing one of

the construction projects for 2019 to provide additional resources to accommodate all of the recommendations in the plan; The project that is to be reduced in magnitude is Douglas Road; Staff will notify the residents of the change and that it is not removed but just spread over a couple of years;

That staff be requested to revise the long term construction schedule to accommodate the need for additional maintenance resources; staff will provide a draft of this for Council consideration; that the gravel resurfacing long term plan will be revised to reflect the change from 6 inches of gravel every 10 years to 3 inches of gravel every 5-7 years;

And that the Surface treatment long term plan will be revised to incorporate a grandfathering of existing hard surface roads into future plans to leave these surface treated roads; Staff will provide a revised plan to incorporate these roads; And Finally that it be included in the 2020 budget to hire an additional staff person (labourer) for the Public Works Department to assist in meeting the requirement for maintenance activities. Carried

In light of these Resolutions from Council, staff made adjustments to the 10 Year Hard-Topping Projections for the work to be performed on White Lake Road East to start in 2021. White Lake Road East is to be reconstructed in 2021 and a double coat of surface treatment is to be applied in 2022.

The 10 Year Hard-Topping Projections and the Gravel Roads Projections are both working documents and are adjusted annually to comply with the Roads Needs Study, the Surface Treatment Policy, Council direction and in light of available financial resources.

**Overview:**

Please find attached the annual well monitoring reports for the Warsaw Road, Stoney Lake Road and Halls Glen closed landfill sites.

From the reports there are no significant changes from previous years. All three reports state that "the groundwater level and chemical data do not indicate a significant anomaly from the results of previous years".

While in previous years new monitoring stations and wells have been requested, at this time no new monitoring locations are needed unless they run dry. Two locations may become an issue in the future, a background monitor at the Stoney Lake Landfill location and a surface water location at the Hall's Glen Transfer Station. In 2020 the residential wells for the Warsaw Road Landfill site will need to be tested as it will have been three years since their last test (2017).

**Conclusion:**

Our monitoring contract with GHD expired at the end of the 2019 monitoring cycle, staff inquired to see if a one year extension could be negotiated to cover the 2020 monitoring cycle. Please see the attached proposal from GHD which falls within the amount budgeted for the 2020 monitoring year and complies with our Procurement Policy – F2.

**Recommendation:**

That the C.A.O.-2020-14 report, dated April 24, 2020 regarding Transfer Station and Landfill Water Monitoring - 2019 for the Hall's Glen Transfer Station, the Stoney Lake Transfer Station and the Warsaw Road Landfill Site all be received for information and further that the proposal for the 2020 monitoring year be received.

**Financial Impact:** The cost of the 2020 monitoring program is \$38530.00 excluding H.S.T. and including the Township's portion of the H.S.T. the cost is \$39,208 which is slightly less than the \$40,000 which was budgeted.

**Strategic Plan Applicability:**

The continuation of the well monitoring while mandated by the MOECC it is also consistent with the Environmental Goal of the adopted Strategic Plan *"to preserve and enhance the natural heritage features and resources of the township"*.

**Sustainability Plan Applicability:**

Not applicable.



## 2019 Groundwater Monitoring Report

Halls Glen Landfill Site  
(PC of A A341004)  
Township of Douro-Dummer  
County of Peterborough

**GHD** | 347 Pido Road Unit 29, Peterborough, Ontario, K9J 6X7 Canada  
11193337 | 01 | Report No 1 | March 10, 2019



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Plate 2	Property Plan
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## 1. Introduction

The following report presents the results of the 2019 groundwater monitoring program that was completed for the Halls Glen Landfill Site in the Township of Douro-Dummer (formerly Township of Dummer) of the County of Peterborough. The monitoring program was conducted in accordance with the scope of work as presented by our proposal dated October 24, 2013 as well as additional requirements outlined in various Ministry of the Environment, Conservation and Parks (MECP) Memorandums.

## 2. Background

The Halls Glen Landfill Site is situated along the south side of County Road No. 6, 10km north of the community of Warsaw. The Geologic Plan, Plate 1, illustrates the location of the landfill with respect to nearby roads and watercourses. The location of the property is described as part of Lot 25, Concession 4 in the Township of Douro-Dummer.

Details regarding the operation of the landfill are outlined in the Provisional Certificate of Approval (PC of A) No. A 341004 dated October 8, 1980. The site also operates as a transfer station according to PC of A No. A 341007 dated October 25, 1991, and the amended Certificate of Approval (C of A) dated February 1, 2006 (see Appendix A). Two Memorandums were issued by MECP personnel in 2014 in response to reviewing the 2013 Groundwater Monitoring Report (see Appendix A).

A Memorandum dated June 23, 2014 provides commentary on the groundwater aspects of the 2013 monitoring program. A Memorandum dated August 7, 2014 presented comments relating to surface water. The MOE recommendations were implemented in the monitoring program in 2016. In general, the background data consisted of the following documents:

1. Current PC's of A issued by the MECP (Appendix A);
2. Excerpts from a report prepared by Hydroterra Limited regarding details of the monitoring well construction and borehole records (Appendix B);
3. MECP well record for monitor MW-7 that was installed in March, 1997 (Appendix B), MECP well records for monitors MW-8, 9, 10, 11 and 12 that were installed in the Fall of 2001 (Appendix B), MECP well record for monitor MW-13 (TW1-02) that was installed in October, 2002 (Appendix B)
4. Monitoring program and sampling protocol established for the landfill site by the former Township of Dummer (Appendix C); and
5. Reports prepared by Geo-Logic Inc./ GHD dated 1994, 1996 to 2006, 2009 to 2019 and AECOM Canada Ltd. dated 2007-2008 presenting the results of previous monitoring programs.



## 3. Site Conditions

### 3.1 General Geology

The site is situated in an area within the physiographic region known as the Dummer Moraine (Chapman and Putnam, 1984). This region is characterized by relatively flat, stoney ground covered with shallow deposits of glacial drift (till). Based on previous investigations, this material is covered locally by a layer of glaciolacustrine sand. Bedrock underlying the site consists of limestone belonging to the Lindsay Formation. The bedrock is part of the Trenton-Black River Group and is of Middle Ordovician age. Based on previous subsurface data, bedrock underlies the site at an average depth of 3.25m below the ground surface.

### 3.2 Existing Groundwater Monitors

In total, thirteen (13) groundwater monitoring stations were included during both monitoring circuits (spring and fall). The location of the monitors with respect to the property limits is illustrated on the Site Plan, Plate 2. Monitors MW 1, 2, 3, 4, 5, 6 and 7 consist of a 38mm diameter standpipe and a 50mm diameter piezometer, which have been constructed within a common borehole. Monitors MW 8, 9, 10, 11 and 13 consist of two (2) 50mm diameter piezometers with MW 12 having three (3) 50mm diameter piezometers that have been constructed within a common borehole. The monitoring stations are protected by a 150mm diameter steel locked well casing. In general, each monitor consists of a bedrock monitor and an overburden monitor with the exception of MW12 which has one (1) overburden monitor and two (2) bedrock monitors at different depths. Details pertaining to the construction of the monitoring wells are presented in Appendix B. A description of the monitoring station locations is summarized in Table 3.1.

During the summer of 2003, the landfill refuse area was prepared for closure. The landfill area was mounded and capped. It is our understanding that further work was conducted in 2004 and the work continued in 2005. Monitors MW-2 and MW-6 casing were extended to allow for the mounding of the landfill. Elevation data for these two (2) monitors have been calculated using past measurements of well depth compared to the 2004 recorded values.



Table 3.1 Monitoring Well Locations and Installation Dates

Monitor	Descriptive Location
MW 1-91 MW 13-02	up-gradient to existing landfill area
MW 2-91	within the central area of the refuse landfill
MW 3-91 MW 4-91 MW 5-91 MW 6-91 MW 7-97 MW 8-01 MW 9-01 MW 10-01 MW 11-01 MW 12-01	down-gradient of existing landfill

Note: See Site Plan for precise location of monitoring stations.

### 3.3 Pattern of Groundwater Movement

Groundwater monitoring was conducted during two sampling circuits in 2019. The water level data was acquired on May 30<sup>th</sup> and October 29<sup>th</sup>, 2019. The measurements are presented on Plate 5 and summarized in Table 3.2. Elevation data was not available for the monitor installed in October 2002 (MW-13). The ground water elevations for MW-2 and MW-6 for the monitoring circuits were adjusted to compensate for the extended casings using field measurements.

As is past monitoring events, monitors MW1-II, MW 2-I and MW2-II were dry during both sampling circuits while MW 5-II was dry for the fall circuit. The overburden groundwater monitoring data for May 2019 is presented on the Site Plan, Plate 2. Based on the data, the pattern of overburden and the deeper groundwater movement appears to be in a southeasterly direction.



Table 3.2 2018 Water Level Summary

Monitor Number	Elevation Top of Casing	Water Level Elevation	
		May 30, 2019	Oct. 29 2019
Overburden Monitors			
MW 1-II	271.24	dry	dry
MW 2-II	282.49	dry	dry
MW 3-II	269.23	268.47	268.02
MW 4-II	268.28	266.73	266.39
MW 5-II	271.35	268.52	267.19
MW 6-II	271.01	268.46	267.37
MW 7-II	269.03	267.00	266.63
MW 8-II	270.74	266.46	264.93
MW 9-II	267.25	266.27	265.72
MW 10-II	267.97	265.96	265.76
MW 11-II	268.50	265.94	265.75
MW 12-I	268.00	266.40	266.24
MW 13-II	na	na	na
Bedrock Monitors			
MW 1-I	271.24	268.54	268.42
MW 2-I	282.53	dry	dry
MW 3-I	269.23	268.02	267.41
MW 4-I	268.28	266.36	266.21
MW 5-I	271.35	266.83	266.78
MW 6-I	271.01	266.49	266.31
MW 7-I	269.03	266.33	265.77
MW 8-I	270.74	266.35	265.69
MW 9-I	267.25	266.59	266.31
MW 10-I	267.97	266.09	265.77
MW 11-I	268.50	266.11	265.92
MW 12-II	268.00	266.48	266.30
MW 12-III	268.00	266.59	266.35
MW 13-I	na	na	na

Notes: All measurements are presented in metres. Monitor top of casing elevations provided by TSH.  
(na) indicates information not available.



### 3.4 Horizontal Hydraulic Gradient

Horizontal hydraulic gradient is simply the slope of the water table or potentiometric surface. It is the change in hydraulic head over the change in distance between the two monitoring wells or  $dh/dl$ . In mathematical terms, horizontal gradient is rise over run.

$$dh/dl = \text{difference in head} / \text{horizontal distance between wells} = (h_2 - h_1) / L$$

All well locations were recorded using the Ministry of Natural Resources (MNR) Topographical mapping and plotted on the Site Plan, Plate 2. The distances between the wells were measured after plotting well locations on the MNR mapping for the site. Water level elevation was obtained from Table 3.2.

Overburden wells for the site are divided into shallow and deeper wells. Two gradients per monitoring period were calculated for each level of overburden wells for the spring monitoring period as most were dry during the fall. The average horizontal gradient for the shallow overburden wells was 9.7 m/km. The average horizontal gradient for the deeper overburden wells was 4.3 m/km. The results are summarized on Table 3.3.

Three gradients of bedrock wells were calculated for each monitoring period. The average horizontal gradient within the bedrock is calculated at 3.3 m/km. The results of the bedrock gradient analysis are summarized on Table 3.4.

Table 3.3 Hydraulic Gradient – Overburden Wells

Monitoring Wells	Shallow / Deep Spring / Fall 2019	Groundwater Elevation (m)	Distance Between Wells (km)	Hydraulic Gradient (m/km)
MW 3-II MW 4-II	Shallow / Spring	268.47 266.73	0.095	18.3
MW 3-II MW 7-II	Shallow / Spring	268.47 267.00	0.87	1.69
MW 6-II MW 11-II	Deep / Spring	268.46 265.94	0.28	9.0
MW 12-I MW 9-II	Deep / Spring	266.32 266.15	0.23	0.17
MW 3-II MW 4-II	Shallow / Fall	268.02 266.39	0.095	17.1
MW 3-II MW 7-II	Shallow / Fall	268.02 266.63	0.87	1.60
MW 6-II MW 11-II	Deep / Fall	267.37 265.75	0.28	5.79
MW 12-I MW 9-II	Deep / Fall	266.24 265.72	0.23	2.26
Average	Shallow		0.48	9.67
Average	Deep		0.26	4.31



Table 3.4 Hydraulic Gradient – Bedrock Wells

Monitoring Wells	Spring/Fall 2019	Groundwater Elevation (m)	Distance Between Wells (km)	Hydraulic Gradient (m/km)
MW 1-I MW 5-I	Spring	268.45 266.83	0.22	7.4
MW 7-I MW 8-I	Spring	266.33 266.35	0.38	0.1
MW 12-II MW 10-I	Spring	266.59 266.09	0.25	2.0
MW 1-I MW 5-I	Fall	268.48 266.78	0.22	7.7
MW 7-I MW 8-I	Fall	265.77 265.69	0.38	0.2
MW 12-II MW 10-I	Fall	266.35 265.77	0.25	2.3
Average	Spring		0.28	3.2
Average	Fall		0.28	3.4
Yearly Average				3.3

### 3.5 Hydraulic Conductivity

The hydraulic conductivity of a soil is described as a measure of the soil's ability to transmit water. Slug tests were performed in 2009 on two overburden and two bedrock wells in order to assess the permeability of the two layers present at the site. The results of the testing indicate that the overburden soils to be silty sand with a relatively high hydraulic conductivity. The bedrock results indicate this layer to be fractured limestone. Table 3.5 summarizes the results of slug tests performed at the site. The graphs of the hydraulic conductivity testing are presented in Appendix E.

Table 3.5 Hydraulic Gradient – Bedrock Wells

Location	Test Type	Hydraulic Conductivity (cm/s)	Geometric Mean K (cm/s)	Representative Aquifer
MW-3-1 MW-3-1	Falling Head Rising Head	6E-03 3E-03	10E-03	Fractured limestone Fractured limestone
MW-7-2 MW-7-2	Falling Head Rising Head	3E -02 2E-02	10E-02	Silty sand, clean sand Silty sand, clean sand
MW-8-2 MW-8-2	Falling Head Rising Head	2E-02 4E-02	10E-02	Silty sand Silty sand, clean sand
MW-8-1 MW-8-1	Falling Head Rising Head	4E-03 2E-03	10E-03	Fractured limestone Fractured limestone



## 4. Monitoring Program

GHD followed the established sampling and monitoring protocol for the Halls Glen landfill site during the 2019 season. Details of this protocol are summarized in Appendix C. An overview of the protocol is outlined below.

1. Field work to be carried out at all thirteen (13) monitoring stations during the spring and fall seasons.
2. Field work and sampling to be completed at four (4) residential wells during the spring and fall sampling period. Two (2) surface water stations to be sampled during both monitoring circuit.
3. Methane gas hydrogen sulphide generation was measured at each well using a portable multi-gas indicator.
4. Water levels were then recorded for each monitor prior to well purging.
5. Three to five measured casing volumes were then removed from each monitor in order to ensure that representative groundwater samples were obtained.
6. In-situ chemical testing was conducted during the purging operation in order to determine a stabilized water quality condition. The in-situ testing included parameters such as temperature, conductivity, pH, Orp and DO.
7. After the purging operation, representative samples of groundwater were collected in proper containers with appropriate preservatives where needed.
8. The water samples were delivered to SGS Laboratories in Lakefield. Sampling was carried out as per previous sampling circuits.
9. Reviewed slug testing on wells to determine hydraulic conductivity values as requested by MECP review (dated September 2, 2009) of the Halls Glen 2008 Monitoring Report prepared by AECOM Canada Ltd. Hydraulic Gradients were calculated using well locations and groundwater elevations.

## 5. Water Quality Data

### 5.1 General

Representative groundwater samples from each of the monitors were subjected to chemical testing for specified parameters. The parameters tested included those listed in Column 1 of Schedule 5 (Comprehensive List) in the spring and Column 2 (Indicator List) in the fall, of the Landfill Standards: A Guideline on Regulatory and Approval Requirements for New or Expanding Sites for the deeper wells. All metals were analyzed for the parameters listed in Schedule 5 Column 1 for all wells. In addition, selected samples were analyzed for volatile organic compounds (VOCs) to evaluate any trends that may develop. The surface water stations and shallow monitors that discharge to surface water were analyzed for the parameters listed in Column 3 of Schedule 5 of the Landfill Standards Guideline (Comprehensive List for Surface Water). The certificates of analysis are included in Appendix D.



## 5.2 Overburden Monitors

As in the past, monitor MW 1-II and MW 2-II were measured dry during the spring and fall 2019 sampling period. MW 5-II which usually has had insufficient water for sampling did generate enough water for sampling in the spring but not in the fall sampling circuit. Monitoring Well 3-II was also dry in the fall sampling period. In general, the groundwater levels in the monitors were found to be at normal elevation in the spring but lower in the fall. The chemical results from the shallow wells (where samples were obtained) have been summarized in Tables 5.1 and 5.2.

The data is presented with the Ontario Drinking Water Standards (ODWS) and Provincial Water Quality (PWQO) for comparison purposes. As in past reports, the monitors located closest to the former landfill area (MW-3, MW-5-II, MW- 6-II and MW-7-II) had the highest number of the parameters exceeding the PWQO and ODWS during both sampling circuits. Iron was elevated in down-gradient monitor MW 10-II during both sampling circuits. Although Iron has been historically elevated for the area and is interpreted to be naturally elevated this should be closely monitored for any upwards trends. Elevated levels of total dissolved solids (TDS) were reported in some wells during both sampling periods. MW-4-II that has in the past had exceedances for some parameters, met all analyzed parameters in 2019.

Although there were still exceedances of the ODWS and PWQO for some parameters there are no upward trends in the remaining monitors or in the parameters indicating exceedances. Future monitoring programs should continue to monitor these parameters to evaluate potential environmental concerns.

As in past reports, the monitoring data indicates that the monitoring stations located near the landfill area are being impacted by the landfill. The following overburden wells had parameters that exceeded the ODWS in 2019.

### **Spring Circuit Exceedances of ODWS**

Alkalinity	MW 3-II, 5-II, 6-II
Iron	MW 5-II, 6-II 10-II, 11-II
TDS	MW-3-II, 5-II, 6-II
Manganese	MW 3-II, 5-II, 6-II, 7-II, 10-II

### **Fall Circuit Exceedances of ODWS**

Alkalinity	MW 3-II, 6-II
Iron	MW 6-II, 10-II
TDS	MW 3-II, 6-II
Manganese	MW 6-II

The MECP in their 2014 memorandum indicated that all shallow wells that possibly discharge to the wetland located southeast of the landfill, be analyzed for the same parameters as surface water and must be compared to the PWQO standards. It was once again noted that the majority of exceedances were from monitoring wells MW 3-II, 5-II and 6-II that are located next to the landfill. These wells had the most exceedances while monitors further down gradient showed very few exceedances. The following overburden wells had parameters that exceeded the PWQO in 2019.





#### **Spring Circuit Exceedances of PWQO**

Iron	MW-5-II, 6-II, 10-II, 11-II
Boron	MW-3-II, 5-II, 6-II
Ammonia	MW-5-II, 6-II

#### **Fall Circuit Exceedances of PWQO**

Iron	MW 6-II, 10-II,
Ammonia	MW 6-II
Boron	MW 3-II, 6-II
Phenolics	MW 6-II
Copper	MW 6-II

In addition to the aforementioned parameters, monitors MW-3-II, MW-4-II, MW-5-II, MW-6-II, MW-7-II and MW-11-II were sampled for VOCs during the spring and fall sampling circuits. The monitors did not yield detectable levels of VOCs in either the spring or fall sampling circuits. As such all levels are within the ODWS and PWQO. The results of the chemical testing are presented in Appendix D.



Table 5.1 May 2019 Overburden Monitors

Parameters	Overburden Monitors											ODWS	PWQO
	MW 3-II	MW 4-II	MW 5-II	MW 6-II	MW 7-II	MW 8-II	MW 9-II	MW 10-II	MW 11-II	MW 12-1	MW 13-II		
May 30, 2019													
<b>BOD</b>	< 4	< 4	6	< 4	< 4	< 4	< 4	< 4	< 4	< 4	< 4	---	---
<b>TSS</b>	713	653	124	228	148	23	66	50	5	42	28	---	---
<b>Alkalinity</b>	536	218	806	792	191	235	241	243	224	284	230	30-500	---
<b>pH</b>	7.42	7.77	6.86	6.98	7.84	7.66	8.00	7.54	8.09	7.42	7.51	6.5-8.5	6.5-8.5
<b>Conductivity</b>	1110	320	1600	1640	331	429	653	599	465	675	569	---	---
<b>TDS</b>	677	186	934	1010	209	257	214	334	274	403	329	500	---
<b>COD</b>	11	< 8	47	70	< 8	< 8	< 8	< 8	< 8	< 8	10	---	---
<b>Phosphorus</b>	0.52	0.24	0.15	0.06	0.05	< 0.03	< 0.03	0.09	< 0.03	< 0.03	0.05	---	---
<b>TKN</b>	0.6	< 0.5	11.8	22.5	< 0.5	< 0.5	< 0.5	0.7	< 0.5	< 0.5	0.8	---	---
<b>Ammonia</b>	0.7	< 0.1	11.0	22.1	< 0.1	< 0.1	< 0.1	0.8	0.5	0.1	0.4	---	**3.3
<b>Phenolics</b>	< 0.001	< 0.001	0.005	0.006	< 0.001	0.002	0.003	< 0.001	< 0.001	< 0.001	0.002	---	0.005
<b>Sulphate</b>	70	< 2	9	170	11	7	16	8	6	22	18	500	---
<b>Chloride</b>	37	2	93	80	6	3	66	48	14	51	51	250	---
<b>Nitrite</b>	0.33	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.07	< 0.03	< 0.03	< 0.03	1.0	---
<b>Nitrate</b>	1.01	< 0.06	0.23	< 0.06	0.08	< 0.06	< 0.06	0.08	< 0.06	< 0.06	0.65	10	---
<b>Mercury</b>	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
<b>Arsenic</b>	0.0002	<0.0002	0.0007	0.0016	< 0.0002	<0.0002	0.0003	0.0002	<0.0002	< 0.0002	<0.0002	0.002	0.05
<b>Barium</b>	0.175	0.0877	0.667	0.685	0.0876	0.0531	0.158	0.626	0.381	0.713	0.137	200	---
<b>Boron</b>	0.563	0.034	0.401	0.831	0.055	0.014	0.026	0.118	0.085	0.104	0.051	1.0	0.2
<b>Calcium</b>	246	92.9	281	372	72.1	103	105	117	96.6	126	139	---	---
<b>Cadmium</b>	0.000018	0.000003	0.000012	0.000012	0.000003	.000003	.000003	.000003	.000003	0.000003	0.000004	0.005	0.0002
<b>Chromium</b>	0.00019	0.00013	0.00072	0.00118	0.00017	0.00027	0.00015	0.00014	0.00059	0.00016	0.00015	0.05	---
<b>Cooper</b>	0.0011	0.0002	0.0016	0.0054	0.0007	0.0003	0.0008	0.0003	<0.0002	< 0.0002	0.0007	1.0	0.005
<b>Iron</b>	0.132	< 0.007	13.3	15.6	0.008	0.007	0.293	6.91	1.55	0.010	0.027	0.3	0.3
<b>Potassium</b>	16.9	0.729	24.4	40.3	1.33	0.472	2.16	2.42	1.99	3.28	3.48	---	---
<b>Magnesium</b>	22.0	2.20	27.8	48.0	3.71	2.82	3.89	11.2	7.40	11.5	4.42	---	---
<b>Manganese</b>	3.24	0.00041	6.61	8.40	0.00092	0.00074	0.0291	0.171	0.0245	0.00352	0.00144	0.05	---
<b>Sodium</b>	38.3	5.32	63.6	109	17.3	3.74	42.9	7.47	6.30	13.7	30.0	200	---
<b>Lead</b>	0.00002	<0.00001	0.00014	0.00020	0.00002	0.00002	0.00002	0.00012	0.00001	<0.00001	0.00003	0.01	0.005
<b>Zinc</b>	0.003	< 0.002	0.004	0.005	0.002	0.002	0.003	0.005	0.004	0.003	0.003	5.0	0.03

Notes: All results in mg/L with the exception of Conductivity (uS/cm) and pH, (---) indicates no data, (np) indicates not performed. Highlighted values exceed ODWS or PWQO.



Table 5.2 October 2019 Overburden Monitors

Parameters	Overburden Monitors										ODWS	PWQO
	MW 3-II	MW 4-II	MW 6-II	MW 7-II	MW 8-II	MW 9-II	MW 10-II	MW 11-II	MW 12-I	MW 13-II		
Oct. 29, 2019												
BOD	< 4	< 4	21	< 4	< 4	< 4	< 4	< 4	< 4	< 4	---	---
TSS	183	1130	110	178	37	2	55	6	38	69	---	---
Alkalinity	559	287	951	322	272	260	245	242	265	331	30-500	---
pH	7.58	7.93	7.60	7.92	8.12	8.11	8.03	8.10	7.92	7.82	6.5-8.5	6.5-8.5
Conductivity	1630	705	2010	691	748	737	621	584	649	833	---	---
TDS	1120	374	1240	451	434	414	354	320	403	474	500	---
COD	20	< 8	68	< 8	< 8	< 8	< 8	< 8	< 8	< 8	---	---
Phosphorus	0.11	0.39	0.06	0.06	0.03	< 0.03	0.06	0.04	< 0.03	0.10	---	---
TKN	< 0.5	< 0.5	25.4	< 0.5	< 0.5	< 0.5	1.1	1.0	< 0.5	< 0.5	---	---
Ammonia	0.1	< 0.1	23.3	< 0.1	< 0.1	< 0.1	1.1	0.9	< 0.1	< 0.1	---	**3.3
Phenolics	0.002	< 0.001	0.006	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	---	0.005
Sulphate	210	6	61	15	12	11	7	10	28	26	500	--
Chloride	100	34	110	35	69	73	48	33	44	58	250	---
Nitrite	0.03	< 0.03	0.04	< 0.03	< 0.03	< 0.03	0.04	< 0.03	< 0.03	< 0.03	1.0	---
Nitrate	5.39	0.45	3.72	1.36	0.66	0.93	0.08	0.18	< 0.06	2.36	10	---
Mercury	<0.01	< 0.01	0.02	0.02	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Arsenic	0.0003	< 0.0002	0.0012	0.0004	< 0.0002	< 0.0002	< 0.0002	0.0007	0.0008	0.0003	0.002	0.05
Barium	0.237	0.156	0.467	0.211	0.158	0.184	0.580	0.0408	0.230	0.155	200	---
Boron	0.827	0.036	0.753	0.138	0.050	0.065	0.145	0.176	0.099	0.046	1.0	0.2
Calcium	325	120	322	130	127	121	129	147	117	144	---	---
Cadmium	0.000030	0.000004	0.000016	0.000003	0.000005	0.000003	0.000003	0.000005	0.000003	0.000007	0.005	0.0002
Chromium	0.00030	0.00018	0.00080	0.00030	0.00025	0.00016	0.00012	0.00020	0.00013	0.00022	0.05	---
Cooper	0.0031	0.0014	0.0087	0.0031	0.0008	0.0014	< 0.0002	0.0011	0.0005	0.0020	1.0	0.005
Iron	0.020	< 0.007	3.86	< 0.007	0.010	0.038	4.03	0.124	0.019	0.019	0.3	0.3
Potassium	21.1	1.56	33.9	5.41	1.40	2.57	2.69	7.59	2.25	3.64	---	---
Magnesium	24.4	3.75	30.8	10.1	3.82	3.82	10.9	221	7.58	4.68	---	---
Sodium	43.3	24.4	101	29.8	36.8	46.5	5.54	76.7	12.0	36.5	200	---
Manganese	0.0520	0.00099	5.34	0.00029	0.00433	0.00464	0.0544	0.0147	0.0201	0.00227	0.05	---
Lead	0.00003	0.00002	0.00001	0.00003	0.00003	0.00002	0.00001	0.00002	0.00001	0.00004	0.01	0.005
Zinc	0.004	0.002	< 0.002	< 0.002	0.003	0.003	< 0.002	0.004	0.003	0.004	5.0	0.03

Notes: All results in mg/L with the exception of Conductivity (uS/cm) and pH, (---) indicates no data, (np) indicates not performed. Highlighted values exceed ODWS or PWQO



### 5.3 Bedrock Monitors

All of the bedrock monitors were sampled during the 2019 sampling circuits with the exception of MW 2-I, which was dry during both circuits. MW 2-I has been historically dry. The results of the testing are compared in Tables 5.3 and 5.4 against the ODWS. In general, the results are similar to past years with MW 5-I and MW 6-I yielding the most exceedances. MW 3-I and 4-I that yielded exceedances in the past had very few in 2019. All of these wells are directly adjacent to the landfill. As in past years, iron and manganese are elevated in other monitors. TDS that is generally elevated in other monitors was not this year. It is interpreted that these parameters are naturally elevated since the background monitors MW 1-I exceeded the criteria for TDS. Future monitoring programs should continue to monitor these parameters to evaluate potential environmental concerns. The results of the chemical testing are presented in Appendix D.

The following deeper bedrock wells had parameters that exceeded the ODWS in 2019.

#### **Spring Circuit Exceedances of ODWS**

Alkalinity	MW 5-I
TDS	MW 1-I (background) 5-I, 6-I
Iron	MW 5-I, 6-I
Manganese	MW 4-I, 5-I, 6-I, 9-I, 10-I, 11-I, 12-II

#### **Fall Circuit Exceedances of ODWS**

Alkalinity	MW 5-I
DOC	MW 5-I, 6-I
Iron	MW 5-I, 6-I
TDS	MW 1-I (background) 3-I, 4-I, 5-I, 6-I
Manganese	MW 4-I, 5-I, 6-I, 8-I, 9-I, 10-I 11-I, 12-II

In addition to the aforementioned parameters, monitors MW-3-I, MW-4-I, MW-5-I, MW-6-I, MW-7-I and MW-11-I were sampled for VOCs during the spring and fall sampling circuits. All other wells were sampled for the VOC parameters listed in Schedule 5 Column 1 during the spring circuit. The monitors yielded results below the detectable levels of VOCs in both the spring or fall sampling circuits with the exception of Benzene and Monochlorobenzene in Monitor MW 5-I in the fall sampling period which reported levels just above the detection limit. Generally monitors close to the landfill have yielded detectable VOC levels for a some parameters but only MW 5-I reported detectable levels this year. Duplicate sample 14-I (MW7-I) also indicated no detectable VOC's. The results of the chemical testing are presented in Appendix D.



Table 5.3 May 2019 Bedrock Monitors

Parameters	Bedrock Monitors													ODWS
	MW 1-I	MW 3-I	MW 4-I	MW 5-I	MW 6-I	MW 7-I	MW 8-I	MW 9-I	MW 10-I	MW 11-I	MW 12-II	MW 12-III	MW 13-I	
May 30, 2019														
<b>Alkalinity</b>	272	248	291	536	468	370	284	271	245	260	294	290	249	<b>30-500</b>
<b>pH</b>	7.53	7.34	8.08	7.44	7.21	7.92	7.53	7.41	7.74	7.78	7.62	8.06	8.10	<b>6.5-8.5</b>
<b>Conductivity</b>	1150	526	713	980	1260	808	795	605	616	643	740	711	628	---
<b>TDS</b>	711	294	434	574	749	474	489	391	400	400	463	443	394	<b>500</b>
<b>COD</b>	< 8	< 8	< 8	17	25	65	< 8	34	< 8	9	8	< 8	< 8	---
<b>Phosphorus</b>	0.04	< 0.03	< 0.03	0.04	0.14	0.04	< 0.03	< 0.03	< 0.03	< 0.03	0.03	< 0.03	< 0.03	---
<b>TKN</b>	< 0.5	< 0.5	1.1	6.2	6.6	< 0.5	< 0.5	0.5	< 0.5	0.5	< 0.5	< 0.5	< 0.5	---
<b>Ammonia</b>	< 0.1	< 0.1	1.2	5.8	6.6	< 0.1	< 0.1	0.7	0.2	0.7	0.3	< 0.1	< 0.1	---
<b>Phenolics</b>	0.006	< 0.001	0.002	0.002	0.006	0.002	0.001	< 0.001	0.002	< 0.001	0.001	0.001	0.003	---
<b>Sulphate</b>	79	9	22	12	44	34	18	41	25	37	72	26	10	<b>500</b>
<b>Chloride</b>	180	24	51	29	130	47	83	16	51	29	38	55	57	<b>250</b>
<b>Nitrite</b>	< 0.03	< 0.03	< 0.03	< 0.03	0.28	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	<b>1.0</b>
<b>Nitrate</b>	2.29	1.41	1.19	0.71	0.65	0.13	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	2.42	<b>10</b>
<b>Mercury</b>	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	
<b>Arsenic</b>	<0.0002	<0.0002	<0.0002	0.0011	0.0002	0.0005	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<b>0.002</b>
<b>Barium</b>	0.282	0.0836	0.115	0.434	0.402	0.136	0.106	0.688	0.839	0.460	0.252	0.0399	0.118	<b>200</b>
<b>Boron</b>	0.093	0.025	0.069	0.213	0.246	0.516	0.114	0.590	0.260	0.362	0.609	0.090	0.021	<b>1.0</b>
<b>Calcium</b>	175	106	118	203	198	34.0	125	58.7	103	101	111	162	132	---
<b>Cadmium</b>	<0.000003	<0.000003	0.000006	<0.000003	<0.000003	0.000003	<0.000003	<0.000003	<0.000003	<0.000003	<0.000003	<0.000003	<0.000003	<b>0.005</b>
<b>Chromium</b>	0.00017	0.00018	0.00013	0.00033	0.00031	0.00013	0.00012	0.00015	0.00013	0.00018	0.00035	0.00026	0.00016	<b>0.05</b>
<b>Cooper</b>	0.0009	0.0004	0.0005	0.0003	0.0003	<0.0002	0.0009	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0004	<b>1.0</b>
<b>Iron</b>	< 0.007	< 0.007	0.012	11.1	0.684	0.007	0.016	< 0.007	0.085	0.042	0.143	0.054	< 0.007	<b>0.3</b>
<b>Potassium</b>	5.56	2.86	5.64	16.1	18.3	2.25	3.77	6.17	4.69	4.26	3.75	1.94	1.88	---
<b>Magnesium</b>	15.0	2.96	4.94	15.5	13.8	7.59	11.7	22.7	20.7	19.4	24.7	6.18	3.11	---
<b>Manganese</b>	0.00003	0.00024	0.168	1.17	1.53	0.00076	0.00523	0.0820	0.173	0.0629	0.139	0.0145	0.00015	<b>0.05</b>
<b>Sodium</b>	73.0	21.1	37.0	36.5	71.4	151	48.4	51.7	13.2	12.6	41.4	15.7	38.2	<b>200</b>
<b>Lead</b>	0.00001	0.00001	0.00001	0.00002	0.00020	0.00003	0.00001	0.00001	0.00001	0.00003	0.00046	0.00026	0.00004	<b>0.01</b>
<b>Zinc</b>	< 0.002	0.007	0.003	0.002	0.003	0.002	0.003	< 0.002	0.004	0.003	0.004	0.008	0.002	<b>5.0</b>

Notes: All results in mg/L with the exception of Conductivity (uS/cm) and pH, (---) indicates no data, (np) indicates not performed. Highlighted values exceed ODWS.



Table 5.4 October 2019 Bedrock Monitors

Parameters	Bedrock Monitors													ODWS
	MW 1-I	MW 3-I	MW 4-I	MW 5-I	MW 6-I	MW 7-I	MW 8-I	MW 9-I	MW 10-I	MW 11-I	MW 12-II	MW 12-III	MW 13-I	
Oct. 29, 2019														
<b>Alkalinity</b>	261	330	378	653	429	328	274	241	232	248	285	272	250	<b>30-500</b>
<b>pH</b>	7.98	7.90	7.57	7.21	7.94	8.12	7.94	8.23	8.16	8.22	7.95	7.75	7.89	<b>6.5-8.5</b>
<b>Conductivity</b>	1150	920	1050	1510	1210	844	801	561	608	598	730	694	534	---
<b>TDS</b>	666	534	597	874	671	469	454	323	334	334	417	391	286	<b>500</b>
<b>COD</b>	< 8	< 8	< 8	47	11	< 8	< 8	24	< 8	11	18	< 8	< 8	---
<b>Ammonia</b>	< 0.1	< 0.1	0.4	14.5	9.0	0.1	0.2	0.7	0.2	0.9	0.4	< 0.1	< 0.1	---
<b>Sulphate</b>	74	20	42	7	43	33	19	42	23	29	78	24	8	<b>500</b>
<b>Chloride</b>	170	56	90	120	120	45	78	18	49	35	37	51	21	<b>250</b>
<b>Nitrate</b>	2.40	2.51	2.14	0.24	0.50	0.25	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	0.26	<b>10</b>
<b>DOC</b>	< 1	2	3	14	6	2	< 1	< 1	< 1	< 1	< 1	1	1	<b>5</b>
<b>Barium</b>	0.278	0.118	0.193	0.664	0.337	0.128	0.106	0.570	0.803	0.446	0.204	0.0664	0.0824	<b>200</b>
<b>Boron</b>	0.105	0.050	0.079	0.340	0.227	0.445	0.102	0.491	0.273	0.396	0.548	0.143	0.019	<b>1.0</b>
<b>Calcium</b>	178	137	214	249	217	40.1	121	55.7	91.9	90.6	115	140	96.5	---
<b>Iron</b>	< 0.007	< 0.007	0.125	32.6	1.34	0.009	0.018	0.008	0.014	0.019	0.007	0.099	< 0.007	<b>0.3</b>
<b>Magnesium</b>	14.2	3.35	7.48	22.9	11.0	7.52	11.3	18.9	20.5	20.7	26.8	8.91	2.59	---
<b>Sodium</b>	69.4	43.0	49.2	80.2	60.9	152	45.9	42.6	13.0	12.3	45.7	18.8	28.4	<b>200</b>
<b>Arsenic</b>	<0.0002	<0.0002	0.0002	0.0035	0.0004	0.0008	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<b>0.002</b>
<b>Cadmium</b>	0.000003	0.000012	0.000045	0.000003	0.000005	0.000016	0.000009	<0.000003	<0.000003	<0.000003	<0.000003	<0.000003	0.000003	<b>0.005</b>
<b>Chromium</b>	0.00017	0.00019	0.00013	0.00090	0.00029	0.00017	0.00016	0.00016	0.00014	0.00018	0.00023	0.00015	0.00023	<b>0.05</b>
<b>Cooper</b>	0.0014	0.0016	0.0009	0.0011	0.0014	0.0005	0.0009	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	0.0005	<b>1.0</b>
<b>Potassium</b>	5.45	3.59	5.67	32.2	16.4	2.55	3.64	5.32	4.59	4.23	4.16	2.06	2.24	---
<b>Manganese</b>	0.00185	0.00620	0.0694	2.68	1.46	0.00831	0.0837	0.0700	0.136	0.0853	0.148	0.05023	0.00013	<b>0.05</b>
<b>Sodium</b>	69.4	43.0	49.2	80.2	60.9	152	45.9	42.6	13.0	12.3	45.7	18.8	28.4	<b>200</b>
<b>Lead</b>	0.00014	0.00005	0.00002	0.00005	0.00026	0.00003	0.00014	0.00001	0.00001	0.00008	0.00010	0.00003	0.00002	<b>0.01</b>
<b>Zinc</b>	< 0.002	0.004	< 0.002	0.002	0.004	< 0.002	0.003	< 0.002	< 0.002	< 0.002	0.003	< 0.002	0.003	<b>5.0</b>

Notes: All results in mg/L with the exception of Conductivity (uS/cm) and pH, (---) indicates no data, (np) indicates not performed. Highlighted values exceed ODWS.



## 5.4 Reasonable Use Concept

Reference is made to previous monitoring reports that presented estimated criteria for significant contaminant indicators. The Reasonable Use Concept evaluation was developed from MECP Guideline B-7 and Guideline B-7-1 Determination of Contaminant Limits and Attenuation Zones. The criterion is based on the following equation.

$$X = B + F (W - B)$$

Where:

X = maximum acceptable concentration at property boundary

B = background concentration of parameter

F = factor of 0.5 for aesthetic parameter and 0.25 for health related parameter

W = ODWS value for each particular parameter

The MECP (in their June 23, 2014 Memorandum) indicated that RUC should be applied to the parameters of Schedule 5 Column 2 indicator list for groundwater leachate for parameters that had ODWS. The RUC was applied to samples from both the overburden and bedrock monitors. Background water quality for the overburden monitors utilized the chemical results from monitor MW 13 while background water quality for the bedrock monitors utilized the chemical results from the bedrock monitor at stations MW 1 and MW 13. The results for the shallow monitors RUC are illustrated on Plates 6A and 6C. The results for the bedrock monitors RUC are illustrated on plates 6B and 6D with the RUC exceedances for the shallow wells summarized below.

### **Spring 2019 Overburden Monitors Exceedances of RUC**

Alkalinity	MW 3-II, 5-II, 6-II
TDS	MW 3-II, 5-II, 6-II
Iron	MW 5-II, 6-II, 9-II, 10-II, 11-II
Manganese	MW-3-II, 5-II, 6-II, 7-II
Barium	MW-5-II **, 6-II **

### **Fall 2019 Overburden Monitors Exceedances of RUC**

Alkalinity	MW 3-II, 6-II
TDS	MW 3-II, 6-II
Iron	MW 6-II, MW-9-II*, 10-II, 11-II
Manganese	MW 3-II, 6-II, 10-II

\*\* indicates value within ODWS.



Exceedances for the bedrock monitors are listed below.

#### **Spring 2019 Bedrock Monitors Exceedances of RUC**

Alkalinity	MW-5-I, MW-6-I**
TDS	MW 4-1, MW-5-I, MW-7-I
Barium	MW 3-I, MW 9-I, MW 10-I
Iron	MW-5-I, MW-6-I, MW-8-1
Manganese	MW MW-4-I, 5-I, MW-6-I, MW-9-I, MW-10-I, MW-11-I, MW 12-II
Sodium	MW-7-I

#### **Fall 2019 Bedrock Monitors Exceedances of RUC**

Alkalinity	MW5-I, MW 6-I
TDS	MW 3-I, MW 4-I, MW-5-I, MW-6-I
DOC	MW 5-1 MW 6-I
Barium	MW 5-1
Iron	MW-5-I, MW-6-I, MW-8-I
Manganese	MW-4-I, 5-I, MW-6-I, MW-8-I, MW-9-I, MW-10-I, MW-11-I, MW 12-II, MW-12-III

\*\*indicates value within ODWS.

A historical review of past monitoring programs indicates elevated levels of parameters within the monitors immediately down-gradient of the refuse area. The 2019 monitoring indicated less shallow monitors exceeded RUC MAC while similar monitors exceeded the RUC MAC's as historically in the fall. Based on the data off site significant impact has not been observed and it is anticipated that the potential for impact will decrease over time due to closure of the landfill site.

### **5.5 Historical Chemical Comparison**

The MECP in their June 23, 2014 Memorandum indicated that a historical comparison be conducted for the chemical results for all parameters in the MECP Schedule 5 Column 2 Indicator List for Groundwater and Leachate for all monitors. For monitors MW-1 to MW-7 the data dates back to 1993 while in the newer monitors MW-8 to MW-12 well the data is from 2001 to present. Background Monitor MW-13 data ranges from installation in 2006 to 2019. No data is available for this well for 2007-2008 as TSH could not locate it for sampling.

The review of the historical chemical data indicates that monitors within the landfill or near the mound experience more elevated parameters compared to those down gradient. For the most part the values for each parameter in each well either remain constant or show seasonal fluctuations with the occasionally spike that generally returns to normal.





The exception to this appears to be at Monitoring Location 6, which is located within the south-eastern portion of the landfill. The shallow groundwater monitor MW-6-II and the deeper monitor 6-I are both showing an increasing trend for Ammonia.

Although there appears to be an upwards trend at monitoring location MW-6, the down-gradient monitors at locations MW-4 and MW-7, are not showing increasing trends for the Schedule 5 Column 2 parameters. Although there does appear to be a plume around MW-6 at this time it does not appear to be spreading to the south or east. The chemical comparison graphs are presented in Appendix F.

## 5.6 Residential Wells

Four (4) residential wells were sampled during the fall of 2019 but only three in the spring. Residential Well R-1 was observed during the spring circuit to be compromised to the point it was unable to be sampled. The well was abandoned in the summer of 2019 and a new monitoring well was established adjacent to the former well at a depth similar to the former dug well. The remaining three wells are deeper drilled wells (R2, R3 and R4). R1 and R2 are situated down-gradient of the landfill site and R3 and R4 are situated up-gradient. The wells were sampled and analyzed for the same parameters as the monitoring wells. The results of the 2019 residential well monitoring circuits are presented on Table 5.5 with the locations of the residential wells and the surface water stations presented on Plate 2.

As in past monitoring programs, the majority of the parameters tested are within the ODWS with respect to the residential wells. TDS (total dissolved solids) in R4 exceeded the criteria during the fall sampling circuit. TDS is considered an aesthetic objective under the ODWS and has been historically elevated in some of the residential wells. R1 and R3 exceeded for iron and manganese in the fall sample obtained. Iron levels in R-2 that have in the past exceeded the ODWS were within the criteria during both sampling circuits. The results of the sampling are presented in Appendix D. The 2019 sampling program did not yield any detectable concentrations of VOCs in the residential wells.

The results of the analyses indicate that the landfill appears to have had no impact on the surrounding residential wells. It should be noted that R-1 is located down-gradient of the landfill. This property is now part of the landfill property. Because of its location, it is our opinion that R-1 intercepts the shallow groundwater regime that represents the on-site conditions. In addition, the former well has been used for several years as a groundwater monitoring station that has resulted in a long history of chemical data. For these reasons, it is our opinion that R-1 should be used as a trigger point (RUC exceedance would trigger action) when evaluating the potential for off-site impacts from the former landfill operation. R3 showed no indication of contamination during the spring sampling but had iron and manganese levels that exceeded the ODWS in the fall sampling period. R1 could not be sampled in the spring. This should be closely monitored in the future monitoring events to see if a trend is developing. The results for the R-1 monitor are summarized on Table 5.5 while the RUC summary for this well is illustrated on Plate 5E.



Table 5.5 2019 Residential Well Water Quality Summary

Parameters	Residential Monitors								ODWS
	R-1 May / 19	R-1 Oct. / 19	R-2 May / 19	R-2 Oct. / 19	R-3 May / 19	R-3 Oct. / 19	R-4 May / 19	R4 Oct. / 19	
Alkalinity	Unable to	273	272	291	243	257	288	336	30-500
pH	Sample	7.93	7.54	7.79	7.95	7.72	8.01	7.75	6.5-8.5
Conductivity		721	695	777	552	825	743	1290	---
TDS		423	403	454	343	480	411	726	500
COD		< 8	< 8	< 8	< 8	< 8	25	< 8	---
Phosphorus		0.074	< 0.03	< 0.003	< 0.03	0.005	< 0.03	0.023	---
TKN			< 0.5		< 0.5		< 0.5		---
Ammonia		< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	---
Phenolics			< 0.002		< 0.002		< 0.002		---
Sulphate		18	17	11	< 2	19	13	17	500
Chloride		55	62	70	32	92	52	210	250
Nitrite			< 0.03		< 0.03		< 0.03		1
Nitrate (as N)		1.43	3.97	1.14	0.62	3.56	3.15	1.59	10
DOC		1	1	< 1	3	2	5	1	5.0
Mercury			< 0.01		< 0.01		< 0.01		
Arsenic		0.0005	< 0.0002	< 0.0002	< 0.0002	< 0.0002	0.0003	< 0.0002	0.025
Barium		0.262	0.0953	0.0983	0.0377	0.0495	0.117	0.141	1.0
Boron		0.100	0.009	0.025	0.010	0.048	0.016	0.029	5.0
Calcium		111	126	125	56.2	56.9	128	120	---
Cadmium		0.000131	0.000008	0.000013	0.000006	0.000019	0.000004	0.000011	0.005
Chromium		0.00159	0.00023	0.00040	0.00033	0.00019	0.00025	0.00058	0.05
Copper		0.0044	0.154	2.29	0.210	0.0546	0.109	0.0862	5.0
Iron		0.664	< 0.007	0.010	< 0.007	0.591	< 0.007	0.014	0.3
Potassium		4.30	1.34	1.14	1.42	0.793	3.26	3.22	---
Magnesium		7.54	3.24	3.32	1.58	1.84	3.29	3.29	---
Manganese		3.27	0.00022	0.00032	0.00056	0.263	0.00010	0.00061	0.05
Sodium		31.0	21.3	38.3	70.4	123	34.6	153	200
Lead		0.00134	< 0.003	0.00128	0.00237	0.00132	0.009	0.00143	0.01
Zinc		0.010	0.00064	0.106	0.019	0.029	0.00229	0.037	5.0

Notes: All results in mg/L with the exception of Conductivity (uS/cm) and pH, (---) indicates no data, (np) indicates not performed. **Highlighted** values exceed ODWS.



## 5.7 Surface Water Monitoring

Two surface water sampling station were also utilized during the May and October 2019 sampling period. The surface water station (S-1) is located down-gradient from the landfill site and is adjacent to R1. Surface Water location S-2 is a background surface water monitor that was added in the fall of 2014. The samples obtained were analyzed for the parameters listed in Column 3 of Schedule 5 of the Landfill Standards Guideline (Comprehensive List for Surface Water). In-field measurements were taken at the surface water stations as presented in Table 5.6. The results of the analyses are summarized in Table 5.7. The results of the analysis are included in Appendix D. All of the parameters tested are within their respective current Provincial Water Quality Objective (PWQO), Canadian Water Quality Objective (CWQO) and Aquatic Protection Value (APV) with the exception of phenolics for PWQO in both fall and spring samples for both the background sample and the down-gradient sample and Nitrates and Nitrites in the background sample in the fall. It should be noted that the water samples obtained from S-1 and S-2 in the fall were stagnant with very little water for sampling. It is our opinion that this is not representative of the flowing conditions. It is recommended that should this condition arise in the future, an additional location be found in the general area of S-1.

Table 5.6 2019 Surface Water Field Measurements

Parameter	Field Measurement			
	S-1	S-2	S-1	S-2
	May, 2019	May, 2019	Oct. 2019	Oct. 2019
Temperature (°C)	13.8	14.9	12.2	13.9
pH	7.75	7.52	7.92	7.74
Conductivity (us/cm)	505	555	441	648
Dissolved Oxygen (mg/L)	5.90	7.30	5.71	5.06
ORP	---	---	180	190
Flow	Pond – Continuous Flow	Pond – Continuous Flow	Pond - Stagnant	Pond - Stagnant



Table 5.7 2019 Surface Water Data

Parameters	Sample Locations				APV	CWQG	PWQO
	S-1 May 2019	S-2 May 2019	S-1 Oct. 2019	S-2 Oct. 2019			
BOD	< 4	< 4	16	23			
TSS	5	< 2	2	28			
Alkalinity (mg/L)	240	235	245	168			
pH	8.09	7.70	7.85	7.72		6.0-9.0	6.5-8.5
Conductivity	603	638	587	675			
TDS	366	363	354	489			
COD	< 8	11	16	60			
TKN	< 0.5	< 0.5	< 0.5	1.1			
Ammonia	< 0.1	< 0.1	< 0.1	0.3			
Phenolics	0.004	0.003	0.010	0.011	0.04**	0.004	0.001
Sulphate	4	7	17	89			
Chloride (mg/L)	56	67	33	36	180	128	
Nitrite	< 0.03	< 0.03	< 0.03	1.16		0.06	
Nitrate	0.18	< 0.06	1.00	10.3		2.9	
Mercury	< 0.01	< 0.01	< 0.01	< 0.01			
Arsenic	< 0.0002	< 0.0002	0.0003	0.0005	0.150		
Barium	0.0764	0.0593	0.115	0.115	2.30		
Boron	0.017	0.013	0.025	0.030	3.55	1.50	0.2
Calcium	96.7	89.5	98.7	106			
Cadmium	0.000005	0.000003	0.000030	0.000071	0.00021	0.000017	0.0005
Chromium	0.00016	0.00012	0.00016	0.00032	0.064		
Copper	0.0007	0.0007	0.0039	0.0044	0.0069		0.005
Iron (mg/L)	0.010	0.020	0.042	0.025	1.00*		0.3
Potassium	1.51	1.07	2.29	6.10			
Magnesium	3.27	2.90	3.85	4.67			
Manganese	0.00306	0.0143	0.0299	0.0286			0.05
Sodium	35.3	42.8	22.2	20.3			
Phosphorus	0.006	0.008	0.048	0.404			3.3***
Lead	<0.00001	<0.00001	0.00029	0.00017	0.02		0.005
Zinc	0.003	0.003	0.012	0.009	0.089	0.03	0.02

Notes: Highlighted values exceed standard, \* USA EPA Criterion, \*\* Lowest observed effect criterion

\*\*\* Based on 10° Celcius at 8pH, All results in mg/L with the exception of Conductivity (uS/cm) and pH,

PWQO=Provincial Water Quality Objective, CWQO=Canadian Water Quality Objective, APV=Aquatic Protection Value

## 5.8 Groundwater Trigger Mechanism

Groundwater trigger mechanisms and contingency planning have been developed with respect to VOCs parameters due to detected levels in down gradient wells in past monitoring events. For the down-gradient wells (MW-8, MW-9, MW-10 and MW-11), parameters that have maximum acceptable concentrations (MACs) should consider a trigger of 0.5 of the MAC. The VOC parameters that have interim MACs (IMACs) should consider a trigger of 0.75 of the IMAC. If concentrations of parameters exceed the trigger values, then the contingency plan(s) should be implemented.



For example, consider benzene with an MAC in the ODWS of 5 µg/L. If a groundwater sample is greater than 2.5 µg/L, the contingency plan is triggered. The groundwater trigger mechanism was not exceeded for VOCs for any monitoring well during the 2019 monitoring period.

In addition, to address the MECP concern for a trigger mechanism for the RUC parameters prior to reaching the property boundary, R-1 was selected to be representative of the shallow groundwater on-site. At this location, the potential for off-site impact of the RUC parameters in the shallow groundwater was evaluated as an early warning sign (see Plate 6-E for 2018 results). R-1 was found to be unable to be sampled in the spring. A new shallow monitor was installed in the late fall to replace this well. This monitor was sampled in the fall. Exceedances of the RUC for iron and manganese were recorded for R-1 in the fall. The contingency plan indicates that if a second exceedance is recorded, then the down-gradient wells should be sampled. R-2 is the only well within two (2) kilometers down-gradient of R-1. The results of the iron and manganese testing for R-2 showed non-recordable levels of iron and negligible levels of manganese in both the spring and fall samples. Both were within the ODWS.

Contingency planning may be broken into the following steps when a trigger value is exceeded:

1. Immediately re-sample the well where an exceedance of the trigger value was observed;
2. If a second exceedance is reported, sample down-gradient wells to confirm that off-site migration has not occurred (re-sample if exceedance of trigger value at down-gradient wells);
3. If down-gradient wells at the Site boundary are impacted above trigger value, notify private well owners down-gradient of the Site and sample private wells on a monthly basis for parameter(s) of concern;
4. If private wells are impacted above the triggers values as outlined above, the Township of Douro-Dummer will need to provide an alternative water supply to the home owner (i.e. bottled water, temporary water supply, new well, etc.) until the exceedance of the trigger value subsides; and
5. If impacted, groundwater is migrating off-site (greater than Guideline B-7 values, MECP Table 2 Standards or exceeds ODWS), remediation will need to be implemented or greater attenuation areas established.



## 6. Conclusions and Recommendations

This report presents the results of the 2019 groundwater-monitoring program carried out at the Halls Glen Landfill Site in the Township of Douro-Dummer. It is our professional opinion that the groundwater level and chemical data do not indicate a significant anomaly from the results of the previous years.

The majority of the parameters are within their acceptable limits with a few exceedances in the shallow monitors located adjacent to the refuse area as determined by MECP Guideline B-7. The well trends should be monitored during future monitoring programs to evaluate if the exceedances are increasing.

Initiated during the 2002-monitoring program, monitors MW 3, MW 4, MW 5, MW 6 and MW 7, the bedrock monitor at MW 11 and the residential monitors have been sampled for VOCs annually during both sampling periods. Monitors MW5 and MW6, located within the former landfill, have historically detected low concentrations of some VOC parameters during all of the sampling periods. In 2019 only MW 5-I had recordable values for monochlorobenzene and benzene in the fall sample. The remainder of the monitors have indicated sporadic trace levels of VOCs with no trends or duplication of results. MW 11-I (bedrock), had been yielding relatively low levels of toluene, ethylbenzene and xylenes that were trending downwards towards non-detectable or trace levels of in past years. The 2016-2019 results have indicated non-detectable levels for all VOCs in MW-11-I and MW-11-II in both sampling events. Toluene levels (that meet ODWS) have been measured in MW 3-I and MW 4-I in the past but not for the last 8 monitoring periods. No VOC levels were recorded in any of the other monitoring wells or residential wells during either sampling period in 2019. Future monitoring programs should continue to evaluate the data collected to evaluate the VOC monitoring program. No VOC trigger mechanism values were met during the 2019 monitoring program.

Landfill gas was not detected during the 2019 sampling circuits. The water quality at the residential wells is not interpreted to be affected by the landfill.

Historical trends for BOD, TSS, Alkalinity, pH, Conductivity, COD, Ammonia, Sulphate, Chloride, Nitrate, Barium, Boron, Calcium, Iron, Magnesium, Sodium and Manganese have been tracked annually. All monitors have either been staying stable or decreasing for all parameters with very few exceptions. Monitor M 6-I and MW 6-II have been showing increases in Ammonia for the last few years although Monitors MW 4 and MW 12 that are immediately down gradient of MW 6 do not show increases for ammonia. Iron levels in monitor MW 5-1 has remained higher than other wells. Iron levels at 6-II (landfill shallow monitor) which appeared to be increasing in the past few years showed fluctuations this year but no longer appears to be increasing.

Alkalinity, TDS, Iron and Manganese levels generally exceed the ODWS and the RUC for shallow monitors MW 3-II, MW-5-II and MW 6-II. These wells are located within the landfill area. Shallow monitors immediately down gradient of these monitors (MW-4-II and MW-12-I) generally don't show exceedances of the ODWS or RUC indicating that the impacted shallow groundwater is not impacting the down-gradient shallow ground-water. In the deeper aquifer, landfill monitors MW-5 and OW-6 also have many exceedances of the ODWS and RUC.



Although there are occasional exceedances at down-gradient monitors MW-12-II and MW-12-III, there are rarely exceedances at the monitors further down gradient with the exception of manganese in MW-11-I. Manganese levels in MW-11-I should be monitored in future sampling events to see if the levels increase.

It is our professional opinion that even though the ground water within the landfill area may be impacted, it does not appear to be impacting the down-gradient, shallow or deep groundwater. Surface water samples taken at the site do not show any impact related to the landfill. Down-gradient residential wells show no impact from the landfill.

Exceedance of the RUC for R-1 were noted for iron and manganese in the fall. Down-gradient well R-2 did not show any elevated levels for each parameter. R-1 was formerly a dug well that became unusable and has been replaced by a monitoring station. This monitor was sampled for the first time in the fall and should be closely watched to see if a trend is developing.

Future monitoring programs should consider the following recommendations.

1. At the recommendation of the MECP, the chemical parameter list for monitoring and residential wells should include the parameters in Column 1 (Groundwater) in the spring and Column 2 in the fall. Shallow wells that may discharge to surface water along with surface water samples should be analyzed for Column 3 of Schedule 5 in the Landfill Standards, A Guideline on Regulatory and Approval Requirements for New or Expanding Sites. The surface water monitoring should include the new background station (S-2) that was established in 2014.
2. Sampling should continue VOCs for wells that surround the landfill (MW 3-7) as well as the residential wells. Monitors MW-11-I and MW-11-II had shown detectable levels of VOC's in the past but have not for nine straight monitoring events. It is recommended that VOC monitoring be discontinued at these monitoring wells.
3. The monitoring program should continue to utilize the monitor installed in the fall of 2002 (MW-13) to evaluate the background water quality in the shallow overburden.
4. The use of S-1 (surface Water) as a future predictor of potential RUC impacts offsite should continue for future monitoring periods. If S-1 is stagnant or dry it is recommended that a suitable surface water location be found in the general area of S-1.
5. The monitors should continue to be monitored for any trend increases.



## 6.1 Signatures

We trust that this report meets with your immediate requirements. Should you have any questions, please contact our office.

Sincerely,

GHD

A handwritten signature in black ink, appearing to read "Steven Gagne".

Steven Gagne, H.B.Sc.

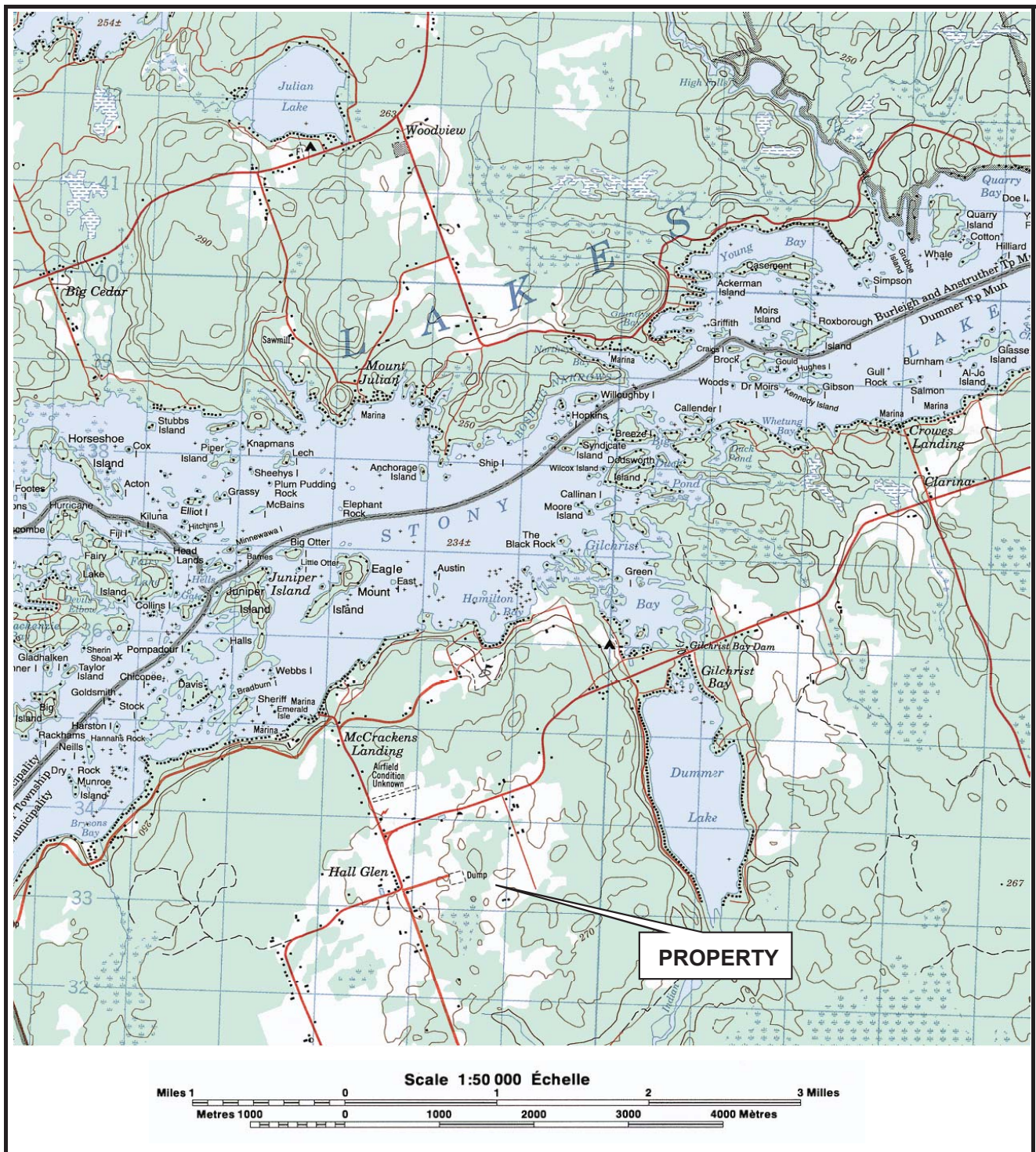
A handwritten signature in black ink, appearing to read "Nyle McIlveen".

Nyle McIlveen, P.Eng.





## Enclosures



Base map compiled from Energy, Mines and Resources Canada Map 31 D/9 dated 1996. Air photography 1999.

**Scale:**  
1:50000  
Coordinate System  
NAD 1983 UTM



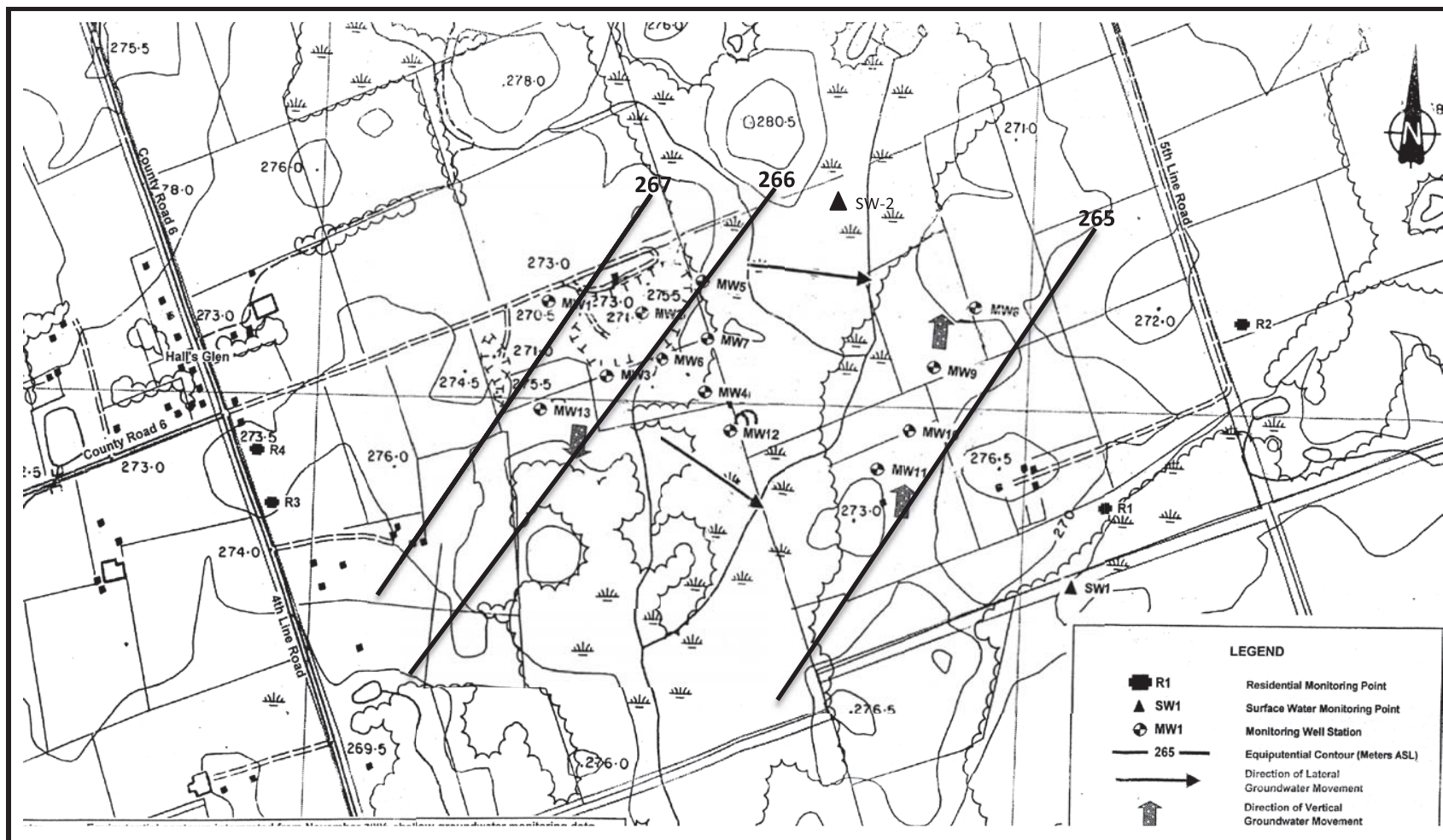
Halls Glenn Landfill  
Douro-Dummer Township  
Peterborough County

11193337-01  
January, 2019

**Vicinity Plan**

**Plate 1**





Source: Ministry of Natural Resources Base Map Series 10 17 7250 49300 dated 1990, Air Photo 1984

**Scale:**  
1: 18000  
Coordinate System:  
NAD 1983 UTM Zone 17



Halls Glenn Landfill  
Douro Dummer Township  
Peterborough County

**Property Plan**

11156057-01  
January, 2019

**Plate 2**



Source: Ministry of Natural Resources Base Map Series10 17 7250 49300 dated 1990, Air Photo 1984

**Scale:**  
1: 18000  
Coordinate System:  
NAD 1983 UTM Zone 17



Halls Glenn Landfill  
Douro Dummer Township  
Peterborough County

11156057-01  
January, 2019

**Property Boundary Plan**

**Plate 3**

## 2018 FIELD DATA SUMMARY

Hall's Glen Landfill Site  
Township of Douro-Dummer, County of Peterborough  
Project No. 11156057-01

	June 6, 2018						October 11, 2017					
Monitoring Well	TEMP (°C)	EC (uS/cm)	DO (ppm)	ORP mV	METHANE (% CH <sub>4</sub> ) / H <sub>2</sub> S (ppm)	pH	TEMP (°C)	EC (uS/cm)	DO (ppm)	ORP mV	METHANE (% CH <sub>4</sub> ) / H <sub>2</sub> S (ppm)	pH
MW 1-I	8.9	767	6.4	164	0/0	7.7	10.8	9	6.6	75	0/0	6.5
MW 1-II					0/0						0/0	
MW 2-I					0/0						0/0	
MW 2-II					0/0						0/0	
MW 3-I	11.7	729	3.7	29	0/0	7.4	10.9	621	9.5	49	0/0	6.7
MW 3-II	11.3	490	3.7	86	0/0	7.0					0/0	
MW 4-I	8.5	477	4.1	-9	0/0	7.6	10.0	723	7.5	138	0/0	7.9
MW 4-II	10.3	295	8.6	-23	0/0	7.8	10.3	565	10.5	134	0/0	8.1
MW 5-I	10.2	958	7.2	-72	0/0	7.1	11.3	1124	9.0	44	0/0	6.1
MW 5-II	12.1	1236	9.6	101	0/0	7.0					0/0	
MW 6-I	11.2	918	4.2	-60	0/0	7.2	10.8	919	10.1		0/0	6.9
MW 6-II	11.7	1953	3.3	-88	0/0	6.9	10.9	832	11.8	55	0/0	6.7
MW 7-I	10.1	590	6.0	56	0/0	8.0	10.3	597	10.6	51	0/0	7.3
MW 7-II	11.3	370	9.8	63	0/0	7.7	11.1	1662	9.8	86	0/0	6.7
MW8-I	9.2	570	4.8	198	0/0	7.7	12.2	695	3.7	21	0/0	6.4
MW8-II	8.5	419	3.4	196	0/0	7.7	13.4	803	8.8	79	0/0	6.1
MW9-I	10.5	420	3.7	-195	0/0	7.9	13.2	533	2.8	-220	0/0	7.6
MW9-II	10.3	404	3.6	-125	0/0	7.7	14.1	655	4.1	-86	0/0	7.4
MW10-I	10.2	447	4.0	-70	0/0	7.8	13.2	556	3.6	-126	0/0	7.5
MW10-II	10.6	442	3.6	-109	0/0	7.6	13.8	518	4.0	-115	0/0	7.6
MW11-I	9.5	435	3.8	-95	0/0	7.8	12.9	589	4.4	-125	0/0	7.7
MW11-II	9.1	345	4.0	-93	0/0	7.8	12.5	528	5.7	-122	0/0	7.7
MW12-I	8.5	457	3.0	-92	0/0	7.6	9.9	477	5.9	-149	0/0	7.6
MW12-II	9.1	501	4.1	-55	0/0	7.7	9.2	576	6.5	-106	0/0	7.5
MW12-III	10.1	510	5.7	147	0/0	7.7	9.5	572	10.8	-51	0/0	7.7
MW 13-I	9.1	385	9.9	158	0/0	7.9	9.6	652	10.3	13	0/0	7.8
MW 13-II	8.9	292	7.1	129	0/0	7.9	10.8	502	8.7	10	0/0	7.6

Notes:  
(---) indicates no data

## 2018 WATER LEVEL MONITORING SUMMARY

Hall's Glen Landfill Site

Township of Douro-Dummer, County of Peterborough

Project No. 11156057-01

MONITORING WELL	TOP OF CASING ELEVATION	June 6, 2018		October 14, 2018	
		WATER LEVEL FROM TOP OF CASING	WATER LEVEL ELEVATION	WATER LEVEL FROM TOP OF CASING	WATER LEVEL ELEVATION
	(M)	(M)	(M)	(M)	(M)
MW1-I	271.24	2.70	268.54	3.52	267.72
MW1-II	271.24	dry	---	dry	---
MW2-I	282.49	dry	---	dry	---
MW2-II	282.53	dry	---	dry	---
MW3-I	269.23	1.10	268.13	2.30	266.93
MW3-II	269.23	1.18	268.05	dry	---
MW4-I	268.28	2.05	266.23	2.50	265.78
MW4-II	268.28	1.86	266.42	2.31	---
MW5-I	271.35	4.92	266.43	5.13	266.22
MW5-II	271.35	3.30	268.05	dry	---
MW6-I	271.01	4.73	266.28	5.16	265.85
MW6-II	271.01	3.08	267.93	3.98	267.03
MW7-I	269.03	2.97	266.06	3.15	265.88
MW7-II	269.03	2.31	266.72	2.96	266.07
MW8-I	270.74	4.48	266.26	5.55	265.19
MW8-II	270.74	4.46	266.28	6.59	264.15
MW9-I	267.25	0.78	266.47	1.30	265.95
MW9-II	267.25	1.10	266.15	2.11	265.14
MW10-I	267.97	2.09	265.88	2.55	265.42
MW10-II	267.97	2.22	265.75	2.51	265.46
MW11-I	268.50	2.52	265.98	2.89	265.61
MW11-II	268.50	2.48	266.02	3.04	265.46
MW12-I	268.00	1.68	266.32	2.16	265.84
MW12-II	268.00	1.61	266.39	2.11	265.89
MW12-III	268.00	1.52	266.48	2.11	265.89
MW13-I	na	1.55	---	2.27	---
MW13-II	na	1.65	---	2.37	---

Notes:

All measurements presented in metres.

MP refers to measuring point (top of protective casing) above surrounding ground surface.

(na) - indicates not available

PLATE 5



**EVALUATION OF REASONABLE USE CRITERIA - OVERBURDEN WELLS, JUNE 2018**  
**Hall's Glen Landfill Site**

PARAMETER	ODWS MAC	BACKGROUND AVERAGE	RUP MAC'S	OVERBURDEN MONITORS						BACKGROUND WELL
				MW 2-II	MW 3-II	MW 4-II	MW 5-II	MW 6-II	MW 7-II	MW 13-II
Alkalinity	500	221	360.50		<b>609</b>	305	<b>819</b>	<b>929</b>	<b>609</b>	221
pH	8.5	7.89	8.20		7.66	7.94	7.18	7.41	7.66	7.89
Conductivity		503			1300	356	1480	2060	1300	503
TDS	500	269	384.50		<b>794</b>	220	<b>969</b>	<b>1310</b>	<b>794</b>	269
COD		8			11	< 8	51	87	11	8
Ammonia		0.9			2.1	< 0.1	11.1	19.7	2.1	0.9
Sulphate	500	18	259.00		78	3	9	180	78	18
Chloride	250	44	147.00		26	4	91	99	26	44
Nitrate	10	0.7	5.36		<b>7.6</b>	0.07	1.02	< 0.06	7.6	0.71
Barium	1	0.16	0.58		0.173	0.0955	<b>0.689</b>	<b>0.701</b>	0.173	0.16
Boron	5	0.074	2.54		0.435	0.045	0.362	0.817	0.435	0.074
Calcium		130			231	107	273	438	231	130
Iron	0.3	0.02	0.16		<b>1.4</b>	< 0.007	<b>29.9</b>	<b>21.4</b>	<b>1.4</b>	0.024
Manganese	0.05	0.00378	0.03		<b>3.15</b>	0.0678	<b>6.76</b>	<b>11.7</b>	<b>3.15</b>	0.00378
Sodium	200	29.3	114.65		58.5	11.4	64	121	58.5	29.3

All results are represented in mg/L unless otherwise stated

ODWS - Ontario Drinking Water Standards, 2000

RUP - Reasonable Use Policy (Policy B-7)      Bolded values exceed RUP.

Background Well MW1-I was reported at less than detection limit for Nitrate (<0.05).

PARAMETER	ODWS MAC	BACKGROUND AVERAGE	RUP MAC'S	OVERBURDEN MONITORS						BACKGROUND WELL
				MW 8-II	MW 9-II	MW 10-II	MW 11-II	MW 12-II		MW 13-II
Alkalinity	500	221	360.50	235	247	251	238	267		221
pH	8.5	7.89	8.20	7.82	7.99	7.82	8.04	7.93		7.89
Conductivity		503		639	616	610	509	690		503
TDS	500	269	384.50	349	317	380	294	<b>414</b>		269
COD		8		11	8	< 8	< 8	< 8		8
Ammonia		0.9		< 0.1	< 0.1	0.6	0.6	0.2		0.9
Sulphate	500	18	259.00	8	10	11	10	24		18
Chloride	250	44	147.00	72	44	52	13	51		44
Nitrate	10	0.7	5.36	0.2	< 0.06	0.4	< 0.06	< 0.06		0.71
Barium	1	0.16	0.58	0.107	0.16	0.566	0.361	<b>0.62</b>		0.16
Boron	5	0.074	2.54	0.043	0.039	0.128	0.164	0.117		0.074
Calcium		130		106	106	128	99.9	135		130
Iron	0.3	0.02	0.16	0.016	<b>0.372</b>	<b>4.28</b>	<b>1.52</b>	< 0.007		0.024
Manganese	0.05	0.00378	0.03	0.0052	0.0159	<b>0.0931</b>	0.0268	0.00515		0.00378
Sodium	200	29.3	114.65	37.4	34.6	6.56	8.7	13.9		29.3

PLATE 6A

**EVALUATION OF REASONABLE USE CRITERIA - BEDROCK WELLS, JUNE 2018**  
**Hall's Glen Landfill Site**

PARAMETER	ODWS MAC	BACKGROUND AVERAGE	RUP MAC'S	BEDROCK MONITORS						BACKGROUND WELL	
				MW2-I	MW3-I	MW4-I	MW5-I	MW6-I	MW7-I	MW1-I	MW13-I
Alkalinity	500	259	379.50		272	310	<b>640</b>	<b>469</b>	301	291	227
pH	8.5	8.09	8.30		8.01	8.01	7.52	7.84	7.76	8.07	8.11
Conductivity		880			643	743	1340	1270	435	1170	590
TDS	500	544	522.00		354	397	<b>774</b>	<b>686</b>	254	774	314
COD		10.5			< 8	< 8	38	25	10	8	13
Ammonia		0.1			0.1	0.4	10.2	6.2	< 0.1	0.1	0.1
Sulphate	500	45.5	272.75		61	350	15	43	12	76	15
Chloride	250	130	190.00		40	65	130	110	14	160	100
Nitrate	10	1.2			1.41	0.88	2.74	0.61	< 0.06	1.48	0.94
DOC	5	2	3.50		<b>4</b>	<b>5</b>	<b>20</b>	<b>9</b>	3	2	2
Barium	1	0.15415	0.58		0.0998	0.115	0.484	0.313	0.123	0.238	0.0703
Boron	5	0.0665	2.53		0.065	0.092	0.295	0.241	0.539	0.111	0.022
Calcium		135.2			135	135	259	194	35.7	174	96.4
Iron	0.3	0.01	0.15		< 0.007	< 0.007	<b>21.8</b>	<b>1.24</b>	< 0.007	0.007	0.007
Manganese	0.05	0.0001	0.03		0.00437	<b>0.234</b>	<b>2.03</b>	<b>1.42</b>	0.00052	0.00012	0.00008
Sodium	200	48.7	124.35		17.8	27.7	54.6	64.1	143	65.8	31.6

All results are represented in mg/L unless otherwise stated

ODWS - Ontario Drinking Water Standards, 2000

RUP - Reasonable Use Policy (Policy B-7)

Bolded values exceed RUP.

Background Well MW1-I was reported at less than detection limit for Nitrate (<0.05).

PARAMETER	ODWS MAC	BACKGROUND AVERAGE	RUP MAC'S	BEDROCK MONITORS						BACKGROUND WELL	
				MW8-I	MW9-I	MW10-I	MW11-I	MW12-II	MW12-III	MW1-I	MW13-I
Alkalinity	500	259	379.50	291	275	241	265	284	281	291	227
pH	8.5	8.09	8.30	7.89	8.15	8.03	8.11	8.11	8.01	8.07	8.11
Conductivity		880		816	633	638	669	767	747	1170	590
TDS	500	544	522.00	457	386	389	391	429	463	774	314
COD		10.5		< 8	19	9	< 8	< 8	< 8	8	13
Ammonia		0.1		< 0.1	0.6	< 0.1	0.8	0.2	< 0.1	0.1	0.1
Sulphate	500	45.5	272.75	16	68	28	53	71	25	76	15
Chloride	250	130	190.00	82	15	51	32	39	60	160	100
Nitrate	10	1.2	5.61	< 0.06	0.14	0.27	< 0.06	< 0.06	< 0.06	1.48	0.94
DOC	5	2	3.50	1	1	3	2	2	< 1	2	2
Barium	1	0.15415	0.58	0.096	0.416	<b>0.702</b>	0.377	0.18	0.0735	0.238	0.0703
Boron	5	0.0665	2.53	0.108	0.385	0.242	0.492	0.533	0.115	0.111	0.022
Calcium		135.2		125	77.2	112	118	119	153	174	96.4
Iron	0.3	0.01	0.15	0.031	0.096	<b>0.481</b>	0.028	0.033	0.04	0.007	0.007
Manganese	0.05	0.0001	0.03	0.00156	<b>0.0526</b>	<b>0.191</b>	<b>0.0814</b>	<b>0.156</b>	0.0161	0.00012	0.00008
Sodium	200	48.7	124.35	47.1	41.8	12	14.8	38.5	14.5	65.8	31.6

PLATE 6B



**EVALUATION OF REASONABLE USE CRITERIA - OVERBURDEN WELLS, NOVEMBER 2018**  
**Hall's Glen Landfill Site**

PARAMETER	ODWS MAC	BACKGROUND AVERAGE	RUP MAC'S	OVERBURDEN MONITORS						BACKGROUND WELL
				MW 2-II	MW 3-II	MW 4-II	MW 5-II	MW 6-II	MW 7-II	MW 13-II
Alkalinity	500	282	391.00			315		<b>505</b>	<b>1080</b>	282
pH	8.5	7.91	8.21			7.87		7.74	7.58	7.91
Conductivity		610				701		1080	2200	610
TDS	500	371	435.50			417		<b>686</b>	<b>1470</b>	371
COD		< 8				< 8		17	95	< 8
Ammonia		< 0.1				< 0.1		< 0.1	23.2	< 0.1
Sulphate	500	15	257.50			11		43	60	15
Chloride	250	30	140.00			50		65	140	30
Nitrate	10	1.4	5.69			0.77		4.76	0.12	1.37
Barium	1	0.106	0.55			0.143		0.304	0.432	0.106
Boron	5	0.027	2.51			0.044		0.269	0.673	0.027
Calcium		109				116		145	308	109
Iron	0.3	0.01	0.16			0.017		0.111	<b>0.178</b>	0.013
Manganese	0.05	0.0096	0.03			0.00114		0.00925	<b>7.44</b>	0.0096
Sodium	200	31.8	115.90			20.6		55.6	<b>128</b>	31.8

All results are represented in mg/L unless otherwise stated

ODWS - Ontario Drinking Water Standards, 2000

RUP - Reasonable Use Policy (Policy B-7)      Bolded values exceed RUP.

Background Well MW1-I was reported at less than detection limit for Nitrate (<0.05).

PARAMETER	ODWS MAC	BACKGROUND AVERAGE	RUP MAC'S	OVERBURDEN MONITORS						BACKGROUND WELL
				MW 8-II	MW 9-II	MW 10-II	MW 11-II	MW 12-I		MW 13-II
Alkalinity	500	282	391.00	272	272	244	247	251		282
pH	8.5	7.91	8.21	8.15	8.14	7.9	7.65	7.95		7.91
Conductivity		610		984	801	619	603	593		610
TDS	500	371	435.50	<b>583</b>	423	360	354	346		371
COD		< 8		9	8	10	9	13		< 8
Ammonia		< 0.1		0.1	0.2	0.6	0.9	0.1		< 0.1
Sulphate	500	15	257.50	14	16	7	13	22		15
Chloride	250	30	140.00	120	85	47	29	45		30
Nitrate	10	1.4	5.69	0.94	0.62	0.23	< 0.06	< 0.06		1.37
Barium	1	0.106	0.55	0.19	0.203	0.472	0.477	<b>0.667</b>		0.106
Boron	5	0.027	2.51	0.023	0.091	0.113	0.129	0.12		0.027
Calcium		109		139	97.6	90.8	102	96.7		109
Iron	0.3	0.01	0.15	1.32	<b>0.526</b>	<b>9.96</b>	<b>3.35</b>	< 0.007		0.013
Manganese	0.05	0.0096	0.03	0.0389	0.0211	<b>0.0751</b>	<b>0.0313</b>	0.00269		0.0096
Sodium	200	31.8	115.90	46	48.3	8.17	5.56	10.4		31.8

PLATE 6C

**EVALUATION OF REASONABLE USE CRITERIA - BEDROCK WELLS, NOVEMBER 2018**  
**Hall's Glen Landfill Site**

PARAMETER	ODWS MAC	BACKGROUND AVERAGE	RUP MAC'S	BEDROCK MONITORS						BACKGROUND WELL	
				MW2-I	MW3-I	MW4-I	MW5-I	MW6-I	MW7-I	MW1-I	MW13-I
Alkalinity	500	282.5	391		354	376	677	469	342	292	273
pH	8.5	7.975	8.2		7.82	7.76	7.56	7.75	8.26	7.96	7.99
Conductivity		966			815	904	1520	1190	787	1110	822
TDS	500	564	532.00		471	537	877	703	454	671	457
COD		8			< 8	8	41	15	< 8	8	8
Ammonia		0.1			< 0.1	0.2	13.3	6.5	< 0.1	0.1	0.1
Sulphate	500	43	271.50		16	27	10	42	30	73	13
Chloride	250	126.5	188.25		52	67	120	100	45	160	93
Nitrate	10	2.0	5.98		2.26	1.58	0.54	0.14	0.25	2.7	1.21
DOC	5	2.5	3.75		2	3	14	6	1	2	3
Barium	1	0.1537	0.58		0.112	0.151	0.587	0.285	0.131	0.229	0.0784
Boron	5	0.062	2.53		0.045	0.11	0.45	0.213	0.54	0.104	0.02
Calcium		114.4			129	155	230	163	40.6	157	71.8
Iron	0.3	0.01	0.15		0.013	0.061	28.4	2.24	< 0.007	0.008	0.007
Manganese	0.05	0.003585	0.03		0.102	0.0535	2.12	1.37	0.00568	0.00682	0.00035
Sodium	200	70.55	135.28		30.7	34.2	81.9	63.7	148	70.5	70.6

All results are represented in mg/L, unless otherwise stated

ODWS - Ontario Drinking Water Standards, 2000

RUP - Reasonable Use Policy (Policy B-7).

Bolded values exceed RUP.

Background Well MW1-I was reported at less than detection limit for Nitrate (<0.05).

PARAMETER	ODWS MAC	BACKGROUND AVERAGE	RUP MAC'S	BEDROCK MONITORS						BACKGROUND WELL	
				MW8-I	MW9-I	MW10-I	MW11-I	MW12-II	MW12-III	MW1-I	MW13-I
Alkalinity	500	282.5	391	292	279	240	256	287	294	292	273
pH	8.5	7.975	8.24	7.85	8.41	8.26	8.19	8	7.83	7.96	7.99
Conductivity		966		818	606	649	647	732	708	1110	822
TDS	500	564	532.00	434	280	374	380	449	426	671	457
COD		8		12	37	< 8	15	15	< 8	8	8
Ammonia		0.1		< 0.1	0.6	0.2	0.7	0.2	< 0.1	0.1	0.1
Sulphate	500	43	271.50	17	31	23	52	66	23	73	13
Chloride	250	126.5	188.25	81	18	50	30	43	56	160	93
Nitrate	10	2.0	5.98	< 0.06	< 0.06	< 0.06	< 0.06	< 0.06	0.08	2.7	1.21
DOC	5	2.5	3.75	< 1	1	< 1	2	2	1	2	3
Barium	1	0.1132	0.56	0.102	0.769	0.747	0.37	0.168	0.0347	0.148	0.0784
Boron	5	0.0495	2.52	0.104	0.612	0.253	0.478	0.501	0.08	0.079	0.02
Calcium		112.4		117	59	98.5	103	97.7	136	153	71.8
Iron	0.3	0.01	0.15	0.031	< 0.007	0.043	0.148	0.024	0.2	0.008	0.007
Manganese	0.05	0.003585	0.03	0.0452	0.0706	0.133	0.0835	0.149	0.0493	0.00682	0.00035
Sodium	200	70.55	135.28	49.7	52.4	14.7	15.7	40.4	15.2	70.5	70.6

PLATE 6D

**EVALUATION OF REASONABLE USE CRITERIA - OVERBURDEN WELLS, 2018**  
**Hall's Glen Landfill Site**

PARAMETER	ODWS MAC	BACKGROUND AVERAGE	RUP MAC'S	OVERBURDEN MONITORS		BACKGROUND WELL	
				R-1 Spring	R-1 Fall	MW 13-II Spring	MW 13-II Fall
Alkalinity	500	251.5	375.75	228	267	221	282
pH	8.5	7.9	8.20	7.98	7.93	7.89	7.91
Conductivity		556.5		623	667	503	610
TDS	500	320	410.00	320	357	269	371
COD		8		8	11	8	8
Ammonia		0.5		0.1	0.3	0.9	0.1
Sulphate	500	16.5	258.25	4	10	18	15
Chloride	250	37	143.50	56	51	44	30
Nitrate	10	1.0	5.52	0.12	0.24	0.71	1.37
Barium	1	0.133	0.57	0.0663	0.0946	0.16	0.106
Boron	5	0.0505	2.53	0.037	0.017	0.074	0.027
Calcium		119.5		101	111	130	109
Iron	0.3	0.02	0.16	<b>0.3</b>	<b>0.371</b>	0.024	0.013
Manganese	0.05	0.01	0.03	0.00241	<b>0.308</b>	0.00378	0.0096
Sodium	200	30.55	115.28	38.8	33.5	29.3	31.8

All results are represented in mg/L unless otherwise stated

ODWS - Ontario Drinking Water Standards, 2000

RUP - Reasonable Use Policy (Policy B-7)

Bolded values exceed RUP.

Background Well MW1-I was reported at less than detection limit for Nitrate (<0.05).

PLATE 6E

## **Appendix A**

### **MOECC C of A and Correspondence**



MEMORANDUM

September 8, 2016

TO: C. Johnston  
Senior Environmental Officer  
Peterborough District Office  
Eastern Region

FROM: B. W. Metcalfe  
Senior Environmental Officer  
Water Resources Unit – Surface Water Group  
Technical Support Section  
Eastern Region

RE: 2015 Groundwater Monitoring Report – Hall's Glen Landfill Site  
Lot 25, Concession 4, Geographic Township of Dummer  
Township of Douro-Dummer, County of Peterborough  
Environmental Compliance Approval (ECA) No. 341007

---

I have reviewed the noted report dated March 2016, prepared by GHD, for the Township of Douro-Dummer, the landfill site Owner. The following comments are offered relative to surface water impact concerns:

**Background Information**

The Hall's Glen landfill Site is situated along the south side of County Road no. 6 approximately 10 km north of the community of Warsaw. The site operates per the provisional Certificate of Approval No. 341004 dated October 8, 1980. The site also operates as a transfer site according to ECA No. A341007. It was reported that during the summer of 2003 the landfill site was prepared for closure. The landfill area has been mounded and capped and it was understood that that further work was conducted in 2004 and 2005. The landfill operates as a natural attenuating site.

**Surface Water Regime**

The landfill site is situated within the Trent River Basin. The major surface water features in the landfill site area include Stony Lake located north of the Site and Dummer Lake located to the east of the Site.

Based on overburden groundwater monitoring data GEO-LOGIC determined that the pattern of overburden groundwater movement within the Site area appears to be in a southeasterly direction. There is possible groundwater discharge from the Site area to the wetland located southeast of the landfill.

## **2015 Surface Water Sampling Program**

Surface water samples were collected on two occasions during May and November of 2015. Surface water sample station S-1 is located downgradient from the landfill site and sample station S-2 is the background surface water monitor that was added in 2014. The collected samples were analyzed for the parameters listed in Column 3 of Schedule 5 of the Landfill Standards Guidelines (Comprehensive List for Surface Water). In-field measurements of water temperature, pH, conductivity and dissolved oxygen were taken for each sampling event.

## **2015 Surface Water Sampling Results**

### **Upstream Background (S-2):**

Surface water sample station, newly established in 2014, is located north, upgradient of the landfill site. Sampling was conducted on two occasions in 2015 during May (spring) and November (fall).

The water quality general chemistry was characterized having BOD (<4 mg/L), COD (9 – 18 mg/L), field Dissolved Oxygen (8.18 mg/L, Nov. 19/15), field Conductivity (109 µS/cm, Nov. 19/15), field pH (7.82, Nov. 19/15), Alkalinity (251 - 269 mg/L), Chlorides (34 - 84 mg/L), Total Ammonia (<0.1 mg/L), Un-ionized Ammonia (n.a.), Nitrate (<0.06 – 0.13 mg/L), Total Phosphorus (0.021 - <0.03 mg/L), Total Suspended Solids (< 2 – 3 mg/L) and Phenols (0.001 – 0.002 mg/L).

- Provincial Water Quality Objectives (PWQO) exceedance was observed only for Phenols (0.002 mg/L slightly exceeded 0.001 mg/L, Nov. 91/15).

### **Downstream Impact (S-1):**

Surface water sample station is located approximately 0.75 km southeast downgradient of the landfill site waste mound. Sampling was conducted on two occasions during May and November 2015.

The water quality general chemistry was characterized having BOD (< 4 mg/L), COD (9 - 10 mg/L), field Dissolved Oxygen (6.05 mg/L, Nov. 4/15), field Conductivity (546 µS/cm, Nov. 4/15), field pH (7.2, Nov. 4/15), Alkalinity (253 - 273 mg/L), Chlorides (59 – 84 mg/L), Total Ammonia (<0.1 mg/L), Un-ionized Ammonia (n.a.), Nitrate (<0.03 mg/L), Total Phosphorus ( 0.012 – <0.03 mg/L), Total Suspended Solids (< 2 – 4 mg/L) and Phenols (<0.001 – 0.001 mg/L).

- There were no PWQO exceedances observed for the relevant parameters analyzed for.

### **Surface Water Quality Impact Assessment**

- The reviewer is in agreement with the landfill site Owner's assessment that all of the water quality parameters tested for are within their respective current PWQO, the Canadian Council of Ministers of the Environment Canadian Water Quality Guidelines, and APV concentrations with the exception of a minor exceedance for Phenols of the PWQO in the background 2015 November (fall) sample.
- The monitoring results for the 2015 sampling events indicated the landfill site was not having an adverse impact to the water quality of the down-gradient surface water monitored at sample location S-2.
- Relative to surface water impact concerns the reviewer is in agreement with the conclusions and recommendations presented in the 2015 Annual Monitoring Report for the Hall's Glen Landfill Site.

#### ***"Original Signed By"***

Bruce Metcalfe  
BWM/dv

ec: G. Faaren  
P. Taylor  
C. Redmond

c: S. Trimper  
B. Metcalfe (Aba2016\aba4161.mem) 6151-AAFLMZ \ X-ref. 6700-AAFLBU  
File SW PB DD C4 03 06, Hall's Glen Landfill Site, Township of Douro-Dummer  
File SW 11 02 07 02, Unnamed Tributary, Stony Lake, Trent River Basin



MEMORANDUM

07 August 2014

TO: C. Johnston  
Senior Environmental Officer  
Peterborough District Office  
Eastern Region

FROM: B. W. Metcalfe  
Senior Environmental Officer  
Water Resources Unit, Surface Water Group  
Technical Support Section  
Eastern Region

RE: 2013 Annual Monitoring Report - Hall's Glen Landfill Site  
Lot 25, Concession 4, Dummer Ward, Geographic Township of Dummer  
Township of Duoro-Dummer, County of Peterborough  
Environmental Compliance Approval (ECA) No. A341004

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I have reviewed the document entitled, "2013 Groundwater Monitoring Report, Hall's Glen Landfill Site (C of A A341004)", dated March 2014, prepared by Geo-Logic Inc. (Geo-Logic) for the Township of Duoro- Dummer. The following comments are offered relative to surface water impact concerns.

**Background Information**

The Hall's Glen landfill Site is situated along the south side of County Road No. 6 approximately 10 km north of the community of Warsaw. The site operates per the provisional Certificate of Approval No. 341004 dated October 8, 1980. The site also operates as transfer site according to Provisional Certificate of Approval No. A341007. It was reported that during the summer of 2003 the landfill site was prepared for closure. The landfill area has been mounded and capped and it was understood that further work was conducted in 2004 and 2005. The landfill operates as a natural attenuating site.

**Surface Water Regime**

The landfill site is situated within the Trent River Basin. The major surface water features in the landfill site area include Stony Lake located north of the site and Dummer Lake located to the east of the site.

Based on overburden groundwater monitoring data Geo-Logic determined that the pattern of overburden groundwater movement appears to be in an easterly direction.



### **Surface Water Monitoring Program**

The groundwater monitoring report includes a limited surface water sampling component for the site. The surface water monitoring program is limited to one surface water sampling station (identified as SW1 on the Site Plan) which is located southeast downgradient of the site. The surface water feature monitored was not identified, but appears to be a drainage ditch or ponded wetland. The landfill site Owner did not include a reference background upstream surface water quality sampling station.

Sample station SW1 was sampled on two occasions, June 10 and November 5, 2013. The collected surface water samples were analyzed for the limited parameter suite specified in Column 4 of Schedule 5 of the Landfill Standards Guideline (Indicator List for Surface Waters).

The analyses of the June 10 and November 5, 2013 collected surface water samples (referenced as sample station S-1) were presented in the SGS Certificate of Analysis Reports dated June 17 and November 13, 2013 respectively.

### **Surface Water Impact Assessment**

SGS summarized the surface water quality data with the assessment that all of the parameters tested are within their respective current PWQO (the PWQO parameters analyzed for were limited only to pH, total phosphorus, phenols, and iron).

A review of the 2013 analytical results showed a total phosphorus concentration of 0.08 mg/L for the June 10/13 sample which exceeded the PWQO of 0.03 mg/L.

- The reviewer would note that there is no upstream background surface water sampling station incorporated in the surface water monitoring program for the landfill site.

### **Summary and Recommendations**

Relative to surface water quality impact assessment purposes the reviewer considers the 2013 Annual Monitoring Report for the Hall's Glen Landfill Site provided by the landfill site Owner to be deficient.

The reviewer provided previous surface water technical comment on the 2012 Annual Monitoring Report for the Hall's Glen Landfill Site (Geo-Logic, 2012) which was presented in the memorandum dated January 20, 2014, from B. Metcalfe, Senior Environmental Officer, Water Resources Unit, Technical Support Section, Eastern Region to D. Johnston, Senior Environmental Officer, Peterborough District Office. The reviewer's recommendations presented in the noted January 20, 2014 memorandum and those provided in this memorandum remain essentially the same. Additional detail regarding the nature and degree of the surface water quality impact associated with the landfill site is required from the landfill site Owner. The reviewer recommends the following:

- In addition to the existing downstream surface water sampling station SW1 a reference upstream background surface water sampling station is required for the surface water monitoring program for the landfill site.

- The chemical parameter suite per Column 4 of Schedule 5 of the Landfill Standards Guideline (Indicator List for Surface Waters) is considered to be inadequate for the purposes of surface water quality impact assessment for this landfill site. The collected surface water samples should be analyzed for the Schedule 5 – Column 3 Comprehensive List for Surface Water (which includes the metals analyses suite) per the MOE Landfill Standards Guideline.
- A surface water quality impact assessment section is required to be provided by the landfill site Owner and this should be included in all future Annual Monitoring Reports for the Hall's Glen Landfill Site.



Bruce Metcalfe  
BWM/gl

- c: G. Faaren  
B. Metcalfe (Aba2014\aba414.mem) 2441-9KKLGX \ X-ref. 2387-9KHRP6  
File SW PB DD C4 03 06, Hall's Glen Landfill Site, Township of Duoro-Dummer  
File SW 11 02 07 02, Unnamed Tributary, Stony Lake, Trent River Basin
- ec: G. Dagg-Foster  
P. Taylor  
J. Matherus

**Ministry of the Environment**

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**Ministère de l'Environnement**

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613/549-4000 ou 1-800/267-0974  
Fax: 613/548-6908



**M E M O R A N D U M**

23 June 2014

**TO:** Chris Johnston  
Senior Environmental Officer  
Peterborough District Office  
Eastern Region

**FROM:** Greg Faaren  
Hydrogeologist  
Technical Support Section  
Eastern Region

**RE:** Hall's Glen Waste Disposal Site, 2013 Annual Monitoring Report  
Lot 25, Concession IV, Geographic Region of Dummer  
Township of Duoro-Dummer, County of Peterborough, A341004

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Purpose

I have reviewed the hydrogeologically pertinent sections of the document entitled "2013 Groundwater Monitoring Report, Hall's Glen Landfill Site (A341004), Township of Douro-Dummer, County of Peterborough" dated March 2014 and prepared by GEO-LOGIC Inc. (GLI). This report was provided on behalf of Township of Douro-Dummer to fulfill the requirements of the Provisional Environmental Compliance Approval (ECA) for the site. I offer the following comments for your consideration.

Summary

- The primary pathway for leachate migration at the site is within the overburden and shallow bedrock to the southeast of the waste mound. Leachate impacted groundwater is present to the south and southeast of the waste mound.
- GLI completed a Guideline B-7 Reasonable Use (RU) assessment as part of the 2013 annual monitoring report. However, the RU assessment only included four (4) parameters (iron, chloride, sulphate and nitrate). The data provided by GLI shows RU exceedances for iron in several downgradient wells. GLI states that the iron concentrations observed in the downgradient wells at locations MW8, MW10 and MW11 may be naturally occurring. Continued monitoring is recommended. Future RU assessments must also include all leachate indicator parameters for the site.
- Leachate impacted groundwater flows to the south and southeast from the waste mound, and may discharge to the wetland in this portion of the site. It is recommended that any monitoring wells that are thought to intercept groundwater that discharges to surface water be analyzed for the same suite of parameters as the surface water samples. The samples should also be analyzed with detection limits commensurate with

the Provincial Water Quality Objectives (PWQO). The samples from these monitoring wells must be compared to the PWQO and the Ontario Drinking Water Quality Standards, Objectives and Guidelines (ODWSOG).

- The fall sample from residential well R2 exceeded the ODWSOG for iron. The spring and fall samples from well R4 also exceeded the ODWSOG for TDS. These impacts do not appear to be landfill related as well R4 is located upgradient of the waste disposal site and well R2 is located downgradient of the site across a wetland. Continued monitoring is recommended.
- Trend analysis information was provided for select monitoring wells at the site, but the supporting data (i.e. numerical data tables) was not provided. It is recommended that the historical sampling data as well as background water quality ranges be included as part of each annual report. The supporting data should be provided in both hard copy and electronic format (i.e. MS Excel) as well. Evaluation of trends in groundwater concentrations should continue to be completed for all leachate indicator parameters at all monitoring wells at the site.
- GLI has provided groundwater trigger mechanisms based on only health related volatile organic compound (VOC) parameters. These parameters alone do not comprise an appropriate trigger mechanism for the site. It is recommended that trigger mechanisms and contingency plans based Guideline B-7, Reasonable Use and surface water issues be developed for the site and provided in the next annual monitoring report. The trigger parameters should include all leachate indicator parameters.
- It is noted that the waste disposal site boundaries are not shown clearly on the figures attached in the report. This issue should be addressed.
- GLI recommends that groundwater samples be analyzed for the list of parameters in Column 2 of Schedule 5 of the Landfill Standards Guideline. The reporting frequency is to be every year. I recommend that the semi-annual groundwater monitoring sampling program continue at this site. The list of parameters should include those listed in Column 1 (spring) and Column 2 (fall) of Schedule 5 of the Landfill Standards Guideline (including manganese).
- As per the MOE's November 2010 Monitoring and Reporting for Waste Disposal Sites Technical Guidance Document, a Monitoring and Screening checklist is to be submitted with all annual monitoring reports, commencing in 2011. In reviewing the Hall's Glen waste disposal site report, it is noted that the checklist was not included. It is recommended that the 2014 report, and all subsequent future reports include a completed and signed checklist.

#### Environmental Compliance Approval (ECA)

The Hall's Glen waste disposal site previously operated under Provisional ECA A341004. The site stopped accepting waste in 2003 and began closure activities at that time. Final capping of the landfill was completed in 2005. The site is located in Lot 25, Concession IV, Geographic Region of Dummer, Township of Douro-Dummer. Originally, the licensed waste footprint was 1.0 hectare within a total property of 2.0 ha. However in 2005, additional buffer lands were

purchased by the Township to bring the site's total area to 48.5 ha. These additional lands were added in an amendment to the site's ECA issued on February 1, 2006. A groundwater monitoring program was implemented for the site as part of the post closure plan. It is noted that the waste disposal site boundaries are not shown clearly on the figures attached in the report.

According to MOE's November 2010 Monitoring and Reporting for Waste Disposal Sites Technical Guidance Document, and as communicated by the ministry (through webinars and information distributed in coordination with the Ontario Waste Management Association both last year and earlier this year), a Monitoring and Screening checklist is to be submitted with all annual monitoring reports, commencing in 2011. In reviewing the 2013 Hall's Glen waste disposal site report, it is noted that the checklist was not included.

### Geology

The consultants previously described the geology of the site as:

- A glacial drift/till unit;
- A glaciolacustrine sand unit; and,
- A limestone bedrock unit (Lindsay Formation).

GLI reports that the typical overburden thickness at the site is approximately 3.25 m.

### Hydrogeology

The consultants previously determined the physical hydrogeological characteristics of the site as:

- Groundwater flow within the overburden on-site is to the southeast towards an unnamed wetland. Groundwater flow within the bedrock is towards the south.
- The hydraulic conductivities at the site range from  $10^{-2}$  to  $10^{-3}$  cm/second.
- GLI reported that the average horizontal gradient for the shallow overburden wells was  $1.6 \times 10^{-2}$  m/m, deep overburden wells was  $4.6 \times 10^{-3}$  m/m and  $3.8 \times 10^{-3}$  m/m in bedrock. Vertical hydraulic gradients are variable with downward gradients observed in wells near the waste mound and upward gradients in wells near the wetland.

GLI reports that monitoring wells MW1-II, MW2-I, MW2-II and MW5-II were not able to be sampled in 2013.

### Background Water Quality

GLI has used monitoring wells MW1-I, MW1-II, MW13-I and MW13-II to represent background water quality conditions for the site. These monitoring wells are located hydraulically upgradient to the existing landfill area. Water samples were unable to be collected from well MW1-II during the 2013 sampling program. The groundwater sampling results show that only dissolved organic carbon (DOC) and total dissolved solids (TDS) from well MW1-I exceeded the ODWSOG in analyzed background groundwater samples in 2013.

### Leachate

Groundwater monitoring wells MW2-I and MW2-II are located within the waste area and are expected to be representative of leachate quality. However, monitoring wells MW2-I and MW2-II were not able to be sampled in 2013. It is noted that both the shallow and deep monitoring wells at locations MW3, MW5 and MW6 were sampled in 2013 and (as in previous years) the groundwater quality in these wells was notably impacted. Elevated concentrations of iron, alkalinity, DOC, sulphate and TDS were noted in these wells. These wells would appear to most represent leachate quality at the landfill.

### Downgradient Water Quality

The primary pathway for leachate migration is inferred to be within the overburden and shallow bedrock in a south to southeasterly direction. Leachate impacts to groundwater as measured in the downgradient locations at this site are summarized as follows:

- The highest levels of leachate indicator parameters were seen in the overburden monitoring wells at locations MW3, MW5 and MW6. Levels of one (1) or more of iron, alkalinity, DOC and TDS exceeded the ODWSOG in each of these wells.
- It is noted that concentrations of most leachate indicator parameters were lower in the spring sampling event (June) than in the fall sampling event (November). GLI also notes that groundwater quality showed less impact in 2013 as compared to previous years. Further monitoring is required to study this trend.
- Exceedances of the ODWSOG for iron were noted in the furthest downgradient monitoring wells (i.e. MW10 and MW11).

GLI reports that the elevated concentrations of iron observed in wells MW8-I, MW10-II and MW11-II may be naturally occurring. The concentrations of iron observed in these monitoring wells are significantly higher than those observed in wells closer to the waste mound, particularly in the shallow zone wells. There may be other factors contributing to the elevated iron concentrations in these wells. However it is noted that elevated concentrations of landfill related iron are evident in some monitoring wells closer to the waste mound.

The results of the VOC analyses conducted showed no exceedances of the ODWSOG for VOC parameters.

It is noted that the groundwater samples from the Hall's Glen waste disposal site were not submitted for analysis of manganese. Manganese is a common leachate indicator parameter at waste disposal sites. The reason for not including manganese in the sampling suite was not provided.

### Groundwater/Surface Water Interaction

The site plans provided by GLI indicate that there are wetlands located off-site to the southeast of the waste mound. GLI reports that vertical hydraulic gradients near the wetland are upward, indicating groundwater discharge conditions. Therefore there is the potential that shallow groundwater discharges to the surface water to the southeast of the site. GLI has not compared the results of the groundwater analyses conducted to the PWQO criteria.



#### Potable Groundwater Sampling

GLI reports that groundwater samples were collected from nearby potable water supply wells R1, R2, R3 and R4 in the spring and fall of 2013. Wells R1 and R2 are located downgradient of the landfill site and across a wetland. Wells R3 and R4 are located upgradient of the landfill near the intersection of 4<sup>th</sup> Line Road and County Road 6.

A review of the sampling results indicates that the spring and fall 2013 water samples from well R4 exceeded the ODWSOG for TDS. However, the samples from well R4 showed low levels of barium, calcium and magnesium, but elevated levels of chloride, sodium, TDS and conductivity. Well R4 is located hydraulically upgradient of the waste disposal site and therefore the impacts in this well are not likely related to the landfill. This well may be showing signs of road salt impacts.

The fall sample from well R2 exceeded the ODWSOG for iron. These impacts do not appear to be landfill related as well R2 is located significantly downgradient of the site across a wetland.

#### Guideline B-7 Reasonable Use

Guideline B-7 applies to operating waste disposal sites and to sites closed post 1986. GLI conducted a Guideline B-7 Reasonable Use for the site as part of the 2013 monitoring program report. However, GLI only used four (4) parameters as part of the Reasonable Use assessment, namely chloride, sulphate, nitrate and iron. Other leachate indicator parameters including TDS, alkalinity and DOC were not included.

GLI reports Reasonable Use (RU) exceedances for iron in several downgradient wells on at least one (1) occasion in 2013. GLI states that the iron concentrations observed in the downgradient wells may be naturally occurring. Iron is not elevated in any of the background groundwater monitoring wells and wells located closer to the waste mound show elevated concentrations of iron likely related to leachate impacts. However, iron concentrations observed in wells MW8-I, MW10-II and MW11-II are significantly higher than those observed in wells closer to the waste mound, particularly in the shallow zone wells. There may be other factors contributing to the elevated iron concentrations in these wells. It is noted that concentrations of leachate indicators in the downgradient wells has decreased from previous years.

The landfill site boundaries are not well illustrated on the site plan. Therefore it is difficult to ascertain where the Guideline B-7 conformance boundary is located.

#### Trigger Mechanisms/Contingency Plans

Information regarding trigger mechanisms or contingency plans was provided in the 2013 report. However, the trigger mechanisms specified were based only on health related parameters from the ODWSOG for VOCs. Trigger mechanisms based on non-health related groundwater parameters or surface water issues were not provided.

Groundwater Monitoring

GLI recommends that groundwater samples be analyzed for the list of parameters in Column 2 of Schedule 5 of the Landfill Standards Guideline. GLI also recommends that additional QA/QC samples be analyzed for VOCs during both sampling events in 2014. The reporting frequency is to be annual.



Greg Faaren, P.Geo.  
GF/sh

ec: Peter Taylor  
Gillian Dagg-Foster  
David Bradley  
Victor Castro

c: File GW PB DD C4 01 03 (A341004)  
GF/IDS #2417-8VLL4E



FEB 08 2006



Ontario

Ministry  
of the  
Environment

Ministère  
de  
l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL  
WASTE DISPOSAL SITE  
NUMBER A341004

Issue Date: February 1, 2006

The Corporation of the Township of Douro-Dummer  
PO Box 92  
Warsaw, Ontario  
K0L 3A0

Site Location: Hall's Glen Landfill Site  
Lot 25, Concession 4, Dummer Ward  
Douro-Dummer Township, County of Peterborough

*You are hereby notified that I have amended Provisional Certificate of Approval No. A341004 issued on October 8, 1980 and amended on April 6, 2001, November 29, 2001, August 29, 2002, July 18, 2003, July 23, 2004 and June 23, 2005 for a Waste Disposal Site (Landfill/Transfer), as follows:*

- I. The total area of the closed Hall's Glen landfill site is hereby increased from 8 hectares to 48.5 hectares in accordance with the letter dated August 30, 2005 to James O' Mara, Director, Environmental Assessment and Approvals Branch, Ministry of the Environment. See Part IV for Registration on Title requirements.
- II. The following definitions are hereby added:
  - (1) (g) "Competent" means knowledgeable, through instruction and practice, and able to carry out any necessary duties in the following:
    - (i) relevant waste management legislation, regulations and guidelines;
    - (ii) major environmental concerns pertaining to the waste to be handled;
    - (iii) emergency response procedures for the waste to be handled;
    - (iv) use and operation of the equipment to be used at the Site;
    - (v) emergency response procedure and alerting;
    - (vi) Site specific written procedures for the control of conditions that may cause an adverse effect; and
    - (vii) requirements of this Certificate.

III. HOUSEHOLD HAZARDOUS WASTE ("HHW") DEPOT

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The Township is hereby approved to establish and operate a household hazardous waste depot at the site, in accordance with the following added conditions and with the items listed in Schedule "B" of this Certificate:

- (34) (a) The HHW depot shall not receive more than 20 cubic metres of HHW per day; and  
(b) The HHW depot shall not store in excess of 50 cubic metres of HHW on site.
- (35) HHW shall not be stored at the Site for longer than one hundred eighty (180) days, unless the consent of the District Manager has been obtained, with the exception of waste oil which shall be stored on site in accordance with Condition 31(b).
- (36) All household hazardous waste received and stored must be managed in accordance with Ontario Regulation 347, R.R.O. 1990, as amended, and with the Ministry of Environment document entitled "Household Hazardous Waste Collection and Facility Guidelines" dated May 1993.
- (37) All storage of liquid wastes shall be in accordance with this Ministry's publication "Guidelines of Environmental Protection Measures at Chemical Storage Facilities", dated October 1978 as amended.
- (38) All HHW shall be stored in secondary containment that is adequate to contain any spills or leaks. Segregated secondary containment shall be provided for incompatible types of waste.
- (39) Incoming HHW shall be inspected by Competent personnel, prior to being accepted at the Site, to ensure that the Site is approved to accept that type of waste.
- (40) All containers shall be clearly labeled indicating the type and nature of the hazardous waste stored as required by regulation. All points of access to the Site shall be posted to warn that the area contains hazardous materials.
- (41) No radioactive wastes shall be accepted at this Site.
- (42) Oil and oil-based paints which have been manufactured prior to 1972; or whose manufacturing date cannot be determined, may contain PCBs and shall be handled as follows:
  - (a) The oil and oil-based paints shall not be mixed (bulked) with other paints prior to testing. Paints which are lab-packed are not considered to be mixed under this Certificate;
  - (b) The oil and oil-based paints shall be tested by a certified laboratory for PCB content and shall be handled in the manner outlined in Condition 42(c) if found to contain PCBs;

- (c) If the oil and oil-based paints are found to have PCBs at or above levels identified in Condition 42(d), it shall be forthwith reported to the District Manager and shall be managed in accordance with Regulation 362 and stored or removed from the Site to an approved PCB storage site, in accordance with written instructions from the District Manager; and
  - (d) The oil and oil-based paints shall not be distributed for reuse if they have any measurable PCB content. The oil and oil-based paint is considered to be a PCB waste, if measured levels are equal to or greater than 50 parts per million.
- (43) Except for oil based paints that become classified as PCB Waste, paints may be offered for reuse to the public. Records shall be kept of the type, volume and recipient of paint returned to the public.
- (44) The Township shall maintain, at the Site, a log book which records daily, the following information:
- (a) date of record;
  - (b) types, quantities and source of HHW received;
  - (c) quantities of HHW stored at the Site;
  - (d) quantities and destination of HHW shipped from the Site; and
  - (e) quantities of waste returned to the public as noted in Condition (42).

IV. The following Conditions are hereby added:

**CERTIFICATE OF REQUIREMENT**

- (45) The Owner shall:
- (a) within sixty (60) calendar days of the date of this Certificate, submit to the Director, for Director's signature, two copies of a completed Certificate of Requirement containing a registerable description of the newly acquired property, in accordance with the attached form; and
  - (b) within twenty (20) calendar days of receiving the Certificate of Requirement signed by the Director, register the Certificate of Requirement in the appropriate Land Registry Office on title to the Property and submit to the Director the duplicate registered copy immediately following registration.
- (46) Pursuant to Section 197 of the *EPA*, neither the *Owner* nor any person having an interest in the Property shall deal with the Property in any way without first giving a copy of this Certificate to each person acquiring an interest in the Property as a result of the dealing.

V. The following items are hereby added to Schedule "B":



- (8) Application for a Provisional Certificate of Approval for a Waste Disposal Site dated September 1, 2005 and signed by Mr. David Clifford, CAO, The Corporation of the Township of Douro-Dummer including all attached supporting information and documentation.
- (9) Document entitled "*County of Peterborough: Household Hazardous Waste (HHW) Facility Operations Manual*" dated August 10, 2005.
- (10) Letter dated August 30, 2005 to Mr. James O'Mara, Director, Environmental Assessment and Approvals Branch, Ministry of Environment from Mr. Michael Cant, Manager, Solid Waste, Totten Sims Hubicki Associates. Re: Amendment for Certificate of Approval No. A341004 including all attachments.
- (11) Letter dated October 11, 2005 to Mr. Matthew Chisholm, Application Processor, Ministry of Environment, from Mr. Michael Cant, Manager, Solid Waste, Totten Sims Hubicki Associates. Re: Application for Approval of a Waste Disposal Site, MOE Reference No. 2960-6FTPZG.
- (12) Letter dated January 24, 2006 to Mr. David Lee, Waste Evaluator, Ministry of Environment, from Mr. Michael Cant, TSH Associates, Re: Draft Notice of Amendment for Certificate of Approval No. A341004.

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

*The reason for section I is to recognize the new total site area of the waste disposal site.*

*The reason for section II is to define the specific meaning of the term "competent" as used in this Notice of Amendment.*

*The reason for the conditions imposed in section III is to approve the establishment and operation of a household hazardous waste transfer station and to ensure that the wastes are managed in a manner that protects the environment and the health and safety of the public.*

*The reason for the conditions imposed in section IV is to ensure that any persons having an interest in the lands are aware that the land has been used for waste disposal operations.*

**This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A341004 dated October 8, 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.

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*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](http://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 1st day of February, 2006



Greg Washuta, P.Eng.  
Director  
Section 39, *Environmental Protection Act*

DL/

c: District Manager, MOE Peterborough  
Michael Cant, Totten Sims Hubicki Associates (1997) Limited

## **Appendix B**

# **Monitoring Well Details and Borehole Data**

TOWNSHIP OF DUMMER  
HALL'S GLEN LANDFILL STUDY

BOREHOLE LOGS

June 27 - July 9, 1991

<u>BOREHOLE</u>	<u>DEPTH INTERVAL (metres below ground)</u>	<u>DRILLER'S DESCRIPTION</u>
1-91	0 - 0.61	Brown CLAY, GRAVEL, hard
	0.61 - 1.98	Grey GRAVEL, dry
	1.98 - 6.10	Grey LIMESTONE
	6.10 - 6.71	Brown SHALE
	Water-bearing zone reported at 6.10 metres	
2-91	0 - 1.22	Brown FILL
	1.22 - 3.05	REFUSE
	3.05 - 4.88	Brown SAND, COBBLES
	4.88 - 5.49	Grey GRAVEL
	5.49 - 6.71	Brown SHALE, wet
	6.71 - 8.53	Grey LIMESTONE
	8.53 - 9.14	Brown SHALE
	Water-bearing zone reported at 8.53 metres	
3-91	0 - 0.91	Brown SAND, CLAY
	0.91 - 1.52	Brown GRAVEL, COBBLES, CLAY, hard
	1.52 - 4.27	Grey LIMESTONE
	Water-bearing zone reported at 3.66 metres	
4-91	0 - 2.74	Grey GRAVEL, BOULDERS
	2.74 - 3.66	Grey LIMESTONE
	3.66 - 4.88	Brown SHALE
	Water-bearing zone reported at 3.66 metres	
5-91	0 - 1.83	Brown SAND, CLAY
	1.83 - 3.20	Brown SAND, GRAVEL
	3.20 - 3.66	Brown SAND, CLAY
	3.66 - 7.01	Grey LIMESTONE
	Water-bearing zone reported at 6.40 metres	

Geo-  
Logic Inc.

Plate B-1

TOWNSHIP OF DUMMER  
HALL'S GLEN LANDFILL STUDY

BOREHOLE LOGS

June 27 - July 9, 1991

<u>BOREHOLE</u>	<u>DEPTH INTERVAL (metres below ground)</u>	<u>DRILLER'S DESCRIPTION</u>
6-91	0 - 0.61	Brown SAND
	0.61 - 2.74	Brown SAND, GRAVEL
	2.74 - 5.18	Grey LIMESTONE
	5.18 - 5.79	Brown SHALE

Water-bearing zone reported at 5.18 metres

Geo-  
Logic Inc.  
Plate B-2



# MONITOR DETAILS

BOREHOLE		MONITOR					SCREENED INTERVAL (mbgl)	SAND FILTER PACK (mbgl)	BENTONITE SEAL (mbgl)	STEEL CASING (mbgl)
NO	Diameter (mm)	NO	Type	Diameter (mm)	Stick-up (m)	Elevation (top.m)				
1-91	150	I	P	50	0.98	271.27	6.71 - 5.18	6.71 - 5.33	5.33 - 4.72	0.91 - +0.88
1-91		II	S	38			1.98 - 0.46	1.98 - 0.46	0.46 - 0.00	
2-91	150	I	P	50	1.07	275.79	9.14 - 7.62	9.14 - 6.70	6.70 - 5.79	0.91 - +1.07
2-91		II	S	38			5.49 - 3.96	5.49 - 0.61	0.61 - 0.00	
3-91	150	I	P	50	1.11	269.23	4.27 - 2.74	4.27 - 2.13	2.13 - 1.52	0.91 - +1.11
3-91		II	S	38			1.52 - 0.00	1.52 - 0.31	0.31 - 0.00	
4-91	150	I	P	50	1.04	268.28	4.88 - 3.35	4.88 - 3.66	3.66 - 3.05	0.91 - +1.04
4-91		II	S	38			3.05 - 1.52	3.05 - 0.61	0.61 - 0.00	
5-91	150	I	P	50	1.00	271.32	7.01 - 5.49	7.01 - 4.27	4.27 - 3.66	0.91 - +1.00
5-91		II	S	38			3.66 - 2.13	3.66 - 0.16	0.61 - 0.00	
6-91	150	I	P	50	1.02	269.83	5.79 - 4.26	5.79 - 3.35	3.35 - 2.74	0.91 - +1.02
6-91		II	S	38			2.74 - 1.22	2.74 - 0.61	0.61 - 0.00	

Geo-  
Logic Inc.  
Plate B-3

 INTERTECH LIMITED

P = Piezometer      mbgl = metres below



Print only in spaces provided.  
Mark correct box with a checkmark, where applicable

County or District	Township/Borough/City/Town/Village		Can block tract survey etc. (see
Peterborough	Dummer Twp., Hall Glen Landfill		Con.4 26
Owner's surname	First name	Address	Date completed
Township of Dummer		C/O Totten Sims Hubicki Assoc. 300 Water St., Whithy, Ont. L1N 9J2	18 OCT 97

[illegible]

WATER RECORD		
Water found at - Feet	Kind of water	
9	<input type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur
	<input type="checkbox"/> Salty	<input type="checkbox"/> Mineral
	<input type="checkbox"/> Salty	<input type="checkbox"/> Gas
18	<input type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur
	<input type="checkbox"/> Salty	<input type="checkbox"/> Mineral
	<input type="checkbox"/> Salty	<input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur
	<input type="checkbox"/> Salty	<input type="checkbox"/> Mineral
	<input type="checkbox"/> Salty	<input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur
	<input type="checkbox"/> Salty	<input type="checkbox"/> Mineral
	<input type="checkbox"/> Salty	<input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur
	<input type="checkbox"/> Salty	<input type="checkbox"/> Mineral
	<input type="checkbox"/> Salty	<input type="checkbox"/> Gas

CASING & OPEN HOLE RECORD					
Hole dam inches	Material	Well thickness inches	Depth - feet		
			From	To	
6 1/2	<input checked="" type="checkbox"/> Steel <input checked="" type="checkbox"/> Galvanized <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Open hole <input type="checkbox"/> Plastic	.188	+ 2	3	
2	<input type="checkbox"/> Steel <input checked="" type="checkbox"/> Galvanized <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Open hole <input type="checkbox"/> Plastic	Piso	+ 2	16	
2	<input type="checkbox"/> Steel <input checked="" type="checkbox"/> Galvanized <input checked="" type="checkbox"/> Concrete <input type="checkbox"/> Open hole <input type="checkbox"/> Plastic	Piso	+ 2	4	

SCREW	Size of opening (See Note)	Diameter	Length
	10	2 inches	2A 5 feet
	Material and type	Depth of top of screw	
	PVC	4 21.6 feet	

PLUGGING & SEALING RECORD	
<input checked="" type="checkbox"/> Annular Grout <input type="checkbox"/> Abandonment	
Depth and at - test	Materials and type (Cement grout, benzene, etc.)
From	
0	Mud Slurry
4	Benarone
11	Gravel
16	Benarone
19	Gravel

PUMPING TEST	Pumping test method <input type="checkbox"/> Pump <input checked="" type="checkbox"/> Sinker	Pumping rate 10 GPM	Duration of pumping Hours 30.00
	Static level Water level and of pumping	Water levels during Pumping <input checked="" type="checkbox"/> Recovery <input type="checkbox"/>	
	15 minutes 30 minutes 45 minutes 60 minutes		
	6 feet 11 feet	11 feet 11 feet 11 feet 11 feet	
	11 flowing gpc rate	Pump intake level feet	Water at end of test <input type="checkbox"/> Clear <input checked="" type="checkbox"/> Cloudy
	Recommended pump type <input type="checkbox"/> Shallow <input type="checkbox"/> Deep	Recommended pump setting feet	Recommended pump rate GPM

**FINAL STATUS OF WELL**

<input type="checkbox"/> Water supply	<input type="checkbox"/> Abandoned, inefficient supply	<input type="checkbox"/> Unfinished
<input type="checkbox"/> Observation well	<input type="checkbox"/> Abandoned, poor quality	<input type="checkbox"/> Replacement well
<input type="checkbox"/> Test hole	<input type="checkbox"/> Abandoned (Other)	
<input type="checkbox"/> Radon gas well	<input type="checkbox"/> Drilling	

**WATER USE**

<input type="checkbox"/> Domestic	<input type="checkbox"/> Commercial	<input type="checkbox"/> Not used
<input type="checkbox"/> Stock	<input type="checkbox"/> Municipal	<input checked="" type="checkbox"/> Other <u>Pesticides</u>
<input type="checkbox"/> Irrigation	<input type="checkbox"/> Public supply	
<input type="checkbox"/> Industrial	<input type="checkbox"/> Cooling & air conditioning	

**METHOD OF CONSTRUCTION**

<input checked="" type="checkbox"/> Cable tool	<input type="checkbox"/> Air percussion	<input type="checkbox"/> Drilling
<input type="checkbox"/> Rotary (conventional)	<input type="checkbox"/> Boring	<input type="checkbox"/> Digging
<input type="checkbox"/> Rotary (reverse)	<input type="checkbox"/> Diamond	<input type="checkbox"/> Other
<input type="checkbox"/> Rotary (air)	<input type="checkbox"/> Jacking	

**LOCATION OF WELL**

In diagram below show distances of well from road and lot line. Indicate north by arrow.

174284

Name of Well Contractor	Well Contractor's Licence No.
C.Hart & Sons Well Drilling Ltd.	2662
Address	
Box 850, Fenelon Falls, Ontario	
Name of Well Technician	Well Technician's Licence No.
Greg Bullock	T-2108
Signature of Technician/Contractor	Submission date
	day mo yr

MINISTRY USE ONLY				

3 - OWNER'S COPY

2506 107/941 FORD Form 9

## MW-7

Geo-  
Logic Inc.  
Plate B-4

Print only in spaces provided.  
Mark correct box with a checkmark, where applicable.

County or District <b>Peterborough</b>	Township or Village (BH-8) <b>Dummer Twp., Halls Glen-Landfill</b>	Con. block test survey, etc. <b>Con. 4</b>	Lot <b>26</b>
Owner's name <b>Township of Dummer</b>	First Name <b>300 Water St., Whitby, ON L1N 9J2</b>	Date completed <b>1 11 01</b>	Day month year

Zone

Location

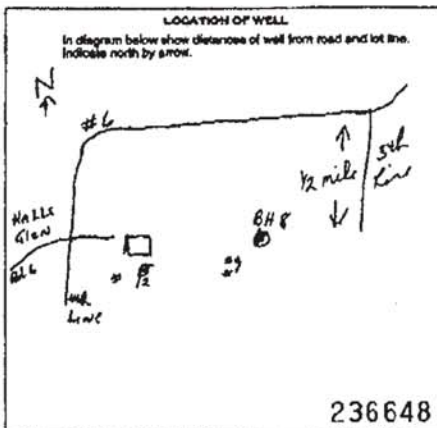
Number

LOG OF OVERBURDEN AND BEDROCK MATERIALS (see instructions)

General colour	Major common materials	Other materials	General description	Depth - feet	
				from	to
Black	Topsoil			0	1
Brown	Gravel	sand		1	9
Brown	Gravel	stones		9	15
Brown	Rock		broken	15	17
Gray	Limestone			17	35

<b>WATER RECORD</b> Water found at - feet 19 Kind of water <input checked="" type="checkbox"/> Fresh <input type="checkbox"/> Salty <input type="checkbox"/> Brackish <input type="checkbox"/> Soft <input type="checkbox"/> Hard <input type="checkbox"/> Other		<b>CASING &amp; OPEN HOLE RECORD</b> Casing depth - feet 6 1/2 Material <input checked="" type="checkbox"/> Steel <input type="checkbox"/> Cast-iron <input type="checkbox"/> Concrete <input type="checkbox"/> Other Well diameter - inches 1.88 Depth - feet From To 2 2 1/2 30 2 2 1/2 17 1/2		<b>PLUGGING &amp; SEALING RECORD</b> Plug depth - feet 0 17 Material and type Bentonite & Mudslurry	
---	--	--	--	---	--

<b>PUMPING TEST</b> Pumping rate 15 Water level at end of pumping 15 Pumping time 8-10 min 30 min 1 hour 2 hours 3 hours 4 hours 5 hours 6 hours 7 hours 8 hours 9 hours 10 hours 11 hours 12 hours 13 hours 14 hours 15 hours 16 hours 17 hours 18 hours 19 hours 20 hours 21 hours 22 hours 23 hours 24 hours 25 hours 26 hours 27 hours 28 hours 29 hours 30 hours 31 hours 32 hours 33 hours 34 hours 35 hours 36 hours 37 hours 38 hours 39 hours 40 hours 41 hours 42 hours 43 hours 44 hours 45 hours 46 hours 47 hours 48 hours 49 hours 50 hours 51 hours 52 hours 53 hours 54 hours 55 hours 56 hours 57 hours 58 hours 59 hours 60 hours 61 hours 62 hours 63 hours 64 hours 65 hours 66 hours 67 hours 68 hours 69 hours 70 hours 71 hours 72 hours 73 hours 74 hours 75 hours 76 hours 77 hours 78 hours 79 hours 80 hours 81 hours 82 hours 83 hours 84 hours 85 hours 86 hours 87 hours 88 hours 89 hours 90 hours 91 hours 92 hours 93 hours 94 hours 95 hours 96 hours 97 hours 98 hours 99 hours 100 hours		<b>FINAL STATUS OF WELL</b> <input type="checkbox"/> Water supply <input type="checkbox"/> Abandoned, insufficient supply <input type="checkbox"/> Unfinished <input type="checkbox"/> Observation well <input type="checkbox"/> Abandoned, poor quality <input type="checkbox"/> Plugged/sealed well <input type="checkbox"/> Test hole <input type="checkbox"/> Abandoned (Other) <input type="checkbox"/> Plugged/sealed well <input type="checkbox"/> Production well <input type="checkbox"/> Other		<b>WATER USE</b> <input type="checkbox"/> Domestic <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Irrigation <input type="checkbox"/> Municipal <input type="checkbox"/> Other <input type="checkbox"/> Public supply <input type="checkbox"/> Other	
---	--	--	--	---	--



<b>METHOD OF CONSTRUCTION</b> <input checked="" type="checkbox"/> Casing test <input type="checkbox"/> Air percussion <input type="checkbox"/> Driving <input type="checkbox"/> Rotary (conventional) <input type="checkbox"/> Boring <input type="checkbox"/> Digging <input type="checkbox"/> Rotary (special) <input type="checkbox"/> Diamond <input type="checkbox"/> Other		<b>MINISTRY USE ONLY</b> Date By For	
---	--	---	--

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M.O.E. WATER WELL RECORD

MW-8

Geo-Logic Inc.  
PLATE B-5



County or District	Township/Borough/City/Town/Village (RH-9)	Con block tract survey, etc.	Lot
Peterborough	Dummer Twp., Halls Glen-Landfill	Con. 4	26
Owner's Name	Final Name	Address c/o Totten Sims Hubicki Assoc.	Date completed
Township of Dummer		300 Water St., Whitby, Ont. L1N 9J2	30 10 01 day month year

[illegible]

WATER RECORD		
Water found at foot	Kind of water	
12	<input type="checkbox"/> Fresh <input type="checkbox"/> Salty <input type="checkbox"/> Fossils	<input type="checkbox"/> Sulphur <input type="checkbox"/> Minerals <input type="checkbox"/> Gas
26	<input type="checkbox"/> Fresh <input type="checkbox"/> Salty <input type="checkbox"/> Fossils	<input type="checkbox"/> Sulphur <input type="checkbox"/> Minerals <input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh <input type="checkbox"/> Salty <input type="checkbox"/> Fossils	<input type="checkbox"/> Sulphur <input type="checkbox"/> Minerals <input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh <input type="checkbox"/> Salty <input type="checkbox"/> Fossils	<input type="checkbox"/> Sulphur <input type="checkbox"/> Minerals <input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh <input type="checkbox"/> Salty <input type="checkbox"/> Fossils	<input type="checkbox"/> Sulphur <input type="checkbox"/> Minerals <input type="checkbox"/> Gas

Invoice date Invoice	Material	Unit Purchase Price	Quantity - Unit	
			From	To
6 1/2	<input checked="" type="checkbox"/> Steel <input type="checkbox"/> Galvanized <input type="checkbox"/> Concrete <input type="checkbox"/> Open hole <input type="checkbox"/> Plastic	.188	+2 1/2	12
2	<input type="checkbox"/> Steel <input type="checkbox"/> Galvanized <input type="checkbox"/> Concrete <input type="checkbox"/> Open hole <input checked="" type="checkbox"/> Plastic	Pieno	+2 1/2	25
2	<input type="checkbox"/> Steel <input type="checkbox"/> Galvanized <input type="checkbox"/> Concrete <input type="checkbox"/> Open hole <input checked="" type="checkbox"/> Plastic	Pieno	+2 1/2	13

SECTION	Base of stratum (Box No.)	Diastem	Length
	10	2	2 x 5
	Material and type	Depth at top of stratum 25, 8:13	
	PVC		

PLUGGING & SEALING RECORDS			
<input checked="" type="checkbox"/> Access spigs		<input type="checkbox"/> Abandonment	
Plugging used as a seal			
Page	To	Material and type (Cement grout, bentonite, etc.)	
0	12	Bentonite	

PUMP TEST	Pumping test method <input checked="" type="checkbox"/> In situ <input type="checkbox"/> Bucket		Pumping rate 8-10 GPM		Duration of pumping 30 min	
	Static level Water level and of pumping		Water losses during 15 minutes    30 minutes		<input type="checkbox"/> Pumping <input type="checkbox"/> Recovery 60 min/48	
	8 feet	feet	feet	feet	feet	feet
	If flowing give rate GPM		Pump breaks out at		Broken at end of test <input type="checkbox"/> Clear <input type="checkbox"/> Cloudy	
	Recommended pump type <input type="checkbox"/> Siphon <input type="checkbox"/> Chain		Recommended pump rating		Recommended pump rate GPM	

**POOL STATUS OF WELL**

<input checked="" type="checkbox"/> Abandoned	<input type="checkbox"/> Abandoned, insubstantial supply	<input type="checkbox"/> Unfinished
<input checked="" type="checkbox"/> Observation well	<input type="checkbox"/> Abandoned, inner quality	<input type="checkbox"/> Repositioned well
<input type="checkbox"/> Test hole	<input type="checkbox"/> Abandoned (Water)	
<input type="checkbox"/> Discharge well	<input type="checkbox"/> Dewatering	

**WATER USE**

<input type="checkbox"/> Domestic	<input type="checkbox"/> Commercial	<input checked="" type="checkbox"/> Not used
<input type="checkbox"/> Stock	<input type="checkbox"/> Municipal	<input type="checkbox"/> Other <u>Process</u>
<input type="checkbox"/> Irrigation	<input type="checkbox"/> Private industry	
<input type="checkbox"/> Industrial	<input type="checkbox"/> Cooling & air conditioning	


**METHOD OF CONSTRUCTION**

<input checked="" type="checkbox"/> Caisson well	<input type="checkbox"/> Air percussion	<input type="checkbox"/> Drilling
<input type="checkbox"/> Rotary (unventilated)	<input type="checkbox"/> Boring	<input type="checkbox"/> Dugout
<input type="checkbox"/> Rotary (ventilated)	<input type="checkbox"/> Diamond	<input type="checkbox"/> Other
<input type="checkbox"/> Rotary (air)	<input type="checkbox"/> Jetting	

LOCATION OF WELL.

In diagram below show distances of well from road and lot line. Indicate north by arrow.

236649

Name of Well Contractor G. Hart & Sons Well Drilling Ltd.	Well Contractor's Licence No. 2662
Address Box 850, Fenelon Falls, Ontario	
Name of Well Technician Jim Lean	Well Technician's Licence No. T-0546
Signature of Technician/Owner 	Installation date day    mo    yr

1 - CONTRACTOR'S COPY

## M.O.E. WATER WELL RECORD

MW-9

Geo-  
Logic Inc.  
PLATE B-6

Print only in spaces provided.  
Mark correct box with a checkmark, where applicable.

County or District Peterborough	Township or Village (OR-10) Dummer Twp., Halls Glen-Landfill	Con block tract survey, etc. Con. 4	Lot 26
Owner's surname Township of Dummer	First Name Address c/o Totten Sims Hubicki Assoc. 300 Water St., Whitby, ON L1N 9J2	Date completed 2 day 11 month	01 year

[illegible]

WATER RECORD		
Water found at - feet	Kind of water	
13	<input checked="" type="checkbox"/> Fresh	<input type="checkbox"/> Sulphur <input type="checkbox"/> Salternate <input type="checkbox"/> Gas
26	<input type="checkbox"/> Fresh <input checked="" type="checkbox"/> <del>Fresh</del>	<input checked="" type="checkbox"/> Sulphur <input type="checkbox"/> Salternate <input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh <input type="checkbox"/> Salty	<input type="checkbox"/> Sulphur <input type="checkbox"/> Salternate <input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh <input type="checkbox"/> Salty	<input type="checkbox"/> Sulphur <input type="checkbox"/> Salternate <input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh <input type="checkbox"/> Salty	<input type="checkbox"/> Sulphur <input type="checkbox"/> Salternate <input type="checkbox"/> Gas

CABING & OPEN-HOLE RECORD					
Inches down surface	Material	Well Inches inches	Depth - feet		
			From	To	
6 1/2	<input checked="" type="checkbox"/> Shale <input checked="" type="checkbox"/> Quartzized <input checked="" type="checkbox"/> Conglomerate <input checked="" type="checkbox"/> Gneiss rock <input checked="" type="checkbox"/> Plastic	.188	+2 1/2	13	
2	<input type="checkbox"/> Shale <input checked="" type="checkbox"/> Quartzized <input checked="" type="checkbox"/> Conglomerate <input checked="" type="checkbox"/> Open hole <input checked="" type="checkbox"/> Plastic	Pieso	+2 1/2	25	
2	<input type="checkbox"/> Shale <input checked="" type="checkbox"/> Quartzized <input checked="" type="checkbox"/> Conglomerate <input checked="" type="checkbox"/> Open hole <input checked="" type="checkbox"/> Plastic	Pieso	+2 1/2	14.3	

SCREEN	Size of opening (Dist. b/w.)	Distances	Length
	10	2 inches	2x 5 feet
	Substrate and type	Depth of bed of screen	
	PVC	25, 14, 3 feet	

PLUGGING & SEALING RECORD		
A. Amperage spent		B. Meter readings
Depth set at - feet	Time	Material and type (Comment grain, barite, etc.)
0	13	Holeplug (outside 6")
13	20 1/2	Sand
20 1/2	22	Holeplug
22	30	Sand

15241 Observations	Pumping level monitored <input type="checkbox"/> Pumping <input type="checkbox"/> No pump		Pumping rate - 6 GPM		Duration of pumping Hours 30	
	Static level		Water tanks during		<input type="checkbox"/> Pumping <input type="checkbox"/> Flows freely	
	Water level and of pumping		15 minutes      30 minutes feet              feet		45 minutes      90 minutes feet              feet	
	8. Sand		Pump intake not at		Water at end of line	
	Is flowing give rise		GPM		<input type="checkbox"/> Clear <input type="checkbox"/> Cloudy	
Recommended pump type <input type="checkbox"/> Shadow <input type="checkbox"/> Clear              Recommended pump setting feet              Recommended pump up feet              Other						

**FINAL STATUS OF WELL**

<input type="checkbox"/> Water supply	<input type="checkbox"/> Abandoned, insufficient supply	<input type="checkbox"/> Unfinished
<input checked="" type="checkbox"/> Observation well	<input type="checkbox"/> Abandoned, poor quality	<input type="checkbox"/> Replacement well
<input type="checkbox"/> Test hole	<input type="checkbox"/> Abandoned (Other)	
<input type="checkbox"/> Production well	<input type="checkbox"/> Dewatering	

**WATER USE**

<input type="checkbox"/> Domestic	<input type="checkbox"/> Commercial	<input type="checkbox"/> Not used
<input type="checkbox"/> Stock	<input type="checkbox"/> Municipal	<input checked="" type="checkbox"/> Other: <u>Manufacturing</u>
<input type="checkbox"/> Irrigation	<input type="checkbox"/> Public supply	
<input type="checkbox"/> Industrial	<input type="checkbox"/> Cooling & air conditioning	


**METHOD OF CONSTRUCTION**

<input checked="" type="checkbox"/> Cable test	<input type="checkbox"/> Air permeation	<input type="checkbox"/> Drilling
<input type="checkbox"/> Pottery (unvitrified)	<input type="checkbox"/> Sealing	<input type="checkbox"/> Digging
<input type="checkbox"/> Pottery (vitrified)	<input type="checkbox"/> Diamond	<input type="checkbox"/> Other .....
<input type="checkbox"/> Pottery (gl)	<input type="checkbox"/> Jetting	

LOCATION OF WELL

In diagram below show distance of well from road and lot line. Indicate north by arrow.

23664

Name of Well Contractor <b>G.Hart &amp; Sons Well Drilling Ltd</b>	Well Contractor's Licence No. <b>2662</b>
Address <b>Box 850, Feneelon Falls, Ontario</b>	
Name of Well Technician <b>Jim Leen</b>	Well Technician's Licence No. <b>T-0546</b>
Signature of Technician/Contractor 	Sub-superior title day mo yr

MINISTRY USE ONLY			

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Page 4108 Case 8-

## M.O.E. WATER WELL RECORD

MW-10

Geo-  
Logic Inc.  
PLATE B-7

Print only in spaces provided.  
Mark correct box with a checkmark, where applicable.

County or District Peterborough	Township/Borough/Village/Town/Village (B4-11) Dummer Twp., Hall's Glen-Tandfill	Con. back sheet survey, etc. Con. 4	Lot 26
Owner's name Township of Dummer	Address c/o Totten Sims Hubicki Assoc. 300 Water St., Whitby, ON L1N 9J2	Date completed 5 11 01 day month year	

General colour	Most common material	Other materials	General description	Depth - feet	
				From	To
Black	Topsoil			0	1
Brown	Gravel			1	5
Brown	Gravel	boulder		5	10
Brown	Broken Rock			10	12
Gray	Limestone			12	30

Water level at - feet	Kind of water
19	<input checked="" type="checkbox"/> Fresh <input type="checkbox"/> Salty <input type="checkbox"/> Brackish <input type="checkbox"/> Mineral <input type="checkbox"/> Gas
29	<input checked="" type="checkbox"/> Fresh <input type="checkbox"/> Salty <input type="checkbox"/> Brackish <input type="checkbox"/> Mineral <input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh <input type="checkbox"/> Salty <input type="checkbox"/> Brackish <input type="checkbox"/> Mineral <input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh <input type="checkbox"/> Salty <input type="checkbox"/> Brackish <input type="checkbox"/> Mineral <input type="checkbox"/> Gas
	<input type="checkbox"/> Fresh <input type="checkbox"/> Salty <input type="checkbox"/> Brackish <input type="checkbox"/> Mineral <input type="checkbox"/> Gas

Casing start depth	Material	Wall thickness	Depth - feet	
			From	To
61	<input checked="" type="checkbox"/> Steel <input type="checkbox"/> Galvanized <input type="checkbox"/> Concrete <input type="checkbox"/> Open hole <input type="checkbox"/> Plastic	188	+21	12
2	<input type="checkbox"/> Steel <input type="checkbox"/> Galvanized <input type="checkbox"/> Concrete <input type="checkbox"/> Open hole <input type="checkbox"/> Plastic	Pieno	+21	25
2	<input type="checkbox"/> Steel <input type="checkbox"/> Galvanized <input type="checkbox"/> Concrete <input type="checkbox"/> Open hole <input type="checkbox"/> Plastic	Pieno	+21	15

Depth of seal - feet		Material and type (Concrete, grout, bentonite, etc.)
From	To	
0	12	Holeplug (outside steel)
11	20	Sand
20	22	Holeplug
22	30	Sand

Pumping test method	Pumping rate	Duration of pumping
<input type="checkbox"/> Pump <input type="checkbox"/> Bailer	2-3 GPM	Hour 30
Steady level	Water level during	Pumping <input type="checkbox"/> Recovery
9 feet	15 minutes 30 minutes 45 minutes 60 minutes	
if having give rate	Pump motor set at	Water at end of test
Recommended pump type	Recommended pump setting	Recommended pump rate
<input type="checkbox"/> Shallow <input type="checkbox"/> Deep		GPM

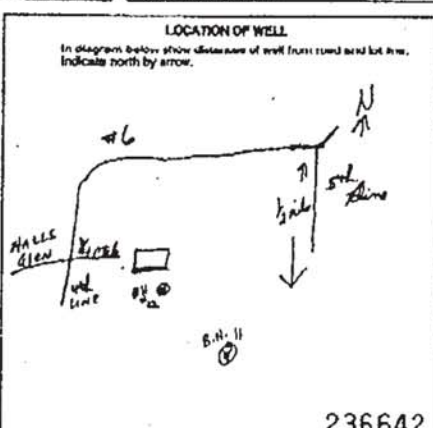
<input type="checkbox"/> Water supply	<input type="checkbox"/> Abandoned, insufficient supply	<input type="checkbox"/> Unfinished
<input checked="" type="checkbox"/> Observation well	<input type="checkbox"/> Abandoned, good quality	<input type="checkbox"/> Replacement well
<input type="checkbox"/> Test hole	<input type="checkbox"/> Abandoned (Clear)	
<input type="checkbox"/> Piezometer well	<input type="checkbox"/> Dewatering	

<input type="checkbox"/> Domestic	<input type="checkbox"/> Commercial	<input type="checkbox"/> Hot water
<input type="checkbox"/> Stock	<input type="checkbox"/> Municipal	<input type="checkbox"/> Other
<input type="checkbox"/> Irrigation	<input type="checkbox"/> Public supply	
<input type="checkbox"/> Industrial	<input type="checkbox"/> Cooling & air conditioning	

<input checked="" type="checkbox"/> Cable tool	<input type="checkbox"/> Air percussion	<input type="checkbox"/> Drilling
<input type="checkbox"/> Rotary (conventional)	<input type="checkbox"/> Boring	<input type="checkbox"/> Digging
<input type="checkbox"/> Rotary (downhole)	<input type="checkbox"/> Diamond	<input type="checkbox"/> Other
<input type="checkbox"/> Rotary (sh)	<input type="checkbox"/> Jetting	



Name of Well Contractor G. HART & Sons Well Drilling Ltd	Well Contractor's License No. 2062
Address Box 850, Fenelon Falls, Ontario	
Name of Well Technician Jim Lean	Well Technician's License No. T-0546
Signature of Technician/Contractor <i>Jim Lean</i>	Submission date day month year

1 - CONTRACTOR'S COPY

0008 (07/00) Print Form 8

M.O.E. WATER WELL RECORD

MW-11

Geo-  
Logic Inc.  
PLATE B-8



Print only in spaces provided.  
Mark correct box with a checkmark, where applicable.

County or District Peterborough	Township/Borough/City/Town/Village (RH-12) Dummer Twp., Halls Glen - Landfill	Can block front survey, etc. Con, 4	Lot 26
Owner's surname Township of Dummer	First Name Address c/o Totten Sims Hubicki Assoc. 300 Water St., Whitby, ON L1N 9J2	Date completed 7 11 01 day month year	
	Zone Rural	Rating Nothing	

General colour	Most common material	Other materials	General description	Depth - last	
				from	to
Black	Topsoil			0	1
Brown	Gravel			1	8
Brown	Gravel	broken rock		8	13
Gray	Limestone			13	29
Gray	Limestone		soft	29	30
Gray	Limestone			30	40

WATER RECORD		
Water fount at - feet	Kind of weather	
13	<input checked="" type="checkbox"/> Fresh	<input checked="" type="checkbox"/> Breeze <input checked="" type="checkbox"/> Moderate <input checked="" type="checkbox"/> Gale
29	<input checked="" type="checkbox"/> Fresh	<input checked="" type="checkbox"/> Breeze <input checked="" type="checkbox"/> Moderate <input checked="" type="checkbox"/> Gale
	<input type="checkbox"/> Fresh	<input type="checkbox"/> Breeze
	<input type="checkbox"/> Squally	<input type="checkbox"/> Stormy
	<input type="checkbox"/> Fresh	<input type="checkbox"/> Breeze
	<input type="checkbox"/> Squally	<input type="checkbox"/> Stormy
	<input type="checkbox"/> Fresh	<input type="checkbox"/> Breeze
	<input type="checkbox"/> Squally	<input type="checkbox"/> Stormy
	<input type="checkbox"/> Fresh	<input type="checkbox"/> Breeze
	<input type="checkbox"/> Squally	<input type="checkbox"/> Stormy

CANNING & OPENING RECORD					
Inches dial inches	Material	Inch increase in dia	Days - test		
			From	To	
6 1/2	Sheet Galvanized Complate Open hole Pleco	.188	+3	13	
2	Sheet Galvanized Complate Open hole Pleco	Pleco	+3	35	
2	Sheet Galvanized Complate Open hole Pleco	Pleco	+3	25 1/2	
2	Sheet Galvanized Complate Open hole Pleco	Pleco	+3	16 1/2	

SECTION	Size of opening (Dist No.)	Diameter	Length
	10	2 inches	3x 5
	Material and type	Depth at top of section 35.25.3 14.5	
	PVC		See

PILING AND SEALING RECORD			
<input type="checkbox"/> Anchor type		<input type="checkbox"/> Abutment	
Depth and L - Seal		Material and type (Element group, location, etc.)	
From	To		
0	13	Bentonite (outside)	
40	31	Sand (inside)	
31	30	Mopelug, * Cont'd	

Pumping test method <input type="checkbox"/> Pump <input checked="" type="checkbox"/> Bailer		Pumping rate 10 - 15 gpm		Duration of pumping _____ hours _____ days _____	
PUMPING TEST	Static level	Water level at end of pumping	Water levels during	<input type="checkbox"/> Pumping	<input type="checkbox"/> Recovery
			15 minutes	30 minutes	All intervals
			_____ feet	_____ feet	_____ feet
	4 feet				
	If flowing give rate	Pumped static test at	Water at end of test	<input type="checkbox"/> Clear	<input type="checkbox"/> Murky
	Recommended pump type	Recommended pump setting	Recommended pump rate		
	<input type="checkbox"/> Whacker <input type="checkbox"/> Deep				


<b>FINAL STATUS OF WELL</b> <input type="checkbox"/> Abandoned, insufficient supply <input checked="" type="checkbox"/> Observations said <input type="checkbox"/> Additional, poor quality <input type="checkbox"/> Test hole <input type="checkbox"/> Abandoned (Other) <input type="checkbox"/> Recharge well <input type="checkbox"/> Dewatering		<input type="checkbox"/> Unfinished <input type="checkbox"/> Replacement well
<b>WATER USE</b> <input type="checkbox"/> Domestic <input type="checkbox"/> Industrial <input type="checkbox"/> Irrigation <input type="checkbox"/> Municipal <input type="checkbox"/> Commercial <input type="checkbox"/> Industrial <input type="checkbox"/> Public supply <input type="checkbox"/> Cooling & air conditioning		<input type="checkbox"/> Hot use <input checked="" type="checkbox"/> Other <b>POWER</b>
<b>METHOD OF CONSTRUCTION</b> <input type="checkbox"/> Casing hole <input type="checkbox"/> Recharge (uncovered) <input type="checkbox"/> Battery (covered) <input type="checkbox"/> Battery (air) <input type="checkbox"/> Air percussion <input type="checkbox"/> Drilling <input type="checkbox"/> Diamond <input type="checkbox"/> Jetting		

LOCATION OF WELL.

In diagram below show distances of well from road and lot line. Indicate north by arrow.

\* 30 - 21 Sand  
 21 - 19 1/2 Holeplug  
 19 1/2 - 9 Sand

236641

Name of Well Contractor <b>G.Hart &amp; Sons Well Drilling Ltd.</b>		Well Permitting License No. <b>2662</b>
Address <b>Box 850, Fenelon Falls, Ontario</b>		
Name of Well Technician <b>Jim Leann</b>		Well Technology's License No. <b>T-0546</b>
Signature and Technician/Carrier 		Submission date <b>Nov 88</b>

MINISTRY USE ONLY			

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0036 877 636 Email: [enquiries@harrington.co.uk](mailto:enquiries@harrington.co.uk)

# M.O.E. WATER WELL RECORD

MW-12

Geo-  
Logic Inc.  
PLATE B-9

[illegible][illegible]

PUMPING TEST	Pumping test employed <input type="checkbox"/> Plumb <input type="checkbox"/> Solder		Pumping rate GPM		Duration of pumping Hours      Mins	
	Static level      Water level and of pumping		Water levels during <input type="checkbox"/> Manual <input type="checkbox"/> Automatic		<input type="checkbox"/> Pumping <input type="checkbox"/> Recovery	
	7 feet      feet		11 minutes      21 minutes		41 minutes      51 minutes	
	if flowing give rate GPM		Pump intake test		Water is sent to test <input type="checkbox"/> Clean <input type="checkbox"/> Cloudy	
	Permeability/dial pump type <input type="checkbox"/> Shallow <input type="checkbox"/> Deep		Recommended pump setting feet		Recommended pump rate GPM	

<b>REAL STATUS OF WELL</b>	
<input type="checkbox"/> Abandoned supply <input type="checkbox"/> Abandoned well <input type="checkbox"/> Observation well <input type="checkbox"/> Test hole <input type="checkbox"/> Production well	<input type="checkbox"/> Abandoned, insufficient supply <input type="checkbox"/> Abandoned, poor quality <input type="checkbox"/> Abandoned (Other) <input type="checkbox"/> Dewatering <input type="checkbox"/> Undrilled <input type="checkbox"/> Replacement well
<b>WATER USE</b>	
<input type="checkbox"/> Domestic <input type="checkbox"/> Irrigation <input type="checkbox"/> Industrial <input type="checkbox"/> Livestock <input type="checkbox"/> Municipal <input type="checkbox"/> Power <input type="checkbox"/> Recreation <input type="checkbox"/> Road construction <input type="checkbox"/> Other (specify)	<input type="checkbox"/> Commercial <input type="checkbox"/> Construction <input type="checkbox"/> Fertilizer supply <input type="checkbox"/> Cooling & air conditioning <input type="checkbox"/> Hot use <input type="checkbox"/> Other (specify)
<b>METHOD OF CONSTRUCTION</b>	
<input type="checkbox"/> Casing test <input type="checkbox"/> Rotary (percussion) <input type="checkbox"/> Rotary (reciprocating) <input type="checkbox"/> Rotary (air)	<input type="checkbox"/> Air percussion <input type="checkbox"/> Casing <input type="checkbox"/> Diamond <input type="checkbox"/> Jet <input type="checkbox"/> Driving <input type="checkbox"/> Digging <input type="checkbox"/> Other

LOCATION OF WELL.

In diagram below show distances of well from road and lot line. Indicate north by arrow.

Name of Well Contractor <b>G. Hart &amp; Sons Well Drilling Ltd.</b>		Well Contractor's License No. <b>2662</b>	
Address <b>Box 850, Fenelon Falls, ON</b>		<b>K0M 1N0</b>	
Name of Well Completion <b>Jim Loan</b>		Well Completion's License No. <b>T-0346</b>	
Signature of Well Contractor <i>[Signature]</i>		Signature of Well Completion <i>[Signature]</i>	

MINISTRY USE ONLY

1. CONTRACTOR'S COPY

### DATA SOURCES AND DATA

## MW-13



## **Appendix C**

# **Chemical Comparison Tables and Certificates of Analysis**



**SGS Canada Inc.**

P.O. Box 4300 - 185 Concession St.  
Lakefield - Ontario - K0L 2H0  
Phone: 705-652-2000 FAX: 705-652-6365

**GHD**

Attn : Gus Bolin

347 Pido Rd., Unit #29, Peterborough  
Canada, K9J 6Z8  
Phone: 705-749-3317, Fax:

Schedule 5 Column 1 with VOC short list

29-June-2018

Date Rec. : 06 June 2018  
LR Report: **CA14178-JUN18**  
Reference: PO# 11156057-01

Copy: #1

## CERTIFICATE OF ANALYSIS

### Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: MW8-1	6: MW9-1	7: MW10-1	8: MW11-II	9: R-1	10: R-2	11: R-3	12: R-4
Sample Date & Time					06-Jun-18	06-Jun-18	06-Jun-18	06-Jun-18	06-Jun-18	06-Jun-18	06-Jun-18	06-Jun-18
Temperature Upon Receipt [°C]	---	---	--	---	13.0	13.0	13.0	13.0	---	---	---	---
Alkalinity [mg/L as CaCO <sub>3</sub> ]	07-Jun-18	18:18	12-Jun-18	21:33	291	275	241	265	228	251	240	272
pH [no unit]	07-Jun-18	18:18	12-Jun-18	21:33	7.89	8.15	8.03	8.11	7.98	7.94	8.01	7.96
Conductivity [µS/cm]	07-Jun-18	18:18	12-Jun-18	21:33	816	633	638	669	623	667	559	743
Total Dissolved Solids [mg/L]	07-Jun-18	21:02	17-Jun-18	22:35	457	386	389	391	320	383	300	409
Chemical Oxygen Demand [mg/L]	08-Jun-18	07:26	14-Jun-18	19:39	< 8	19	9	< 8	8	< 8	27	< 8
Phosphorus (total) [mg/L]	08-Jun-18	18:00	21-Jun-18	16:03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.04
Total Kjeldahl Nitrogen [as N mg/L]	11-Jun-18	20:42	23-Jun-18	09:50	< 0.5	0.7	< 0.5	0.9	< 0.5	< 0.5	< 0.5	< 0.5
Ammonia+Ammonium (N) [mg/L]	08-Jun-18	20:14	21-Jun-18	14:31	< 0.1	0.6	< 0.1	0.8	< 0.1	< 0.1	< 0.1	0.1
4AAP-Phenolics [mg/L]	13-Jun-18	10:00	15-Jun-18	11:46	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	< 0.002	0.007	< 0.002
Sulphate [mg/L]	15-Jun-18	11:21	19-Jun-18	13:58	16	68	28	53	4	9	< 2	10
Chloride [mg/L]	15-Jun-18	11:27	19-Jun-18	13:58	82	15	51	32	56	58	35	71
Nitrite (as N) [mg/L]	13-Jun-18	12:58	13-Jun-18	17:44	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	13-Jun-18	12:58	13-Jun-18	17:44	< 0.06	0.14	0.27	< 0.06	0.12	1.60	0.78	1.34
Dissolved Organic Carbon [mg/L]	08-Jun-18	06:00	13-Jun-18	10:53	1	1	3	2	6	< 1	1	2
Mercury (total) [ug/L]	08-Jun-18	11:00	11-Jun-18	10:28	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Arsenic (dissolved) [mg/L]	12-Jun-18	14:50	13-Jun-18	13:31	0.0018	0.0010	0.0007	0.0004	0.0005	0.0004	0.0003	0.0003
Barium (dissolved) [mg/L]	12-Jun-18	14:50	13-Jun-18	13:31	0.0960	0.416	0.702	0.377	0.0663	0.0853	0.0663	0.105
Boron (dissolved) [mg/L]	12-Jun-18	14:50	13-Jun-18	13:31	0.108	0.385	0.242	0.492	0.037	0.021	0.018	0.024
Calcium (dissolved) [mg/L]	12-Jun-18	14:50	13-Jun-18	13:31	125	77.2	112	118	101	127	102	125

OnLine LIMS

0001425795



SGS Canada Inc.

P.O. Box 4300 - 185 Concession St.  
Lakefield - Ontario - K0L 2H0  
Phone: 705-652-2000 FAX: 705-652-6365

# Schedule 5 Column 1 with VOC short list

LR Report : CA14178-JUN18

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: MW8-1	6: MW9-1	7: MW10-1	8: MW11-II	9: R-1	10: R-2	11: R-3	12: R-4
Cadmium (dissolved) [mg/L]	12-Jun-18	14:50	13-Jun-18	13:31	0.000005	< 0.000003	< 0.000003	< 0.000003	0.000053	0.000004	< 0.000003	0.000022
Chromium (dissolved) [mg/L]	12-Jun-18	14:50	13-Jun-18	13:31	0.00014	0.00011	0.00013	0.00015	0.00019	0.00020	0.00026	0.00020
Copper (dissolved) [mg/L]	12-Jun-18	14:50	13-Jun-18	13:31	0.00116	0.00010	0.00011	0.00012	0.00123	0.394	0.163	0.288
Iron (dissolved) [mg/L]	12-Jun-18	14:50	13-Jun-18	13:31	0.031	0.096	0.481	0.028	0.030	< 0.007	< 0.007	< 0.007
Potassium (dissolved) [mg/L]	12-Jun-18	14:50	13-Jun-18	13:31	3.97	4.51	4.40	5.11	0.890	0.952	0.856	6.01
Magnesium (dissolved) [mg/L]	12-Jun-18	14:50	13-Jun-18	13:31	11.9	14.7	19.6	25.3	3.00	2.97	2.76	3.47
Manganese (dissolved) [mg/L]	12-Jun-18	14:50	13-Jun-18	13:31	0.00156	0.0526	0.191	0.0814	0.00241	0.00011	0.00016	0.00029
Sodium (dissolved) [mg/L]	12-Jun-18	14:50	13-Jun-18	13:31	47.1	41.8	12.0	14.8	38.8	29.0	26.8	43.6
Lead (dissolved) [mg/L]	12-Jun-18	14:50	13-Jun-18	13:31	0.00002	< 0.00001	< 0.00001	< 0.00001	0.00139	0.00088	0.00095	0.00447
Zinc (dissolved) [mg/L]	12-Jun-18	14:50	13-Jun-18	13:31	0.003	0.002	< 0.002	< 0.002	0.008	0.037	0.008	0.127
Benzene [µg/L]	08-Jun-18	16:13	12-Jun-18	15:49	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,4-Dichlorobenzene [µg/L]	08-Jun-18	16:13	12-Jun-18	15:49	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Dichloromethane [µg/L]	08-Jun-18	16:13	12-Jun-18	15:49	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Toluene [µg/L]	08-Jun-18	16:13	12-Jun-18	15:49	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl Chloride [µg/L]	08-Jun-18	16:13	12-Jun-18	15:49	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Bromodichloromethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Bromomethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Carbon tetrachloride [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Chloroethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 5	< 5	< 5	< 5	< 5
Chloroform [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Chloromethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 5	< 5	< 5	< 5	< 5
Dibromochloromethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichlorobenzene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,3-Dichlorobenzene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethylene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,2-Dichloroethene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,2-Dichloroethene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,3-Dichloropropene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,3-Dichloropropene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ethylenedibromide [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2
Monochlorobenzene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Styrene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

OnLine LIMS

0001425795

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: MW8-1	6: MW9-1	7: MW10-1	8: MW11-II	9: R-1	10: R-2	11: R-3	12: R-4
1,1,2,2-Tetrachloroethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Trichlorofluoromethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 5	< 5	< 5	< 5	< 5
1,1,1-Trichloroethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Xylene (total) [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
o-xylene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
m/p-xylene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:49	---	---	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5

S. 4

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Project Specialist  
Environmental Services, Analytical



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**Schedule 5 Column 3**

29-June-2018

**Date Rec. :** 06 June 2018  
**LR Report:** CA14186-JUN18  
**Reference:** 11153057-01

**Copy:** #1

## CERTIFICATE OF ANALYSIS

### Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: MW-8-2	6: MW-9-2	7: MW-10-2	8: MW-11-2	9: S-1	10: S-2
Sample Date & Time			06-Jun-18	06-Jun-18	06-Jun-18	06-Jun-18	06-Jun-18	06-Jun-18
Temperature Upon Receipt [°C]	--	---	13.0	13.0	13.0	13.0	13.0	13.0
Biochemical Oxygen Demand (BOD5) [mg/L]	14-Jun-18	10:09	< 4	< 4	10	< 4	< 4	< 4
Total Suspended Solids [mg/L]	14-Jun-18	15:35	19	2	34	11	8	5
Alkalinity [mg/L as CaCO3]	12-Jun-18	21:55	235	247	251	238	238	230
pH [no unit]	12-Jun-18	21:55	7.82	7.99	7.82	8.04	7.96	8.01
Conductivity [µS/cm]	12-Jun-18	21:55	639	616	610	509	588	652
Total Dissolved Solids [mg/L]	13-Jun-18	10:45	349	317	380	294	326	360
Chemical Oxygen Demand [mg/L]	19-Jun-18	11:58	11	8	< 8	< 8	10	22
Phosphorus (total) [mg/L]	12-Jun-18	13:22	< 0.03	< 0.03	0.04	< 0.03	< 0.03	< 0.03
Total Kjeldahl Nitrogen [as N mg/L]	13-Jun-18	14:59	< 0.5	< 0.5	0.7	0.7	< 0.5	< 0.5
Ammonia+Ammonium (N) [mg/L]	12-Jun-18	09:02	< 0.1	< 0.1	0.6	0.6	< 0.1	< 0.1
4AAP-Phenolics [mg/L]	14-Jun-18	11:38	< 0.001	< 0.001	< 0.001	< 0.001	< 0.001	0.001
Sulphate [mg/L]	19-Jun-18	14:00	8	10	11	10	< 2	< 2
Chloride [mg/L]	19-Jun-18	14:00	72	44	52	13	48	73
Nitrite (as N) [mg/L]	17-Jun-18	12:20	< 0.03	< 0.03	0.19	0.05	< 0.03	< 0.03
Nitrate (as N) [mg/L]	17-Jun-18	12:20	0.20	< 0.06	0.40	< 0.06	0.23	< 0.06
Mercury (total) [ug/L]	11-Jun-18	10:29	< 0.01	0.02	< 0.01	< 0.01	< 0.01	0.02



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# Schedule 5 Column 3

LR Report : CA14186-JUN18

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: MW-8-2	6: MW-9-2	7: MW-10-2	8: MW-11-2	9: S-1	10: S-2
Arsenic (total) [mg/L]	11-Jun-18	14:46	< 0.0002	0.0004	< 0.0002	< 0.0002	< 0.0002	0.0003
Barium (total) [mg/L]	11-Jun-18	14:46	0.107	0.160	0.566	0.361	0.08721	0.06474
Boron (total) [mg/L]	11-Jun-18	14:46	0.043	0.039	0.128	0.164	0.020	0.015
Cadmium (total) [mg/L]	11-Jun-18	14:46	0.000006	< 0.000003	0.000003	0.000003	0.000007	0.000004
Calcium (total) [mg/L]	11-Jun-18	14:46	106	106	128	99.9	103	103
Chromium (total) [mg/L]	11-Jun-18	14:46	0.00013	0.00012	0.00011	0.00011	0.00394	0.00014
Copper (total) [mg/L]	11-Jun-18	14:46	0.00084	0.00098	0.00041	0.00042	0.00047	0.00035
Iron (total) [mg/L]	11-Jun-18	14:46	0.016	0.372	4.28	1.52	0.014	0.080
Potassium (total) [mg/L]	11-Jun-18	14:46	1.31	2.16	2.60	3.19	1.35	1.47
Magnesium (total) [mg/L]	11-Jun-18	14:46	3.64	3.67	11.1	10.3	2.97	2.82
Manganese (total) [mg/L]	11-Jun-18	14:46	0.0052	0.0159	0.0931	0.0268	0.0014	0.0409
Sodium (total) [mg/L]	11-Jun-18	14:46	37.4	34.6	6.56	8.70	28.1	43.9
Lead (total) [mg/L]	11-Jun-18	14:46	0.00004	0.00003	0.00002	0.00002	0.00004	0.00004
Zinc (total) [mg/L]	11-Jun-18	14:46	< 0.002	< 0.002	< 0.002	< 0.002	0.004	< 0.002
Benzene [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
1,4-Dichlorobenzene [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
Dichloromethane [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
Toluene [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
Vinyl Chloride [ug/L]	11-Jun-18	15:54	---	---	---	< 0.2	---	---
Bromodichloromethane [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
Bromoform [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
Bromomethane [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
Carbon tetrachloride [ug/L]	11-Jun-18	15:54	---	---	---	< 0.2	---	---
Chloroethane [ug/L]	11-Jun-18	15:54	---	---	---	< 5	---	---
Chloroform [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
Chloromethane [ug/L]	11-Jun-18	15:54	---	---	---	< 5	---	---
Dibromochloromethane [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
1,2-Dichlorobenzene [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
1,3-Dichlorobenzene [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
1,1-Dichloroethane [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
1,2-Dichloroethane [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
1,1-Dichloroethylene [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---

OnLine LIMS

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Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: MW-8-2	6: MW-9-2	7: MW-10-2	8: MW-11-2	9: S-1	10: S-2
1,2-Dichloropropane [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
trans-1,2-Dichloroethene [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
cis-1,2-Dichloroethene [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
cis-1,3-Dichloropropene [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
trans-1,3-Dichloropropene [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
Ethylbenzene [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
Ethylenedibromide [ug/L]	11-Jun-18	15:54	---	---	---	< 0.2	---	---
Monochlorobenzene [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
Styrene [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
1,1,2,2-Tetrachloroethane [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
Tetrachloroethene [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
Trichloroethylene [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
Trichlorofluoromethane [ug/L]	11-Jun-18	15:54	---	---	---	< 5	---	---
1,1,1-Trichloroethane [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
1,1,2-Trichloroethane [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
Xylene (total) [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
o-xylene [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---
m/p-xylene [ug/L]	11-Jun-18	15:54	---	---	---	< 0.5	---	---

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Schedule 5 Column 1 with full VOC scan

29-June-2018

**Date Rec. :** 07 June 2018  
**LR Report:** CA14224-JUN18  
**Reference:** Project #: 11148416-01 PO#  
73507633

**Copy:** #1

## CERTIFICATE OF ANALYSIS

### Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Approval Date	4: Analysis Approval Time	5: MW-1-1	6: MW-3-1	7: MW-4-1	8: MW-5-1	9: MW-6-1	10: MW-7-1	11: MW-12-2	12: MW-12-3
Sample Date & Time					07-Jun-18	07-Jun-18	07-Jun-18	07-Jun-18	07-Jun-18	07-Jun-18	07-Jun-18	07-Jun-18
Temperature Upon Receipt [°C]					13.0	13.0	13.0	13.0	13.0	13.0	13.0	13.0
Alkalinity [mg/L as CaCO <sub>3</sub> ]	07-Jun-18	18:18	12-Jun-18	21:34	291	272	310	640	469	334	284	281
pH [no unit]	07-Jun-18	18:18	12-Jun-18	21:34	8.07	8.01	8.01	7.52	7.84	8.32	8.11	8.01
Conductivity [uS/cm]	07-Jun-18	18:18	12-Jun-18	21:34	1170	643	743	1340	1270	817	767	747
Total Dissolved Solids [mg/L]	08-Jun-18	15:23	17-Jun-18	22:35	774	354	397	774	686	474	429	463
Chemical Oxygen Demand [mg/L]	08-Jun-18	07:26	13-Jun-18	11:09	< 8	< 8	< 8	38	25	14	< 8	< 8
Phosphorus (total) [mg/L]	11-Jun-18	18:00	12-Jun-18	12:37	< 0.03	< 0.03	0.04	0.08	0.08	0.10	< 0.03	< 0.03
Total Kjeldahl Nitrogen [as N mg/L]	11-Jun-18	16:00	15-Jun-18	10:12	< 0.5	< 0.5	0.5	11.2	7.0	2.3	< 0.5	< 0.5
Ammonia+Ammonium (N) [mg/L]	11-Jun-18	18:00	14-Jun-18	09:06	< 0.1	0.1	0.4	10.2	6.2	< 0.1	0.2	< 0.1
4AAP-Phenolics [mg/L]	15-Jun-18	08:00	16-Jun-18	08:53	0.004	< 0.002	< 0.002	0.005	0.003	< 0.002	< 0.002	< 0.002
Sulphate [mg/L]	18-Jun-18	09:12	19-Jun-18	12:56	76	61	350	15	43	33	71	25
Chloride [mg/L]	18-Jun-18	09:03	19-Jun-18	12:56	160	40	65	130	110	46	39	60
Nitrite (as N) [mg/L]	14-Jun-18	11:53	19-Jun-18	16:46	0.03	0.05	< 0.03	0.05	0.14	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	14-Jun-18	11:53	19-Jun-18	16:46	1.48	1.41	0.88	2.74	0.61	< 0.06	< 0.06	< 0.06
Dissolved Organic Carbon [mg/L]	08-Jun-18	06:00	13-Jun-18	10:49	2	4	5	20	9	3	2	< 1
Mercury (total) [mg/L]	08-Jun-18	11:00	11-Jun-18	10:29	0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001	< 0.00001
Arsenic (dissolved) [mg/L]	13-Jun-18	14:55	14-Jun-18	11:13	< 0.0002	< 0.0002	< 0.0002	0.0027	0.0004	0.0006	< 0.0002	< 0.0002
Barium (dissolved) [mg/L]	13-Jun-18	14:55	14-Jun-18	11:13	0.238	0.0998	0.115	0.484	0.313	0.123	0.180	0.0735

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# Schedule 5 Column 1 with full VOC scan

LR Report : CA14224-JUN18

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Approval Date	4: Analysis Approval Time	5: MW-1-1	6: MW-3-1	7: MW-4-1	8: MW-5-1	9: MW-6-1	10: MW-7-1	11: MW-12-2	12: MW-12-3
Boron (dissolved) [mg/L]	13-Jun-18	14:55	14-Jun-18	11:13	0.111	0.065	0.092	0.295	0.241	0.539	0.533	0.115
Calcium (dissolved) [mg/L]	13-Jun-18	14:55	14-Jun-18	11:13	174	135	135	259	194	35.7	119	153
Cadmium (dissolved) [mg/L]	13-Jun-18	14:55	14-Jun-18	11:13	0.000035	0.000006	0.000017	< 0.000003	0.000008	0.000006	< 0.000003	< 0.000003
Chromium (dissolved) [mg/L]	13-Jun-18	14:55	14-Jun-18	11:13	0.00015	0.00015	0.00016	0.00059	0.00032	0.00016	0.00013	0.00013
Copper (dissolved) [mg/L]	13-Jun-18	14:55	14-Jun-18	11:13	0.00187	0.00061	0.00079	0.00033	0.00059	0.00035	0.00040	0.00030
Iron (dissolved) [mg/L]	13-Jun-18	14:55	14-Jun-18	11:13	< 0.007	< 0.007	< 0.007	21.8	1.24	< 0.007	0.033	0.040
Potassium (dissolved) [mg/L]	13-Jun-18	14:55	14-Jun-18	11:13	4.97	4.14	5.31	19.1	15.3	2.05	3.40	1.66
Magnesium (dissolved) [mg/L]	13-Jun-18	14:55	14-Jun-18	11:13	13.2	4.10	4.95	17.8	11.2	7.00	20.0	5.59
Manganese (dissolved) [mg/L]	13-Jun-18	14:55	14-Jun-18	11:13	0.00012	0.00437	0.234	2.03	1.42	0.00052	0.156	0.0161
Sodium (dissolved) [mg/L]	13-Jun-18	14:55	14-Jun-18	11:13	65.8	17.8	27.7	54.6	64.1	143	38.5	14.5
Lead (dissolved) [mg/L]	13-Jun-18	14:55	14-Jun-18	11:13	< 0.00001	< 0.00001	< 0.00001	< 0.00001	0.00019	< 0.00001	< 0.00001	< 0.00001
Zinc (dissolved) [mg/L]	13-Jun-18	14:55	14-Jun-18	11:13	0.003	0.002	0.002	0.002	0.004	0.002	< 0.002	< 0.002
Benzene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Bromodichloromethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Bromoform [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Bromomethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Carbon tetrachloride [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	---	---
Chloroethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 5	< 5	< 5	< 5	< 5	---	---
Chloroform [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Chloromethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 5	< 5	< 5	< 5	< 5	---	---
Dibromochloromethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,2-Dichlorobenzene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,3-Dichlorobenzene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,4-Dichlorobenzene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,1-Dichloroethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,2-Dichloroethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,1-Dichloroethylene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,2-Dichloropropane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
trans-1,2-Dichloroethene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
cis-1,2-Dichloroethene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
cis-1,3-Dichloropropene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
trans-1,3-Dichloropropene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Ethylbenzene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Ethylenedibromide [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	---	---
Dichloromethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Monochlorobenzene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	0.6	< 0.5	< 0.5	---	---

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Schedule 5 Column 1 with full VOC scan

LR Report : CA14224-JUN18

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Approval Date	4: Analysis Approval Time	5: MW-1-1	6: MW-3-1	7: MW-4-1	8: MW-5-1	9: MW-6-1	10: MW-7-1	11: MW-12-2	12: MW-12-3
Styrene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,1,2,2-Tetrachloroethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Tetrachloroethene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Toluene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Trichloroethylene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Vinyl Chloride [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	---	---
Trichlorofluoromethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 5	< 5	< 5	< 5	< 5	---	---
1,1,1-Trichloroethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,1,2-Trichloroethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Xylene (total) [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
o-xylene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
m/p-xylene [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,1,1,2-Tetrachloroethane [ug/L]	08-Jun-18	16:13	12-Jun-18	15:50	---	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---

Analysis	13: MW-13-1
Sample Date & Time	07-Jun-18
Temperature Upon Receipt [°C]	13.0
Alkalinity [mg/L as CaCO3]	227
pH [no unit]	8.11
Conductivity [uS/cm]	590
Total Dissolved Solids [mg/L]	314
Chemical Oxygen Demand [mg/L]	13
Phosphorus (total) [mg/L]	0.04
Total Kjeldahl Nitrogen [as N mg/L]	< 0.5
Ammonia+Ammonium (N) [mg/L]	< 0.1
4AAP-Phenolics [mg/L]	< 0.002
Sulphate [mg/L]	15
Chloride [mg/L]	100
Nitrite (as N) [mg/L]	< 0.03
Nitrate (as N) [mg/L]	0.94
Dissolved Organic Carbon [mg/L]	2
Mercury (total) [mg/L]	0.00001
Arsenic (dissolved) [mg/L]	< 0.0002



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Schedule 5 Column 1 with full VOC scan

LR Report : CA14224-JUN18

Analysis	13: MW-13-1
Barium (dissolved) [mg/L]	0.0703
Boron (dissolved) [mg/L]	0.022
Calcium (dissolved) [mg/L]	96.4
Cadmium (dissolved) [mg/L]	0.000012
Chromium (dissolved) [mg/L]	0.00023
Copper (dissolved) [mg/L]	0.00068
Iron (dissolved) [mg/L]	< 0.007
Potassium (dissolved) [mg/L]	1.91
Magnesium (dissolved) [mg/L]	2.31
Manganese (dissolved) [mg/L]	0.00008
Sodium (dissolved) [mg/L]	31.6
Lead (dissolved) [mg/L]	0.00002
Zinc (dissolved) [mg/L]	0.013
Benzene [ug/L]	---
Bromodichloromethane [ug/L]	---
Bromoform [ug/L]	---
Bromomethane [ug/L]	---
Carbon tetrachloride [ug/L]	---
Chloroethane [ug/L]	---
Chloroform [ug/L]	---
Chloromethane [ug/L]	---
Dibromochloromethane [ug/L]	---
1,2-Dichlorobenzene [ug/L]	---
1,3-Dichlorobenzene [ug/L]	---
1,4-Dichlorobenzene [ug/L]	---
1,1-Dichloroethane [ug/L]	---
1,2-Dichloroethane [ug/L]	---
1,1-Dichloroethylene [ug/L]	---
1,2-Dichloropropane [ug/L]	---
trans-1,2-Dichloroethene [ug/L]	---
cis-1,2-Dichloroethene [ug/L]	---
cis-1,3-Dichloropropene [ug/L]	---
trans-1,3-Dichloropropene [ug/L]	---
Ethylbenzene [ug/L]	---
Ethylenedibromide [ug/L]	---
Dichloromethane [ug/L]	---



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Schedule 5 Column 1 with full VOC scan

LR Report :

CA14224-JUN18

Analysis	13: MW-13-1
Monochlorobenzene [ug/L]	---
Styrene [ug/L]	---
1,1,2,2-Tetrachloroethane [ug/L]	---
Tetrachloroethene [ug/L]	---
Toluene [ug/L]	---
Trichloroethylene [ug/L]	---
Vinyl Chloride [ug/L]	---
Trichlorofluoromethane [ug/L]	---
1,1,1-Trichloroethane [ug/L]	---
1,1,2-Trichloroethane [ug/L]	---
Xylene (total) [ug/L]	---
o-xylene [ug/L]	---
m/p-xylene [ug/L]	---
1,1,1,2-Tetrachloroethane [ug/L]	---

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**Schedule 5 Column 3**

29-June-2018

**Date Rec. :** 07 June 2018  
**LR Report:** CA14225-JUN18  
**Reference:** PO# 73510995 Project #:  
111562057-1

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## CERTIFICATE OF ANALYSIS

### Final Report

Analysis	3: Analysis Approval Date	4: Analysis Approval Time	5: MW-3-2	6: MW-4-2	7: MW-5-2	8: MW-6-II	9: MW-7-2	10: MW-12-1	11: MW-13-2
Sample Date & Time			07-Jun-18	07-Jun-18	07-Jun-18	07-Jun-18	07-Jun-18	07-Jun-18	07-Jun-18
Temperature Upon Receipt [°C]			13.0	13.0	13.0	13.0	13.0	13.0	13.0
Biochemical Oxygen Demand (BOD5) [mg/L]	14-Jun-18	15:23	7	< 4	< 4	< 4	< 4	< 4	< 4
Total Suspended Solids [mg/L]	13-Jun-18	14:36	392	1340	1610	188	259	19	46
Alkalinity [mg/L as CaCO3]	12-Jun-18	21:55	609	305	819	929	286	267	221
pH [no unit]	12-Jun-18	21:55	7.66	7.94	7.18	7.41	7.97	7.93	7.89
Conductivity [uS/cm]	12-Jun-18	21:55	1300	356	1480	2060	650	690	503
Total Dissolved Solids [mg/L]	13-Jun-18	11:20	794	220	969	1310	380	414	269
Chemical Oxygen Demand [mg/L]	13-Jun-18	11:09	11	< 8	51	87	< 8	< 8	< 8
Phosphorus (total) [mg/L]	12-Jun-18	12:37	0.13	0.23	0.18	0.05	0.06	< 0.03	0.04
Total Kjeldahl Nitrogen [as N mg/L]	15-Jun-18	10:12	2.6	< 0.5	14.3	23.4	< 0.5	< 0.5	1.7
Ammonia+Ammonium (N) [mg/L]	14-Jun-18	15:14	2.1	< 0.1	11.1	19.7	0.2	0.2	0.9
4AAP-Phenolics [mg/L]	15-Jun-18	11:46	0.001	< 0.001	0.006	0.010	< 0.001	< 0.001	< 0.001
Sulphate [mg/L]	21-Jun-18	15:55	78	3	9	180	16	24	18
Chloride [mg/L]	20-Jun-18	14:05	26	4	91	99	7	51	44
Nitrite (as N) [mg/L]	19-Jun-18	16:47	0.90	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.10
Nitrate (as N) [mg/L]	19-Jun-18	16:47	7.60	0.07	1.02	< 0.06	< 0.06	< 0.06	0.71
Mercury (total) [ug/L]	11-Jun-18	10:29	< 0.01	0.03	< 0.01	0.01	< 0.01	< 0.01	< 0.01
Arsenic (total) [mg/L]	12-Jun-18	09:31	0.0003	< 0.0002	0.0020	0.0028	< 0.0002	< 0.0002	< 0.0002

OnLine LIMS

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# Schedule 5 Column 3

LR Report : CA14225-JUN18

Analysis	3: Analysis Approval Date	4: Analysis Approval Time	5: MW-3-2	6: MW-4-2	7: MW-5-2	8: MW-6-II	9: MW-7-2	10: MW-12-1	11: MW-13-2
Barium (total) [mg/L]	12-Jun-18	09:31	0.173	0.0955	0.689	0.701	0.144	0.620	0.160
Boron (total) [mg/L]	12-Jun-18	09:31	0.435	0.045	0.362	0.817	0.076	0.117	0.074
Calcium (total) [mg/L]	12-Jun-18	09:31	231	107	273	438	110	135	130
Cadmium (total) [mg/L]	12-Jun-18	09:31	0.000012	0.000004	0.000006	0.000014	< 0.000003	0.000021	0.000004
Chromium (total) [mg/L]	12-Jun-18	09:31	0.00020	0.00015	0.00075	0.00163	0.00024	0.00011	0.00017
Copper (total) [mg/L]	12-Jun-18	09:31	0.00178	0.00057	0.00058	0.00430	0.00154	0.00017	0.00080
Iron (total) [mg/L]	12-Jun-18	09:31	1.40	< 0.007	29.9	21.4	< 0.007	< 0.007	0.024
Potassium (total) [mg/L]	12-Jun-18	09:31	18.1	1.81	23.3	44.0	1.87	3.40	4.47
Magnesium (total) [mg/L]	12-Jun-18	09:31	22.6	2.92	24.7	50.4	5.07	11.0	4.43
Manganese (total) [mg/L]	13-Jun-18	13:32	3.15	0.0678	6.76	11.7	0.00208	0.00515	0.00378
Sodium (total) [mg/L]	12-Jun-18	09:31	58.5	11.4	64.0	121	19.9	13.9	29.3
Lead (total) [mg/L]	12-Jun-18	09:31	0.00003	< 0.00001	0.00005	0.00005	0.00003	0.00002	0.00002
Zinc (total) [mg/L]	12-Jun-18	09:31	< 0.002	0.002	0.004	0.002	0.004	0.002	0.003
Benzene [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Bromodichloromethane [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Bromoform [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Bromomethane [ug/L]	14-Jun-18	15:00	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Carbon tetrachloride [ug/L]	12-Jun-18	15:41	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	---	---
Chloroethane [ug/L]	12-Jun-18	15:41	< 5	< 5	< 5	< 5	< 5	---	---
Chloroform [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Chloromethane [ug/L]	12-Jun-18	15:41	< 5	< 5	< 5	< 5	< 5	---	---
Dibromochloromethane [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,2-Dichlorobenzene [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,3-Dichlorobenzene [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,4-Dichlorobenzene [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,1-Dichloroethane [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,2-Dichloroethane [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,1-Dichloroethylene [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,2-Dichloropropane [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
trans-1,2-Dichloroethene [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
cis-1,2-Dichloroethene [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
cis-1,3-Dichloropropene [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
trans-1,3-Dichloropropene [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Ethylbenzene [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Ethylenedibromide [ug/L]	12-Jun-18	15:41	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	---	---
Dichloromethane [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---

OnLine LIMS

0001426177

Analysis	3: Analysis Approval Date	4: Analysis Approval Time	5: MW-3-2	6: MW-4-2	7: MW-5-2	8: MW-6-II	9: MW-7-2	10: MW-12-1	11: MW-13-2
Monochlorobenzene [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Styrene [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,1,2,2-Tetrachloroethane [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Tetrachloroethene [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Toluene [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Trichloroethylene [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Vinyl Chloride [ug/L]	12-Jun-18	15:41	< 0.2	< 0.2	< 0.2	< 0.2	< 0.2	---	---
Trichlorofluoromethane [ug/L]	12-Jun-18	15:41	< 5	< 5	< 5	< 5	< 5	---	---
1,1,1-Trichloroethane [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,1,2-Trichloroethane [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
Xylene (total) [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
o-xylene [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
m/p-xylene [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---
1,1,1,2-Tetrachloroethane [ug/L]	12-Jun-18	15:41	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	---	---

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Schedule 5 Column 2

21-October-2018

**Date Rec. :** 11 October 2018  
**LR Report:** CA14226-OCT18  
**Reference:** PO#73510995 11156055-01  
**Copy:** #1

## CERTIFICATE OF ANALYSIS

### Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: MW-8-1	6: MW-9-1	7: MW-10-1	8: MW-11-1
Sample Date & Time					11-Oct-18	11-Oct-18	11-Oct-18	11-Oct-18
Temp Upon Receipt [°C]	---	---	--	---	17.0	17.0	17.0	17.0
Alkalinity [mg/L as CaCO <sub>3</sub> ]	11-Oct-18	13:13	14-Oct-18	21:26	292	279	240	256
pH [no unit]	11-Oct-18	13:13	14-Oct-18	21:26	7.85	8.41	8.26	8.19
Conductivity [uS/cm]	11-Oct-18	13:13	14-Oct-18	21:26	818	606	649	647
TDS [mg/L]	11-Oct-18	14:59	14-Oct-18	15:49	434	280	374	380
COD [mg/L]	12-Oct-18	08:16	14-Oct-18	22:16	12	37	< 8	15
NH <sub>3</sub> +NH <sub>4</sub> [as N mg/L]	18-Oct-18	17:50	18-Oct-18	14:53	< 0.1	0.6	0.2	0.7
SO <sub>4</sub> [mg/L]	16-Oct-18	15:48	18-Oct-18	15:31	17	31	23	52
Cl [mg/L]	16-Oct-18	15:53	18-Oct-18	15:31	81	18	50	30
NO <sub>3</sub> [as N mg/L]	16-Oct-18	21:10	18-Oct-18	15:06	< 0.06	< 0.06	< 0.06	< 0.06
DOC [mg/L]	15-Oct-18	18:00	17-Oct-18	09:36	< 1	1	< 1	2
Ba (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	09:25	0.102	0.769	0.747	0.370
B (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	09:25	0.104	0.612	0.253	0.478
Ca (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	09:25	117	59.0	98.5	103
Fe (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	09:25	0.031	< 0.007	0.043	0.148


OnLine LIMS

0001549246



Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: MW-8-1	6: MW-9-1	7: MW-10-1	8: MW-11-1
Mg (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	09:25	12.3	22.9	22.0	26.9
Na (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	09:25	49.7	52.4	14.7	15.7
As (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	09:25	< 0.0002	< 0.0002	< 0.0002	< 0.0002
Cd (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	09:25	< 0.000003	< 0.000003	< 0.000003	< 0.000003
Cr (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	09:26	0.00014	0.00011	0.00011	0.00016
Cu (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	09:26	0.00143	0.00044	0.00013	0.00031
K (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	09:26	3.58	5.38	4.29	4.52
Mn (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	09:26	0.0452	0.0706	0.133	0.0835
Pb (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	09:26	0.00003	0.00001	0.00002	0.00001
Zn (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	09:26	0.003	0.004	0.005	0.004
Benzene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
Bromodichloromethane [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
Bromoform [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
Bromomethane [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
Carbon tetrachloride [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.2
Chloroethane [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 5
Chloroform [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
Chloromethane [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 5
Dibromochloromethane [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
1,2-Dichlorobenzene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
1,3-Dichlorobenzene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
1,4-Dichlorobenzene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
1,1-Dichloroethane [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
1,2-Dichloroethane [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
1,1-Dichloroethylene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
1,2-Dichloropropane [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
trans-1,2-Dichloroet [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
cis-1,2-Dichloroethe [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
cis-1,3-Dichloroprop [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: MW-8-1	6: MW-9-1	7: MW-10-1	8: MW-11-1
trans-1,3-Dichloropr [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
Ethylbenzene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
Ethylenedibromide [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.2
Dichloromethane [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
Monochlorobenzene [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
Styrene [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
1,1,2,2-Tetrachloroe [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
Tetrachloroethene [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
Toluene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
Trichloroethylene [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
Vinyl Chloride [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.2
Trichlorofluorometha [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 5
1,1,1-Trichloroethan [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
1,1,2-Trichloroethan [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
Xylene (total) [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
o-xylene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
m-p-xylene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5
1,1,1,2-Tetrachloroe [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	---	---	---	< 0.5


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**Schedule 5 Column 3, Column 1 metals**

**Project :** PO#735108995 11156057-01

13-November-2018

**GHD**

Attn : Gus Bolin

347 Pido Rd., Unit #29, Peterborough  
Canada, K9J 6Z8  
Phone: 705-749-3317, Fax:

**Date Rec. :** 11 October 2018  
**LR Report:** CA14227-OCT18  
**Reference:** PO#735108995  
11156057-01Gus Bolin

**Copy:** #1

## CERTIFICATE OF ANALYSIS

### Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: MW-8-2	6: MW-9-2	7: MW-10-2	8: MW-11-2
Sample Date & Time			11-Oct-18	11-Oct-18	11-Oct-18	11-Oct-18
Temperature Upon Receipt [°C]	--	---	17.0	17.0	17.0	17.0
Biochemical Oxygen Demand (BOD5) [mg/L]	16-Oct-18	14:02	6	< 4	6	< 4
Total Suspended Solids [mg/L]	16-Oct-18	16:06	17	8	29	8
Alkalinity [mg/L as CaCO <sub>3</sub> ]	14-Oct-18	21:27	272	272	244	247
pH [no unit]	14-Oct-18	21:27	8.15	8.14	7.90	7.65
Conductivity [uS/cm]	14-Oct-18	21:27	984	801	619	603
Total Dissolved Solids [mg/L]	14-Oct-18	15:49	583	423	360	354
Chemical Oxygen Demand [mg/L]	16-Oct-18	14:02	9	8	10	9
Phosphorus (total) [mg/L]	17-Oct-18	11:21	0.04	0.04	0.06	0.05
Total Kjeldahl Nitrogen [as N mg/L]	18-Oct-18	10:40	0.7	< 0.5	1.3	1.4
Ammonia+Ammonium (N) [as N mg/L]	16-Oct-18	12:27	0.1	0.2	0.6	0.9
4AAP-Phenolics [mg/L]	15-Oct-18	15:32	0.005	0.004	0.004	0.004
Sulphate [mg/L]	18-Oct-18	15:31	14	16	7	13
Chloride [mg/L]	18-Oct-18	15:31	120	85	47	29
Nitrite (as N) [mg/L]	18-Oct-18	15:06	< 0.03	< 0.03	0.18	< 0.03
Nitrate (as N) [mg/L]	18-Oct-18	15:06	0.94	0.62	0.23	< 0.06
Mercury (total) [ug/L]	16-Oct-18	14:18	0.03	0.02	0.01	< 0.01
Arsenic (dissolved) [mg/L]	19-Oct-18	14:54	0.0003	0.0004	0.0003	< 0.0002
Barium (dissolved) [mg/L]	19-Oct-18	14:58	0.190	0.203	0.472	0.477
Boron (dissolved) [mg/L]	19-Oct-18	14:58	0.023	0.091	0.113	0.129
Calcium (dissolved) [mg/L]	19-Oct-18	14:58	139	97.6	90.8	102
Cadmium (dissolved) [mg/L]	19-Oct-18	14:58	0.000010	0.000008	0.000008	0.000008
Chromium (dissolved) [mg/L]	19-Oct-18	14:58	0.00026	0.00070	0.00100	0.00016
Copper (dissolved) [mg/L]	19-Oct-18	14:58	0.00063	0.00189	0.00039	< 0.00002
Iron (dissolved) [mg/L]	19-Oct-18	14:58	1.32	0.526	9.96	3.35
Potassium (dissolved) [mg/L]	19-Oct-18	14:58	1.31	4.86	3.54	2.57
Magnesium (dissolved) [mg/L]	19-Oct-18	14:58	4.98	5.78	10.3	10.4
Manganese (dissolved) [mg/L]	19-Oct-18	14:58	0.0389	0.0211	0.0751	0.0313
Sodium (dissolved) [mg/L]	19-Oct-18	14:58	46.0	48.3	8.17	5.56

**SGS Canada Inc.**

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**Schedule 5 Column 3, Column 1 metals****Project :** PO#735108995 11156057-01**LR Report :** CA14227-OCT18

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: MW-8-2	6: MW-9-2	7: MW-10-2	8: MW-11-2
Lead (dissolved) [mg/L]	19-Oct-18	14:58	0.00058	0.00031	0.00028	0.00013
Zinc (total) [mg/L]	19-Oct-18	14:58	< 0.002	0.005	< 0.002	< 0.002
Benzene [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
Bromodichloromethane [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
Bromoform [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
Bromomethane [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
Carbon tetrachloride [ug/L]	17-Oct-18	13:58	---	---	---	< 0.2
Chloroethane [ug/L]	17-Oct-18	13:58	---	---	---	< 5
Chloroform [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
Chloromethane [ug/L]	17-Oct-18	13:58	---	---	---	< 5
Dibromochloromethane [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
1,2-Dichlorobenzene [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
1,3-Dichlorobenzene [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
1,4-Dichlorobenzene [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
1,1-Dichloroethane [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
1,2-Dichloroethane [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
1,1-Dichloroethylene [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
1,2-Dichloropropane [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
trans-1,2-Dichloroethene [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
cis-1,2-Dichloroethene [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
cis-1,3-Dichloropropene [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
trans-1,3-Dichloropropene [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
Ethylbenzene [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
Ethylenedibromide [ug/L]	17-Oct-18	13:58	---	---	---	< 0.2
Dichloromethane [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
Monochlorobenzene [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
Styrene [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
1,1,2,2-Tetrachloroethane [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
Tetrachloroethene [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
Toluene [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
Trichloroethylene [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
Vinyl Chloride [ug/L]	17-Oct-18	13:58	---	---	---	< 0.2
Trichlorofluoromethane [ug/L]	17-Oct-18	13:58	---	---	---	< 5
1,1,1-Trichloroethane [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
1,1,2-Trichloroethane [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
Xylene (total) [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
o-xylene [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
m/p-xylene [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5
1,1,1,2-Tetrachloroethane [ug/L]	17-Oct-18	13:58	---	---	---	< 0.5



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**Schedule 5 Column 3, Column 1 metals**

**Project :** PO#735108995 11156057-01

**LR Report :** CA14227-OCT18

*Chris Sullivan*



Chris Sullivan, B.Sc., C.Chem  
Project Specialist  
Environmental Services, Analytical



**SGS Canada Inc.**

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**GHD**

Attn : Gus Bolin

347 Pido Rd., Unit #29, Peterborough  
Canada, K9J 6Z8  
Phone: 705-749-3317, Fax:

**Schedule 5 Column 2**

**Project :** 11156055-01

01-November-2018

**Date Rec. :** 13 October 2018  
**LR Report:** **CA14289-OCT18**  
**Reference:** PO#73510995 11156055-01 Gus Bolin

**Copy:** #1

## CERTIFICATE OF ANALYSIS

### Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: MW-12-2	6: MW-12-3	7: MW-13-1	8: MW-7-1
Sample Date & Time					12-Oct-18	12-Oct-18	12-Oct-18	12-Oct-18
Temp Upon Receipt [°C]	---	---	--	---	10.0	10.0	10.0	10.0
Alkalinity [mg/L as CaCO <sub>3</sub> ]	15-Oct-18	14:46	16-Oct-18	14:33	287	294	273	342
pH [no unit]	15-Oct-18	14:46	16-Oct-18	14:33	8.00	7.83	7.99	8.26
Conductivity [uS/cm]	15-Oct-18	14:46	16-Oct-18	14:33	732	708	822	787
TDS [mg/L]	15-Oct-18	14:21	17-Oct-18	13:06	449	426	457	454
COD [mg/L]	17-Oct-18	07:43	17-Oct-18	16:25	15	< 8	< 8	< 8
NH <sub>3</sub> +NH <sub>4</sub> [as N mg/L]	18-Oct-18	17:50	18-Oct-18	14:54	0.2	< 0.1	< 0.1	< 0.1
SO <sub>4</sub> [mg/L]	18-Oct-18	13:55	19-Oct-18	13:27	66	23	13	30
Cl [mg/L]	18-Oct-18	13:49	19-Oct-18	13:27	43	56	93	45
NO <sub>3</sub> [as N mg/L]	16-Oct-18	23:21	18-Oct-18	15:58	< 0.06	0.08	1.21	0.25
DOC [mg/L]	23-Oct-18	14:00	30-Oct-18	13:41	2	1	3	1
Ba (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	0.168	0.0347	0.0784	0.131
B (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	0.501	0.080	0.020	0.540



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## Schedule 5 Column 2

Project : 11156055-01

LR Report : CA14289-OCT18

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: MW-12-2	6: MW-12-3	7: MW-13-1	8: MW-7-1
Ca (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	97.7	136	71.8	40.6
Fe (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	0.024	0.200	< 0.007	< 0.007
Mg (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	22.2	5.99	2.31	8.26
Na (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	40.4	15.2	70.6	148
As (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	< 0.0002	< 0.0002	< 0.0002	0.0006
Cd (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	< 0.000003	< 0.000003	< 0.000003	0.000007
Cr (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	0.00012	0.00013	0.00015	0.00016
Cu (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	0.00024	0.00022	0.00077	0.00048
K (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	3.11	1.67	2.64	2.45
Mn (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	0.149	0.0493	0.00035	0.00568
Pb (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	< 0.00001	0.00002	0.00003	0.00002
Zn (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	< 0.002	0.002	< 0.002	< 0.002
Benzene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
Bromodichloromethane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
Bromoform [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
Bromomethane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
Carbon tetrachloride [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.2
Chloroethane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 5
Chloroform [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
Chloromethane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 5
Dibromochloromethane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
1,2-Dichlorobenzene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
1,3-Dichlorobenzene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
1,4-Dichlorobenzene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
1,1-Dichloroethane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
1,2-Dichloroethane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
1,1-Dichloroethylene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5



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## Schedule 5 Column 2

Project : 11156055-01

LR Report : CA14289-OCT18

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: MW-12-2	6: MW-12-3	7: MW-13-1	8: MW-7-1
1,2-Dichloropropane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
trans-1,2-Dichloroet [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
cis-1,2-Dichloroethe [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
cis-1,3-Dichloroprop [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
trans-1,3-Dichloropr [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
Ethylbenzene [ug/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
Ethylenedibromide [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.2
Dichloromethane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
Monochlorobenzene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
Styrene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
1,1,2,2-Tetrachloroe [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
Tetrachloroethene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
Toluene [ug/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
Trichloroethylene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
Vinyl Chloride [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.2
Trichlorofluorometha [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 5
1,1,1-Trichloroethan [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
1,1,2-Trichloroethan [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
Xylene (total) [ug/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
o-xylene [ug/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
m-p-xylene [ug/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5
1,1,1,2-Tetrachloroe [µg/L]	16-Oct-18	16:02	18-Oct-18	16:15	---	---	---	< 0.5







**SGS Canada Inc.**

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**Schedule 5 Column 2**

**Project :** 11156055-01

**LR Report :** CA14289-OCT18

*Rob Irwin B.Sc., C.Chem*  
*Technical Manager, Inorganic Chemistry*  
*Environmental, Analytical Services*



**SGS Canada Inc.**

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**GHD**

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Schedule 5 Column 2

01-November-2018

**Date Rec. :** 15 October 2018  
**LR Report:** CA14290-OCT18  
**Reference:** PO#73510995 11156055-01  
**Copy:** #1

## CERTIFICATE OF ANALYSIS

### Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: MW-1-1	6: MW-3-1	7: MW-4-1	8: MW-5-1	9: MW-6-1
Sample Date & Time					12-Oct-18	12-Oct-18	12-Oct-18	12-Oct-18	12-Oct-18
Temp Upon Receipt [°C]	---	---	--	---	8.0	8.0	8.0	8.0	8.0
Alkalinity [mg/L as CaCO3]	15-Oct-18	14:46	16-Oct-18	14:33	292	354	376	677	469
pH [no unit]	15-Oct-18	14:46	16-Oct-18	14:33	7.96	7.82	7.76	7.56	7.75
Conductivity [uS/cm]	15-Oct-18	14:46	16-Oct-18	14:33	1110	815	904	1520	1190
TDS [mg/L]	15-Oct-18	14:21	17-Oct-18	13:06	671	471	537	877	703
COD [mg/L]	17-Oct-18	07:43	17-Oct-18	16:25	< 8	< 8	8	41	15
Total P [mg/L]	18-Oct-18	19:10	22-Oct-18	10:48	0.04	< 0.03	< 0.03	< 0.03	0.06
NH3+NH4 [as N mg/L]	18-Oct-18	17:50	23-Oct-18	12:01	< 0.1	< 0.1	0.2	13.3	6.5
SO4 [mg/L]	18-Oct-18	13:55	19-Oct-18	13:27	73	16	27	10	42
Cl [mg/L]	18-Oct-18	13:49	19-Oct-18	15:23	160	52	67	120	100
NO3 [as N mg/L]	17-Oct-18	04:00	22-Oct-18	14:29	2.70	2.26	1.58	0.54	0.14
DOC [mg/L]	23-Oct-18	14:00	24-Oct-18	12:48	2	2	3	14	6
Ba (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	0.229	0.112	0.151	0.587	0.285
B (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	0.104	0.045	0.110	0.450	0.213
Ca (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	157	129	155	230	163

OnLine LIMS

0001563222



SGS Canada Inc.



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## Schedule 5 Column 2

LR Report : CA14290-OCT18

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Date Completed	4: Analysis Time Completed	5: MW-1-1	6: MW-3-1	7: MW-4-1	8: MW-5-1	9: MW-6-1
Fe (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	0.008	0.013	0.061	28.4	2.24
Mg (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	14.9	4.46	7.42	22.5	11.6
Na (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	70.5	30.7	34.2	81.9	63.7
As (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	< 0.0002	< 0.0002	< 0.0002	0.0026	0.0005
Cd (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	0.000007	0.000022	0.000014	< 0.000003	0.000003
Cr (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	0.00012	0.00011	0.00018	0.00077	0.00032
Cu (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	0.00330	0.00281	0.00177	0.00111	0.00086
K (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	4.84	3.69	4.46	25.1	13.3
Mn (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	0.00682	0.102	0.0535	2.12	1.37
Pb (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	0.00015	0.00016	0.00009	0.00007	0.00021
Zn (diss) [mg/L]	19-Oct-18	09:57	23-Oct-18	10:05	0.004	0.005	0.003	0.003	0.004
Benzene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
Bromomethane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
Carbon tetrachloride [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.2	< 0.2	< 0.2	< 0.2
Chloroethane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 5	< 5	< 5	< 5
Chloroform [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
Chloromethane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 5	< 5	< 5	< 5
Dibromochloromethane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichlorobenzene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
1,3-Dichlorobenzene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
1,4-Dichlorobenzene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethylene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,2-Dichloroet [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,2-Dichloroethe [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Date Completed	4: Analysis Time Completed	5: MW-1-1	6: MW-3-1	7: MW-4-1	8: MW-5-1	9: MW-6-1
cis-1,3-Dichloroprop [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,3-Dichloropr [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene [ug/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
Ethylenedibromide [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.2	< 0.2	< 0.2	< 0.2
Dichloromethane [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
Monochlorobenzene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
Styrene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroe [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
Toluene [ug/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl Chloride [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.2	< 0.2	< 0.2	< 0.2
Trichlorofluorometha [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 5	< 5	< 5	< 5
1,1,1-Trichloroethan [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethan [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
Xylene (total) [ug/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
o-xylene [ug/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
m-p-xylene [ug/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1,2-Tetrachloroe [µg/L]	16-Oct-18	16:02	18-Oct-18	16:16	---	< 0.5	< 0.5	< 0.5	< 0.5

  
  
**Rob Irwin B.Sc., C.Chem**  
 Technical Manager, Inorganic Chemistry  
 Environmental, Analytical Services

**SGS Canada Inc.**

P.O. Box 4300 - 185 Concession St.  
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Phone: 705-652-2000 FAX: 705-652-6365

13-November-2018

**GHD**

Attn : Gus Bolin

347 Pido Rd., Unit #29, Peterborough  
Canada, K9J 6Z8  
Phone: 705-749-3317, Fax:

**Date Rec. :** 13 October 2018  
**LR Report:** CA14303-OCT18  
**Reference:** PO#735108995  
11156057-01Gus Bolin

**Copy:** #1

# CERTIFICATE OF ANALYSIS

## Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: MW-12-1	6: MW-13-2	7: MW-7-2	8: MW-14-1
Sample Date & Time			12-Oct-18	12-Oct-18	12-Oct-18	12-Oct-18
Temperature Upon Receipt [°C]	--	---	10.0	10.0	10.0	10.0
Biochemical Oxygen Demand (BOD5) [mg/L]	22-Oct-18	13:36	9	< 4	< 4	---
Total Suspended Solids [mg/L]	19-Oct-18	11:53	2	< 2	100	---
Alkalinity [mg/L as CaCO <sub>3</sub> ]	16-Oct-18	14:33	251	282	1080	---
pH [no unit]	16-Oct-18	14:33	7.95	7.91	7.58	---
Conductivity [uS/cm]	16-Oct-18	14:33	593	610	2200	---
Total Dissolved Solids [mg/L]	17-Oct-18	13:22	346	371	1470	---
Chemical Oxygen Demand [mg/L]	22-Oct-18	13:36	13	< 8	95	---
Phosphorus (total) [mg/L]	17-Oct-18	13:50	< 0.03	0.06	< 0.03	---
Total Kjeldahl Nitrogen [as N mg/L]	06-Nov-18	12:51	< 0.5	< 0.5	31.9	---
Ammonia+Ammonium (N) [as N mg/L]	24-Oct-18	09:15	0.1	< 0.1	23.2	---
4AAP-Phenolics [mg/L]	25-Oct-18	09:04	< 0.001	< 0.001	0.003	---
Sulphate [mg/L]	19-Oct-18	13:27	22	15	60	---
Chloride [mg/L]	19-Oct-18	15:23	45	30	140	---
Nitrite (as N) [mg/L]	17-Oct-18	12:29	< 0.03	< 0.03	< 0.03	---
Nitrate (as N) [mg/L]	17-Oct-18	12:29	< 0.06	1.37	0.12	---
Mercury (total) [ug/L]	17-Oct-18	14:33	< 0.01	< 0.01	0.01	---
Mercury (dissolved) [mg/L]	17-Oct-18	14:33	< 0.00001	< 0.00001	0.00001	---
Arsenic (dissolved) [mg/L]	30-Oct-18	15:22	< 0.0002	< 0.0002	0.0009	---
Barium (dissolved) [mg/L]	30-Oct-18	15:22	0.667	0.106	0.432	---
Boron (dissolved) [mg/L]	30-Oct-18	15:22	0.120	0.027	0.673	---
Calcium (dissolved) [mg/L]	30-Oct-18	15:22	96.7	109	308	---
Cadmium (dissolved) [mg/L]	30-Oct-18	15:22	< 0.000003	0.000004	0.000008	---
Chromium (dissolved) [mg/L]	30-Oct-18	15:22	0.00003	0.00007	0.00093	---
Copper (dissolved) [mg/L]	30-Oct-18	15:22	0.00030	0.00071	0.00318	---
Iron (dissolved) [mg/L]	30-Oct-18	15:22	< 0.007	0.013	0.178	---
Potassium (dissolved) [mg/L]	30-Oct-18	15:22	3.30	3.17	39.4	---
Magnesium (dissolved) [mg/L]	30-Oct-18	15:22	12.1	2.82	37.6	---
Manganese (dissolved) [mg/L]	30-Oct-18	15:22	0.00269	0.00960	7.44	---



## Schedule 5 Column 3, Column 1 metals

## SGS Canada Inc.

P.O. Box 4300 - 185 Concession St.

Lakefield - Ontario - K0L 2H0

Phone: 705-652-2000 FAX: 705-652-6365

LR Report : CA14303-OCT18

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: MW-12-1	6: MW-13-2	7: MW-7-2	8: MW-14-1
Sodium (dissolved) [mg/L]	30-Oct-18	15:22	10.4	31.8	128	---
Lead (dissolved) [mg/L]	30-Oct-18	15:22	< 0.00001	< 0.00001	< 0.00001	---
Zinc (dissolved) [mg/L]	30-Oct-18	15:22	< 0.002	< 0.002	< 0.002	---
Benzene [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
Bromodichloromethane [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
Bromoform [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
Bromomethane [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
Carbon tetrachloride [ug/L]	18-Oct-18	16:17	---	---	< 0.2	< 0.2
Chloroethane [ug/L]	18-Oct-18	16:17	---	---	< 5	< 5
Chloroform [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
Chloromethane [ug/L]	18-Oct-18	16:17	---	---	< 5	< 5
Dibromochloromethane [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
1,2-Dichlorobenzene [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
1,3-Dichlorobenzene [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
1,4-Dichlorobenzene [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
1,1-Dichloroethane [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
1,2-Dichloroethane [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
1,1-Dichloroethylene [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
1,2-Dichloropropane [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
trans-1,2-Dichloroethene [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
cis-1,2-Dichloroethene [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
cis-1,3-Dichloropropene [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
trans-1,3-Dichloropropene [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
Ethylbenzene [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
Ethylenedibromide [ug/L]	18-Oct-18	16:17	---	---	< 0.2	< 0.2
Dichloromethane [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
Monochlorobenzene [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
Styrene [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
Tetrachloroethene [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
Toluene [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
Trichloroethylene [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
Vinyl Chloride [ug/L]	18-Oct-18	16:17	---	---	< 0.2	< 0.2
Trichlorofluoromethane [ug/L]	18-Oct-18	16:17	---	---	< 5	< 5
1,1,1-Trichloroethane [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
1,1,2-Trichloroethane [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
Xylene (total) [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
o-xylene [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
m/p-xylene [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane [ug/L]	18-Oct-18	16:17	---	---	< 0.5	< 0.5




**SGS Canada Inc.**

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Schedule 5 Column 3, Column 1 metals

LR Report : CA14303-OCT18

*Chris Sullivan*  
  
**Chris Sullivan, B.Sc., C.Chem**  
**Project Specialist**  
**Environmental Services, Analytical**



**SGS Canada Inc.**  
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## GHD

Attn : Gus Bolin

347 Pido Rd., Unit #29, Peterborough  
Canada, K9J 6Z8  
Phone: 705-749-3317, Fax:

Schedule 5 Column 3, Column 1 metals

Project : PO#735108995 11156057-01

13-November-2018

Date Rec. : 13 October 2018  
LR Report: **CA14304-OCT18**  
Reference: PO#735108995  
11156057-01 Gus Bolin

Copy: #1

# CERTIFICATE OF ANALYSIS

## Final Report

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: MW-4-2	6: MW-6-2
Sample Date & Time			12-Oct-18	12-Oct-18
Temperature Upon Receipt [°C]	--	---	8.0	8.0
Biochemical Oxygen Demand (BOD5) [mg/L]	22-Oct-18	13:35	< 4	< 4
Total Suspended Solids [mg/L]	18-Oct-18	13:47	2520	704
Alkalinity [mg/L as CaCO3]	16-Oct-18	14:33	315	505
pH [no unit]	16-Oct-18	14:33	7.87	7.74
Conductivity [uS/cm]	16-Oct-18	14:33	701	1080
Total Dissolved Solids [mg/L]	17-Oct-18	13:06	417	686
Chemical Oxygen Demand [mg/L]	17-Oct-18	16:26	< 8	17
Phosphorus (total) [mg/L]	17-Oct-18	13:50	< 0.03	0.05
Total Kjeldahl Nitrogen [as N mg/L]	18-Oct-18	09:49	< 0.5	< 0.5
Ammonia+Ammonium (N) [as N mg/L]	24-Oct-18	09:15	< 0.1	< 0.1
4AAP-Phenolics [mg/L]	25-Oct-18	09:04	< 0.001	0.002
Sulphate [mg/L]	19-Oct-18	13:27	11	43
Chloride [mg/L]	19-Oct-18	13:27	50	65
Nitrite (as N) [mg/L]	19-Oct-18	14:42	< 0.03	< 0.03
Nitrate (as N) [mg/L]	19-Oct-18	14:42	0.77	4.76
Mercury (total) [ug/L]	17-Oct-18	14:33	< 0.01	0.02
Mercury (dissolved) [mg/L]	03-Nov-18	07:09	0.00001	0.00001
Arsenic (dissolved) [mg/L]	30-Oct-18	15:25	< 0.0002	< 0.0002
Barium (dissolved) [mg/L]	30-Oct-18	15:25	0.143	0.304
Boron (dissolved) [mg/L]	30-Oct-18	15:25	0.044	0.269
Calcium (dissolved) [mg/L]	30-Oct-18	15:25	116	145
Cadmium (total) [mg/L]	30-Oct-18	15:25	0.000004	0.000005
Chromium (dissolved) [mg/L]	30-Oct-18	15:25	0.00014	0.00039
Copper (dissolved) [mg/L]	30-Oct-18	15:25	0.00071	0.00358
Iron (dissolved) [mg/L]	30-Oct-18	15:25	0.017	0.111
Potassium (dissolved) [mg/L]	30-Oct-18	15:25	1.80	9.57
Magnesium (dissolved) [mg/L]	30-Oct-18	15:25	3.82	16.5
Manganese (dissolved) [mg/L]	30-Oct-18	15:25	0.00114	0.00925



**SGS Canada Inc.**

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**Schedule 5 Column 3, Column 1 metals****Project :** PO#735108995 11156057-01**LR Report :** CA14304-OCT18

Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: MW-4-2	6: MW-6-2
Sodium (dissolved) [mg/L]	30-Oct-18	15:25	20.6	55.6
Lead (dissolved) [mg/L]	30-Oct-18	15:25	0.00004	0.00019
Zinc (dissolved) [mg/L]	30-Oct-18	15:25	< 0.002	< 0.002
Benzene [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
Bromodichloromethane [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
Bromoform [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
Bromomethane [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
Carbon tetrachloride [ug/L]	18-Oct-18	16:16	< 0.2	< 0.2
Chloroethane [ug/L]	18-Oct-18	16:16	< 5	< 5
Chloroform [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
Chloromethane [ug/L]	18-Oct-18	16:16	< 5	< 5
Dibromochloromethane [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
1,2-Dichlorobenzene [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
1,3-Dichlorobenzene [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
1,4-Dichlorobenzene [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
1,1-Dichloroethane [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
1,2-Dichloroethane [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
1,1-Dichloroethylene [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
1,2-Dichloropropane [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
trans-1,2-Dichloroethene [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
cis-1,2-Dichloroethene [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
cis-1,3-Dichloropropene [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
trans-1,3-Dichloropropene [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
Ethylbenzene [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
Ethylenedibromide [ug/L]	18-Oct-18	16:16	< 0.2	< 0.2
Dichloromethane [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
Monochlorobenzene [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
Styrene [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
Tetrachloroethene [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
Toluene [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
Trichloroethylene [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
Vinyl Chloride [ug/L]	18-Oct-18	16:16	< 0.2	< 0.2
Trichlorofluoromethane [ug/L]	18-Oct-18	16:16	< 5	< 5
1,1,1-Trichloroethane [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
1,1,2-Trichloroethane [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
Xylene (total) [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
o-xylene [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
m/p-xylene [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane [ug/L]	18-Oct-18	16:16	< 0.5	< 0.5



**SGS Canada Inc.**

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**Schedule 5 Column 3, Column 1 metals**

**Project :** PO#735108995 11156057-01

**LR Report :** CA14304-OCT18

*Chris Sullivan*



**Chris Sullivan, B.Sc., C.Chem**  
**Project Specialist**  
**Environmental Services, Analytical**



**SGS Canada Inc.**

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**GHD**

Attn : Gus Bolin

347 Pido Rd., Unit #29, Peterborough  
Canada, K9J 6Z8  
Phone: 705-749-3317, Fax:

Schedule 5 Column 2

21-October-2018

**Date Rec. :** 11 October 2018  
**LR Report:** **CA15200-OCT18**  
**Reference:** PO#73510995 11156055-01

**Copy:** #1

## CERTIFICATE OF ANALYSIS

### Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time Completed	3: Analysis Date Completed	4: Analysis Time Completed	5: R-1	6: R-2	7: R-3	8: R-4
Sample Date & Time					11-Oct-18	11-Oct-18	11-Oct-18	11-Oct-18
Temp Upon Receipt [°C]	---	---	--	---	17.0	17.0	17.0	17.0
Alkalinity [mg/L as CaCO <sub>3</sub> ]	11-Oct-18	13:13	14-Oct-18	21:27	267	286	255	374
pH [no unit]	11-Oct-18	13:13	14-Oct-18	21:27	7.93	8.12	8.28	8.17
Conductivity [uS/cm]	11-Oct-18	13:13	14-Oct-18	21:27	667	894	792	1610
TDS [mg/L]	11-Oct-18	14:59	14-Oct-18	20:54	357	509	434	843
COD [mg/L]	12-Oct-18	08:52	14-Oct-18	22:17	11	< 8	22	10
NH <sub>3</sub> +NH <sub>4</sub> [as N mg/L]	18-Oct-18	17:50	18-Oct-18	15:00	0.3	< 0.1	< 0.1	< 0.1
SO <sub>4</sub> [mg/L]	16-Oct-18	15:48	18-Oct-18	15:31	10	13	< 2	18
Cl [mg/L]	16-Oct-18	15:53	18-Oct-18	15:31	51	110	84	280
NO <sub>3</sub> [as N mg/L]	16-Oct-18	21:10	18-Oct-18	15:06	0.24	0.59	1.78	2.49
DOC [mg/L]	15-Oct-18	18:00	17-Oct-18	09:39	3	2	3	5
Ba (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	10:08	0.0946	0.106	0.00061	0.145
B (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	10:08	0.017	0.023	0.033	0.037
Ca (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	10:08	111	138	0.32	137
Fe (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	10:08	0.371	< 0.007	< 0.007	< 0.007

OnLine LIMS

0001549239



SGS Canada Inc.



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## Schedule 5 Column 2

LR Report : CA15200-OCT18

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Date Completed	4: Analysis Time Completed	5: R-1	6: R-2	7: R-3	8: R-4
Mg (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	10:08	3.99	4.63	0.025	4.04
Na (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	10:08	33.5	49.0	193	154
As (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	10:08	0.0003	< 0.0002	< 0.0002	0.0002
Cd (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	10:08	0.000031	< 0.000003	< 0.000003	0.000004
Cr (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	10:08	0.00017	0.00017	0.00016	0.00029
Cu (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	10:08	0.00185	0.144	0.0600	0.0845
K (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	10:08	1.68	1.37	0.273	3.76
Mn (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	10:08	0.308	0.00025	0.00013	0.00029
Pb (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	10:08	0.00288	0.00057	0.00032	0.00217
Zn (diss) [mg/L]	18-Oct-18	03:46	19-Oct-18	10:09	0.013	0.009	0.009	0.036
Benzene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
Bromodichloromethane [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
Bromoform [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
Bromomethane [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
Carbon tetrachloride [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.2	< 0.2	< 0.2	< 0.2
Chloroethane [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 5	< 5	< 5	< 5
Chloroform [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
Chloromethane [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 5	< 5	< 5	< 5
Dibromochloromethane [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichlorobenzene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
1,3-Dichlorobenzene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
1,4-Dichlorobenzene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethane [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloroethane [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
1,1-Dichloroethylene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
1,2-Dichloropropane [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
trans-1,2-Dichloroet [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,2-Dichloroethe [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
cis-1,3-Dichloroprop [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5

Analysis	1: Analysis Start Date	2: Analysis Start Time Completed	3: Analysis Date Completed	4: Analysis Time Completed	5: R-1	6: R-2	7: R-3	8: R-4
trans-1,3-Dichloropr [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
Ethylbenzene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
Ethylenedibromide [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.2	< 0.2	< 0.2	< 0.2
Dichloromethane [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
Monochlorobenzene [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
Styrene [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroe [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
Tetrachloroethene [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
Toluene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
Trichloroethylene [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
Vinyl Chloride [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.2	< 0.2	< 0.2	< 0.2
Trichlorofluorometha [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 5	< 5	< 5	< 5
1,1,1-Trichloroethan [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
1,1,2-Trichloroethan [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
Xylene (total) [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
o-xylene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
m-p-xylene [ug/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5
1,1,1,2-Tetrachloroe [µg/L]	15-Oct-18	16:49	17-Oct-18	13:59	< 0.5	< 0.5	< 0.5	< 0.5

  
  
**Rob Irwin B.Sc., C.Chem**  
 Technical Manager, Inorganic Chemistry  
 Environmental, Analytical Services



**SGS Canada Inc.**  
P.O. Box 4300 - 185 Concession St.  
Lakefield - Ontario - K0L 2H0  
Phone: 705-652-2000 FAX: 705-652-6365

**Schedule 5 Column 3, Column 1 metals**

**Project :** PO#73510995 11156057-01

21-October-2018

**GHD**

Attn : Gus Bolin

347 Pido Rd., Unit #29, Peterborough  
Canada, K9J 6Z8  
Phone: 705-749-3317, Fax:

**Date Rec. :** 11 October 2018  
**LR Report:** CA15199-OCT18  
**Reference:** PO#73510995  
11156057-01

**Copy:** 1

## CERTIFICATE OF ANALYSIS

### Final Report

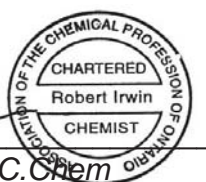
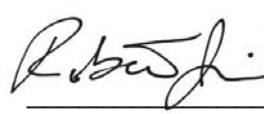
Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: S-1
Sample Date & Time			11-Oct-18
Temperature Upon Receipt [°C]	--	---	17.0
Biochemical Oxygen Demand (BOD5) [mg/L]	16-Oct-18	14:02	18
Total Suspended Solids [mg/L]	16-Oct-18	16:06	27
Alkalinity [mg/L as CaCO <sub>3</sub> ]	14-Oct-18	21:27	278
pH [no unit]	14-Oct-18	21:27	7.87
Conductivity [uS/cm]	14-Oct-18	21:27	613
Total Dissolved Solids [mg/L]	14-Oct-18	20:54	371
Chemical Oxygen Demand [mg/L]	16-Oct-18	14:02	58
Total Kjeldahl Nitrogen [as N mg/L]	18-Oct-18	10:41	1.1
Ammonia+Ammonium (N) [as N mg/L]	16-Oct-18	13:27	0.1
4AAP-Phenolics [mg/L]	15-Oct-18	15:32	0.032
Sulphate [mg/L]	18-Oct-18	15:31	25
Chloride [mg/L]	18-Oct-18	15:31	25
Nitrite (as N) [mg/L]	18-Oct-18	14:34	< 0.03
Nitrate (as N) [mg/L]	18-Oct-18	14:34	< 0.06
Mercury (total) [ug/L]	16-Oct-18	14:25	0.01
Arsenic (total) [mg/L]	16-Oct-18	11:35	0.0013
Barium (total) [mg/L]	16-Oct-18	11:35	0.145
Boron (total) [mg/L]	16-Oct-18	11:35	0.037
Calcium (total) [mg/L]	16-Oct-18	11:35	128
Cadmium (total) [mg/L]	16-Oct-18	11:35	0.000056
Chromium (total) [mg/L]	16-Oct-18	11:35	0.00093
Copper (total) [mg/L]	16-Oct-18	11:35	0.00172
Iron (total) [mg/L]	16-Oct-18	11:35	0.528
Potassium (total) [mg/L]	16-Oct-18	11:35	5.49
Magnesium (total) [mg/L]	16-Oct-18	11:35	4.48
Manganese (total) [mg/L]	16-Oct-18	11:35	0.197
Sodium (total) [mg/L]	16-Oct-18	11:35	18.9
Phosphorus (total) [mg/L]	16-Oct-18	11:35	0.342

**SGS Canada Inc.**

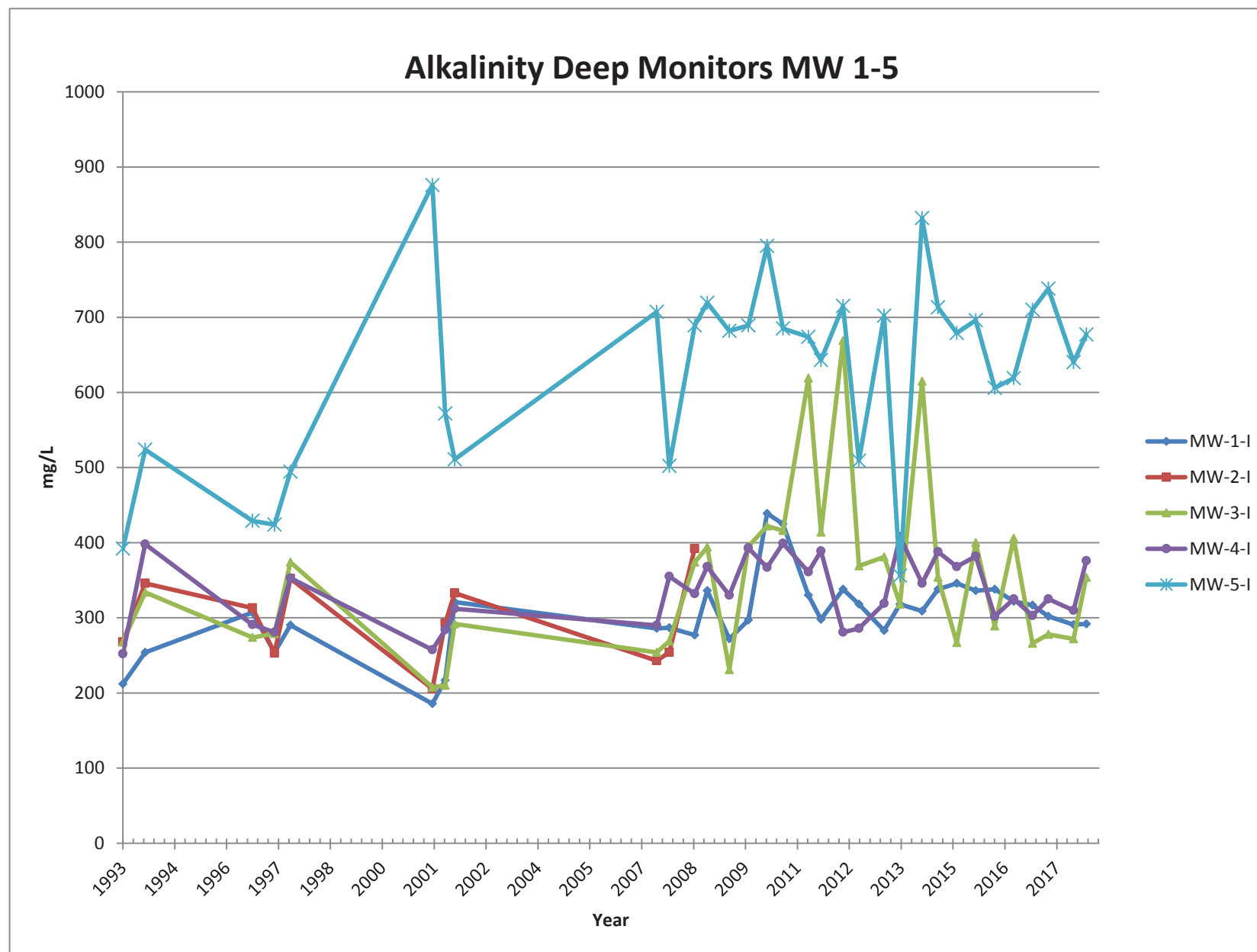
P.O. Box 4300 - 185 Concession St.  
Lakefield - Ontario - K0L 2H0  
Phone: 705-652-2000 FAX: 705-652-6365

**Schedule 5 Column 3, Column 1 metals****Project :** PO#73510995 11156057-01**LR Report :** CA15199-OCT18

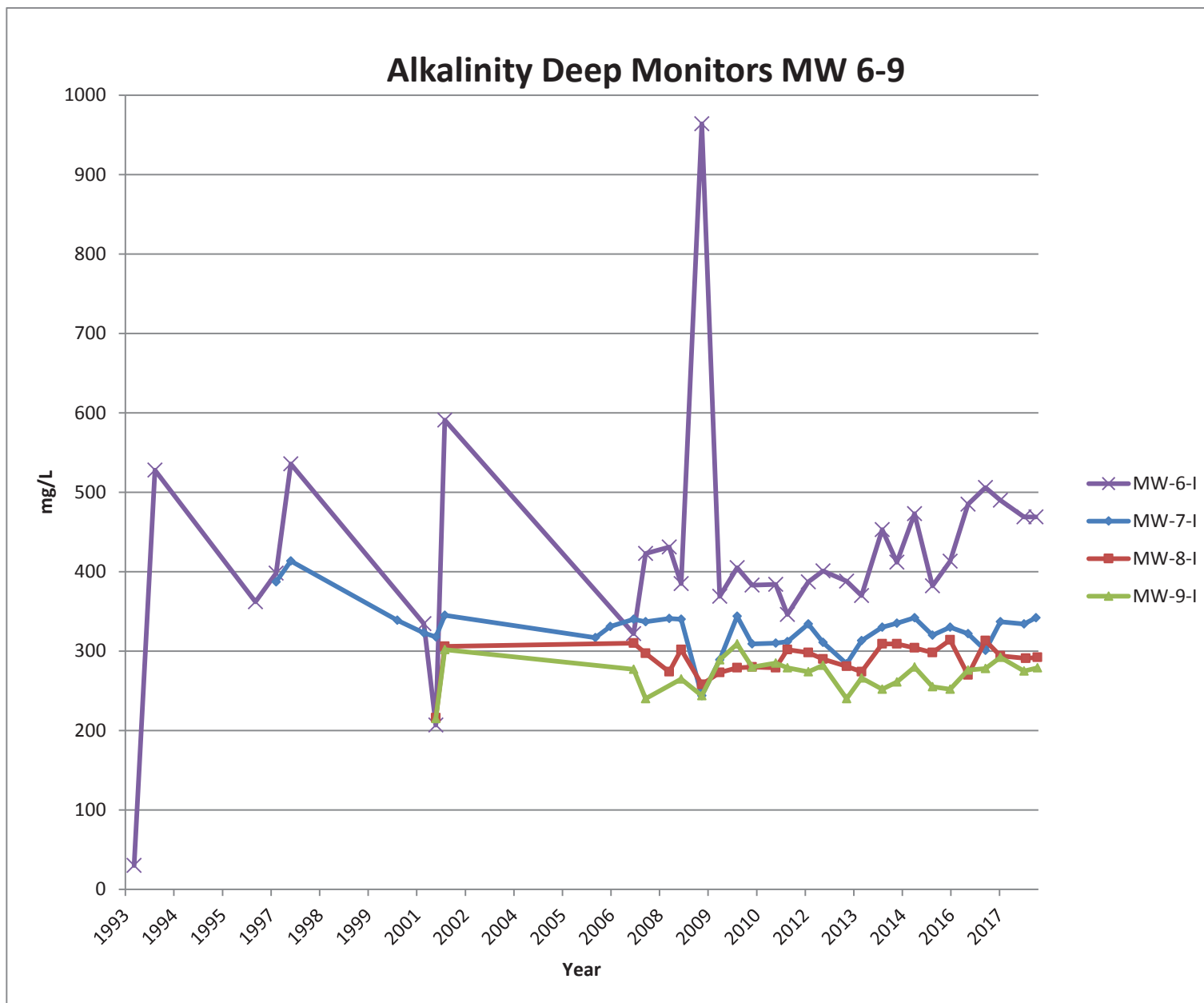
Analysis	3: Analysis Completed Date	4: Analysis Completed Time	5: S-1
Lead (total) [mg/L]	16-Oct-18	11:35	0.00033
Zinc (total) [mg/L]	16-Oct-18	11:35	0.006

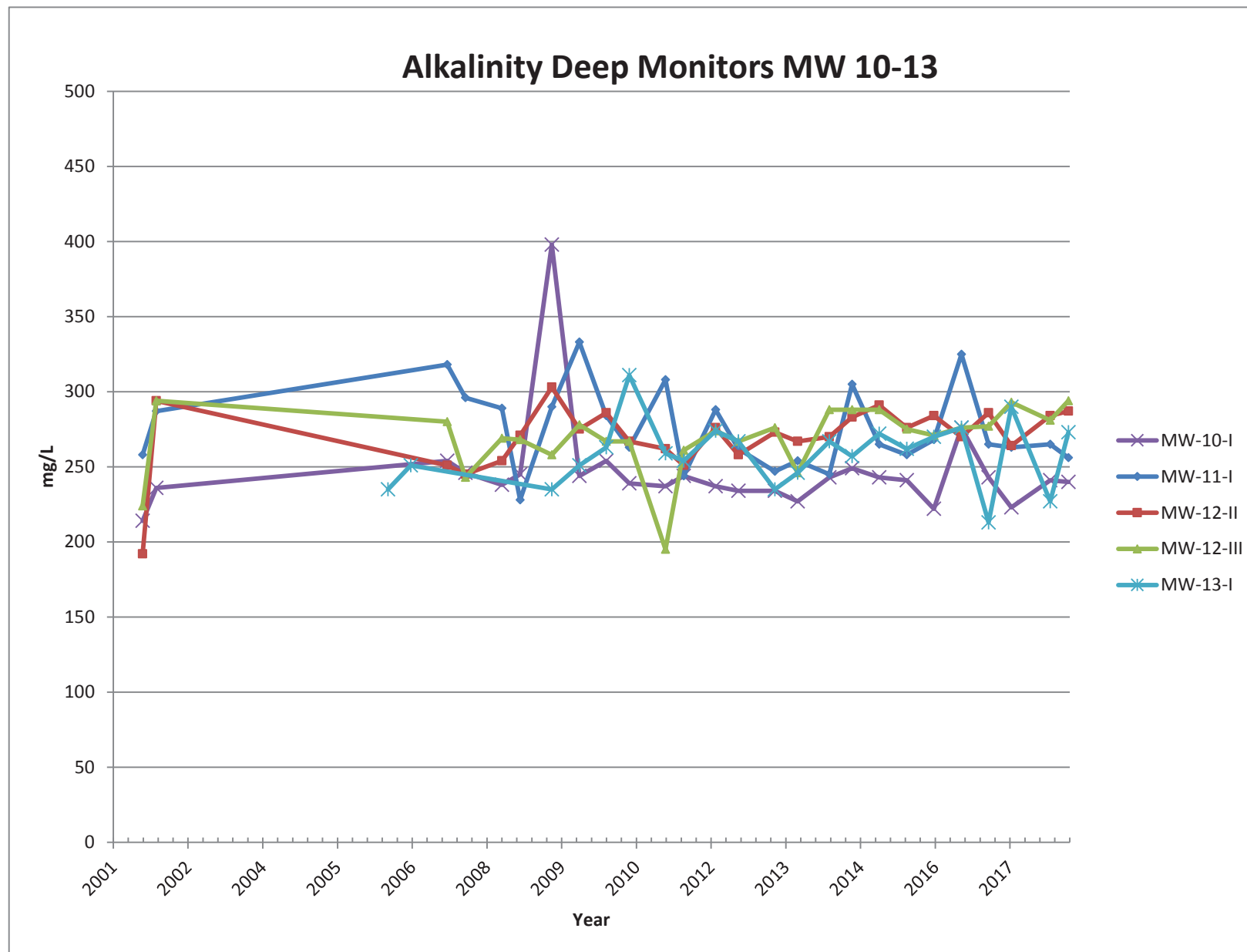


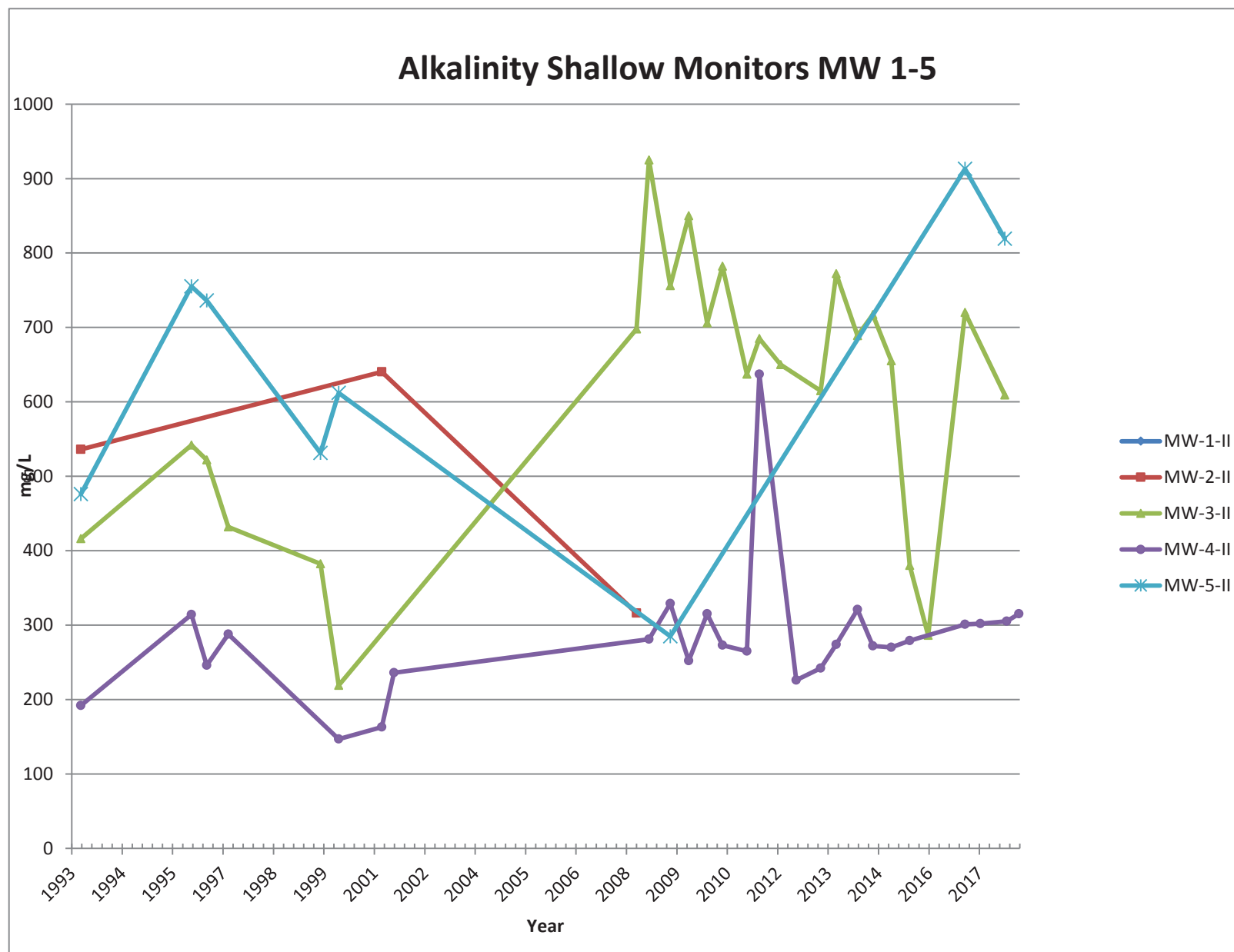
*Rob Irwin B.Sc., C.Chem*  
Technical Manager, Inorganic Chemistry  
Environmental, Analytical Services

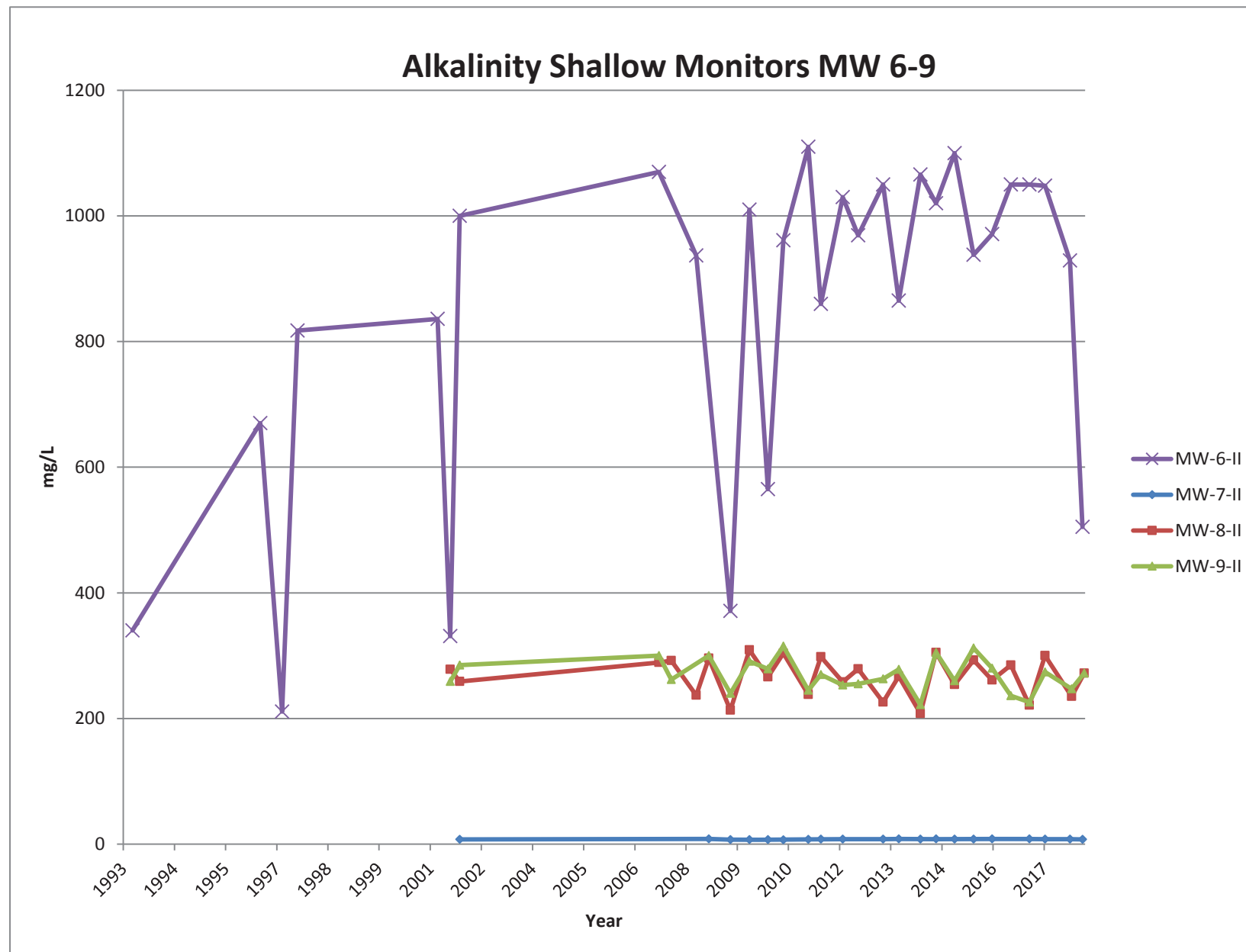


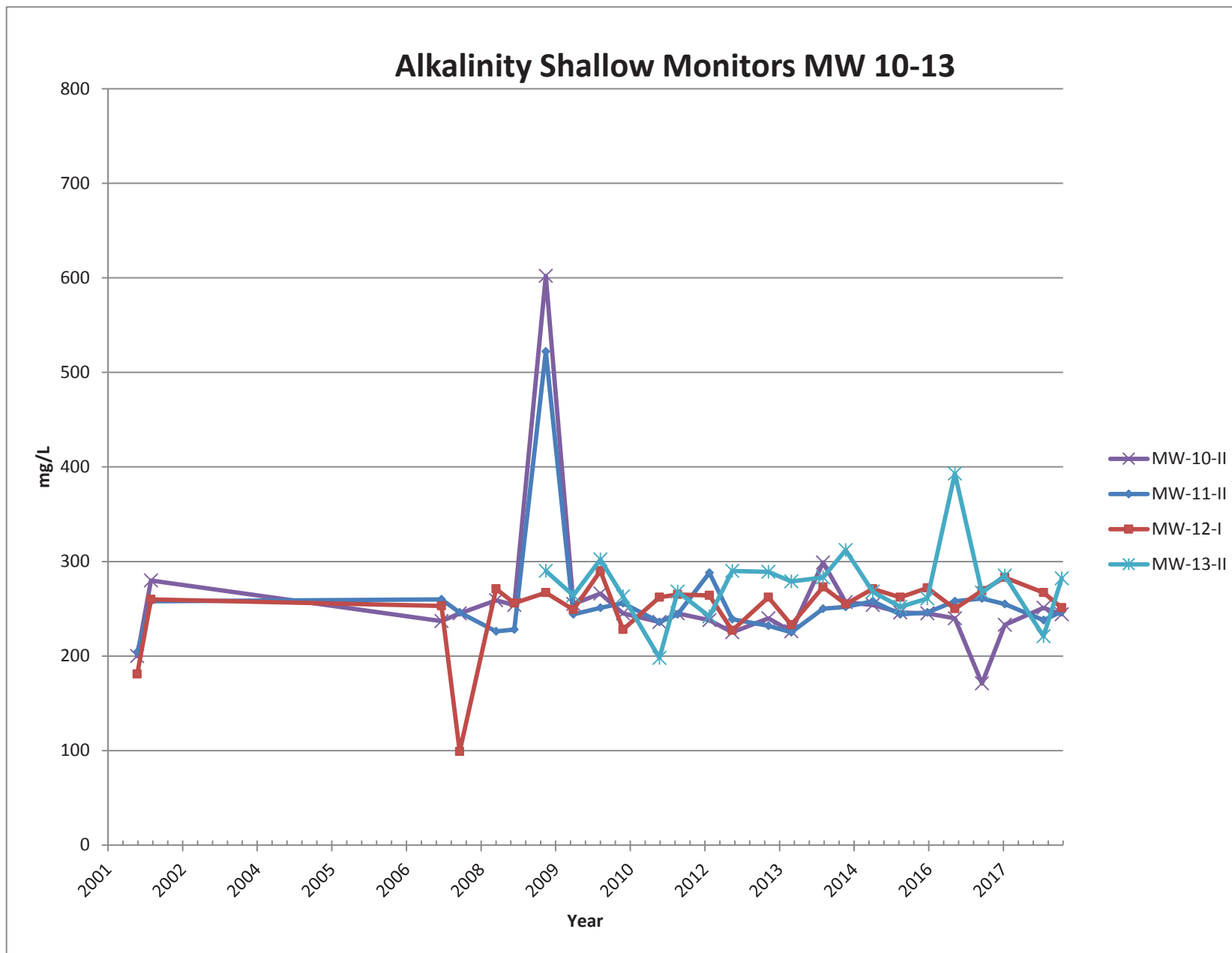


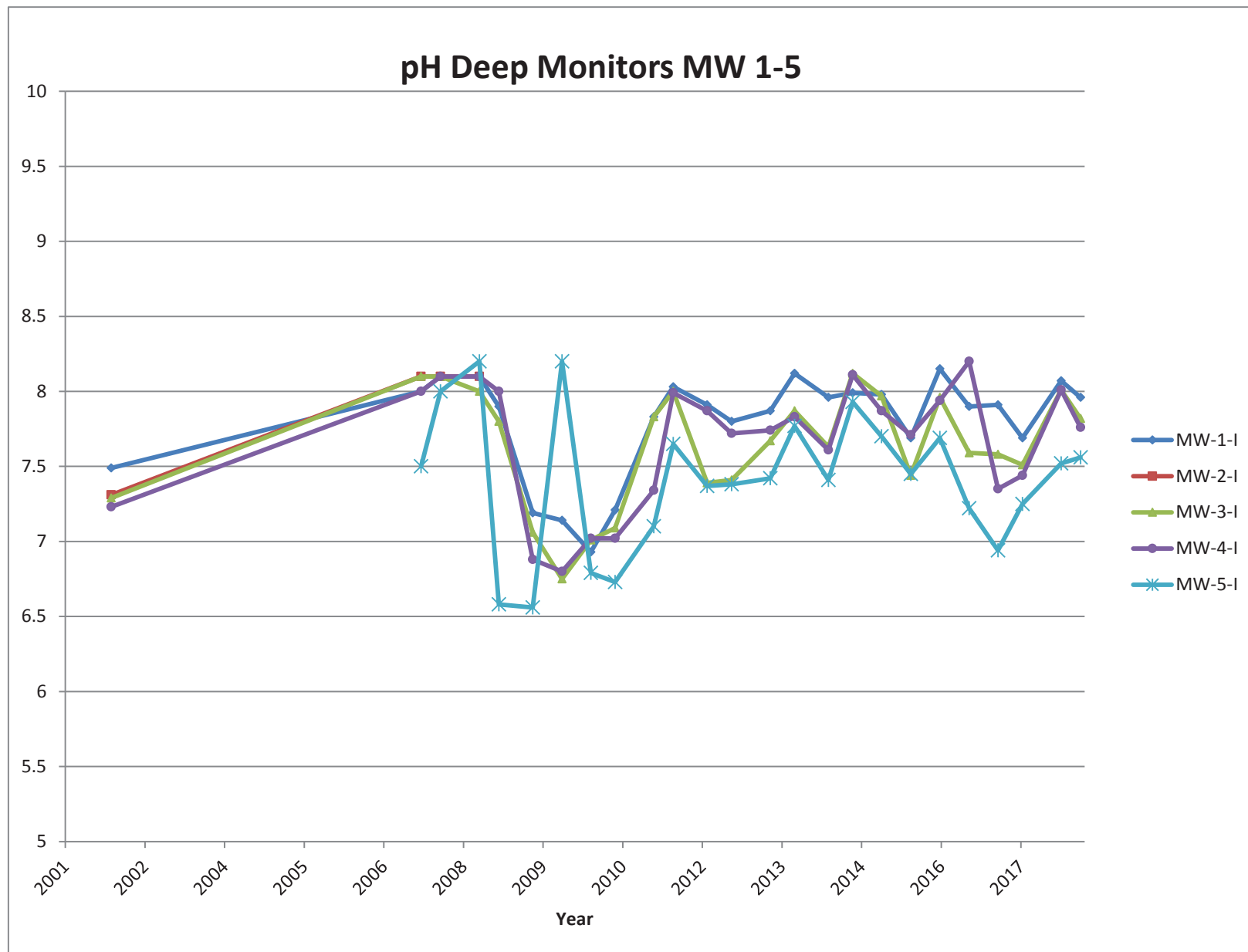


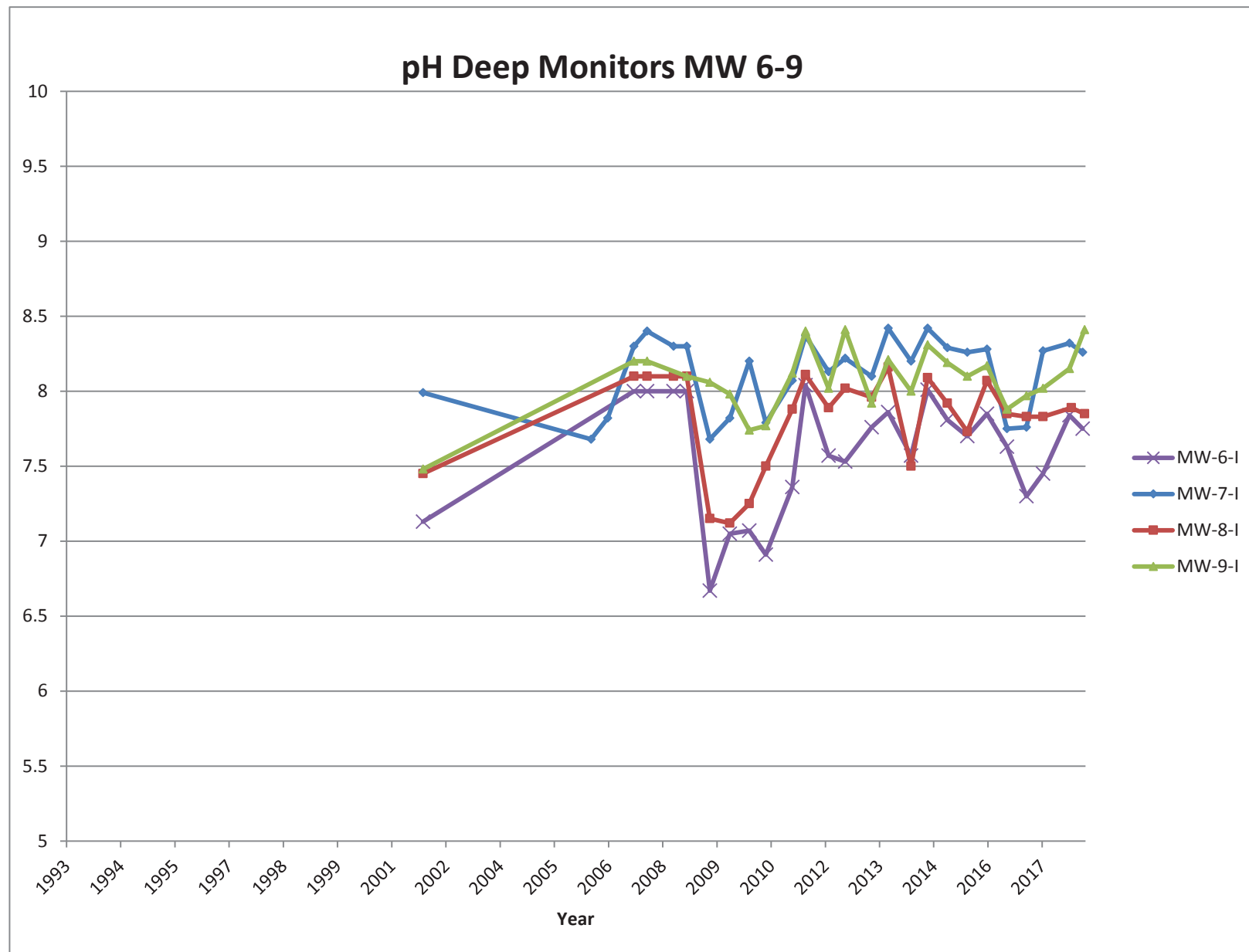


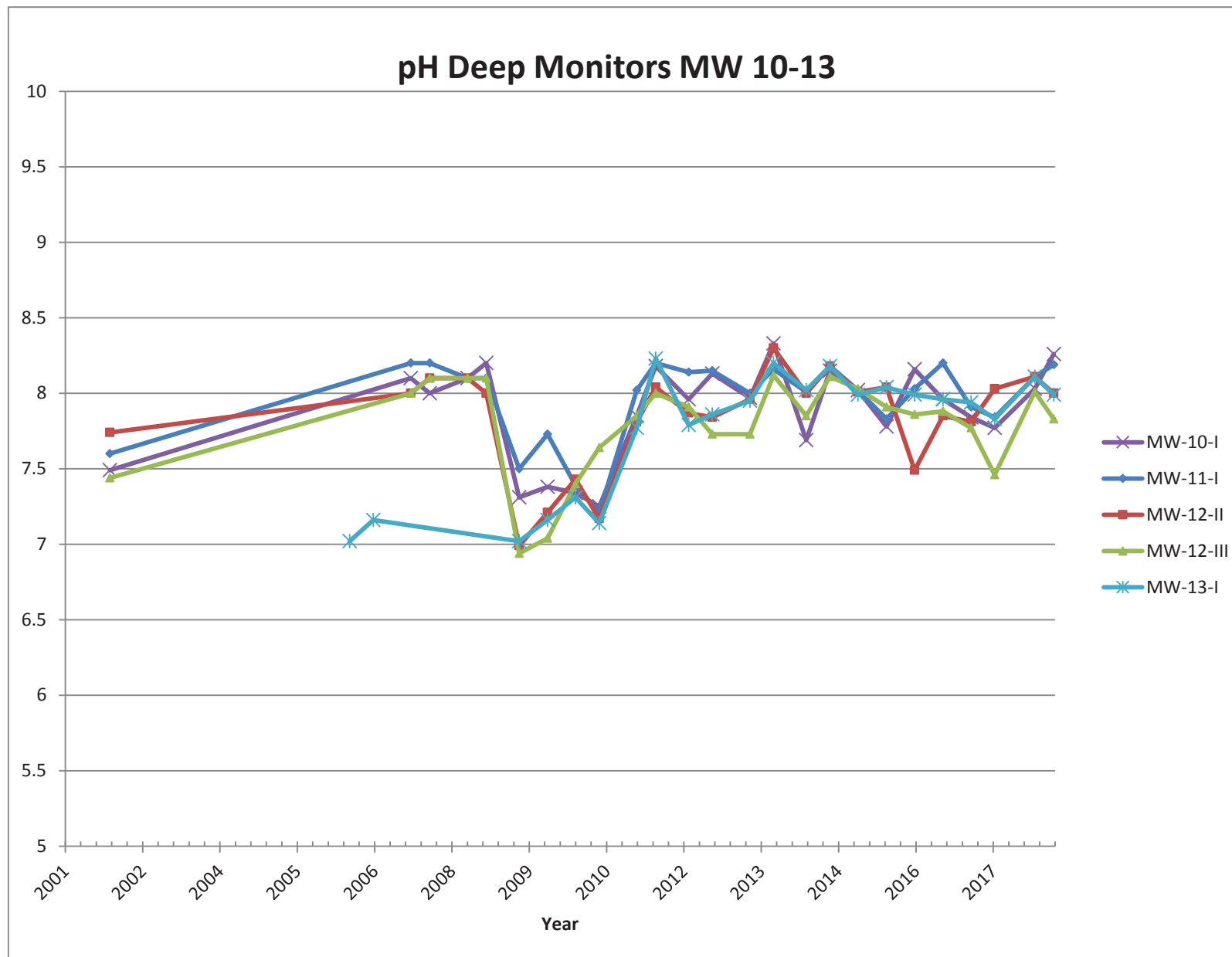




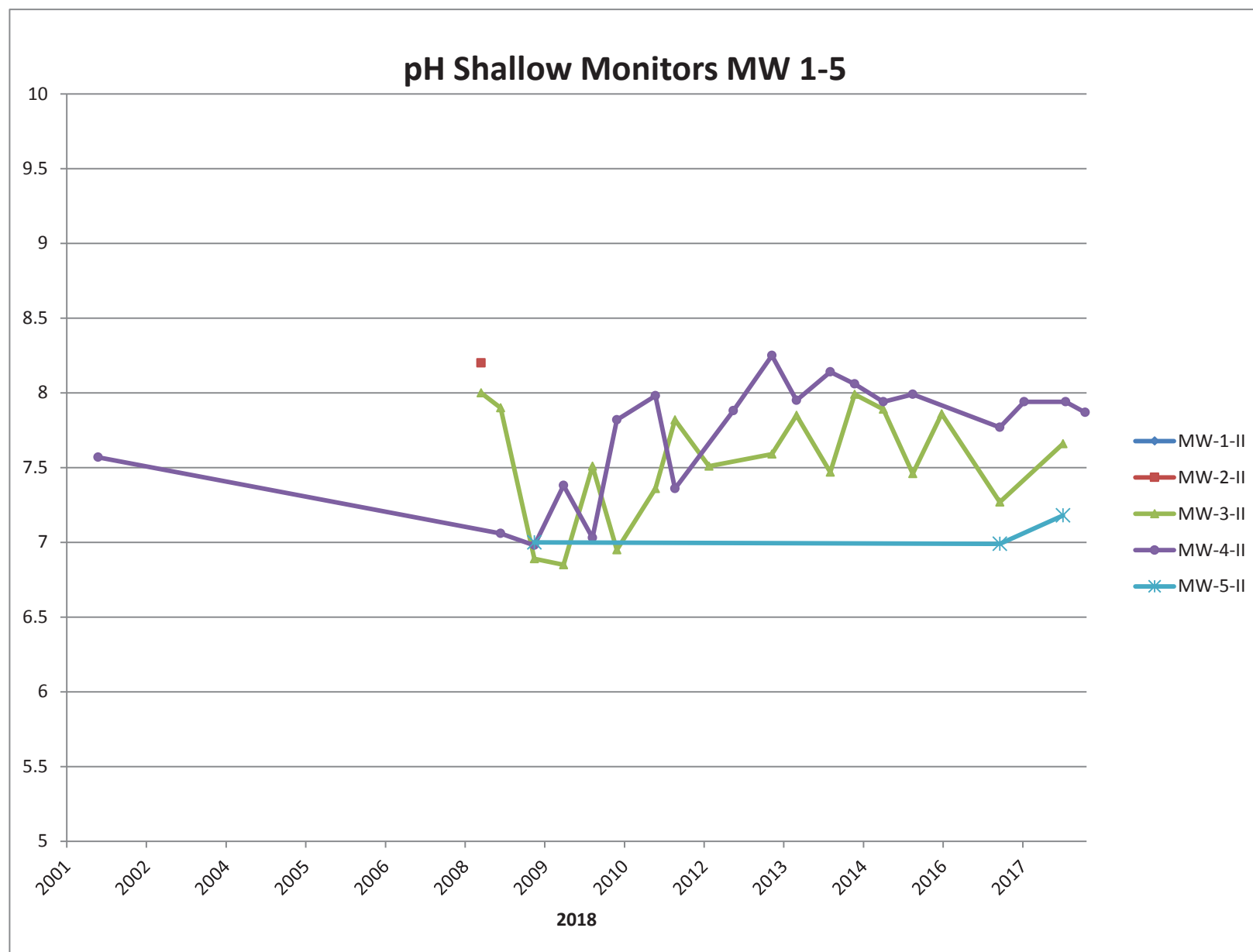


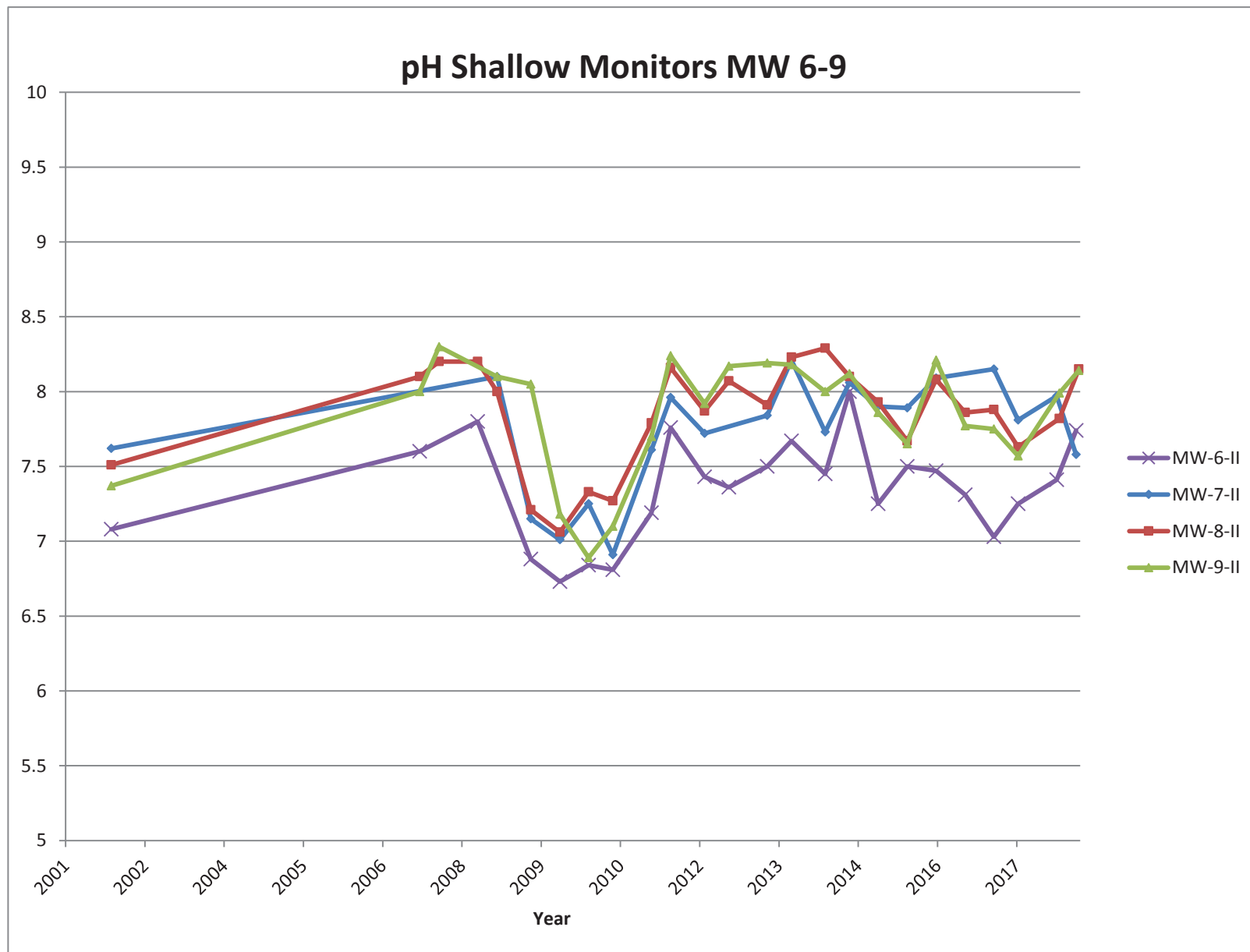


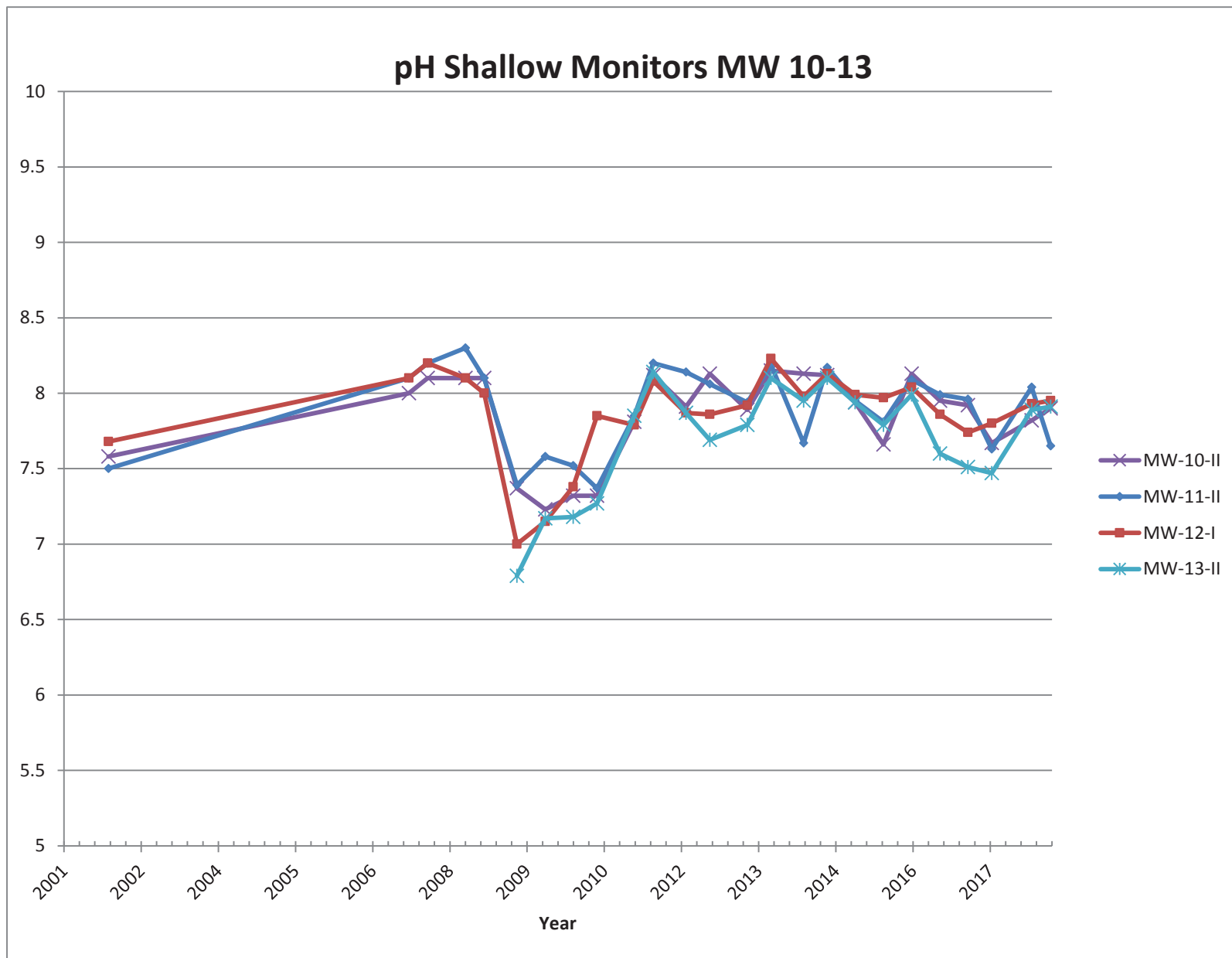


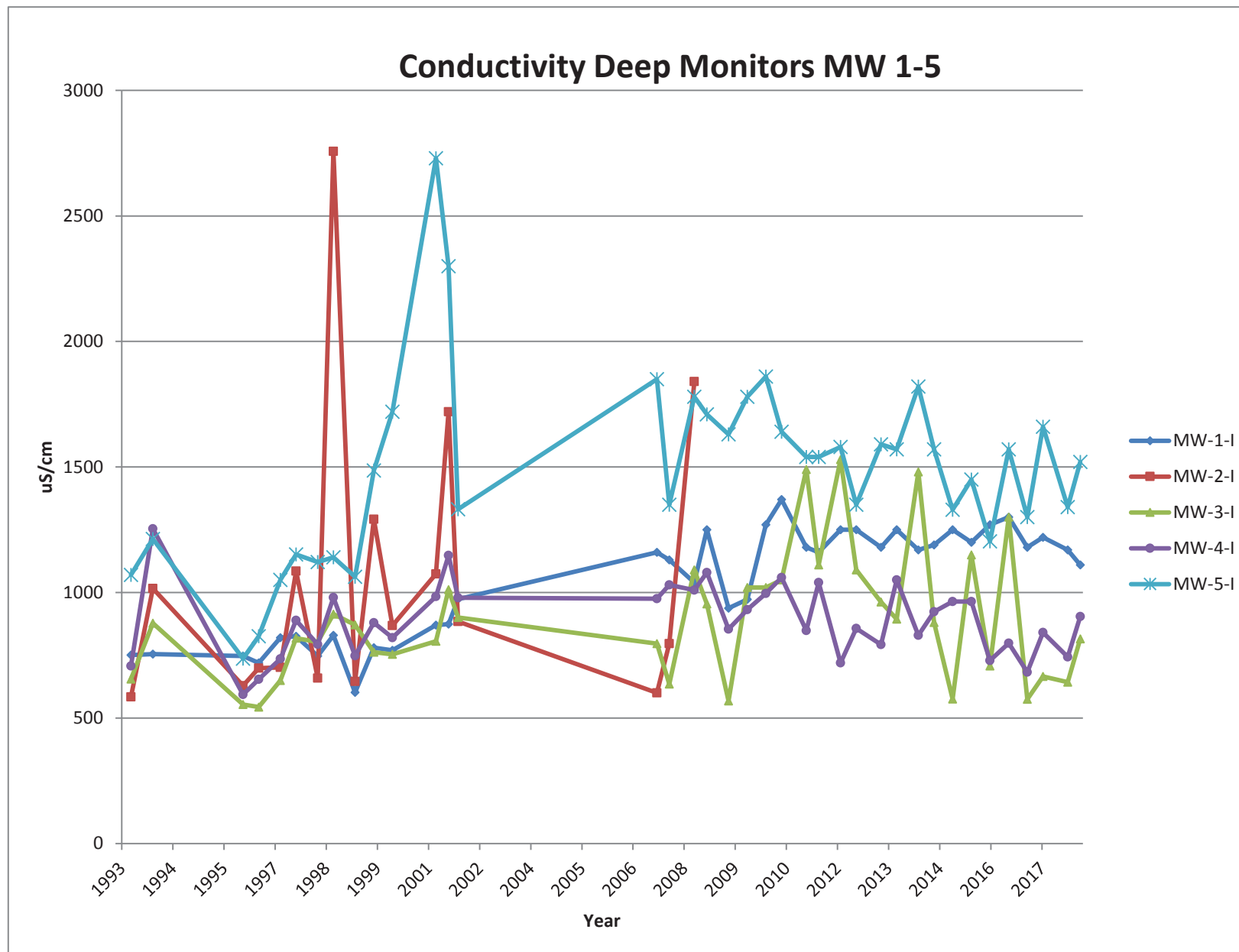


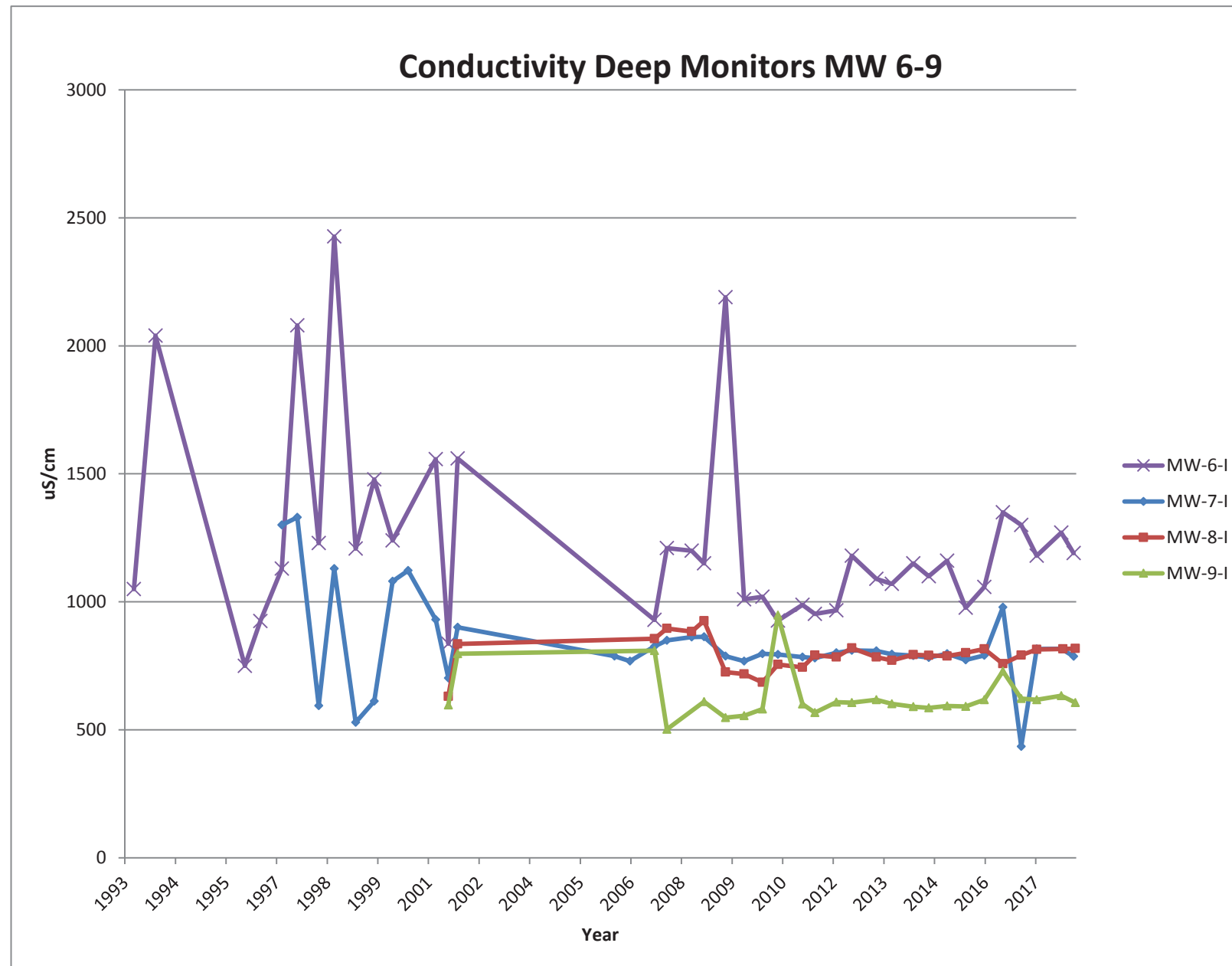


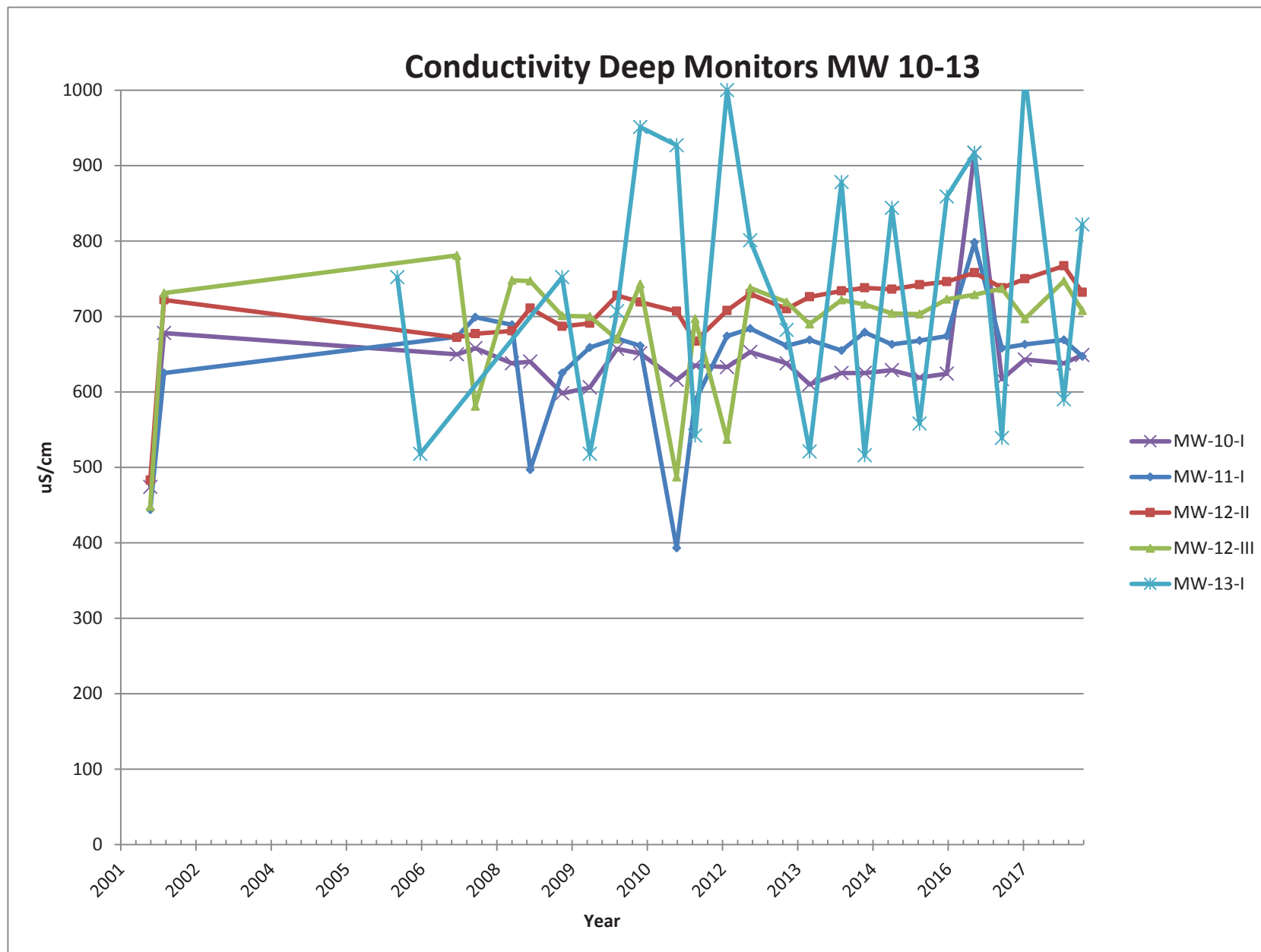


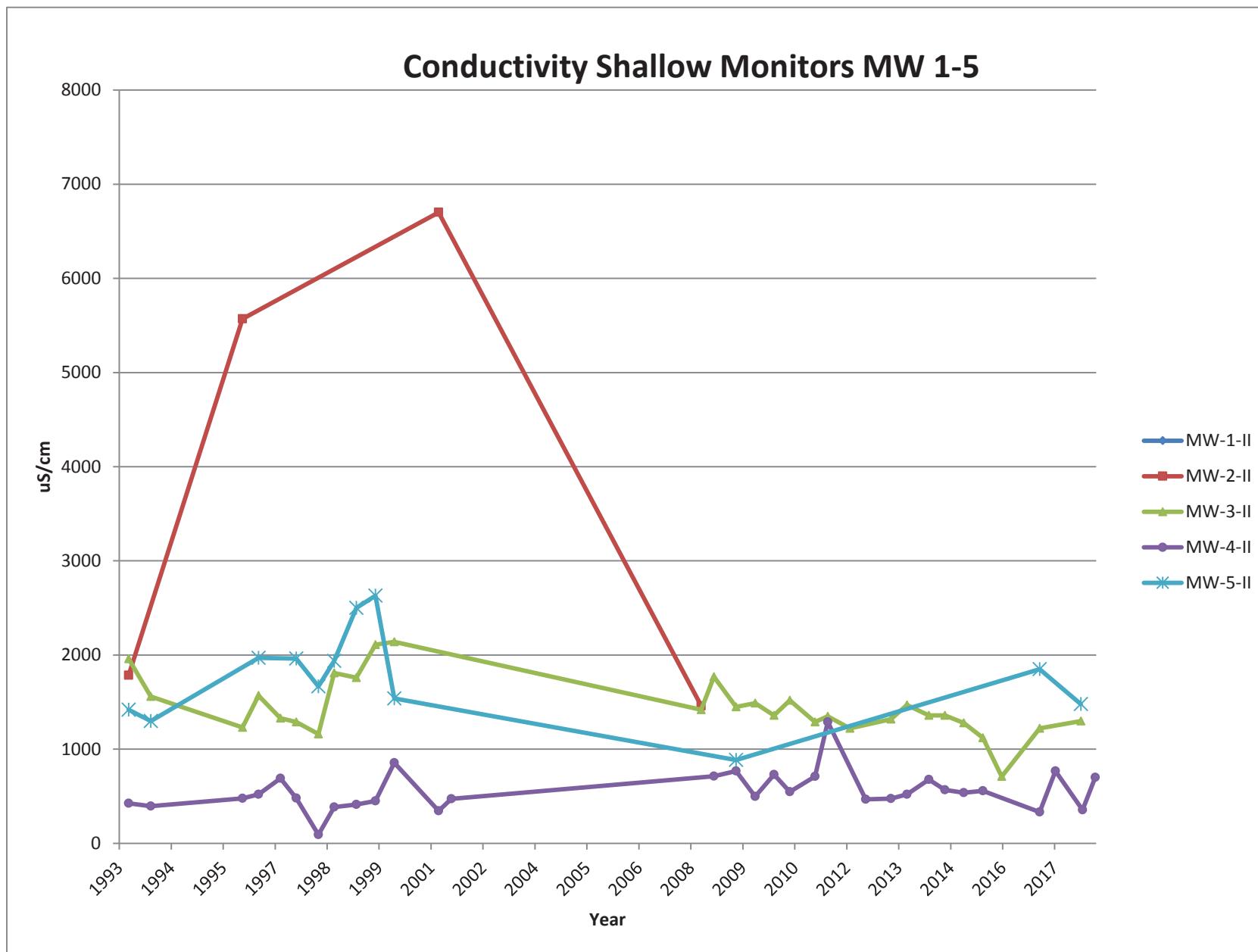


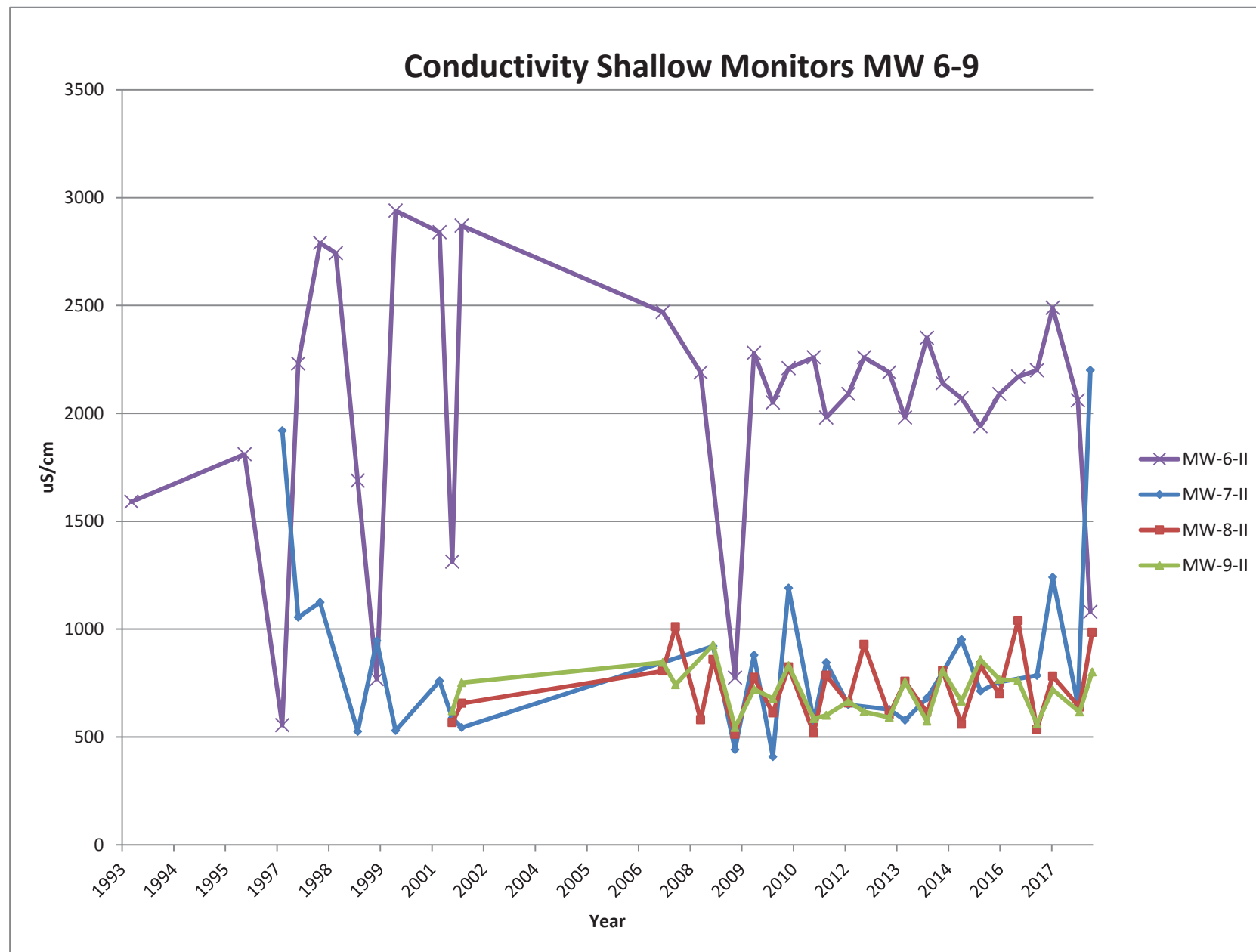






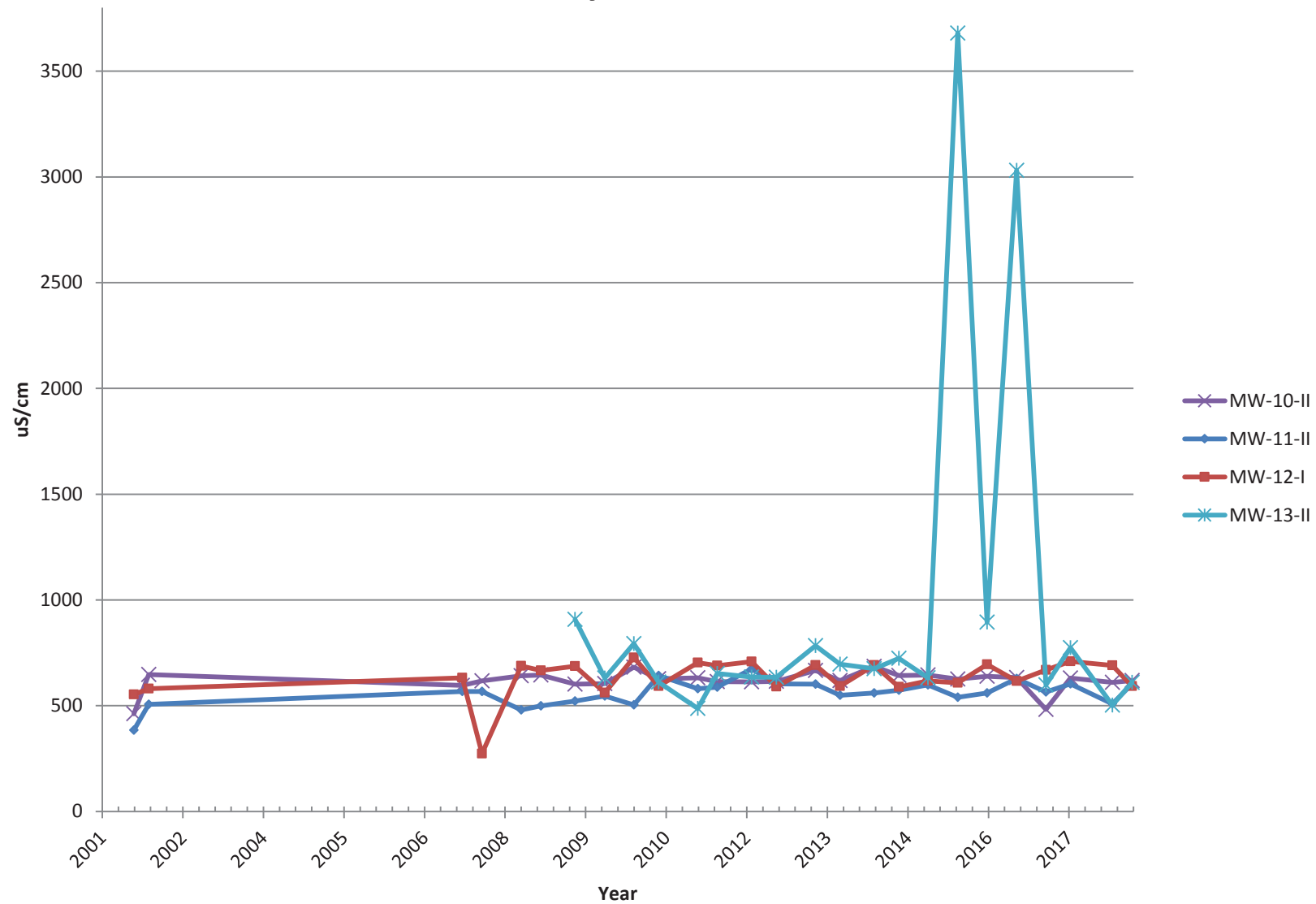


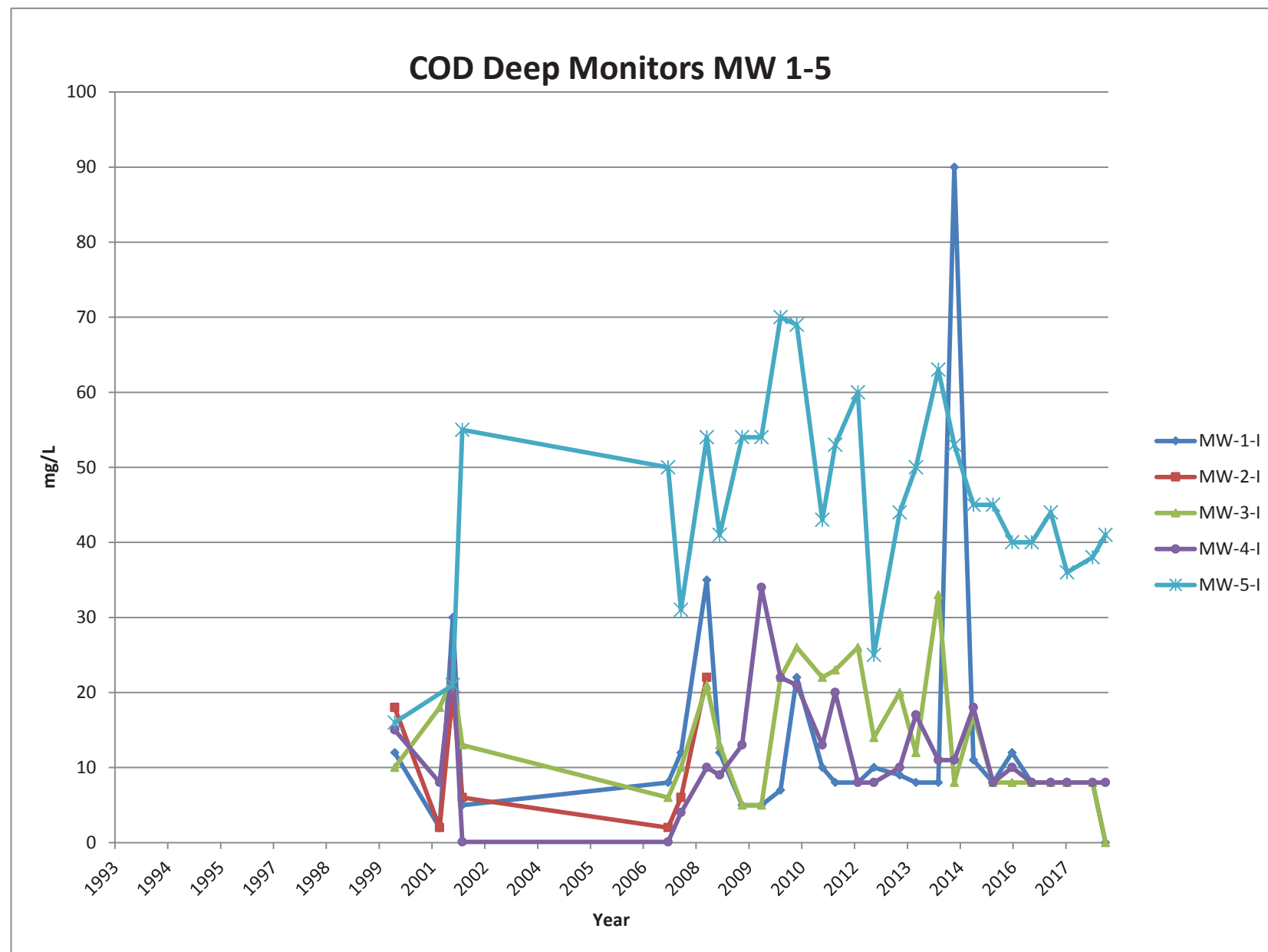


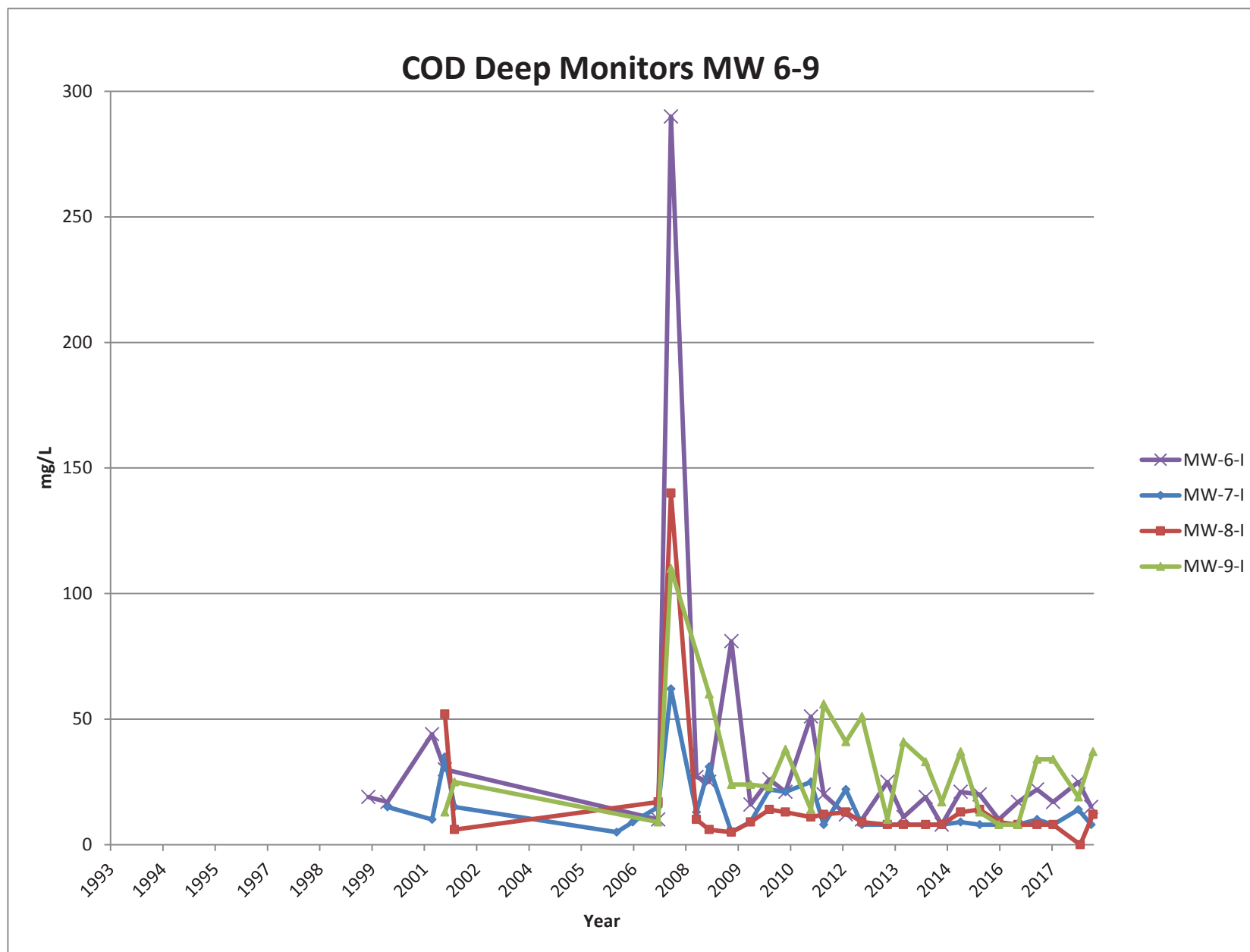


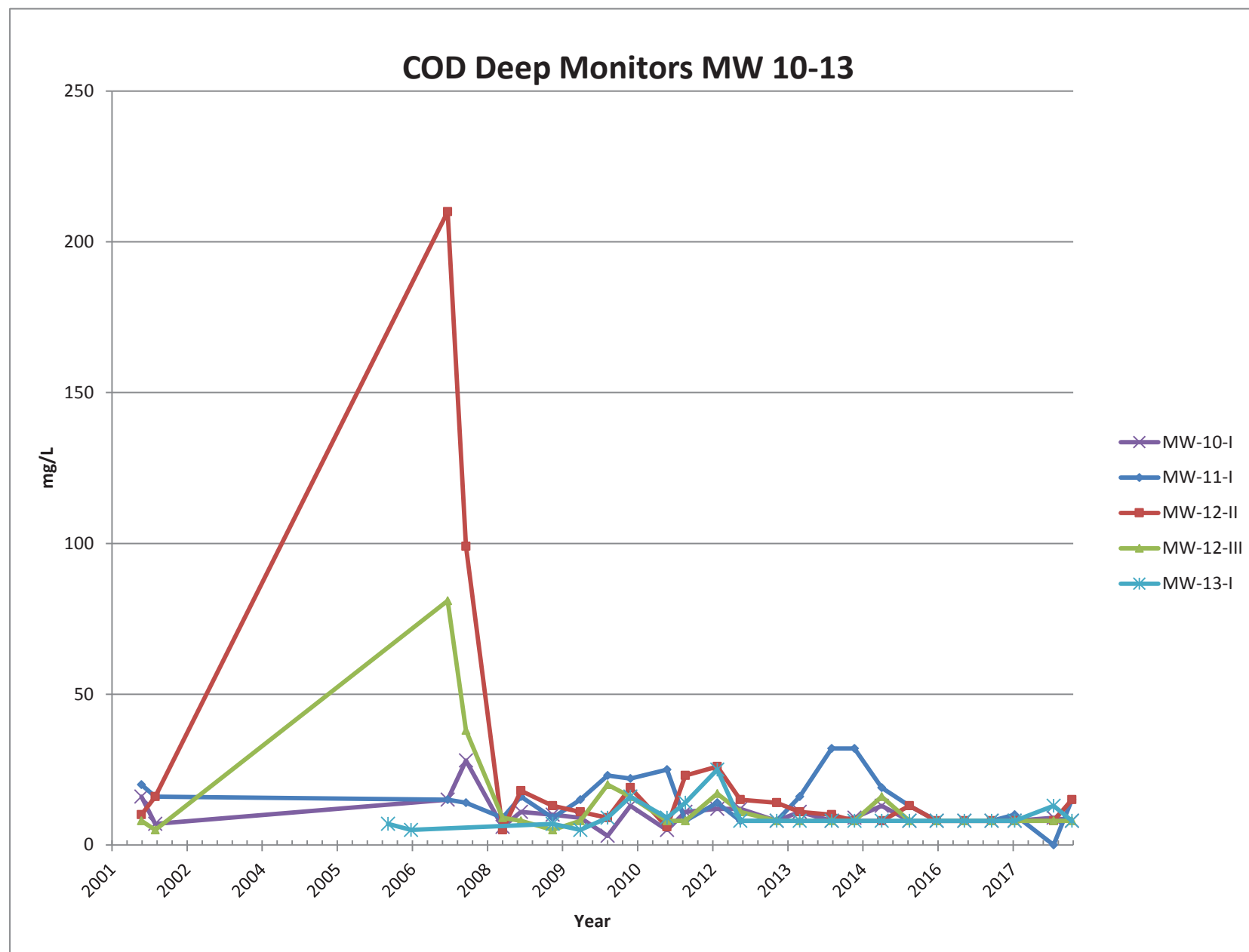


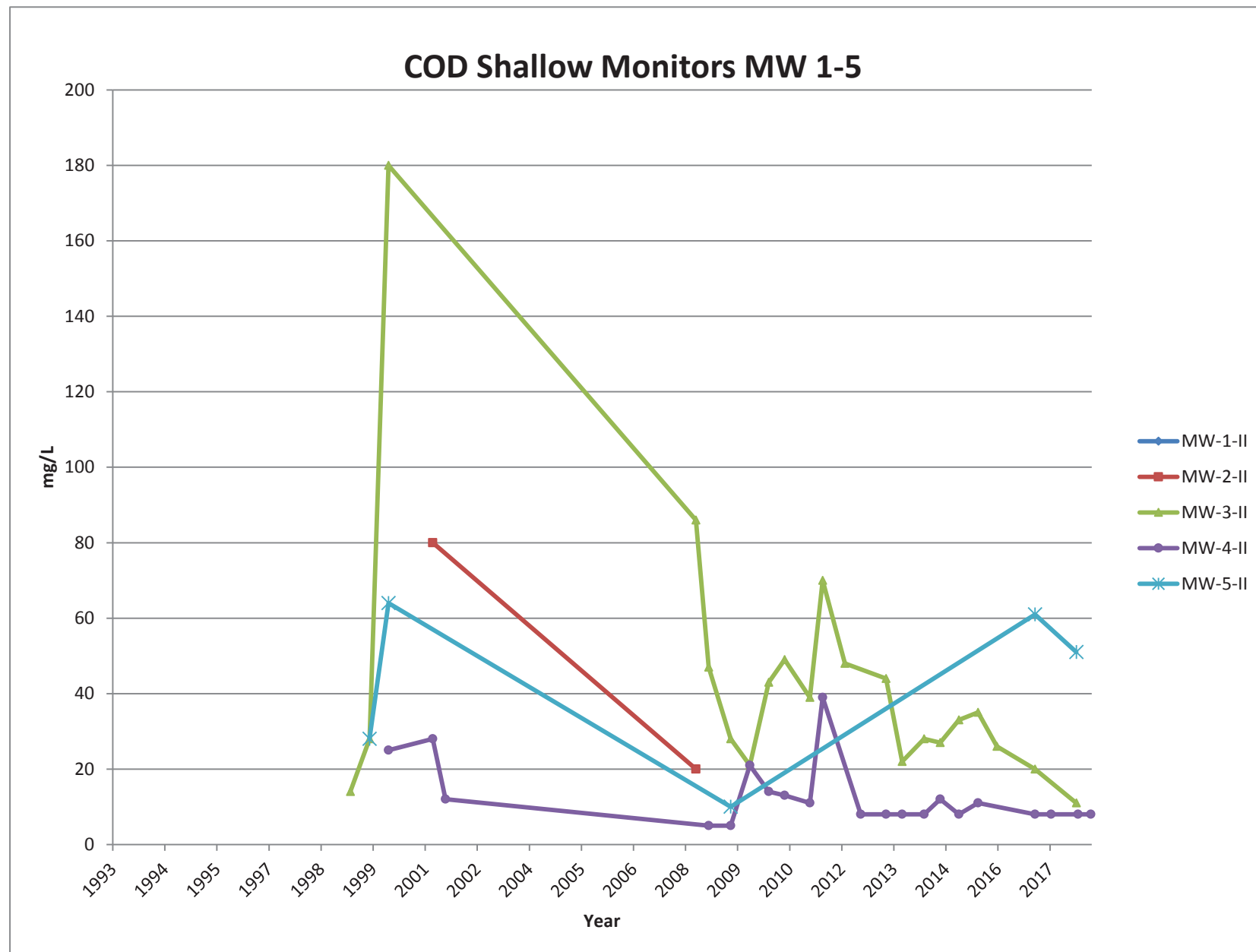
### Conductivity Shallow Monitors MW 10-13



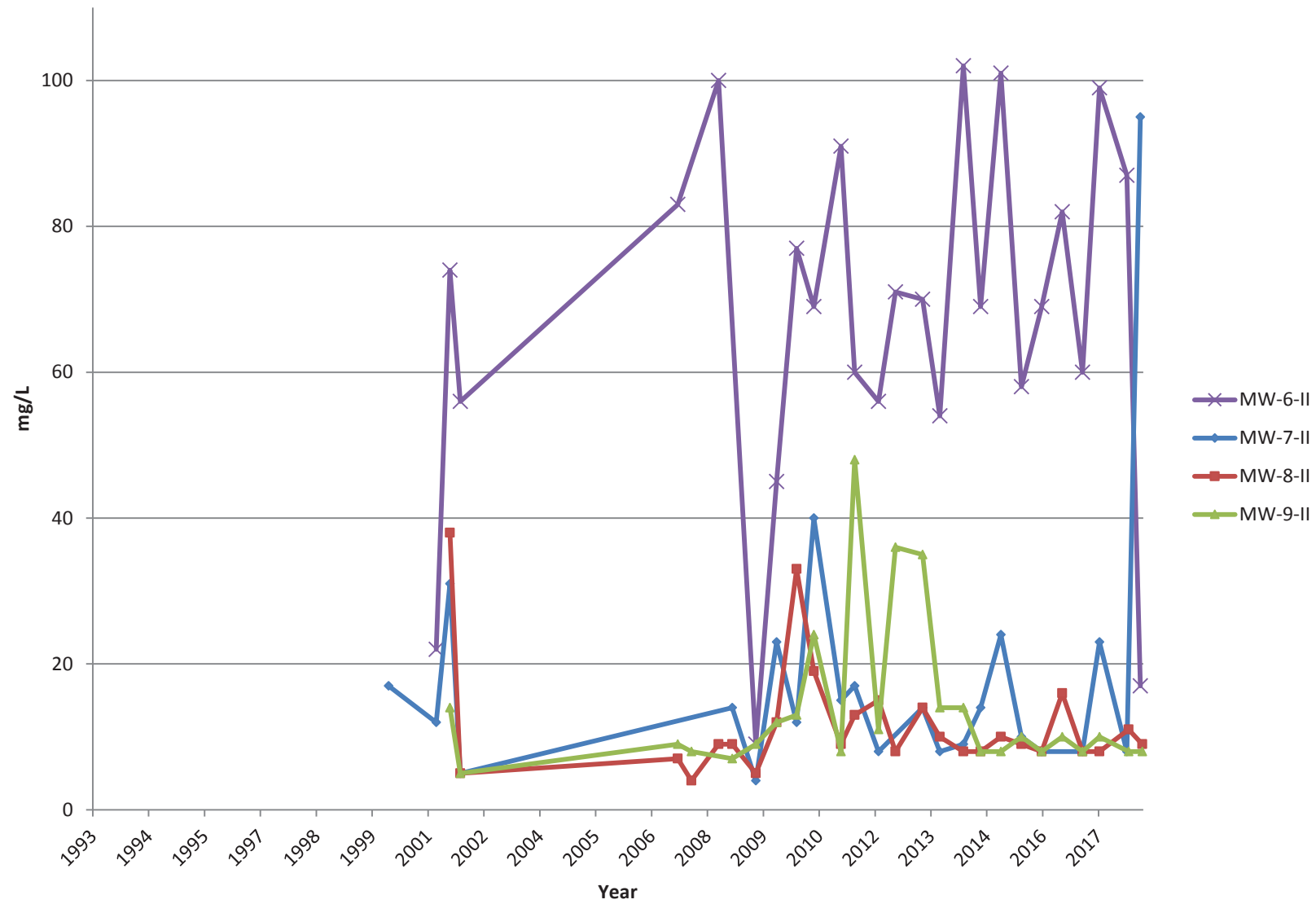


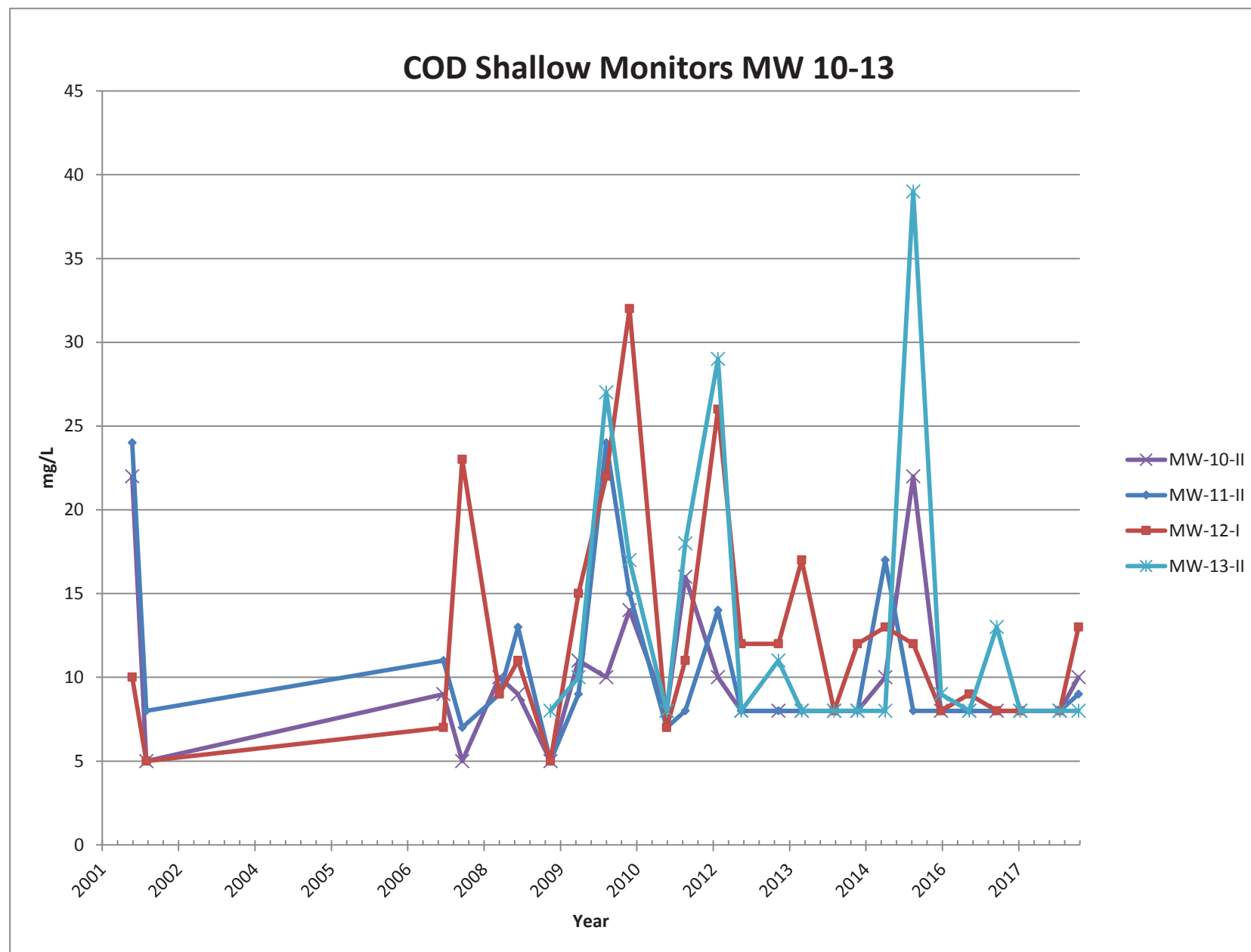


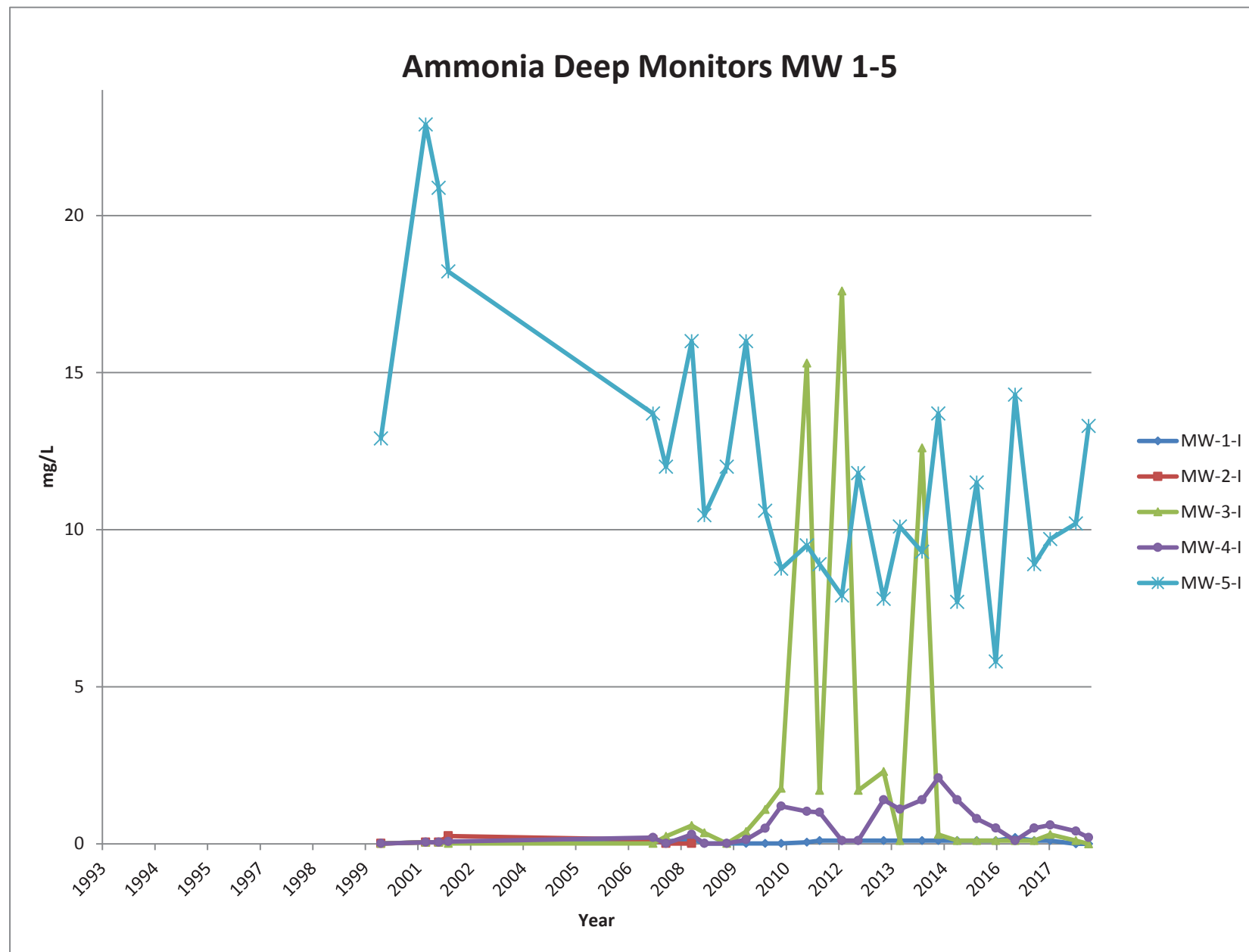




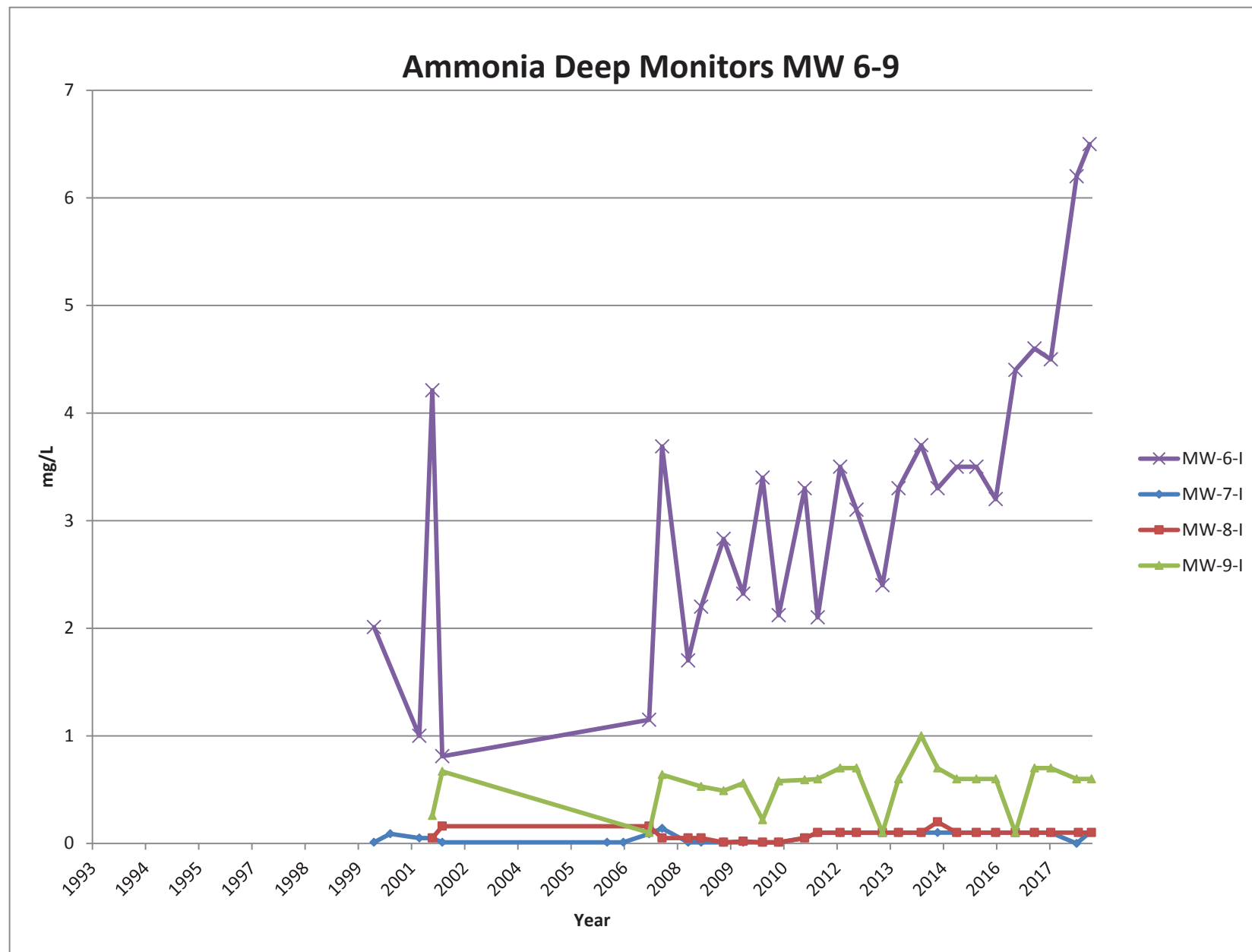
## COD Shallow Monitors MW 6-9



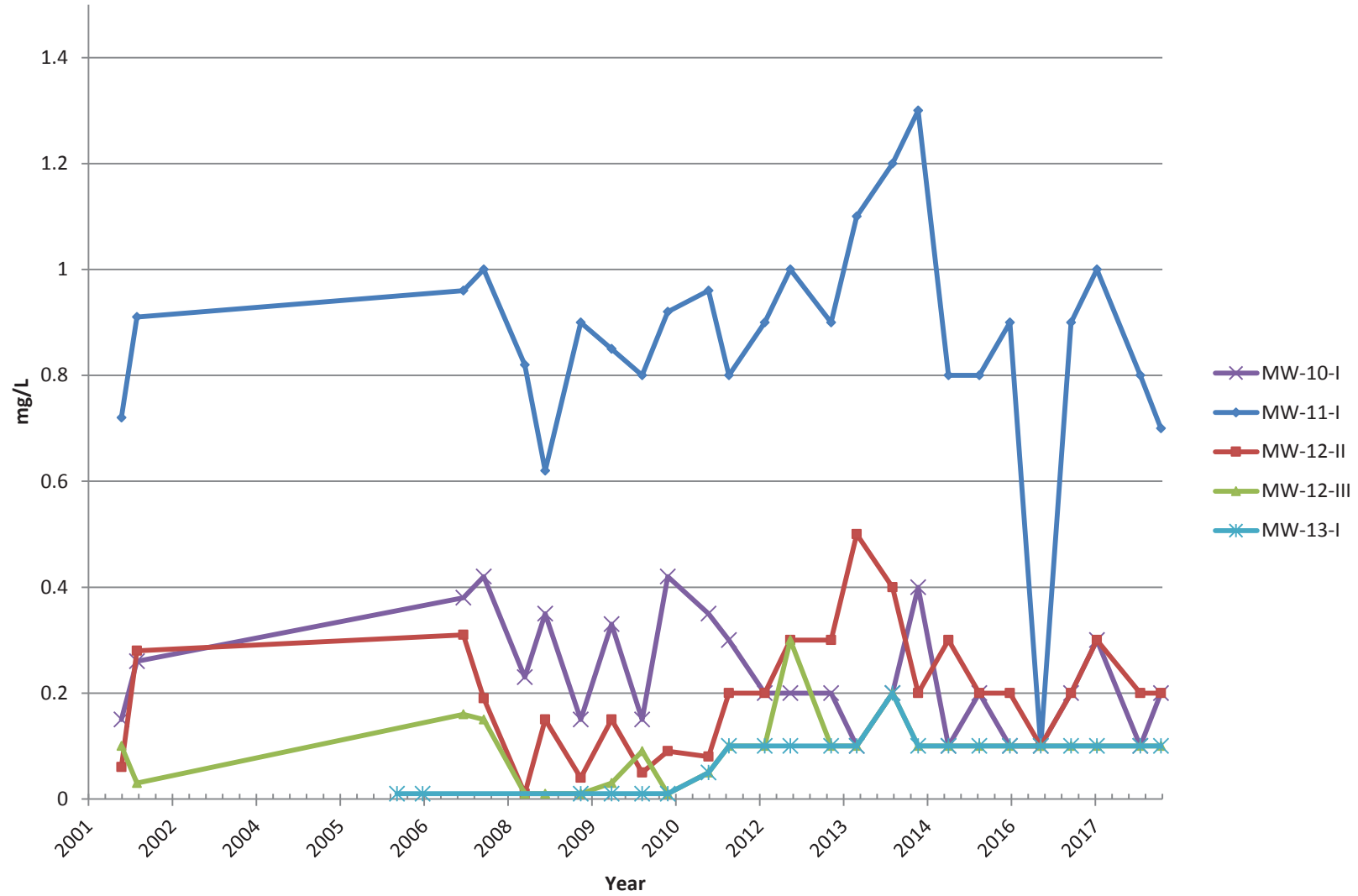


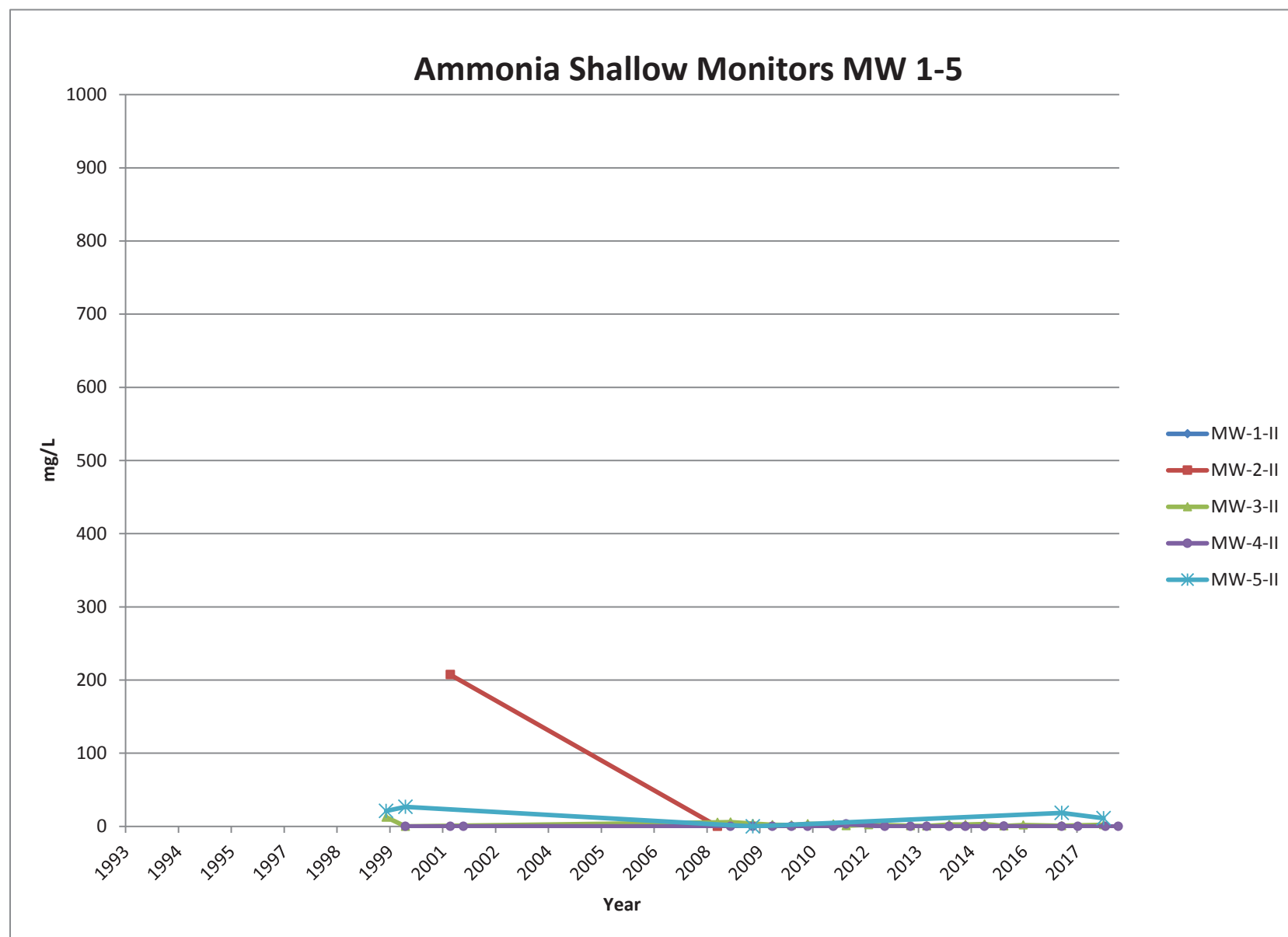


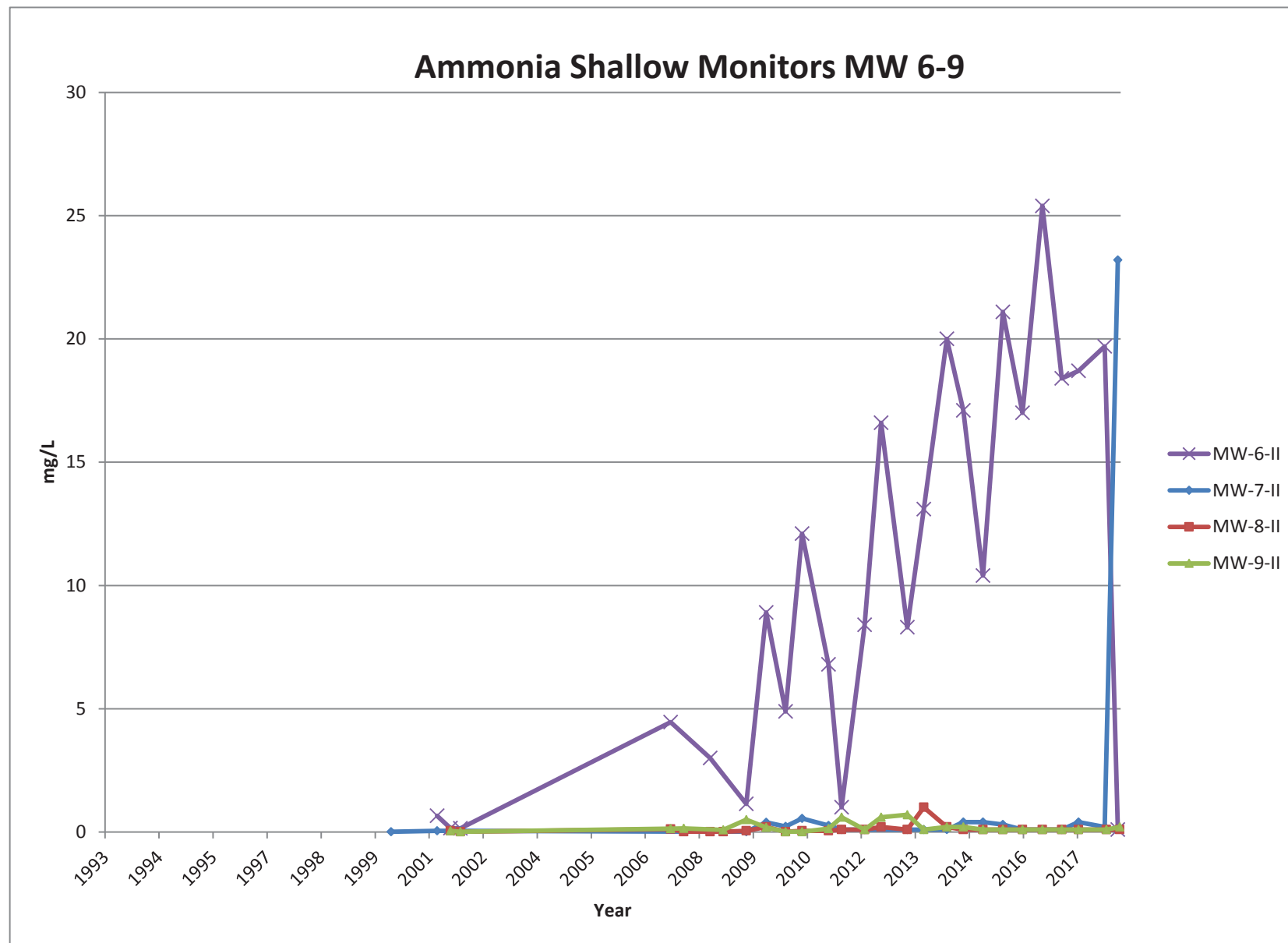


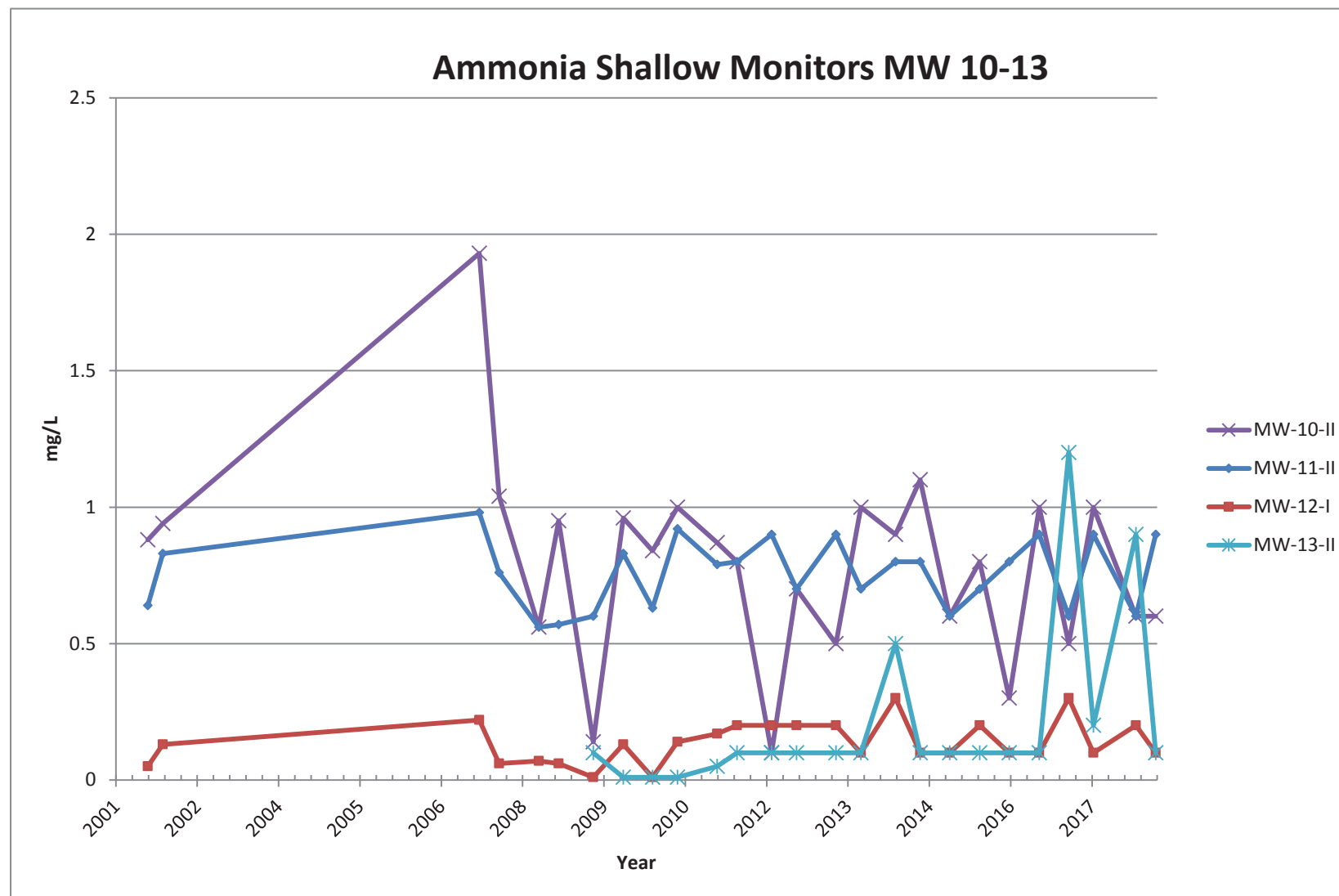


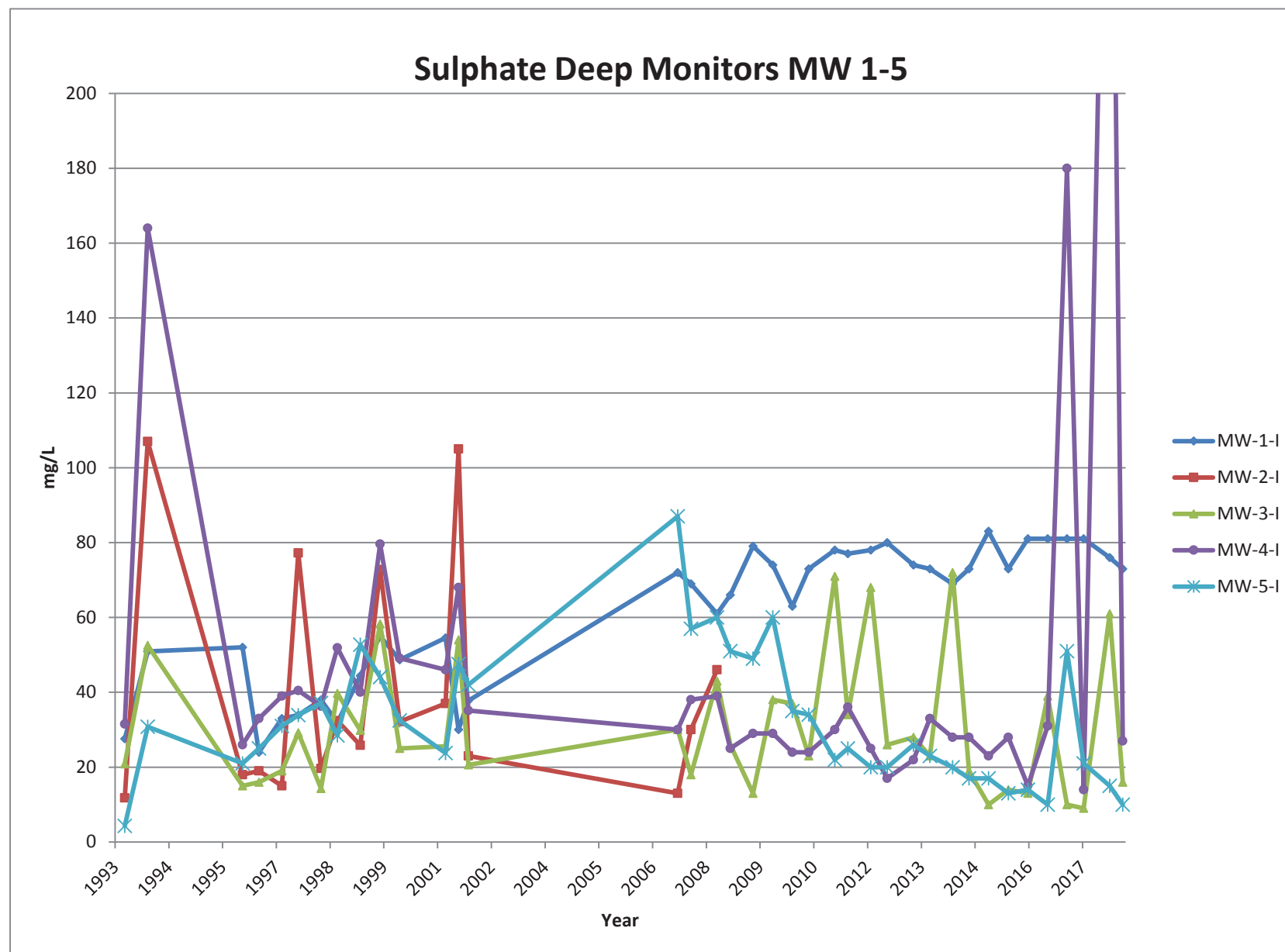
### Ammonia Deep Monitors MW 10-13

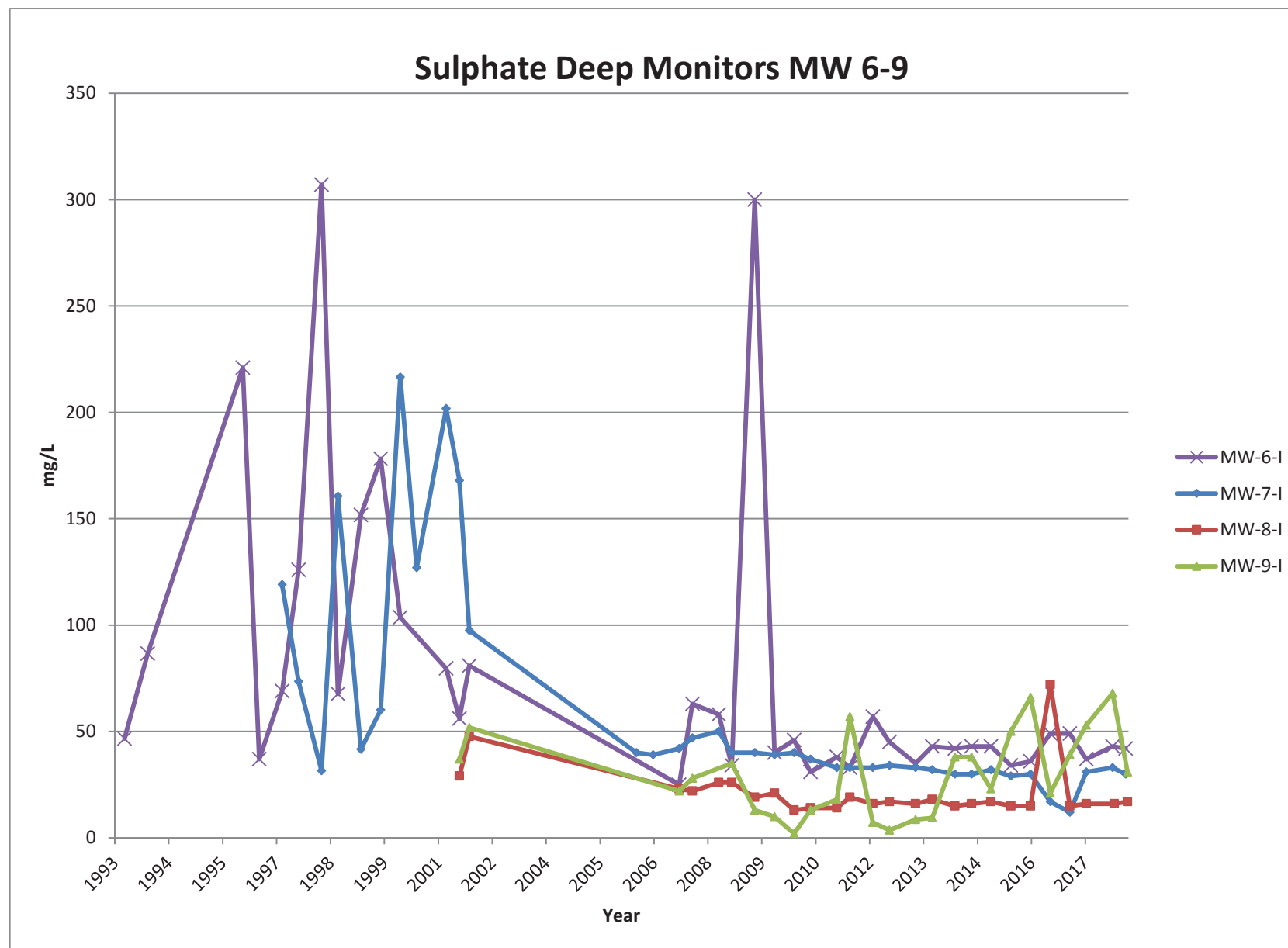




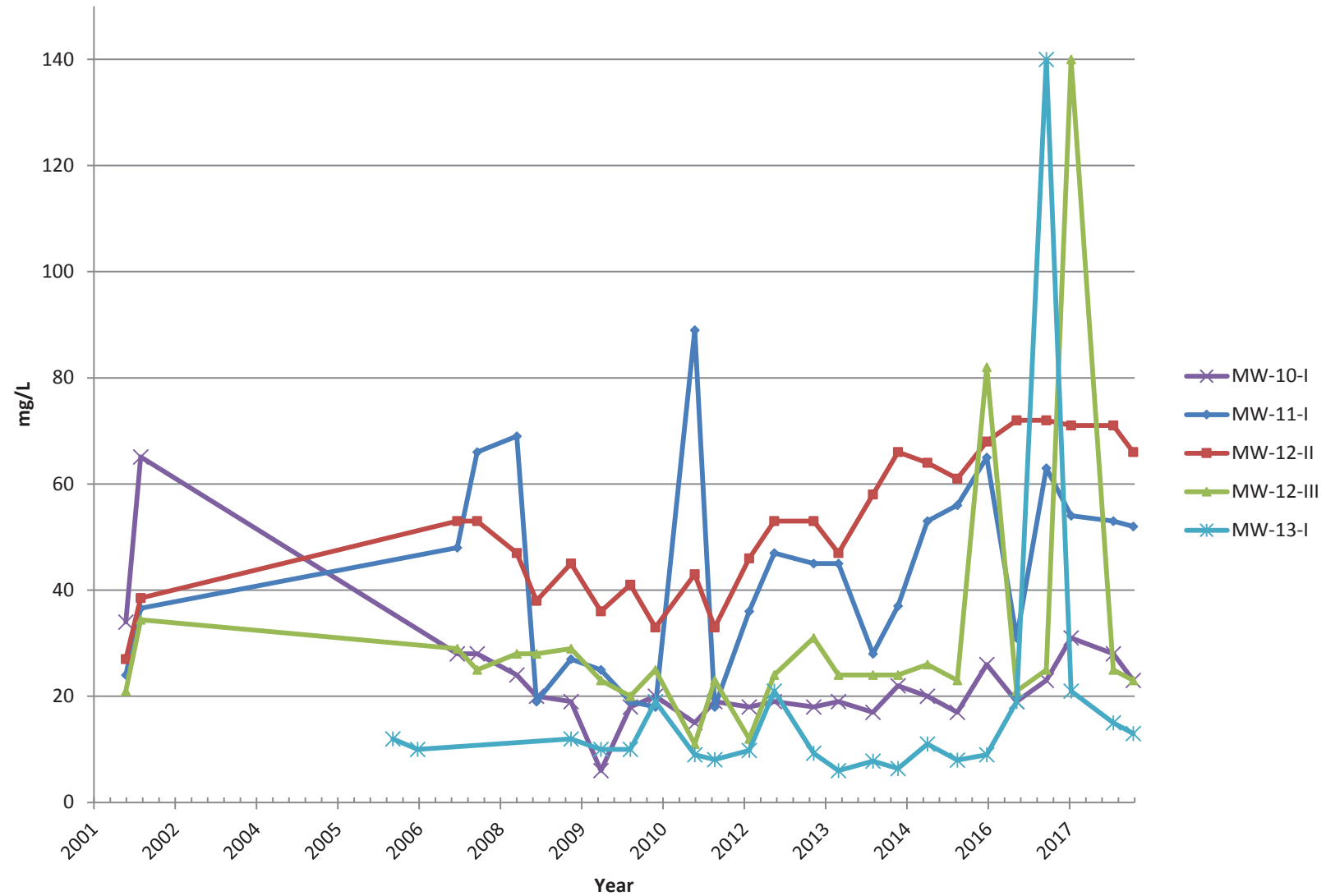




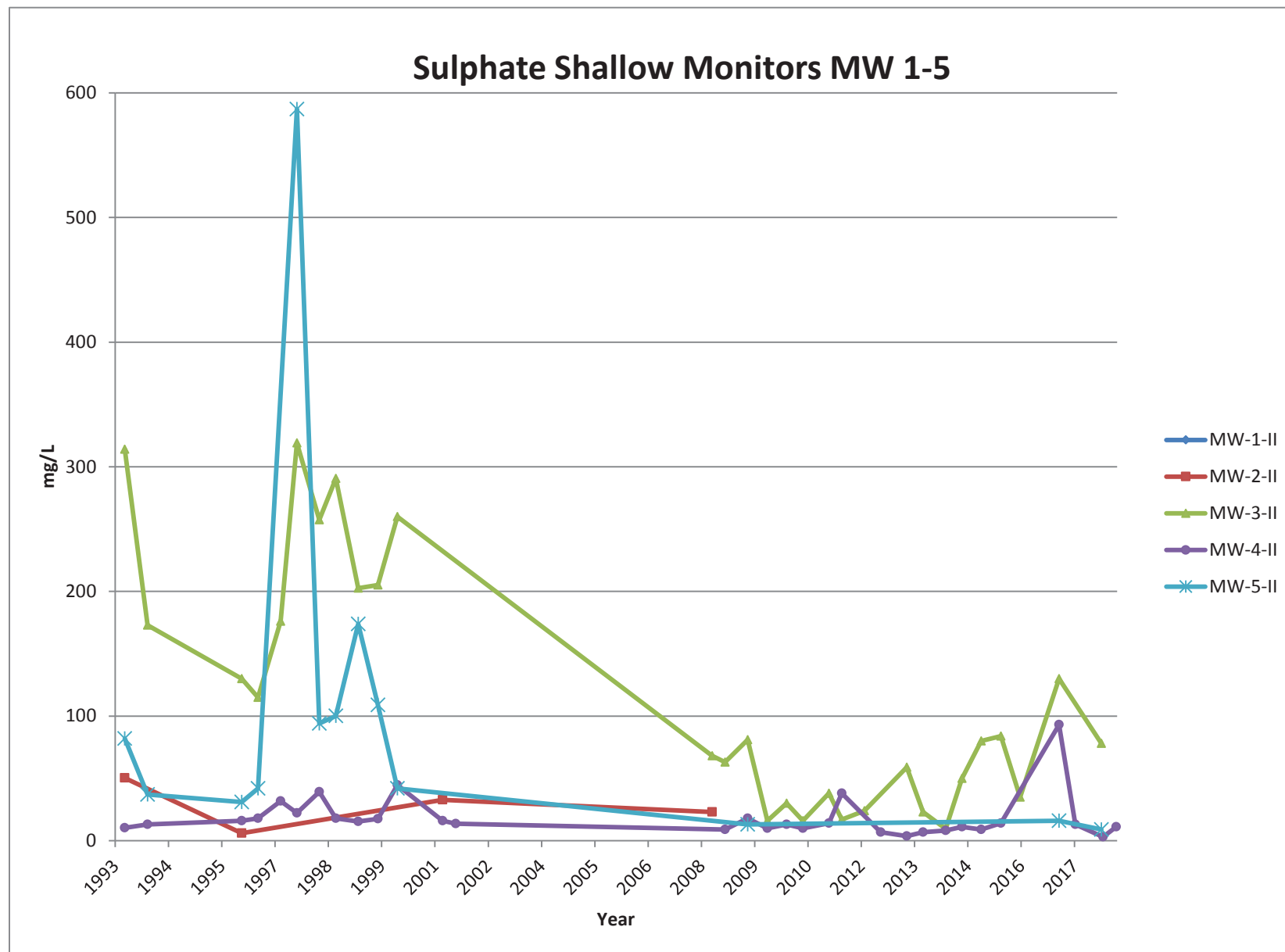


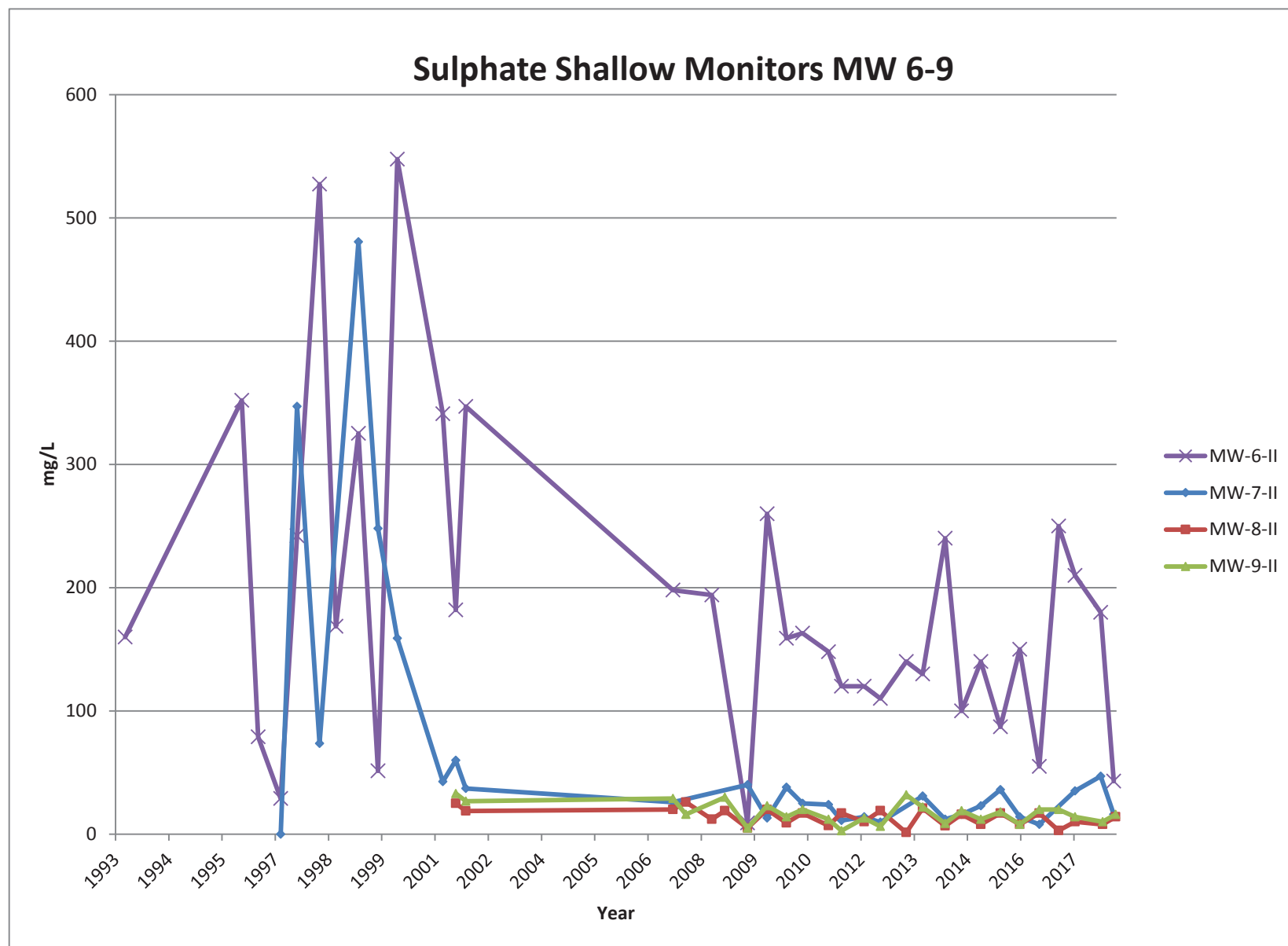


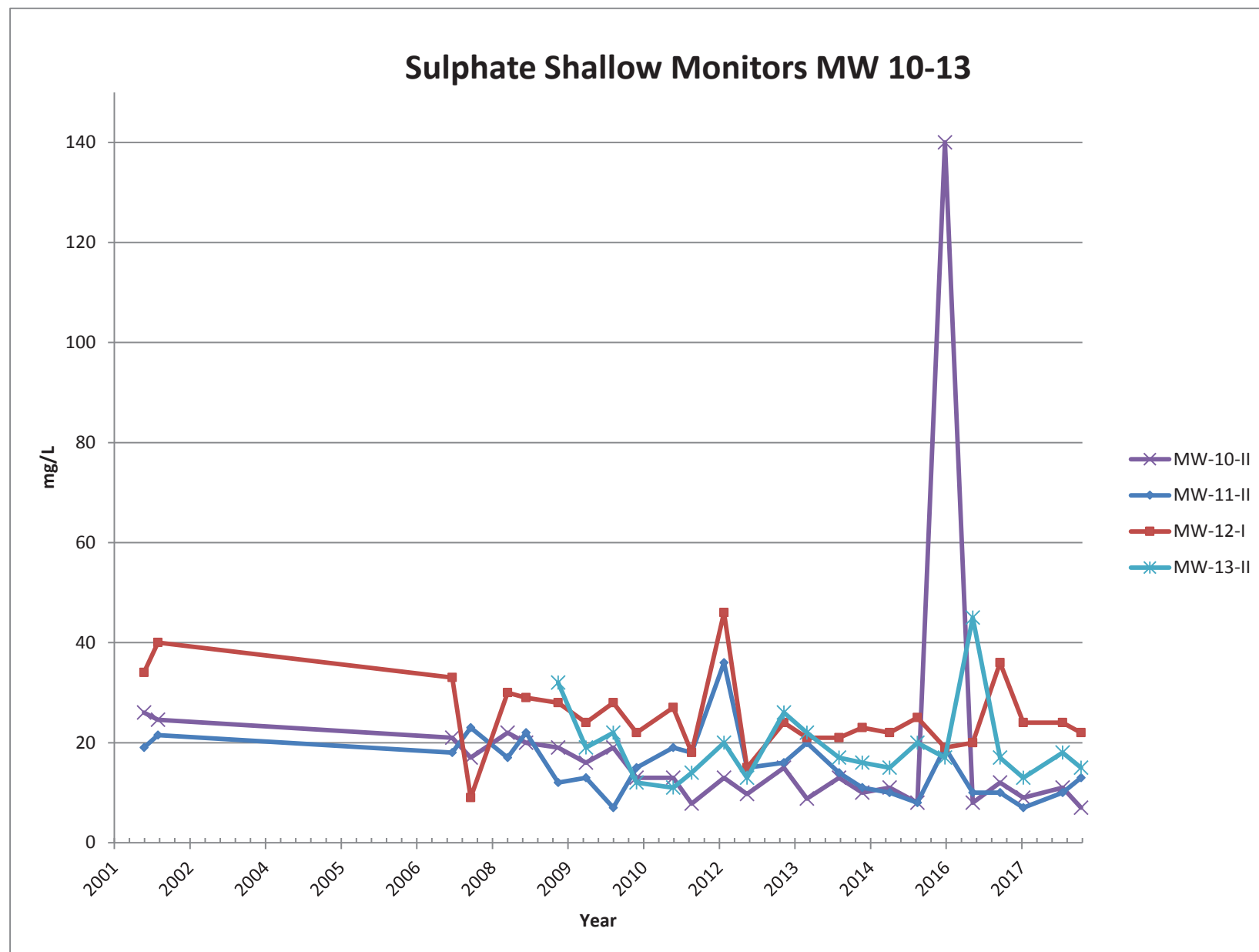
### Sulphate Deep Monitors MW 10-13

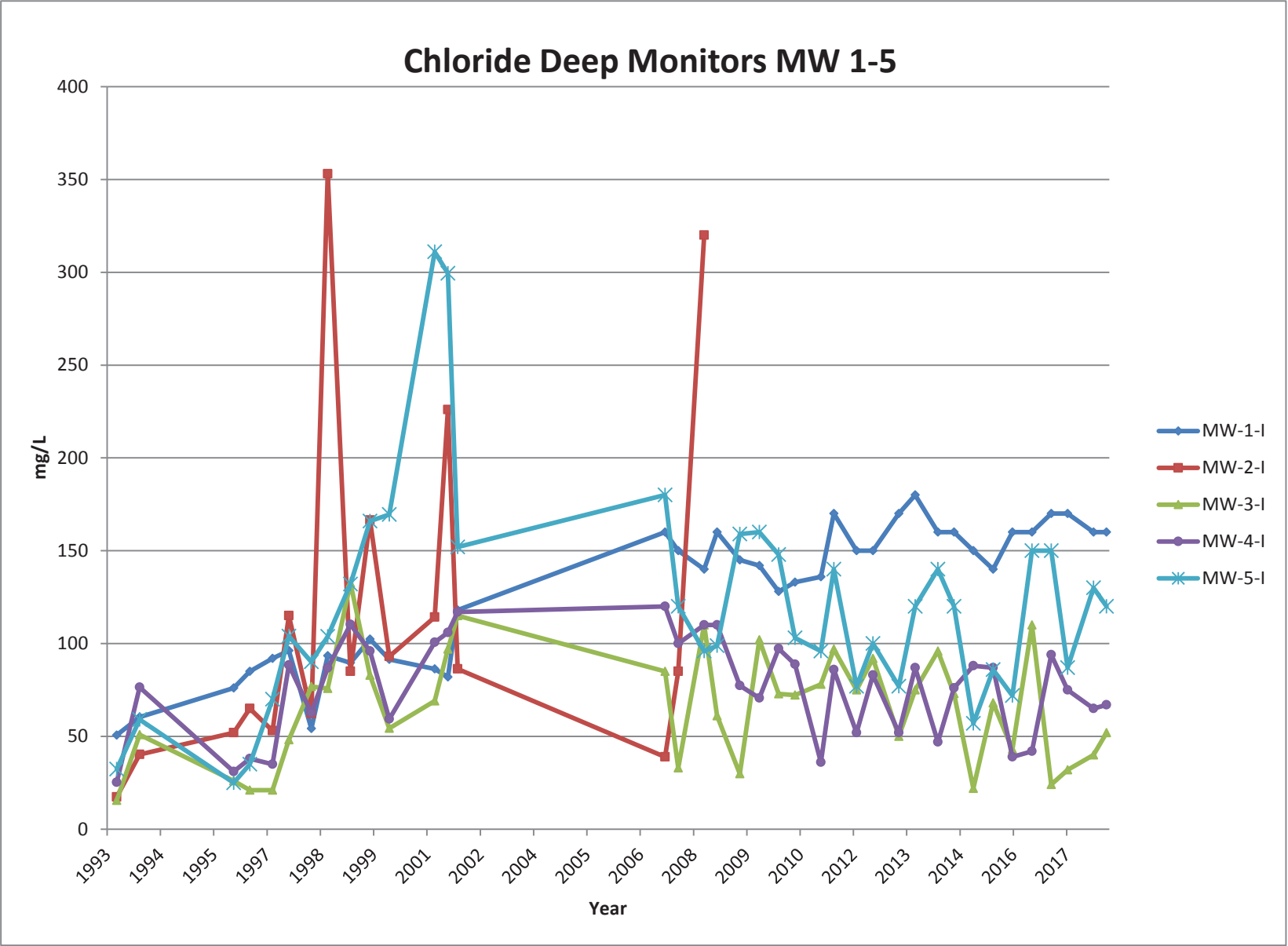


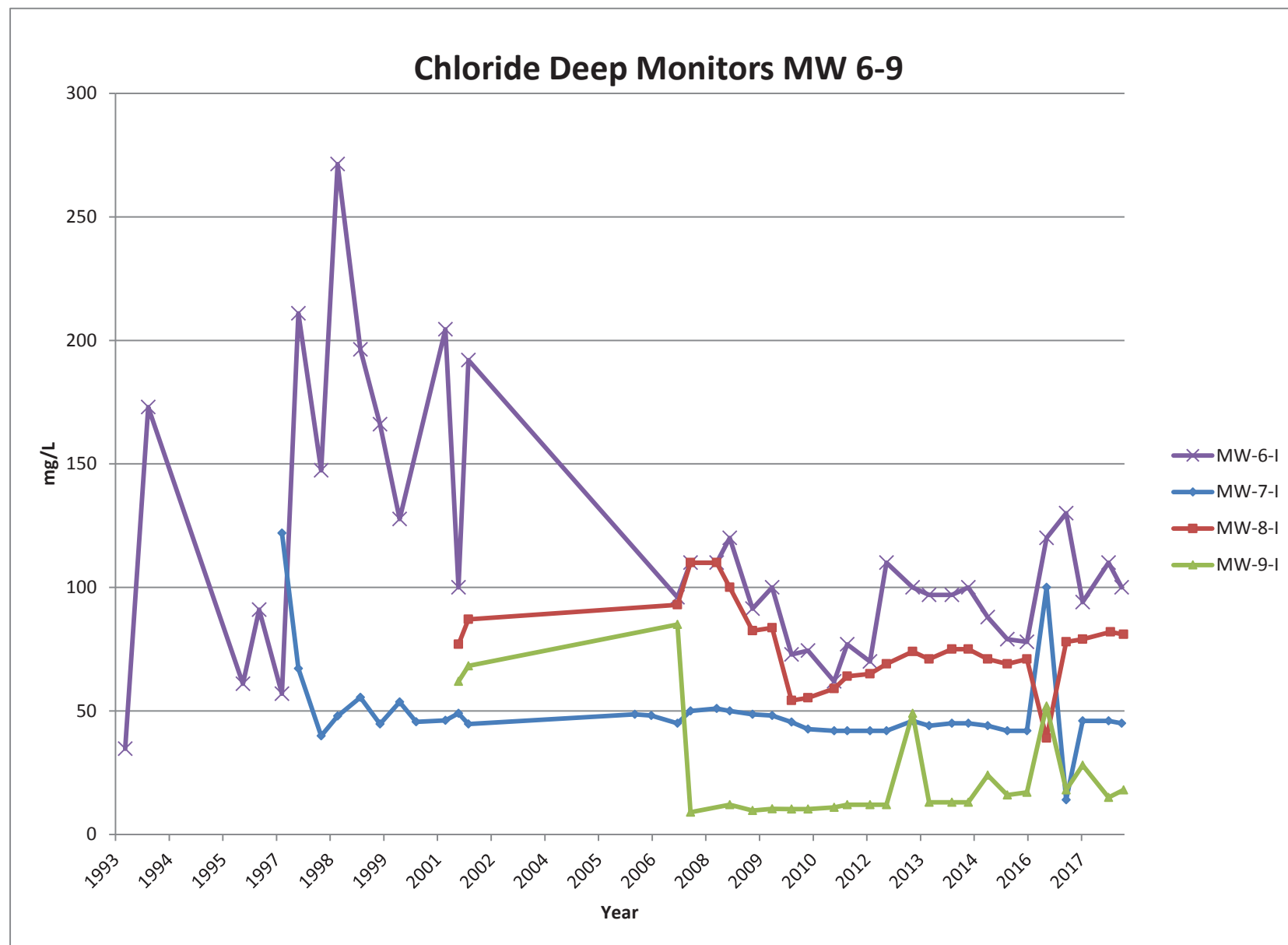


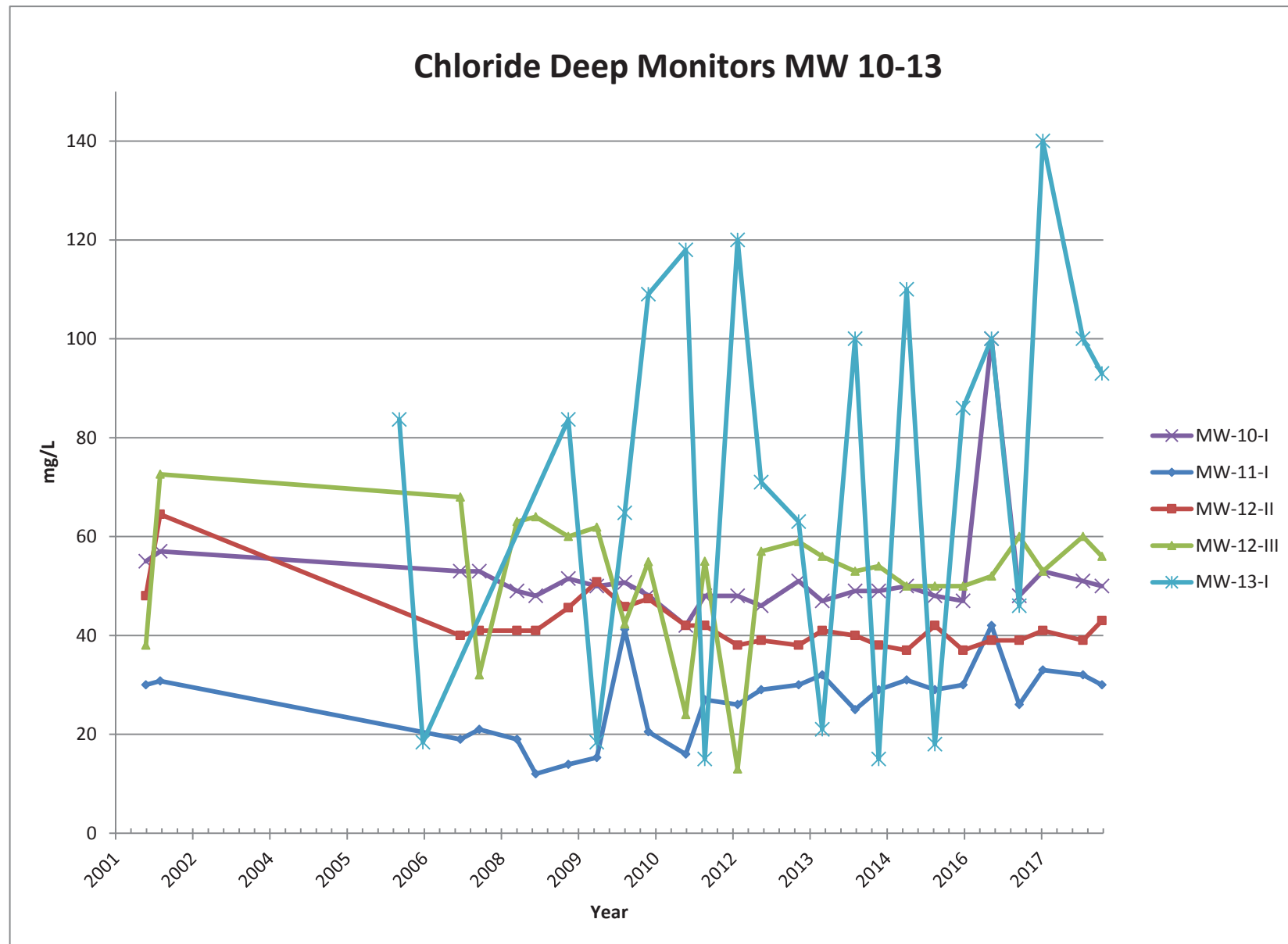


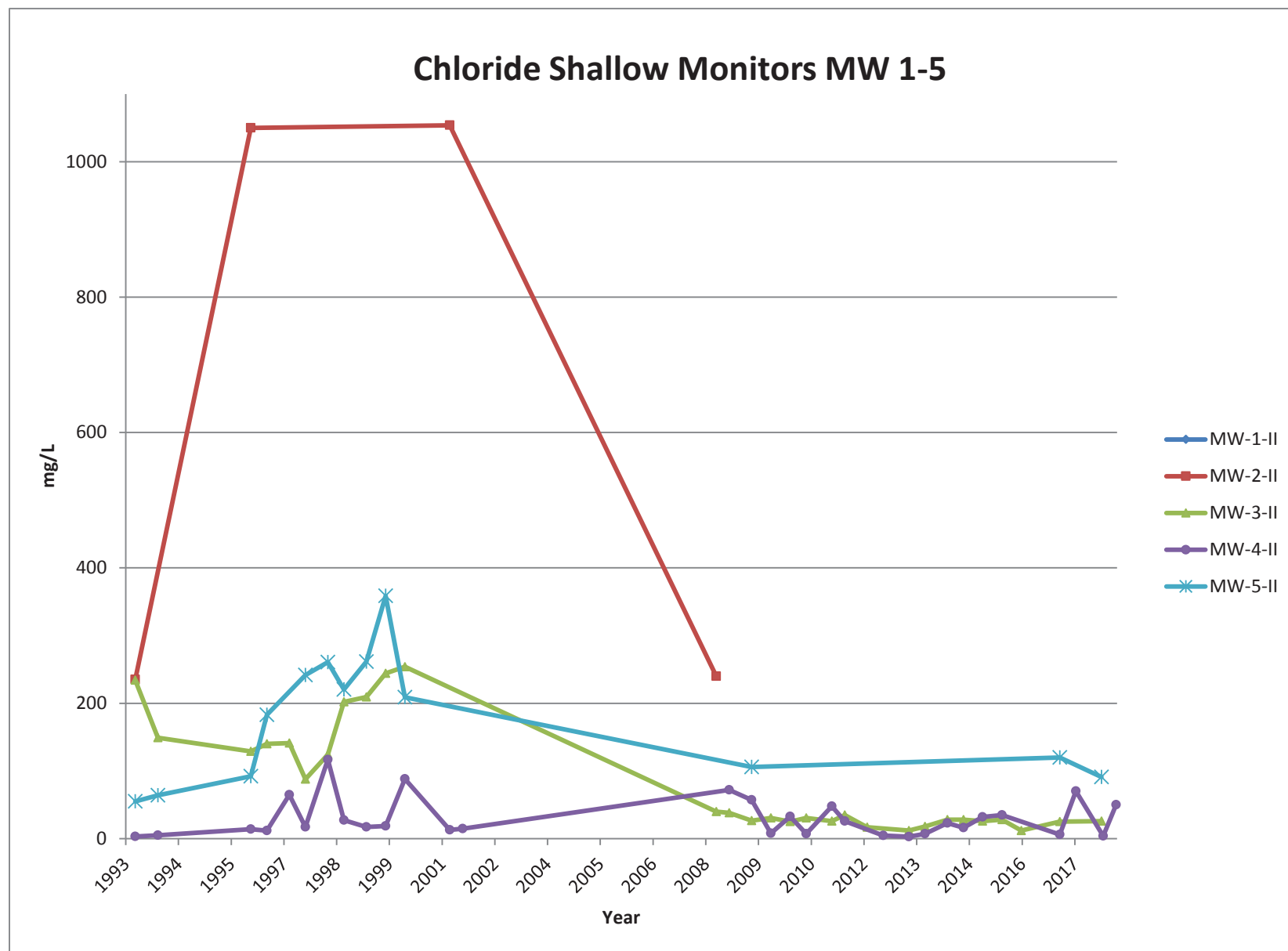


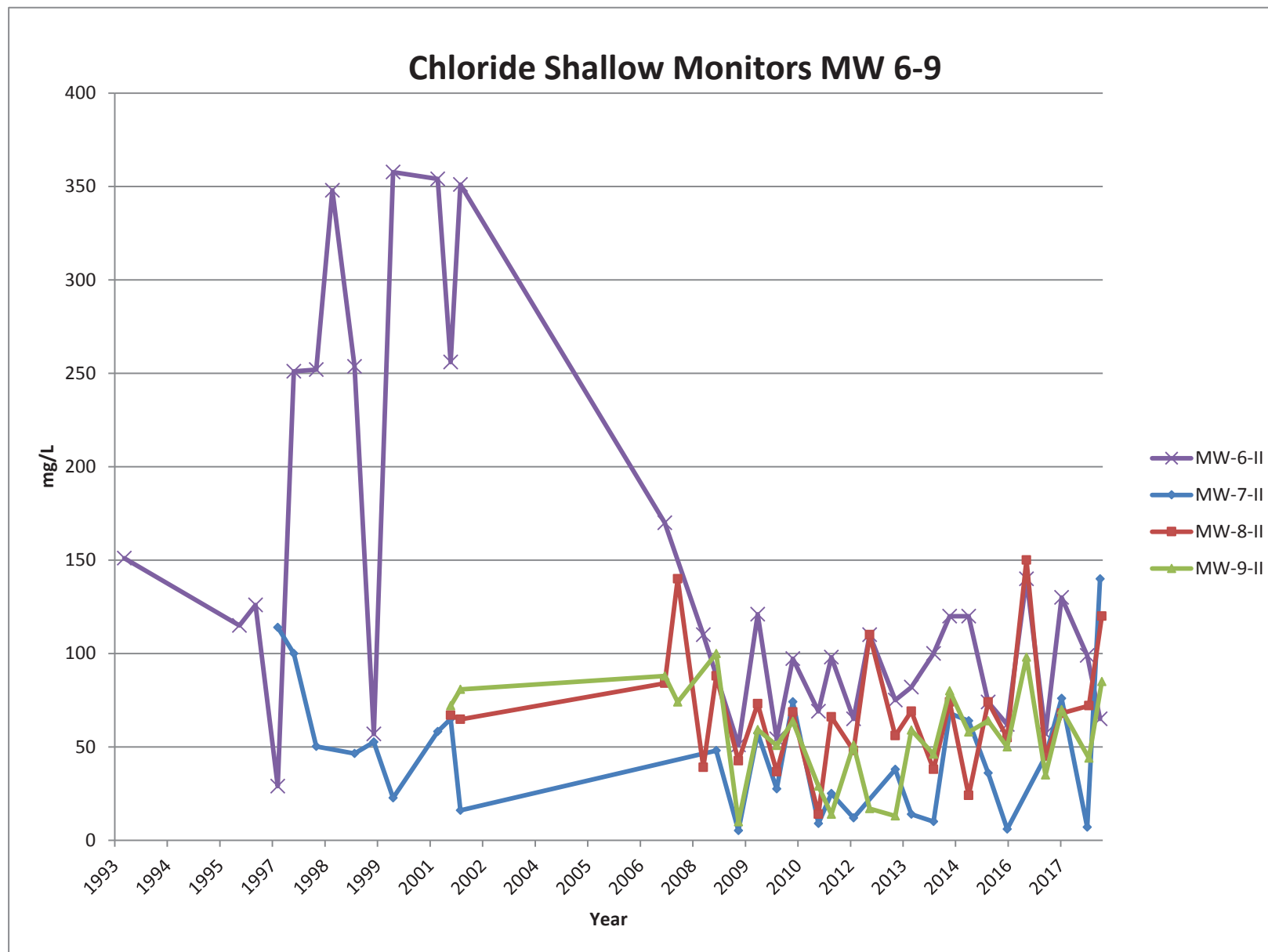




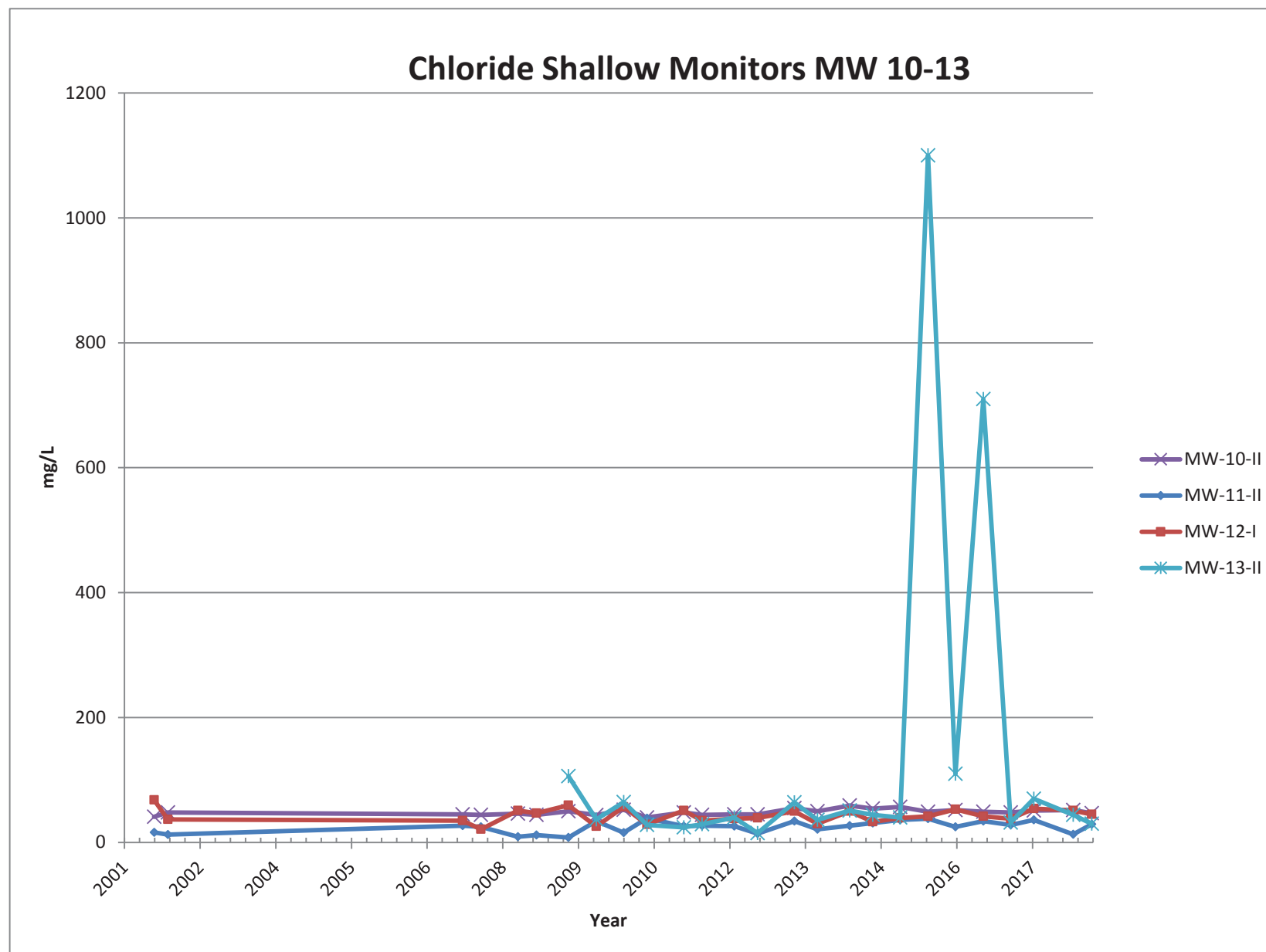


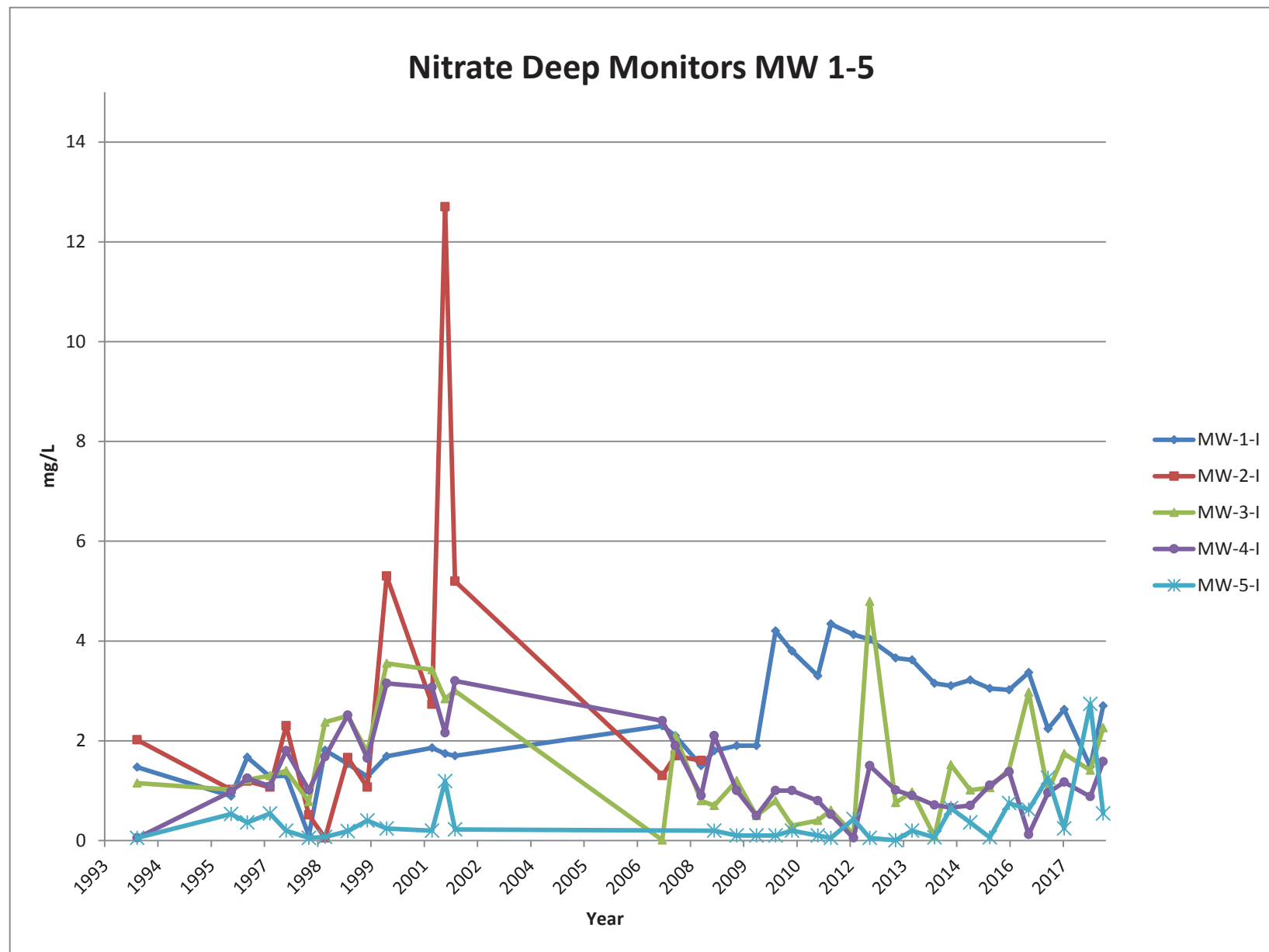


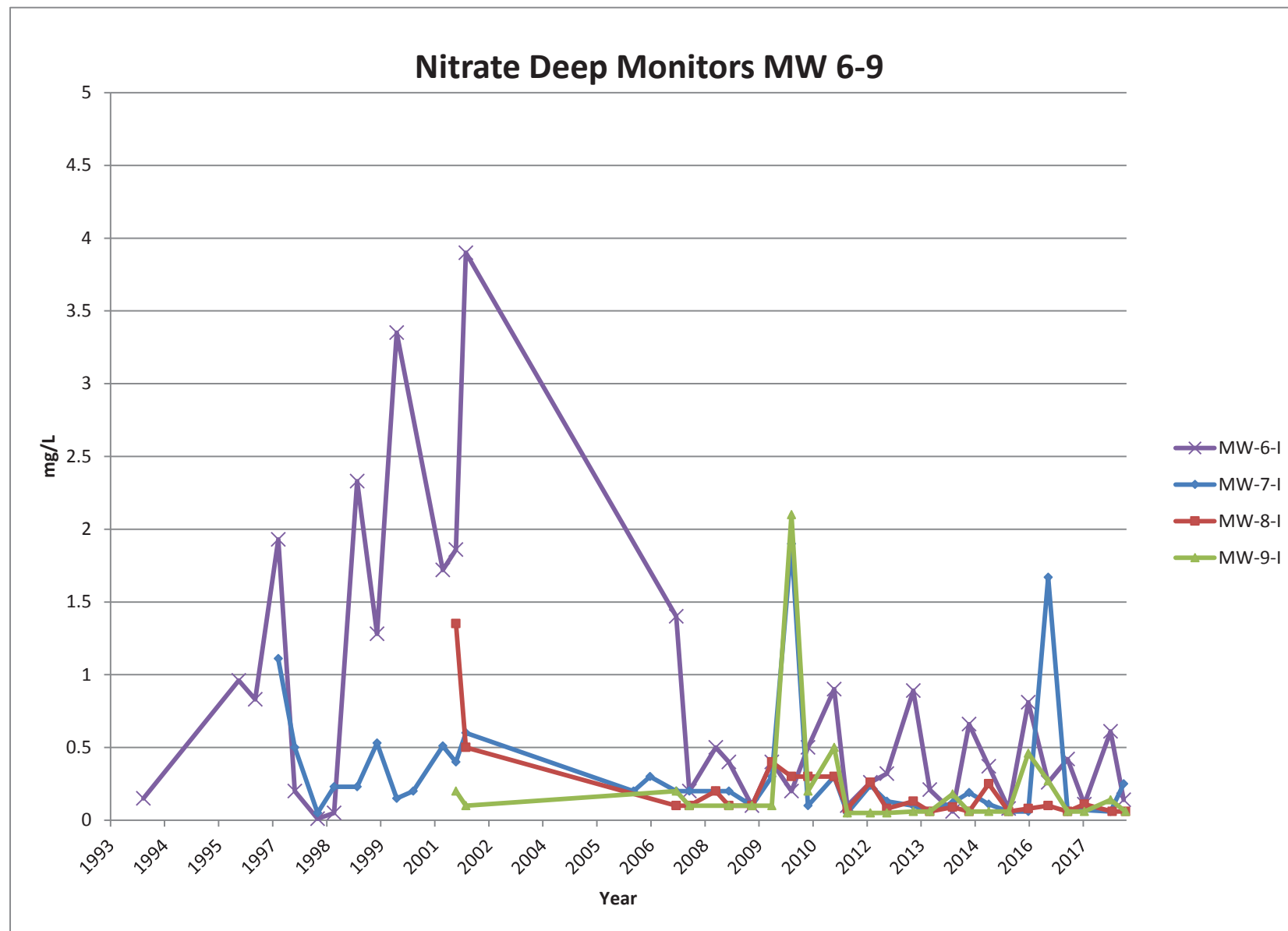


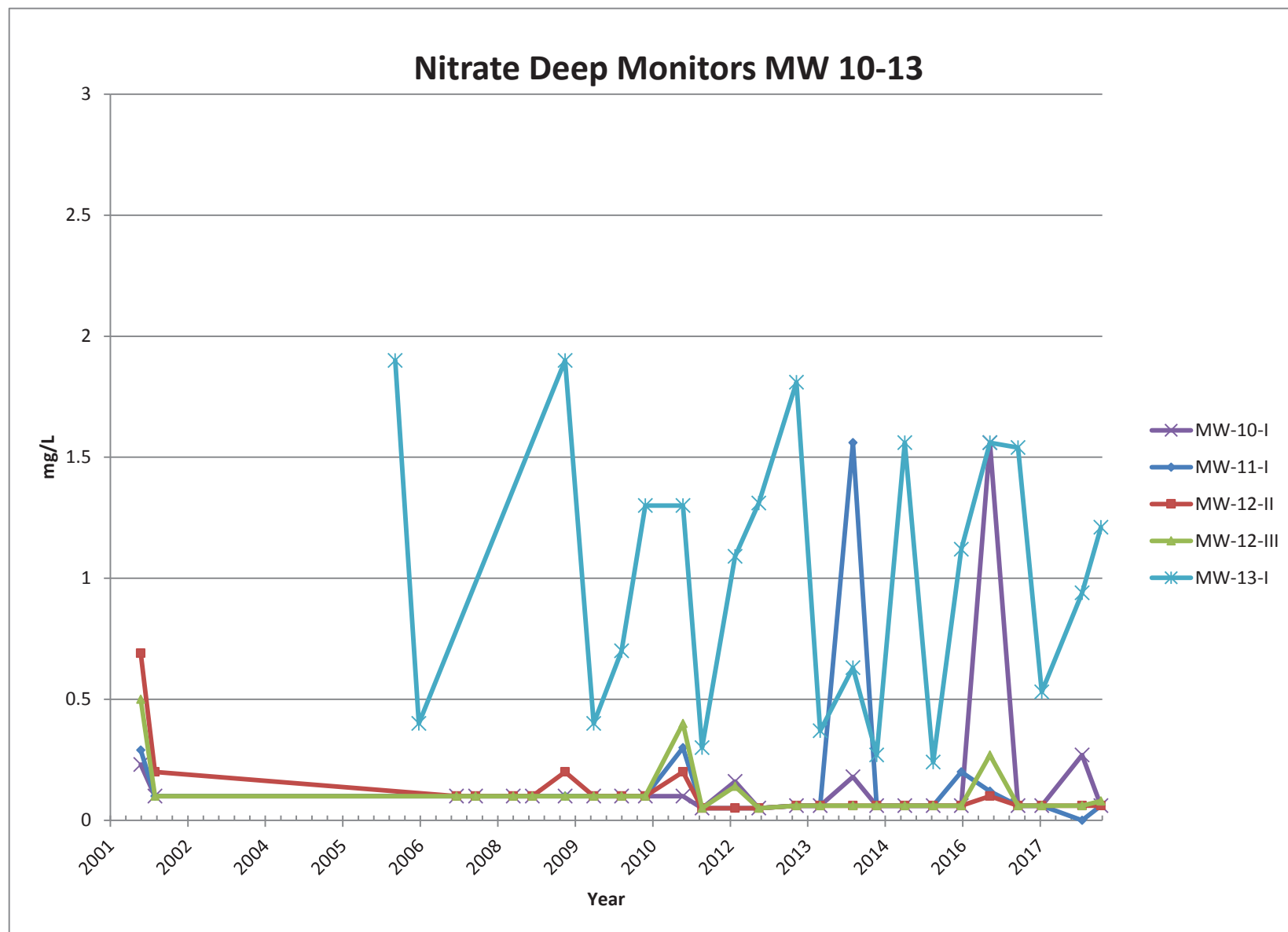


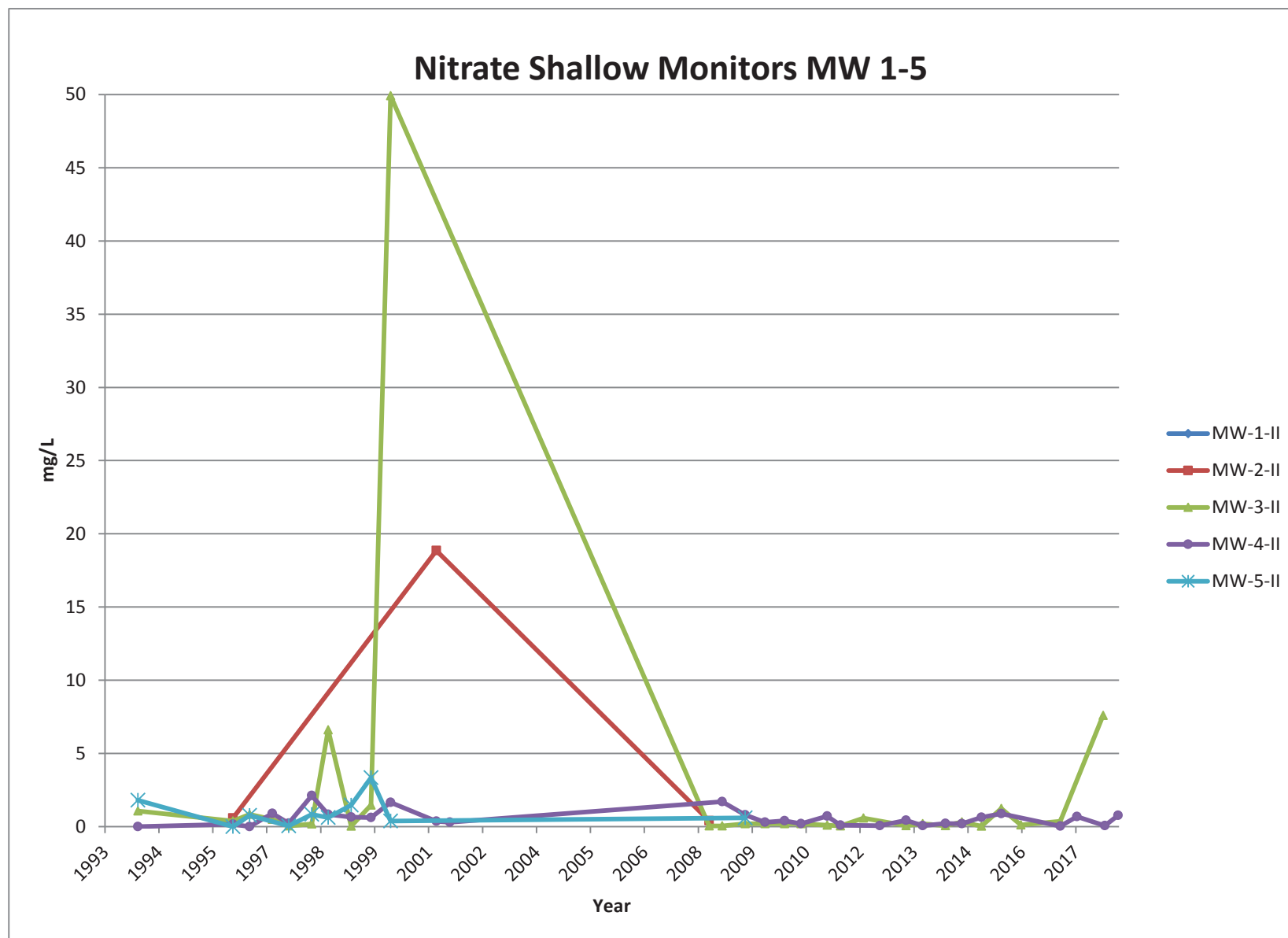


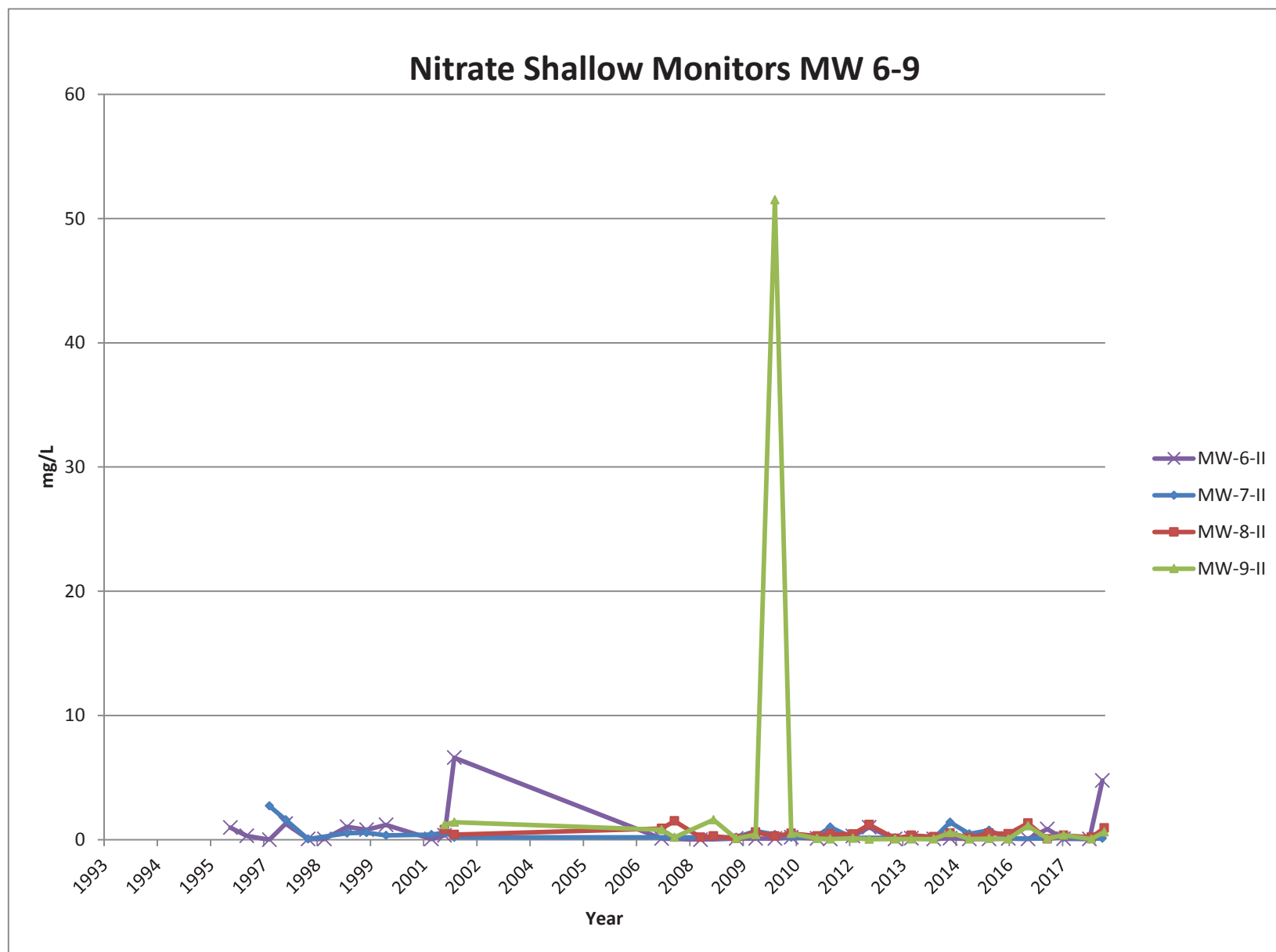


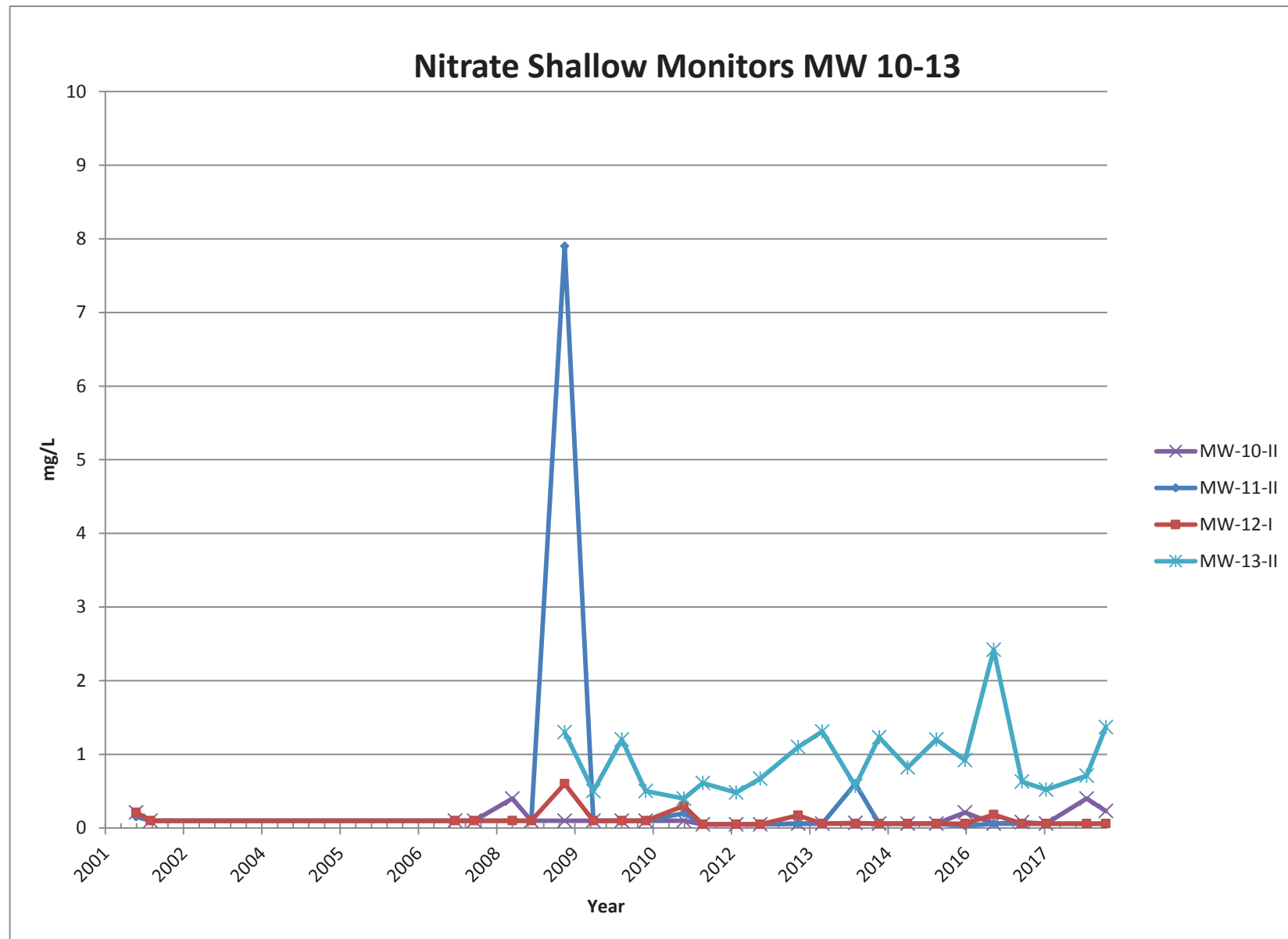


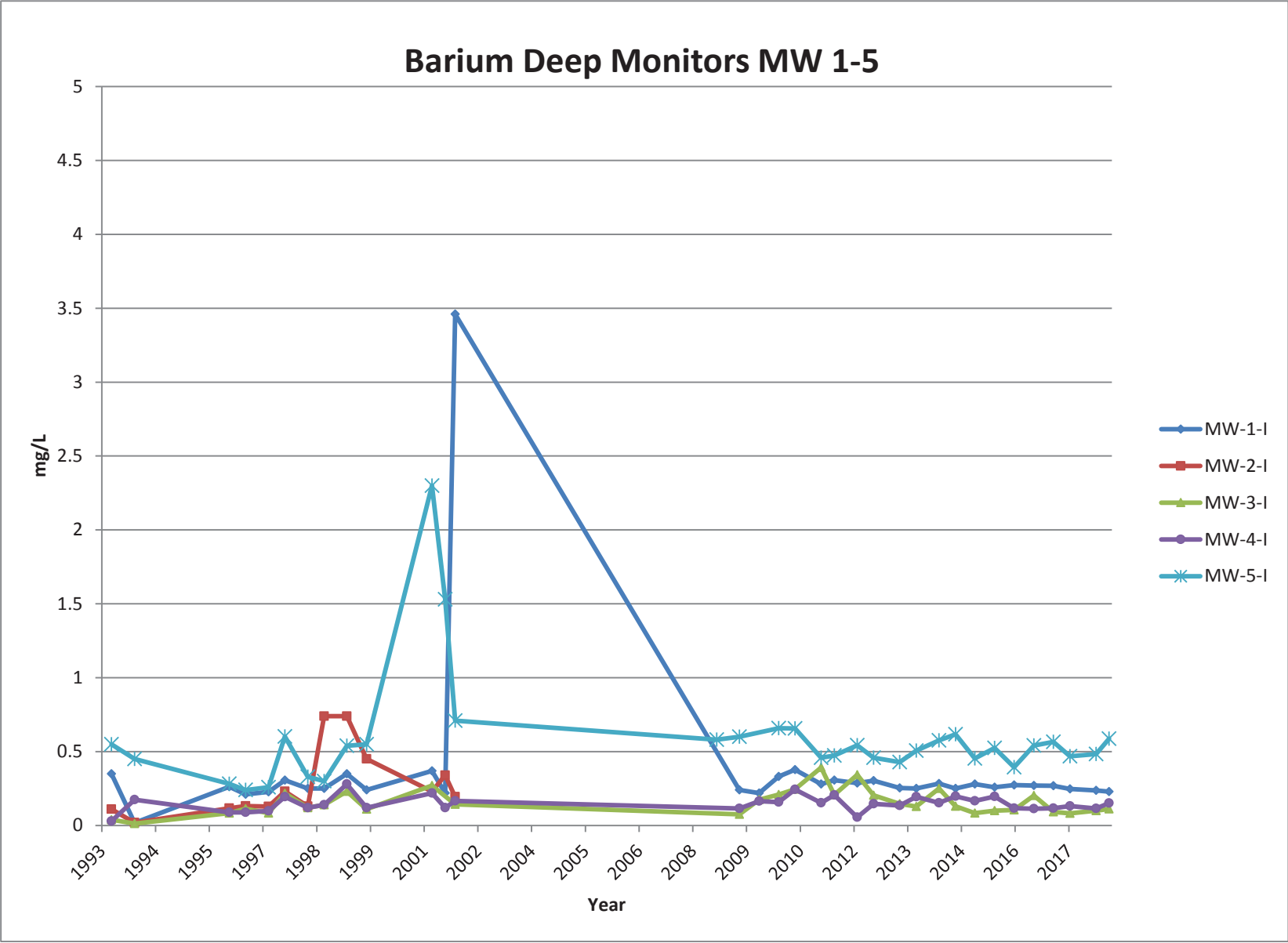




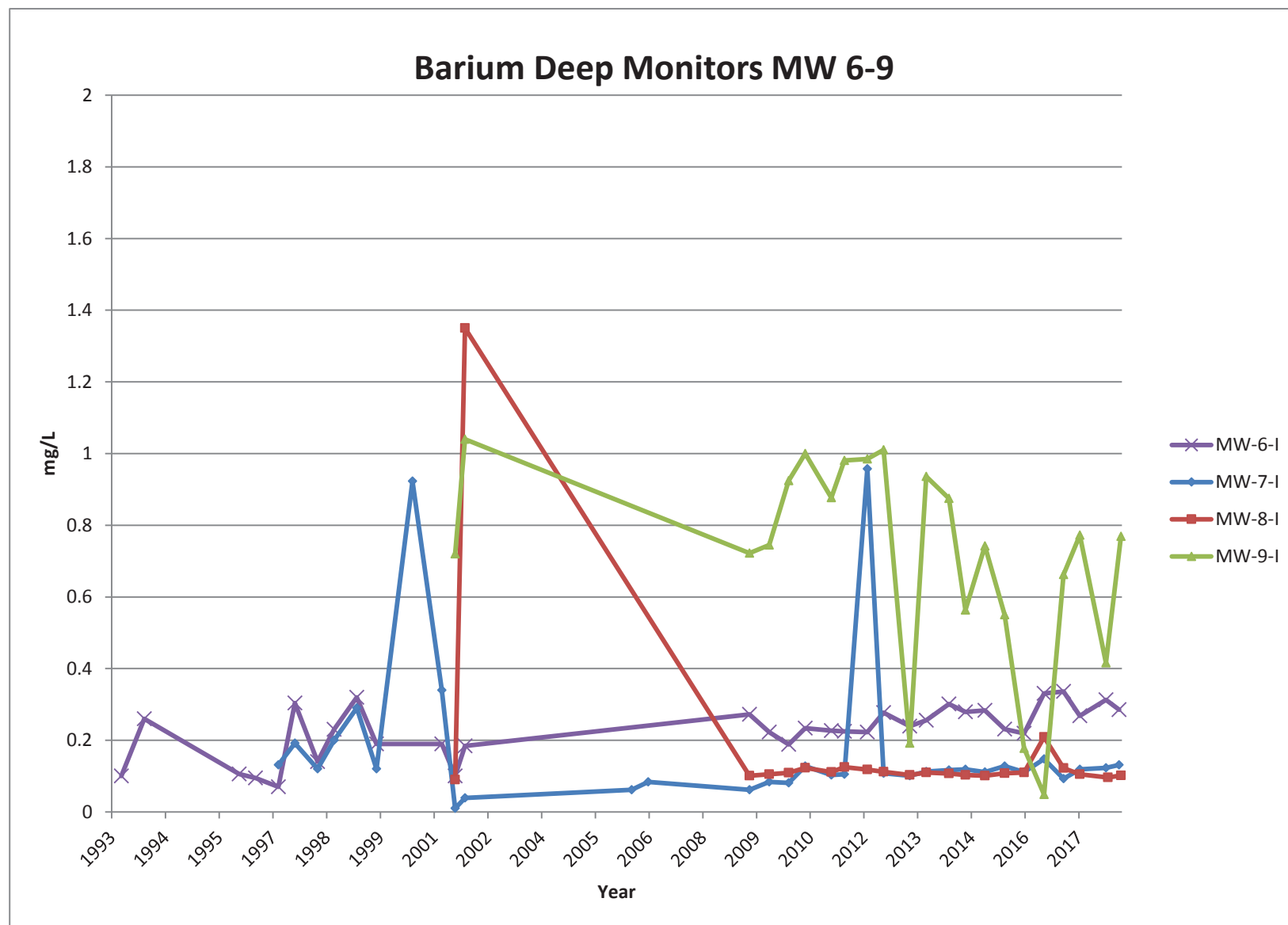


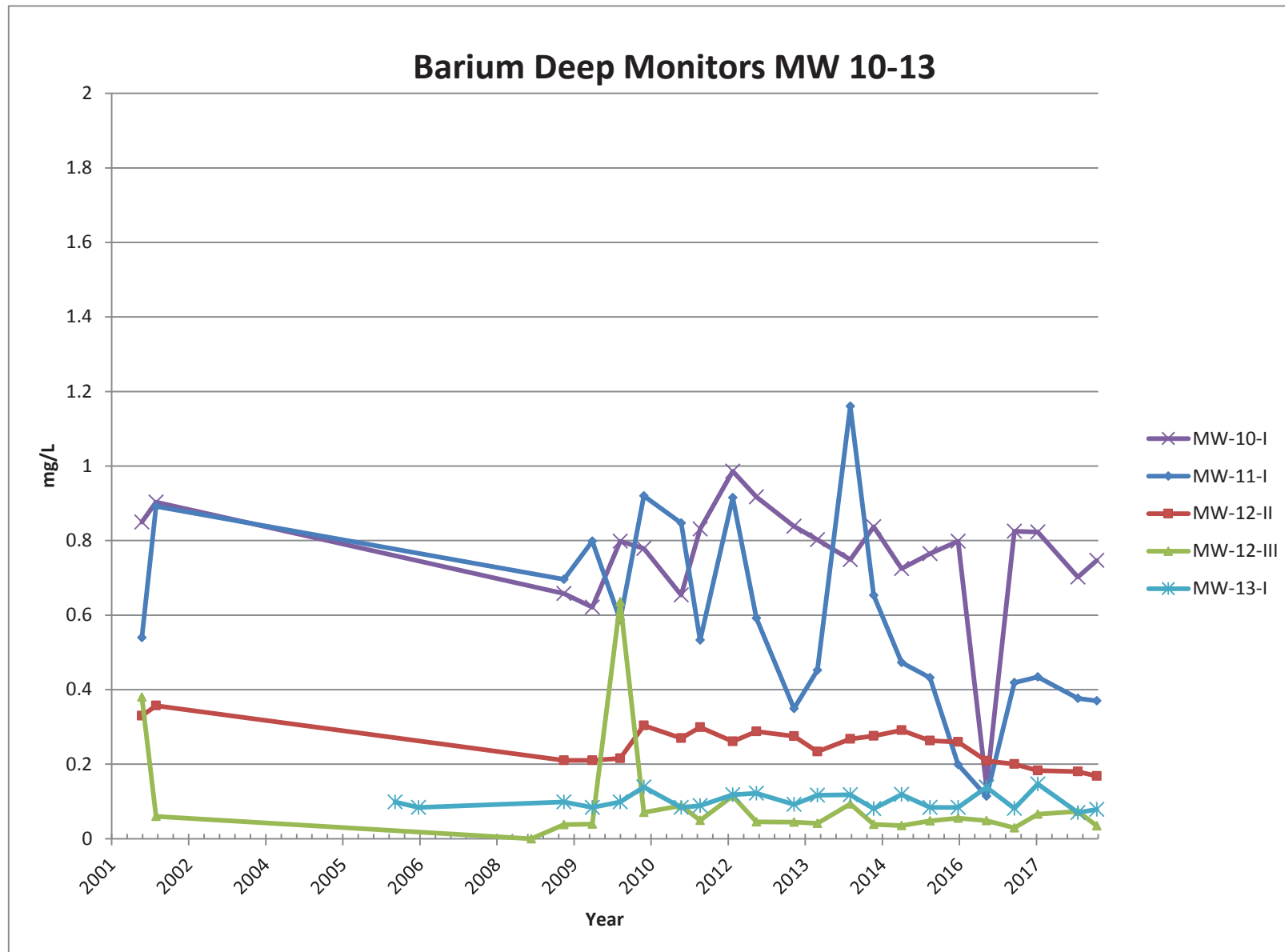


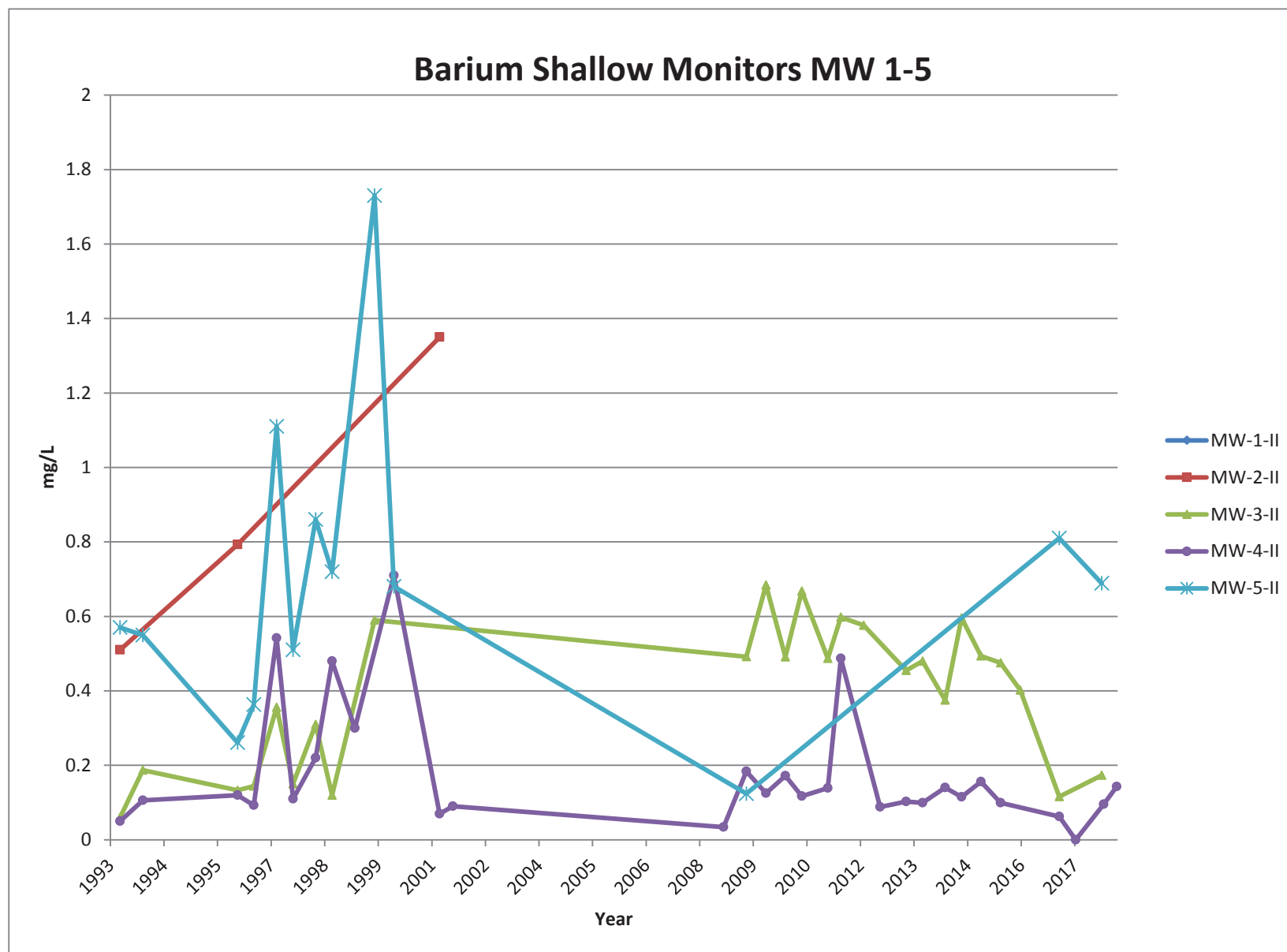


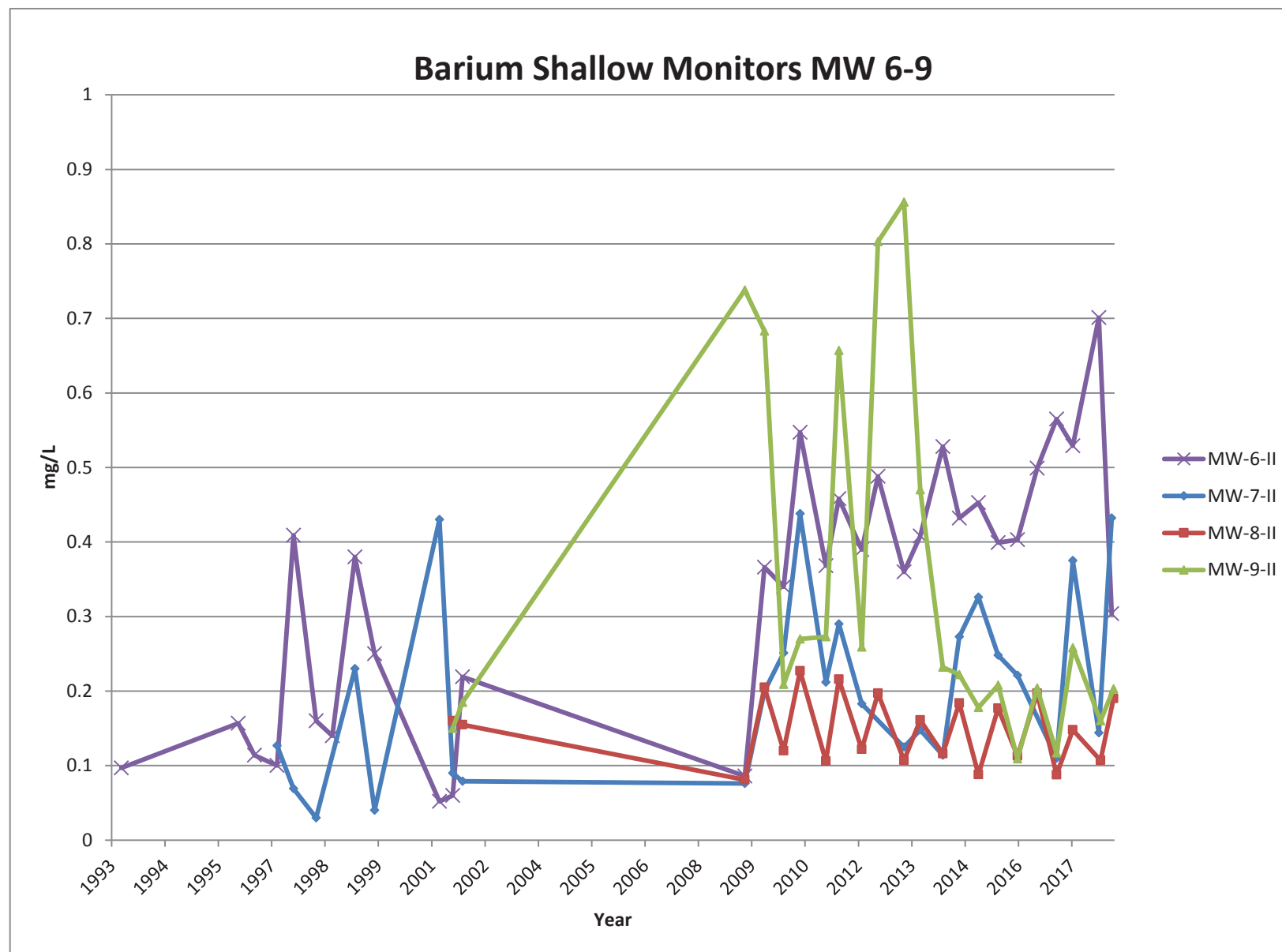


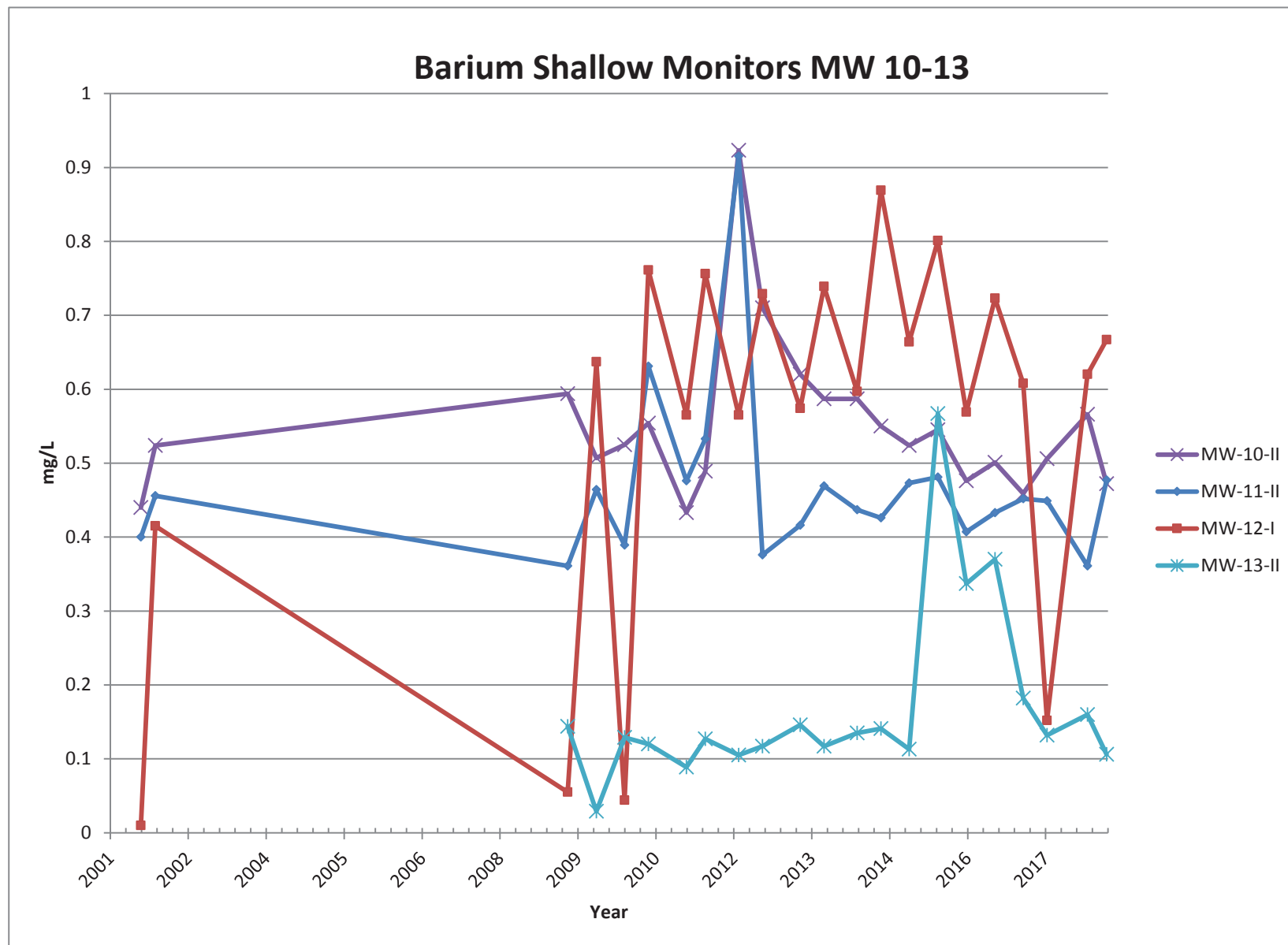


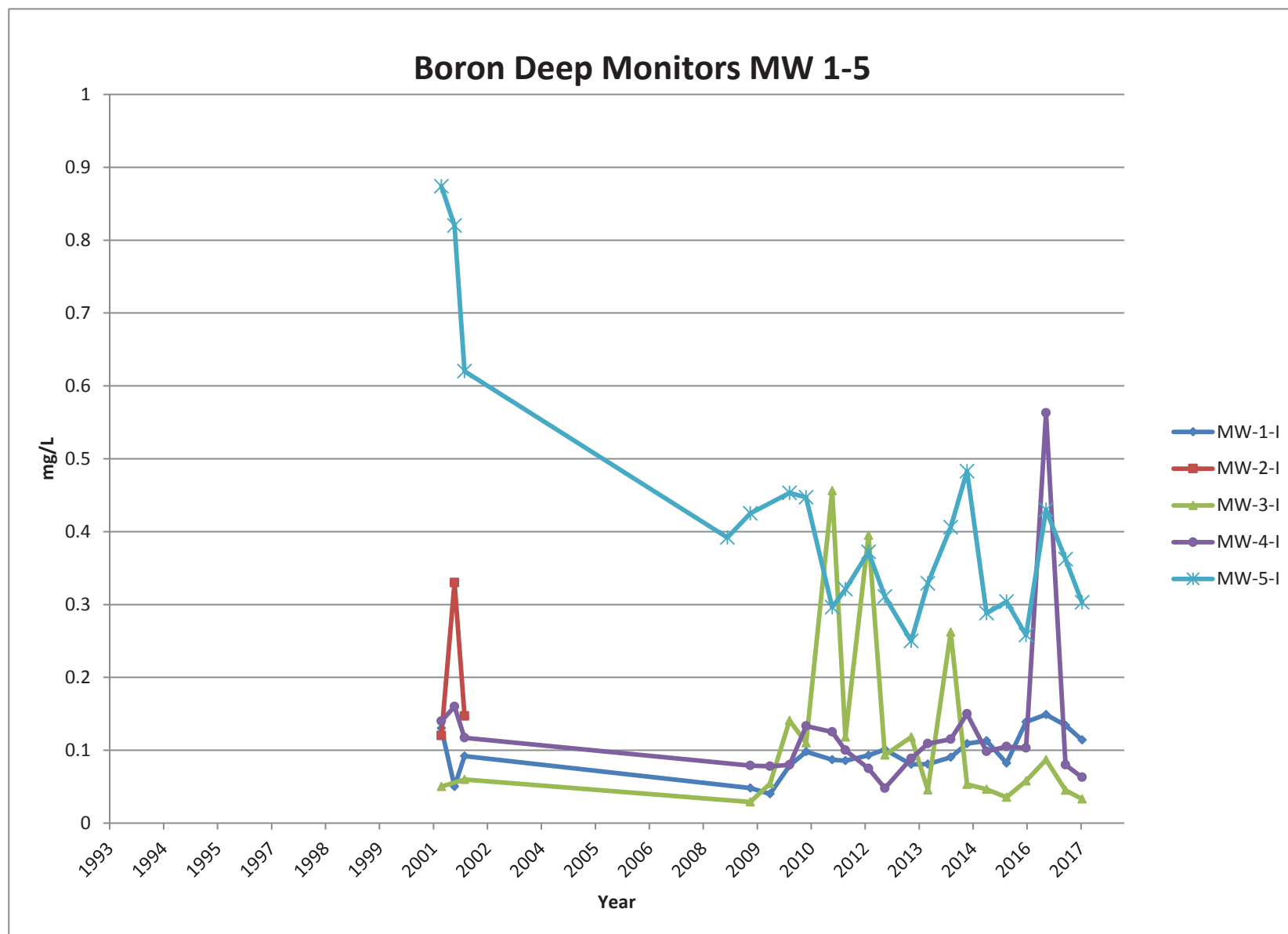


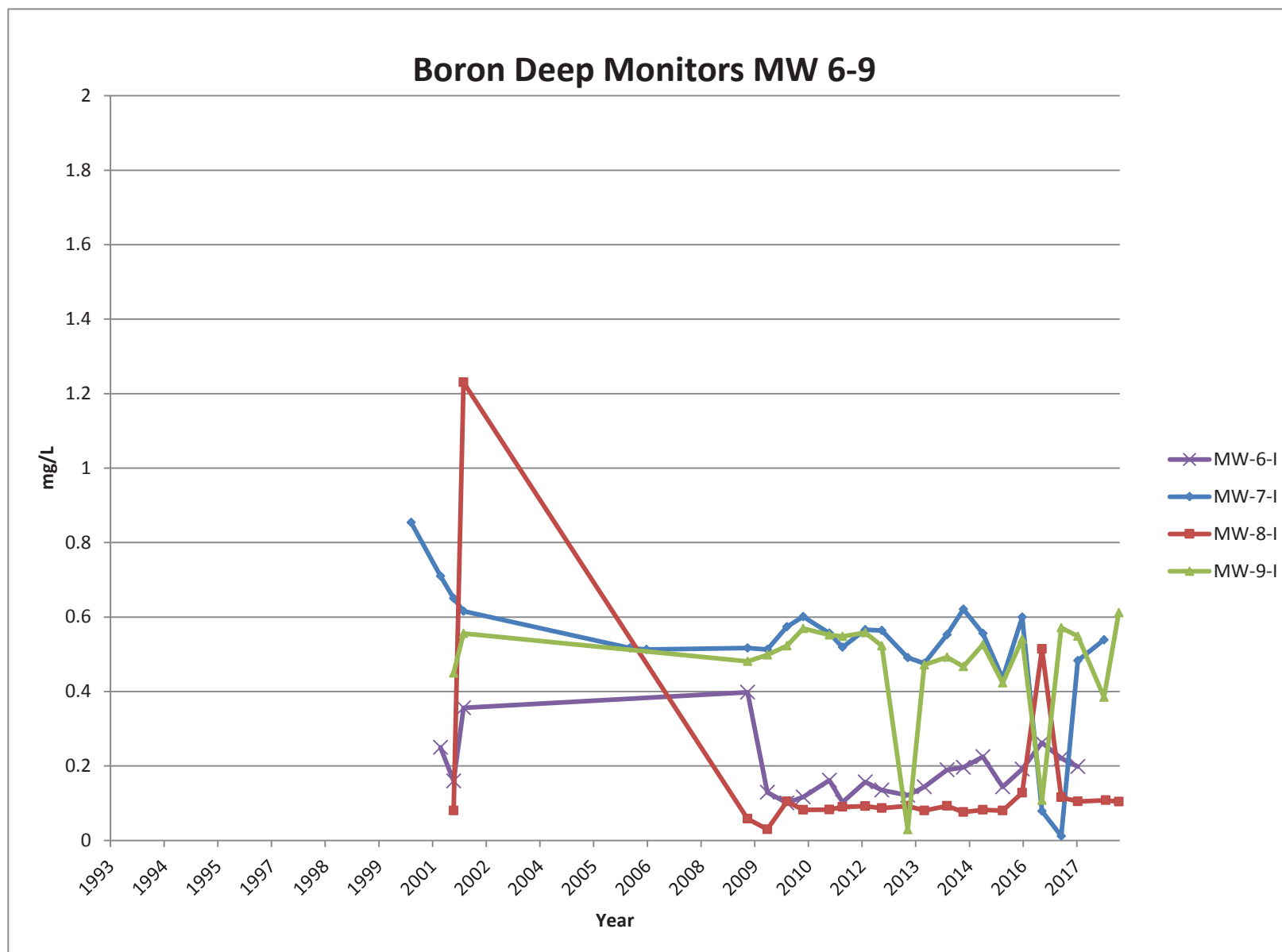


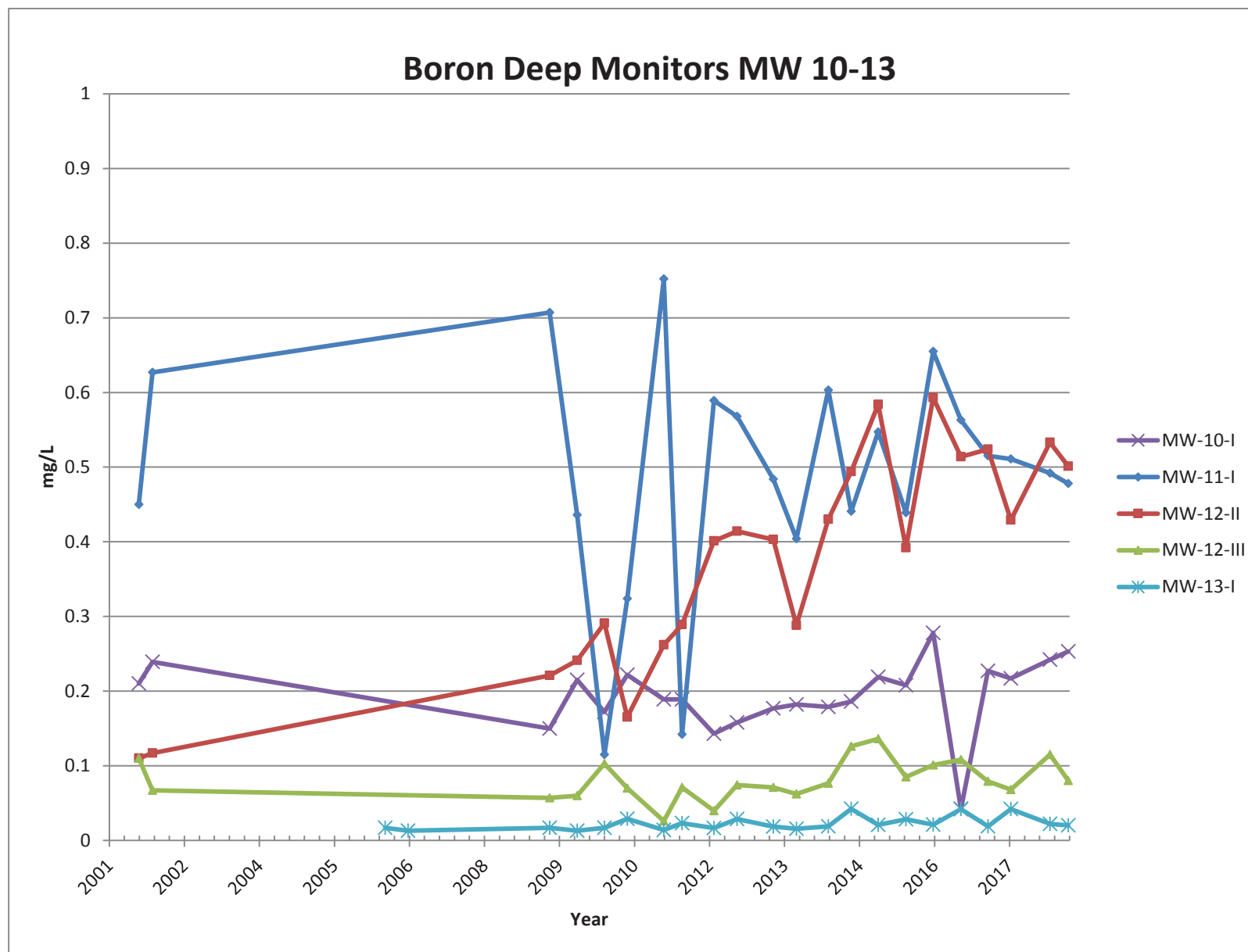




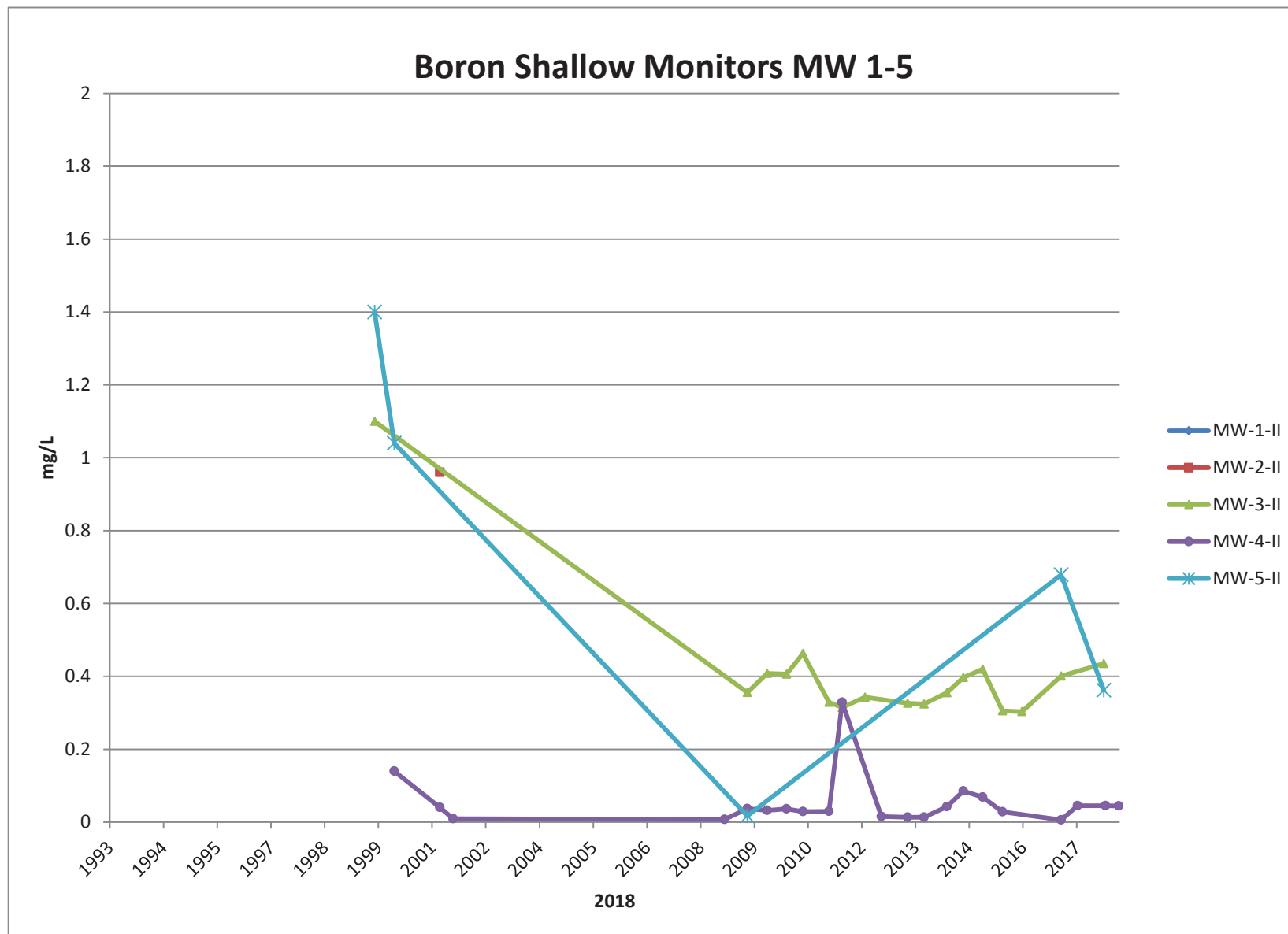


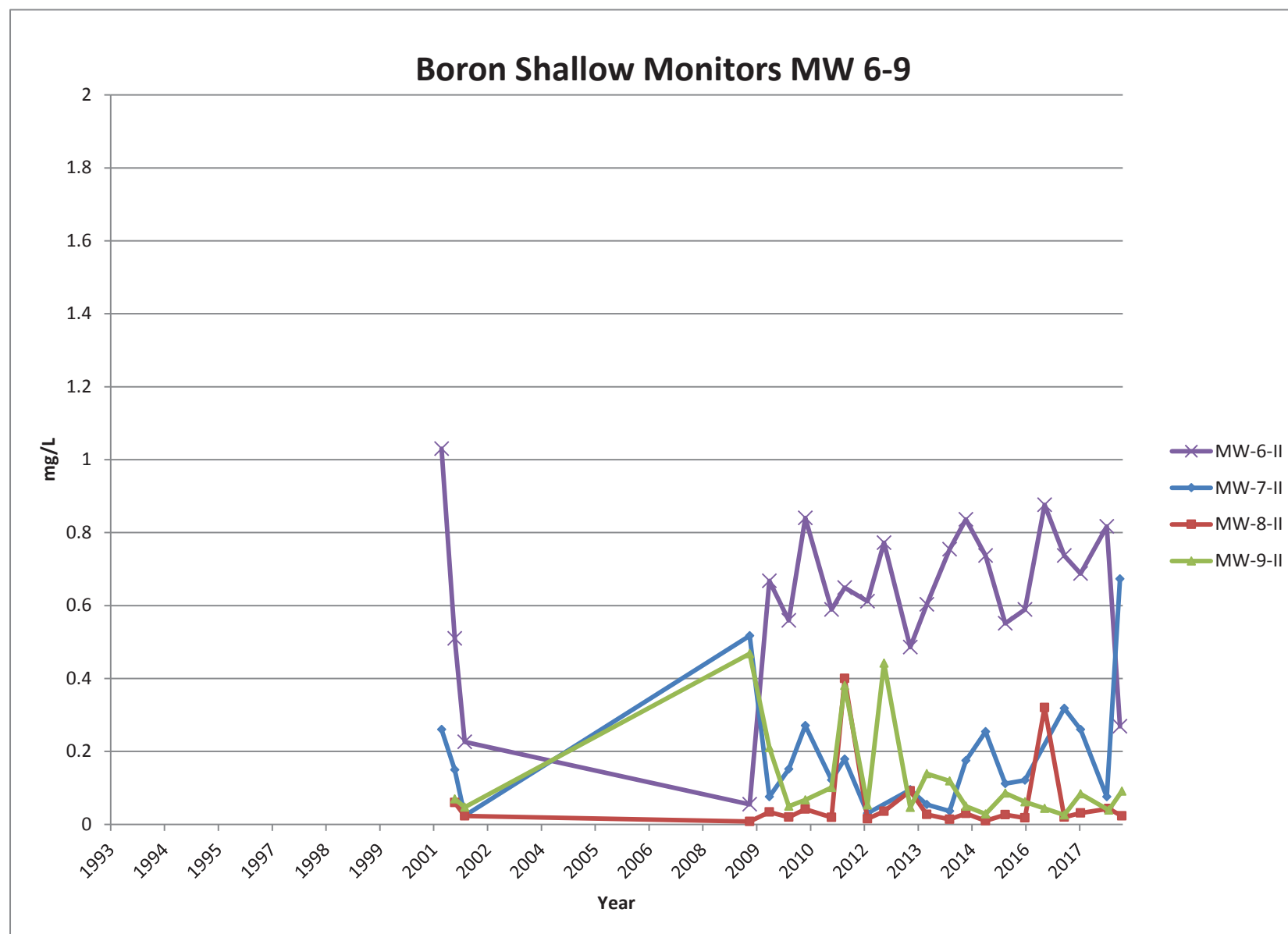


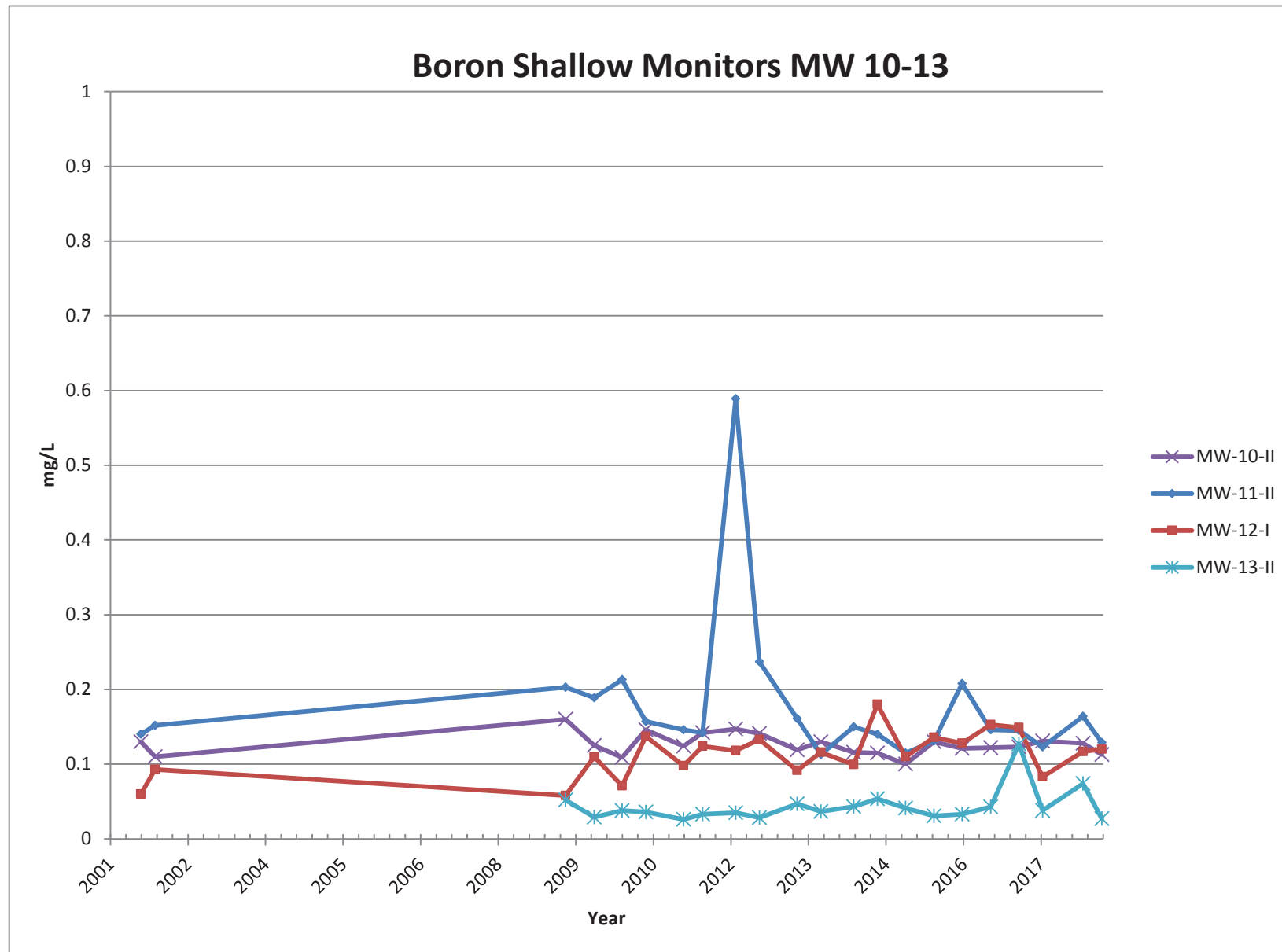


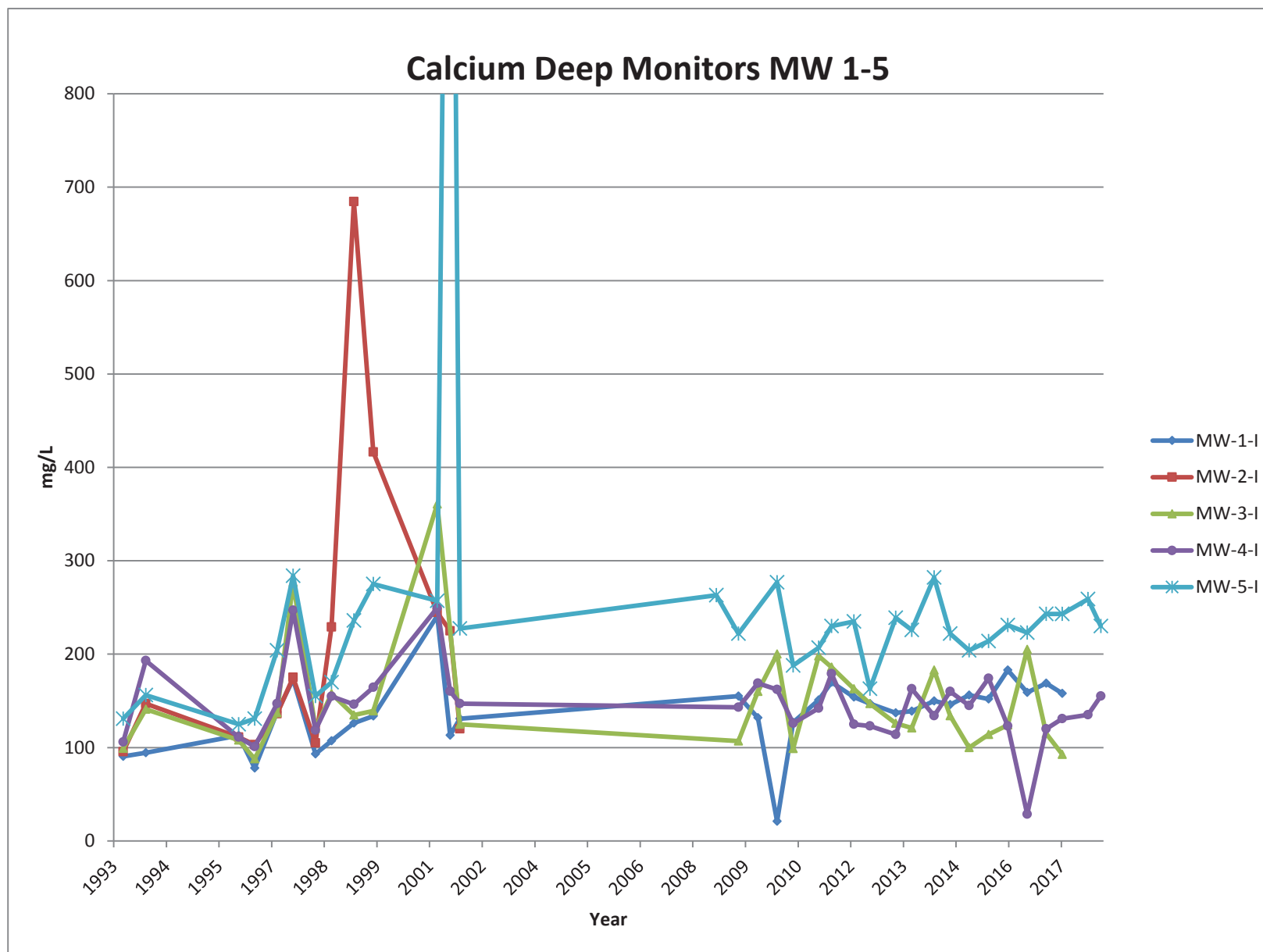


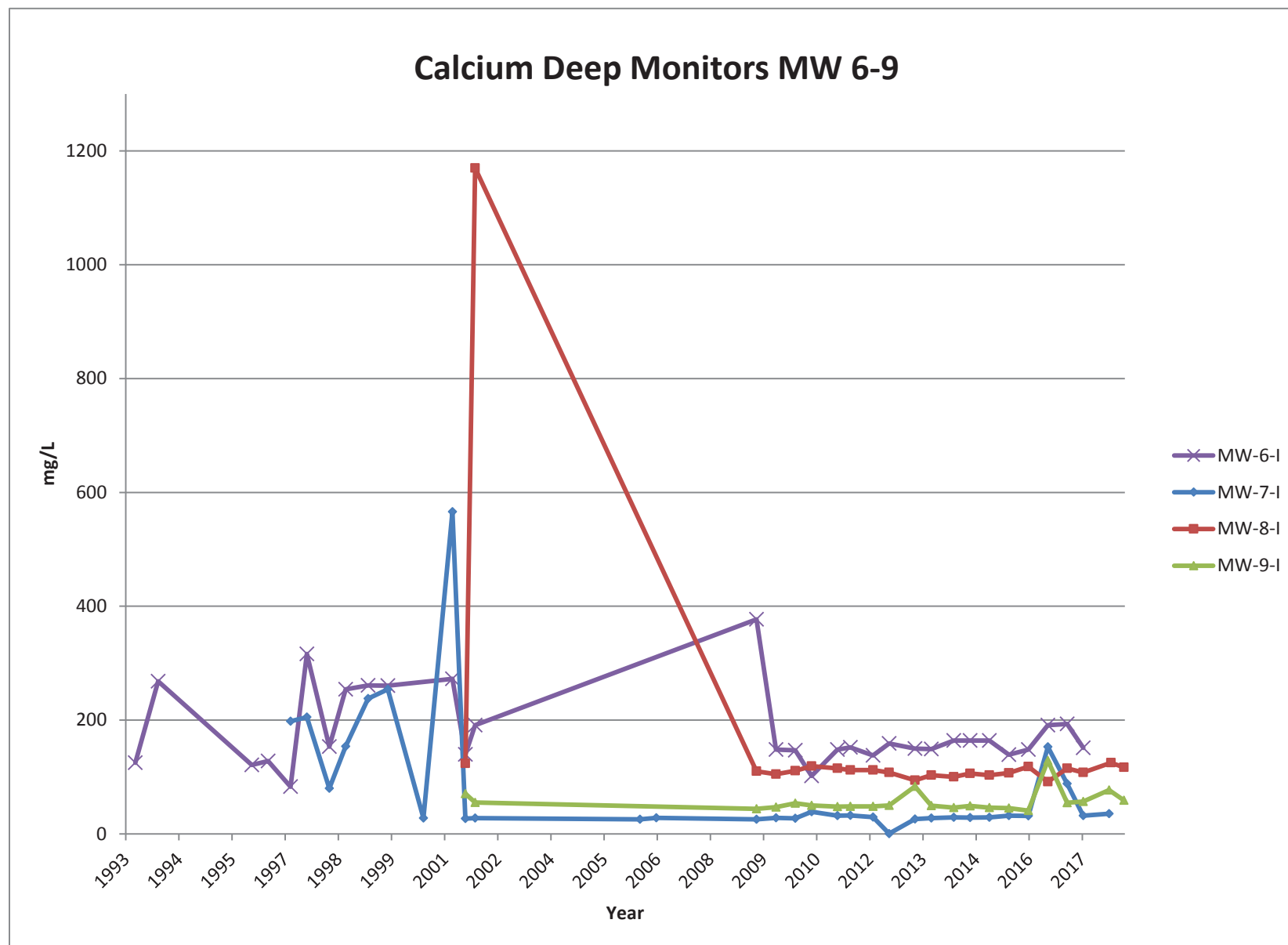


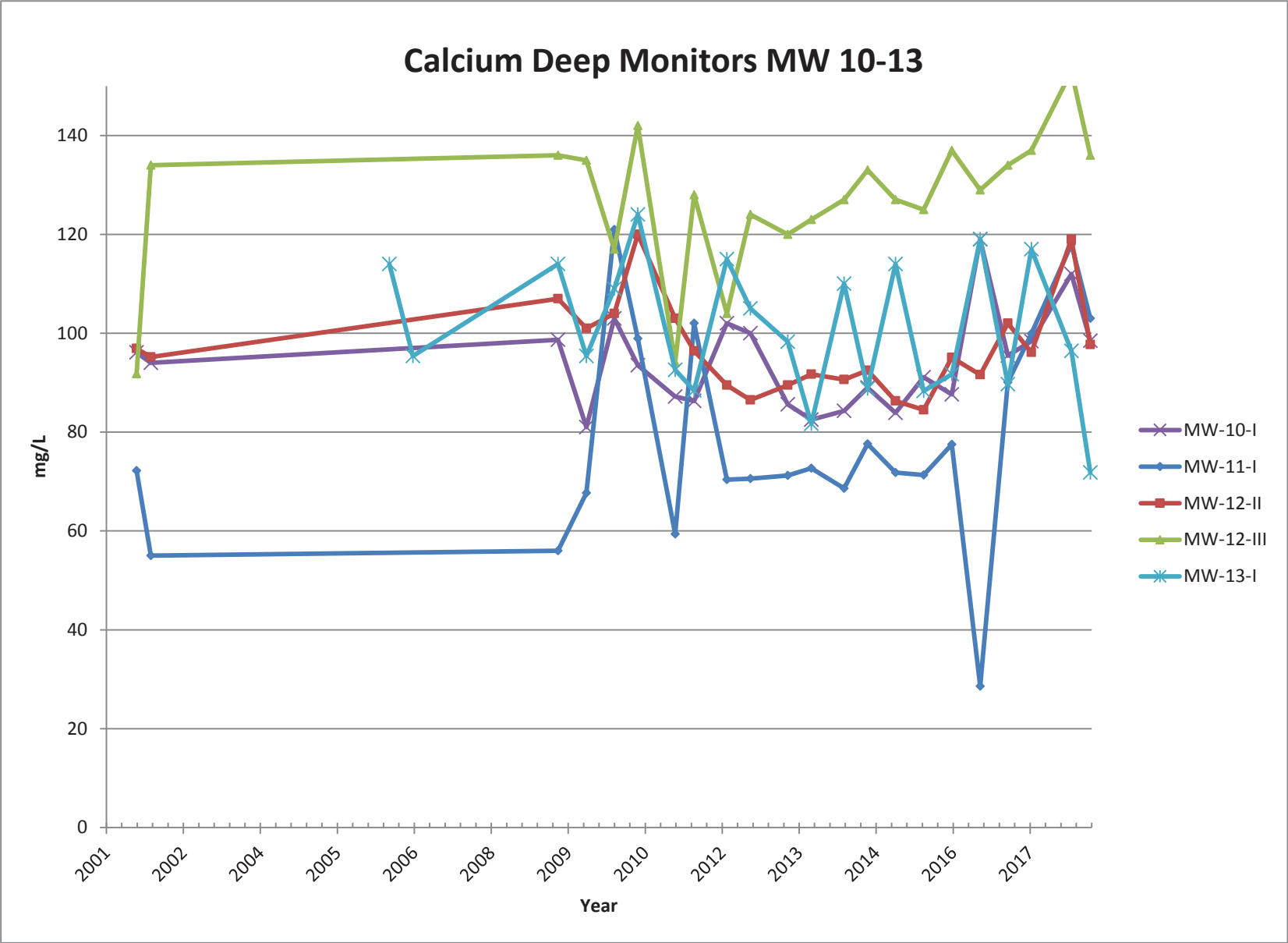


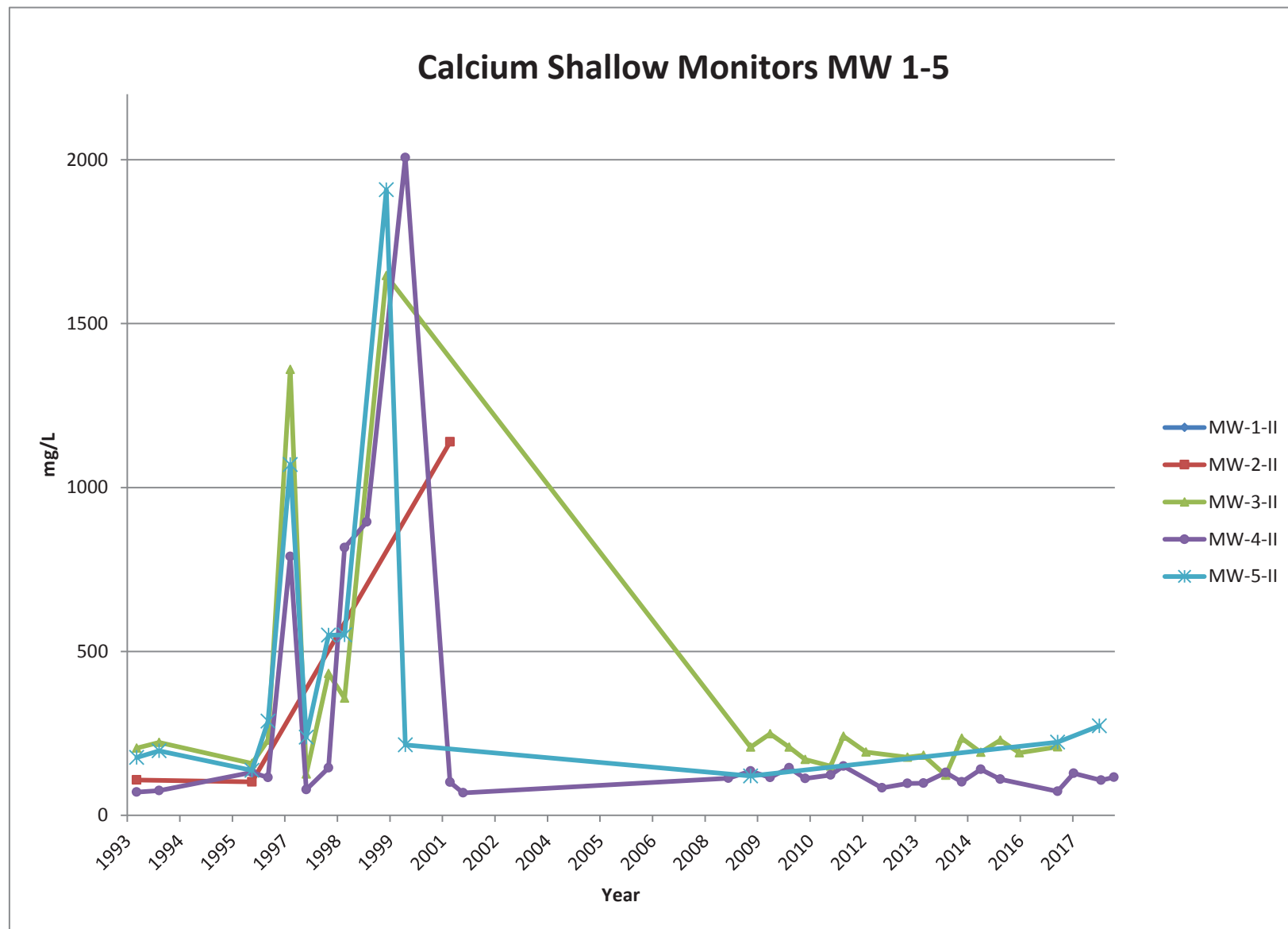


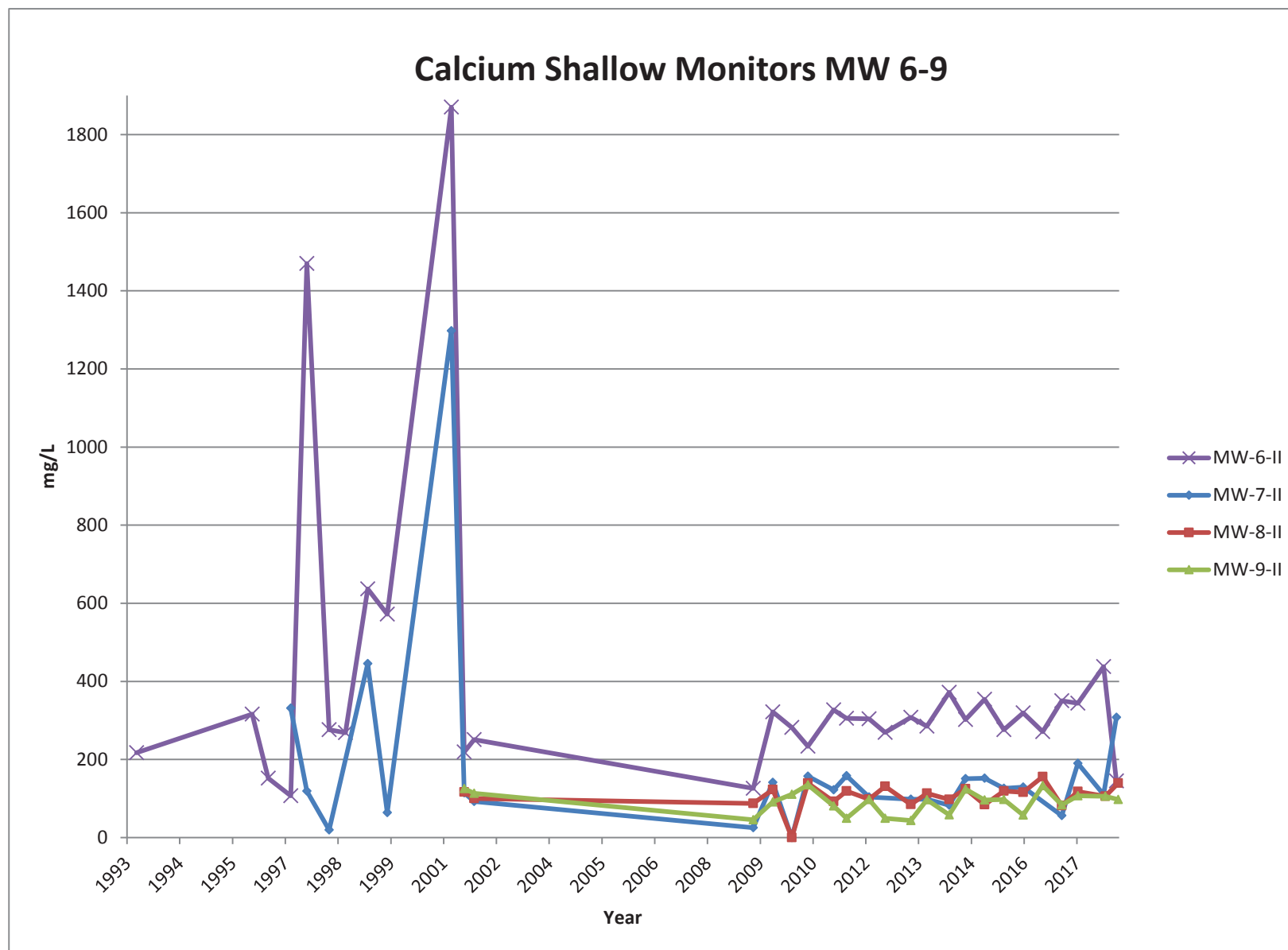




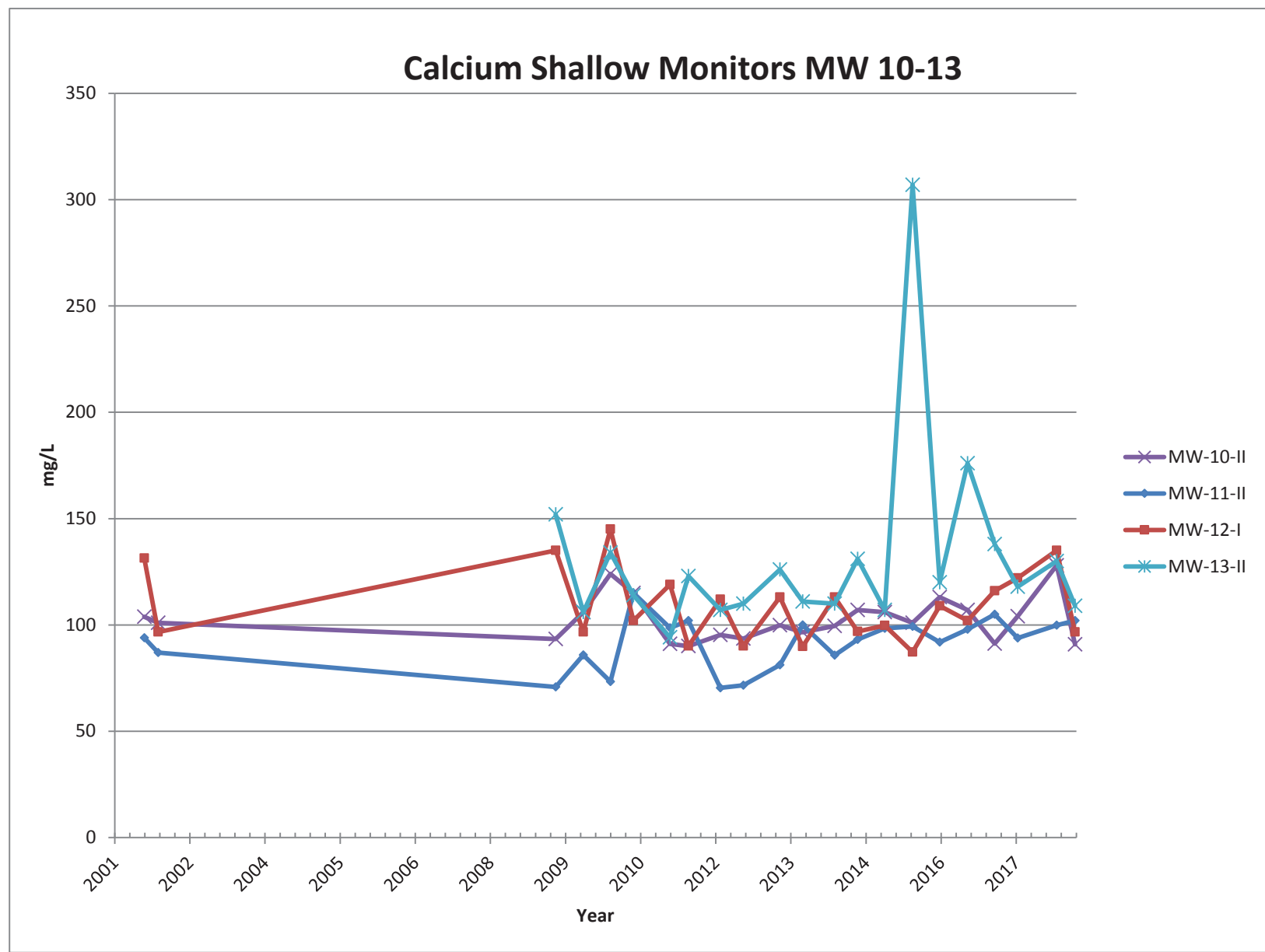


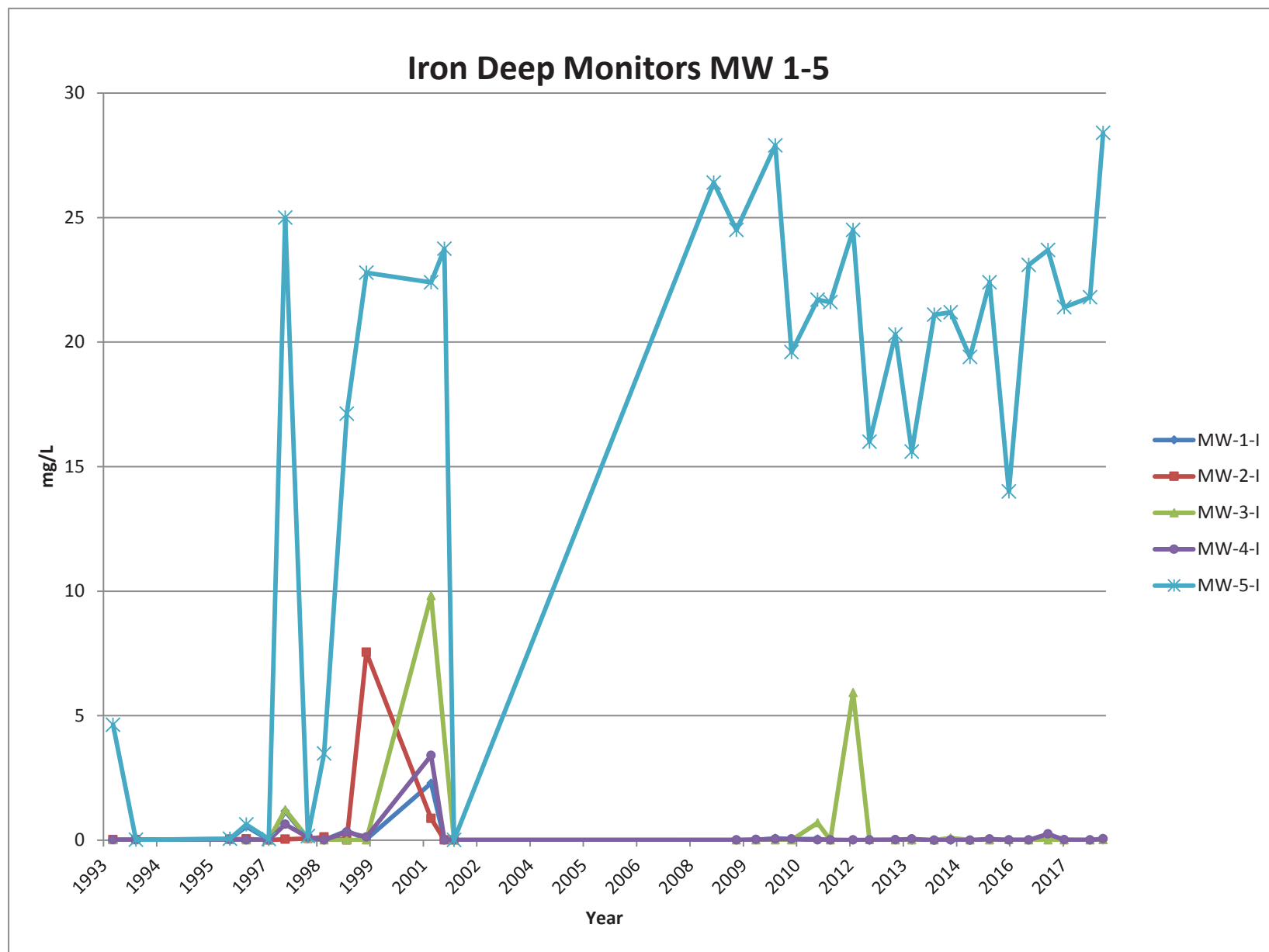


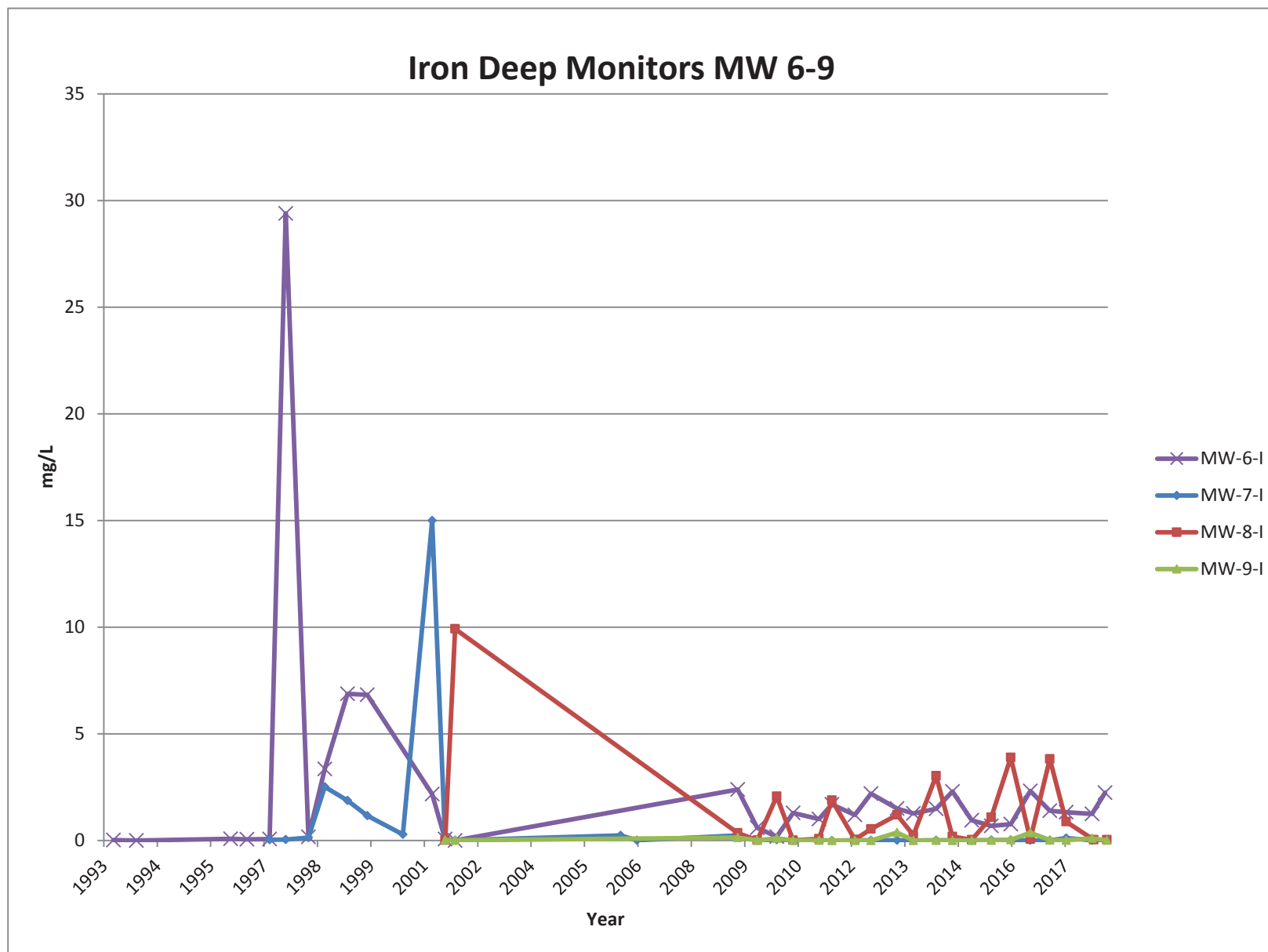


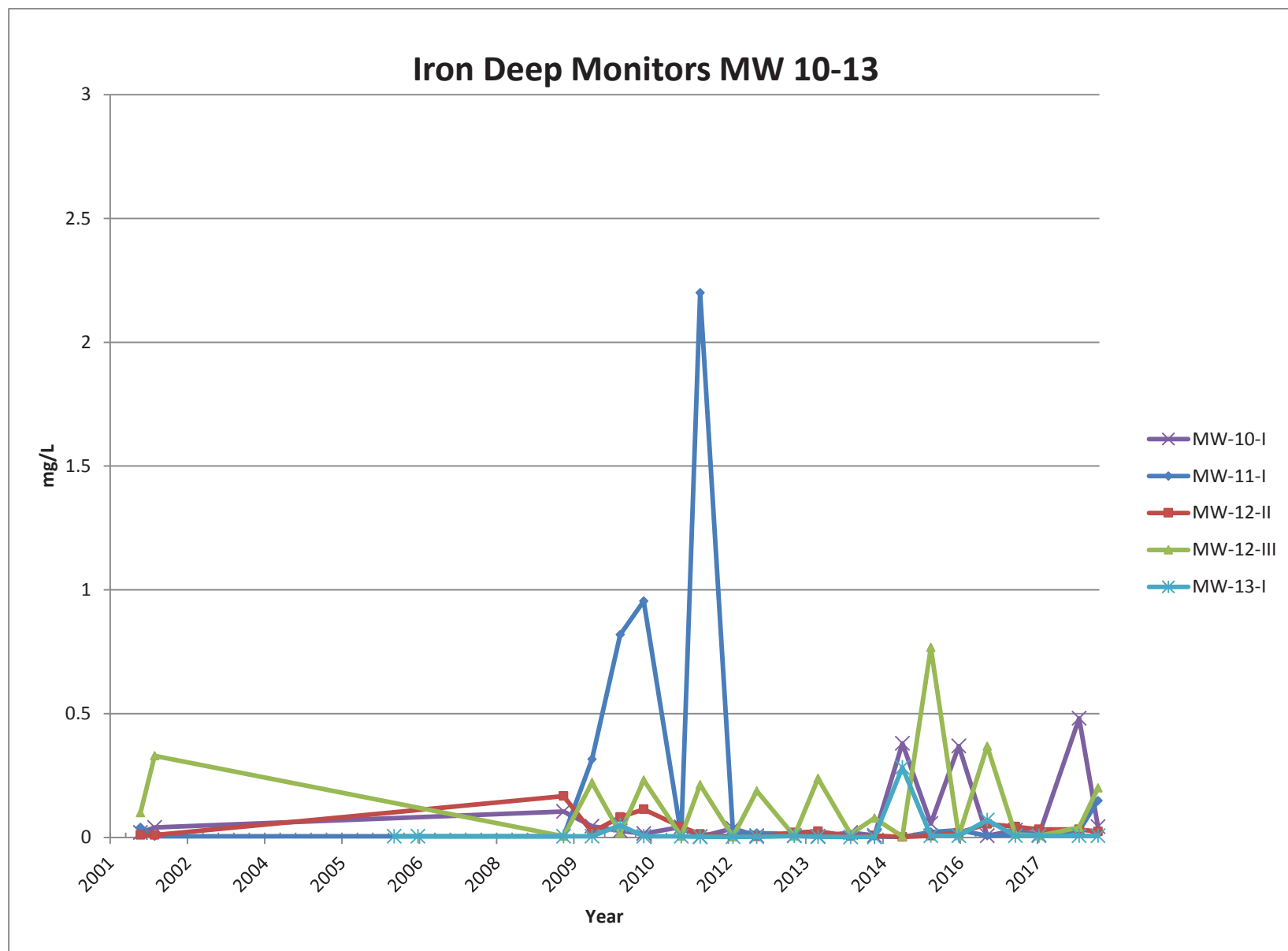


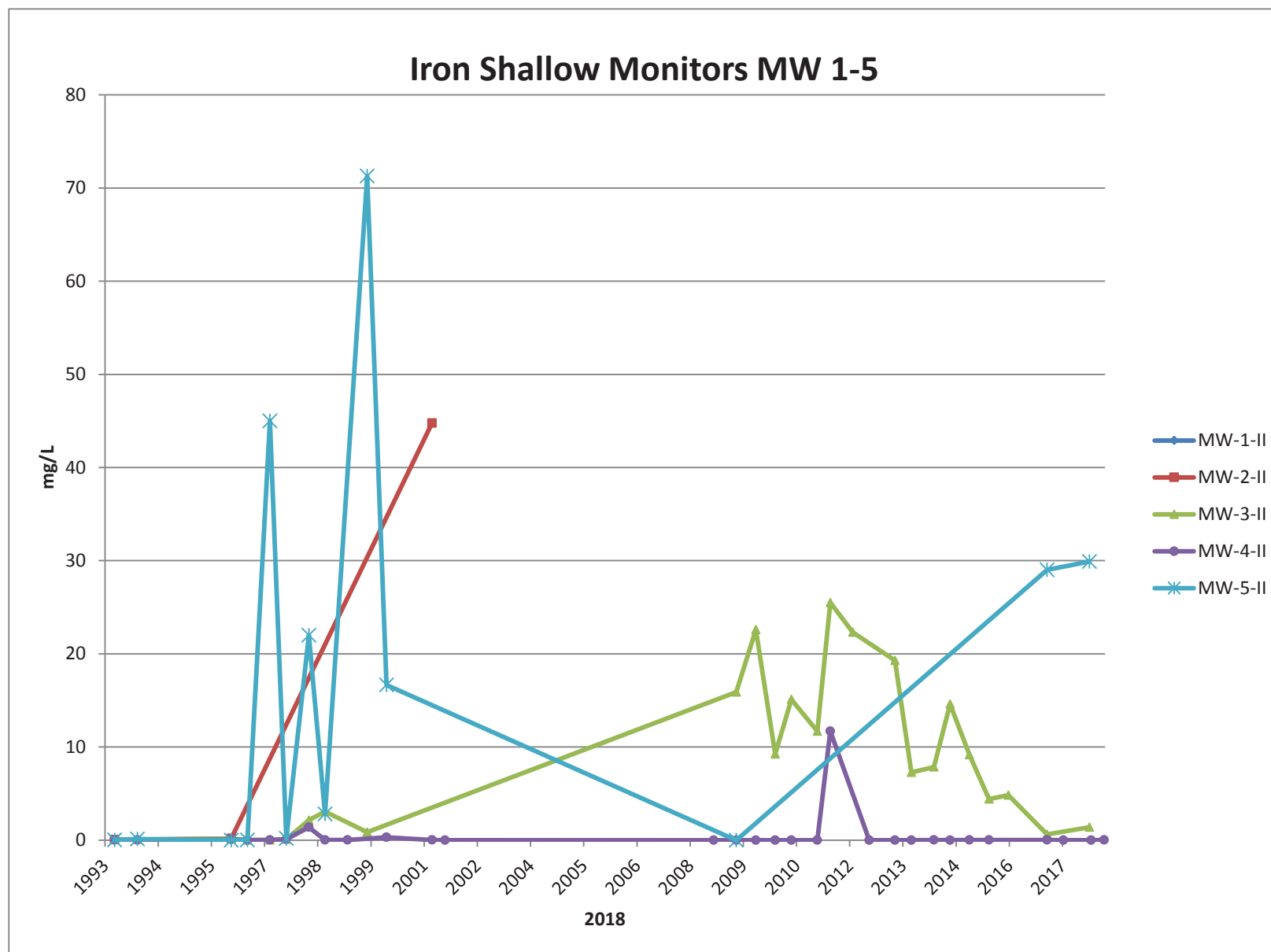


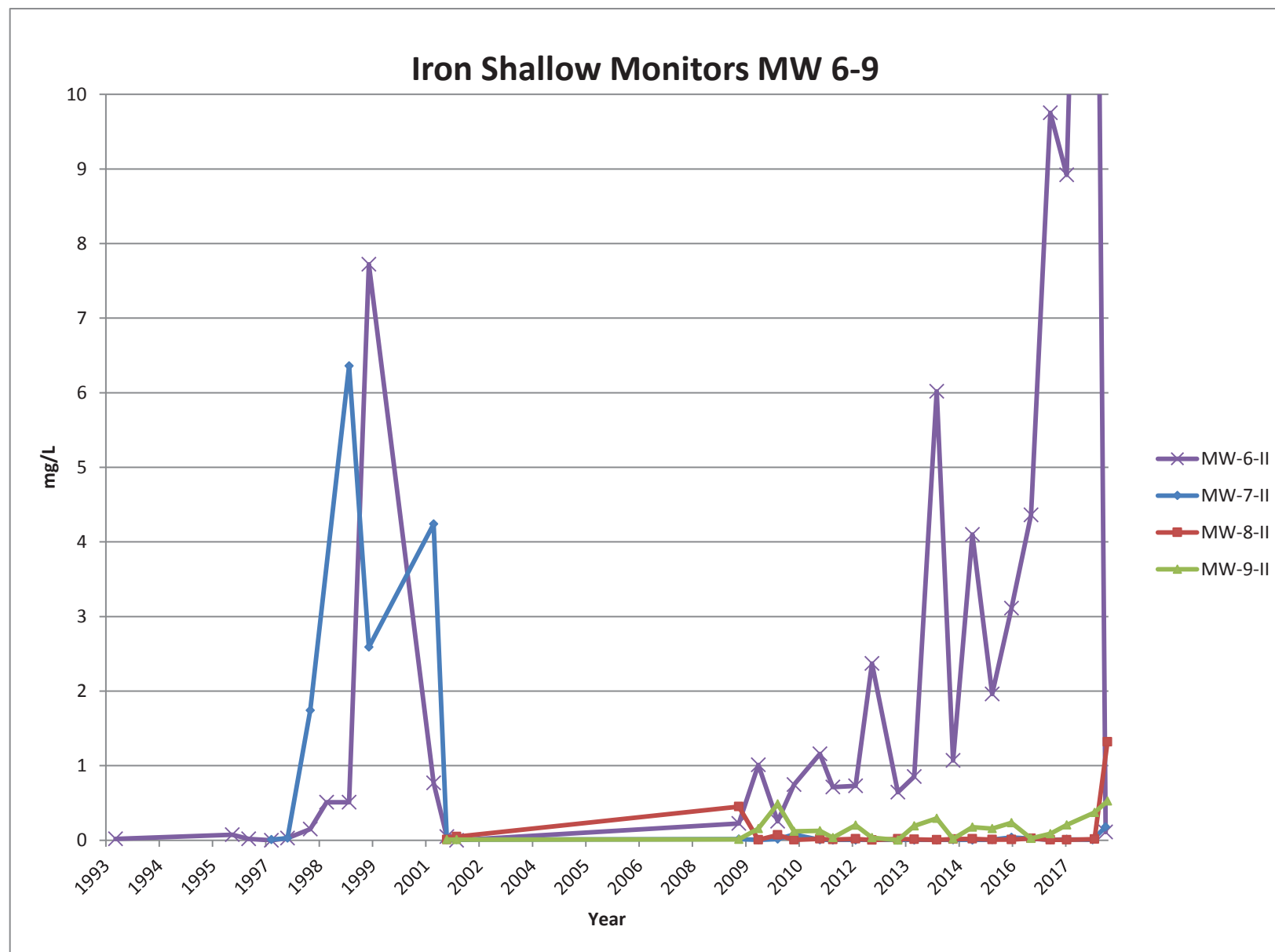


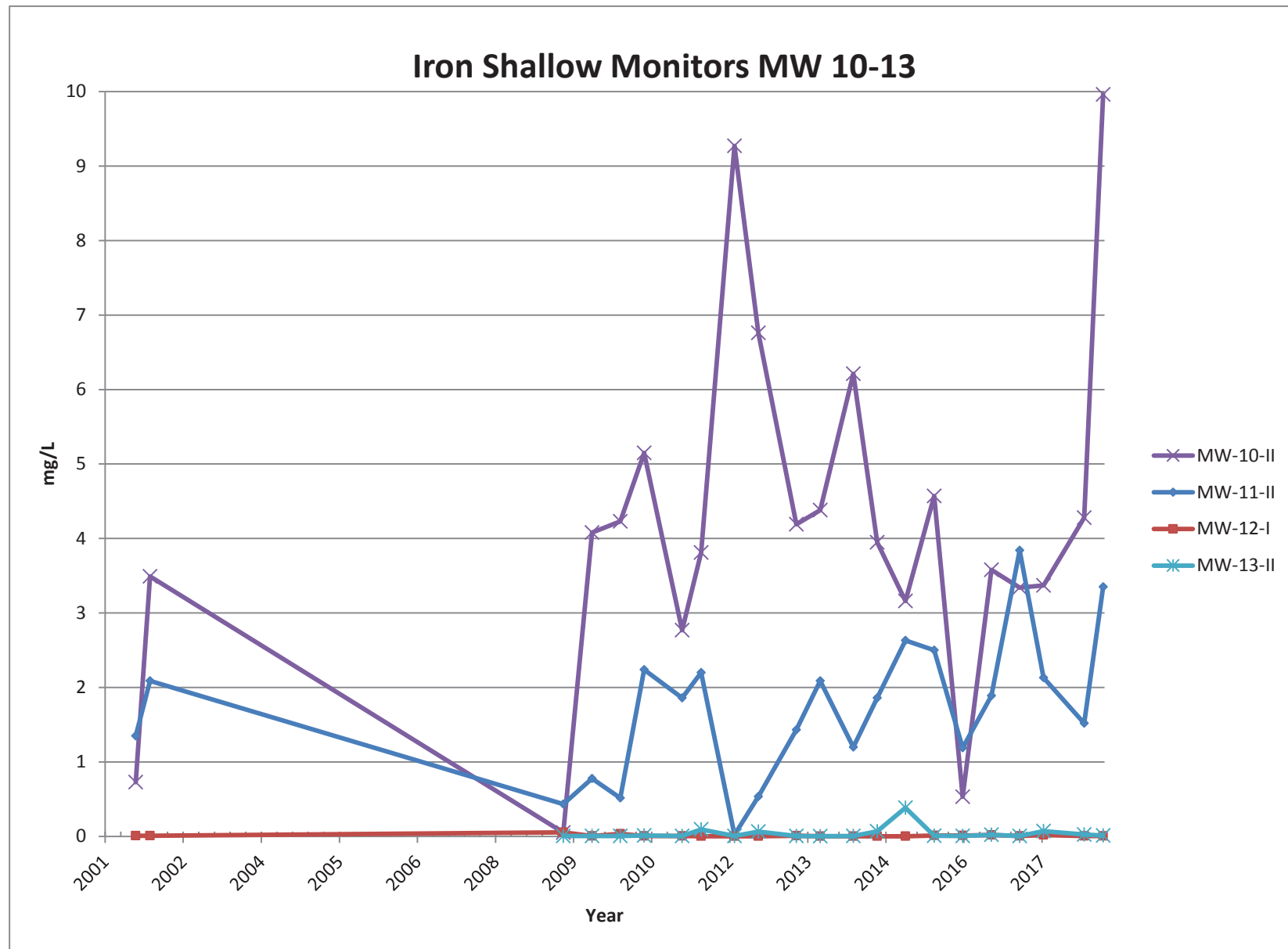


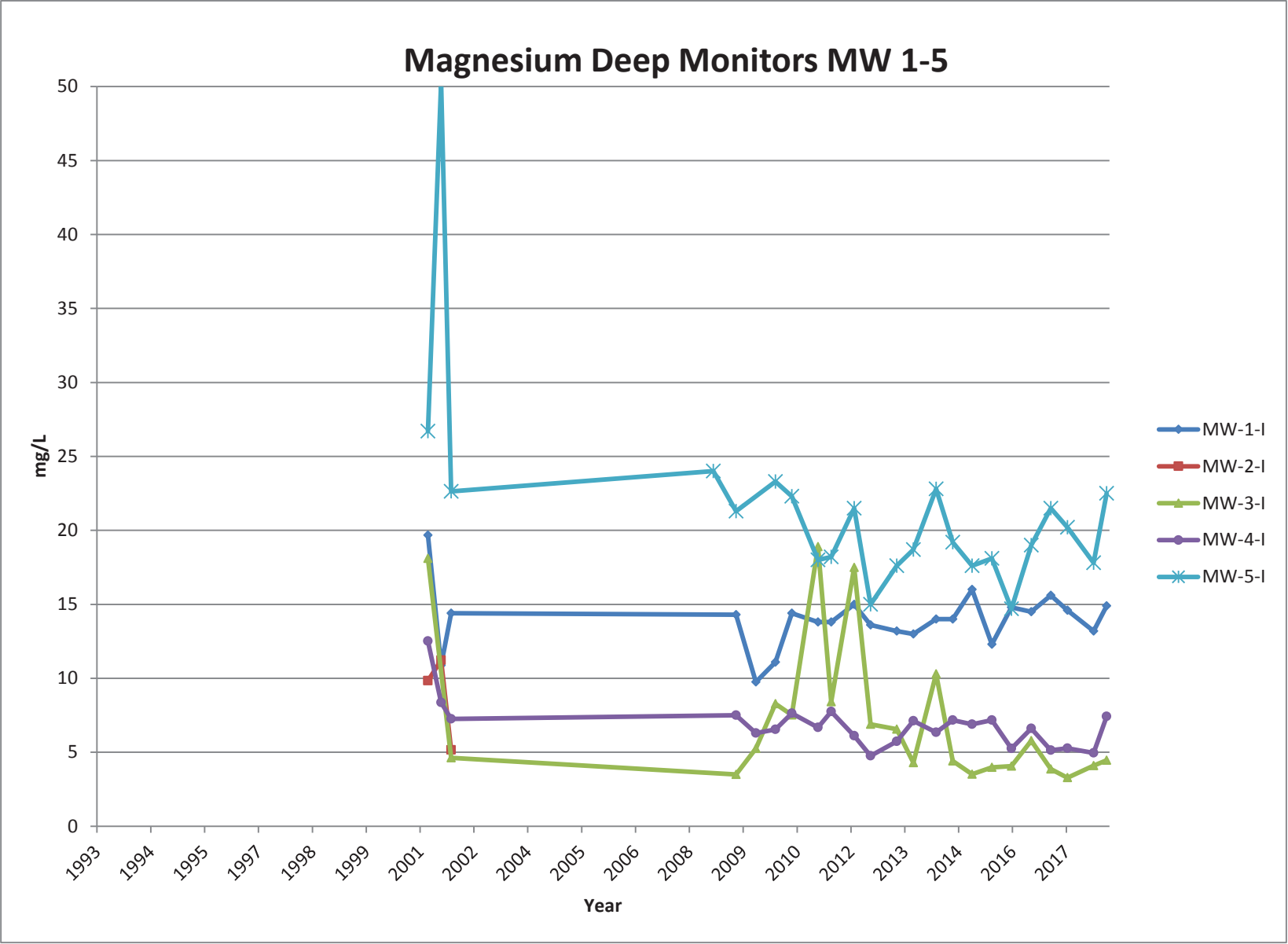




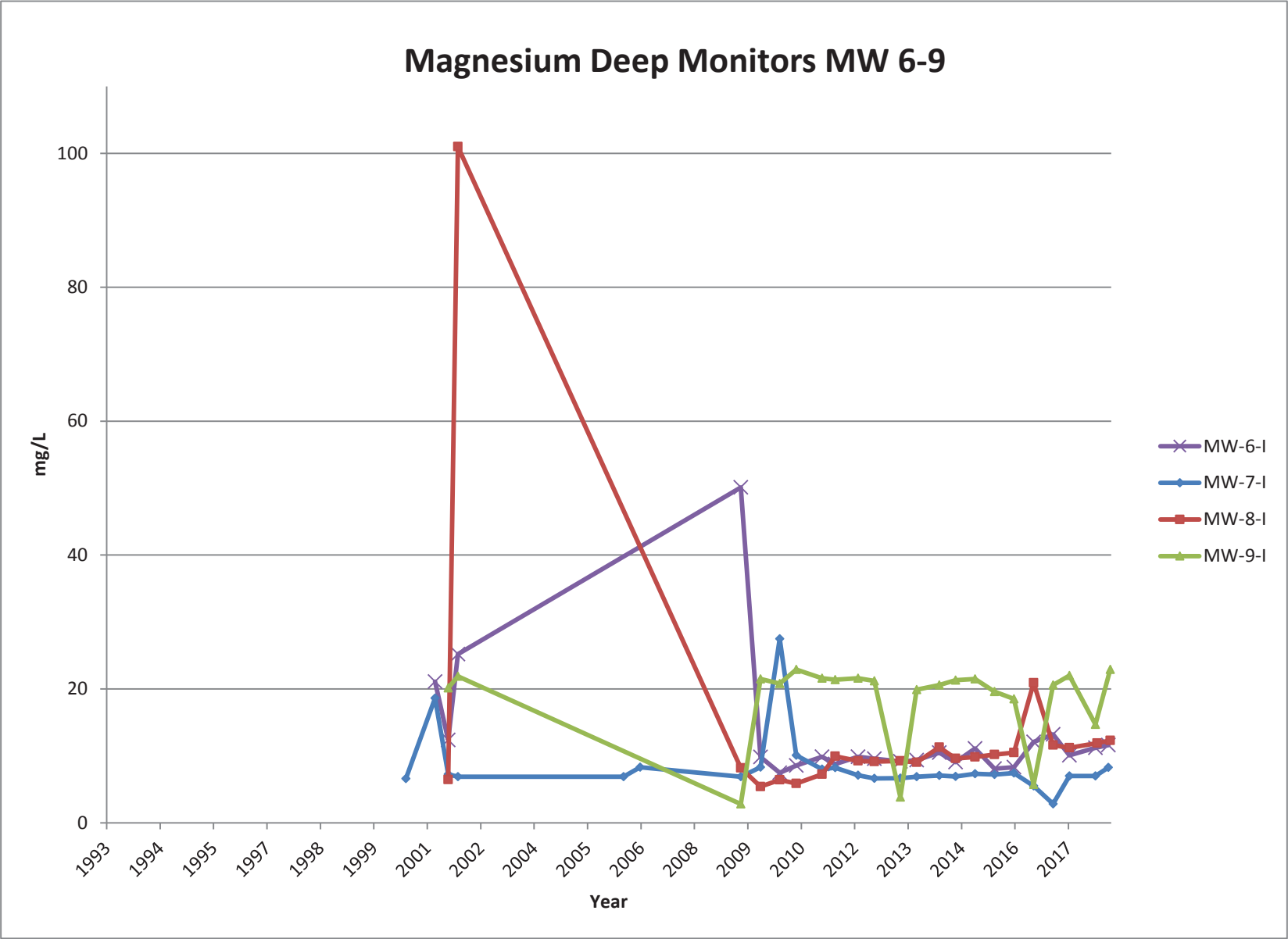


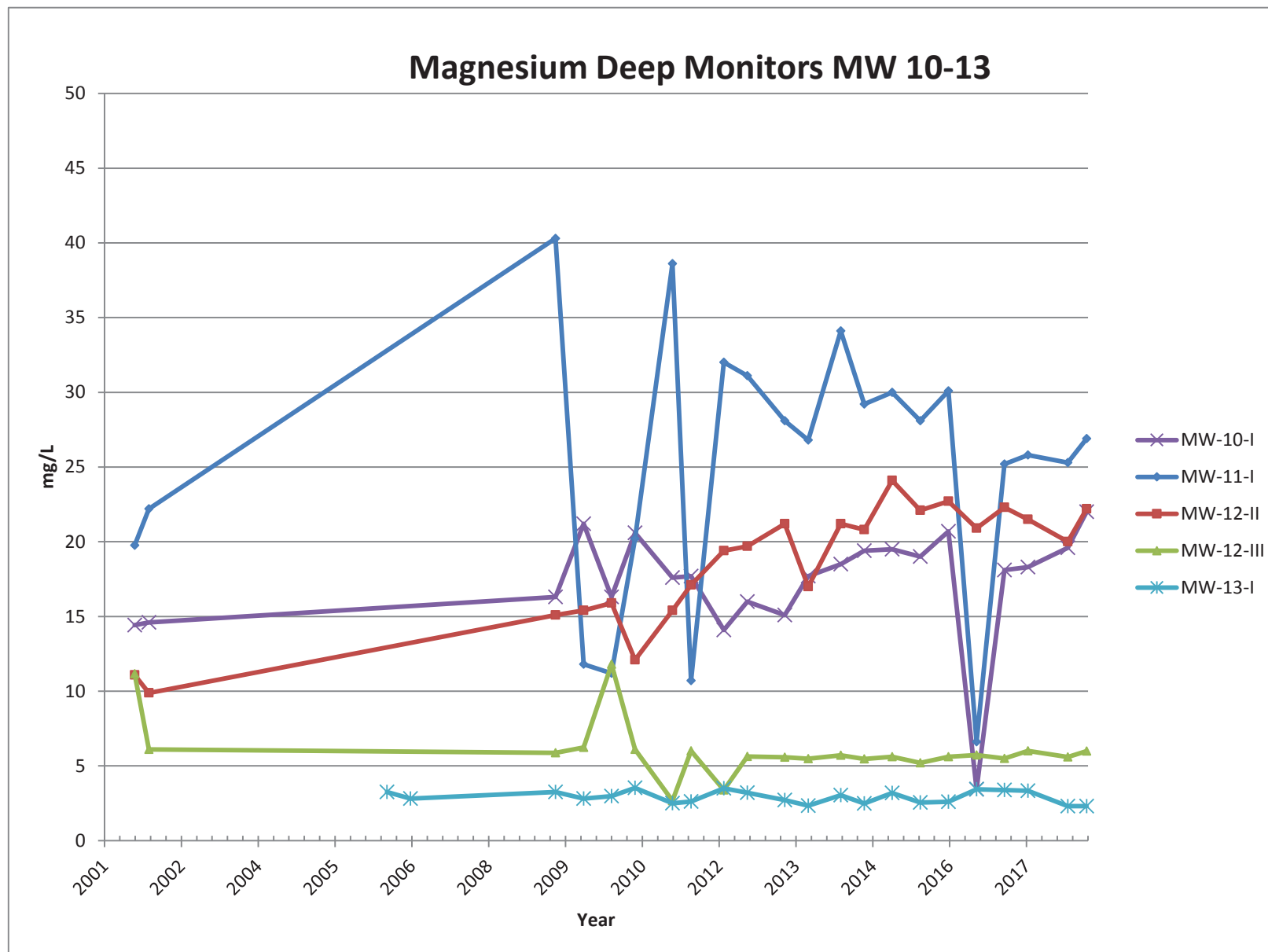


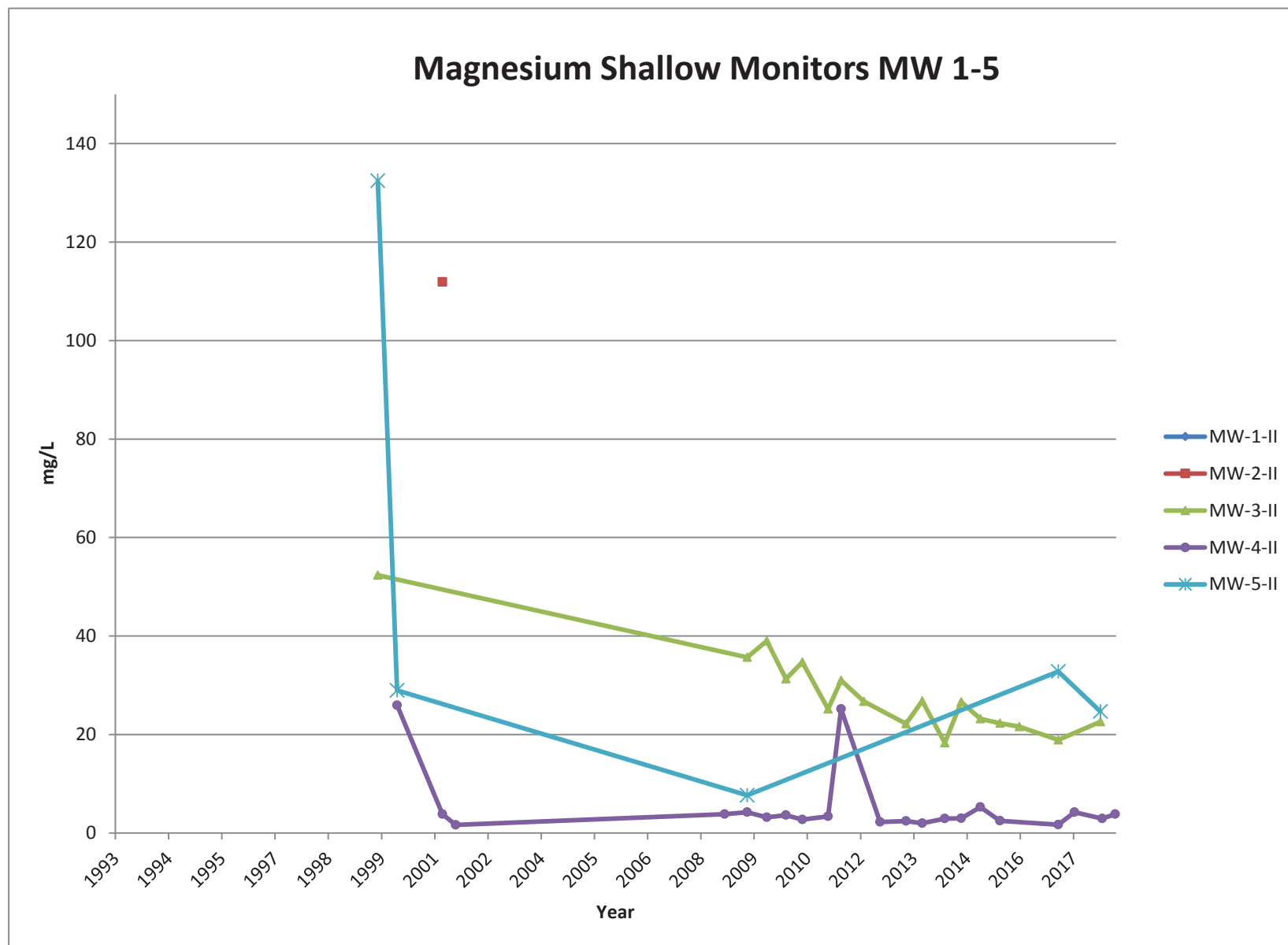




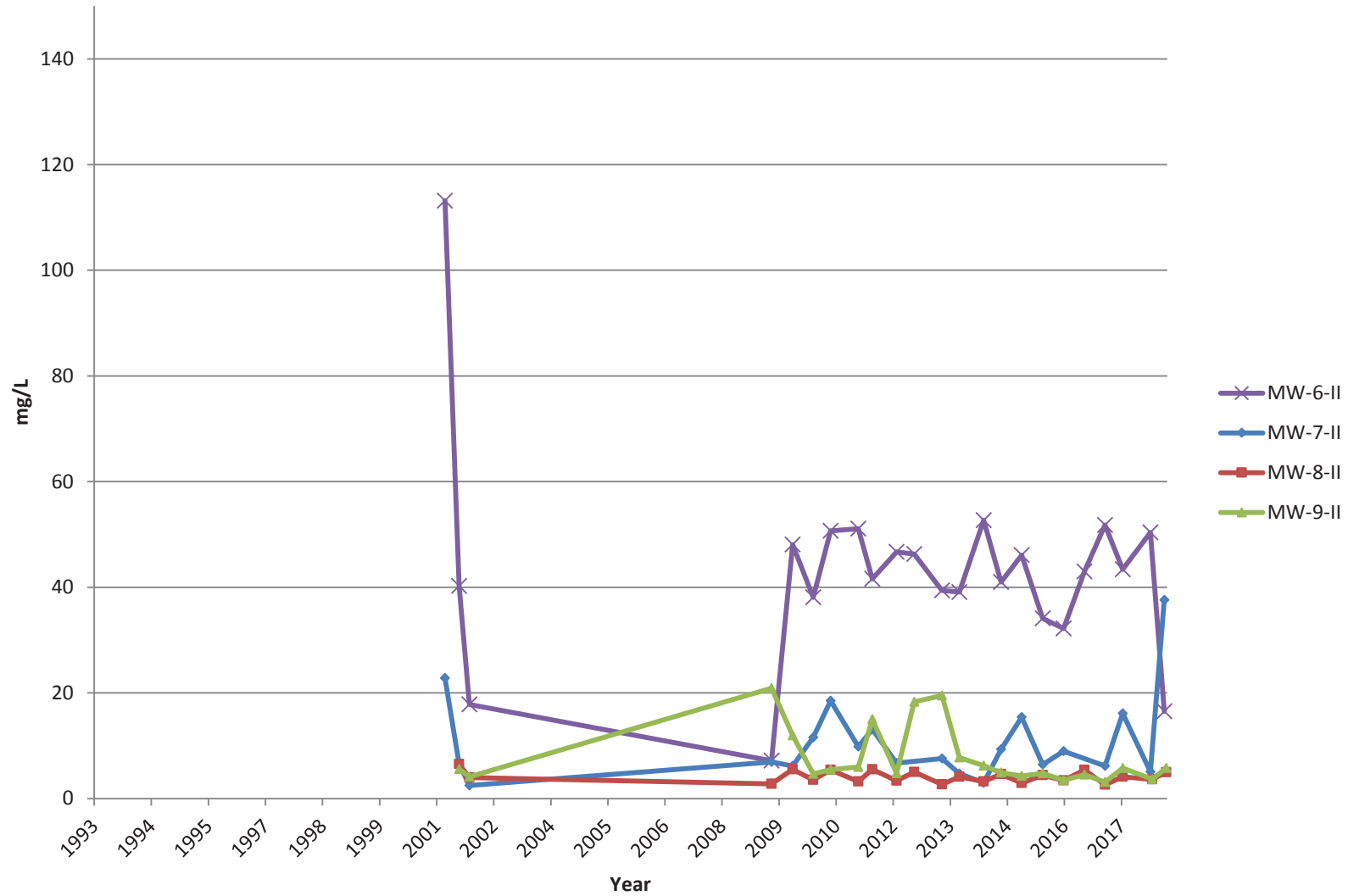


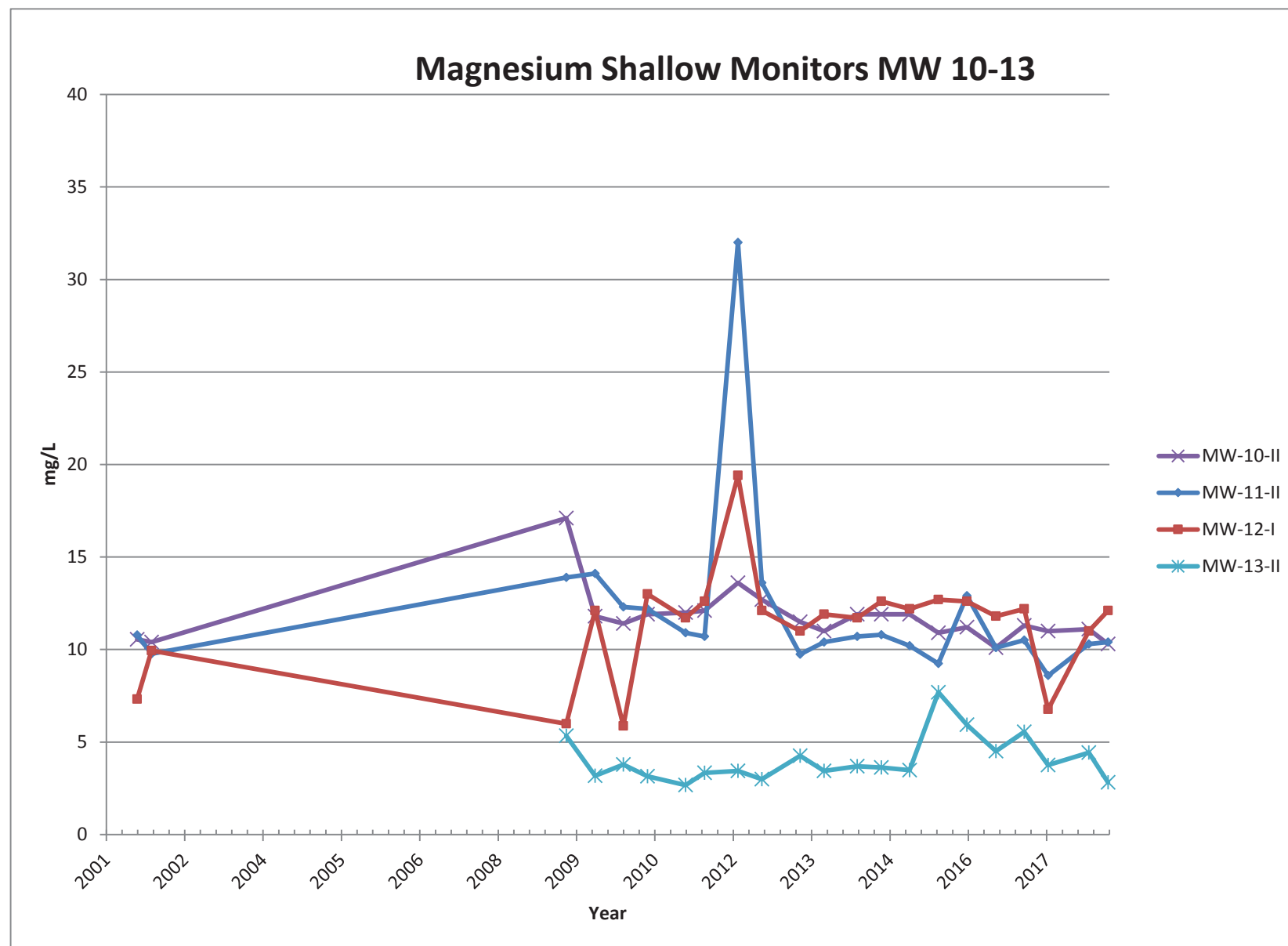


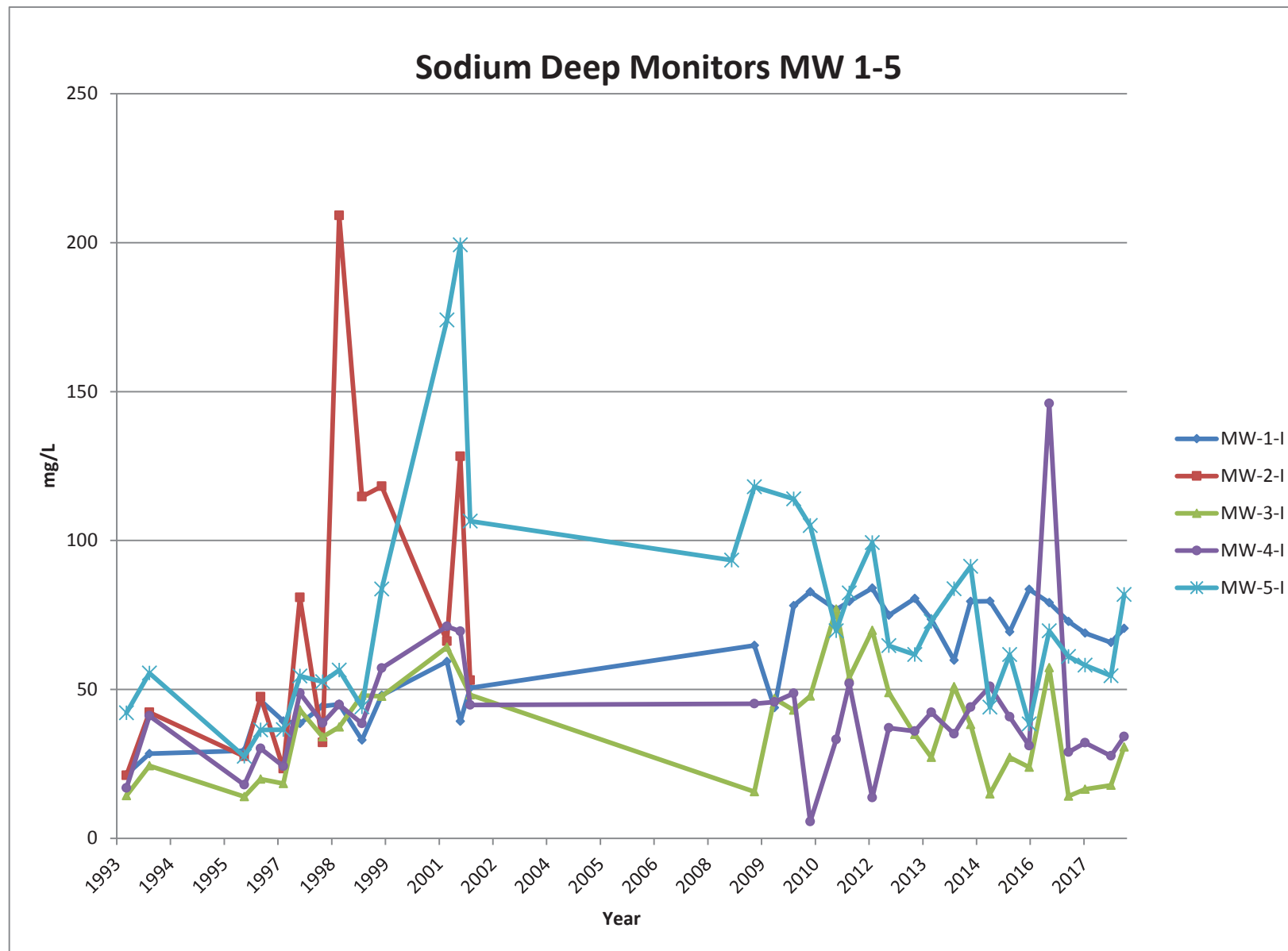


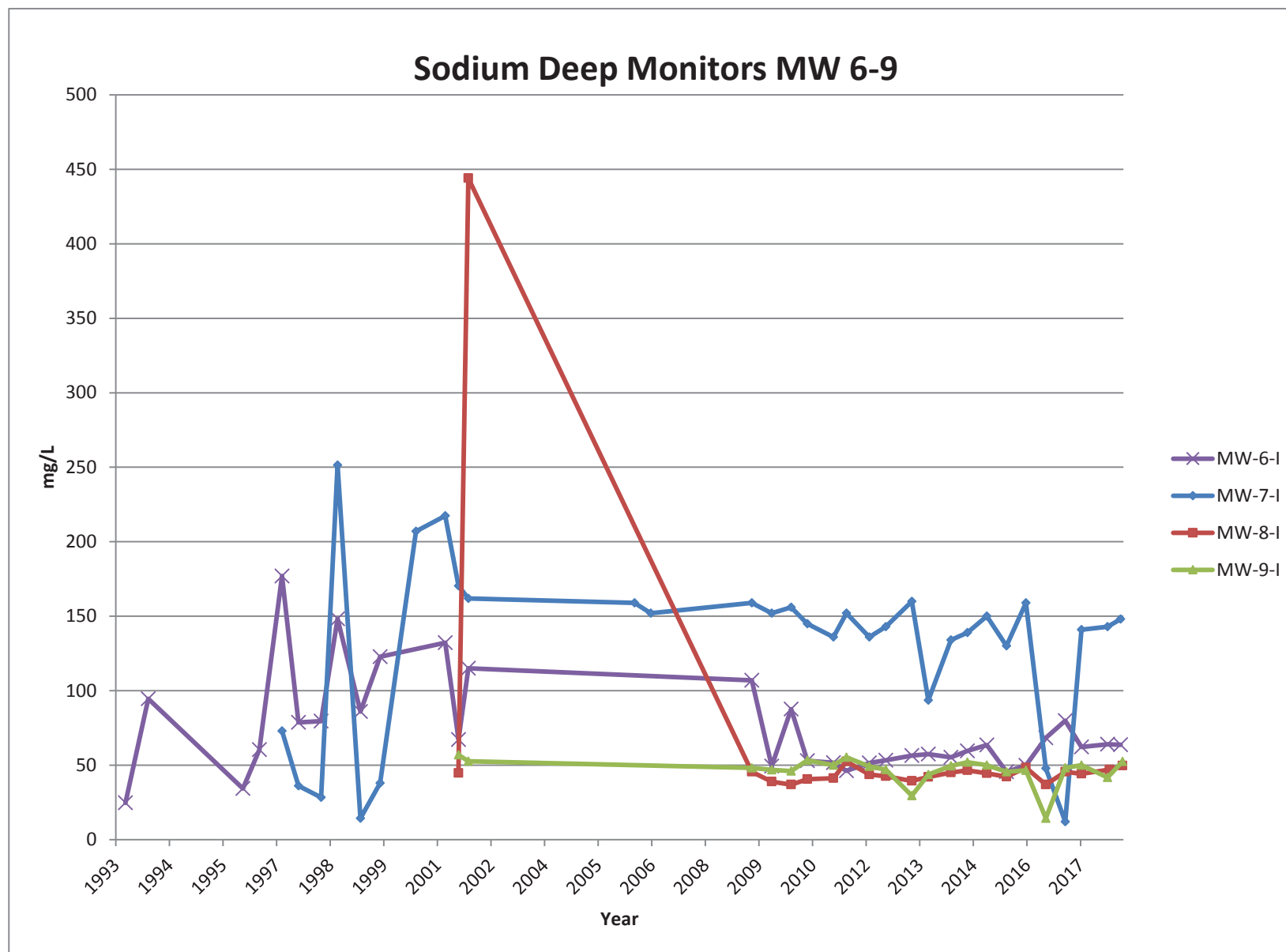


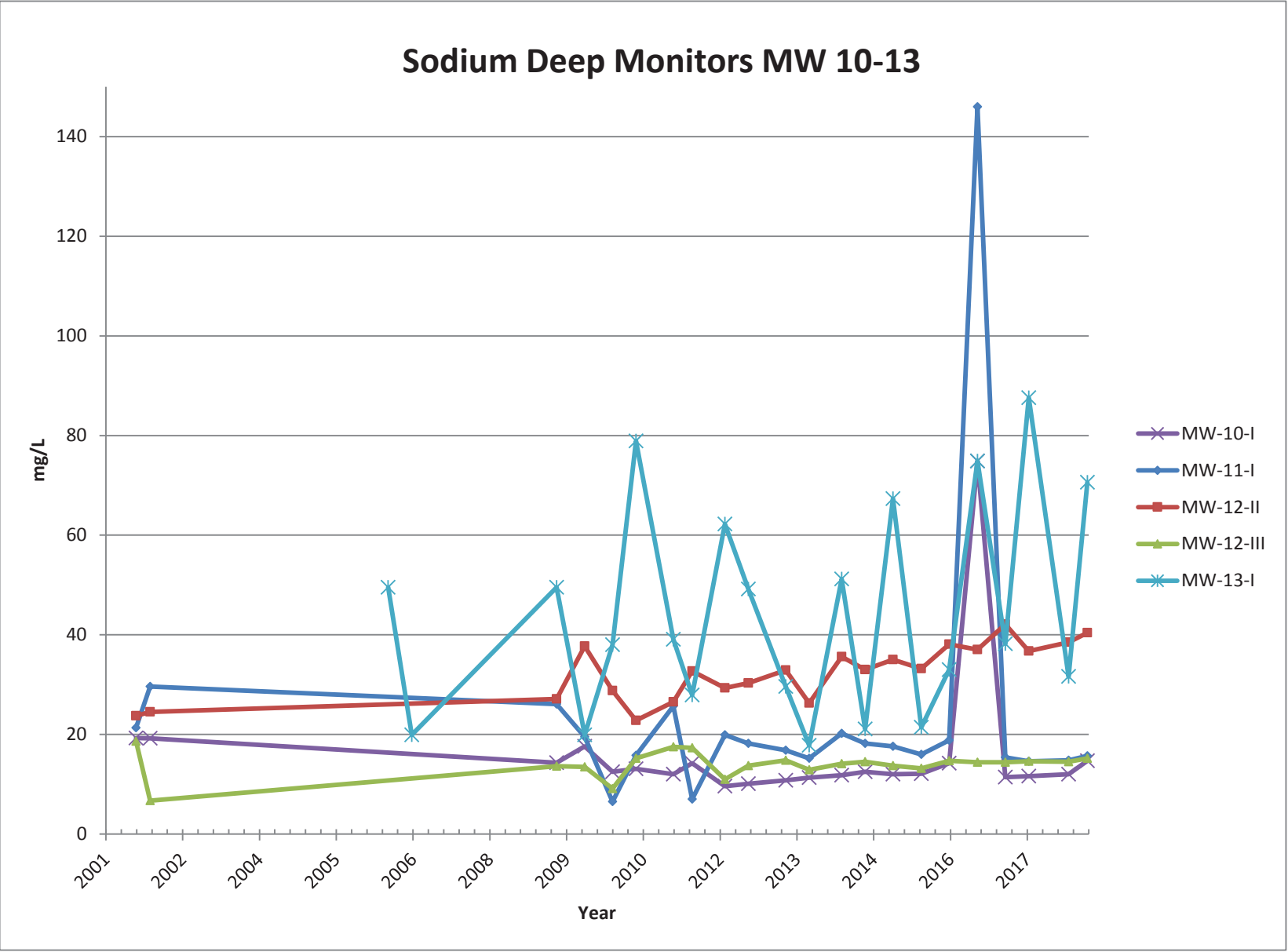
## Magnesium Shallow Monitors MW 6-9



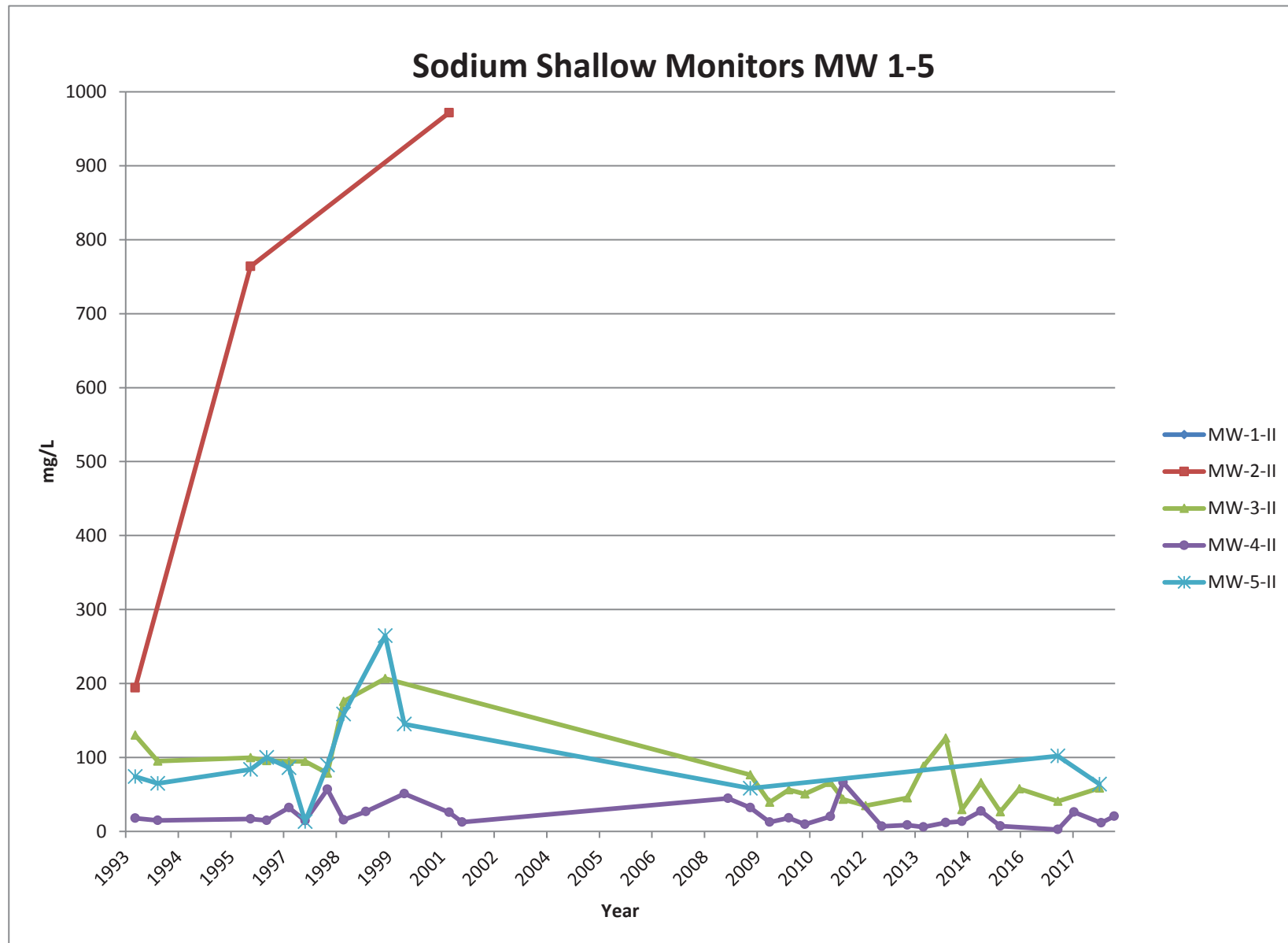


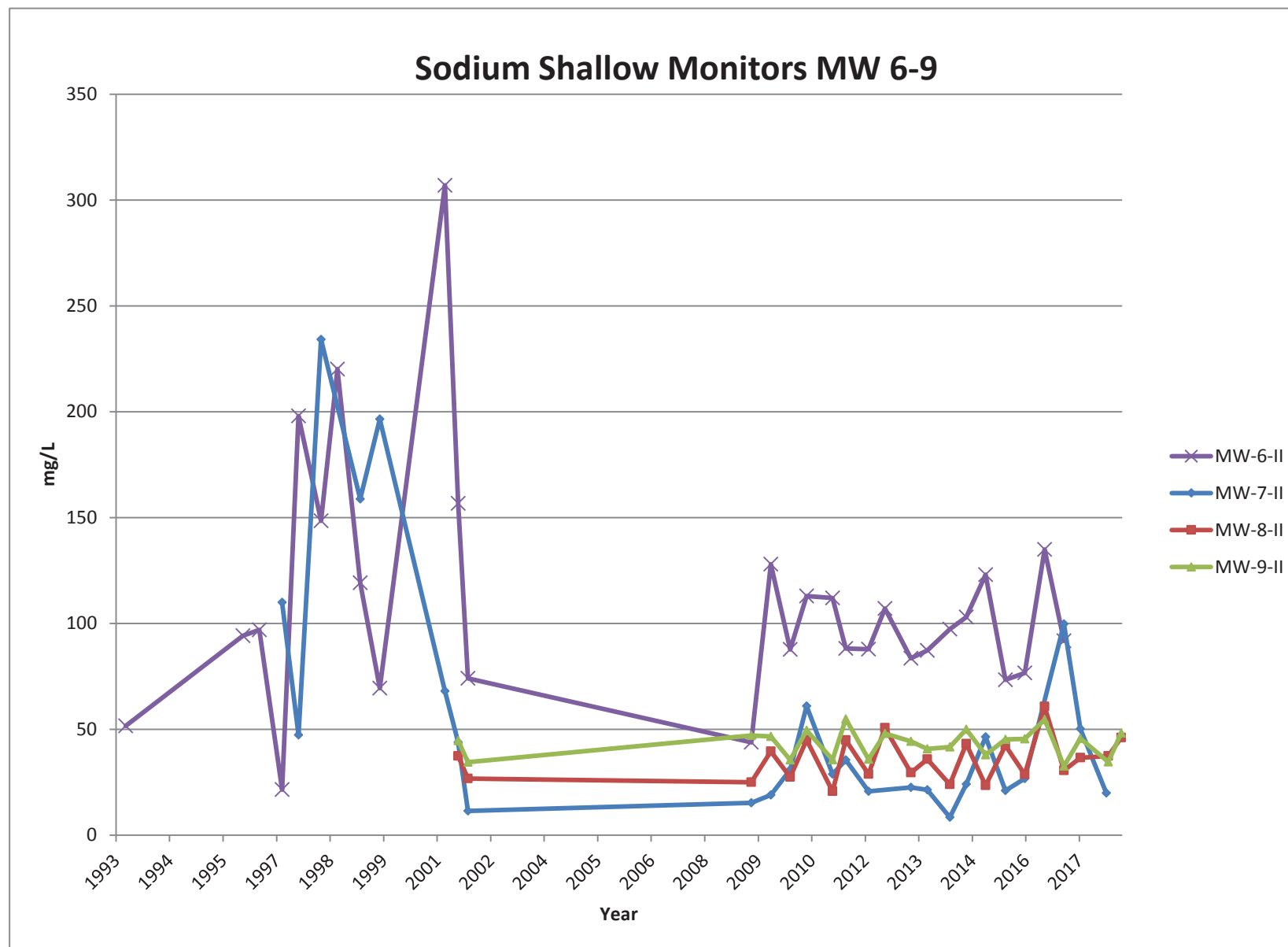


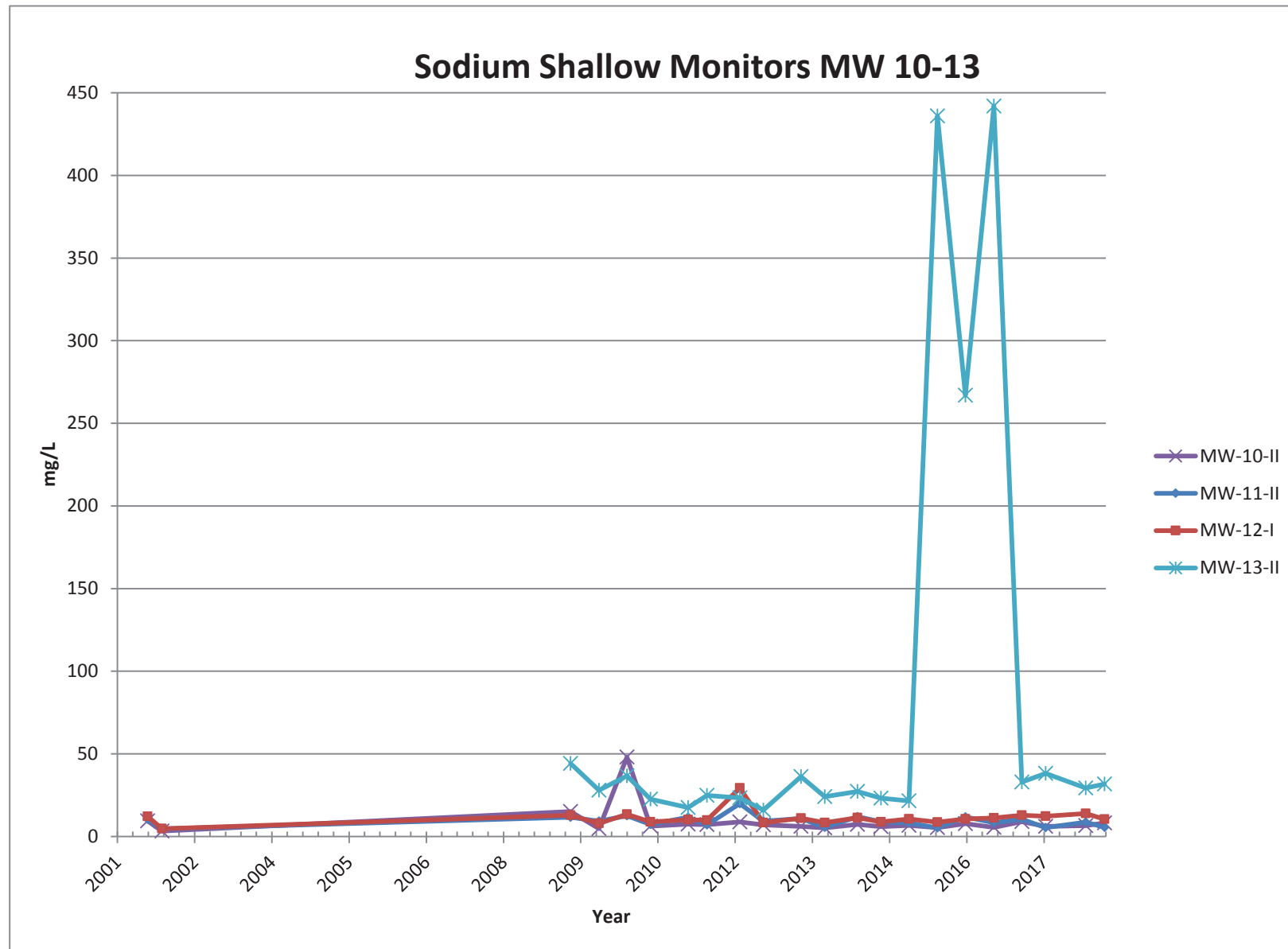


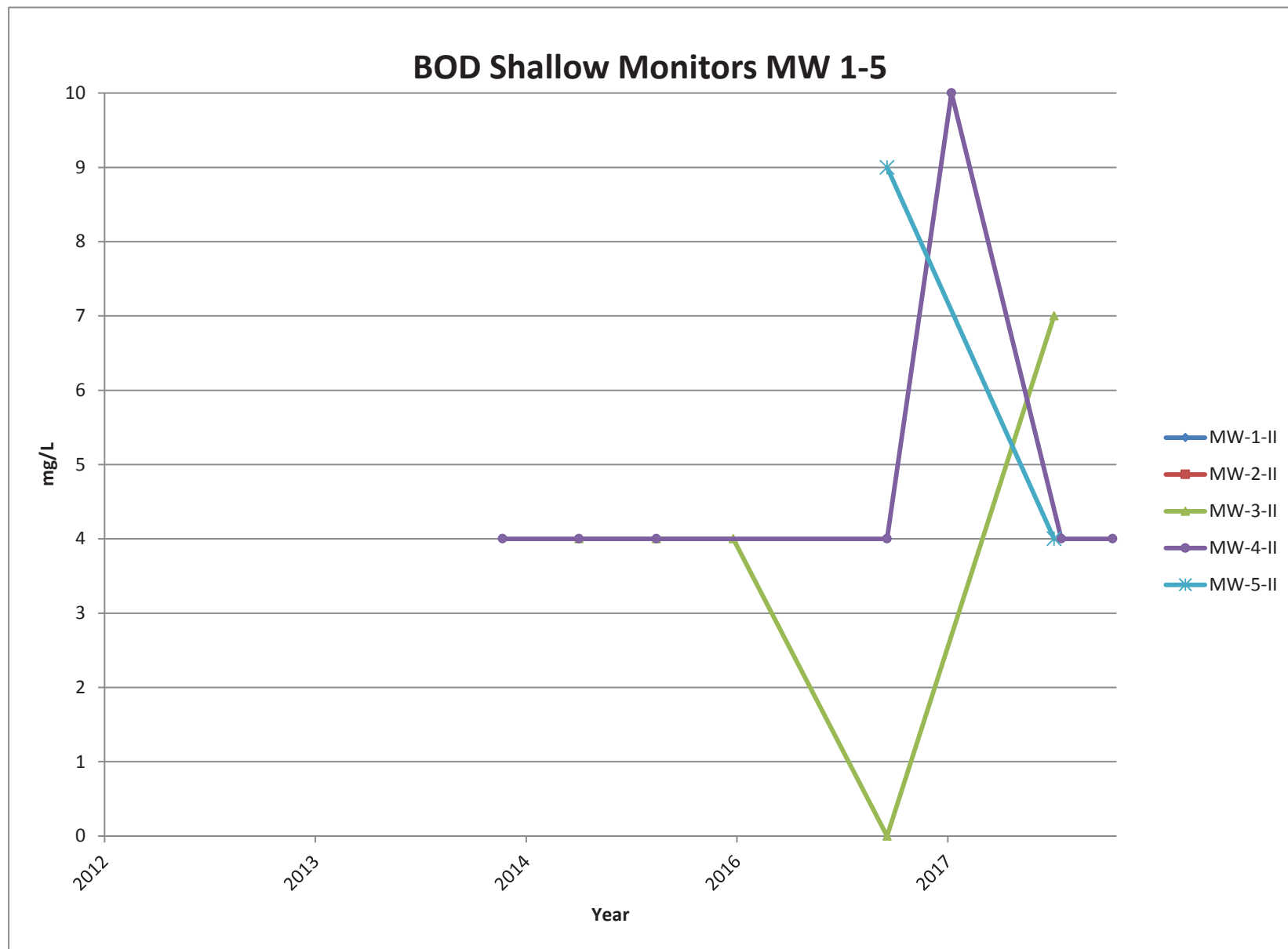


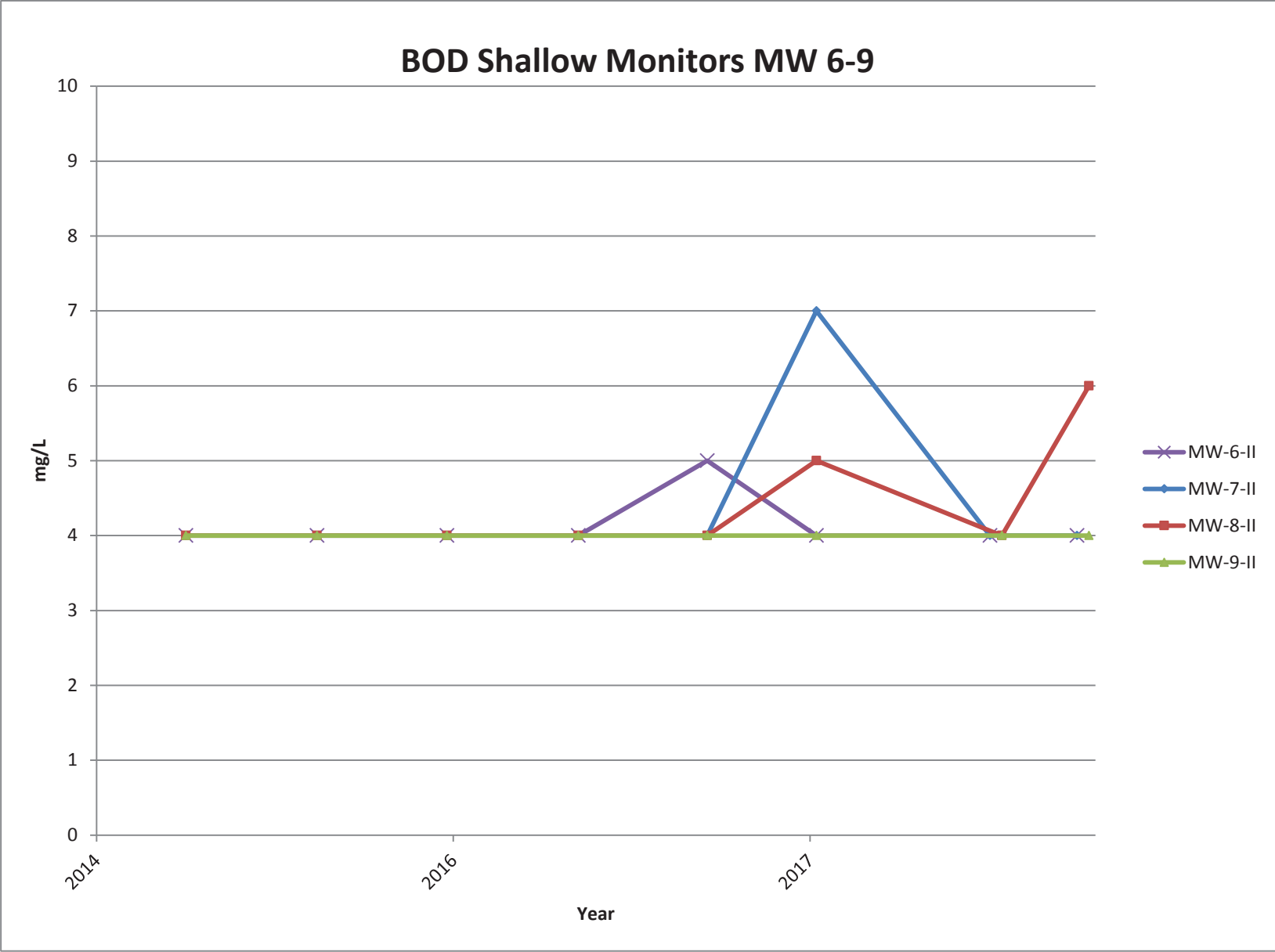


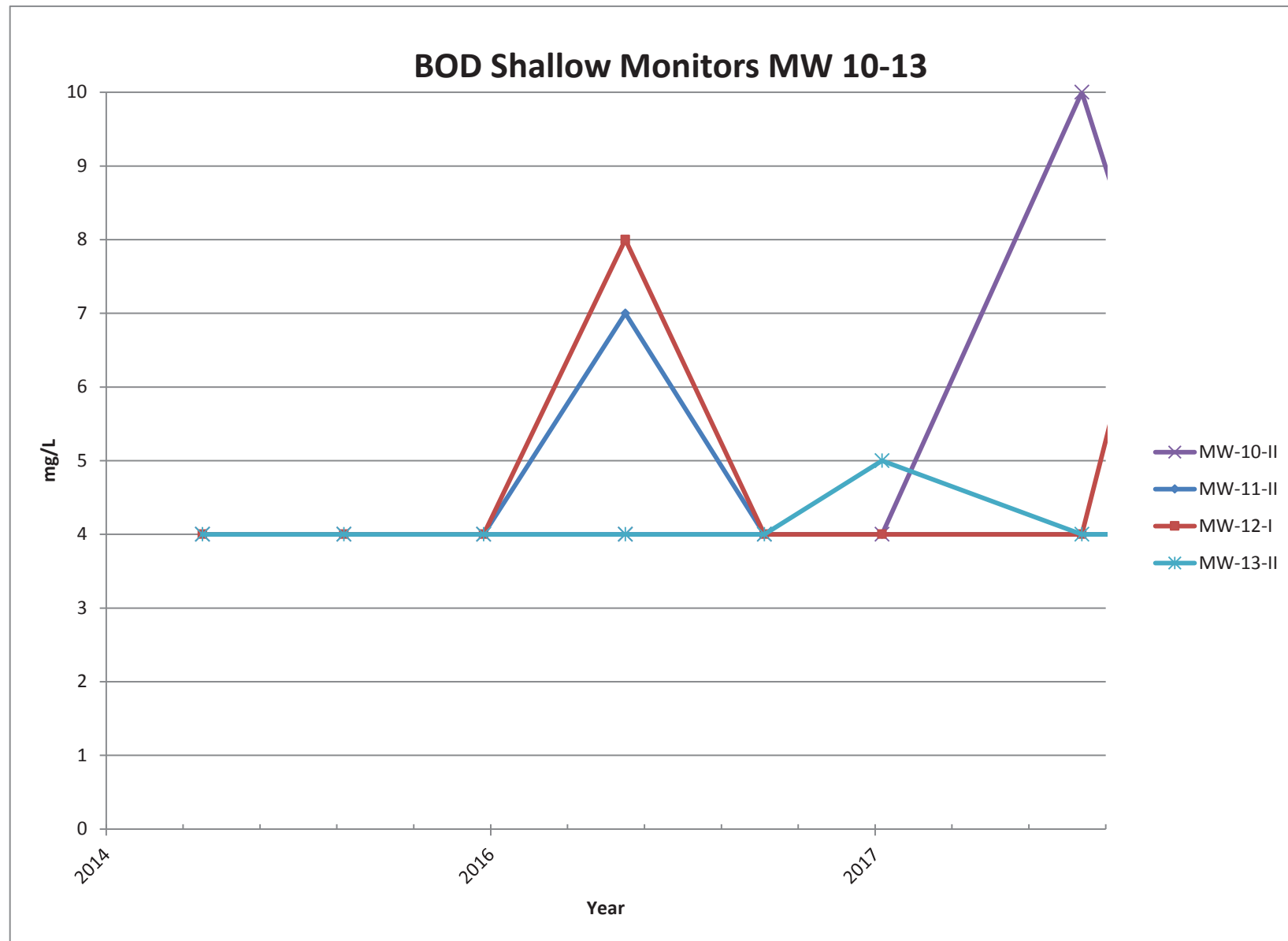


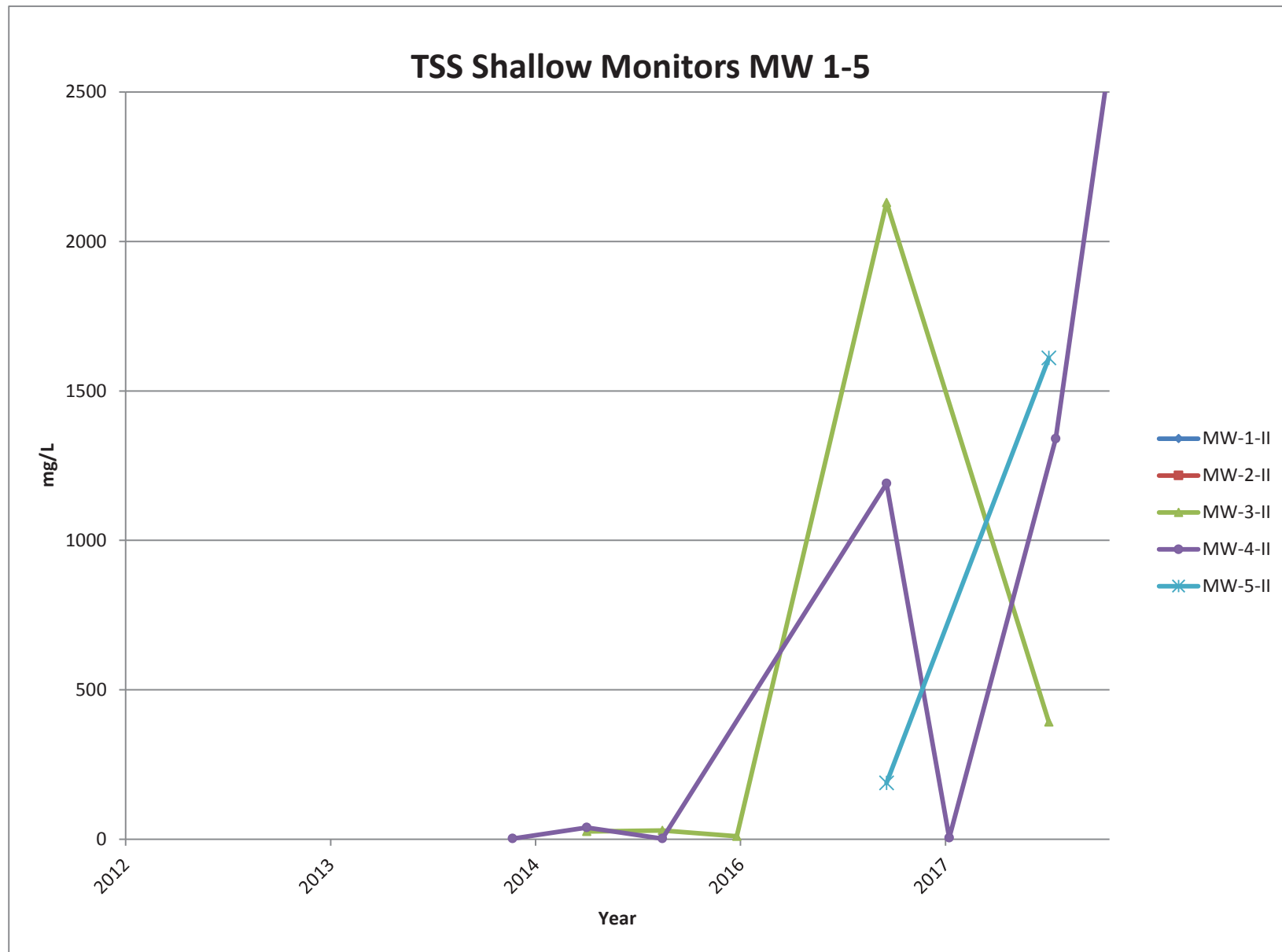


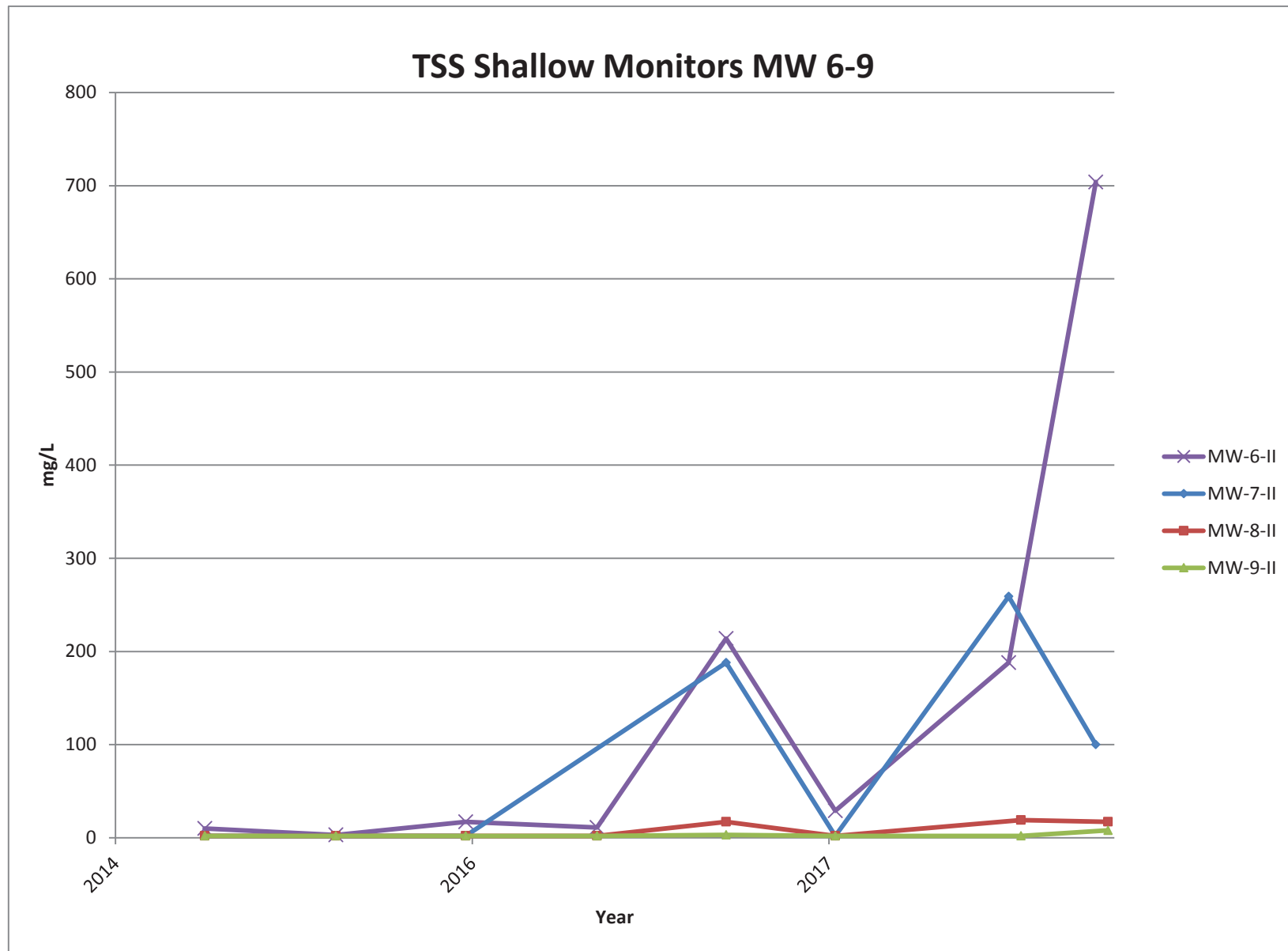




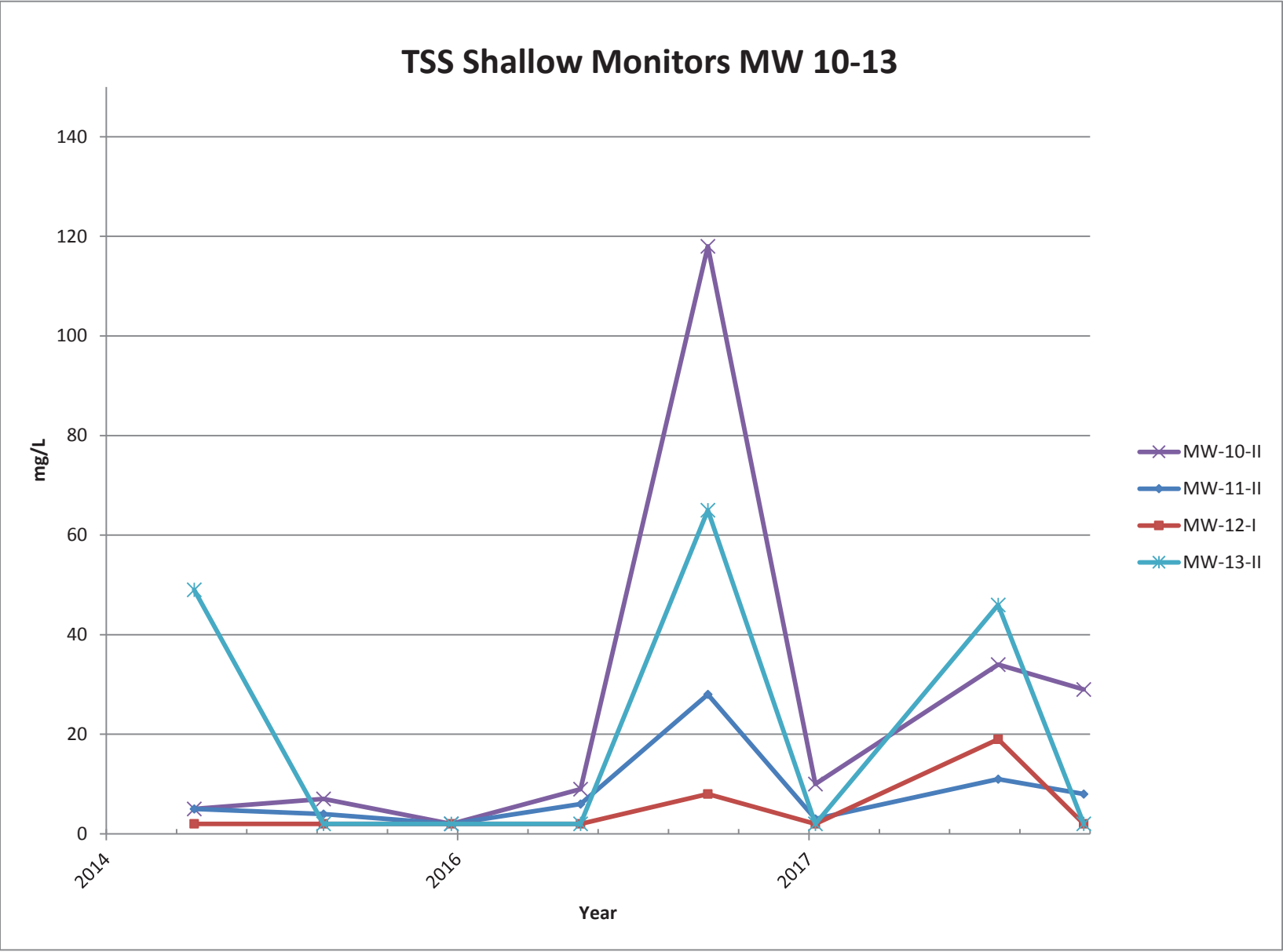








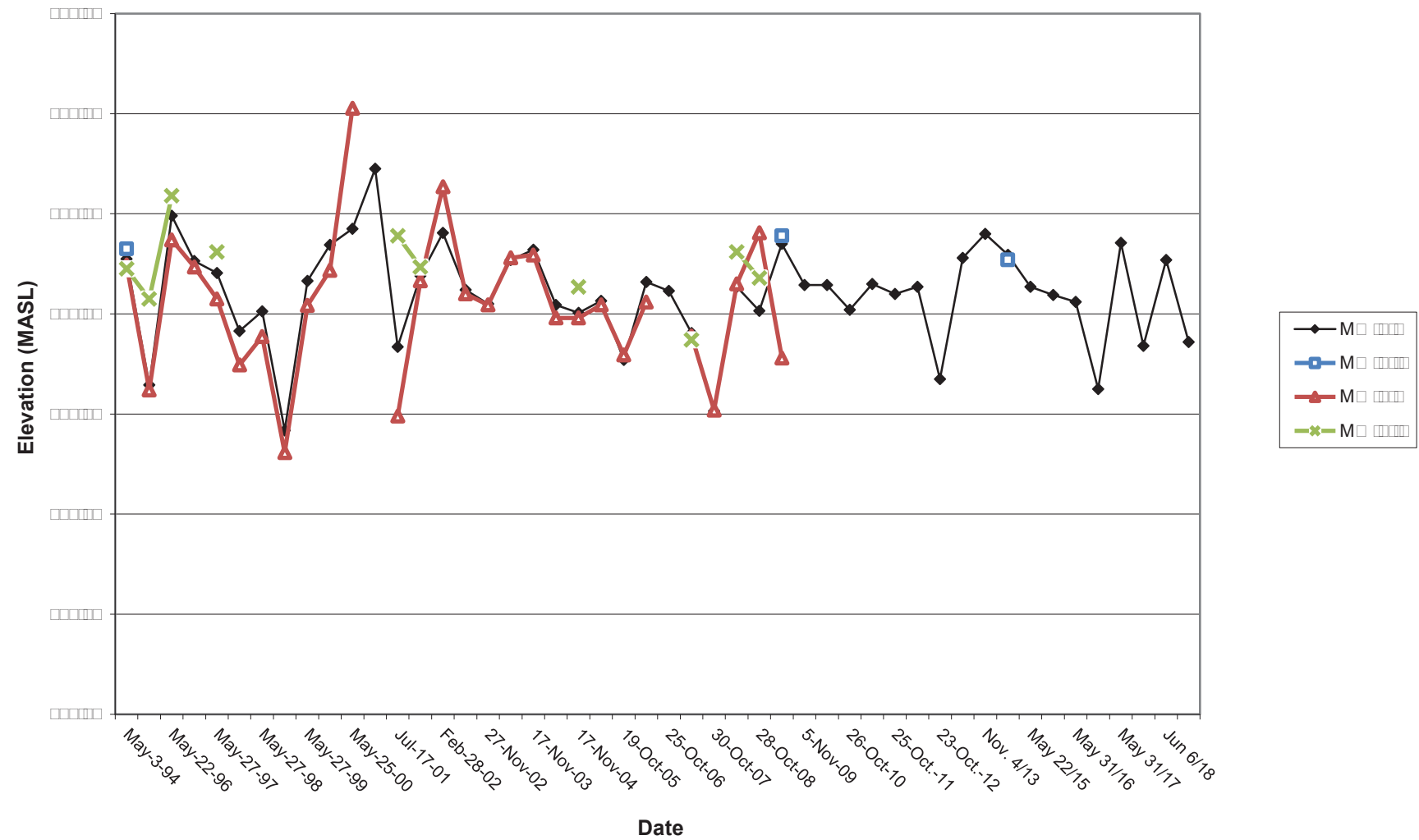




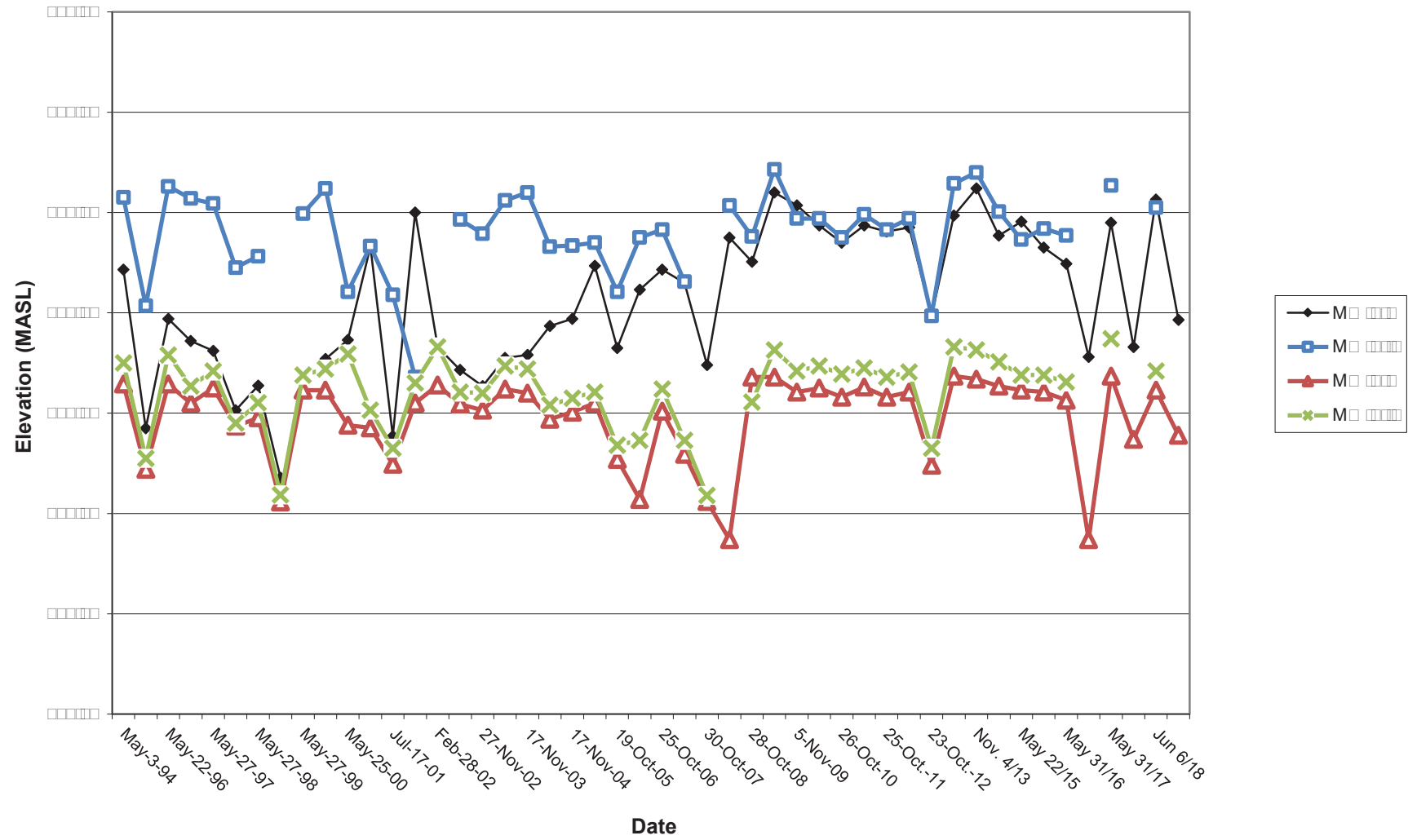
## **Appendix D**

# **Water Level Elevations and Hydraulic Gradient Graphs**

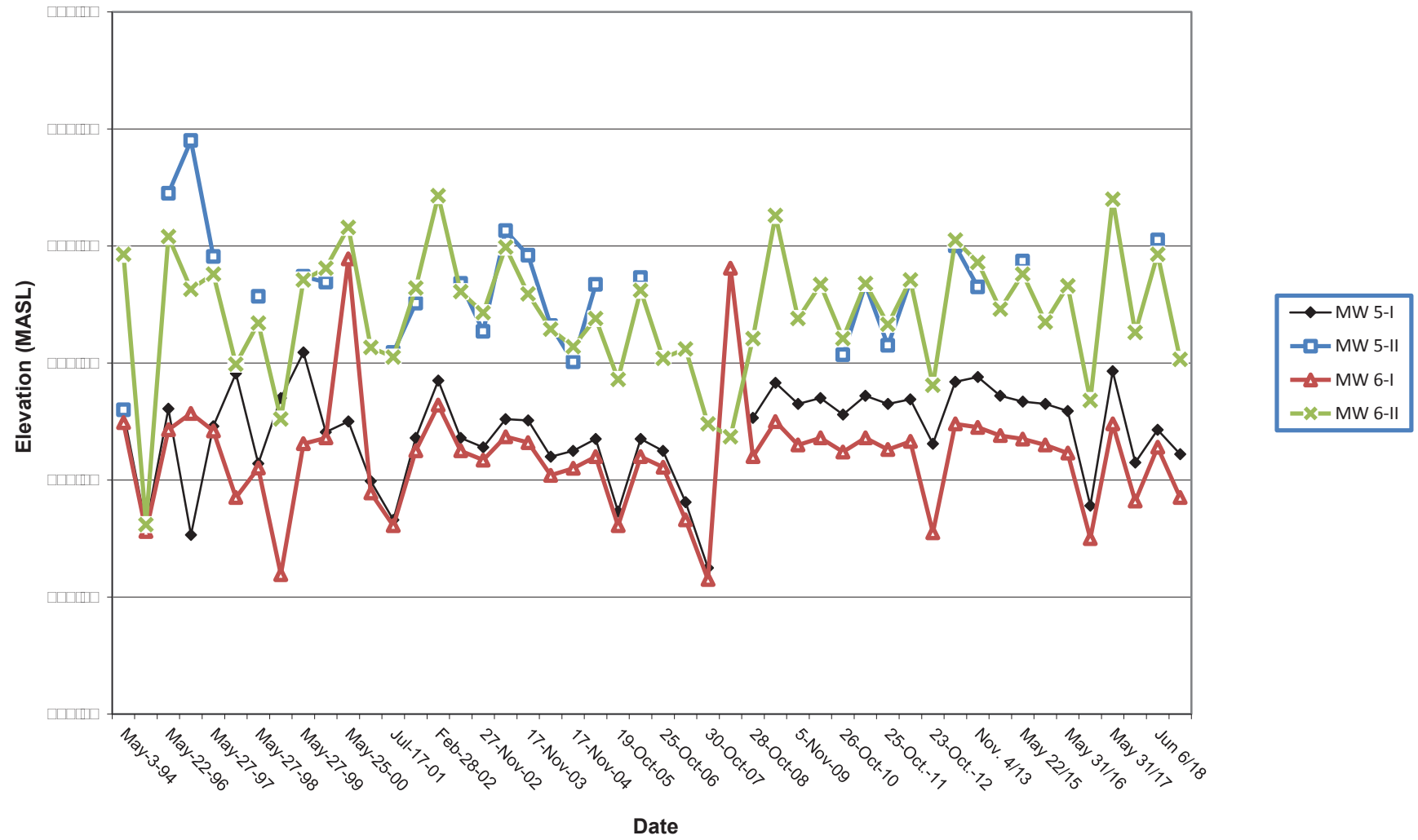
WATERLEVEL ELEVATION



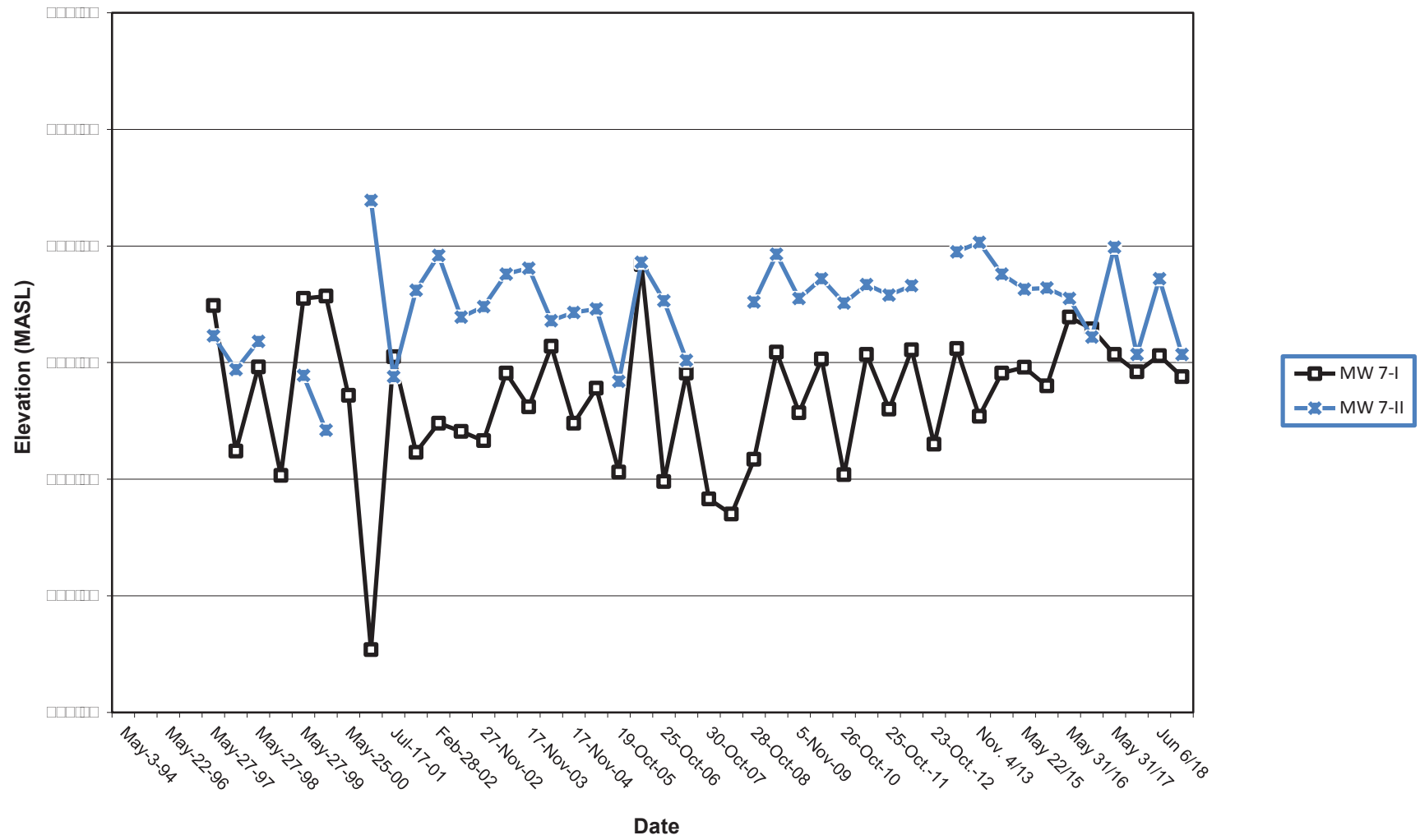
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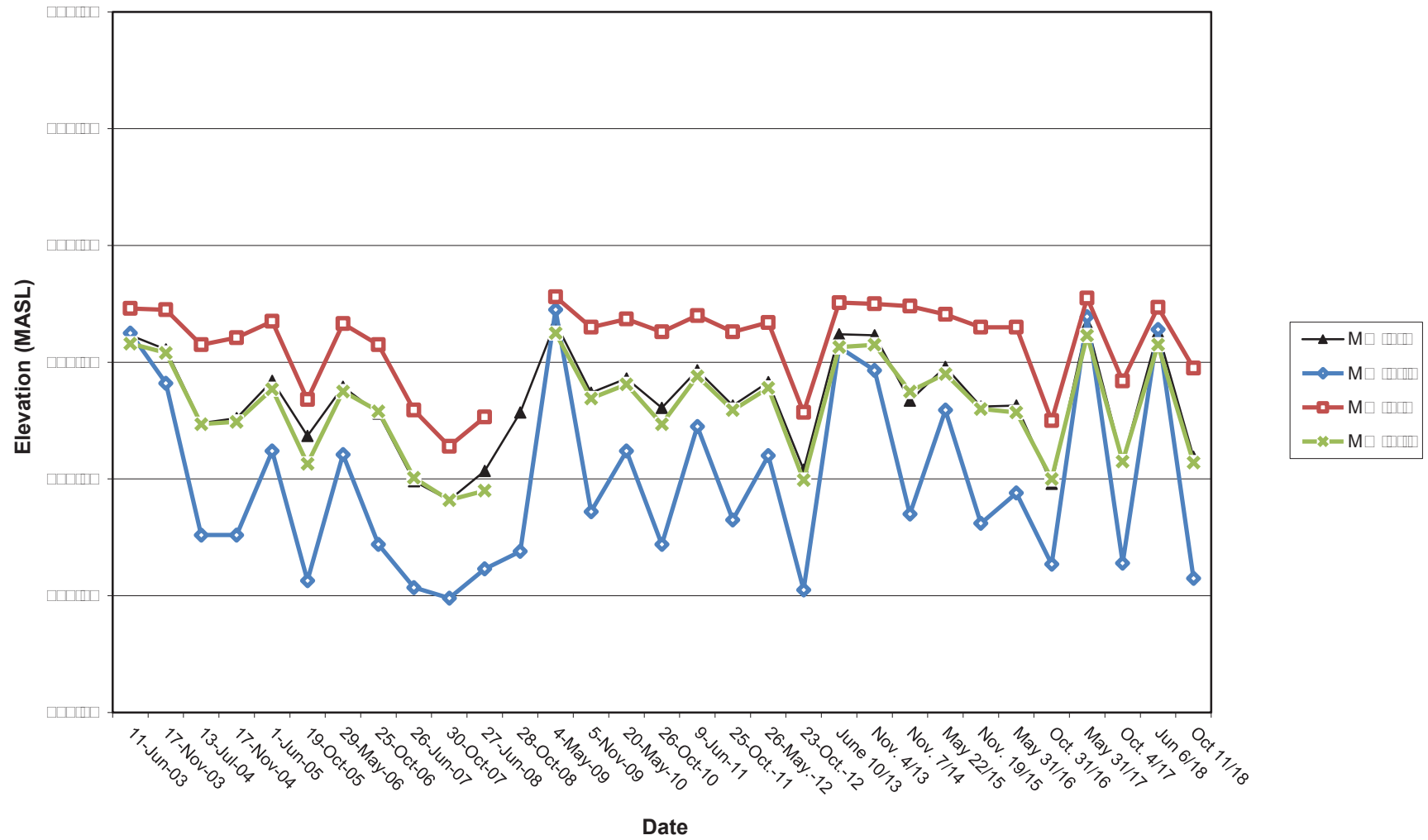
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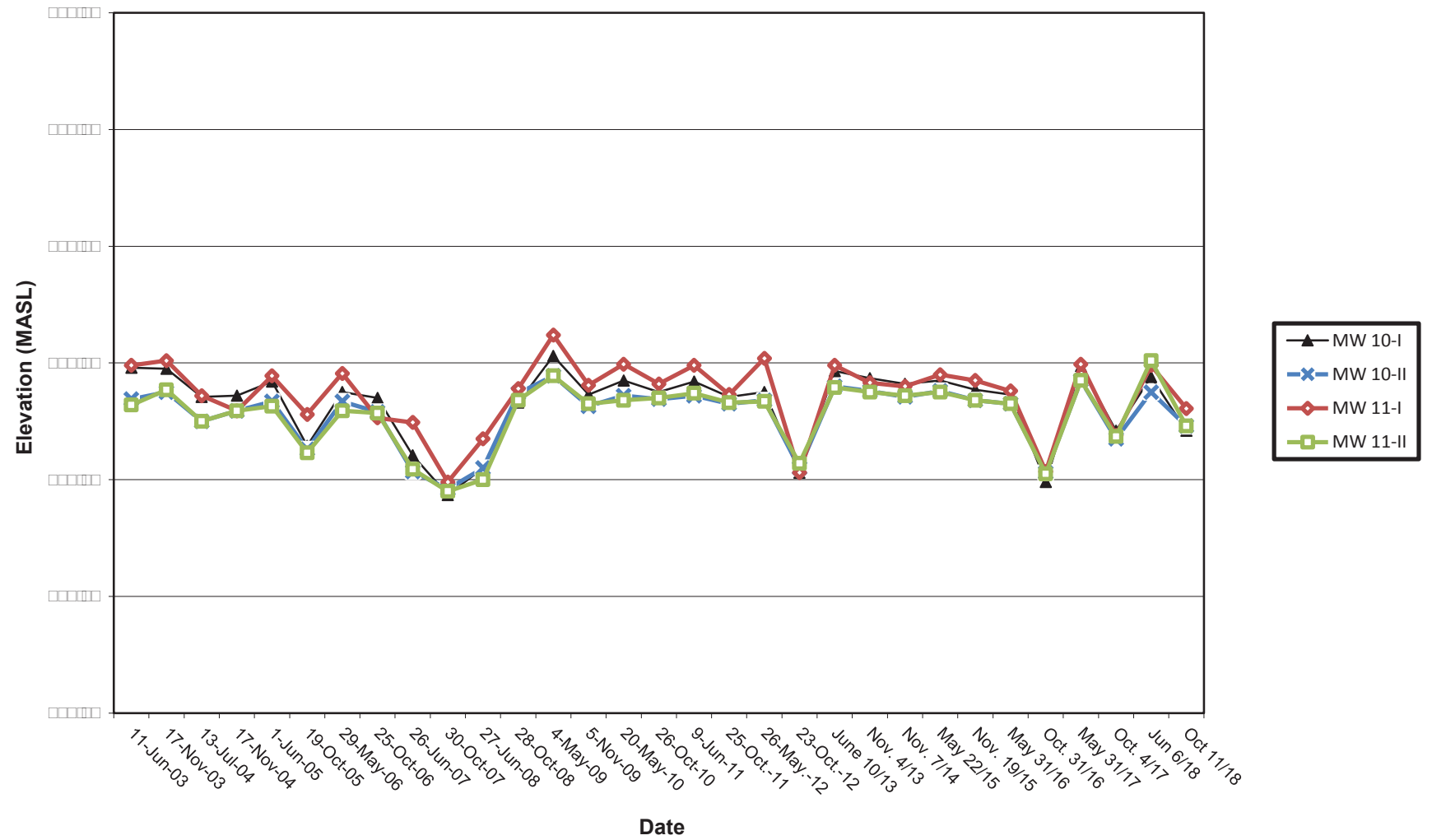
# WATERLEVEL ELEVATIONS



# WATERLEVEL ELEVATIONS

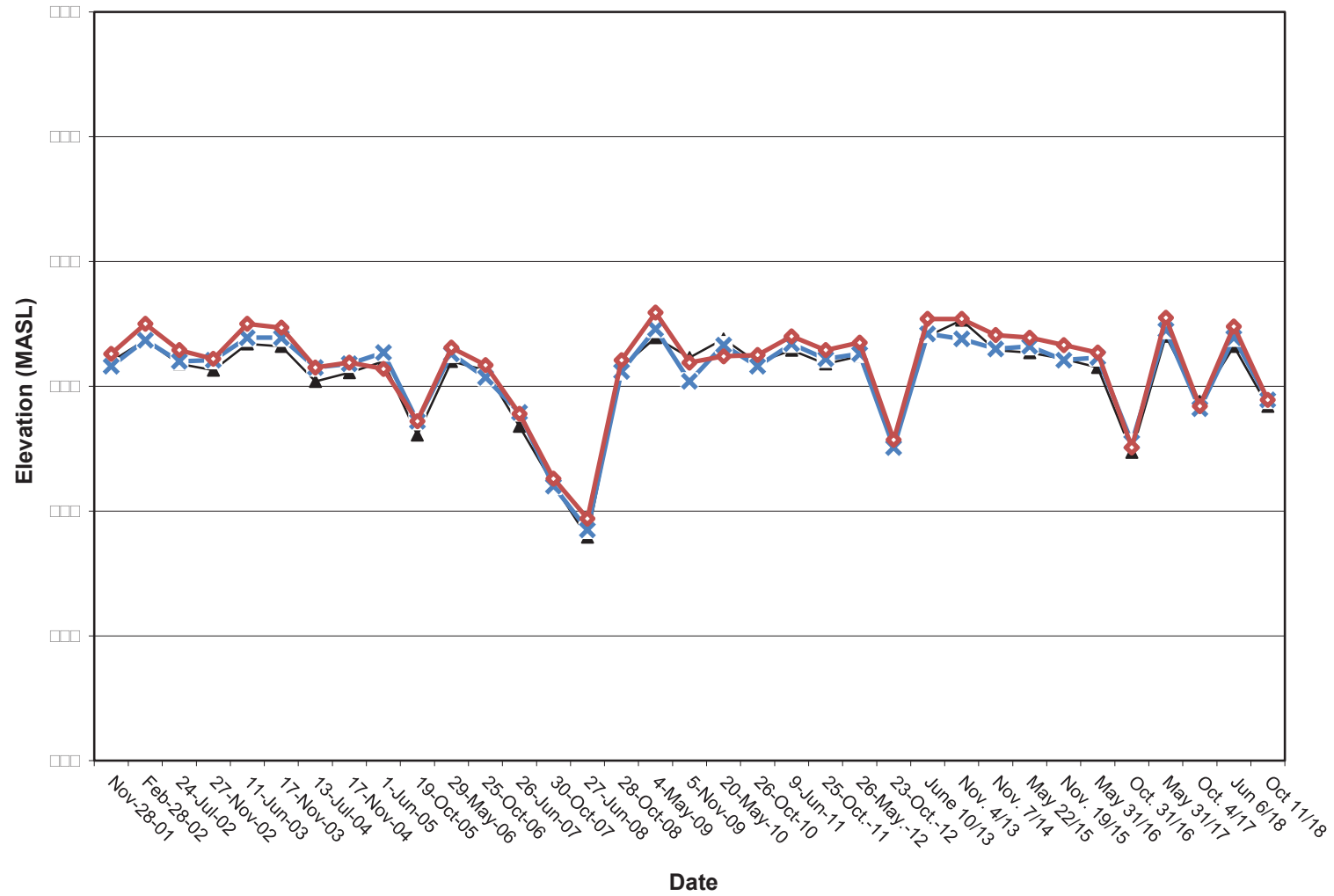


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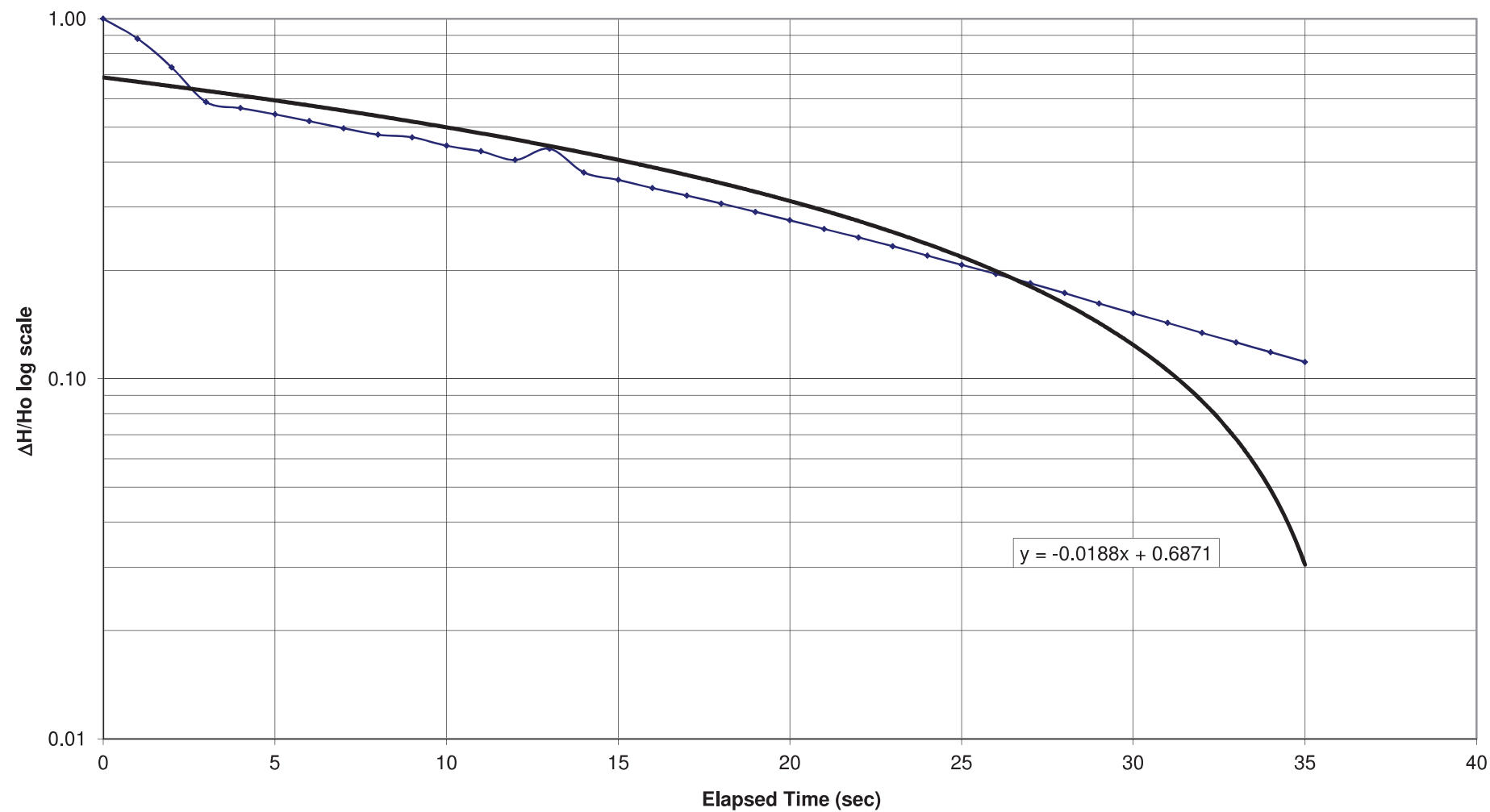




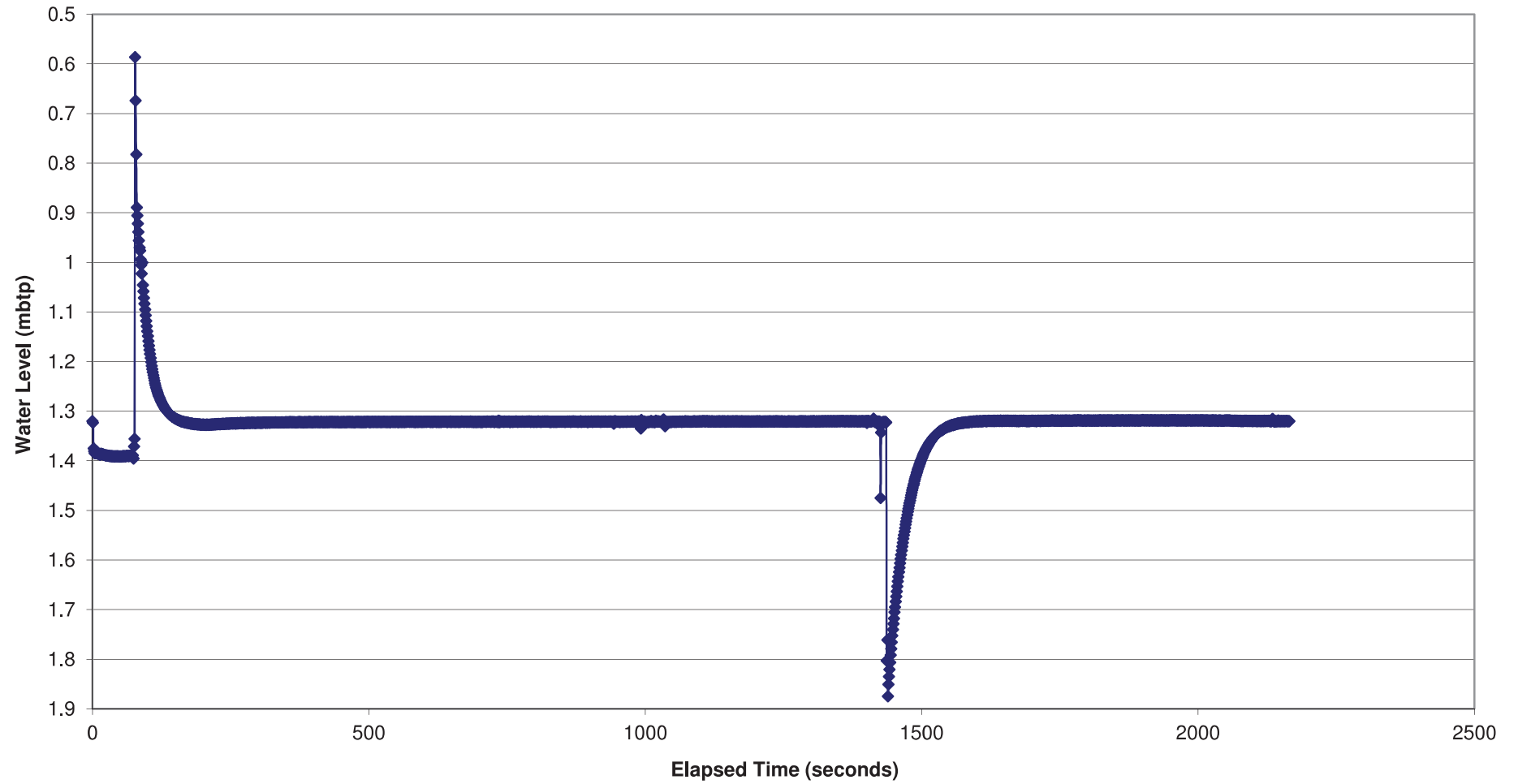
# WATERLEVEL ELEVATIONS



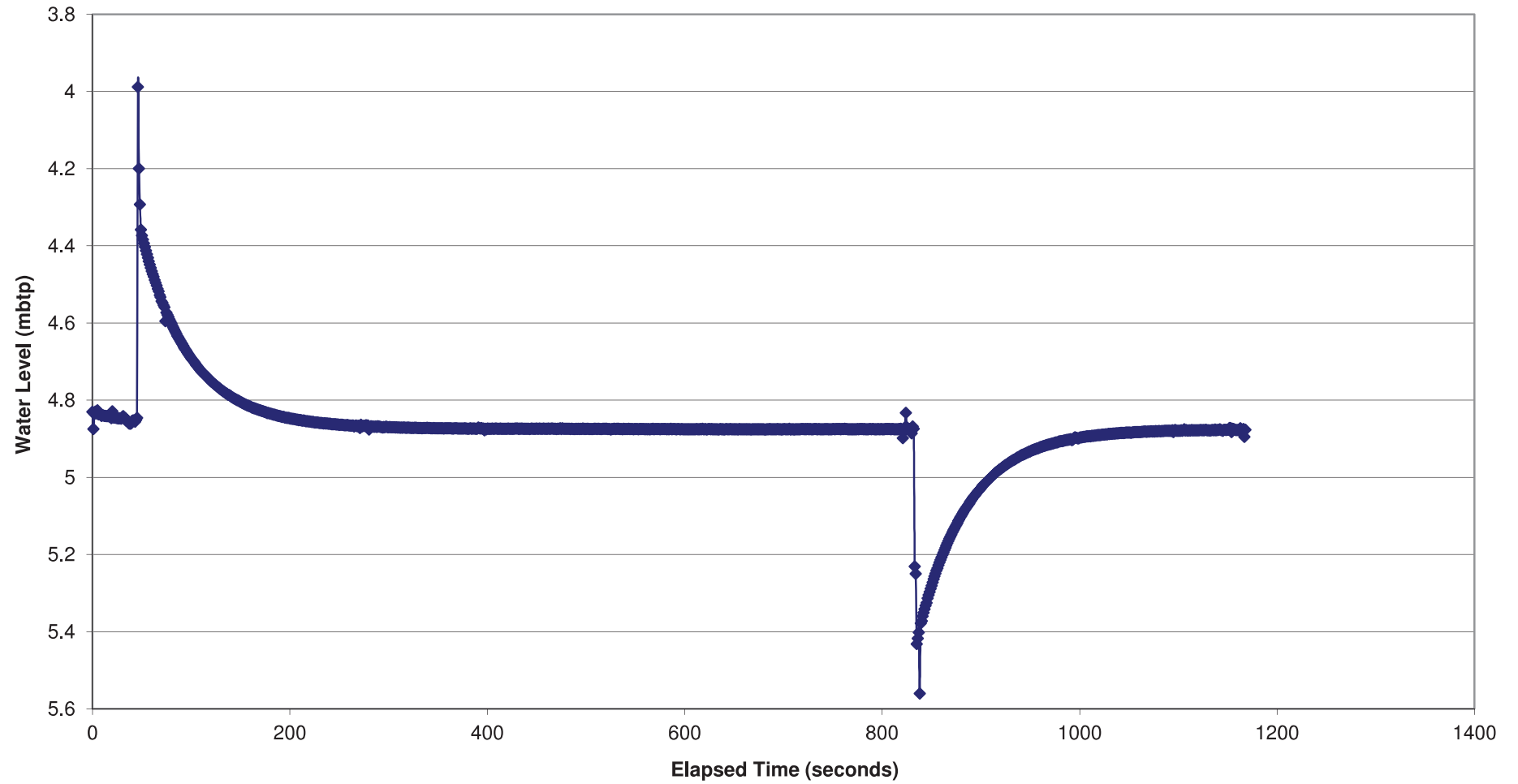
Falling Head Hydraulic Conductivity Analysis at MW-3-1



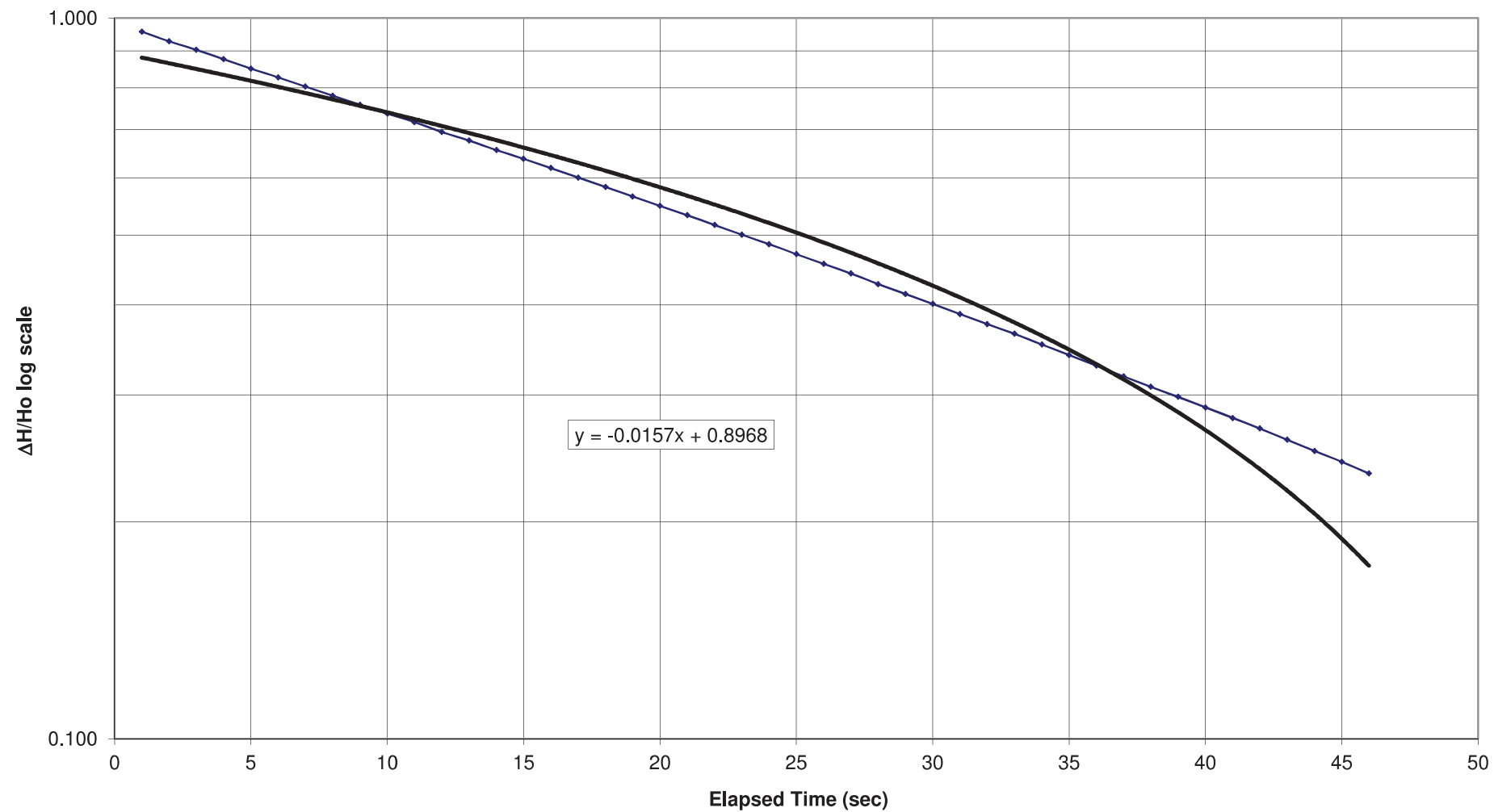
Hydraulic Conductivity Testing at MW-3-1  
Hall's Glenn Landfill



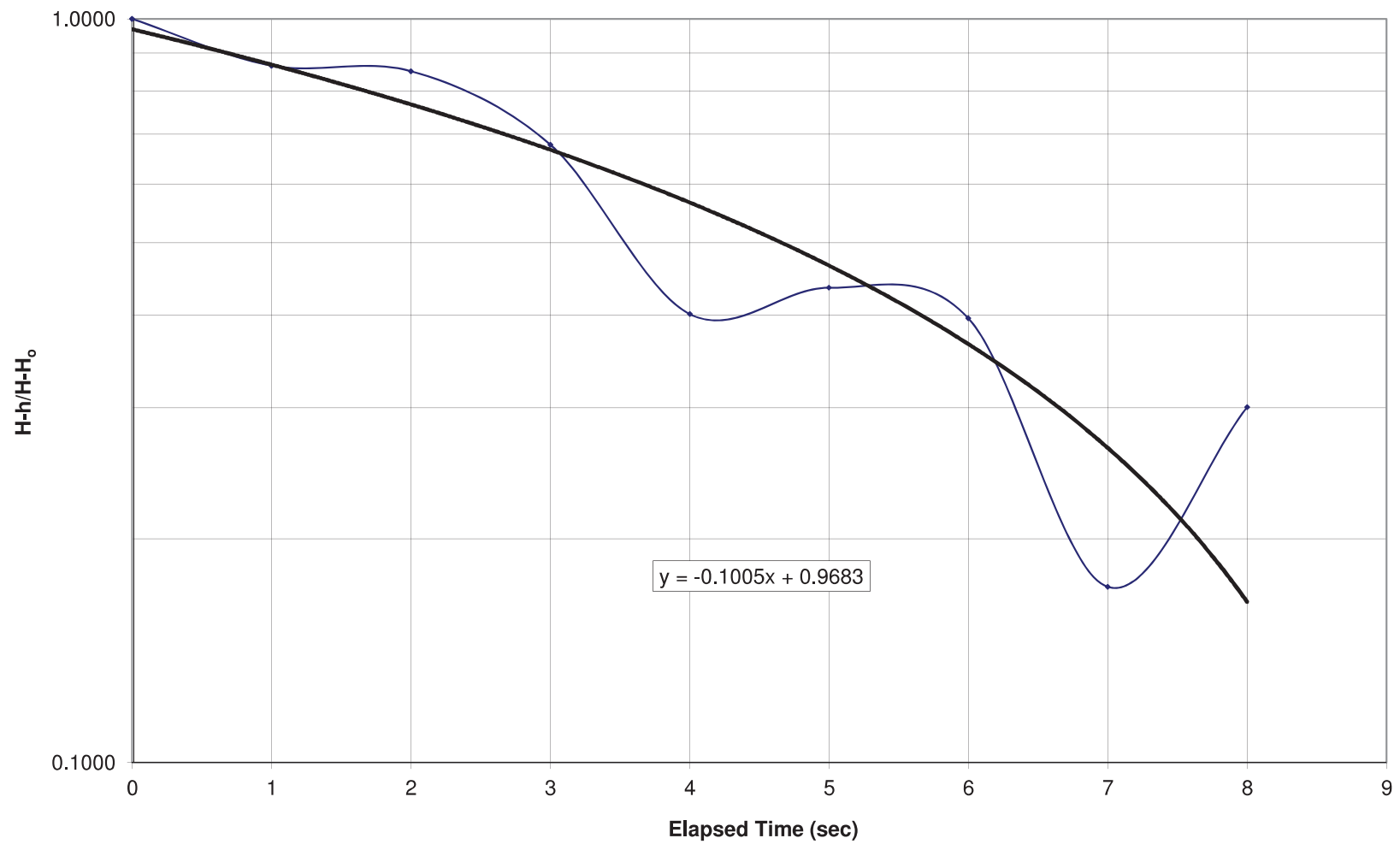
Hydraulic Conductivity Testing at MW-8-1  
Hall's Glenn Landfill



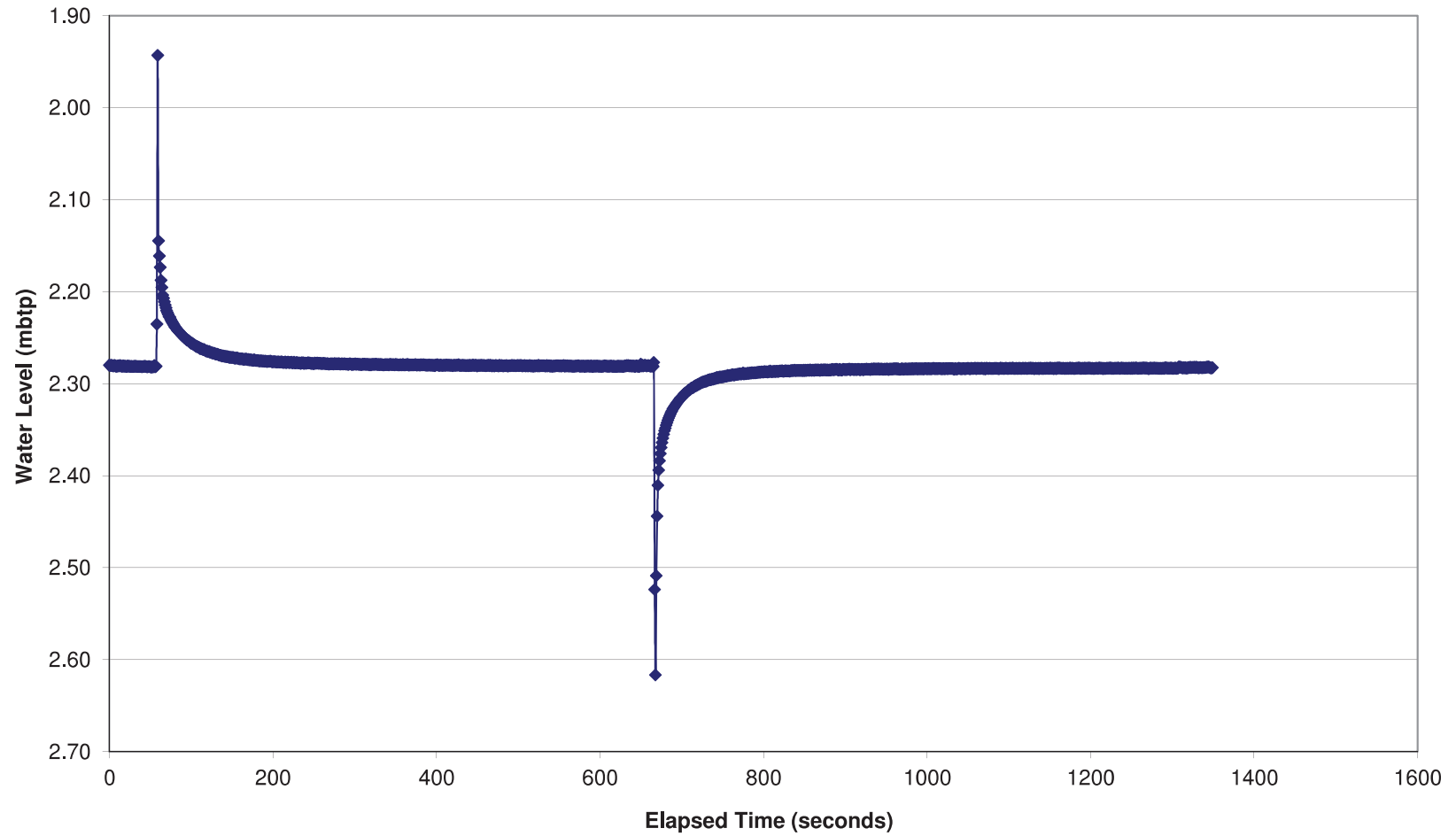
### Rising Head Hydraulic Conductivity Analysis at MW-3-1



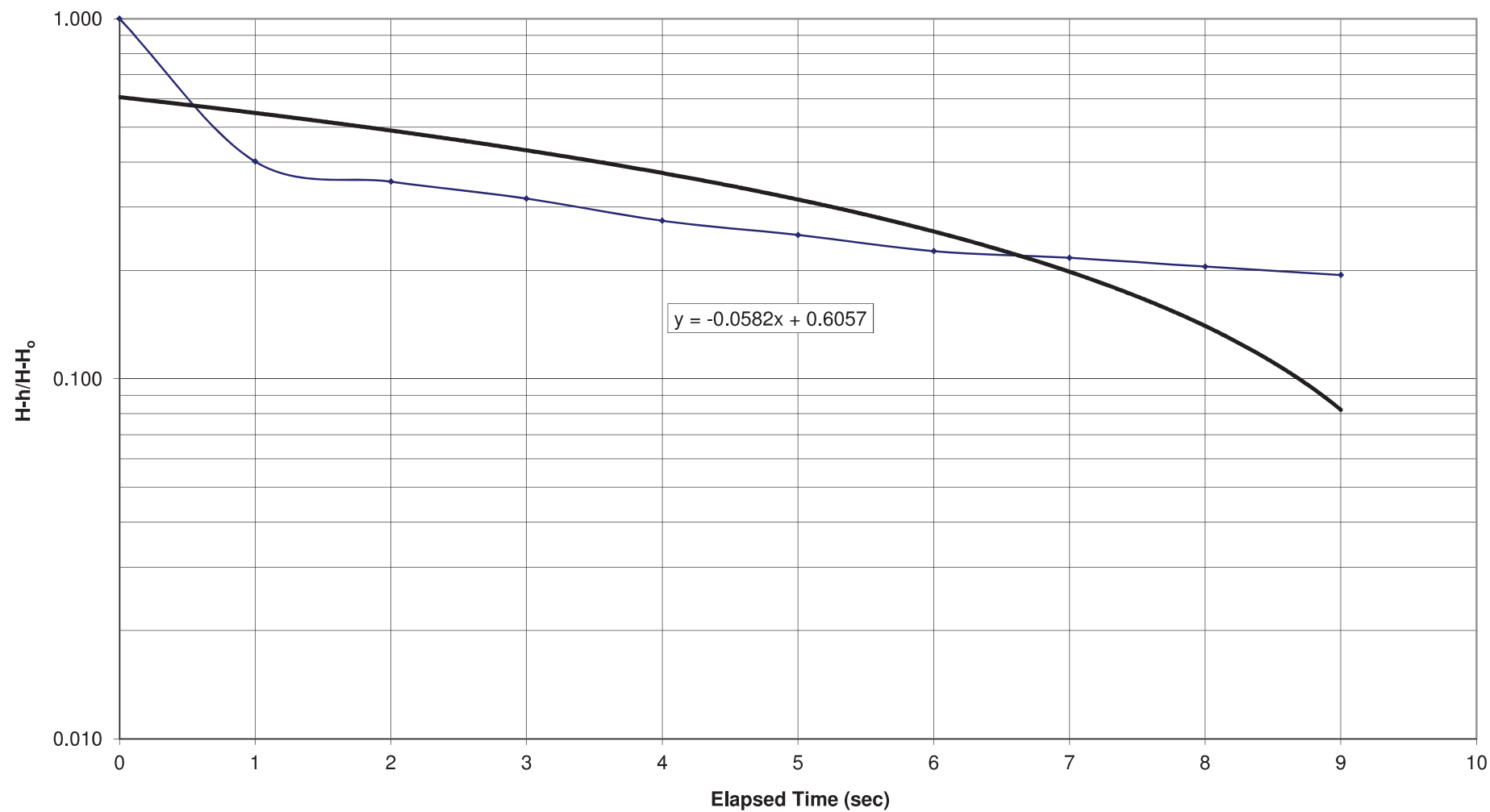
### Falling Head Hydraulic Conductivity Analysis at MW-8-2



Hydraulic Conductivity Testing at MW-7-2  
Hall's Glenn Landfill

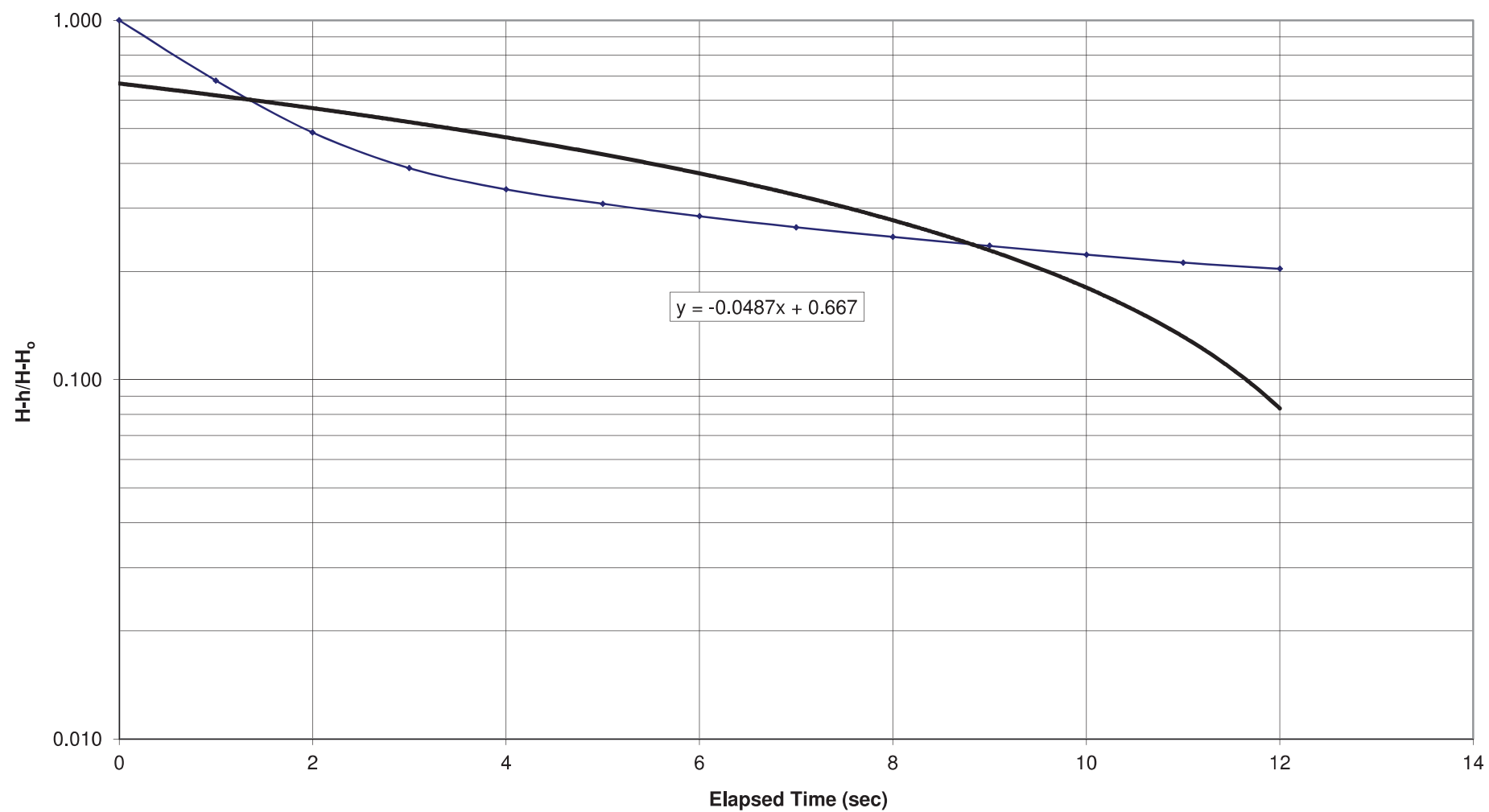


Falling Head Hydraulic Conductivity Analysis at MW-7-2

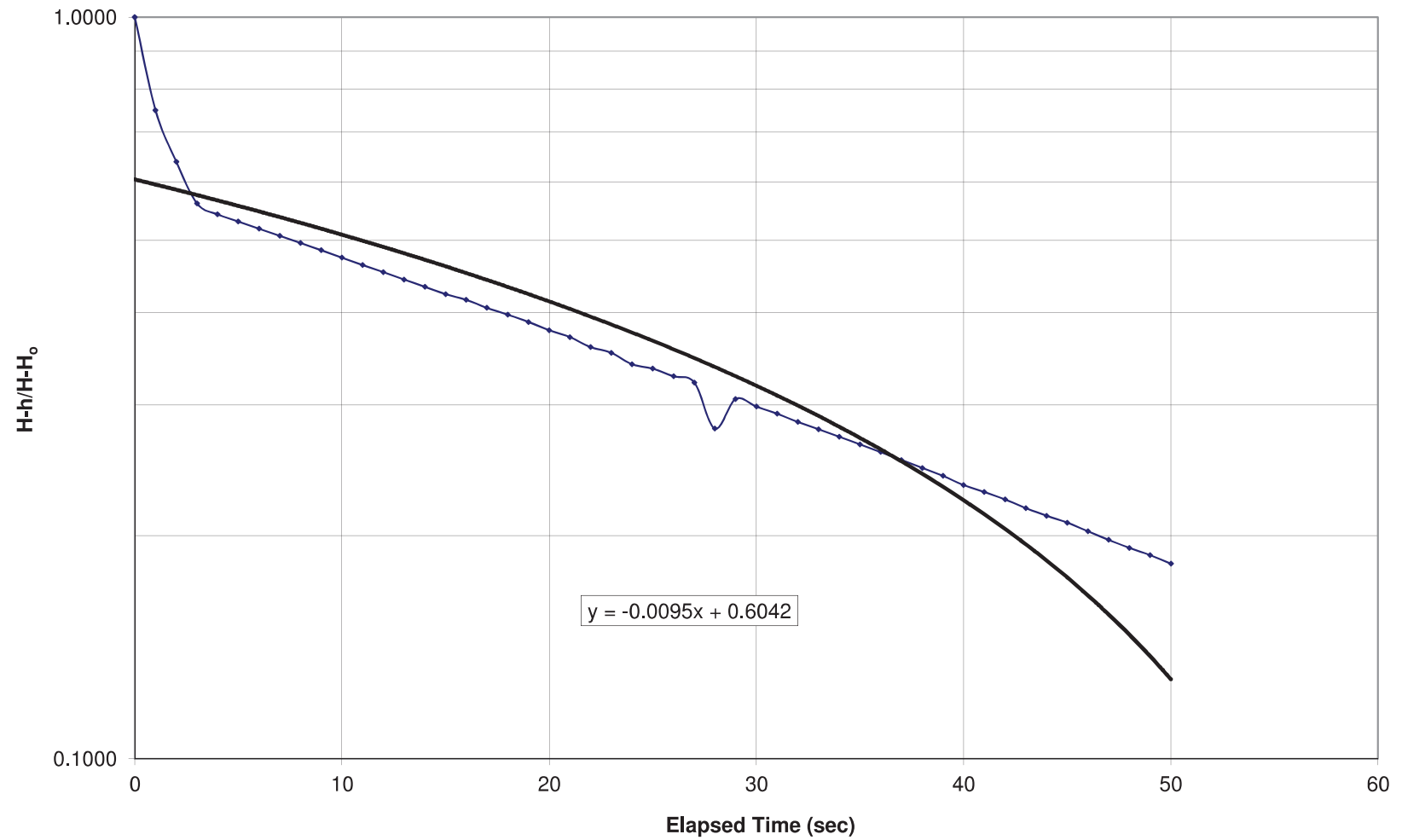




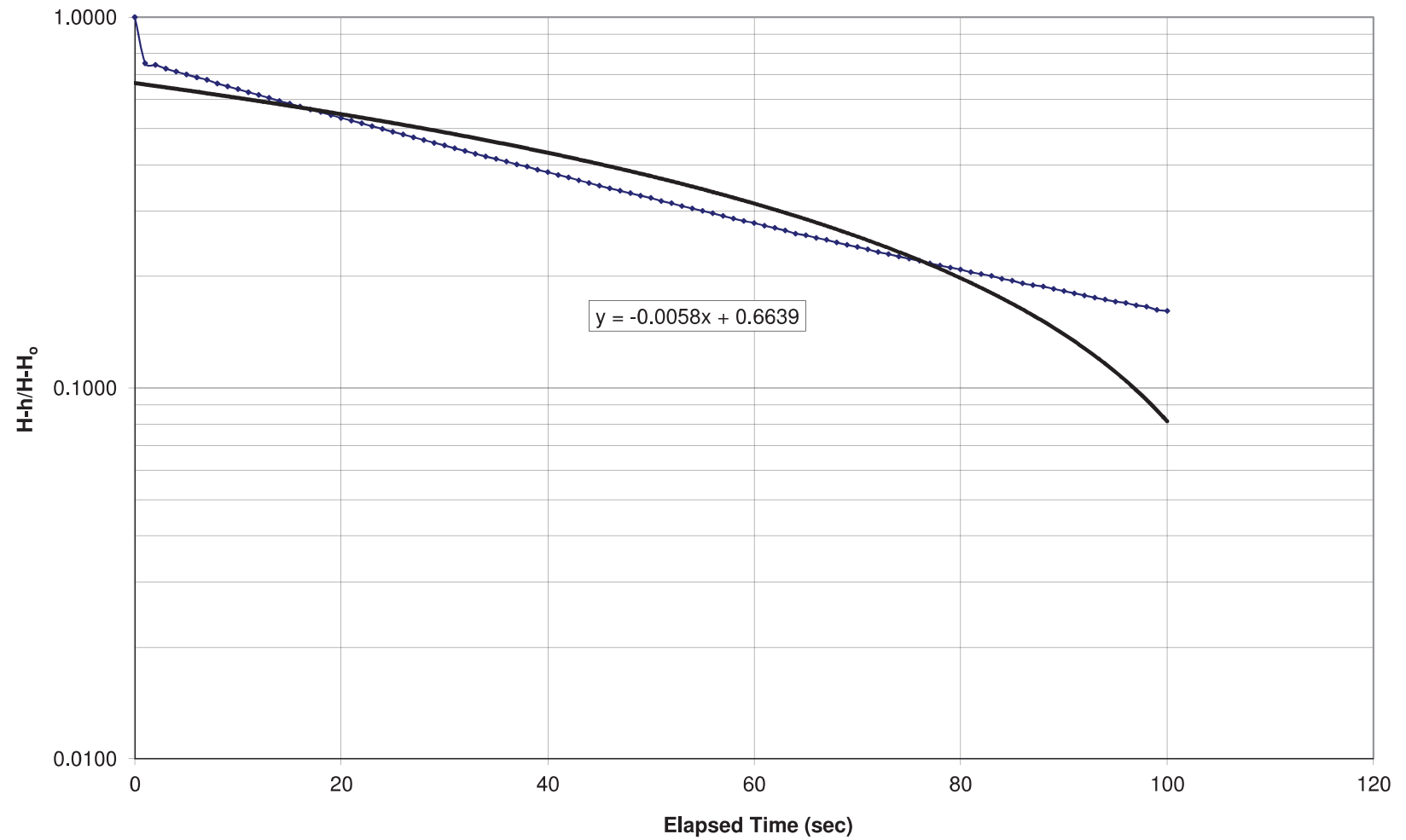
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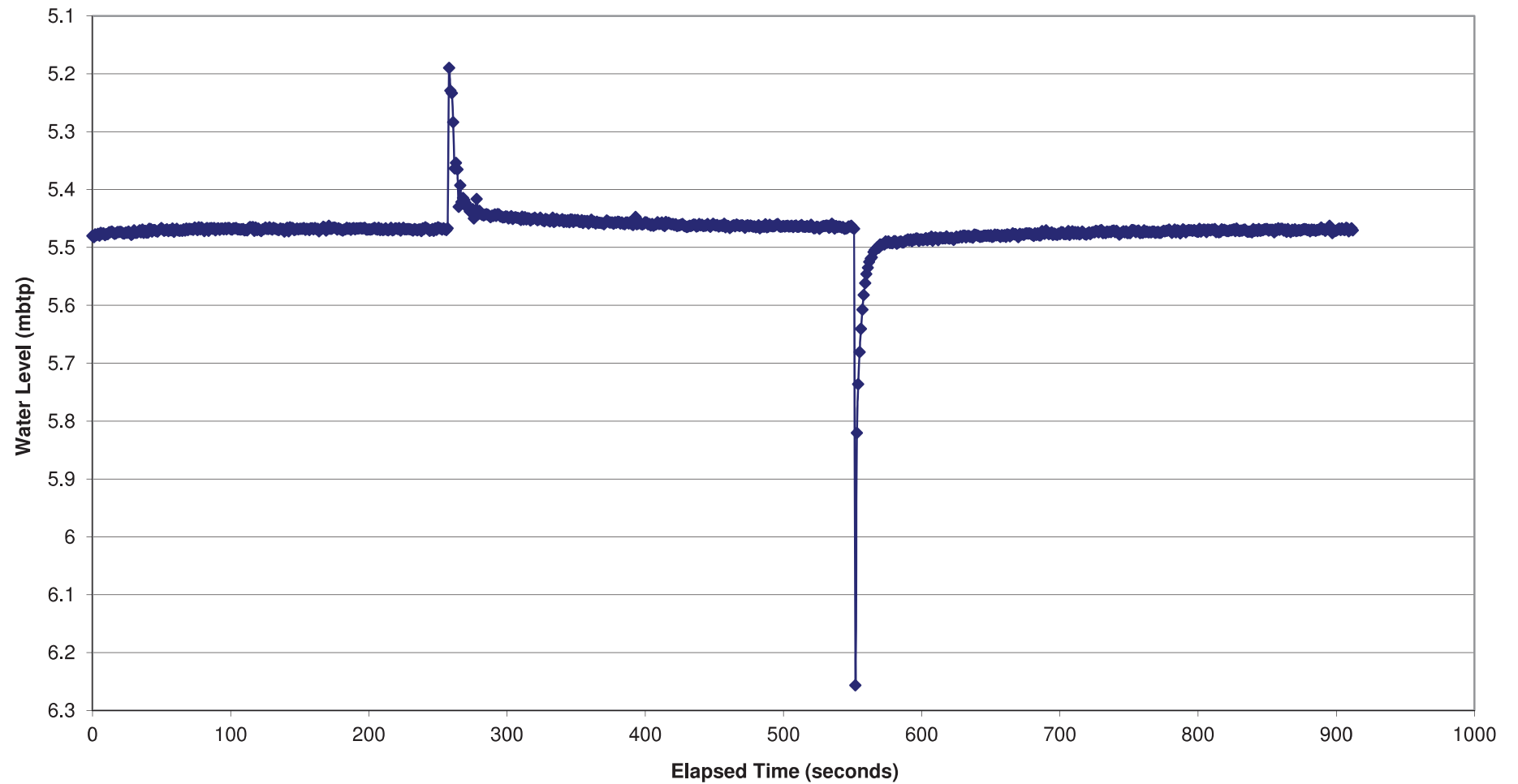
### Falling Head Hydraulic Conductivity Analysis at MW-8-1



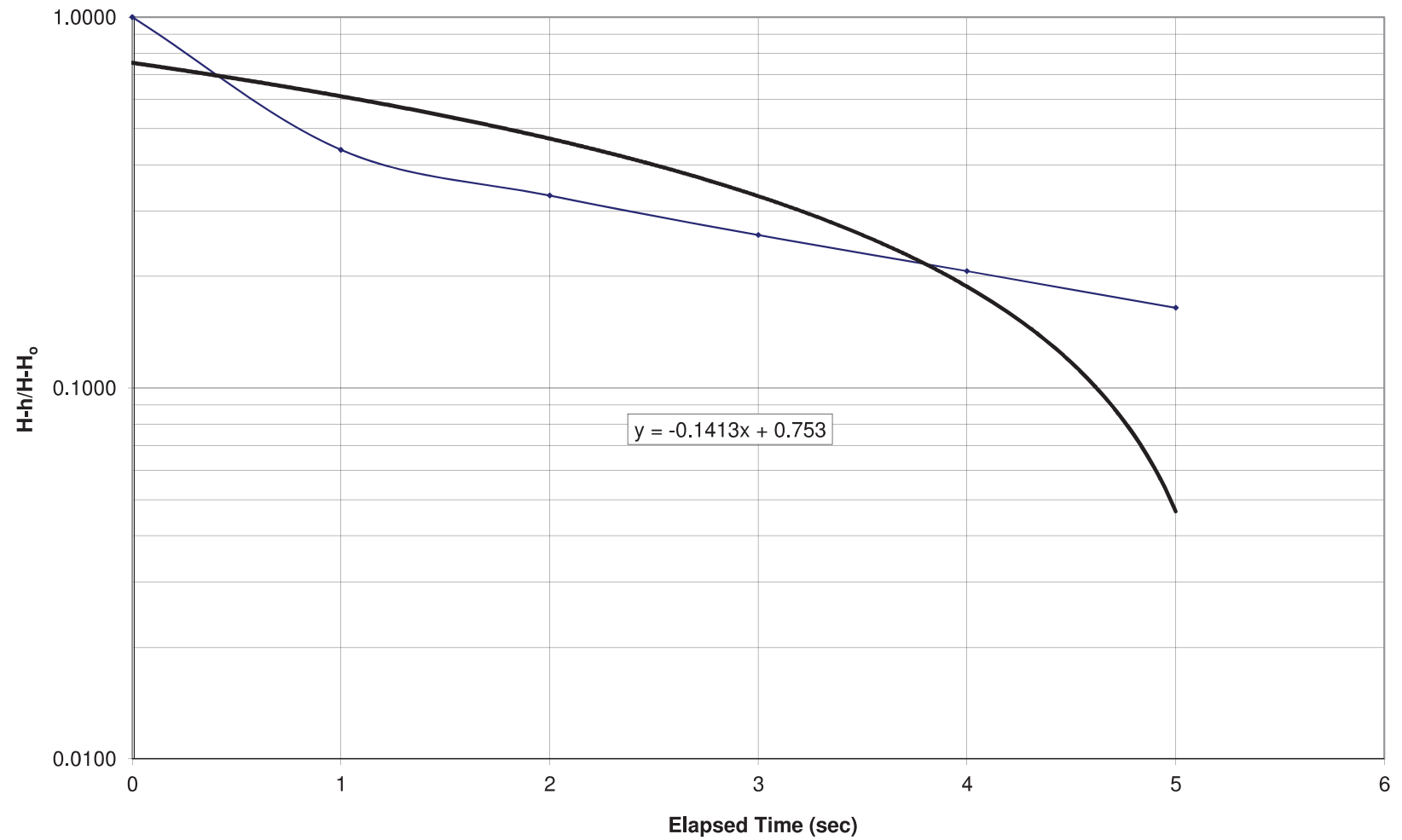
### Rising Head Hydraulic Conductivity Analysis at MW-8-1



Hydraulic Conductivity Testing at MW-8-2  
Hall's Glenn Landfill



### Rising Head Hydraulic Conductivity Analysis at MW-8-2



## **Appendix E**

# **MOECC Monitoring and Screening Checklist**

## Appendix D-Monitoring and Screening Checklist

### General Information and Instructions

**General Information: The checklist is to be completed, and submitted with the Monitoring Report.**

**Instructions:** A complete checklist consists of:

- (a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.
- (b) completed contact information for the Competent Environmental Practitioner (CEP)
- (c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

**Definition of Groundwater CEP:**

For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:

- (a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or
- (b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..

**Definition of Surface water CEP:**

A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

<b>Monitoring Report and Site Information</b>	
<b>Waste Disposal Site Name</b>	Hall's Glenn Landfill Site
<b>Location (e.g. street address, lot, concession)</b>	1951 County Road 6, Part Lot 5, Concession 4, Township of Douro-Dummer (Douro), County of Peterborough
<b>GPS Location (taken within the property boundary at front gate/ front entry)</b>	17 781275E 445174N
<b>Municipality</b>	Township of Douro-Dummer
<b>Client and/or Site Owner</b>	Corporation of the Township of Douro-Dummer
<b>Monitoring Period (Year)</b>	2019
This Monitoring Report is being submitted under the following:	
<b>Environmental Compliance Approval Number:</b>	Provisional Certificate of Approval A341004
<b>Director's Order No.:</b>	N/A
<b>Provincial Officer's Order No.:</b>	N/A
<b>Other:</b>	N/A

<b>Report Submission Frequency</b>	<input checked="" type="radio"/> Annual <input type="radio"/> Other	Specify (Type Here):	
<b>The site is:</b> (Operation Status)	<input type="radio"/> Open <input type="radio"/> Inactive <input checked="" type="radio"/> Closed		
<b>Does your Site have a Total Approved Capacity?</b>	<input type="radio"/> Yes <input checked="" type="radio"/> No		
<b>If yes, please specify Total Approved Capacity</b>		Units	
<b>Does your Site have a Maximum Approved Fill Rate?</b>	<input type="radio"/> Yes <input checked="" type="radio"/> No		
<b>If yes, please specify Maximum Approved Fill Rate</b>		Units	
<b>Total Waste Received within Monitoring Period (Year)</b>		Units	
<b>Total Waste Received within Monitoring Period (Year)</b> <i>Methodology</i>			
<b>Estimated Remaining Capacity</b>		Units	
<b>Estimated Remaining Capacity</b> <i>Methodology</i>			
<b>Estimated Remaining Capacity</b> <i>Date Last Determined</i>	Select Date		
<b>Non-Hazardous Approved Waste Types</b>	<input type="checkbox"/> Domestic <input type="checkbox"/> Industrial, Commercial & Institutional (IC&I) <input type="checkbox"/> Source Separated Organics (Green Bin) <input type="checkbox"/> Tires	<input type="checkbox"/> Contaminated Soil <input type="checkbox"/> Wood Waste <input type="checkbox"/> Blue Box Material <input type="checkbox"/> Processed Organics <input type="checkbox"/> Leaf and Yard Waste	<input type="checkbox"/> Food Processing/Preparation Operations Waste <input type="checkbox"/> Hauled Sewage Other: <div>Provide any other approved waste types not listed here</div>
<b>Subject Waste Approved Waste Classes: Hazardous &amp; Liquid Industrial</b> (separate waste classes by comma)			
<b>Year Site Opened</b> (enter the Calendar Year <u>only</u> )	1977	<b>Current ECA Issue Date</b>	5-Mar-13
<b>Is your Site required to submit Financial Assurance?</b>	<input type="radio"/> Yes <input checked="" type="radio"/> No		
<b>Describe how your Landfill is designed.</b>	<input checked="" type="radio"/> Natural Attenuation only <input type="radio"/> Fully engineered Facility <input type="radio"/> Partially engineered Facility		
<b>Does your Site have an approved Contaminant Attenuation Zone?</b>	<input type="radio"/> Yes <input checked="" type="radio"/> No		



If closed, specify C of A, control or authorizing document closure date:	22-May-96
Has the nature of the operations at the site changed during this monitoring period?	<input type="radio"/> Yes <input checked="" type="radio"/> No
If yes, provide details:	Type Here
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)	<input type="radio"/> Yes <input checked="" type="radio"/> 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

Monitor R-1

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
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date

3) a) Is landfill gas being monitored or controlled at the site?		<input checked="" type="radio"/> Yes <input type="radio"/> 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?		<input type="radio"/> Yes <input checked="" type="radio"/> 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:		<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> 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
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select 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):		
<input checked="" type="radio"/> Yes <input type="radio"/> No	If no, specify (Type Here):	

## Sampling and Monitoring Program Results/WDS Conditions and Assessment:

<p>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.</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p>If no, the potential design and operational concerns/exceptions are as follows (Type Here):</p>	
<p>6) The site meets compliance and assessment criteria.</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p>If no, list and explain exceptions (Type Here):</p>	
<p>7) The site continues to perform as anticipated. There have been no unusual trends/changes in measured leachate and groundwater levels or concentrations.</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p>If no, list exceptions and explain reason for increase/change (Type Here):</p>	
<p>1) Is one or more of the following risk reduction practices in place at the site:</p> <p>(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</p> <p>(b) There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or</p> <p>(c) The site meets the following two conditions (typically achieved after 15 years or longer of site operation):</p> <p style="margin-left: 20px;">i. The site has developed stable leachate mound(s) and stable leachate plume geometry/concentrations; and</p> <p style="margin-left: 20px;">ii. Seasonal and annual water levels and water quality fluctuations are well understood.</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p>Note which practice(s):</p>	<p><input type="checkbox"/> (a) <input type="checkbox"/> (b) <input checked="" type="checkbox"/> (c)</p>
<p>9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Applicable</p>	<p>Monitor R-1 exceeded for Iron. This well is an old dug residential well that has been severely compromised. It has been recommended that the well be abandoned and that a new monitor be constructed in the same area.</p>	

## 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:

1-Mar-19

## Recommendations:

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

<p><input type="radio"/> No changes to the monitoring program are recommended</p> <p><input checked="" type="radio"/> The following change(s) to the monitoring program is/are recommended:</p>	<p>It is recommended that the R-1 monitor be abandoned and a new monitor installed at the same general location.</p>
<p><input checked="" type="radio"/> No Changes to site design and operation are recommended</p> <p><input type="radio"/> The following change(s) to the site design and operation is/are recommended:</p>	<p>Type Here</p>

<b>Name:</b>	Nyle McIlveen, P.Eng.		
<b>Seal:</b>	Add Image 		
<b>Signature:</b>		<b>Date:</b>	22-Mar-20
<b>CEP Contact Information:</b>	Nyle McIlveen, P./Eng.		
<b>Company:</b>	GHD		
<b>Address:</b>	347 Pido Road, Unit 29, Peterborough, Ontario K9J 6X7		
<b>Telephone No.:</b>	(705) 749-3317	<b>Fax No. :</b>	(705) 749-9248
<b>E-mail Address:</b>	nyle.mcilveen@ghd.com		
<b>Co-signers for additional expertise provided:</b>			
<b>Signature:</b>		<b>Date:</b>	
<b>Signature:</b>		<b>Date:</b>	Select Date

<b>Surface Water WDS Verification:</b>		
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)	Dummer Lake	
Distance(s)	2.5 Km	
Based on all available information and site knowledge, it is my opinion that:		
<b>Sampling and Monitoring Program Status:</b>		
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:	<input checked="" type="radio"/> Yes <input type="radio"/> No	If no, identify issues (Type Here):
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):	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not applicable (No C of A, authorizing / control document applies)	If no, specify below or provide details in an attachment.
<b>Surface Water Sampling Location</b>	<b>Description/Explanation for change (change in name or location, additions, deletions)</b>	<b>Date</b>
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date

<b>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.</b>		<input checked="" type="radio"/> <b>Yes</b> <input type="radio"/> <b>No</b> <input type="radio"/> <b>Not Applicable</b>	
<b>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:</b>		<input checked="" type="radio"/> <b>Yes</b> <input type="radio"/> <b>No</b> <input type="radio"/> <b>Not Applicable</b>	If no, specify below or provide details in an attachment.
<b>Surface Water Sampling Location</b>	<b>Description/Explanation for change (change in name or location, additions, deletions)</b>	<b>Date</b>	
S-2	S-2 is a background surface water location that was established in 2014.	7-May-14	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
<b>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):</b>		<input checked="" type="radio"/> <b>Yes</b> <input type="radio"/> <b>No</b>	If no, specify (Type Here):



## 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
Type Here	Type Here	Type Here
Type Here	Type Here	Type Here
Type Here	Type Here	Type Here
Type Here	Type Here	Type Here
Type Here	Type Here	Type Here
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)?	<input type="radio"/> Yes  <input type="radio"/> No	If yes, specify (Type Here)

<p>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.</p>	<p><input type="radio"/> Yes</p> <p><input checked="" type="radio"/> No</p>	<p>Surface Monitor S-1 exceeded for iron and manganese in the fall sampling. There was very minimal water for sampling at this location. In the past when the surface water at this location at this location was stagnant and / or very minimal (generally in the fall), there have been exceedances similar to this year. We</p>
<p>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)):</p>	<p><input type="radio"/> Yes</p> <p><input checked="" type="radio"/> No</p> <p><input type="radio"/> Not Known</p> <p><input type="radio"/> Not Applicable</p>	<p>Monitor R-1 exceeded for Iron. This well is an old dug residential well that has been severely compromised. It has been recommended that the well be abandoned and that a new monitor be constructed in the same area.</p>
<p>9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</p>	<p><input type="radio"/> Yes</p> <p><input checked="" type="radio"/> No</p> <p><input type="radio"/> Not Applicable</p>	<p>If yes, list value(s) that are/have been exceeded and follow-up action taken (Type Here)</p>

## 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


Type Here

☐ The following change(s) to the monitoring program is/are recommended:

☐ No changes to the site design and operation are recommended

Monitor R-2 should be decommissioned and a new monitor be installed in the same area.

☒ The following change(s) to the site design and operation is/are recommended:

<b>CEP Signature</b>		
<b>Relevant Discipline</b>	Civil engineering, hydrogeology	
<b>Date:</b>	22-Mar-20	
<b>CEP Contact Information:</b>	Nyle McIlveen, P.Eng.	
<b>Company:</b>	GHD	
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<b>E-mail Address:</b>	nyle.mcilveen@ghd.com	
<b>Save As</b>		<b>Print Form</b>



# 2019 Groundwater Monitoring Report

Warsaw Road Landfill Site  
(PC of A A340902)  
Township of Douro-Dummer  
County of Peterborough

**GHD** | 347 Pido Road Unit 29 Peterborough Ontario K9J 6X7 Canada  
11193447 | 01 | Report No 1 | March 10, 2020



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Plate 1	Geologic Plan
Plate 2	Site Plan 2A – 2D
Plate 3	2019 Field Monitoring Summary
Plate 4	2019 Water Level Monitoring Summary



## 1. Introduction

The following report presents the results of the 2019 groundwater monitoring program completed for the Warsaw Road Landfill Site in the Township of Douro-Dummer (formerly Township of Douro), County of Peterborough. The monitoring program was conducted in accordance with the scope of work as presented by our proposal dated January 15, 2009 as well as additional requirements outlined in the Ministry of the Environment, Conservation and Parks (MECP) review of AECOM Canada Ltd. Warsaw Road Landfill Site "2008 Annual Monitoring Report" and subsequent Memorandum dated January 16, 2012.

## 2. Background

The Warsaw Road Landfill Site is situated along the south side of County Road No. 4, 6 km southwest of the community of Warsaw. The Geologic Plan, Plate 1, illustrates the location of the landfill with respect to surrounding roads and watercourses. The property is described as a 2.0 hectare (ha) refuse footprint situated within a 2.43 ha property in Part of Lot 8, Concession 5 in the Township of Douro-Dummer.

Details regarding the operation of the landfill are outlined in the Provisional Certificate of Approval (PC of A) No. A 340902 dated September 17, 1978, an amendment to the PC of A for continued operation was issued on September 30, 1994. A second PC of A was issued on June 22, 1996 for the final closure of the site. A C of A was issued by the MOE on June 13, 2004 for a passive landfill gas venting system at the Warsaw Road Landfill Site. Copies of the PC of As are presented in Appendix A along with the aforementioned MECP Memorandum.

Background data pertaining to the site was from the AECOM Canada Ltd. (AECOM) 2008 report obtained late in 2009.

Reference is made to the following background documents associated with the Warsaw Road Landfill Site:

1. Current PC's of A issued by the MECP (Appendix A);
2. Excerpts from a report prepared by Hydrotterra Limited regarding details of the monitoring well construction and borehole records (Appendix B);
3. MECP well record abandonment for monitors TW-3-1, TW-4-1 and TW-8-1 (Appendix B);
4. Monitoring program and sampling protocol established for the landfill site by the former Township of Douro (Appendix C); and
5. Reports prepared by AECOM dated 2007 and 2008 and Geo-Logic from 2009 to the present related to past monitoring programs.





## 3. Site Conditions

### 3.1 General Geology

The site is situated in an area within the physiographic region known as the Peterborough Drumlin Field (Chapman and Putnam, 1984). This region is characterized by relatively northeast-southwest trending drumlin features. Bedrock underlying the site consists of limestone, with the minor shale of the Middle Ordovician Trenton-Black River Group.

Surface drainage at the site is generally southwest towards a tributary of June's Creek which eventually outlets into the Indian River situated approximately 3.5km southeast of the site.

### 3.2 Monitoring Program

#### 3.2.1 Groundwater

The groundwater monitoring network consists of eight (8) monitors locations, designated as TW 4 (located up-gradient, northwest of the landfill); TW 7 (located at the southerly refuse perimeter); TW 3, TW 2, TW 6, TW 8 and TW 9 (located within the down-gradient attenuation zone); and TW 5 (located on the east side Douro Fourth Line). Monitor TW 9 has routinely been dry or contains too little water for sampling.

Previously, monitoring locations were multi-depth well installations but over time, the bedrock monitors identified as "–1", were sealed to prevent upward migration of mineralized water. Monitors TW 2 and TW 3-2 are constructed of 32mm diameter PVC pipe while the remaining monitors are 50mm diameter PVC pipe.

Residential wells RW-1, RW-2, RW-3 and RW-4 are included in the sampling circuit every three (3) years including the 2017 monitoring circuits. Installation information and construction particulars for the monitoring wells are presented in Appendix B. Locations of the monitors are depicted on the Site Plan, Plates 2A and 2B. More specific details of the ground surface including topography and vegetation are illustrated on Plates 2C and 2D.

#### 3.2.2 Surface Water

The surface water monitoring network comprises of four stations, DSW 9 (situated southwest of the landfill); DSW 7 and DSW 17 (within the attenuation zone); DSW 11 (an unnamed water course). The location of the surface water locations is depicted on the Site Plan, Plate 2B through to 2D.

#### 3.2.3 Landfill Gas

The landfill gas-monitoring network involves the groundwater monitors listed in section 3.2.1 (sampled twice per year), and six gas probes (GP 1, GP 2, GP 3, GP 4, GP 5, GP 6). The location of the gas probes is depicted on the Site Plan, Plate 2A.



### 3.3 Pattern of Groundwater Movement

Groundwater monitoring was conducted during two sampling circuits in 2019. The water level data was acquired on May 31 and October 25, 2019. The measurements are presented on Plate 4 and summarized in Table 3.1. Historical elevation data was obtained from the AECOM 2007-2008 monitoring report and Geo-Logic 2009-2019 monitoring reports for comparison purposes. The groundwater existed at elevations that ranged from 93.46m (TW 3-2) to 104.72m (TW 4-2) in May 2019 and from 93.10m (TW 3-2) to 102.53 m (TW 4-2) in October of 2019.

The groundwater monitoring data for 2019 is presented on Plate 3.1. Based on the data, the pattern of shallow groundwater movement appears to be in a southwesterly direction with higher water levels in TW 4-2 and TW 7 than in the down-gradient attenuation lands. Water levels were relatively similar to other years. Historical data from Cambium Environmental (1997-2006) and AECOM Canada Ltd. (2007-2008) are included in Appendix D.

Table 3.1 2019 Water Level Summary

Monitor Number	Elevation Top of Casing	Water Level Elevation	
		May 31, 2019	October 25, 2019
TW 2	96.96	95.71	95.48
TW 3-2	93.73	93.46	93.10
TW 4-2	105.04	104.72	102.53
TW 5-2	95.98	95.70	95.39
TW 6-2	96.86	95.16	94.84
TW 7	100.35	96.70	96.02
TW 8-2	96.29	---	95.04
TW 9-2	96.10	dry	dry

Notes: All measurements are presented in metres. Monitor top of casing elevations provided by TSH. Elevations are referenced to an assumed benchmark of 100.00 metres.

### 3.4 Hydraulic Conductivity

The hydraulic conductivity of a soil is described as a measure of the soil's ability to transmit water. Slug tests were performed on four (4) wells in order to assess the permeability at the representative elevations on site in 2009. TW 2 and TW 7 are screened in the shallow overburden, TW 6-2 is screened in the mid-level overburden, while TW 5-2 is screened in the deeper overburden. Table 3.2 summarizes the results of slug tests performed at the site.



Table 3.2 Warsaw Road Hydraulic Conductivity

Location	Test Type	Hydraulic Conductivity (cm/s)	Geometric Mean K (cm/s)	Representative Aquifer
TW 2	Rising Head	2.06E-03	2.06E-03	Silty Sand
TW 5-2	Falling Head	9.15E-03	5.43E-03	Silty Sand
TW 5-2	Rising Head	3.23E-03		Silty Sand
TW 6-2	Falling Head	1.26E-01	7.37E-02	Clean Sand
TW 6-2	Rising Head	4.30E-02		Silty Sand, Clean Sand
TW 7	Falling Head	6.60E-03	3.22E-03	Silty Sand
TW 7	Rising Head	1.57E-03		Silty Sand

## 4. Sampling/Monitoring Program

GHD followed the established sampling and monitoring protocol for the Warsaw Road Landfill Site. Details of this protocol are summarized in Appendix C. An overview of the protocol is presented below.

1. Fieldwork was carried out at all groundwater monitoring stations during the spring and fall season. Monitor TW 9-2 provided insufficient water for sampling during both sampling periods.
2. The four (4) surface water stations were sampled during the spring circuit while three (3) were dry in the fall.
3. Methane gas and hydrogen sulphide was measured at each monitoring well using a 4 gas meter during both sampling periods. The six gas probes were measured five (5) times during 2019.
4. Water levels were then recorded for each groundwater monitor prior to well purging.
5. Three to five measured casing volumes were then removed from each monitor in order to ensure that representative groundwater samples were obtained.
6. In-situ chemical analyses were carried out during the purging operation in order to determine a stabilized water quality condition. The in-situ testing included temperature, conductivity, ORP, H<sub>2</sub>S and pH.
7. After the purging operation, representative samples of groundwater were collected in proper containers with appropriate preservatives where needed.
8. The water samples were then delivered to SGS Laboratories in Lakefield for both sampling circuits.
9. Slug testing on representative wells to determine hydraulic conductivity values were completed in 2009. The testing was requested by the (MECP) review (dated December 29, 2008) of the Warsaw Road Landfill 2007 Monitoring Report prepared by AECOM Canada Ltd. Hydraulic Gradients were calculated using well locations and groundwater elevations.



## 5. Water Quality Data

### 5.1 General

Representative groundwater samples from each of the monitors were subjected to chemical testing for specified parameters. The parameters tested for included the parameters in Column 3 (Comprehensive List for Surface Water) of Schedule 5 in the Landfill Standards: A Guideline on Regulatory and Approval Requirements for New or Expanding Sites as well as for Column 1 metals. In addition, samples from TW 7 were analyzed for volatile organic compounds to evaluate any trends that may develop over time. Each surface water station was sampled for the parameters listed in Column 3 of Schedule 5 of the Landfill Standards Guideline (Comprehensive List for Surface Water).

### 5.2 Groundwater Monitors

The sampling monitors are divided into up-gradients background monitor (TW 4-2), landfill monitor (TW 7) and down-gradients monitors (TW 2, TW 3-2, TW 5-2, TW 6-2, TW 8-2 and TW 9-2). Monitor TW 9-2 contained insufficient water for sampling during both sampling circuits. A list of the wells that had parameters that exceeded the Ontario Drinking Water Standards (ODWS or PWQO) for the 2019 spring and fall sampling periods is listed below.

#### Parameter

#### Spring

TDS	All Wells
Iron	TW 2, TW-3-2, TW-7
Manganese	TW 2, TW-3-2, TW-7
Phenolics	TW-5-2
Alkalinity	TW-5-2
Phosphorus	TW 2, TW 3-2, TW 5-2, TW 7

#### Fall

TDS	All Wells
Iron	TW 2, TW 3-2, TW 7
Manganese	TW 2, TW 3-2, TW 6-2, TW 7
Phenolics	TW-2 TW 4-2, TW 7
Phosphorus	TW-7

Some wells showed exceedances for TDS, Iron, Manganese, Phenolics and Phosphorus. Total dissolved solids (TDS), manganese and iron have been historically elevated in these monitors in the past. Iron has been historically elevated for the general area.

Phosphorus levels in some wells marginally exceeded the PWQO in some wells in the spring and only marginally in one well in the fall. This should be monitored in future monitoring events. Phenolics showed marginal exceedances in one (1) well in the spring and three (3) different wells in the fall. The chemical results from the monitoring wells have been summarized in Tables 5.1 and 5.2. The data is presented with the ODWS and PWQO criteria for comparison purposes. The results indicate less parameter exceedances of the ODWS or PWQO as in the previous year.



Chemical comparison graphs for iron, manganese, conductivity and chloride are presented in Appendix D. The graphs indicate similar results as in previous years with the exception of chloride that appears to be slightly trending upwards even in the background monitor. Although the levels are well within the ODWS and have shown no increases at the surface water locations chloride should still be monitored in the future to see if this trend continues. The certificates of analysis are included in Appendix E.

Table 5.1 2019 Spring Groundwater Quality Summary

PARAMETERS	Warsaw Road Landfill Site Monitors							Ontario Drinking Water Standards	PWQO
	TW 2	TW 3-2	TW 5-2	TW 6-2	TW 7	TW 8-2	TW 4-2 Background		
May 31, 2019									
BOD	4	< 4	< 4	< 4	< 4	Dry	< 4	---	---
TSS	1770	150	140	22	931		50	---	---
Alkalinity	407	366	2340	386	332		276	30-500	---
pH	7.41	7.30	8.05	7.91	7.83		8.02	6.5-8.5	6.5-8.5
Conductivity	933	962	1010	917	1040		878	---	---
TDS	611	563	571	509	571		529	500	---
COD	37	24	< 8	< 8	< 8		< 8	---	---
Phosphorus	0.74	0.23	0.19	< 0.03	0.42		< 0.03	---	0.03
TKN	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5		< 0.5	---	---
Ammonia	< 0.1	< 0.1	< 0.1	< 0.1	0.5		< 0.1	---	3.3**
Phenolics	0.001	< 0.001	0.002	< 0.001	< 0.001		< 0.001	---	0.001
Sulphate	< 2	23	8	10	2		6	500	--
Chloride	99	87	160	76	130		130	250	---
Nitrite	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03		< 0.03	1.0	---
Nitrate	< 0.06	0.08	0.31	0.10	0.21		1.35	10	---
Mercury	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01	0.001	
Arsenic	0.0007	0.0006	< 0.0002	< 0.0002	0.0006		< 0.0002	0.002	0.05
Barium	0.139	0.113	0.166	0.109	0.105		0.0503	200	---
Boron	0.015	0.099	0.016	0.055	0.128		0.010	1.0	0.2
Calcium	166	148	131	148	173		126	---	---
Cadmium	0.000014	0.000005	< 0.000003	0.000004	0.000073		0.000005	0.005	0.0002
Chromium	0.00025	0.00027	0.00015	0.00015	0.00117		0.00099	0.05	---
Copper	0.0004	0.0005	0.0008	0.0014	0.0024		0.0006	1.0	0.005
Iron	1.50	1.21	< 0.007	< 0.007	2.03		0.021	0.3	0.3
Potassium	0.840	5.98	1.20	5.67	4.34		0.521	---	---
Magnesium	8.98	9.53	7.85	6.70	20.2		3.78	---	---
Manganese	0.550	0.277	0.00005	0.0122	0.587		0.00012	0.05	0.05
Sodium	48.9	42.9	57.6	31.3	48.0		52.2	200	---
Lead	0.00003	0.00005	< 0.00001	< 0.00001	0.01074		< 0.00001	0.01	0.005
Zinc	0.004	0.009	< 0.002	0.002	0.032		0.003	5.0	0.03

Notes: All results in mg/L with the exception of Conductivity (uS/cm), Mercury (ug/L), and pH  
 Highlighted indicates an exceedance of the ODWS and/or PWQO.



Table 5.2 2019 Fall Groundwater Quality Summary

PARAMETERS	Warsaw Road Landfill Site Monitors							Ontario Drinking Water Standards	PWQO
	TW 2	TW 3-2	TW 5-2	TW 6-2	TW 7	TW 8-2	TW 4-2 Background		
Oct. 5, 2017									
BOD	< 4	< 4	< 4	< 4	< 4	< 4	< 4	---	---
TSS	2	2	< 2	2	7	2	< 2	---	---
Alkalinity	249	382	289	360	331	309	283	30-500	---
pH	7.72	7.79	7.88	7.37	7.81	7.95	7.89	6.5-8.5	6.5-8.5
Conductivity	1160	1040	953	1160	1030	997	1060	---	---
TDS	871	654	529	663	597	566	686	500	---
COD	34	30	< 8	< 8	9	< 8	< 8	---	---
Phosphorus	< 0.03	< 0.03	< 0.03	< 0.03	0.04	< 0.03	< 0.03	---	0.03
TKN	0.6	0.6	< 0.5	1.2	0.9	< 0.5	< 0.5	---	---
Ammonia	< 0.1	0.1	< 0.1	1.0	0.8	< 0.1	< 0.1	---	3.3**
Phenolics	0.005	< 0.001	< 0.001	< 0.001	0.004	< 0.001	0.002	---	0.001
Sulphate	40	26	14	< 2	< 2	13	8	500	--
Chloride	210	100	130	160	140	140	160	250	---
Nitrite	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	1.0	---
Nitrate	< 0.06	< 0.06	0.24	1.14	< 0.06	< 0.06	2.50	10	---
Mercury	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.001	---
Arsenic	0.0005	0.0008	< 0.0002	0.0002	0.0009	< 0.0002	0.0002	0.002	0.05
Barium	0.145	0.122	0.151	0.145	0.139	0.210	0.0582	200	---
Boron	0.016	0.140	0.022	0.065	0.099	0.027	0.014	1.0	0.2
Calcium	175	164	128	171	145	134	152	---	---
Cadmium	0.000021	0.000014	< 0.000003	0.000016	< 0.000003	< 0.000003	0.000337	0.005	0.0002
Chromium	0.00024	0.00035	0.00010	0.00012	0.00019	0.00015	0.00027	0.05	---
Copper	0.0027	0.0014	0.0010	0.0018	0.0003	0.0005	0.0005	1.0	0.005
Iron	0.605	1.08	0.009	0.029	4.13	0.100	0.011	0.3	0.3
Potassium	0.560	6.74	1.40	8.69	4.63	1.69	0.687	---	---
Magnesium	8.03	11.5	8.02	9.89	13.4	11.1	4.92	---	---
Manganese	0.0887	0.282	0.00248	0.0796	1.27	0.0259	0.00065	0.05	0.05
Sodium	68.8	53.4	64.8	70.5	63.6	62.0	62.9	200	---
Lead	0.00005	0.00010	< 0.00001	0.00006	0.00005	0.00002	0.00013	0.01	0.005
Zinc	0.003	0.004	< 0.002	0.004	0.002	< 0.002	0.004	5.0	0.03

Notes: All results in mg/L with the exception of Conductivity (uS/cm) and pH  
 Highlighted indicates an exceedance of the ODWS and/ or PWQO.

In addition to the above analysis, monitor TW 7 was sampled for volatile organic compounds (VOCs) analysis during both sampling circuits. In both circuits all VOC parameters were reported with values below their respective detection limits. These certificates of analysis are also included in Appendix E.



A MECP memorandum indicated “that any groundwater locations that discharge to surface water should be identified and compared to the PWQO”. The groundwater at all monitoring wells, with the exception of TW 4-2, potentially discharges to surface water. TW 3-2 is immediately up-gradient of DSW-9 while TW-2, TW 5-2 and TW 8-2 are immediately up-gradient of DSW-17, and TW-6-2 is up-gradient of DSW 7. Since TW 4-2 is the background monitor it was also analyzed for Column 3 of Schedule 5 parameters for comparative purposes.

### 5.3 Surface Water Monitors

Surface water samples were collected during both the May and October sampling period. In-field measurements were taken at the surface water station as presented in Table 5.2. Only DSW11 had water in the fall as the remainder were dry. The MECP has recommended their recent review that “If ponded conditions are representative of the nature of the surface water feature, sampling should be undertaken”. The wells were dry not ponded in the fall.

Table 5.2 2019 Surface Water Field Measurements

Parameter	Field Measurement							
	DSW 7		DSW 9		DSW 11		DSW 17	
	May 31, 2019	Oct. 25, 2019	May 31, 2019	Oct. 25, 2019	May 31, 2019	Oct. 25, 2019	May 31, 2019	Oct. 25, 2019
Temperature (°C)	12.8	dry	14.5	dry	15.0	8.6	14.0	dry
pH	7.97		7.61		7.76	5.80	7.89	
Conductivity (us/cm)	561		698		460	522	731	
Dissolved Oxygen (mg/L)	9.30		7.40		5.60	5.93	6.67	
Hydrogen Sulphide	0		0		0	---	0	
ORP	139		160		153	22.4	3.6	

The surface water samples were submitted for analysis of Column 3, Schedule 5 of the Landfill Standards Guideline (Indicator List for Surface Water). All of the parameters tested are within their respective current PWQO with the exception of TDS, Phosphorus, Phenolics, Iron and Manganese. DSW 9 showed the majority of the exceedances. DSW 9 is a pond in the middle of the pasture field that is down-gradient of DSW7 and DSW 11 which did not show similar results.

There were less exceedances in 2019 as there were in 2018 especially in DSW 7. Phenols showed minor exceedances more often this year were it has not in the past. This should be monitored in the future. The results of the sampling are summarized on Table 5.3 with the certificates of analysis presented in Appendix E.



Table 5.3 Leachate Indicator Parameters 2019 Surface Water Quality Results

Parameters	Surface Water Locations								Ontario Drinking Water Standards	PWQO
	DSW 7		DSW 9		DSW 11		DSW 17			
	May 31 2019	Oct. 25 2019	May 31 2019	Oct. 25 2019	May 31 2019	Oct. 25 2019	May 31 2019	Oct. 25 2019		
BOD	< 4	dry	13	dry	< 4	< 4	< 4	dry	---	---
TSS	< 2		23		27	<2	5		---	---
Alkalinity	282		239		237	250	324		30-500	---
pH	8.24		8.48		8.35	7.94	8.35		6.5-8.5	6.5-8.5
Conductivity	702		770		529	678	881		---	---
TDS	423		511		346	440	534		500	---
COD	< 8		53		29	52	34		---	---
Phosphorus	<0.003		0.398		0.013	0.017	0.035		---	0.02
TKN	< 0.5		1.5		< 0.5	0.8	< 0.5		---	---
Ammonia	< 0.1		0.6		< 0.1	< 0.1	< 0.1		---	3.3**
Phenolics	< 0.001		0.009		0.002	0.003	0.007		---	0.001
Sulphate	6		< 2		< 2	< 2	< 2		500	--
Chloride	64		64		36	64	100		250	---
Nitrite	< 0.03		< 0.03		< 0.03	< 0.03	< 0.03		1.0	---
Nitrate	< 0.06		0.08		< 0.06	< 0.06	< 0.06		10	---
Mercury	< 0.01		< 0.01		< 0.01	< 0.01	< 0.01		200	---
Arsenic	<0.0002		0.0005		0.0003	0.0005	0.0004		1.0	0.2
Barium	0.0764		0.0798		0.0304	0.0421	0.0891		200	---
Boron	0.051		0.073		0.017	0.017	0.066		1.0	0.2
Calcium	109		115		89.4	112	131			---
Cadmium	<0.000003		0.000021		<0.000003	<0.000003	0.000010		0.005	0.0002
Chromium	< 0.00008		0.00019		< 0.00008	0.00015	0.00013		0.05	---
Copper	0.0003		0.0025		0.0002	0.0005	0.0006		1.0	0.005
Iron	0.03		0.988		0.03	0.047	0.086		0.3	0.3
Potassium	3.75		10.2		0.937	2.29	5.18		---	---
Magnesium	6.29		9.38		3.55	4.40	8.20		---	---
Manganese	0.0266		1.29		0.00565	0.0129	0.0784		0.05	0.05
Sodium	28.4		31.0		19.2	27.2	58.7		200	---
Lead	< 0.00001		0.00020		< 0.00001	<0.00001	0.00006		0.01	0.005
Zinc	< 0.002		0.009		< 0.002	0.003	0.003		5.0	0.03

Notes: All results in mg/L with the exception of Conductivity (uS/cm) and pH.

Highlighted indicates an exceedance of the ODWS and/or PWQO.

### 5.3.1 Surface Water Trigger Mechanism

Trigger mechanism established for this site is based on 8 consecutive samples that the analysis shows that one of the trigger parameters exceed the 75th percentile of DSW 16 (background sample). DSW 16 values are derived from historical results as it was dry in 2019. Once this has happened, then the contingency plan is triggered. Only sample sites DSW 7 and DSW 17 are used as trigger sites. Trigger parameters are set as chloride, conductivity, iron, and manganese. Tables 5.4 and 5.5, compares parameters to values for the trigger sites for the last 8 sampling periods. No parameter has exceeded the trigger value for the 8 consecutive periods. Therefore, the contingency plan is not triggered.





Table 5.4 Surface Water Trigger Mechanism 2016 – 2019 DSW 7

Parameters	Trigger Value	DSW 7							
		June 2016	Oct. 2016	June 2017	Sep. 2017	June 2018	Oct. 2018	May 2019	Oct. 2019
Chloride	310	89	Dry	58	Dry	60	77	64	Dry
Conductivity	1460	766	Dry	575	Dry	797	859	702	Dry
Iron	1.77	0.067	Dry	0.348	Dry	1.37	0.990	0.03	Dry
Manganese	0.696	0.0317	Dry	0.0196	Dry	1.07	1.58	0.0266	Dry

Notes: All results in mg/L with the exception of Conductivity (uS/cm). Trigger value reported as 75<sup>th</sup> percentile of average past monitoring events.

Table 5.5 Surface Water Trigger Mechanism 2016 – 2019 DSW 17

Parameters	Trigger Value	DSW 17							
		June 2016	Oct. 2016	June 2017	Sep. 2017	June 2018	Oct. 2018	May 2019	Oct. 2019
Chloride	310	110	Dry	96	Dry	90	Dry	100	Dry
Conductivity	1460	965	Dry	810	Dry	829	Dry	881	Dry
Iron	1.77	0.056	Dry	0.090	Dry	0.598	Dry	0.086	Dry
Manganese	0.696	0.0201	Dry	0.0336	Dry	0.150	Dry	0.0784	Dry

Notes: All results in mg/L with the exception of Conductivity (uS/cm). Trigger value reported as 75<sup>th</sup> percentile of average past monitoring events.

## 5.4 Residential Wells

The four residential wells are sampled every three (3) years. The wells were sampled in 2017 and are not due to be sampled till 2020.



## 5.5 Landfill Gas Monitoring

Landfill gas monitoring was conducted at six gas probe that have been installed within and adjacent to the buried refuse area. The locations of the gas probes are depicted on Plate 2A. Hydrogen sulphide gas was not detected. Methane gas was detected in GP5 for all sampling periods. The readings ranged from 18% to 55% by volume. GP6 which in the past has recorded sporadic methane levels ranging from 0% in May to 10% in October. No methane was detected in any of the other gas probes for the 5 periods. The results of the monitoring are summarized in Table 5.7. Graphs depicting the results of methane gas monitoring for the last nine years are presented in Appendix D.

Table 5.7 2019 Warsaw Landfill Gas Monitoring

Date	GP-1	GP-2	GP-3	GP-4	GP-5	GP-6
January	0	0	0	0	18	0
February	0	0	0	0	19	1
October	0	0	0	0	38	4
November	0	0	0	0	42	7
December	0	0	0	0	55	10

## 6. Conclusions and Recommendations

This report presents the results of the 2019 groundwater monitoring program completed at the Warsaw Road Landfill Site in the Township of Douro-Dummer. It is our professional opinion that the groundwater level and chemical data do not indicate a significant anomaly from the results of the previous years. The majority of the parameters are within their acceptable limits with a few exceedances in the shallow monitors located adjacent to the refuse area. The results are similar to past years.

Future monitoring data should be compiled on an annual basis to evaluate any trends. Surface water sample results were also similar to previous years. The results of sampling at the trigger sampling locations were compared to background concentrations of select parameters. The results indicated that the contingency plan did not need to be activated and will not be for the foreseeable future as all 2019 results were all within the trigger values.

1. The monitoring wells and surface water locations should continue to be monitored for the parameters established in this report. Surface water stations will be sampled even if ponded or stagnant.
2. Water Quality at the residential wells should be tested in 2020 as part of the required frequency, i.e. once every 3<sup>rd</sup> year testing.
3. Sampling should continue for VOC parameters for monitor TW 7.



## 6.1 Signatures

We trust that this report meets with your immediate requirements. Should you have any questions, please contact our office.

Sincerely,

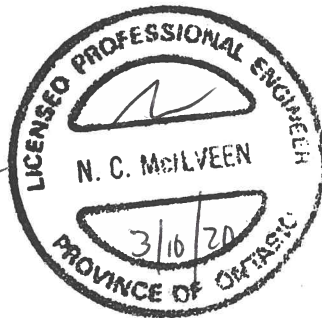
GHD

A handwritten signature in black ink, appearing to read "Steven Gagne", written over a horizontal line.

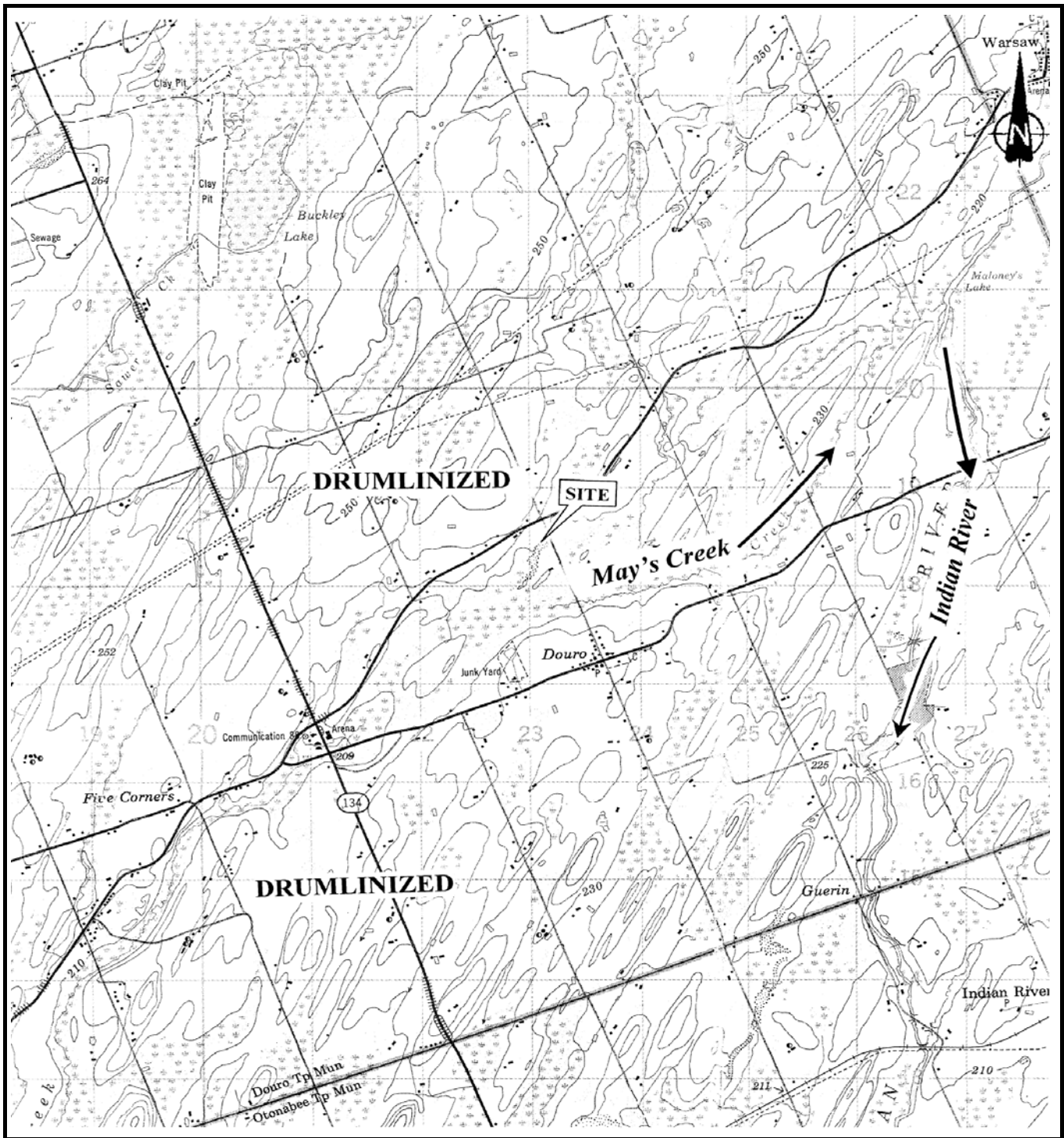
Steven Gagne, H.B.Sc.

A handwritten signature in black ink, appearing to read "Nyle McIlveen", written over a horizontal line.

Nyle McIlveen, P.Eng.



## Enclosures



Base map compiled from Energy, Mines and Resources Canada Map 31 D/8 dated 1985. Air photography dated 1981.

**Scale:**  
1:50000  
Coordinate System  
NAD 1983 UTM

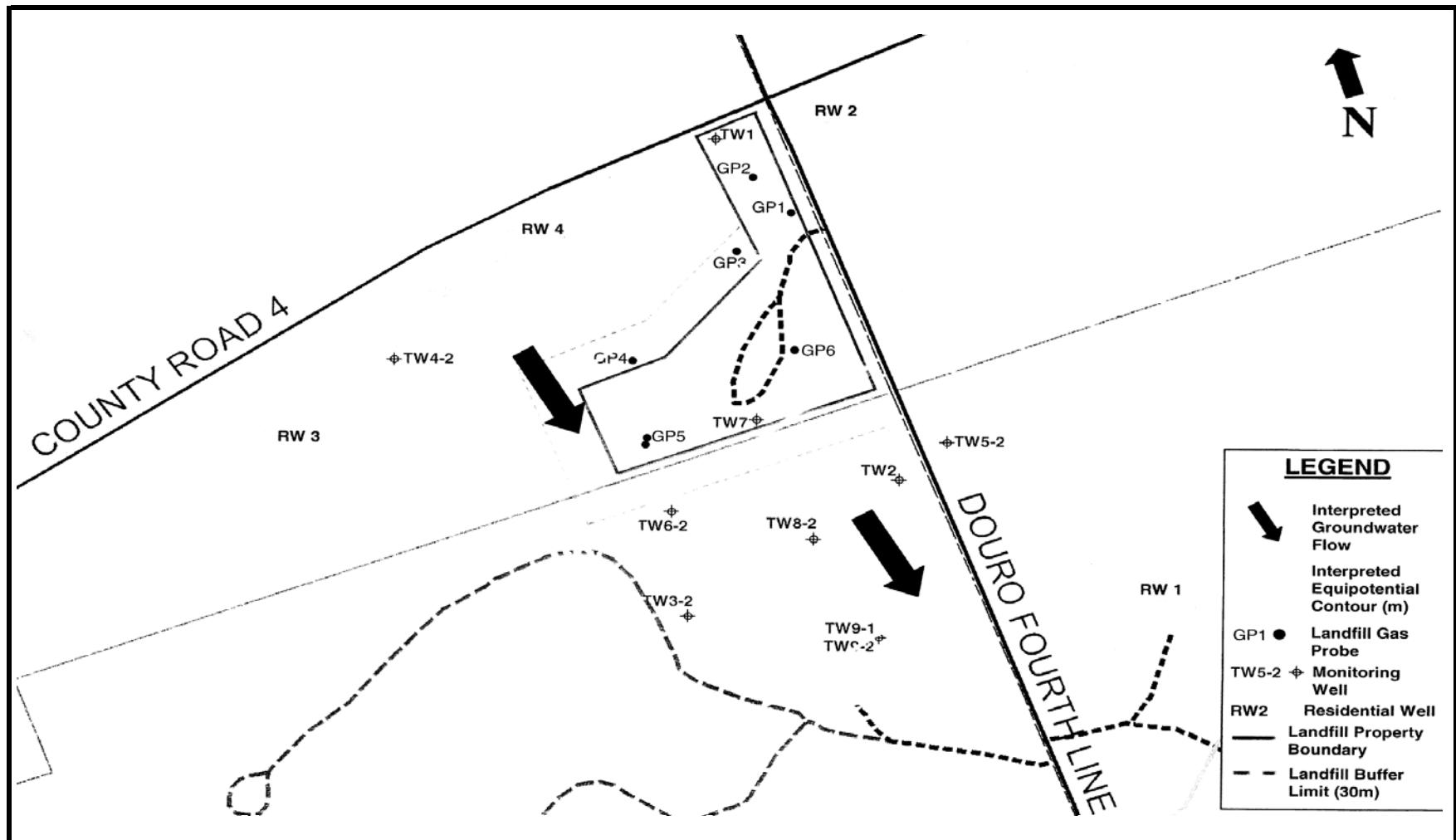


Warsaw Road Landfill  
Part Lot 8, Concession 5  
Township of Douro-Dummer

11193447  
March 2020

**Vicinity Plan**

**Plate 1**



Base Plan Provided By AECOM

**Scale:**  
Not To Scale  
Coordinate System:  
NAD 1983 UTM Zone 17

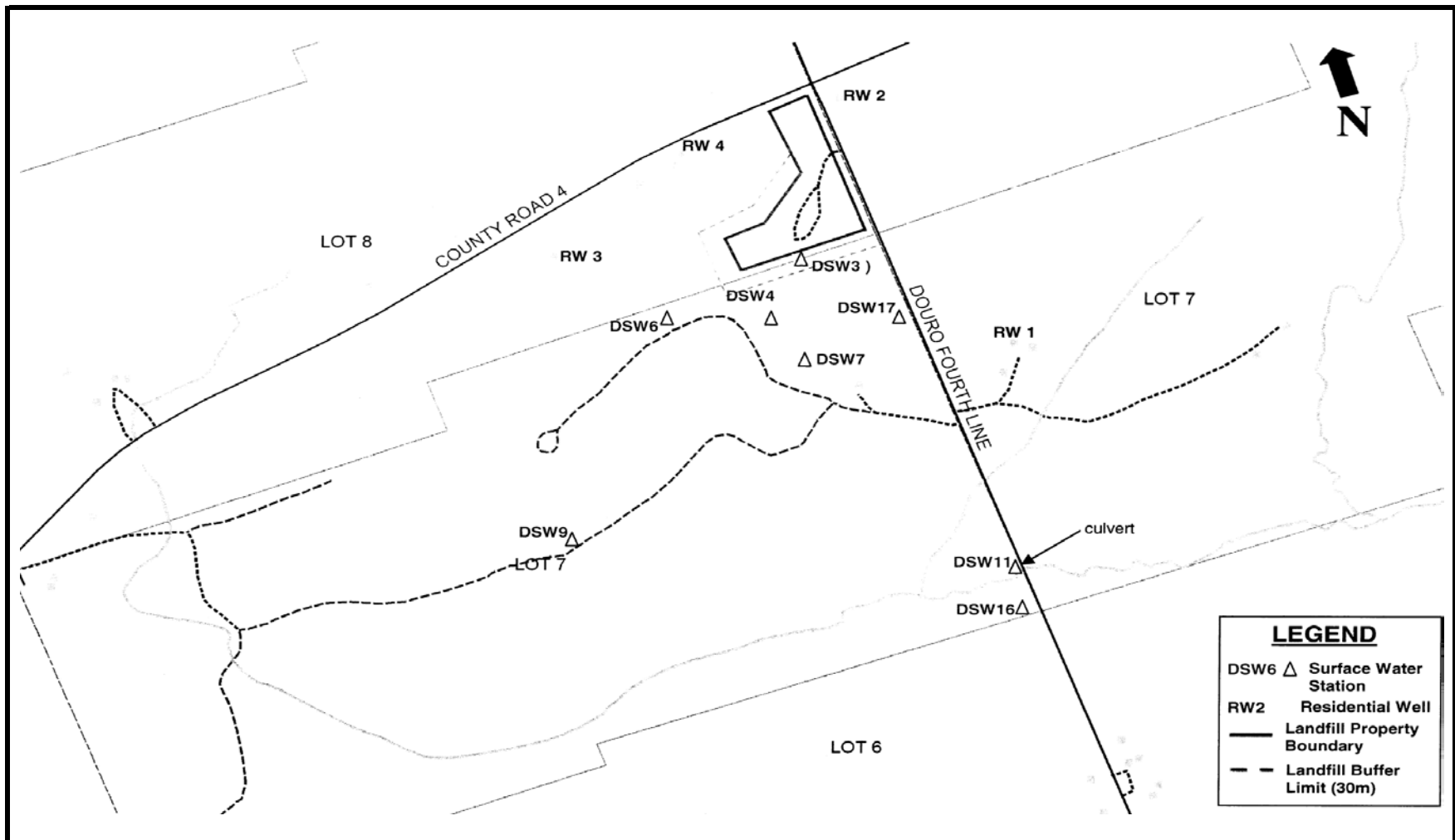


Warsaw Road Landfill  
Part Lot 8, Concession 5  
Former Township of Douro-Dummer

11193447  
1-Mar-20

**Plot Plan A**

**Plate 2A**



Base Plan Provided By AECOM

**Scale:**  
Not To Scale  
Coordinate System:  
NAD 1983 UTM Zone 17



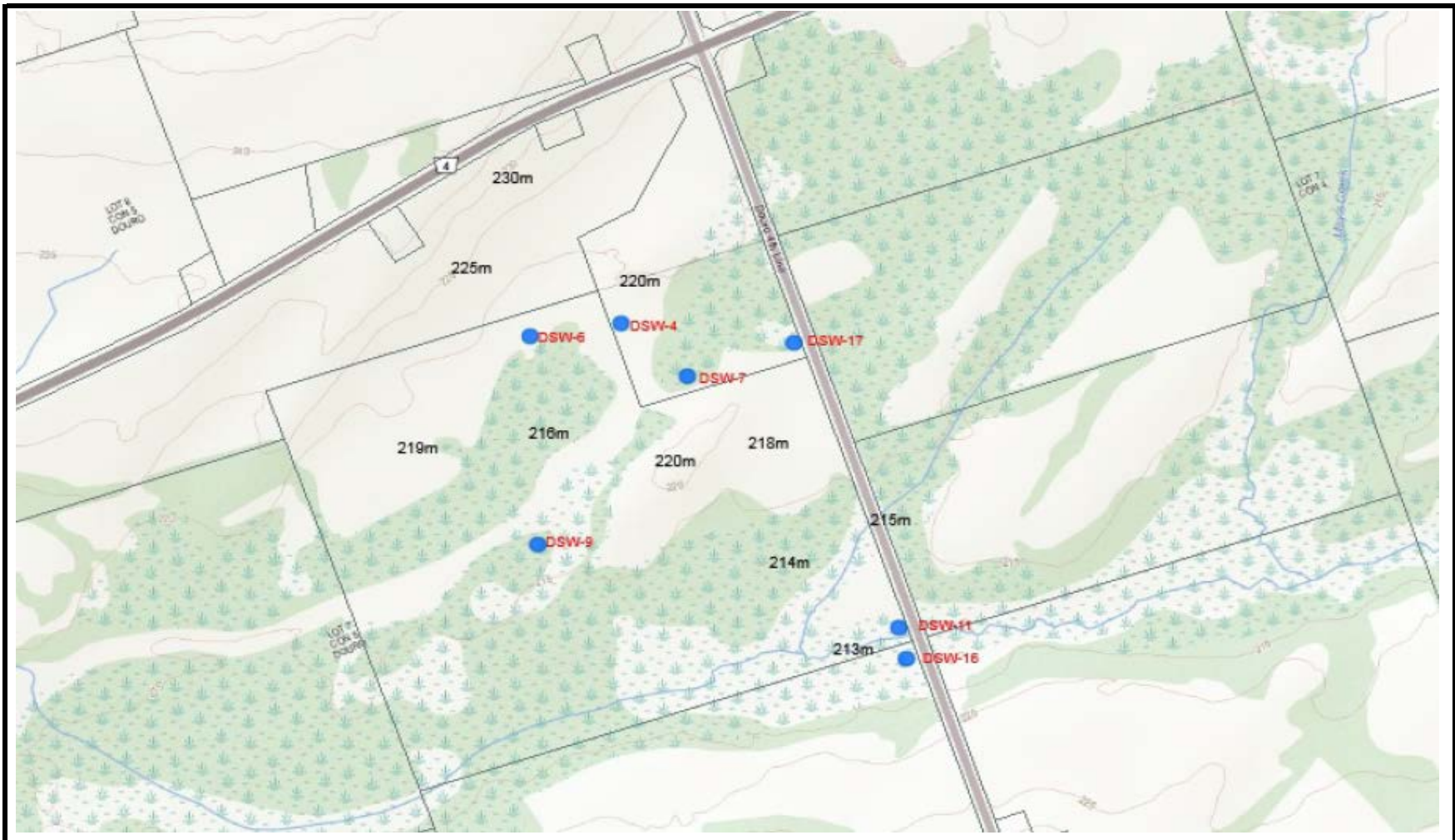
Warsaw Road Landfill  
Part Lot 8, Concession 5  
Former Township of Douro-Dummer

11193447  
March 2020

**Plot Plan B**

**Plate 2B**





Base Plan Provided By AECOM

**Scale:**  
Not To Scale  
Coordinate System:  
NAD 1983 UTM Zone 17



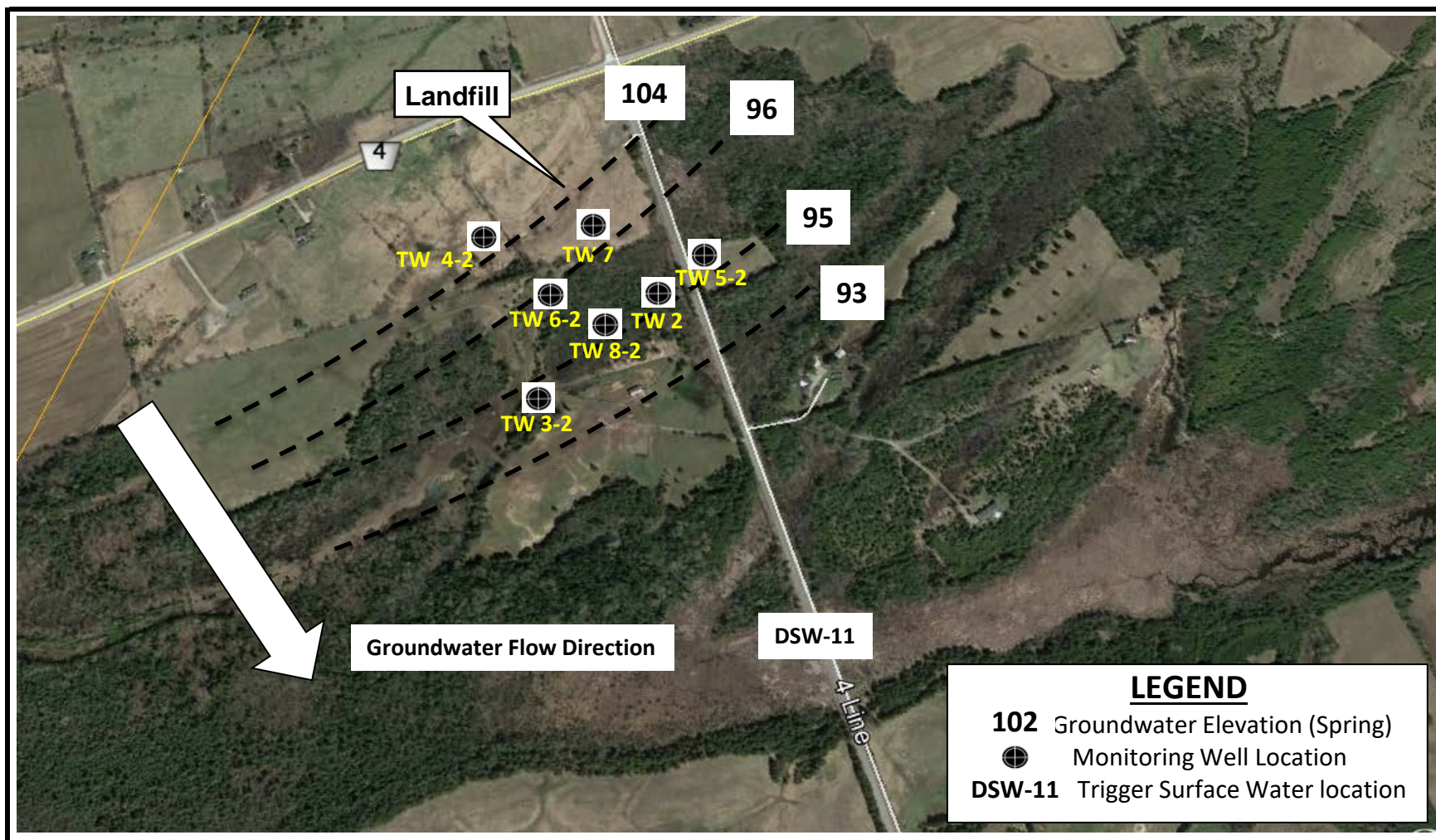
Warsaw Road Landfill  
Part Lot 8, Concession 5  
Former Township of Douro-Dummer

11193447  
March 2020

**Surface Elevation Plan**

**Plate 2C**





Base Plan Provided By AECOM

**Scale:**  
Not To Scale  
Coordinate System:  
NAD 1983 UTM Zone 17



Warsaw Road Landfill  
Part Lot 8, Concession 5  
Former Township of Douro-Dummer

11193447  
March 2020

**Groundwater Flow Plan**

**Plate 2D**

# 2019 FIELD MONITORING SUMMARY

Warsaw Road Landfill Site  
Township of Douro-Dummer, County of Peterborough  
Project No. 11193447-01

MONITORING WELL	May 31, 2019						October 25, 2019					
	Temp.	EC	Methane	pH	H <sub>2</sub> S	ORP	Temp.	EC	Methane	pH	H <sub>2</sub> S	ORP
	(°C)	(uS/cm)	(% CH <sub>4</sub> )				(°C)	(uS/cm)	(% CH <sub>4</sub> )			
TW-2	9.7	738	0	7.55	0	200	11.1	915	0	6.29	0	195
TW-3-2	8.5	692	0	7.26	0	70	11.2	774	0	6.84	0	177
TW-4-2	9.5	664	0	7.71	0	34	11.1	780	0	7.14	0	172
TW-5-2	8.4	725	0	7.71	0	98	11.0	688	0	5.98	0	200
TW-6-2	9.0	686	0	7.45	0	119	22.0	839	0	6.76	0	178
TW-7	9.8	784	0	7.78	0	150	11.2	734	0	6.77	0	2
TW-8-2							10.5	727	0	6.54	0	185

Notes:  
(---) indicates no data

GHD  
PLATE 3

## 2019 WATER LEVEL MONITORING SUMMARY

Warsaw Road Landfill Site  
Township of Douro-Dummer, County of Peterborough  
Project No. 11193447

		May 31, 2019		October 25, 2019	
MONITORING WELL	TOP OF CASING ELEVATION	WATER LEVEL FROM TOP OF CASING	WATER LEVEL ELEVATION	WATER LEVEL FROM TOP OF CASING	WATER LEVEL ELEVATION
	(M)	(M)	(M)	(M)	(M)
TW-2	97.08	1.37	95.71	1.60	95.48
TW-3-2	94.83	1.37	93.46	1.73	93.10
TW-4-2	105.99	1.27	104.72	3.46	102.53
TW-5-2	96.63	0.93	95.70	1.24	95.39
TW-6-2	97.66	2.50	95.16	2.82	94.84
TW-7	100.68	3.98	96.70	4.66	96.02
TW-8-2	97.16	---	---	2.12	95.04
TW-9-2	96.38	dry	na	dry	na

Notes:

All measurements presented in metres.

MP refers to measuring point (top of protective casing) above surrounding ground surface.

(na) - indicates not available

PLATE 4

# **Appendix A**

## **MOECC Provisional Certificates of Approval and Correspondence**



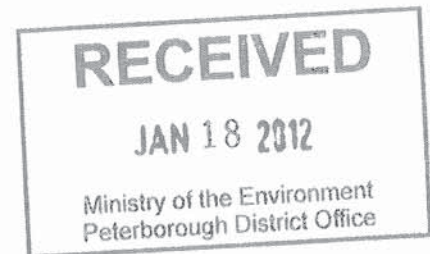
MEMORANDUM

January 16, 2012

TO: Keith Jamieson  
Senior Environmental Officer  
Peterborough District Office  
Eastern Region

FROM: Beth Gilbert  
Surface Water Specialist  
Technical Support Section  
Eastern Region

RE: 2009 & 2010 Annual Monitoring Reports  
Warsaw Road Waste Disposal Site (WDS)  
Douro-Dummer, Peterborough County  
IDS#: 7014-85CMVP and 3120-8FVRRN



I have reviewed the above mentioned monitoring reports prepared by Geo-Logic Inc. for surface water impacts and have the following comments to offer.

**Background**

Comments were most recently provided on this site in a memorandum (dated July 7, 2010) authored by Mr. Mark Phillips, MOE Surface Water Scientist on the 2007 and 2008 Annual Monitoring Reports (AMR).

The WDS includes a 2 hectare fill area within a larger 2.43 hectare licensed area. The site was operated as a landfill by the Township for approximately 25 years before it was closed in 1996.

The Warsaw WDS is bounded to the south and east by a low-lying area that is wet at ground surface during most of the year. Agriculture pasture land borders the northern and western boundaries of the site. The Provincially Significant Indian River/Warsaw South Wetland surrounds the site. Drainage from the site flows to the south-southeast towards the wetland. Shallow groundwater is described as flowing in a south-easterly direction.

The surface water sampling program involves sampling at 7 locations, twice annually, for chloride, conductivity, iron, manganese, as well as field parameters: pH, temperature, and dissolved oxygen. These parameters are the basis for the trigger mechanism and are used to



determine if the landfill is impacting on surface waters. If the analysis shows that one of these parameters exceeds the 75<sup>th</sup> percentile of the background sample data (DSW16) then the contingency plan is triggered.

The AMR indicates that surface water sampling location DSW16 (downgradient from the landfill) serves as a background sampling location. DSW4 and DSW7 are located down-gradient from the landfill within the wetland. DSW17 is located downgradient from the landfill within the roadside ditch. DSW6 is located within the wetland to the west of the WDS and DSW9 is located within the wetland to the southwest of the WDS. DSW11 is located a substantial distance south of the WDS on a small creek. DSW3 was located at the foot of the landfill within the wetland, but is no longer active as it was impacted by soils which eroded during final cover placement.

The measured parameters were compared to the Provincial Water Quality Objectives (PWQOs) (MOE 1994).

## **2010 AMR**

In 2010, three surface water stations were sampled in spring (DSW9, DSW11, DSW17) and two stations were sampled in the fall (DSW11 and DSW17). These samples were analyzed for the parameters listed in Column 4, Schedule 5 of the Landfill Standards Guideline (Indicator List for Surface Water). The remaining stations were not sampled as they were either dry or ponded. The AMR does not indicate which stations were dry and which were ponded. The contingency plan was not triggered for 2010.

Boron exceedances of the PWQO (PWQO = 0.002 mg/L) occurred in the spring and fall of 2010. Boron exceedances occurred at all stations sampled (DSW9, DSW11, DSW17). Concentrations were highest at DSW9 (0.043 mg/L). However, comparison with the draft Canadian Water Quality Guideline for boron of 1.5 mg/L (based on more up-to-date toxicology information) showed no exceedances and indicates that aquatic toxicity is not anticipated.

Iron concentrations were greater than the PWQO at DSW9, but only marginally greater (0.313 mg/L). With the data provided, the reviewer cannot determine whether the iron PWQO exceedance is greater than the 75<sup>th</sup> percentile at the background site. There was no explanation offered for this exceedance; however, past memos (September 23, 2004; Dec 4, 2007) indicate that the PWQO for iron has been exceeded at the background site (DSW16).

Phosphorus concentrations exceeded the PWQO of 0.03 mg/L at DSW17 and DSW 11. Concentrations ranged from 0.04-0.05 mg/L at DSW17 and from 0.01 to 0.08 mg/L at DSW11. This is not unexpected given that the site drains a nutrient rich wetland environment where phosphorus concentrations and primary productivity are expected to be high.

## **2009 AMR**

In 2009, two surface water stations were sampled in spring and fall (DSW11 and DSW17). These samples were analyzed for the parameters listed in Column 4, Schedule 5 of the Landfill Standards Guideline (Indicator List for Surface Water). The remaining stations were not sampled as they were either dry or ponded. The AMR does not indicate which stations were dry and which were ponded. The contingency plan was not triggered for 2009.

In 2009, the only PWQO exceedance found was for phosphorus at DSW 17. Phosphorus ranged from <0.01 - 0.04 mg/L.

## **Comments/Recommendations**

With the limited data provided, the waste disposal site does not appear to be having an impact on the water quality measured at the surface water trigger locations at this time. The measured parameters were recorded at levels below PWQO and CWQG with the exception of iron, boron, and phosphorus. Based on the iron PWQO and interim draft guideline for boron, the monitoring data suggests that concentrations of boron and iron are not at levels that are likely to be toxic to aquatic organisms. Similarly for phosphorus, these concentrations are not unexpected for a productive wetland type environment.

In both the 2009 and 2010 AMR, Geo-logic recommends that surface water monitoring locations should continue to be monitored for the parameters established in the 2008 AECOM report. I do not support this recommendation as the parameters analyzed in the 2008 AECOM report did not include a number of the parameters listed in Column 4, Schedule 5 of the Landfill Standards Guideline (Indicator List for Surface Water) including: ammonia, TKN, suspended solids, total dissolved solids, sulphate, phenol, or phosphorus. I recommend that the surface water locations should continue to be analyzed for the parameters established in the 2009 and 2010 Geo-logic AMR.

It should also be noted that the sampling station DSW3 was lost due to erosion of final cover material and has never been replaced with a suitable monitoring station located in close proximity to the waste mound – wetland interface to capture impacts associated with overland flow and/or groundwater discharge as requested in a previous memo from Mr. Mark Phillips, dated December 4, 2007.

The sampling sites are illustrated on Plate 2B. In addition Plate 2B is not sufficient for indicating the extent of hydrologic features at the site. The Plate should show the location of surface water sampling sites (indicated with a dot and a label), groundwater sampling sites, groundwater flow direction, topographic contours, ponds, creeks, roadside ditches, wetlands, direction of flow, etc.



The AMR should provide a description of the sampling sites (nature of the surface water feature, flow, location description, etc.) with an opinion on whether the sites are still appropriate for providing monitoring data to assess impacts from the landfill. Following this review of the monitoring design, the trigger mechanism should be re-visited.

Sampling was not conducted at monitoring locations where water was ponded. It is not known at which locations this occurred. If ponded conditions are representative of the nature of the surface water feature, sampling should be undertaken. Stagnant or ponded waters may represent a potential conduit for contaminants to surface water features at other times of the year.

The AMR provided annual data for the trigger parameters summarized in table form. Although the certificates of analysis are provided in the appendix and include the suite of indicator parameters listed in Schedule 5, Column 4 of the Ministry's "Landfill Standards: A Guideline on the Regulatory and Approval Requirements for New or Expanding Landfill Sites," (OMOE 1998) this data should be presented within the same table as the trigger parameters within the main body of the AMR and compared to PWQOs for a comprehensive view of water quality conditions at the sample locations. The reviewer could not find a description of the trigger mechanism within the documents provided in the AMR. Future reports should contain a copy of the document which outlines the trigger mechanism.

The measured parameters could not be compared to background water quality, as this information was not provided. Future AMR should provide a table summarizing the 75<sup>th</sup> percentile for the measured parameters at the background site. This data should be a 'running' percentile which incorporates the monitoring data from the previous year in the calculation of percentiles. Any exceedance beyond these values or their respective PWQOs should be explained.

The WDS is surrounded by the Provincially Significant Indian River/Warsaw South Wetland. The report does not indicate whether the levels of parameters being measured at the sampling sites, in particular Iron and Boron, are anticipated to have an impact on the features and functions for which the wetland has been identified.

The consultants need to identify which (if any) groundwater monitoring locations represent groundwater which is discharging to surface water and compare groundwater quality at these locations to the PWQO (OMOE 1994).

### **Summary of Comments**

- With the limited data provided, the WDS does not appear to be having an impact on the water quality at the monitored surface water stations.



- Boron, Iron and phosphorus concentrations exceeded PWQOs. In the case of Boron, concentrations did not exceed the more up-to-date CWQG. In the case of iron, the exceedance of PWQO was minimal and restricted to one date and location. In the case of phosphorus, concentrations in this range are not unusual given the site drains a productive stagnant wetland environment. These parameters should continue to be monitored.
- Sampling should continue for the parameters established in the 2009 & 2010 AMR.
- The design of the surface water monitoring locations should be re-evaluated to determine if the sites are still appropriate for determining surface water impacts from the landfill. After this evaluation, the trigger mechanism should be re-visited.
- Data was not provided for a station representing background water quality conditions. Future AMR should indicate the 75<sup>th</sup> percentile of measured concentrations at the background monitoring location.
- Future reports should contain a copy of the document which outlines the trigger mechanism.
- Any future AMR should show the extent of hydrologic features at the site including location of surface water sampling sites (indicated with a dot and a label), groundwater sampling sites, groundwater flow direction, topographic contours, ponds, creeks, roadside ditches, wetlands, direction of flow, etc.
- Any groundwater monitoring locations that discharge to surface water should be identified and compared to PWQOs.

Should you have any questions on the above, please do not hesitate to contact me at 613-540-6864.



Beth Gilbert, M.Sc.  
BG/gl

c: Mark Phillips, Surface Water Scientist  
Beth Gilbert, Surface Water Reviewer  
Shawn Kinney, Ground Water Reviewer  
Peter Taylor, Water Resources Unit Supervisor  
David Bradley, Peterborough District Office Supervisor  
SW-PB-DD C5-03-06 (Douro-Dummer) (Warsaw Road (South) Landfill)  
GW-PB-DD 01-03-C5 (Warsaw Road Waste Disposal Site)

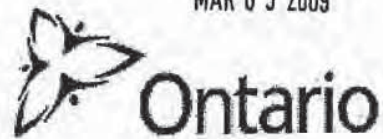


**Ministry of the Environment**

Eastern Region  
Peterborough District Office  
Peterborough Area Office  
2nd Floor South Tower  
300 Water St S  
Peterborough ON K9J 8M5  
Fax: (705)755-4321  
Tel: (705) 755-5271

**Ministère de l'Environnement**

Direction régionale de l'Est  
2e étage tour sud  
300 rue Water S  
Peterborough ON K9J 8M5  
Télécopieur: (705)755-4321  
Tél: (705) 755-5271



MAR 03 2009

February 26, 2009

David Clifford, CAO  
The Corporation of the Township of Douro-Dummer  
894 South St., PO Box 92  
Warsaw, Ontario,  
K0L 3A0

Dear Mr. Clifford

**RE:** Warsaw Road Landfill Site, 2007 Annual Monitoring Report  
Reference Number 4647-7DSGUL

The Ministry of the Environment's, Eastern Region Technical Support Section, have completed the technical review associated with the above-stated document. A copy of the comments are attached to this letter for your review and implementation.

Further, it is recommended that the Township provide a copy of the attached comments to their consultant for their review and consideration, as applicable.

Should you have any questions or concerns pertaining to this letter or the attached comments, please do not hesitate to contact Chris Johnston, Senior Environmental Officer, at 705 755-4308.

Yours truly,

Tim Hannah  
Peterborough District Office

File Storage Number: SIPBDOC05 610 - LOT 8



## Ministry of the Environment

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

## Ministère de l'Environnement

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



## MEMORANDUM

29 December 2008

TO: Cathy Curlew  
Senior Environmental Officer  
Peterborough District Office  
Eastern Region

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

RE: 2008 Annual Monitoring Report  
Warsaw Road Closed Waste Disposal Site A340902  
Lot 8, Concession 5, Geographic Township of Douro  
Township of Douro-Dummer

---

I have reviewed the hydrogeologic aspects of the following documents entitled:

- "Warsaw Road Landfill Site, 2007 Annual Monitoring Report" Totten Sims Hubicki Associates, March 2008.

Appendix B of the report includes the document entitled:

- "2007 Annual Report, Warsaw Landfill, Township of Douro-Dummer, Provisional Certificate of Approval A 340902" Hydroterra Limited, February 2008.

I submit the following comments for your consideration.

**Summary**

1. The site is closed. Guideline B-9 applies. Manganese levels are twice as high as the provincial objective at the existing attenuation zone boundary. Monitoring of this situation should continue.
2. The primary pathway for migration of leachate is reportedly southward through the shallow overburden and bedrock.

- 2 -

3. The potential does not exist for surface water impacts to occur at this time.
4. The proposed groundwater monitoring program is satisfactory.
5. Future monitoring reports should include hydraulic conductivity data for all on-site monitoring wells.
6. Future monitoring reports should include site diagrams depicting a horizontal scale.

#### **Certificate of Approval**

The Warsaw Road Waste Disposal Site operates under Certificate of Approval A340902. The site was licensed for the use and operation of a 2.0 hectare landfill site within a total site area of 2.43 hectares. The landfill underwent final closure in 1996. The landfill is a naturally attenuating site.

#### **Geology**

Appendix B, the Hydroterra document, describes site geology. Figure 1 of the appended Hydroterra report provides geologic cross sections. Appendix D includes borehole logs for 9 boreholes. Based on this information, the general site geology is as follows:

- Sandy loam, silty sand and sandy gravel: up to 4 metres
- Bedrock: Limestone with minor shale

Overburden in the eastern edge portion of the site differs from this general condition and is comprised of clay till.

#### **Hydrogeologic Conditions**

##### **Hydraulic Conductivity**

The provided documents do not present hydraulic conductivity data. I therefore cannot advise you on leachate migration rates. Future monitoring reports should include hydraulic conductivity data for all on-site monitoring wells.

##### **Horizontal Hydraulic Gradient**

The field notes provided in Appendix D tabulate water level measurements for April and October 2007. Based on the overburden materials and water level data I conclude that the general hydraulic gradient is from the fill area southward towards monitor TW3-2. The provided site diagrams and cross sections do not include a horizontal scale. I am unable to confirm the magnitude of the horizontal gradients.



- 3 -

### Vertical Gradient

Monitoring location TW9 appears to be the only remaining multi-level groundwater monitoring location. An upward gradient was observed at TW-9.

The well abandonment log provided in Appendix D indicated that bedrock monitor TW3-1 was historically a flowing well. This suggests that an upward gradient also exists at TW-3, located west of TW-9.

### Groundwater Flow Direction

As noted above, the groundwater flow direction within the sandy overburden is from the fill area southward towards monitor TW3-2.

Anomalously low water levels measured in TW9-2 appear to suggest flow towards the TW9 location. I note, however, that TW9-2 is screened in "clayey silt" which is likely less amenable to groundwater flow than the sandy gravel noted at the TW3 location.

### Hydrogeologic Units

The sand and gravel overburden existing over most of the site is a shallow aquifer. The clay till material in the south-eastern portion probably functions as an aquitard and may be a confining layer in the vicinity of TW9. The underlying limestone bedrock is also an aquifer which appears to recharge upwards in the southern part of the site.

### Conceptual Model

The primary pathway of leachate migration from the waste disposal site is the shallow overburden and fractured bedrock aquifer.

### Background Water Quality

TW4-2 is a representative background monitor. In my previous review memorandum dated 29 November 2007 I examined the median values of the 5 recent sample analyses for this well, as provided in Table 5 of the 2007 monitoring report. The water quality at TW4-1 conformed to the Ontario Drinking Water Standards and Objectives with the following exceptions:

- The median *hardness* level was 335 mg/l. This is 3 times greater than the 100 mg/l aesthetic objective.
- The median *total dissolved solids* level was 491 mg/l. This is approximately equal to the 500 mg/l aesthetic objective.

- 4 -

### Leachate Water Quality

Monitoring well TW-7 is completed within the fill area. I have examined the most recent water quality data for this well, as presented in Appendix E of the 2008 report. I note the following contaminants of concern:

- The *manganese* concentration ranged from 0.48 mg/l to 1.3 mg/l. These values are 9.6 to 26 times greater than the 0.05 mg/l aesthetic objective.
- The *iron* concentration ranged from 2.4 mg/l to 2.9 mg/l. These values are 8 to 10 times greater than the 0.3 mg/l aesthetic objective.

Overall, manganese concentrations were slightly lower compared to the preceding year, while iron concentrations increased slightly.

### Downgradient Water Quality

I am satisfied that the extent of iron and manganese impacts have been determined. Downgradient monitor TW3-2 was impacted by manganese and iron.

Manganese levels were 2.2 to 2.4 times greater than the 0.05 mg/l provincial drinking water criterion. Iron levels slightly exceeded the 0.3 mg/l drinking water criterion during October 2007, but conformed to the criterion in April 2007.

There has been minimal change since the previous year. The situation should continue to be monitored.

### GW/SW Interaction

I have previously concluded that no surface water receivers existed downgradient of the fill area in the immediate vicinity of the site. This assessment was based upon an examination of Ontario Base Map #10 17 7200 49150. Mr. Mark Phillips, a Regional Surface Water Scientist, has subsequently advised me that an evaluated wetland exists approximately 350 metres downgradient of the fill area.

The most recent groundwater monitoring data suggests that excessive leachate impacts in groundwater would not extend to the evaluated wetland. I conclude that the potential does not exist for surface water impacts via this pathway at this time.

### Guideline B-7

The Warsaw Road Waste Disposal Site is closed. Guideline B-7 does not apply. I note that the manganese levels at downgradient monitor TW3-2 are more than twice the provincial drinking



- 5 -

water objective. Although no residential water wells appear to be under threat, monitoring of this situation should continue.

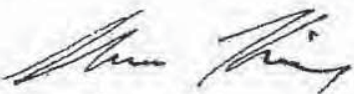
#### Groundwater Monitoring Program and Reporting

The existing groundwater monitoring frequency and analytical parameters are satisfactory for this site. I have examined the groundwater monitoring recommendations summarized in Section 8.0 of the appended Hydroterra report.

The consultant recommends abandonment of the last remaining bedrock monitoring well TW9-1. The consultant expressed concern that naturally salty water in the bedrock aquifer may pose a risk to the adjacent private water well. I do not object to the consultant's recommendation. I recommend that historical water level data and water quality data from TW9-1 continue to be provided in future monitoring reports.

The consultant proposes limiting landfill gas monitoring to monitors GP1 to GP6 inclusive, TW5-2 and TW6-2. This is satisfactory.

The consultant proposes continued monitoring of residential water wells designated as R1, R2, R3, and R4. This is satisfactory.

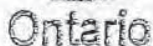


Shawn Kinney, P. Geo

-SK/gl

c: Jacqueline Fuller (Peterborough Area Office)  
Mark Phillips (Surface Water Scientist)  
Peter Taylor (Water Resources Unit)  
GW 03-03 (A340902) DODU Warsaw Road Landfill, Township of Duoro  
SK #8848-7DSH4T





CERTIFICATE OF APPROVAL  
AIR  
NUMBER 6601-SYMSH

Site Location: Warsaw Road Landfill,  
Lot 8, Concession 5, Douro Ward  
Douro-Dummer Township, County of Peterborough

a passive landfill gas venting system serving a municipal landfill, consisting of two (2) vents, each having a diameter of 0.05 metre, extending 3.0 metres above grade;

*In accordance with Section 129 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:*

- The Notice should also include:**

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

*This Notice must be served upon:*

The Director  
Section 9, Environmental Protection Act

**LAKEFIELD RESEARCH LIMITED**  
Environmental Services  
**RECEIVED**

97004

1985-76  
Filer

FORWARDED TO:  
HARRIS  
FRANKS  
K. FRANKS  
K. FRANKS WITH ME

Environmental Protection Act

2300 Yonge St., 12th Floor  
Box 2302  
Toronto, Ontario  
M4P 1B4

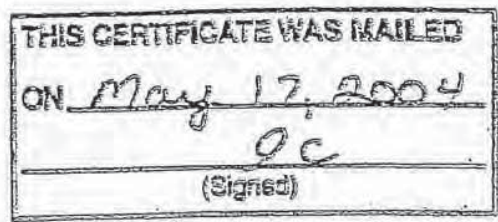
AND

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](http://www.ert.gov.on.ca)

*The above noted works are approved under Section 9 of the Environmental Protection Act.*

DATED AT TORONTO this 13th day of May, 2004



A handwritten signature in dark ink, appearing to read "Neil Parrish", written over a horizontal line.

Neil Parrish, P.Eng.  
Director  
Section 9, Environmental Protection Act

QW/  
District Manager, MOE Peterborough  
Linda Elliott, SGS Lakefield Research Limited ✓



Ministry of  
Environment  
and Energy

Ministère de  
l'Environnement  
et de l'Énergie

220, Avenue Ontario  
Toronto ON M5S 1H2

220, Avenue Ontario  
Toronto ON M5S 1H2

APPROVAL BRANCH

3rd Floor

TEL: (416) 440-3544

FAX: (416) 440-6973

May 22, 1998

Clark Administrator  
The Township of Douro  
General Delivery  
Douro, Ontario  
R0L 1S0

RECEIVED MAY 30 1998

Dear Sir/Madam:

Re: Notice of Amendment - Site Closure  
Provisional Certificate of Approval No. A 340902-  
Township of Douro Waste Disposal Site

Enclosed is a copy of the Notice of Amendment for the above mentioned Provisional Certificate of Approval. The Notice provides for closure of this waste disposal site. In addition, it should be noted that Conditions 19 and 20 of this Notice require additional information with respect to the Surface Water Monitoring program and contingency plans. As such, for your assistance a copy of the Ministry's document entitled "MOEE Eastern Region - Surface Water Unit, Interim Guidance Document for the Development of Waste Disposal Site Contingency Plan Trigger for Surface Water" dated May 01, 1995 is attached.

Please note that all other terms and conditions as outlined in the original certificate of Approval and all subsequent Notices remain unchanged.

I trust this document is adequate. If you have any questions, please feel free to contact Mr. J. Kaasalainen at (416) 440-7032.

Sincerely,



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

Encl.  
JAK/es

cc:

Brian Ward, Director, MOEE Southeastern Region  
Richard Raeburn-Gibson, MOEE Peterborough District Office





RECEIVED .... 10 1991

NR  
Page 1

TO: The Township of Douro  
Douro, Ontario  
K6L 1S0

You are hereby notified that the terms and conditions of Provisional Certificate of Approval No. A 34090 dated September 17, 1980, and all subsequent Notices are hereby amended as follows:

The waste disposal site shall be closed in accordance with the following documents:

- i. The document entitled "Leachate Attenuation Zone Assessment, Warsaw Road (South) Waste Disposal Site, Part of Lot 8, Concession V, Township of Douro, County of Peterborough, Certificate of Approval No. A 34090 dated September 29, 1995 by Lakefield Research Limited.
- ii. The document entitled "Final Site Closure Plan, Township of Douro Warsaw Road (South) Landfill Site" dated October 1995 by Lakefield Research Limited.

In addition, the following conditions are added as part of this approval:

#### Surface Water

19. The Surface Water Monitoring program shall be revised to include the following information:
  - a. identification of significant surface watercourses which are to be monitored for compliance;
  - b. the establishment of monitoring locations at natural marsh/wetland surface waters; and
  - c. the establishment and rationale for locating compliance monitoring stations.

This work shall be done in consultation with the Ministry's Regional Office.

20. A detailed surface water contingency plan complete with appropriate trigger levels shall be submitted to the Regional Director for approval within 120 days of the issuance of this Notice. This contingency plan shall be done in consultation with the Ministry's Regional Office.



# Contaminant Attenuation Zone/Buffer Lands

1. a. The Township shall undertake all necessary efforts to acquire or gain access agreements for the contaminant attenuation zone as described in document (i) above. Written documentation of the progress the Township is making in this regard shall be provided to the Regional Director on a monthly basis.
- b. Within 120 days of acquiring or gaining access agreements for the contaminant attenuation zone the Township shall have a legal survey conducted of these lands, including all buffer lands, and have this Certificate registered as an Instrument in the appropriate Land Registry Office against the title of those lands. A duplicate registered copy of the Instrument shall be submitted to the Director.

## Groundwater

2. a. Within three (3) months of obtaining control and/or access agreements for the contaminant attenuation zone, a multi-level monitoring well shall be constructed close to the new down-gradient property/attenuation zone boundary.
- b. Within three (3) months of the issuance of this Notice, an early warning multi-level monitoring well shall be installed between the waste disposal site and the residential well No. 2 as described in the document entitled "Environmental Impact Assessment, Warsaw Road "South" Landfill Site, Township of Douro" dated April 1995 by Lakefield Research Limited.

These new proposed groundwater monitors shall be incorporated into the monitoring program and the groundwater contingency plans.

The Groundwater Monitoring program shall be revised as follows:

- a. total organic carbon shall be added to the list of parameters to be tested for;
- b. a volatile organic compound scan shall be performed on samples from Monitor TW7; and
- c. the sampling frequency shall be revised to mid-April and late August/early September and shall include all multi-level monitoring wells.

The Township shall notify, in writing, the Regional Director of the abandonment of monitor TW 8 and the upgrade or abandonment of monitor TW2-1.



## Landfill Gas

25. The landfill gas monitoring/contingency plan shall be revised follows:

- a. If an exceedance of the landfill gas trigger level occurs during any one of the sampling events, then two additional confirmatory sampling events shall be conducted within 60 days of the initial exceedance sampling event.
- b. One additional gas probe shall be installed along the east property/buffer zone boundary. This gas probe shall be incorporated into the monitoring program and the landfill gas contingency plans.

*The reason for this amendment is to ensure that the site is closed in an environmentally safe manner.*

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

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

AND

The Director,  
Section 39, Environmental Protection Act,  
Ministry of Environment and Energy,  
250 Davisville Avenue, 3rd Floor,  
Toronto, Ontario,  
M4S 1K2

*DATED AT TORONTO this 22nd day of May, 1996.*

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



Ministry of  
Environment  
and Energy

Ministère de  
l'Environnement  
et de l'Énergie

250 Dufferin Avenue  
Toronto ON M4S 1H2

250 Avenue Dufferin  
Toronto ON M4S 1H2

APPROVALS BRANCH

2nd Floor

Tel. (416) 440-3544

Fax. (416) 440-6973

September 30, 1994

Clerk Administrator  
The Township of Douro  
General Delivery  
Douro, Ontario  
K9L 1S0

Dear Sir/Madam:

Re: Notice of Amendment - Emergency Approval  
Provisional Certificate of Approval No. E 340902  
Township of Douro Waste Disposal Site

Enclosed is a copy of the Notice of Amendment for the above mentioned Provisional Certificate of Approval. The Notice provides for the continued use and operation of the waste disposal site until March 30, 1996, under Section 31, Emergency Approval, of the Environmental Protection Act.

Please note that all other terms and conditions as outlined in the original Certificate of Approval and all subsequent Notices remain unchanged.

I trust this document is adequate. If you have any questions, please feel free to contact Mr. J. Kaasalainen at (416) 440-7032.

Yours truly,



A. Dominski, P.Eng., Acting Supervisor  
Waste Sites & Systems Approvals Unit  
Industrial Approvals Section

Encl.  
JAK/es  
G.C.:

Bryan Ward, Director, MOEE Eastern Region  
Jacques Bourque, MOEE Peterborough District Office





TO: The Township of Douro  
Douro, Ontario  
XCL 190

*You are hereby notified that the terms and conditions of Provisional Certificate of Approval No. 340902, dated September 17, 1980, and all subsequent Notices are hereby amended as follows:*

The Notice dated August 23, 1994 allowing for the continued use and operation of this waste disposal site under Section 31, Emergency Approval, of the Environmental Protection Act is amended by revoking condition 7 and replacing it with the following condition:

7. Waste can be disposed of at the site until March 30, 1996, in accordance with the following plans and specifications:

- i. The Application for a Certificate of Approval for a Waste Disposal Site (Landfill) and supporting documentation dated August 18, 1994.
- ii. The document entitled "The Corporation of the Township of Douro, Warsaw Road Waste Disposal Site, Provisional Certificate of Approval No. A 340902, Interim Site Development Plan and Operations Report", dated August 1994, by the Greer Galloway Group Incorporated.
- iii. Addendum No. 1, dated September 29, 1994, to the "Interim Site Development Plan and Operations Report" by the Greer Galloway Group Inc., dated August 1994.

*In addition, the following conditions are included as part of this approval:*

11. The Township shall undertake all necessary efforts to acquire or gain permanent control of a minimum 30 metre attenuation/buffer zone along the south, east, and west edges of the site, as mentioned in document (ii) above.



12. By June 30, 1995, the Township shall submit for the Director review an assessment of potential and existing impacts to surface water and groundwater resulting from the operation of the waste disposal site and the assessment shall be comprised of:
  - a. a surface water drainage and monitoring plan for the site including upstream or off-stream surface water monitoring station(s) for evaluating the background surface water quality;
  - b. expansion of the surface water monitoring program by including a sampling station at a permanently flowing location on Creek downstream from the waste disposal site to determine impact of the waste disposal site on the water course and to include ambient water temperature as a sampling parameter;
  - c. a groundwater impact assessment based on the Ministry's Policy 15-08, "The Incorporation of the Reasonable Use Concept into the Groundwater Management Activities of the Ministry of Environment and Energy", which shall include the following:
    - i. the installation of a minimum of one up gradient nested groundwater monitor with one piezometer in each of the upper and lower aquifers for evaluating the background groundwater quality; and,
    - ii. the installation of additional nested groundwater monitors in order to determine the vertical and horizontal extent of the contaminant plume and determine whether or not the site is in compliance with the Ministry's Reasonable Use Policy (Policy 15-08) at the property boundary or the proposed attenuation zone boundary.

These new proposed groundwater monitors shall be incorporated into the monitoring program.
13. A work plan shall be submitted to the Director, Eastern Region Ontario Ministry of the Environment and Energy, by November 1, 1994 with regards to the scheduling of the installation of the new groundwater monitoring wells as discussed in Condition 12(c).
14. By November 14, 1994, The Township shall submit to the Director for approval contingency plans to address contaminant migration and leachate related parameters at the site/attenuation zone boundary for both surface water and groundwater which do not comply with the Ministry of the Environment and Energy's Reasonable Use objectives for groundwater and/or with the Provincial Water Quality Objectives for surface water.





Ministry of  
Environment  
and Energy

Ministère de  
l'Environnement  
et de l'Énergie

NOTICE  
3 of 4

15. If for any reason(s) the Township fails to establish the attenuation zone as per condition 11 by June 30, 1995, then a detailed plan of mitigation measures to address off-site contaminant migration for both surface and groundwater which do not comply with the Ministry of the Environment and Energy's Reasonable Use objectives for groundwater and/or with the Provincial Water Quality Objectives for surface water shall be submitted to the Director for approval by September 30, 1995.
16. If the continued interim use of the site is required at the end of this emergency period then an application for an interim expansion pursuant to Section 30 of the Environmental Protection Act shall be submitted to the Director for approval by June 30, 1995.
17. If closure of the site is required at the end of this emergency period then a Closure Plan as per Appendix VII, "Approvals Requirements and Process, Section 7, Closure of a Landfill Site" of the Ministry of the Environment and Energy Approvals Branch document entitled "Guide for Applying for Certificates of Approval, Waste Disposal Sites (Landfills, Transfer or Processing)", dated September 1992 shall be submitted to the Director for approval by June 30, 1995.
18. If closure of the site is required at the end of this emergency period then final cover shall be constructed to a final grade of between 5 and 25 percent as per Ministry of the Environment and Energy guidelines.

The reason for this amendment is that an emergency situation with respect to waste disposal exists for the Township of Douro. The continued use of the site is to allow sufficient time for the Township to determine, evaluate, and implement alternative solutions for alleviating the emergency situation.

The conditions added to this certificate are to ensure that the waste disposal site is operated in an environmentally safe manner.

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

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





Ministry of  
Environment  
and Energy

Ministère de  
l'Environnement  
et de l'Énergie

NOTES  
4/4

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

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

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

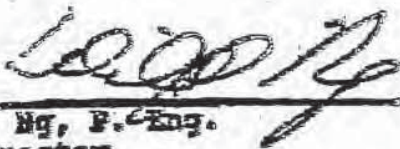
*This Notice must be served upon:*

Secretary,  
Environmental Appeal Board,  
1112 St. Clair Avenue West,  
Suite 502,  
Toronto, Ontario,  
M4V 1K3

AND

The Director,  
Section 39, Environmental Protection Act,  
Ministry of Environment and Energy,  
250 Davidson Avenue,  
Toronto, Ontario,  
M4S 1H2

DATED AT TORONTO this 10th day of September, 1994.

  
W. Ng, P. Eng.  
Director  
Section 39  
Environmental Protection Act

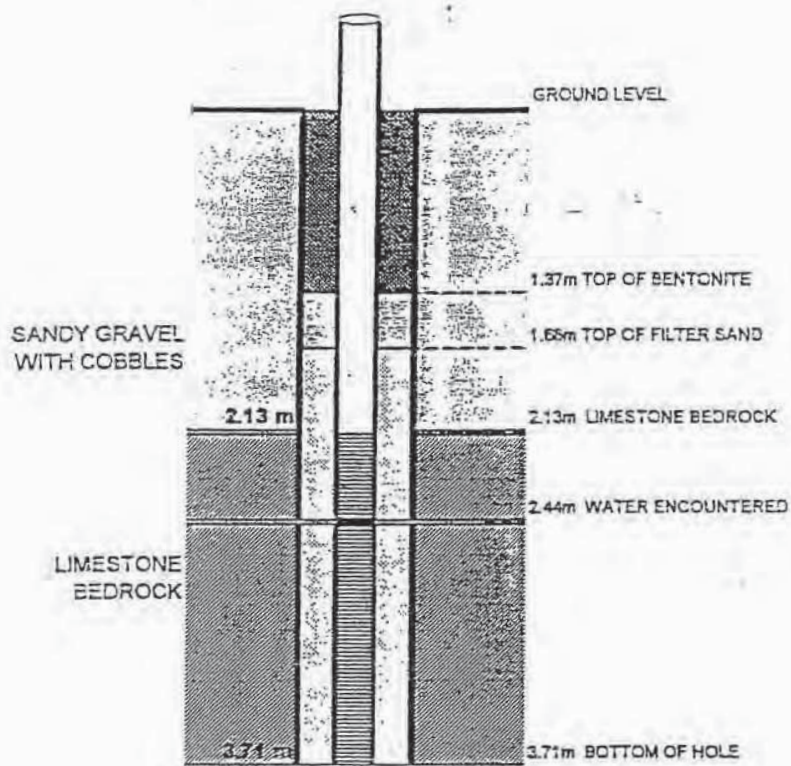
## **Appendix B**

# **Monitoring Well Details and Borehole Data**

TW - 1

DOURO LANDFILL

SOUTH SITE



LIMESTONE BEDROCK



BENTONITE HOLE PLUG



SANDY GRAVEL WITH COBBLES



FILTER SAND



NATURAL BACKFILL

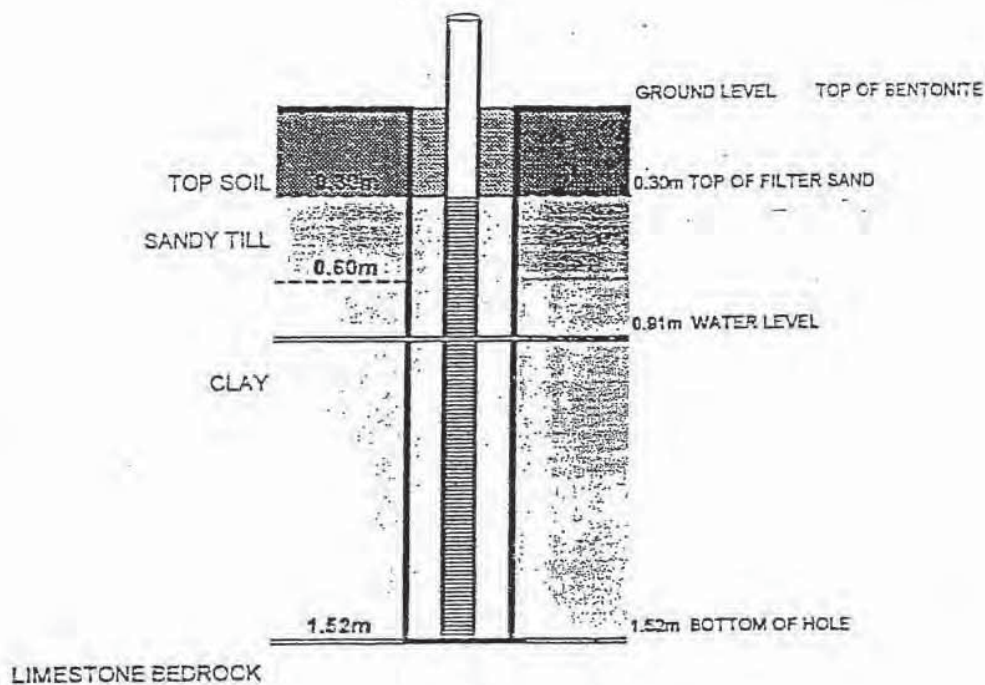
ENVIRONMENTAL SERVICES  
LAKEFIELD, ONTARIO  
KOL 2H0, (705) 652-2020

**LAKEFIELD  
RESEARCH  
LIMITED**

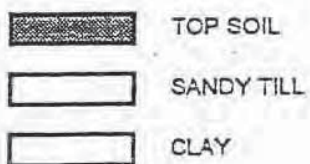
TW - 2

DOURO LANDFILL

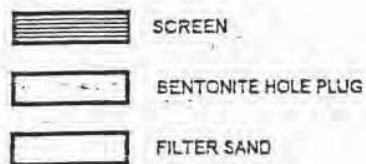
SOUTH SITE



STRATIGRAPHY LEGEND



BORE HOLE LEGEND

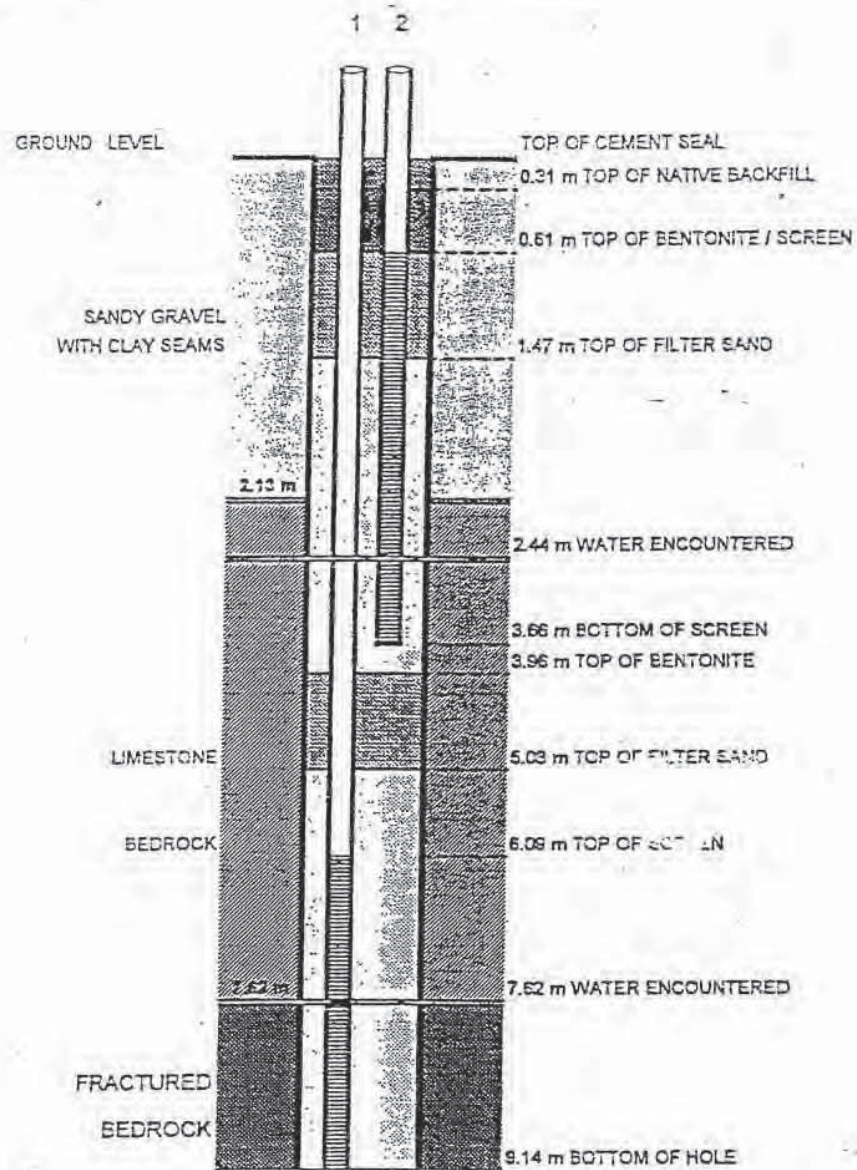




TW-3

DOURO LANDFILL

SOUTH SITE



## STRATIGRAPHY LEGEND

- SANDY GRAVEL WITH CLAY SEAMS
- LIMESTONE BEDROCK
- FRACTURED LIMESTONE BEDROCK

## BORE HOLE LEGEND

- CEMENT SEAL
- NATURAL BACKFILL
- BENTONITE HOLE PLUG
- FILTER SAND

ENVIRONMENTAL SERVICES  
LAKEFIELD, ONTARIO  
KOL 2H0, (705) 652-2020

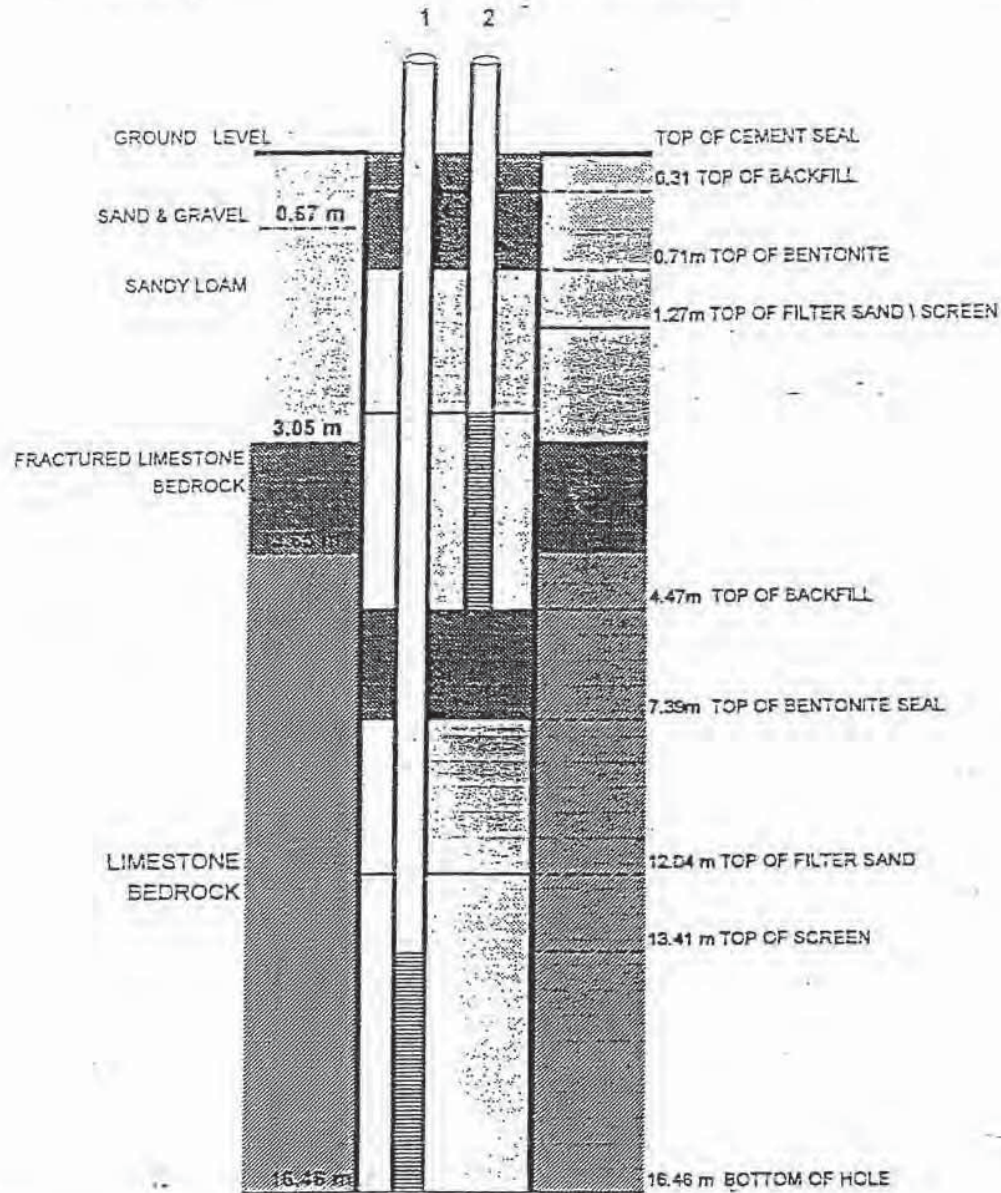
LAKEFIELD  
RESEARCH  
LIMITED



94TW - 4

DOURO LANDFILL

SOUTH SITE



## STRATIGRAPHY LEGEND

	SAND AND GRAVEL
	SANDY LOAM
	FRACTURED LIMESTONE BEDROCK
	LIMESTONE BEDROCK

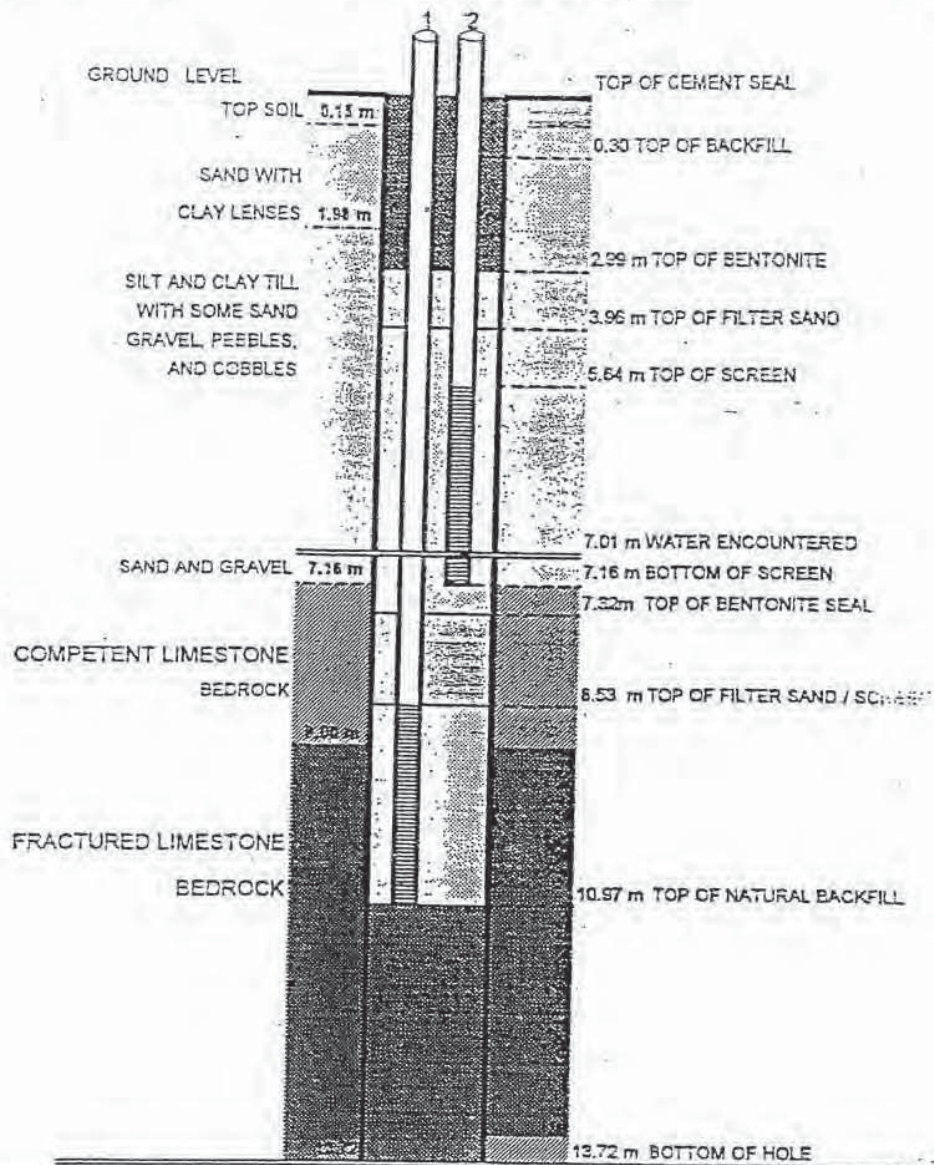
## BOREHOLE LEGEND

	CEMENT SEAL
	NATURAL BACKFILL
	BENTONITE HOLE PLUG
	FILTER SAND

ENVIRONMENTAL SERVICES  
LAKEFIELD, ONTARIO  
KOL 2H0, (705) 652-2020

LAKEFIELD  
RESEARCH  
LIMITED



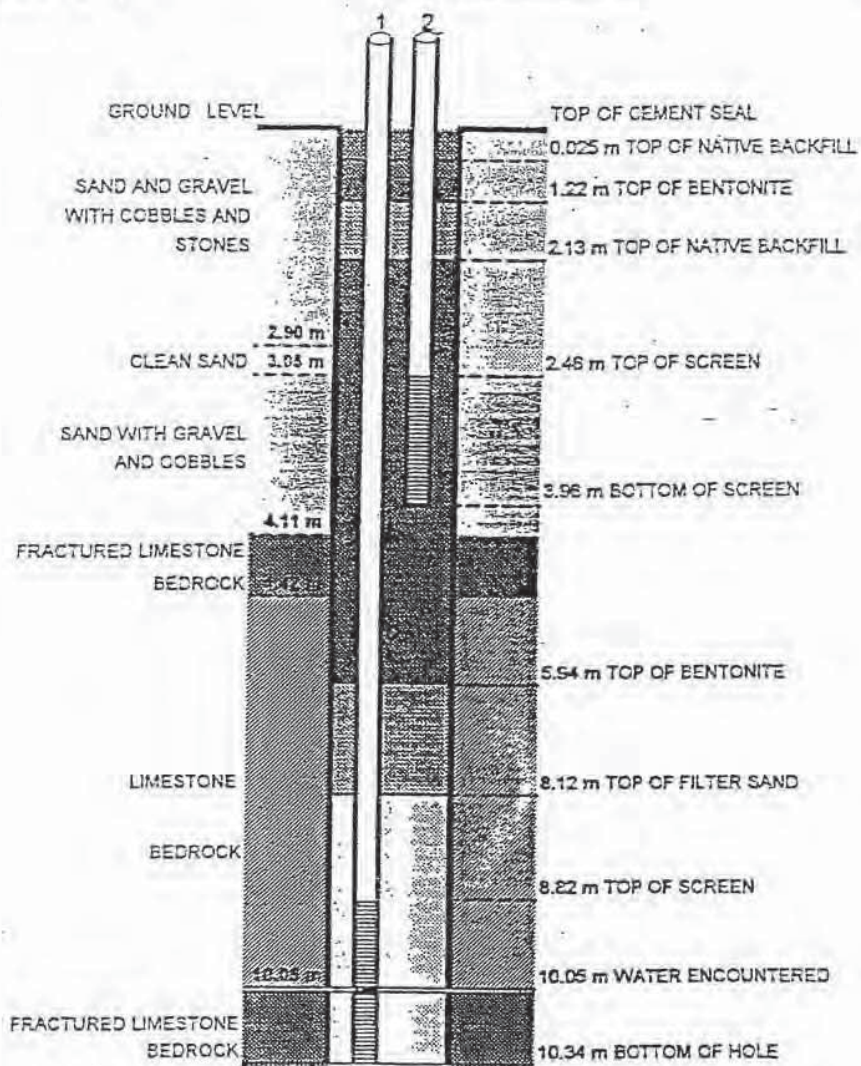


## STRATIGRAPHY LEGEND

	TOP SOIL
	SILT ..... COBBLES
	SAND AND GRAVEL
	COMPETENT LIMESTONE BEDROCK
	FRACTURED LIMESTONE BEDROCK

## BORE HOLE LEGEND

	CEMENT SEAL
	NATURAL BACKFILL
	BENTONITE HOLE PLUG
	FILTER SAND



## STRATIGRAPHY LEGEND

	SAND AND GRAVEL ..... STONES
	CLEAN SAND
	SAND WITH GRAVEL AND COBBLES
	LIMESTONE BEDROCK
	FRACTURED LIMESTONE BEDROCK

## BORE HOLE LEGEND

	CEMENT SEAL
	NATURAL BACKFILL
	BENTONITE HOLE PLUG
	FILTER SAND



<b>BOREHOLE LOG</b> # TW 7		PROJECT NAME DOURO SOUTH LANDFILL SITE		LOGGED BY D. BUCHOLTZ	
DRILLING METHOD HOLLOW STEM AUGERS		PROJECT No 7777-079	DATE DRILLED AUG 16, 1995	GROUND ELEV. 100.35	SCALE 1:125

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE		COMMENTS
				TYPE	N VALUE	
0			protective locking casing			Stick-up is 0.60m
1			cement			Water measurement taken after completion of well installation
2			bentonite			Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
3			filter sand			
4		WASTE	bentonite			Protective casing with lock was installed and cemented in place.
5			banded grout			2" PVC schedule 80 pipe and screen was installed.
6						Screen is 5' (1.52m) in length.
7			filter sand			
8		fractured limestone BEDROCK	screen	SS		8.51m bottom of hole
9						
10						
11						
12						
13						
14						
15						
16						
17						
18		assumed competent limestone BEDROCK				
19						

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<b>BOREHOLE LOG</b> # TW 8-1		<b>PROJECT NAME</b> DOURO SOUTH LANDFILL SITE		<b>LOGGED BY</b> D. BUCHOLTZ	
<b>DRILLING METHOD</b> HOLLOW STEM AUGERS		<b>PROJECT No</b> 7777-079	<b>DATE DRILLED</b> AUG 16, 1995	<b>GROUND ELEV.</b> 96.30	<b>SCALE</b> 1:125

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE		COMMENTS
				TYPE	VALUE	
			protective locking casing			
0		dark brown organic TOP SOIL				
		light brown SANDY GRAVEL	cement bentonite	SS		Stick-up is 0.84m
1		light brown hard fine SAND with some PEBBLES		SS		
2			water	SS		water measurement taken after completion of well installation
3		grey hard SILTY SAND		SS		
4		grey hard wet SILTY SAND		SS		Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
5		possible gravel, no sample in split spoon		SS		
6		grey hard dry SILTY SAND		SS		Protective casing with lock was installed and cemented in place.
7		grey hard wet SILTY SAND		SS		
8		grey hard dry SILTY SAND		SS		2" PVC schedule 80 pipe and screen was installed.
		competent limestone BEDROCK		SS		
9		*fracture zone				SS=split spoon sample samples collected at 2ft (0.61m) intervals
10		competent limestone BEDROCK	benseal grout			
11		*fracture zone				
12		competent limestone BEDROCK				
13		competent limestone BEDROCK	bentonite			Screen is 5' (1.52m) in length.
14						
15			filter sand			
16			screen			16.56m bottom of hole
17						
18		assumed competent limestone BEDROCK				
19						
		*cs noted from drill core				

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<b>BOREHOLE LOG</b> # TW B-1		<b>PROJECT NAME</b> DOURO SOUTH LANDFILL SITE		<b>LOGGED BY</b> D. BUCHOLTZ	
<b>DRILLING METHOD</b> HOLLOW STEM AUGERS		<b>PROJECT No</b> 7777-079	<b>DATE DRILLED</b> AUG 16, 1995	<b>GROUND ELEV.</b> 96.30	<b>SCALE</b> 1:125

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE		COMMENTS
				TYPE	VALUE	
0		dark brown organic TOP SOIL	protective locking casing			
		light brown SANDY GRAVEL	cement bentonite	SS		
1		light brown hard fine SAND with some PEBBLES		SS		Stick-up is 0.84m
2			water	SS		water measurement taken after completion of well installation
3		grey hard SILTY SAND		SS		
4		grey hard wet SILTY SAND		SS		
5		possible gravel, no sample in split-spoon		SS		Wells were dedicated at completion of drilling with Waterma tubing and foot valves.
6		grey hard dry SILTY SAND		SS		
7		grey hard wet SILTY SAND		SS		Protective casing with lock was installed and cemented in place.
8		grey hard dry SILTY SAND		SS		
9		competent limestone BEDROCK		SS		2" PVC schedule 80 pipe and screen was installed.
10		*fracture zone	benseal grout			SS=split spoon sample samples collected at 2ft (0.61m) intervals
11		competent limestone BEDROCK				
12						
13		competent limestone BEDROCK	bentonite			Screen is 5' (1.52m) in length.
14						
15			filter sand			
16			screen			
17						16.56m bottom of hole
18		assumed competent limestone BEDROCK				
19						
		*cs noted from drill core				


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<b>BOREHOLE LOG</b> # TW 8-2		<b>PROJECT NAME</b> DOURO SOUTH LANDFILL SITE		<b>LOGGED BY</b> D. BUCHOLTZ	
<b>DRILLING METHOD</b> HOLLOW STEM AUGERS		<b>PROJECT No</b> 7777-079	<b>DATE DRILLED</b> AUG 16, 1995	<b>GROUND ELEV.</b> 96.29	<b>SCALE</b> 1:125

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS		SAMPLE TYPE	N VALUE	COMMENTS
			protective locking casing				Stick-up is 0.55m
0		dark brown organic TOP SOIL					Water measurement taken after completion of well installation
		light brown SANDY GRAVEL	cement bentonite				
1		light brown hard fine SAND with some PEBBLES					Wells were dedicated at completion of drilling with Wattera tubing and foot valves.
2							
3		grey hard SILTY SAND					Protective casing with lock was installed and cemented in place.
4		grey hard wet SILTY SAND	beneath grout				
5		possible gravel, no sample in split spoon	bentonite				2" PVC schedule 80 pipe and screen was installed.
6		grey hard dry SILTY SAND					Screen is 5" (1.52m) in length.
7		grey hard wet SILTY SAND	screen				7.61m bottom of hole
8		grey hard dry SILTY SAND	filter sand				
9		competent limestone BEDROCK *fracture zone					
10		competent limestone BEDROCK *fracture zone					
11							
12							
13							
14		competent limestone BEDROCK (from TW 8-1 well log data)					
15							
16							
17							
18		assumed competent limestone BEDROCK					
19							
		* as note from drill core					

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<b>BOREHOLE LOG</b> # BH9-1		PROJECT NAME TOWNSHIP OF DOURO WARSAW ROAD LANDFILL		LOGGED BY D. BUCHOLTZ LAKEFIELD RESEARCH LIMITED	
DRILLING METHOD HOLLOW STEM AUGER		PROJECT No 7777-369	DATE DRILLED AUGUST 20, 1997	GROUND ELEV. N/A	SCALE NTS

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS		SAMPLE		COMMENTS
					TYPE	N VALUE	
0		ORGANIC, overburden	CEMENT				Drilling commenced 08:00hrs, Aug 20/97
1		SILT, sandy, rocks, brown, wet					Well instrumented with dedicated inertia pump upon completion.
2							
3		SILT, clayey, rocks, grey, moist					
4							
5		SILT, clayey, rocks, grey, dry dense	BENTONITE				
6							
7							
8		BEDROCK, limestone heavily fractured					
9							Water was encountered @ 10.85m (35.6ft) below grade.
10		BEDROCK, limestone	SILCA SAND				Bottom of hole at 11.34m (37.2ft) below grade.
11							
12			BENTONITE				
13							
14							
15							
16							
17							
18							
19							

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185 CONCESSION STREET  
LAKEFIELD, ONTARIO, CANADA  
  
21, 1st AVENUE  
SCHUMACHER, ONTARIO, CANADA

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LAKEFIELD, ONTARIO  
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## BOREHOLE LOG

BH9-2

PROJECT NAME  
TOWNSHIP OF DOURO  
WARSAW ROAD LANDFILLLOGGED BY D. BUCHOLTZ  
LAKEFIELD RESEARCH LIMITED

DRILLING METHOD

HOLLOW STEM AUGER

PROJECT No  
7777-369DATE DRILLED  
AUGUST 20, 1997GROUND ELEV.  
N/ASCALE  
NTS

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE		COMMENTS
				TYPE	N VALUE	
0		ORGANIC, overburden	PROTECTIVE CASING			Drilling commenced 08:00hrs, Aug 20/97
1		SILT, sandy, rocks, brown, wet	CEMENT			Well instrumented with dedicated inertia pump upon completion.
2			BENTONITE			TWS-2 has 50MM PVC Schedule 40 riser pipe and 1.52m No.10 slotted screen
3		SILT, clayey, rocks, grey, moist				
4						
5		SILT, clayey, rocks, grey, dry, dense	SILICA SAND			Water was encountered @ 3.00m (9.8ft) below grade.
6						
7			BENTONITE			Bottom of hole at 6.91m (22.67ft) below grade.
8		BEDROCK, limestone heavily fractured				
9						
10		BEDROCK, limestone				
11						
12						
13						
14						
15						
16						
17						
18						
19						

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ENVIRONMENTAL SERVICES185 CONCESSION STREET  
LAKEFIELD, ONTARIO, CANADA21, 1st AVENUE  
SCHUMACHER, ONTARIO, CANADAENVIRONMENTAL SERVICES  
LAKEFIELD, ONTARIO  
KOL 2H0, (705) 652-2020



Warsaw Road

LOG OF OVERBURDEN AND BEDROCK MATERIALS (non-interactive)					
General Correl.	Main correlation (number)	Other resources	General description	Depth - in	
				Feet	Meters
NOTE: WITH ABANDONMENT					
T.W. 3-1. NORMALLY A FLOWING WELL					
WAS NOT FLOWING AT TIME OF					
ABANDONMENT.					
SOUTH LAMP FILL.					

PUMPING TEST	Pumping test type		Pumping rate		Duration of pumping	
	<input type="checkbox"/> Pump	<input type="checkbox"/> Sinker	GPM		_____ Hours	_____ Mins
	Static level	Water level end of pumping	Water surface during		<input type="checkbox"/> Pumping	<input type="checkbox"/> Recovery
			15 minutes	30 minutes	All minutes	60 minutes
	_____ feet	_____ feet	_____ feet	_____ feet	_____ feet	_____ feet
	Pumping device rate		Pump stroke per sec		Water at end of test	
					<input type="checkbox"/> Draw <input type="checkbox"/> Charge	
	Recharge/recovery device type		Recharge/recovery device setting		Recharge/recovery device rate	
	<input type="checkbox"/> Shallow <input type="checkbox"/> Deep				_____ GPM	

**METHOD OF CONSTRUCTION**

<input type="checkbox"/> Cast in place	<input type="checkbox"/> All precast joint	<input type="checkbox"/> Drilling
<input type="checkbox"/> Precast (conventional)	<input type="checkbox"/> Splicing	<input type="checkbox"/> Dipping
<input type="checkbox"/> Precast reinforced	<input type="checkbox"/> Diaphragm	<input type="checkbox"/> Other _____
<input type="checkbox"/> Precast (old)	<input type="checkbox"/> Jacketing	

Name of well Contractor		Well Contractor's License No.	
TRIACUA DRILLING		6778	
Date			

PRZ 2 LAKEHEAD ONT	
Name on file: <u>THOMPSON</u>	PRZ THOMPSON'S LICENSE NO. <u>726 55</u>
<u>PAID IN N. BRICK</u>	
Supplier's name: <u>PAID IN N. BRICK</u>	Supplier's name: <u>PAID IN N. BRICK</u>

LOCATION OF WELL

In diagram below show distances of well from road and lot line.  
Indicate north by arrow.

PIEDMOUNT RD = A

171300

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Print only in spaces provided.  
Mark correct box with a checkmark, where applicable.

Weslow Road

County or District <b>PETIT POUCH</b>	Township or City/Town/Village <b>DOUGLASS</b>	Cash, Bonds, Paid, Survey, etc. <b>5</b>	Lot <b>8</b>
Course & Distance From corner <b>TOWARD MID OF DOUGLASS</b>	Bearing <b>DOUGLASS CANT.</b>	Date <b>24 08 97</b>	

[illegible][illegible]

PUMPING TEST	Pumping test method		Pumping time		Duration of pumping	
	<input type="checkbox"/> Pump	<input type="checkbox"/> Injector			_____ hours _____ mins	
	Shock test	Water level and at surface	Water level during	<input type="checkbox"/> Pumping	<input type="checkbox"/> Recovery	
			15 minutes	30 minutes	45 minutes	60 minutes
			_____ feet	_____ feet	_____ feet	_____ feet
	1) Flowing, gpm / day		Pump intake is less at _____ gpm		Water at top of bore _____	
					<input type="checkbox"/> Clear <input type="checkbox"/> Cloudy	
	Recommended pump size		Recommended pump setting		Recommended pump rate	
	<input type="checkbox"/> Shallow <input type="checkbox"/> Deep					

**FINAL STATUS OF WELL**

<input type="checkbox"/> Water bearing	<input checked="" type="checkbox"/> Abandoned, production ready	<input type="checkbox"/> Unfractured
<input type="checkbox"/> Desaturated well	<input type="checkbox"/> Abandoned, poor quality	<input type="checkbox"/> Permeability seal
<input type="checkbox"/> Test hole	<input type="checkbox"/> Abandoned (Other)	
<input type="checkbox"/> Perforation seal	<input type="checkbox"/> Destroying	

**WATER USE**

<input type="checkbox"/> Domestic	<input type="checkbox"/> Commercial	<input type="checkbox"/> Not listed
<input type="checkbox"/> Stock	<input type="checkbox"/> Municipal	<input type="checkbox"/> Other _____
<input type="checkbox"/> Irrigation	<input type="checkbox"/> Public supply	
<input type="checkbox"/> Industrial	<input type="checkbox"/> Cooling & air conditioning	

**METHOD OF CONSTRUCTION**

<input type="checkbox"/> Cake test	<input type="checkbox"/> All assessments	<input type="checkbox"/> Driving
<input type="checkbox"/> Pottery (commercial)	<input type="checkbox"/> Barring	<input type="checkbox"/> Dropping
<input type="checkbox"/> Pottery (artisan)	<input type="checkbox"/> Diamond	<input type="checkbox"/> Other _____
<input type="checkbox"/> Pottery (art)	<input type="checkbox"/> Jolting	

LOCATION OF WELL

In diagram below show orientation of well from road and lot line.  
Indicate north by arrow.

PTBO COUNTY RD #4

1200'

200'

TWH-1

MOD. 11

11.11

TWP 10N R10E #4

171313

Name of the Contractor <b>TRIADQUA DRINKING</b>	When Contracted or Licensed No. <b>6778</b>
Address <b>RR#2 LAKEFIELD ONT.</b>	
Name of the Technician <b>PATRICK O'BRIEN</b>	When Contracted or Licensed No. <b>7265</b>
Signature of the Technician <b>P. O'Brien</b>	Signature of the Inspector <b>[Signature] 97</b>

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Print only in spaces provided.  
Mark correct box with a checkmark, where applicable.

Warsaw Road

County of Census <b>PETERBOROUGH</b>	Township and Range <b>TOWNSHIP OF DOUGLAS</b>	Section, Range, Township, and Co. <b>5</b>	Lot <b>3</b>
Owner's Name <b>TOWNSHIP OF DOUGLAS</b>	Address <b>DOUGLAS CNT</b>	Date <b>24 08 21</b>	

[illegible]

WATER USED			
Water used in - (Feet)	Kind of water		
1	<input type="checkbox"/> Fresh	<input type="checkbox"/> Surface	<input type="checkbox"/> Subsurface
	<input type="checkbox"/> Brackish	<input type="checkbox"/> Salty	<input type="checkbox"/> Seawater
2	<input type="checkbox"/> Fresh	<input type="checkbox"/> Surface	<input type="checkbox"/> Subsurface
	<input type="checkbox"/> Brackish	<input type="checkbox"/> Salty	<input type="checkbox"/> Seawater
3	<input type="checkbox"/> Fresh	<input type="checkbox"/> Surface	<input type="checkbox"/> Subsurface
	<input type="checkbox"/> Brackish	<input type="checkbox"/> Salty	<input type="checkbox"/> Seawater
4	<input type="checkbox"/> Fresh	<input type="checkbox"/> Surface	<input type="checkbox"/> Subsurface
	<input type="checkbox"/> Brackish	<input type="checkbox"/> Salty	<input type="checkbox"/> Seawater
5	<input type="checkbox"/> Fresh	<input type="checkbox"/> Surface	<input type="checkbox"/> Subsurface
	<input type="checkbox"/> Brackish	<input type="checkbox"/> Salty	<input type="checkbox"/> Seawater
6	<input type="checkbox"/> Fresh	<input type="checkbox"/> Surface	<input type="checkbox"/> Subsurface
	<input type="checkbox"/> Brackish	<input type="checkbox"/> Salty	<input type="checkbox"/> Seawater

CASING & OPEN HOLE RECORD				
Well No.	Interval	Well Name	Depth	Time
Start Page			Feet	%
<input type="checkbox"/>	Shale			
<input type="checkbox"/>	Quartzite			
<input type="checkbox"/>	Carbonate			
<input type="checkbox"/>	Clay shale			
<input type="checkbox"/>	Phosphate			
<input type="checkbox"/>	Shale			
<input type="checkbox"/>	Quartzite			
<input type="checkbox"/>	Carbonate			
<input type="checkbox"/>	Clay shale			
<input type="checkbox"/>	Phosphate			
<input type="checkbox"/>	Shale			
<input type="checkbox"/>	Quartzite			
<input type="checkbox"/>	Carbonate			
<input type="checkbox"/>	Clay shale			
<input type="checkbox"/>	Phosphate			

SCREEN	State or territory (Use the 3)	Continents	Latitude	Year
	Islands or other areas	Islands	Depth at site or pressure	
<p align="center"><b>PLUGGING &amp; SEALING RECORD</b></p> <p><input type="checkbox"/> Drilling Success      <input checked="" type="checkbox"/> Abandoned Plug</p> <p>Driller last name      Time      Material and grade (Cement grade, Portland, etc.)</p> <p>Notes:      <i>+3 54.3 BENTONITE</i></p>				

Pump(s) was/were		Pump(s) size		Duration of pumping	
<input type="checkbox"/> Pump	<input type="checkbox"/> Booster	GPM		_____ hours _____ mins	
Static head _____		Water levels during		<input type="checkbox"/> Pumping <input type="checkbox"/> Recovery	
15 minutes		30 minutes		all minutes	
_____ feet	_____ feet	_____ feet	_____ feet	_____ feet	_____ feet
11 Measuring gear used		Pumps placed on at		Water on or at level	
GPM		_____ feet		<input type="checkbox"/> Clear <input type="checkbox"/> Cloudy	
Recommended surge type		Recommended pump setting		Recommended pump rate	
<input type="checkbox"/> Shallow <input type="checkbox"/> Deep		_____ feet		_____ GPM	

FINAL STATUS OF WELL		
<input type="checkbox"/> Water supply	<input type="checkbox"/> Abandoned, insufficient supply	<input type="checkbox"/> Unfinished
<input type="checkbox"/> Obsolete water	<input type="checkbox"/> Abandoned, too shallow	<input type="checkbox"/> Production well
<input type="checkbox"/> Test hole	<input type="checkbox"/> Abandoned (Other)	
<input type="checkbox"/> Recharge well	<input type="checkbox"/> Damaging	

**WATER USE**

<input type="checkbox"/> Domestic	<input type="checkbox"/> Commercial	<input type="checkbox"/> Not used
<input type="checkbox"/> Stock	<input type="checkbox"/> Manufacture	<input type="checkbox"/> Other _____
<input type="checkbox"/> Irrigation	<input type="checkbox"/> Public supply	
<input type="checkbox"/> Industrial	<input type="checkbox"/> Cooling in air conditioning	

**METHOD OF CONSTRUCTION**

<input type="checkbox"/> Cast in place	<input type="checkbox"/> Air transportation	<input type="checkbox"/> Drilling
<input type="checkbox"/> Precast (conventional)	<input type="checkbox"/> Blowing	<input type="checkbox"/> Dredging
<input type="checkbox"/> Precast & overlaid	<input type="checkbox"/> Dismantle	<input type="checkbox"/> Other _____
<input type="checkbox"/> Precast (wet)	<input type="checkbox"/> Jacking	

LOCATION OF WELL

In diagram below show distances of well from road and lot line. Indicate north by arrow.

The diagram is a hand-drawn sketch on a grid background. At the top, it is titled "LOCATION OF WELL". Below the title, a note reads: "In diagram below show distances of well from road and lot line. Indicate north by arrow." The diagram shows a horizontal line labeled "FD ROAD" at the top. A vertical line labeled "LOT LINE" runs down the right side. A north arrow points upwards in the top right corner. A dashed line extends from the road towards the left. A curved, irregular shape is labeled "LANDFILL AREA". A circle with a dot inside is labeled "OK 300'" and "TWB-1". A vertical double-headed arrow between the road and the well is labeled "1000'". In the bottom right corner, there is a box containing the text "TWP FOR PL #4". At the very bottom, the number "171314" is written.

Name of the Contractor <b>TRIACUA DRILLING</b>	The Contractor's License No. <b>6778</b>
Name of the Technician <b>T. R. LAKEFIELD CNT</b>	The Technician's License No. <b>T 2655</b>
Name of the Technician <b>PATRICK O'BRIEN</b>	The Technician's License No. <b>27 03 97</b>

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2008-07-04 11:00:00

## **Appendix C**

# **Established Monitoring Program and Sampling Protocol**

## SECTION I: GROUNDWATER MONITORING AND SAMPLING PROTOCOL

### 1.0 WATER LEVEL MEASUREMENTS

1. Prior to purging/sampling, water levels shall be measured by the wetted-taped method or with an electric depth gauge to the nearest 0.01 metres (or 0.01 feet).
2. MEASUREMENTS SHALL BE TAKEN WITHOUT THE REMOVAL OF THE DEDICATED SAMPLING DEVICE. (tubing and foot-valve arrangements).
3. MEASUREMENTS SHALL BE TAKEN FROM TOP OF THE MONITORED WELL. IN MOST CASES, THE MEASUREMENT WILL BE TAKEN FROM TOP OF THE PVC CASING AND NOT THE TOP OF THE PROTECTIVE CASING.
4. Measurements shall be recorded on FORM 1 for each specific monitor in the log book, indicating MEASURING POINT.
5. Rinse tip of measuring device with distilled water after taking measurement in each monitor.

### 2.0 PURGING PROCEDURE

1. Prior to sampling, each well shall be purged to remove the stagnant water within the casing.
2. THREE CASING VOLUMES SHALL BE REMOVED BY THE DEDICATED SAMPLERS OR BY BAILER FROM THE WELLS WITH MODERATE INFLOW. THE PURGED WATER SHALL BE MEASURED INTO A CALIBRATED CONTAINER AND THE VOLUME REMOVED SHALL BE RECORDED ON FORM 2 FOR THE SPECIFIC MONITOR IN THE LOG BOOK.
3. SLOW INFLOW MONITORS SHALL BE PURGED ENTIRELY DRY. THE VOLUME OF PURGED WATER SHALL BE RECORDED IN FORM 2 FOR THE SPECIFIC MONITOR ON THE LOG BOOK.



## SECTION I: GROUNDWATER MONITORING AND SAMPLING PROTOCOL

### 2.0 PURGING PROCEDURE (cont'd)

4. The volume of standing water in each monitor shall be calculated from the highest recorded static level and the total well depth and recorded on FORM 2. This volume will not appreciably change with seasonal fluctuations and may be used as the uniform standard in determining the purged volume during each sampling survey.
5. Conductivity, temperature and pH values shall be recorded after the removal of each casing volume to confirm stabilized quality conditions. When this field-measurement program is initiated, these quality results may be utilized to determine if the purged volume may be reduced to two casing volumes. Field monitoring equipment shall be calibrated each day prior to use, and results noted on FORM 6.

### 3.0 SAMPLING/SUBMISSION PROCEDURE

1. Suitable sample bottles (containing premeasured preservatives, as required) and QA/QC blanks shall be obtained from the analyzing laboratory in advance of the sampling program. The number and type of field and spiked blanks shall be determined by prior consultation with the laboratory representative.
2. Samples shall be collected the day following the purging exercise (to permit water-level recovery in the slower responding monitors) by means of the dedicated samplers in all monitor wells.
3. Sample collection shall be undertaken in the following sequence, as necessary:
  - Volatile organics
  - Pesticides/herbicides
  - Phenolics
  - Heavy metals
  - General chemistry

## SECTION I: GROUNDWATER MONITORING AND SAMPLING PROTOCOL

### 3.0 SAMPLING/SUBMISSION PROCEDURE (cont'd)

4. Samples collected for heavy-metal determinations (which include iron and manganese) shall be field filtered before placement into sample bottle containing the acid preservative. If appreciable sediment occurs in the sample and filtering cannot be undertaken, a sample shall be collected in a bottle without preservative, and the sediment shall be allowed to settle before a sample is decanted into a bottle without preservative for subsequent filtration and analysis by the laboratory.
5. Sample collected for volatile organics shall completely fill the sample bottle, with no air space permitted.
6. PLACE SAMPLES INTO A COOLER WITH PRE-FROZEN ICE PACKS AND DELIVER TO LABORATORY WITHIN 24 HOURS AFTER COMPLETION OF PROGRAM.
7. Sampling information shall be recorded on FORM 3 of the log book.
8. Each sample bottle shall be labelled to indicate the project name, well designation, time of sample collection, preservatives added and analyses to be performed.
9. If submitted to other than the MOE, a chain of custody form shall be completed and submitted together with the samples to the laboratory.



## SECTION II: SURFACE WATER MONITORING AND SAMPLING PROTOCOL

1. Water samples shall be collected upstream, opposite and downstream from the landfill side of the watercourse.
2. Sampling shall be preferably undertaken under baseflow conditions (to observe maximum quality impact). Thus, there shall be several days without precipitation antecedent to the sampling survey.
3. Sampling shall be preferably undertaken when the stream has a discernable flow. Sampling of pondings shall be discouraged unless representative of the local conditions.
4. Samples shall be collected at mid-depth in the stream (to prevent the uptake of bottom sediments) and preferably from the middle of the stream. Remove bottle cap when sampling point reached and point bottle opening opposite direction of flow.
5. Samples shall be directly collected into the sample bottles (with or without preservatives, as required) WITHOUT filtering.
6. Field measurements shall be taken of the temperature, conductivity, and pH at each sampling station when samples are collected for chemical analysis. Additionally, the stream and weather conditions shall be noted and the prevailing flow shall be determined by estimation of the stream depth, width and the current velocity.
7. Pertinent information on the stream conditions shall be recorded for each station during each site visit on FORM 4 of the log book.
8. Any digitally-metered instrument used to obtain field measurements (other than temperature) shall be calibrated before and after the sampling survey to ensure reliable results.

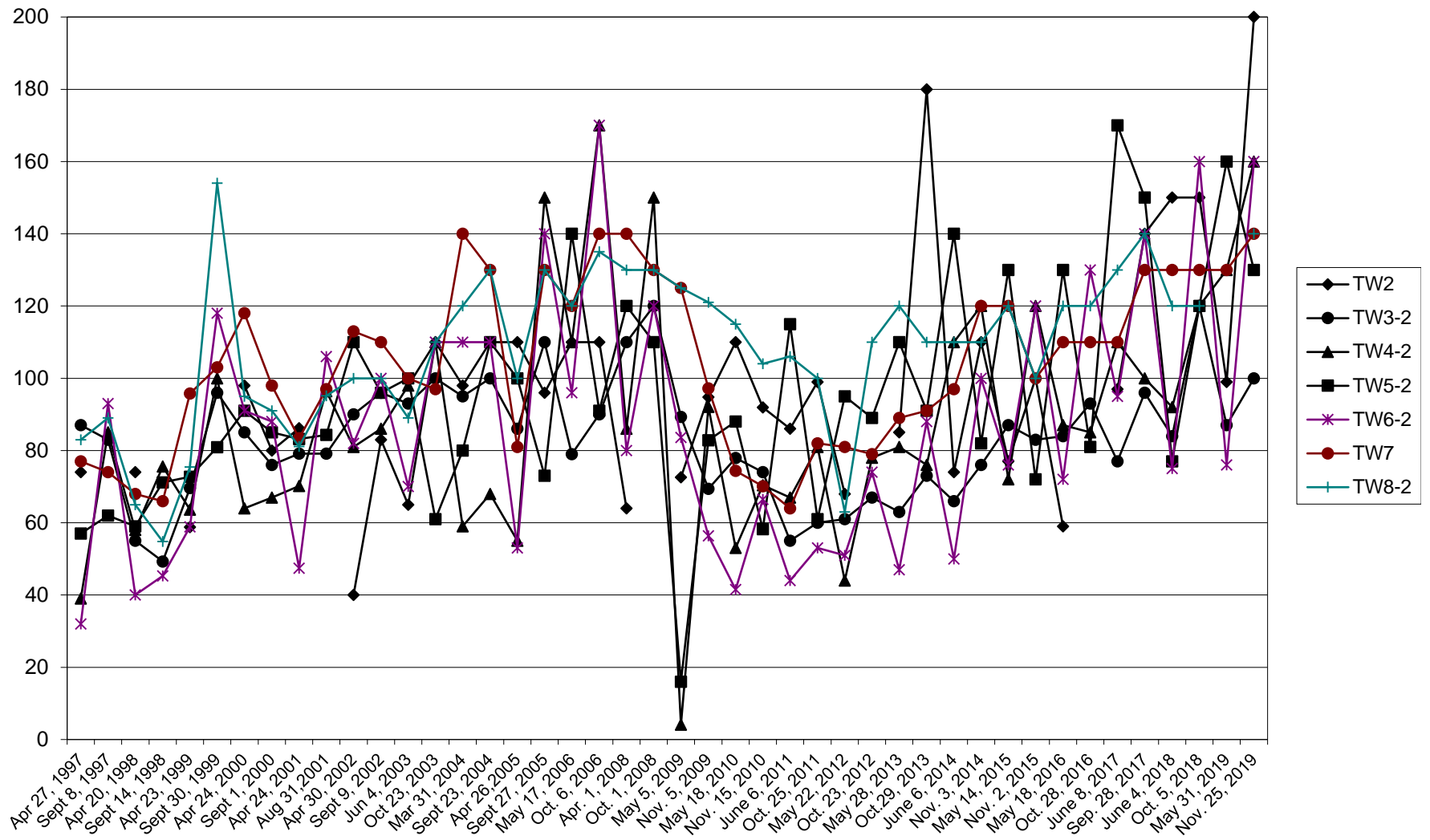
### SECTION III: COMBUSTIBLE GAS MONITORING PROTOCOL

1. Prior to the field survey, the combustible gas detector shall be calibrated to ensure acceptable gas measurements.
2. When measuring the gas concentration in any probe, a specific sequence shall be followed:
  - i) Thoroughly purge by aspirating atmospheric air through instrument.
  - ii) Zero high-level (0-100 percent) and low-level (0-5 percent) detection scales.
  - iii) Aspirate gas from probe initially USING THE HIGH SCALE (0-100 percent) until a steady reading is observed on the scale.
  - iv) If a gas concentration below 5 percent is indicated, set to low-level scale (0-5 percent) and aspirate until a steady reading is observed on the scale.
  - v) Conclude test by purging instrument with atmospheric air.
3. Combustible gas presence/absence and concentrations shall be recorded on FORM 5 of the log book.

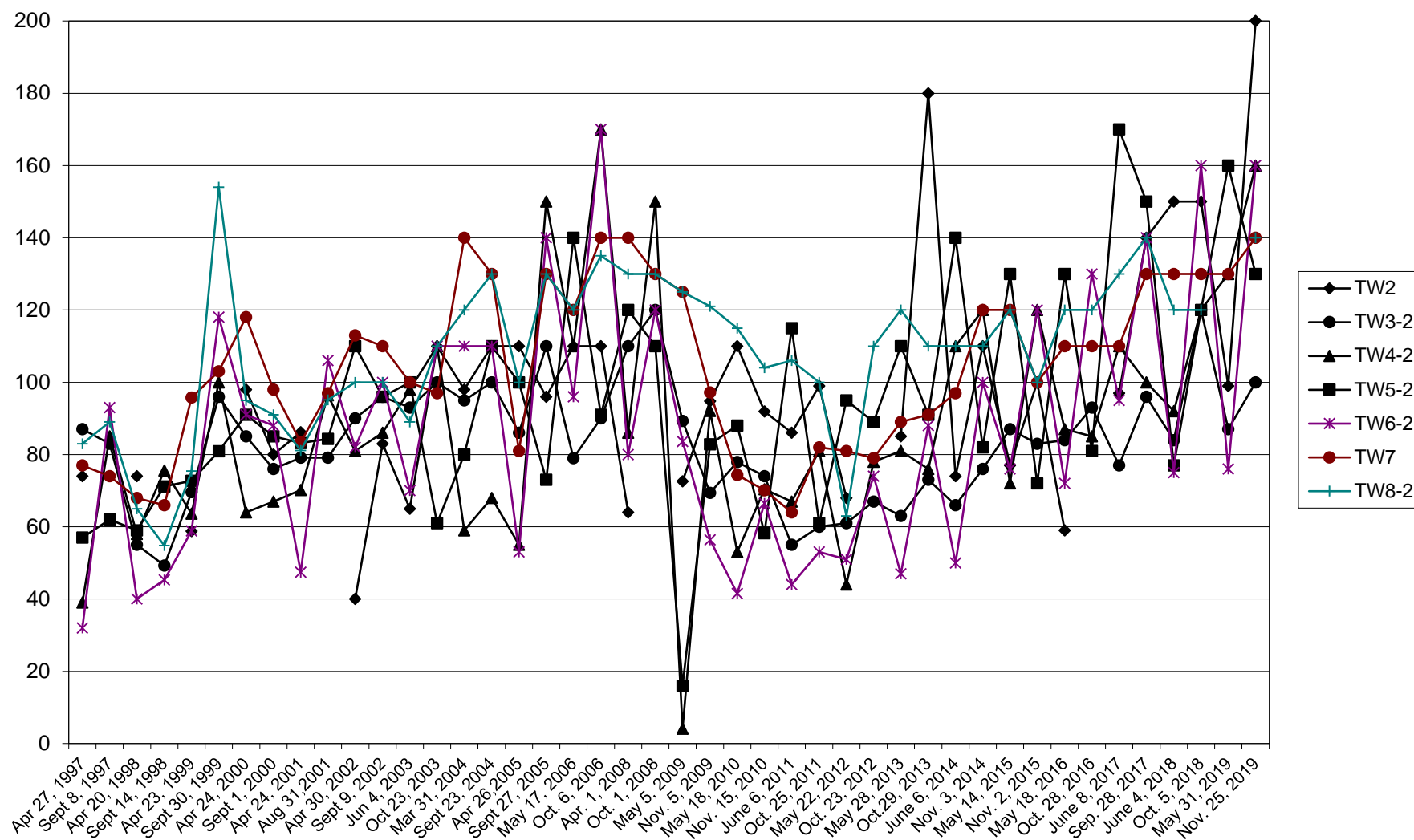
## **Appendix D**

# **Water Hydrographs, Chemical Comparison Graphs, Hydraulic Conductivity Graphs**

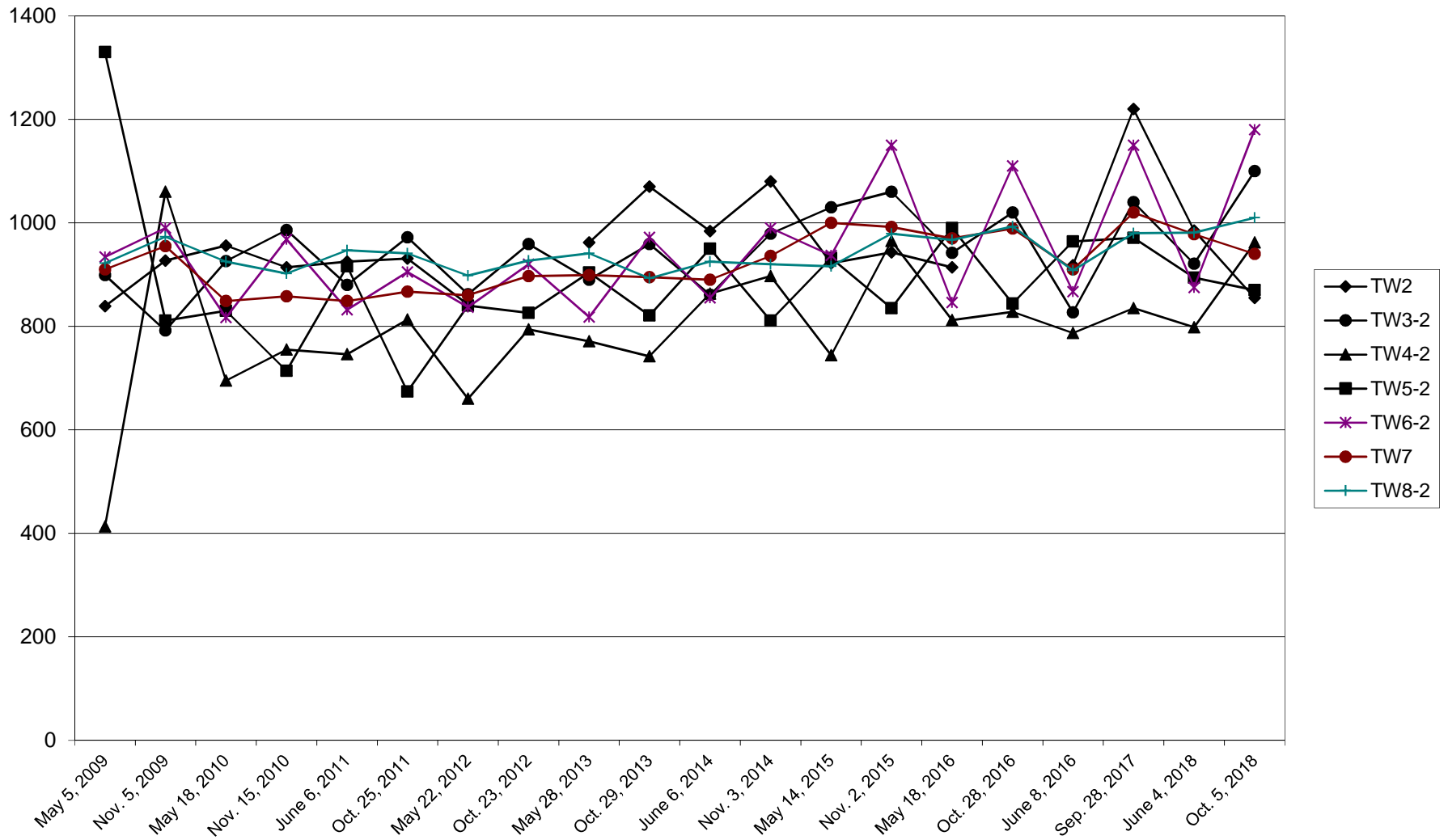
# CHLORIDE - WARSAW ROAD LAND FILL SITE



## CHLORIDE - WARSAW ROAD LAND FILL SITE

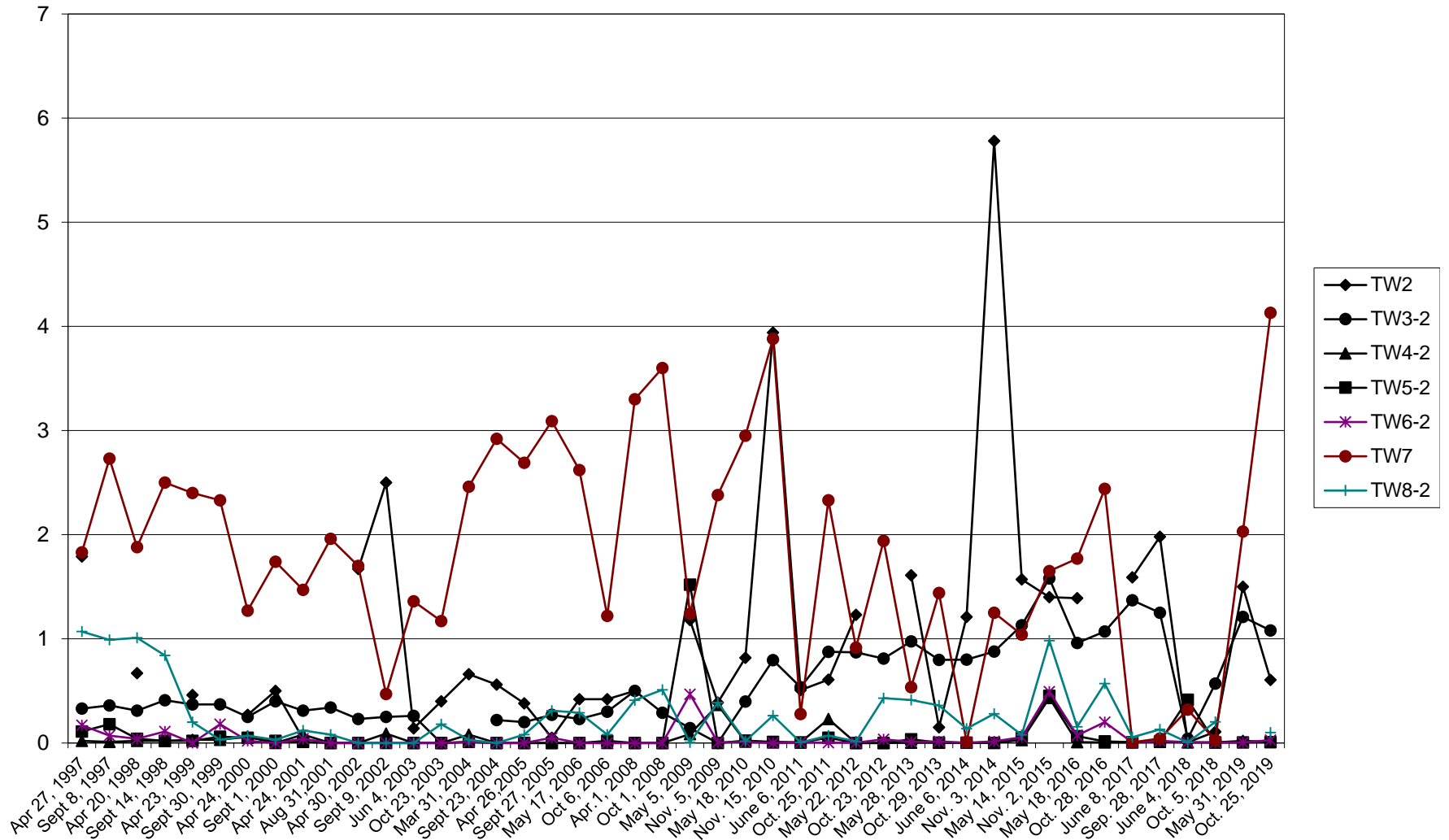


# CONDUCTIVITY - WARSAW ROAD LAND FILL SITE

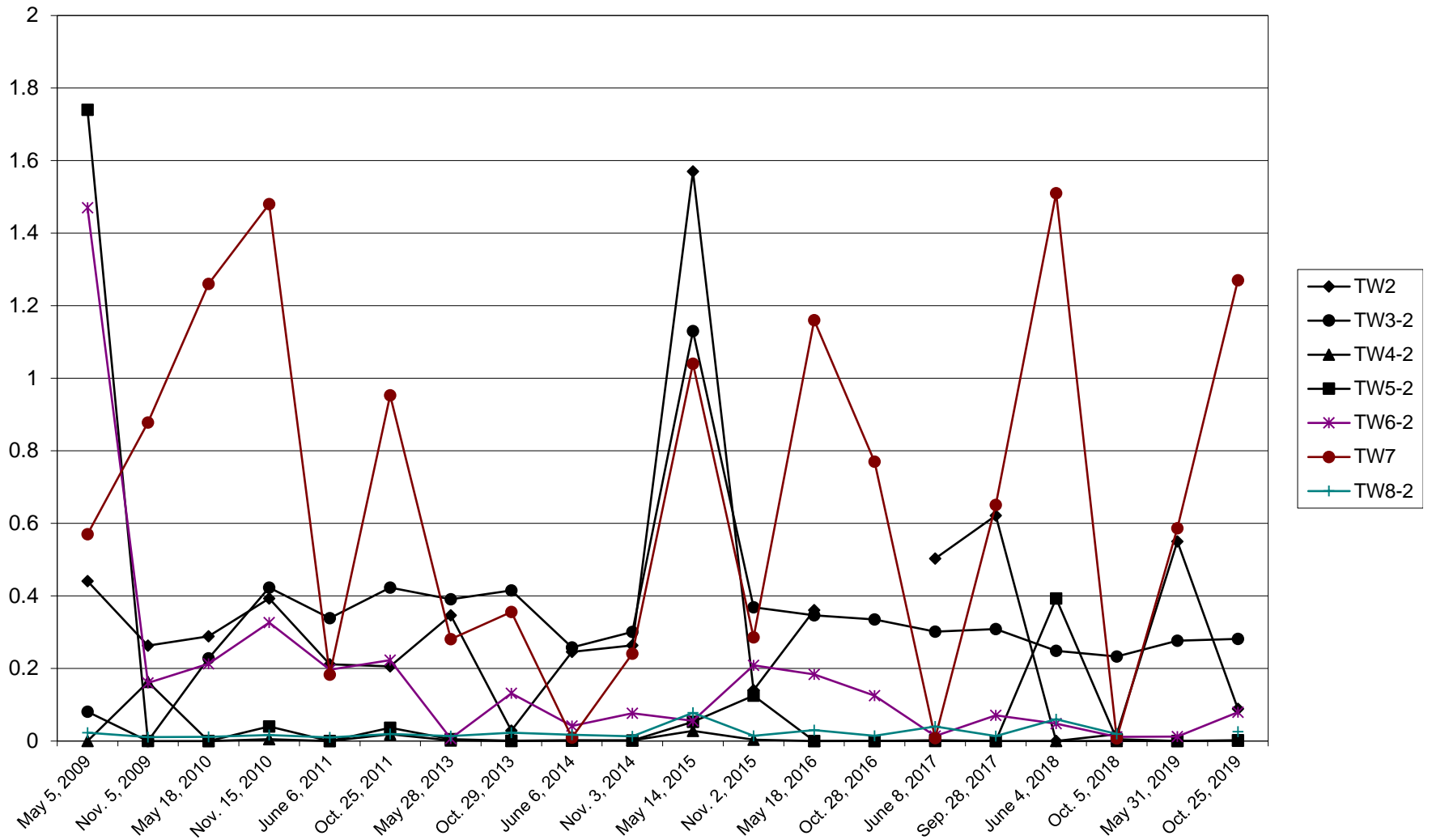




# IRON - WARSAW ROAD LAND FILL SITE

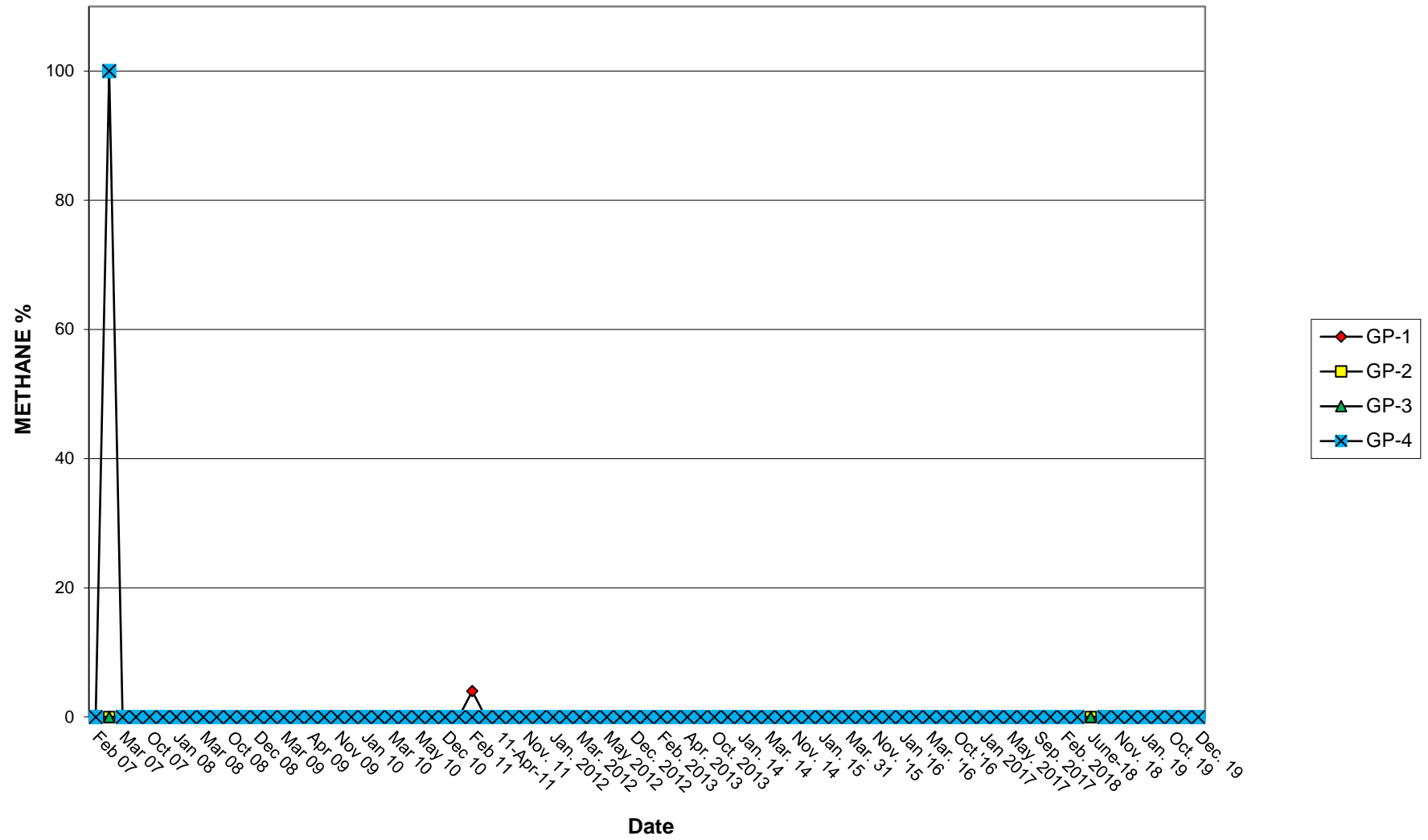


# MANGANESE - WARSAW ROAD LAND FILL SITE

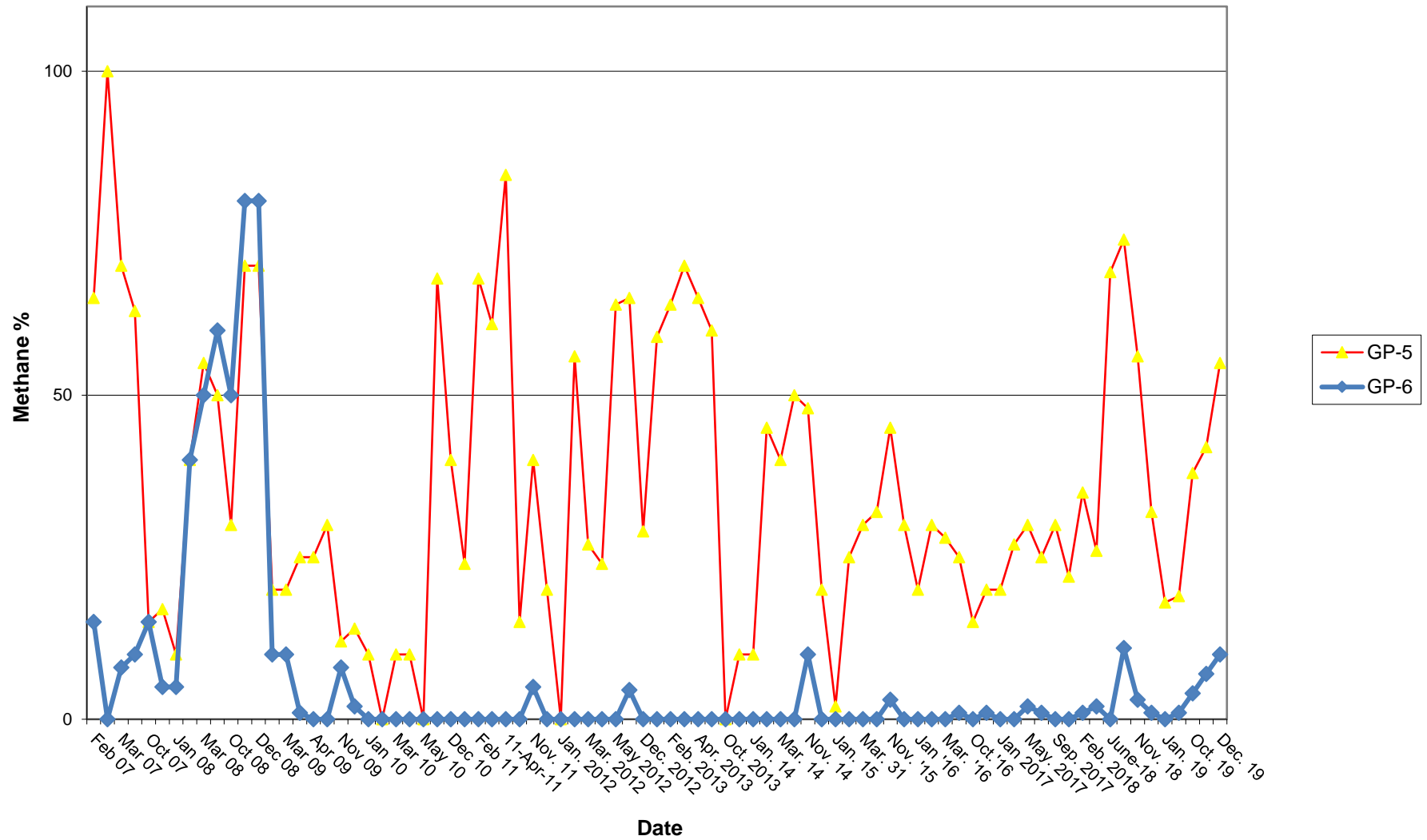




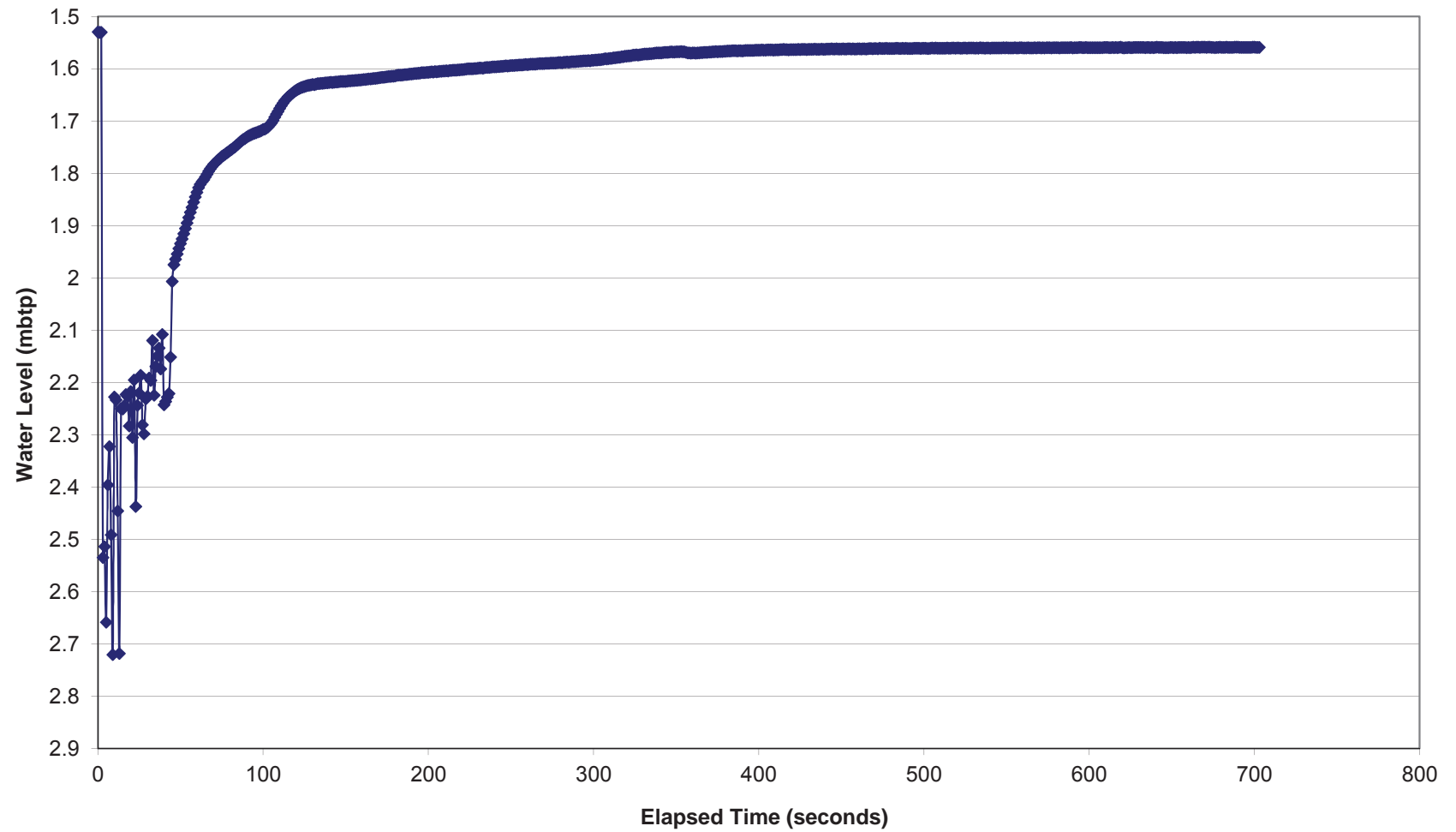
## METHANE LEVELS



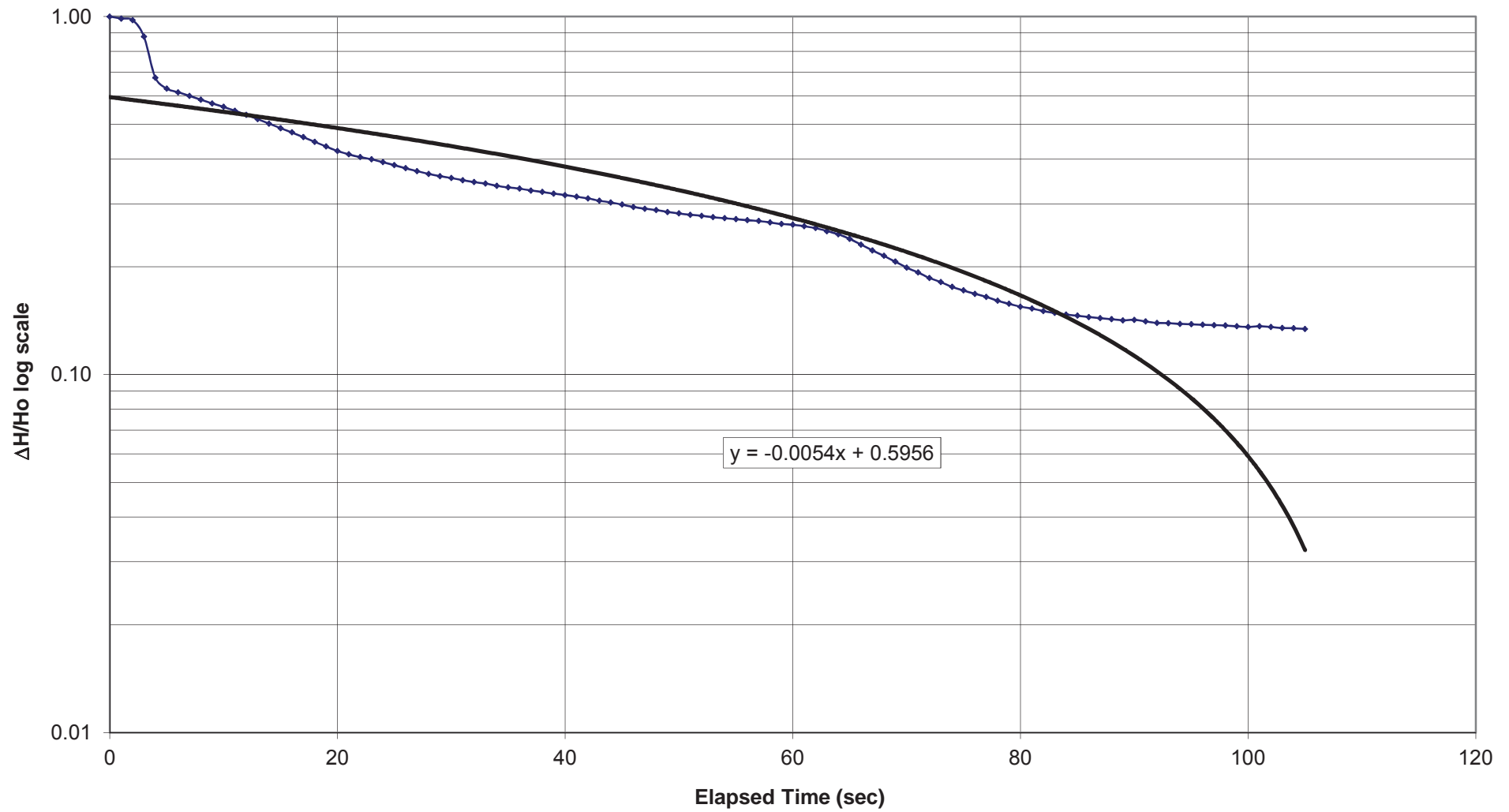
## METHANE LEVELS



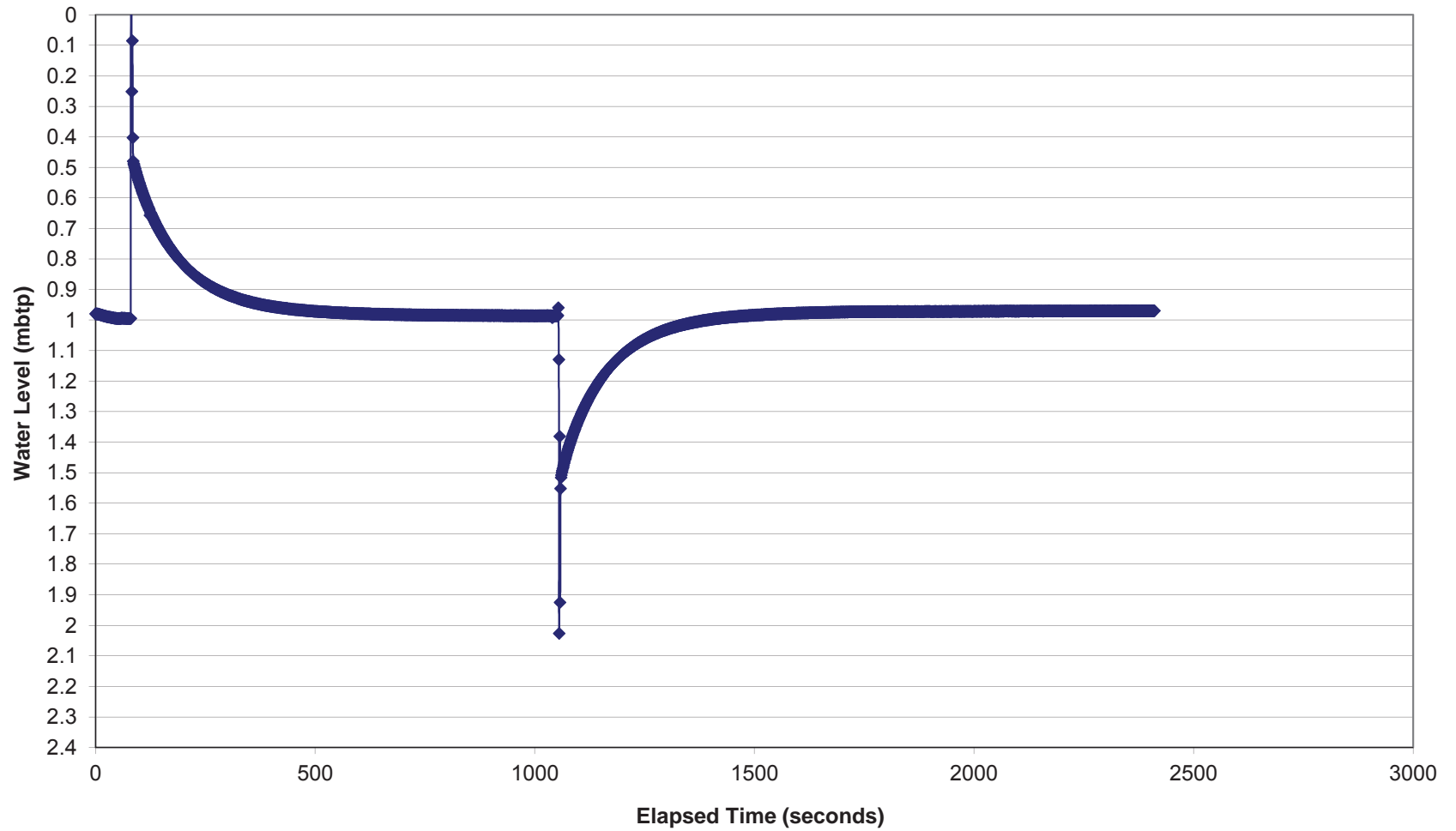
### Hydraulic Conductivity Testing at TW-2 Warsaw Landfill



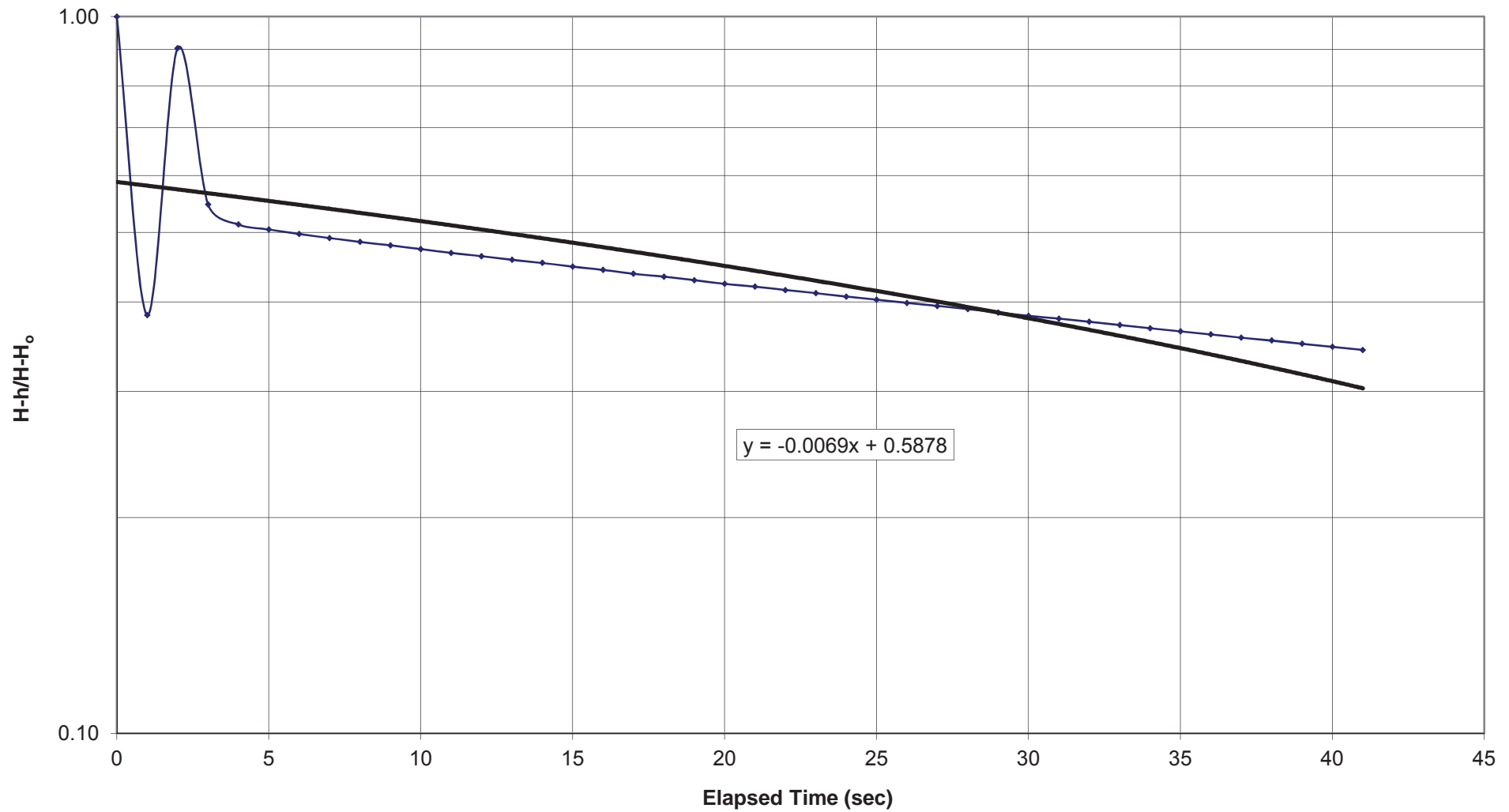
### Rising Head Hydraulic Conductivity Analysis at TW-2



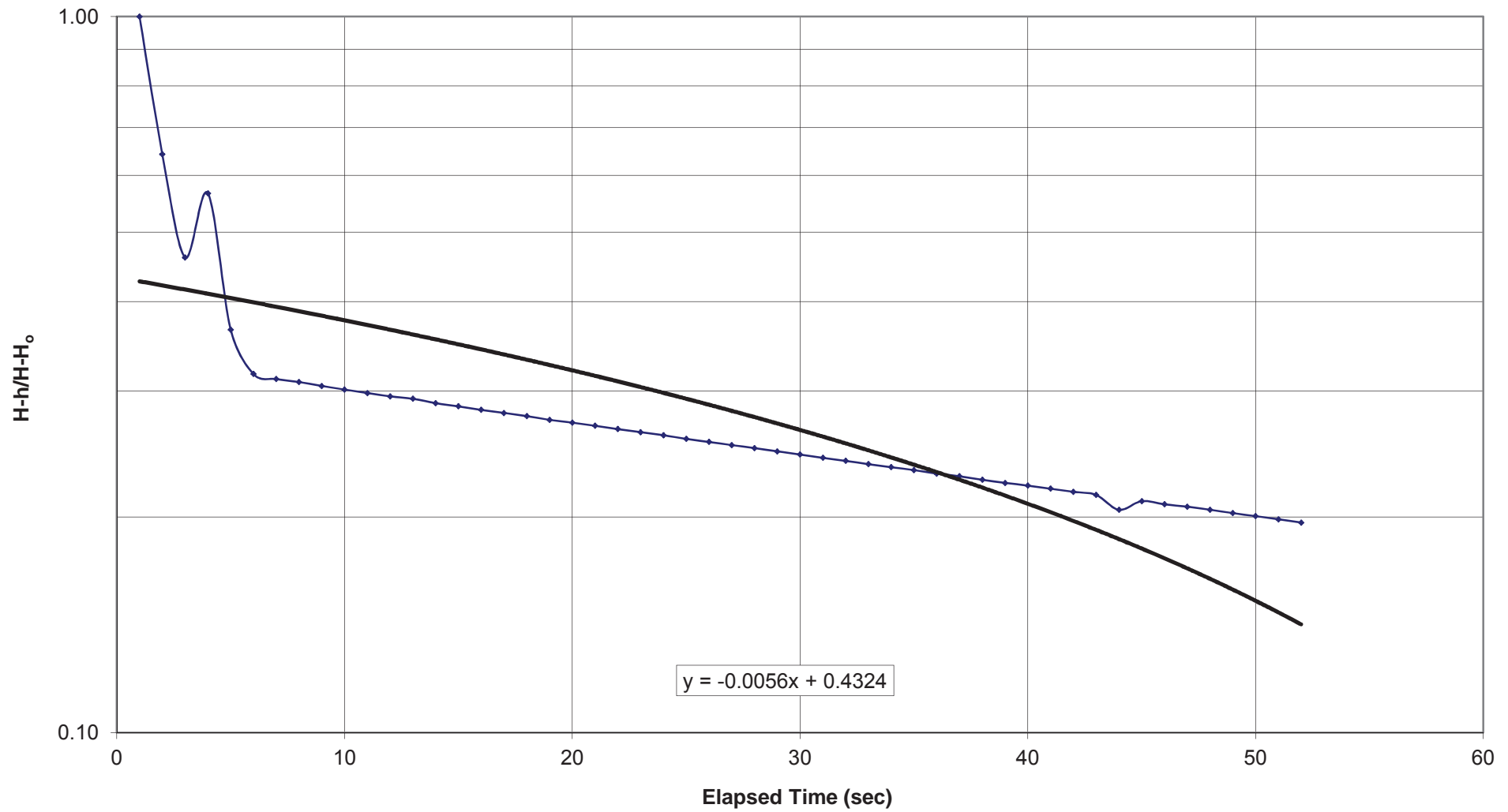
# Hydraulic Conductivity Testing at TW-5-2 Warsaw Landfill



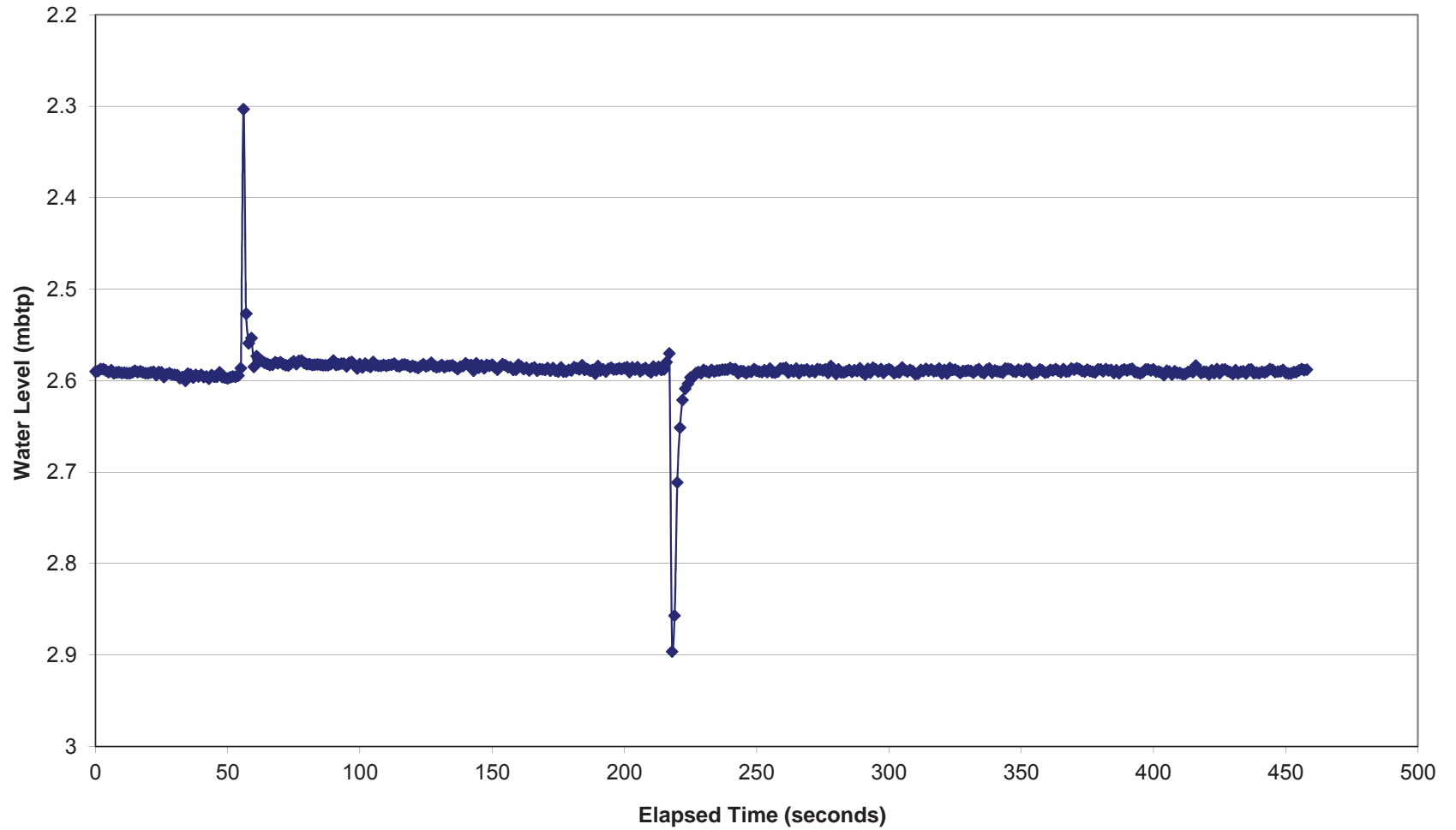
### Rising Head Hydraulic Conductivity Analysis at TW-5-2



### Falling Head Hydraulic Conductivity Analysis at TW-5-2

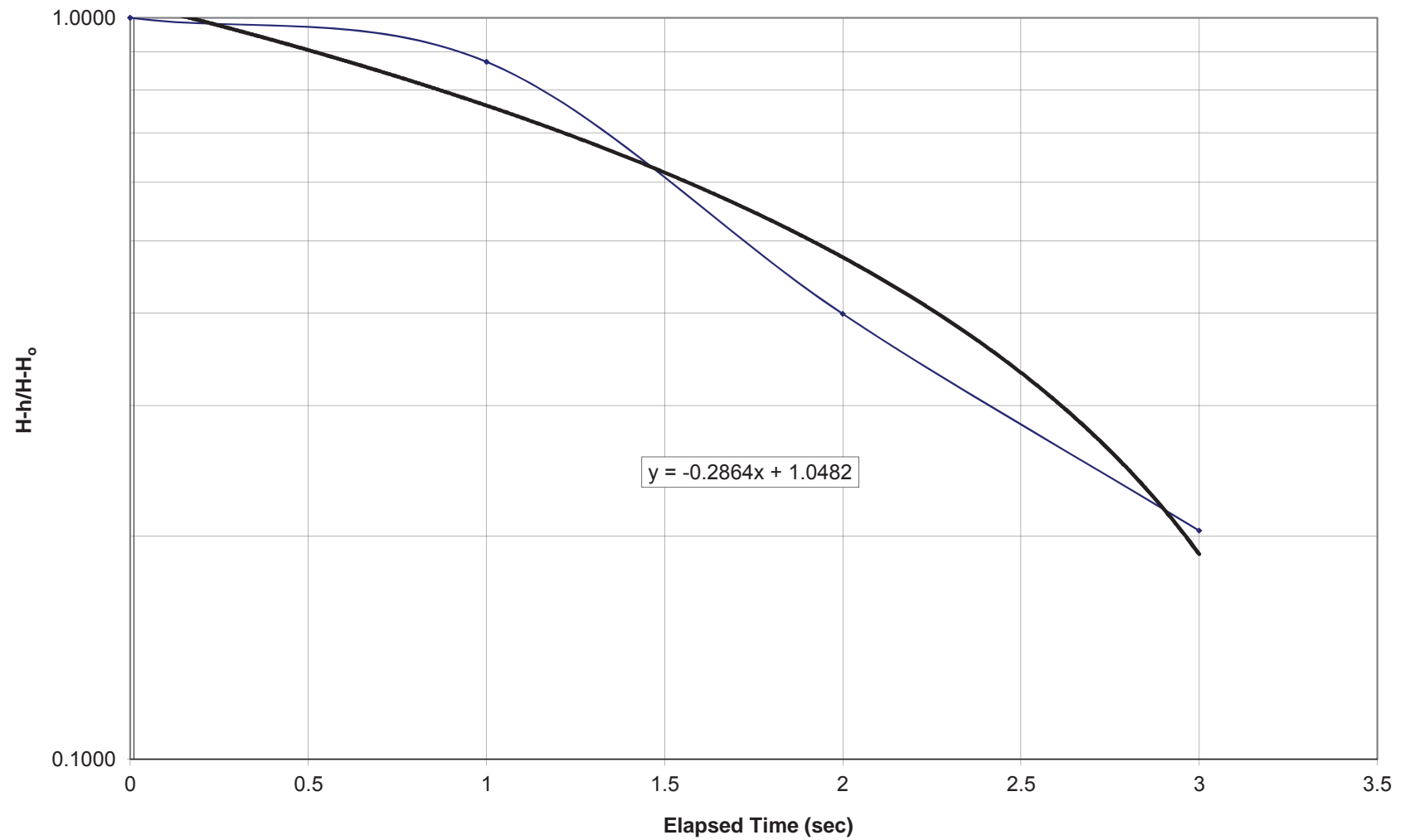


# Hydraulic Conductivity Testing at TW-6-2 Warsaw Landfill

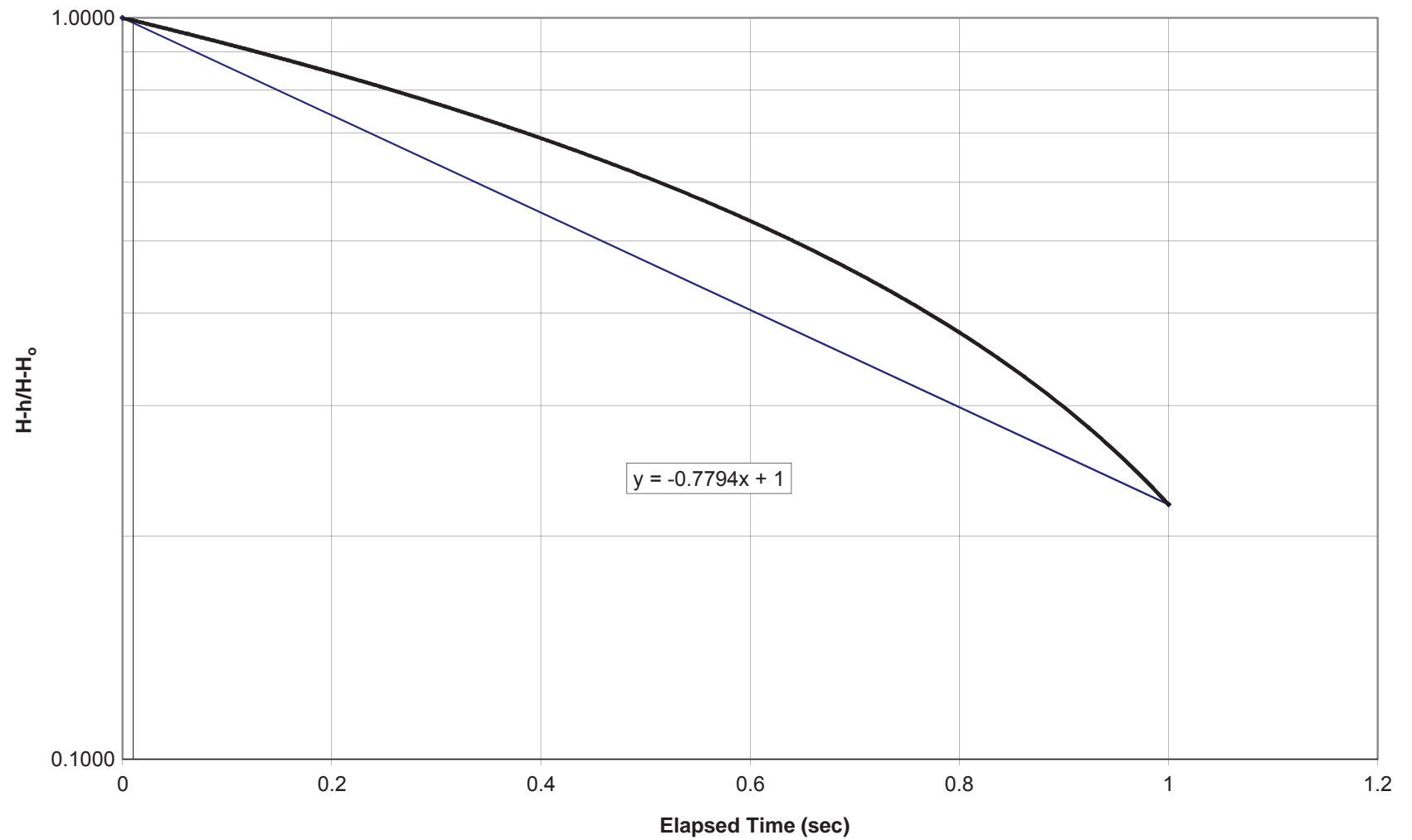




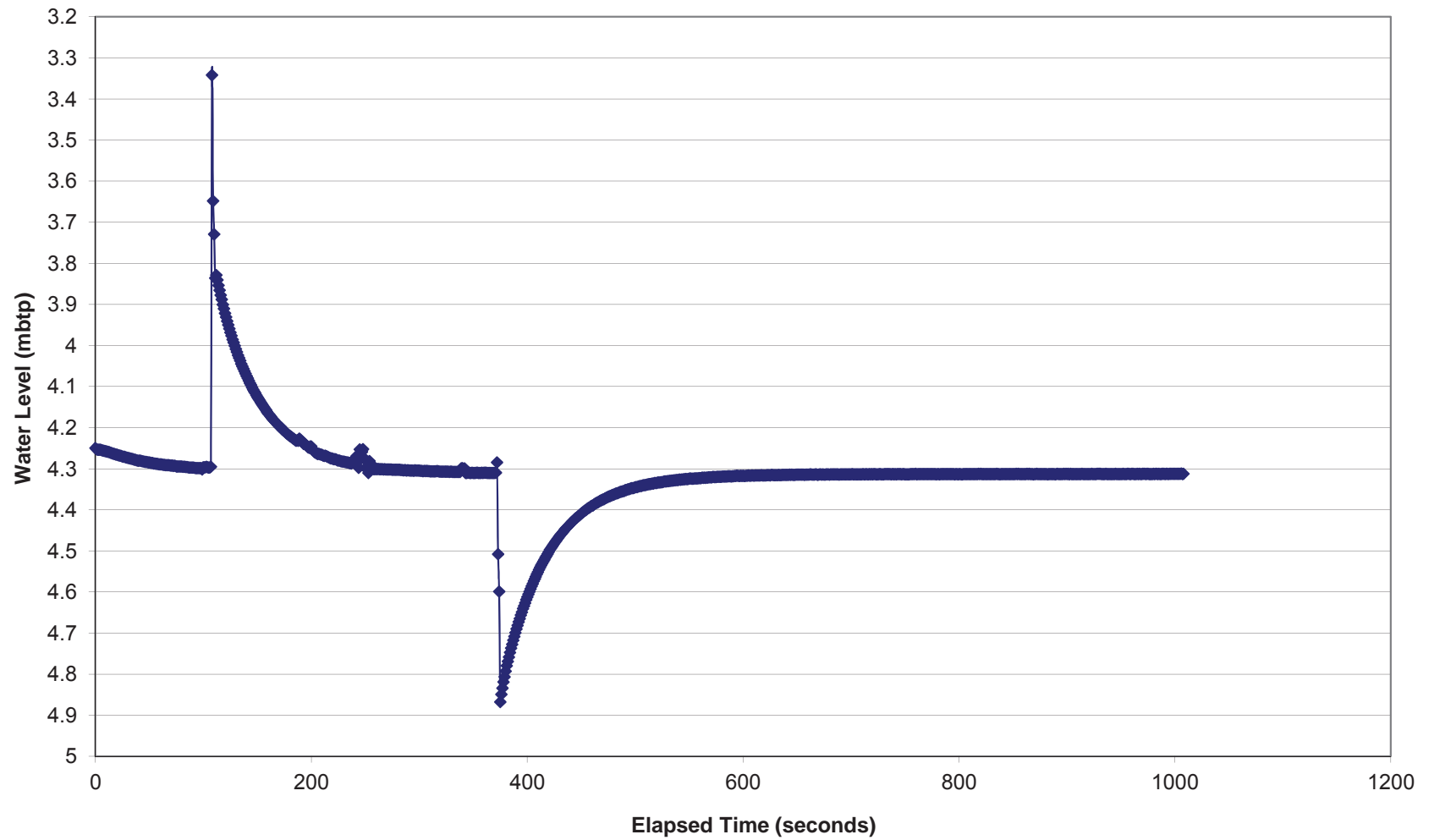
### Rising Head Hydraulic Conductivity Analysis at TW-6-2



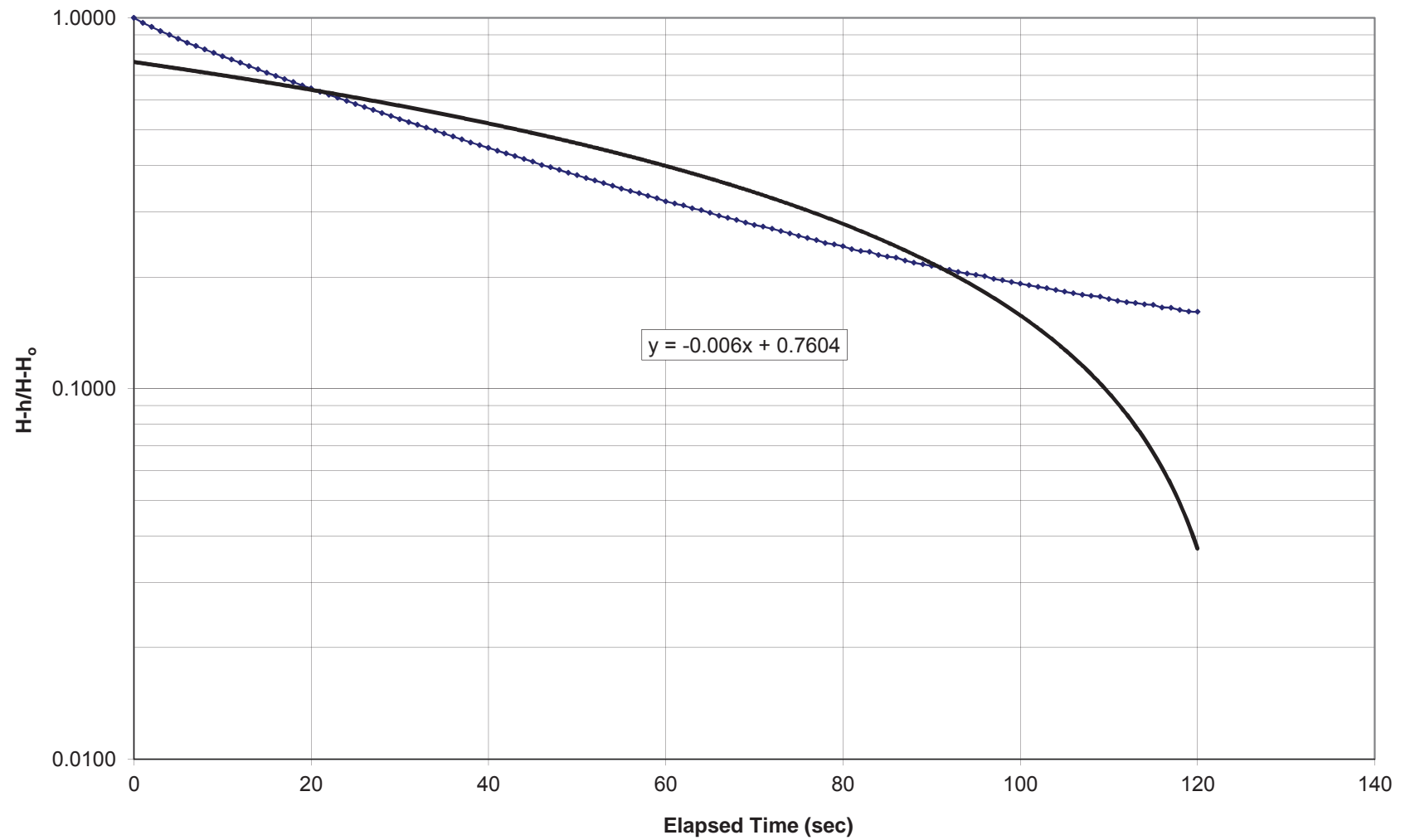
### Falling Head Hydraulic Conductivity Analysis at TW-6-2



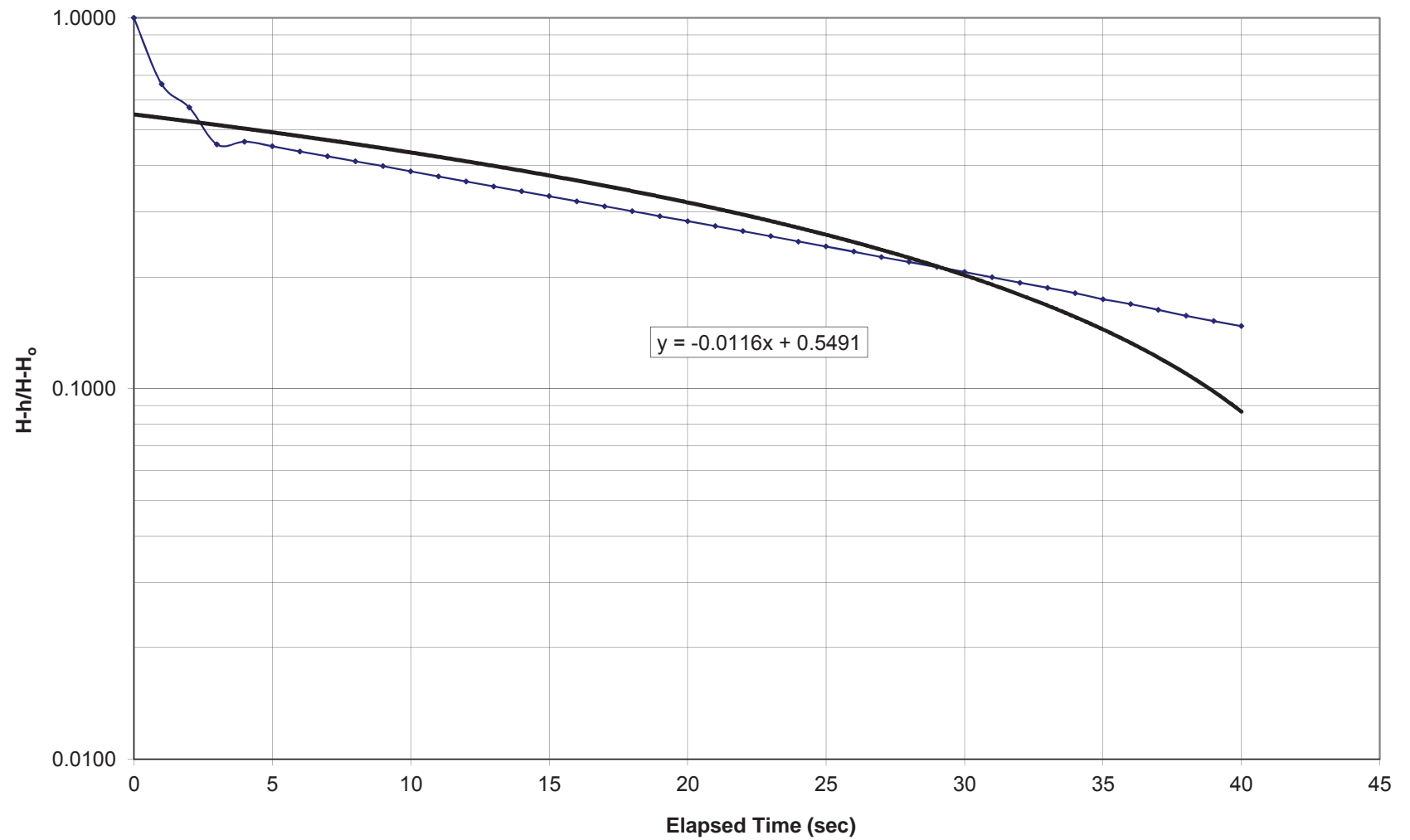
# Hydraulic Conductivity Testing at TW-7 Warsaw Landfill



### Rising Head Hydraulic Conductivity Analysis at TW-7



### Falling Head Hydraulic Conductivity Analysis at TW-7



## **Appendix E**

### **2019 Water Quality Data**



## FINAL REPORT

CA18152-MAY19 R

73515228, 11193447-01

Prepared for

**GHD**

## First Page

### CLIENT DETAILS

Client GHD

Address 347 Pido Rd., Unit #29, Peterborough  
Canada, K9J 6Z8  
Phone: 705-749-3317. Fax:

Contact Gus Bolin

Telephone 705-749-3317

Facsimile

Email gus.bolin@ghd.com

Project 73515228, 11193447-01

Order Number

Samples Surface Water (1)

### LABORATORY DETAILS

Project Specialist Brad Moore Hon. B.Sc

Laboratory SGS Canada Inc.

Address 185 Concession St., Lakefield ON, K0L 2H0

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SGS Reference CA18152-MAY19

Received 05/28/2019

Approved 06/04/2019

Report Number CA18152-MAY19 R

Date Reported 06/04/2019

### COMMENTS

### SIGNATORIES

Brad Moore Hon. B.Sc

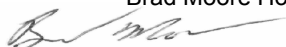






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# FINAL REPORT

CA18152-MAY19 R

Client: GHD

Project: 73515228, 11193447-01

Project Manager: Gus Bolin

Samplers: K Geraldi

PACKAGE: - General Chemistry (WATER)

Sample Number 5  
Sample Name SW-7  
Sample Matrix Surface Water  
Sample Date 28/05/2019

Parameter	Units	RL	Result
General Chemistry			
Biochemical Oxygen Demand (BOD5)	mg/L	2	< 4 ↑
Total Suspended Solids	mg/L	2	< 2
Alkalinity	mg/L as CaCO3	2	282
Conductivity	uS/cm	2	702
Total Dissolved Solids	mg/L	30	423
Chemical Oxygen Demand	mg/L	8	< 8
Total Kjeldahl Nitrogen	as N mg/L	0.5	< 0.5
Ammonia+Ammonium (N)	as N mg/L	0.1	< 0.1

PACKAGE: - Metals and Inorganics (WATER)

Sample Number 5  
Sample Name SW-7  
Sample Matrix Surface Water  
Sample Date 28/05/2019

Parameter	Units	RL	Result
Metals and Inorganics			
Sulphate	mg/L	2	6
Nitrite (as N)	as N mg/L	0.03	< 0.03
Nitrate (as N)	as N mg/L	0.06	< 0.06
Arsenic (total)	mg/L	0.0002	< 0.0002
Barium (total)	mg/L	0.00002	0.0764
Boron (total)	mg/L	0.002	0.051
Calcium (total)	mg/L	0.01	109



FINAL REPORT

CA18152-MAY19 R

Client: GHD

Project: 73515228, 11193447-01

Project Manager: Gus Bolin

Samplers: K Geraldi

PACKAGE: - Metals and Inorganics (WATER)

Sample Number 5  
Sample Name SW-7  
Sample Matrix Surface Water  
Sample Date 28/05/2019

Parameter	Units	RL	Result
Metals and Inorganics (continued)			
Cadmium (total)	mg/L	0.000003	< 0.000003
Chromium (total)	mg/L	0.00008	< 0.00008
Copper (total)	mg/L	0.0002	0.0003
Iron (total)	mg/L	0.007	0.038
Potassium (total)	mg/L	0.009	3.75
Magnesium (total)	mg/L	0.001	6.29
Manganese (total)	mg/L	0.00001	0.0266
Sodium (total)	mg/L	0.01	28.4
Phosphorus (total)	mg/L	0.003	< 0.003
Lead (total)	mg/L	0.00001	< 0.00001
Zinc (total)	mg/L	0.002	< 0.002



FINAL REPORT

CA18152-MAY19 R

Client: GHD  
Project: 73515228, 11193447-01  
Project Manager: Gus Bolin  
Samplers: K Geraldi

PACKAGE: - Other (ORP) (WATER)

Sample Number 5  
Sample Name SW-7  
Sample Matrix Surface Water  
Sample Date 28/05/2019

Parameter	Units	RL	Result
Other (ORP)			
pH	no unit	0.05	8.24
Chloride	mg/L	1	64
Mercury (total)	µg/L	0.01	< 0.01

PACKAGE: - Phenols (WATER)

Sample Number 5  
Sample Name SW-7  
Sample Matrix Surface Water  
Sample Date 28/05/2019

Parameter	Units	RL	Result
Phenols			
4AAP-Phenolics	mg/L	0.001	< 0.001



FINAL REPORT

CA18152-MAY19 R

QC SUMMARY

Alkalinity  
Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0547-MAY19	mg/L as CaCO3	2	< 2	0	10	99	80	120	NA		

Ammonia by SFA  
Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0230-MAY19	as N mg/L	0.1	<0.1	0	10	101	90	110	99	75	125



FINAL REPORT

CA18152-MAY19 R

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0587-MAY19	mg/L	1	<1	0	20	101	80	120	102	75	125
Sulphate	DIO0587-MAY19	mg/L	2	<2	0	20	102	80	120	100	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0636-MAY19	mg/L	0.03	<0.03	ND	20	92	80	120	99	75	125
Nitrate (as N)	DIO0636-MAY19	mg/L	0.06	<0.06	0	20	97	80	120	105	75	125



QC SUMMARY

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0053-MAY19	mg/L	2	< 2	2	30	93	70	130	NV	70	130

Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0523-MAY19	mg/L	8	<8	ND	20	82	80	120	87	75	125

Conductivity

Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0547-MAY19	uS/cm	2	< 2	0	10	100	90	110	NA		



FINAL REPORT

CA18152-MAY19 R

QC SUMMARY

Mercury by CVAAS  
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0029-MAY19	ug/L	0.01	<0.01	ND	20	99	80	120	112	70	130





# FINAL REPORT

CA18152-MAY19 R

## QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (total)	EMS0201-MAY19	mg/L	0.0002	<0.0002	2	20	100	90	110	96	70	130
Barium (total)	EMS0201-MAY19	mg/L	0.00002	<0.00002	2	20	99	90	110	NV	70	130
Boron (total)	EMS0201-MAY19	mg/L	0.002	<0.002	0	20	93	90	110	NV	70	130
Calcium (total)	EMS0201-MAY19	mg/L	0.01	<0.01	1	20	97	90	110	NV	70	130
Cadmium (total)	EMS0201-MAY19	mg/L	0.000003	4e-006	ND	20	96	90	110	94	70	130
Chromium (total)	EMS0201-MAY19	mg/L	0.00008	<0.00008	2	20	98	90	110	95	70	130
Copper (total)	EMS0201-MAY19	mg/L	0.0002	<0.0002	6	20	99	90	110	NV	70	130
Iron (total)	EMS0201-MAY19	mg/L	0.007	<0.007	0	20	98	90	110	NV	70	130
Potassium (total)	EMS0201-MAY19	mg/L	0.009	<0.009	2	20	99	90	110	NV	70	130
Magnesium (total)	EMS0201-MAY19	mg/L	0.001	<0.001	1	20	98	90	110	NV	70	130
Manganese (total)	EMS0201-MAY19	mg/L	0.00001	<0.00001	0	20	100	90	110	NV	70	130
Sodium (total)	EMS0201-MAY19	mg/L	0.01	<0.01	1	20	101	90	110	NV	70	130
Lead (total)	EMS0201-MAY19	mg/L	0.00001	<0.00001	7	20	99	90	110	NV	70	130
Zinc (total)	EMS0201-MAY19	mg/L	0.002	<0.002	ND	20	101	90	110	95	70	130



# FINAL REPORT

CA18152-MAY19 R

## QC SUMMARY

### Metals in aqueous samples - ICP-OES

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Phosphorus (total)	EMS0201-MAY19	mg/L	0.003	<0.003	ND	20	97	90	110	NV	70	130

### pH

Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0547-MAY19	no unit	0.05	NA	0		101			NA		

### Phenols by SFA

Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0220-MAY19	mg/L	0.001	<0.001	4	10	96	90	110	90	75	125



FINAL REPORT

CA18152-MAY19 R

QC SUMMARY

Solids Analysis

Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0006-JUN19	mg/L	30	<30	ND	20	97	90	110	NA		

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0535-MAY19	mg/L	2	< 2	ND	10	NV	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0221-MAY19	as N mg/L	0.5	<0.5	3	10	99	90	110	96	75	125

## QC SUMMARY

---

**Method Blank:** a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

**Duplicate:** Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

**LCS/Spike Blank:** Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

**Matrix Spike:** A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

**Reference Material:** a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

**RL:** Reporting limit

**RPD:** Relative percent difference

**AC:** Acceptance criteria

**Multielement Scan Qualifier:** as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

**Duplicate Qualifier:** for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

**Matrix Spike Qualifier:** for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

## LEGEND

## FOOTNOTES

**NSS** Insufficient sample for analysis.

**RL** Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

**NA** The sample was not analysed for this analyte

**ND** Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated. This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at [http://www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm). The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

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-- End of Analytical Report --



## FINAL REPORT

CA18153-MAY19 R

PO#: 73515228, 11193447-01

Prepared for

**GHD**

## First Page

### CLIENT DETAILS

Client GHD

Address 347 Pido Rd., Unit #29, Peterborough  
Canada, K9J 6Z8  
Phone: 705-749-3317. Fax:

Contact Gus Bolin

Telephone 705-749-3317

Facsimile

Email gus.bolin@ghd.com

Project PO#: 73515228, 11193447-01

Order Number

Samples Ground Water (6)

### LABORATORY DETAILS

Project Specialist Brad Moore Hon. B.Sc

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SGS Reference CA18153-MAY19

Received 05/28/2019

Approved 06/04/2019

Report Number CA18153-MAY19 R

Date Reported 06/04/2019

### COMMENTS

Bromomethane LCS; Recovery is outside control limits; the overall quality control for this analysis has been assessed and meets method acceptability criteria.

### SIGNATORIES

Brad Moore Hon. B.Sc

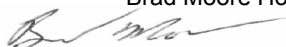




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# FINAL REPORT

CA18153-MAY19 R

Client: GHD

Project: PO#: 73515228, 11193447-01

Project Manager: Gus Bolin

Samplers: K Gerald

PACKAGE: - BTEX (WATER)

Sample Number 5  
Sample Name TW-2  
Sample Matrix Ground Water  
Sample Date 28/05/2019

Parameter	Units	RL	Result
BTEX			
Benzene	ug/L	0.5	< 0.5
Ethylbenzene	ug/L	0.5	< 0.5
Toluene	ug/L	0.5	< 0.5
Xylene (total)	ug/L	0.5	< 0.5
o-xylene	ug/L	0.5	< 0.5
m/p-xylene	ug/L	0.5	< 0.5

PACKAGE: - General Chemistry (WATER)

Sample Number 5 6 7 8 9 10  
Sample Name TW-2 TW-3-2 TW-4-2 TW-5-2 TW-6-2 TW-7  
Sample Matrix Ground Water Ground Water Ground Water Ground Water Ground Water Ground Water  
Sample Date 28/05/2019 28/05/2019 28/05/2019 28/05/2019 28/05/2019 28/05/2019

Parameter	Units	RL	Result	Result	Result	Result	Result	Result
General Chemistry								
Biochemical Oxygen Demand (BOD5)	mg/L	2	4	< 4 †	< 4 †	< 4 †	< 4 †	< 4 †
Total Suspended Solids	mg/L	2	1770	150	50	140	22	931
Alkalinity	mg/L as CaCO3	2	407	366	276	2340	386	332
Conductivity	uS/cm	2	933	962	878	1010	917	1040
Total Dissolved Solids	mg/L	30	611	563	529	571	509	571
Chemical Oxygen Demand	mg/L	8	37	24	< 8	< 8	< 8	< 8
Total Kjeldahl Nitrogen	as N mg/L	0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ammonia+Ammonium (N)	as N mg/L	0.1	< 0.1	< 0.1	< 0.1	< 0.1	< 0.1	0.5



# FINAL REPORT

CA18153-MAY19 R

Client: GHD

Project: PO#: 73515228, 11193447-01

Project Manager: Gus Bolin

Samplers: K Gerald

PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	6	7	8	9	10
Sample Name	TW-2	TW-3-2	TW-4-2	TW-5-2	TW-6-2	TW-7
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/05/2019	28/05/2019	28/05/2019	28/05/2019	28/05/2019	28/05/2019

Parameter	Units	RL	Result	Result	Result	Result	Result	Result
Metals and Inorganics								
Phosphorus (total)	mg/L	0.03	0.74	0.23	< 0.03	0.19	< 0.03	0.42
Sulphate	mg/L	2	< 2	23	6	8	10	2
Nitrite (as N)	as N mg/L	0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N)	as N mg/L	0.06	< 0.06	0.08	1.35	0.31	0.10	0.21
Arsenic (dissolved)	mg/L	0.0002	0.0007	0.0006	< 0.0002	< 0.0002	< 0.0002	0.0006
Barium (dissolved)	mg/L	0.00002	0.139	0.113	0.0503	0.166	0.109	0.105
Boron (dissolved)	mg/L	0.002	0.015	0.099	0.010	0.016	0.055	0.128
Calcium (dissolved)	mg/L	0.01	166	148	126	131	148	173
Cadmium (dissolved)	mg/L	0.000003	0.000014	0.000005	0.000005	< 0.000003	0.000004	0.000073
Chromium (dissolved)	mg/L	0.00008	0.00025	0.00027	0.00099	0.00015	0.00015	0.00117
Copper (dissolved)	mg/L	0.0002	0.0004	0.0005	0.0006	0.0008	0.0014	0.0024
Iron (dissolved)	mg/L	0.007	1.50	1.21	0.021	< 0.007	< 0.007	2.03
Potassium (dissolved)	mg/L	0.009	0.840	5.98	0.521	1.20	5.67	4.34
Magnesium (dissolved)	mg/L	0.001	8.98	9.53	3.78	7.85	6.70	20.2
Manganese (dissolved)	mg/L	0.00001	0.550	0.277	0.00012	0.00005	0.0122	0.587
Sodium (dissolved)	mg/L	0.01	48.9	42.9	52.2	57.6	31.3	48.0
Lead (dissolved)	mg/L	0.00001	0.00003	0.00005	< 0.00001	< 0.00001	< 0.00001	0.01074
Zinc (dissolved)	mg/L	0.002	0.004	0.009	0.003	< 0.002	0.002	0.032



# FINAL REPORT

CA18153-MAY19 R

Client: GHD

Project: PO#: 73515228, 11193447-01

Project Manager: Gus Bolin

Samplers: K Geraldi

## PACKAGE: - Other (ORP) (WATER)

Sample Number	5	6	7	8	9	10
Sample Name	TW-2	TW-3-2	TW-4-2	TW-5-2	TW-6-2	TW-7
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/05/2019	28/05/2019	28/05/2019	28/05/2019	28/05/2019	28/05/2019

Parameter	Units	RL	Result	Result	Result	Result	Result	Result
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### Other (ORP)

pH	no unit	0.05		7.41	7.30	8.02	8.05	7.91	7.83
Chloride	mg/L	1		99	87	130	160	76	130
Mercury (total)	µg/L	0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

## PACKAGE: - Phenols (WATER)

Sample Number	5	6	7	8	9	10
Sample Name	TW-2	TW-3-2	TW-4-2	TW-5-2	TW-6-2	TW-7
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/05/2019	28/05/2019	28/05/2019	28/05/2019	28/05/2019	28/05/2019

Parameter	Units	RL	Result	Result	Result	Result	Result	Result
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### Phenols

4AAP-Phenolics	mg/L	0.001		0.001	< 0.001	< 0.001	0.002	< 0.001	< 0.001
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## PACKAGE: - THMs (VOC) (WATER)

Sample Number	5
Sample Name	TW-2
Sample Matrix	Ground Water
Sample Date	28/05/2019

Parameter	Units	RL	Result
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### THMs (VOC)

Bromodichloromethane	µg/L	0.5	< 0.5
Bromoform	µg/L	0.5	< 0.5
Dibromochloromethane	µg/L	0.5	< 0.5



# FINAL REPORT

CA18153-MAY19 R

Client: GHD

Project: PO#: 73515228, 11193447-01

Project Manager: Gus Bolin

Samplers: K Gerald

PACKAGE: - VOCs (WATER)

Sample Number 5  
Sample Name TW-2  
Sample Matrix Ground Water  
Sample Date 28/05/2019

Parameter	Units	RL	Result
VOCs			
Bromomethane	µg/L	0.5	< 0.5
Carbon tetrachloride	µg/L	0.2	< 0.2
Chloroethane	µg/L	5.0	< 5
Chloroform	µg/L	0.5	< 0.5
Chloromethane	µg/L	5.0	< 5
1,2-Dichlorobenzene	µg/L	0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	< 0.5
1,1-Dichloroethane	µg/L	0.5	< 0.5
1,2-Dichloroethane	µg/L	0.5	< 0.5
1,1-Dichloroethylene	µg/L	0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	< 0.5
trans-1,2-Dichloroethene	µg/L	0.5	< 0.5
cis-1,2-Dichloroethene	µg/L	0.5	< 0.5
cis-1,3-Dichloropropene	µg/L	0.5	< 0.5
trans-1,3-Dichloropropene	µg/L	0.5	< 0.5
Ethylenedibromide	µg/L	0.2	< 0.2
Dichloromethane	µg/L	0.5	< 0.5
Monochlorobenzene	µg/L	0.5	< 0.5
Styrene	µg/L	0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	< 0.5
Tetrachloroethene	µg/L	0.5	< 0.5
Trichloroethylene	µg/L	0.5	< 0.5



FINAL REPORT

CA18153-MAY19 R

Client: GHD

Project: PO#: 73515228, 11193447-01

Project Manager: Gus Bolin

Samplers: K Geraldi

PACKAGE: - VOCs (WATER)

Sample Number 5  
Sample Name TW-2  
Sample Matrix Ground Water  
Sample Date 28/05/2019

Parameter	Units	RL	Result
VOCs (continued)			
Vinyl Chloride	µg/L	0.2	< 0.2
Trichlorofluoromethane	µg/L	5.0	< 5
1,1,1-Trichloroethane	µg/L	0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	< 0.5



FINAL REPORT

CA18153-MAY19 R

QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0001-JUN19	mg/L as CaCO3	2	< 2	7	10	102	80	120	NA		
Alkalinity	EWL0547-MAY19	mg/L as CaCO3	2	< 2	0	10	99	80	120	NA		
Alkalinity	EWL0576-MAY19	mg/L as CaCO3	2	< 2	1	10	101	80	120	NA		
Alkalinity	EWL0583-MAY19	mg/L as CaCO3	2	< 2	0	10	97	80	120	NA		
Alkalinity	EWL0601-MAY19	mg/L as CaCO3	2	< 2	1	10	102	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0230-MAY19	as N mg/L	0.1	<0.1	0	10	101	90	110	99	75	125



FINAL REPORT

CA18153-MAY19 R

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0587-MAY19	mg/L	1	<1	0	20	101	80	120	102	75	125
Sulphate	DIO0587-MAY19	mg/L	2	<2	0	20	102	80	120	100	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0636-MAY19	mg/L	0.03	<0.03	ND	20	92	80	120	99	75	125
Nitrate (as N)	DIO0636-MAY19	mg/L	0.06	<0.06	0	20	97	80	120	105	75	125



FINAL REPORT

CA18153-MAY19 R

QC SUMMARY

Biochemical Oxygen Demand  
Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0053-MAY19	mg/L	2	< 2	2	30	93	70	130	NV	70	130

Chemical Oxygen Demand  
Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0523-MAY19	mg/L	8	<8	ND	20	82	80	120	87	75	125
Chemical Oxygen Demand	EWL0524-MAY19	mg/L	8	<8	0	20	94	80	120	101	75	125





FINAL REPORT

CA18153-MAY19 R

QC SUMMARY

Conductivity  
Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0001-JUN19	uS/cm	2	< 2	2	10	99	90	110	NA		
Conductivity	EWL0547-MAY19	uS/cm	2	< 2	0	10	100	90	110	NA		
Conductivity	EWL0576-MAY19	uS/cm	2	2	1	10	101	90	110	NA		
Conductivity	EWL0583-MAY19	uS/cm	2	2	1	10	97	90	110	NA		
Conductivity	EWL0601-MAY19	uS/cm	2	< 2	0	10	100	90	110	NA		

Mercury by CVAAS  
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0029-MAY19	ug/L	0.01	<0.01	ND	20	99	80	120	112	70	130



# FINAL REPORT

CA18153-MAY19 R

## QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (dissolved)	EMS0190-MAY19	mg/L	0.0002	< 0.0002	ND	20	96	90	110	95	70	130
Barium (dissolved)	EMS0190-MAY19	mg/L	0.00002	< 0.00002	ND	20	102	90	110	NV	70	130
Boron (dissolved)	EMS0190-MAY19	mg/L	0.002	< 0.002	ND	20	91	90	110	NV	70	130
Calcium (dissolved)	EMS0190-MAY19	mg/L	0.01	< 0.01	14	20	95	90	110	74	70	130
Cadmium (dissolved)	EMS0190-MAY19	mg/L	0.000003	< 0.000003	ND	20	98	90	110	102	70	130
Chromium (dissolved)	EMS0190-MAY19	mg/L	0.00008	< 0.00008	ND	20	97	90	110	NV	70	130
Copper (dissolved)	EMS0190-MAY19	mg/L	0.0002	< 0.0002	ND	20	100	90	110	NV	70	130
Iron (dissolved)	EMS0190-MAY19	mg/L	0.007	< 0.007	ND	20	92	90	110	NV	70	130
Potassium (dissolved)	EMS0190-MAY19	mg/L	0.009	< 0.009	1	20	94	90	110	78	70	130
Magnesium (dissolved)	EMS0190-MAY19	mg/L	0.001	< 0.001	14	20	98	90	110	81	70	130
Manganese (dissolved)	EMS0190-MAY19	mg/L	0.00001	< 0.00001	ND	20	99	90	110	NV	70	130
Sodium (dissolved)	EMS0190-MAY19	mg/L	0.01	< 0.01	ND	20	96	90	110	86	70	130
Lead (dissolved)	EMS0190-MAY19	mg/L	0.00001	< 0.00001	13	20	102	90	110	96	70	130
Zinc (dissolved)	EMS0190-MAY19	mg/L	0.002	< 0.002	2	20	96	90	110	80	70	130



FINAL REPORT

CA18153-MAY19 R

QC SUMMARY

pH  
Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0001-JUN19	no unit	0.05	NA	0		100			NA		
pH	EWL0547-MAY19	no unit	0.05	NA	0		101			NA		
pH	EWL0576-MAY19	no unit	0.05	NA	0		100			NA		
pH	EWL0583-MAY19	no unit	0.05	NA	0		101			NA		
pH	EWL0601-MAY19	no unit	0.05	NA	0		101			NA		

Phenols by SFA  
Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0220-MAY19	mg/L	0.001	<0.001	4	10	96	90	110	90	75	125



FINAL REPORT

CA18153-MAY19 R

QC SUMMARY

Phosphorus by SFA  
Method: SM 4500-P J | Internal ref.: ME-CA-IENVISFA-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Phosphorus (total)	SKA0226-MAY19	mg/L	0.03	<0.03	2	10	105	90	110	90	75	125

Solids Analysis  
Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0006-JUN19	mg/L	30	<30	ND	20	97	90	110	NA		



FINAL REPORT

CA18153-MAY19 R

QC SUMMARY

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0525-MAY19	mg/L	2	< 2	1	10	NV	90	110	NA		
Total Suspended Solids	EWL0535-MAY19	mg/L	2	< 2	ND	10	NV	90	110	NA		
Total Suspended Solids	EWL0546-MAY19	mg/L	2	< 2	10	10	NV	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0221-MAY19	as N mg/L	0.5	<0.5	3	10	99	90	110	96	75	125



# FINAL REPORT

CA18153-MAY19 R

## QC SUMMARY

### Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,1,2-Tetrachloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	91	50	140
1,1,1-Trichloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	97	60	130	74	50	140
1,1,2,2-Tetrachloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	104	60	130	104	50	140
1,1,2-Trichloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	98	60	130	119	50	140
1,1-Dichloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	93	60	130	73	50	140
1,1-Dichloroethylene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	82	60	130	58	50	140
1,2-Dichlorobenzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	101	60	130	72	50	140
1,2-Dichloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	95	60	130	87	50	140
1,2-Dichloropropane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	91	60	130	84	50	140
1,3-Dichlorobenzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	85	50	140
1,4-Dichlorobenzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	86	50	140
Benzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	98	60	130	90	50	140
Bromodichloromethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	98	60	130	91	50	140
Bromoform	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	101	60	130	90	50	140
Bromomethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	159	50	140	109	50	140
Carbon tetrachloride	GCM0613-MAY19	ug/L	0.2	<0.2	ND	30	99	60	130	82	50	140
Chloroethane	GCM0613-MAY19	ug/L	5.0	<5	ND	30	93	60	130	82	50	140
Chloroform	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	103	60	130	75	50	140
Chloromethane	GCM0613-MAY19	ug/L	5.0	<5	ND	30	99	60	130	76	50	140
cis-1,2-Dichloroethene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	80	50	140



# FINAL REPORT

CA18153-MAY19 R

## QC SUMMARY

### Volatile Organics (continued)

Method: EPA 5030B/8260C | Internal ref.: ME-CA-ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
cis-1,3-Dichloropropene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	98	60	130	73	50	140
Dibromochloromethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	98	60	130	124	50	140
Dichloromethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	96	60	130	77	50	140
Ethylbenzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	105	60	130	95	50	140
Ethylenedibromide	GCM0613-MAY19	ug/L	0.2	<0.2	ND	30	97	60	130	125	50	140
m/p-xylene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	105	60	130	94	50	140
Monochlorobenzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	93	50	140
o-xylene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	108	60	130	98	50	140
Styrene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	108	60	130	70	50	140
Tetrachloroethene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	100	60	130	110	50	140
Toluene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	92	50	140
trans-1,2-Dichloroethene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	93	60	130	71	50	140
trans-1,3-Dichloropropene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	104	60	130	76	50	140
Trichloroethylene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	95	60	130	88	50	140
Trichlorofluoromethane	GCM0613-MAY19	ug/L	5.0	<5	ND	30	100	50	140	85	50	140
Vinyl Chloride	GCM0613-MAY19	ug/L	0.2	<0.2	ND	30	102	60	130	79	50	140

## QC SUMMARY

---

**Method Blank:** a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

**Duplicate:** Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

**LCS/Spike Blank:** Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

**Matrix Spike:** A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

**Reference Material:** a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

**RL:** Reporting limit

**RPD:** Relative percent difference

**AC:** Acceptance criteria

**Multielement Scan Qualifier:** as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

**Duplicate Qualifier:** for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

**Matrix Spike Qualifier:** for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.



## LEGEND

## FOOTNOTES

**NSS** Insufficient sample for analysis.

**RL** Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

**NA** The sample was not analysed for this analyte

**ND** Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

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-- End of Analytical Report --



## FINAL REPORT

CA14816-OCT19 R

11192447-01, Warsaw Road Landfill

Prepared for

**GHD**

## First Page

### CLIENT DETAILS

Client GHD

Address 347 Pido Rd., Unit #29, Peterborough  
Canada, K9J 6Z8  
Phone: 705-749-3317. Fax:

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Project 11192447-01, Warsaw Road Landfill  
Order Number  
Samples Surface Water (1)

### LABORATORY DETAILS

Project Specialist Brad Moore Hon. B.Sc  
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SGS Reference CA14816-OCT19  
Received 10/25/2019  
Approved 11/04/2019  
Report Number CA14816-OCT19 R  
Date Reported 11/04/2019

### COMMENTS

### SIGNATORIES

Brad Moore Hon. B.Sc

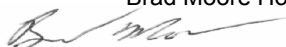




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# FINAL REPORT

CA14816-OCT19 R

Client: GHD

Project: 11192447-01, Warsaw Road Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: **PWQO - General Chemistry** (WATER)

Sample Number 5  
Sample Name SW-11  
Sample Matrix Surface Water  
Sample Date 25/10/2019

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result
<b>General Chemistry</b>				
Biochemical Oxygen Demand (BOD5)	mg/L	2		< 4 †
Alkalinity	mg/L as CaCO3	2		250
Conductivity	uS/cm	2		678
Total Suspended Solids	mg/L	2		< 2
Total Dissolved Solids	mg/L	30		440
Chemical Oxygen Demand	mg/L	8		52
Total Kjeldahl Nitrogen	as N mg/L	0.5		0.8
Ammonia+Ammonium (N)	as N mg/L	0.1		< 0.1

PACKAGE: **PWQO - Metals and Inorganics** (WATER)

Sample Number 5  
Sample Name SW-11  
Sample Matrix Surface Water  
Sample Date 25/10/2019

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result
<b>Metals and Inorganics</b>				
Sulphate	mg/L	2		< 2
Nitrite (as N)	as N mg/L	0.03		< 0.03
Nitrate (as N)	as N mg/L	0.06		< 0.06
Arsenic (total)	mg/L	0.0002	0.005	0.0005
Barium (total)	mg/L	0.00002		0.0421
Boron (total)	mg/L	0.002	0.2	0.017
Calcium (total)	mg/L	0.01		112



FINAL REPORT

CA14816-OCT19 R

Client: GHD

Project: 11192447-01, Warsaw Road Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: PWQO - Metals and Inorganics (WATER)

Sample Number 5  
Sample Name SW-11  
Sample Matrix Surface Water  
Sample Date 25/10/2019

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result
Metals and Inorganics (continued)				
Cadmium (total)	mg/L	0.000003	0.0001	< 0.000003
Chromium (total)	mg/L	0.00008		0.00015
Copper (total)	mg/L	0.0002	0.001	0.0005
Iron (total)	mg/L	0.007	0.3	0.047
Potassium (total)	mg/L	0.009		2.29
Magnesium (total)	mg/L	0.001		4.40
Manganese (total)	mg/L	0.00001		0.0129
Sodium (total)	mg/L	0.01		27.2
Phosphorus (total)	mg/L	0.003	0.01	0.017
Lead (total)	mg/L	0.00001	0.001	< 0.00001
Zinc (total)	mg/L	0.002	0.02	0.003



FINAL REPORT

CA14816-OCT19 R

Client: GHD  
Project: 11192447-01, Warsaw Road Landfill  
Project Manager: Gus Bolin  
Samplers: Gus Bolin

PACKAGE: PWQO - Other (ORP) (WATER)

Sample Number 5  
Sample Name SW-11  
Sample Matrix Surface Water  
Sample Date 25/10/2019

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result
Other (ORP)				
pH	no unit	0.05	8.5	7.94
Chloride	mg/L	1		64
Mercury (total)	µg/L	0.01	0.2	< 0.01

PACKAGE: PWQO - Phenols (WATER)

Sample Number 5  
Sample Name SW-11  
Sample Matrix Surface Water  
Sample Date 25/10/2019

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result
Phenols				
4AAP-Phenolics	mg/L	0.001	0.001	0.003



EXCEEDANCE SUMMARY

				PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E L1
Parameter	Method	Units	Result	

SW-11

Phosphorous	SM 3030/EPA 200.8	µg/L	0.017	0.01
4AAP-Phenolics	SM 5530B-D	mg/L	0.003	0.001





FINAL REPORT

CA14816-OCT19 R

QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0496-OCT19	mg/L as CaCO3	2	< 2	2	10	105	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0252-OCT19	as N mg/L	0.1	<0.1	0	10	100	90	110	99	75	125



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CA14816-OCT19 R

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0587-OCT19	mg/L	1	<1	6	20	98	80	120	102	75	125
Sulphate	DIO0587-OCT19	mg/L	2	<2	ND	20	98	80	120	105	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0549-OCT19	mg/L	0.03	<0.03	ND	20	102	80	120	111	75	125
Nitrate (as N)	DIO0549-OCT19	mg/L	0.06	<0.06	0	20	102	80	120	105	75	125



QC SUMMARY

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0049-OCT19	mg/L	2	< 2	4	30	89	70	130	128	70	130

Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0509-OCT19	mg/L	8	<8	ND	20	112	80	120	104	75	125

Conductivity

Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0496-OCT19	uS/cm	2	< 2	1	10	99	90	110	NA		



FINAL REPORT

CA14816-OCT19 R

QC SUMMARY

Mercury by CVAAS  
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0031-OCT19	ug/L	0.01	<0.01	ND	20	111	80	120	110	70	130



FINAL REPORT

CA14816-OCT19 R

QC SUMMARY

Metals in aqueous samples - ICP-MS  
Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (total)	EMS0204-OCT19	mg/L	0.0002	<0.0002	5	20	108	90	110	107	70	130
Barium (total)	EMS0204-OCT19	mg/L	0.00002	<0.00002	2	20	99	90	110	73	70	130
Boron (total)	EMS0204-OCT19	mg/L	0.002	<0.002	0	20	94	90	110	NV	70	130
Calcium (total)	EMS0204-OCT19	mg/L	0.01	<0.01	3	20	92	90	110	NV	70	130
Cadmium (total)	EMS0204-OCT19	mg/L	0.000003	<0.000003	ND	20	100	90	110	110	70	130
Chromium (total)	EMS0204-OCT19	mg/L	0.00008	<0.00008	16	20	100	90	110	100	70	130
Copper (total)	EMS0204-OCT19	mg/L	0.0002	<0.0002	ND	20	100	90	110	NV	70	130
Iron (total)	EMS0204-OCT19	mg/L	0.007	<0.007	1	20	94	90	110	NV	70	130
Potassium (total)	EMS0204-OCT19	mg/L	0.009	<0.009	2	20	93	90	110	NV	70	130
Magnesium (total)	EMS0204-OCT19	mg/L	0.001	<0.001	1	20	91	90	110	NV	70	130
Manganese (total)	EMS0204-OCT19	mg/L	0.00001	<0.00001	2	20	108	90	110	NV	70	130
Sodium (total)	EMS0204-OCT19	mg/L	0.01	<0.01	0	20	99	90	110	NV	70	130
Lead (total)	EMS0204-OCT19	mg/L	0.00001	<0.00001	12	20	100	90	110	94	70	130
Phosphorus (total)	EMS0204-OCT19	mg/L	0.003	0.003	2	20	90	90	110	NV	70	130
Zinc (total)	EMS0204-OCT19	mg/L	0.002	<0.002	ND	20	110	90	110	126	70	130



FINAL REPORT

CA14816-OCT19 R

QC SUMMARY

pH  
Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0496-OCT19	no unit	0.05	NA	1		100			NA		

Phenols by SFA  
Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0004-NOV19	mg/L	0.001	<0.001	7	10	109	90	110	107	75	125
4AAP-Phenolics	SKA0282-OCT19	mg/L	0.001	<0.001	8	10	108	90	110	115	75	125

Solids Analysis  
Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0485-OCT19	mg/L	30	<30	1	20	93	90	110	NA		



FINAL REPORT

CA14816-OCT19 R

QC SUMMARY

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0489-OCT19	mg/L	2	< 2	8	10	NV	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0255-OCT19	as N mg/L	0.5	<0.5	ND	10	99	90	110	100	75	125

## QC SUMMARY

---

**Method Blank:** a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

**Duplicate:** Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

**LCS/Spike Blank:** Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

**Matrix Spike:** A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

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**RL:** Reporting limit

**RPD:** Relative percent difference

**AC:** Acceptance criteria

**Multielement Scan Qualifier:** as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

**Duplicate Qualifier:** for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

**Matrix Spike Qualifier:** for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.



## LEGEND

## FOOTNOTES

**NSS** Insufficient sample for analysis.

**RL** Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

**NA** The sample was not analysed for this analyte

**ND** Non Detect

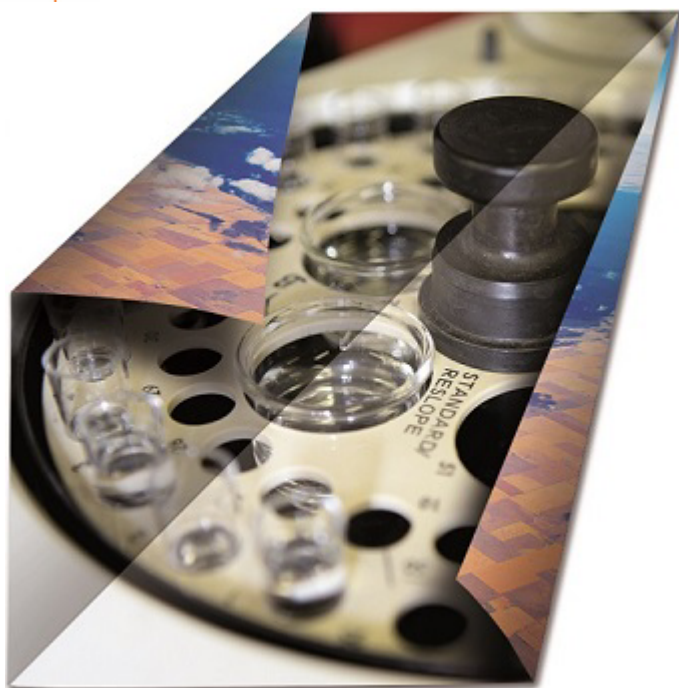
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-- End of Analytical Report --



## FINAL REPORT

CA14815-OCT19 R1

11192447-01, Warsaw Road Landfill

Prepared for

**GHD**

## First Page

### CLIENT DETAILS

Client GHD

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Canada, K9J 6Z8  
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Project 11192447-01, Warsaw Road Landfill

Order Number

Samples Ground Water (7)

### LABORATORY DETAILS

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SGS Reference CA14815-OCT19

Received 10/25/2019

Approved 11/05/2019

Report Number CA14815-OCT19 R1

Date Reported 11/05/2019

### COMMENTS

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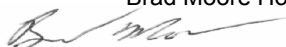




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# FINAL REPORT

CA14815-OCT19 R1

Client: GHD

Project: 11192447-01, Warsaw Road Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: - BTEX (WATER)

Sample Number 10  
Sample Name TW-7  
Sample Matrix Ground Water  
Sample Date 25/10/2019

Parameter	Units	RL	Result
BTEX			
Benzene	ug/L	0.5	< 0.5
Ethylbenzene	ug/L	0.5	< 0.5
Toluene	ug/L	0.5	< 0.5
Xylene (total)	ug/L	0.5	< 0.5
o-xylene	ug/L	0.5	< 0.5
m/p-xylene	ug/L	0.5	< 0.5

PACKAGE: - General Chemistry (WATER)

Sample Number 5 6 7 8 9 10 11  
Sample Name TW-2 TW-3-2 TW-4-2 TW-5-2 TW-6-2 TW-7 TW-8-2  
Sample Matrix Ground Water Ground Water Ground Water Ground Water Ground Water Ground Water Ground Water  
Sample Date 25/10/2019 25/10/2019 25/10/2019 25/10/2019 25/10/2019 25/10/2019 25/10/2019

Parameter	Units	RL	Result	Result	Result	Result	Result	Result	Result
General Chemistry									
Biochemical Oxygen Demand (BOD5)	mg/L	2	< 4 †	< 4 †	< 4 †	< 4 †	< 4 †	< 4 †	< 4 †
Total Suspended Solids	mg/L	2	2	2	< 2	< 2	2	7	2
Alkalinity	mg/L as CaCO3	2	249	382	283	289	360	331	309
Conductivity	uS/cm	2	1160	1040	1060	953	1160	1030	997
Total Dissolved Solids	mg/L	30	871	654	686	529	663	597	566
Chemical Oxygen Demand	mg/L	8	34	30	< 8	< 8	< 8	9	< 8
Total Kjeldahl Nitrogen	as N mg/L	0.5	0.6	0.6	< 0.5	< 0.5	1.2	0.9	< 0.5
Ammonia+Ammonium (N)	as N mg/L	0.1	< 0.1	0.1	< 0.1	< 0.1	1.0	0.8	< 0.1



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Client: GHD

Project: 11192447-01, Warsaw Road Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

## PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	6	7	8	9	10	11
Sample Name	TW-2	TW-3-2	TW-4-2	TW-5-2	TW-6-2	TW-7	TW-8-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019

Parameter	Units	RL	Result	Result	Result	Result	Result	Result	Result
Metals and Inorganics									
Phosphorus (total)	mg/L	0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	0.04	< 0.03
Sulphate	mg/L	2	40	26	8	14	< 2	< 2	13
Nitrite (as N)	as N mg/L	0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N)	as N mg/L	0.06	< 0.06	< 0.06	2.50	0.24	1.14	< 0.06	< 0.06
Arsenic (dissolved)	mg/L	0.0002	0.0005	0.0008	0.0002	< 0.0002	0.0002	0.0009	< 0.0002
Barium (dissolved)	mg/L	0.00002	0.145	0.122	0.0582	0.151	0.145	0.139	0.210
Boron (dissolved)	mg/L	0.002	0.016	0.140	0.014	0.022	0.065	0.099	0.027
Calcium (dissolved)	mg/L	0.01	175	164	152	128	171	145	134
Cadmium (dissolved)	mg/L	0.000003	0.000021	0.000014	0.000337	< 0.000003	0.000016	< 0.000003	< 0.000003
Chromium (dissolved)	mg/L	0.00008	0.00024	0.00035	0.00027	0.00010	0.00012	0.00019	0.00015
Copper (dissolved)	mg/L	0.0002	0.0027	0.0014	0.0005	0.0010	0.0018	0.0003	0.0005
Iron (dissolved)	mg/L	0.007	0.605	1.08	0.011	0.009	0.029	4.13	0.100
Potassium (dissolved)	mg/L	0.009	0.560	6.74	0.687	1.40	8.69	4.63	1.69
Magnesium (dissolved)	mg/L	0.001	8.03	11.5	4.92	8.02	9.89	13.4	11.1
Manganese (dissolved)	mg/L	0.00001	0.0887	0.282	0.00065	0.00248	0.0796	1.27	0.0259
Sodium (dissolved)	mg/L	0.01	68.8	53.4	62.9	64.8	70.5	63.6	62.0
Lead (dissolved)	mg/L	0.00001	0.00005	0.00010	0.00013	< 0.00001	0.00006	0.00005	0.00002
Zinc (dissolved)	mg/L	0.002	0.003	0.004	0.004	< 0.002	0.004	0.002	< 0.002



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Client: GHD

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Project Manager: Gus Bolin

Samplers: Gus Bolin

## PACKAGE: - Other (ORP) (WATER)

Sample Number	5	6	7	8	9	10	11
Sample Name	TW-2	TW-3-2	TW-4-2	TW-5-2	TW-6-2	TW-7	TW-8-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019

Parameter	Units	RL	Result	Result	Result	Result	Result	Result	Result
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### Other (ORP)

pH	no unit	0.05		7.72	7.79	7.89	7.88	7.37	7.81	7.95
Chloride	mg/L	1		210	100	160	130	160	140	140
Mercury (total)	µg/L	0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

## PACKAGE: - Phenols (WATER)

Sample Number	5	6	7	8	9	10	11
Sample Name	TW-2	TW-3-2	TW-4-2	TW-5-2	TW-6-2	TW-7	TW-8-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019	25/10/2019

Parameter	Units	RL	Result	Result	Result	Result	Result	Result	Result
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### Phenols

4AAP-Phenolics	mg/L	0.001		0.005	< 0.001	0.002	< 0.001	< 0.001	0.004	< 0.001
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## PACKAGE: - THMs (VOC) (WATER)

Sample Number	10
Sample Name	TW-7
Sample Matrix	Ground Water
Sample Date	25/10/2019

Parameter	Units	RL	Result
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### THMs (VOC)

Bromodichloromethane	µg/L	0.5	< 0.5
Bromoform	µg/L	0.5	< 0.5
Dibromochloromethane	µg/L	0.5	< 0.5



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Client: GHD

Project: 11192447-01, Warsaw Road Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: - VOCs (WATER)

Sample Number 10  
Sample Name TW-7  
Sample Matrix Ground Water  
Sample Date 25/10/2019

Parameter	Units	RL	Result
VOCs			
Bromomethane	µg/L	0.5	< 0.5
Carbon tetrachloride	µg/L	0.2	< 0.2
Chloroethane	µg/L	5.0	< 5
Chloroform	µg/L	0.5	< 0.5
Chloromethane	µg/L	5.0	< 5
1,2-Dichlorobenzene	µg/L	0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	< 0.5
1,1-Dichloroethane	µg/L	0.5	< 0.5
1,2-Dichloroethane	µg/L	0.5	< 0.5
1,1-Dichloroethylene	µg/L	0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	< 0.5
trans-1,2-Dichloroethene	µg/L	0.5	< 0.5
cis-1,2-Dichloroethene	µg/L	0.5	< 0.5
cis-1,3-Dichloropropene	µg/L	0.5	< 0.5
trans-1,3-Dichloropropene	µg/L	0.5	< 0.5
Ethylenedibromide	µg/L	0.2	< 0.2
Dichloromethane	µg/L	0.5	< 0.5
Monochlorobenzene	µg/L	0.5	< 0.5
Styrene	µg/L	0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	< 0.5
Tetrachloroethene	µg/L	0.5	< 0.5
Trichloroethylene	µg/L	0.5	< 0.5





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Client: GHD

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Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: - VOCs (WATER)

Sample Number 10  
Sample Name TW-7  
Sample Matrix Ground Water  
Sample Date 25/10/2019

Parameter	Units	RL	Result
VOCs (continued)			
Vinyl Chloride	µg/L	0.2	< 0.2
Trichlorofluoromethane	µg/L	5.0	< 5
1,1,1-Trichloroethane	µg/L	0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	< 0.5



QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0483-OCT19	mg/L as CaCO3	2	< 2	1	10	100	80	120	NA		
Alkalinity	EWL0486-OCT19	mg/L as CaCO3	2	< 2	2	10	102	80	120	NA		
Alkalinity	EWL0496-OCT19	mg/L as CaCO3	2	< 2	2	10	105	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0252-OCT19	as N mg/L	0.1	<0.1	0	10	100	90	110	99	75	125



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QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0587-OCT19	mg/L	1	<1	6	20	98	80	120	102	75	125
Sulphate	DIO0587-OCT19	mg/L	2	<2	ND	20	98	80	120	105	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0555-OCT19	mg/L	0.03	<0.03	ND	20	95	80	120	91	75	125
Nitrate (as N)	DIO0555-OCT19	mg/L	0.06	<0.06	1	20	99	80	120	107	75	125



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QC SUMMARY

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0049-OCT19	mg/L	2	< 2	4	30	89	70	130	128	70	130

Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0508-OCT19	mg/L	8	<8	ND	20	98	80	120	98	75	125
Chemical Oxygen Demand	EWL0509-OCT19	mg/L	8	<8	ND	20	112	80	120	104	75	125
Chemical Oxygen Demand	EWL0528-OCT19	mg/L	8	<8	5	20	110	80	120	108	75	125



QC SUMMARY

Conductivity  
Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0483-OCT19	uS/cm	2	4	2	10	100	90	110	NA		
Conductivity	EWL0486-OCT19	uS/cm	2	3	1	10	99	90	110	NA		
Conductivity	EWL0496-OCT19	uS/cm	2	< 2	1	10	99	90	110	NA		

Mercury by CVAAS  
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0031-OCT19	ug/L	0.01	<0.01	ND	20	111	80	120	110	70	130



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## QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (dissolved)	EMS0194-OCT19	mg/L	0.0002	<0.0002	ND	20	100	90	110	95	70	130
Barium (dissolved)	EMS0194-OCT19	mg/L	0.00002	<0.00002	5	20	99	90	110	72	70	130
Boron (dissolved)	EMS0194-OCT19	mg/L	0.002	<0.002	ND	20	96	90	110	NV	70	130
Calcium (dissolved)	EMS0194-OCT19	mg/L	0.01	<0.01	2	20	96	90	110	113	70	130
Cadmium (dissolved)	EMS0194-OCT19	mg/L	0.000003	<0.000003	ND	20	100	90	110	91	70	130
Chromium (dissolved)	EMS0194-OCT19	mg/L	0.00008	<0.00008	9	20	103	90	110	NV	70	130
Copper (dissolved)	EMS0194-OCT19	mg/L	0.0002	<0.0002	2	20	99	90	110	98	70	130
Iron (dissolved)	EMS0194-OCT19	mg/L	0.007	<0.007	2	20	97	90	110	NV	70	130
Potassium (dissolved)	EMS0194-OCT19	mg/L	0.009	<0.009	0	20	97	90	110	106	70	130
Magnesium (dissolved)	EMS0194-OCT19	mg/L	0.001	<0.001	2	20	102	90	110	78	70	130
Manganese (dissolved)	EMS0194-OCT19	mg/L	0.00001	<0.00001	4	20	98	90	110	94	70	130
Sodium (dissolved)	EMS0194-OCT19	mg/L	0.01	<0.01	0	20	107	90	110	NV	70	130
Lead (dissolved)	EMS0194-OCT19	mg/L	0.00001	<0.00001	ND	20	98	90	110	106	70	130
Zinc (dissolved)	EMS0194-OCT19	mg/L	0.002	<0.002	ND	20	105	90	110	118	70	130
Manganese (dissolved)	EMS0217-OCT19	mg/L	0.00001	<0.00001	ND	20	101	90	110	NV	70	130



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QC SUMMARY

pH  
Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0483-OCT19	no unit	0.05	NA	1		100			NA		
pH	EWL0486-OCT19	no unit	0.05	NA	1		100			NA		
pH	EWL0496-OCT19	no unit	0.05	NA	1		100			NA		

Phenols by SFA  
Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0014-NOV19	mg/L	0.001	<0.001	NV	10	102	90	110	87	75	125
4AAP-Phenolics	SKA0029-NOV19	mg/L	0.001	<0.001	ND	10	107	90	110	107	75	125
4AAP-Phenolics	SKA0282-OCT19	mg/L	0.001	<0.001	8	10	108	90	110	115	75	125



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QC SUMMARY

Phosphorus by SFA  
Method: SM 4500-P J | Internal ref.: ME-CA-IENVISFA-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Phosphorus (total)	SKA0250-OCT19	mg/L	0.03	<0.03	3	10	97	90	110	100	75	125

Solids Analysis  
Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0485-OCT19	mg/L	30	<30	1	20	93	90	110	NA		

Suspended Solids  
Method: SM 2540D | Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0489-OCT19	mg/L	2	< 2	8	10	NV	90	110	NA		
Total Suspended Solids	EWL0491-OCT19	mg/L	2	< 2	0	10	NV	90	110	NA		





QC SUMMARY

Total Nitrogen  
Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0255-OCT19	as N mg/L	0.5	<0.5	ND	10	99	90	110	100	75	125



# FINAL REPORT

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## QC SUMMARY

### Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-1ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,1,2-Tetrachloroethane	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	103	60	130	101	50	140
1,1,1-Trichloroethane	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	98	60	130	98	50	140
1,1,2,2-Tetrachloroethane	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	95	60	130	103	50	140
1,1,2-Trichloroethane	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	101	60	130	99	50	140
1,1-Dichloroethane	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	95	60	130	97	50	140
1,1-Dichloroethylene	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	98	60	130	101	50	140
1,2-Dichlorobenzene	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	103	60	130	100	50	140
1,2-Dichloroethane	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	100	60	130	99	50	140
1,2-Dichloropropane	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	102	60	130	104	50	140
1,3-Dichlorobenzene	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	103	60	130	100	50	140
1,4-Dichlorobenzene	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	102	60	130	100	50	140
Benzene	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	101	60	130	102	50	140
Bromodichloromethane	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	102	60	130	102	50	140
Bromoform	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	104	60	130	98	50	140
Bromomethane	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	101	50	140	102	50	140
Carbon tetrachloride	GCM0461-OCT19	ug/L	0.2	<0.2	ND	30	102	60	130	102	50	140
Chloroethane	GCM0461-OCT19	ug/L	5.0	<5	ND	30	67	60	130	99	50	140
Chloroform	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	102	60	130	102	50	140
Chloromethane	GCM0461-OCT19	ug/L	5.0	<5	ND	30	104	60	130	109	50	140
cis-1,2-Dichloroethene	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	102	60	130	103	50	140



# FINAL REPORT

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## QC SUMMARY

Volatile Organics (continued)

Method: EPA 5030B/8260C | Internal ref.: ME-CA-ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
cis-1,3-Dichloropropene	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	102	60	130	100	50	140
Dibromochloromethane	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	102	60	130	100	50	140
Dichloromethane	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	99	60	130	103	50	140
Ethylbenzene	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	103	60	130	104	50	140
Ethylenedibromide	GCM0461-OCT19	ug/L	0.2	<0.2	ND	30	103	60	130	100	50	140
m/p-xylene	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	104	60	130	102	50	140
Monochlorobenzene	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	103	60	130	102	50	140
o-xylene	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	103	60	130	101	50	140
Styrene	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	104	60	130	103	50	140
Tetrachloroethene	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	103	60	130	100	50	140
Toluene	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	102	60	130	103	50	140
trans-1,2-Dichloroethene	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	96	60	130	99	50	140
trans-1,3-Dichloropropene	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	103	60	130	96	50	140
Trichloroethylene	GCM0461-OCT19	ug/L	0.5	<0.5	ND	30	108	60	130	98	50	140
Trichlorofluoromethane	GCM0461-OCT19	ug/L	5.0	<5	ND	30	116	50	140	117	50	140
Vinyl Chloride	GCM0461-OCT19	ug/L	0.2	<0.2	ND	30	100	60	130	105	50	140

## QC SUMMARY

---

**Method Blank:** a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

**Duplicate:** Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

**LCS/Spike Blank:** Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

**Matrix Spike:** A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

**Reference Material:** a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

**RL:** Reporting limit

**RPD:** Relative percent difference

**AC:** Acceptance criteria

**Multielement Scan Qualifier:** as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

**Duplicate Qualifier:** for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

**Matrix Spike Qualifier:** for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

## LEGEND

## FOOTNOTES

**NSS** Insufficient sample for analysis.

**RL** Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

**NA** The sample was not analysed for this analyte

**ND** Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated. This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at [http://www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm). The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

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-- End of Analytical Report --

## **Appendix F**

# **MOECC Monitoring and Screening Checklist**

## Appendix D-Monitoring and Screening Checklist

### General Information and Instructions

**General Information: The checklist is to be completed, and submitted with the Monitoring Report.**

**Instructions:** A complete checklist consists of:

- (a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.
- (b) completed contact information for the Competent Environmental Practitioner (CEP)
- (c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

**Definition of Groundwater CEP:**

For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:

- (a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or
- (b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..

**Definition of Surface water CEP:**

A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

<b>Monitoring Report and Site Information</b>	
<b>Waste Disposal Site Name</b>	Warsaw Road Landfill Site
<b>Location (e.g. street address, lot, concession)</b>	Part Lot 8, Concession 5, Township of Douro-Dummer (Douro), County of Peterborough
<b>GPS Location (taken within the property boundary at front gate/ front entry)</b>	17 781275E 445174N
<b>Municipality</b>	Township of Douro-Dummer
<b>Client and/or Site Owner</b>	Corporation of the Township of Douro-Dummer
<b>Monitoring Period (Year)</b>	2019
This Monitoring Report is being submitted under the following:	
<b>Environmental Compliance Approval Number:</b>	Provisional Certificate of Approval A341004
<b>Director's Order No.:</b>	N/A
<b>Provincial Officer's Order No.:</b>	N/A
<b>Other:</b>	N/A

<b>Report Submission Frequency</b>	<input checked="" type="radio"/> Annual <input type="radio"/> Other	Specify (Type Here):	
<b>The site is:</b> (Operation Status)	<input type="radio"/> Open <input type="radio"/> Inactive <input checked="" type="radio"/> Closed		
<b>Does your Site have a Total Approved Capacity?</b>	<input type="radio"/> Yes <input checked="" type="radio"/> No		
<b>If yes, please specify Total Approved Capacity</b>		Units	
<b>Does your Site have a Maximum Approved Fill Rate?</b>	<input type="radio"/> Yes <input checked="" type="radio"/> No		
<b>If yes, please specify Maximum Approved Fill Rate</b>		Units	
<b>Total Waste Received within Monitoring Period (Year)</b>		Units	
<b>Total Waste Received within Monitoring Period (Year)</b> <i>Methodology</i>			
<b>Estimated Remaining Capacity</b>		Units	
<b>Estimated Remaining Capacity</b> <i>Methodology</i>			
<b>Estimated Remaining Capacity</b> <i>Date Last Determined</i>	Select Date		
<b>Non-Hazardous Approved Waste Types</b>	<input type="checkbox"/> Domestic <input type="checkbox"/> Industrial, Commercial & Institutional (IC&I) <input type="checkbox"/> Source Separated Organics (Green Bin) <input type="checkbox"/> Tires	<input type="checkbox"/> Contaminated Soil <input type="checkbox"/> Wood Waste <input type="checkbox"/> Blue Box Material <input type="checkbox"/> Processed Organics <input type="checkbox"/> Leaf and Yard Waste	<input type="checkbox"/> Food Processing/Preparation Operations Waste <input type="checkbox"/> Hauled Sewage Other: <input type="text"/> Provide any other approved waste types not listed here
<b>Subject Waste Approved Waste Classes: Hazardous &amp; Liquid Industrial</b> (separate waste classes by comma)			
<b>Year Site Opened</b> (enter the Calendar Year <u>only</u> )		<b>Current ECA Issue Date</b>	17/09/1980
<b>Is your Site required to submit Financial Assurance?</b>	<input type="radio"/> Yes <input checked="" type="radio"/> No		
<b>Describe how your Landfill is designed.</b>	<input checked="" type="radio"/> Natural Attenuation only <input type="radio"/> Fully engineered Facility <input type="radio"/> Partially engineered Facility		
<b>Does your Site have an approved Contaminant Attenuation Zone?</b>	<input type="radio"/> Yes <input checked="" type="radio"/> No		



<b>If closed, specify C of A, control or authorizing document closure date:</b>	22-May-96
<b>Has the nature of the operations at the site changed during this monitoring period?</b>	<input type="radio"/> Yes <input checked="" type="radio"/> No
<b>If yes, provide details:</b>	Type Here
<b>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)</b>	<input type="radio"/> Yes <input checked="" type="radio"/> 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

Type Here

Type Here

Select Date

Type Here

Type Here

Select Date

Type Here

Type Here

Select Date

Type Here

Type Here

Select Date

3) a) Is landfill gas being monitored or controlled at the site?		<input checked="" type="radio"/> Yes <input type="radio"/> 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?		<input type="radio"/> Yes <input checked="" type="radio"/> 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:		<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> 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
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select 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):		<input checked="" type="radio"/> Yes <input type="radio"/> No If no, specify (Type Here):

## Sampling and Monitoring Program Results/WDS Conditions and Assessment:

<p>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.</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p>If no, the potential design and operational concerns/exceptions are as follows (Type Here):</p>	
<p>6) The site meets compliance and assessment criteria.</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p>If no, list and explain exceptions (Type Here):</p>	
<p>7) The site continues to perform as anticipated. There have been no unusual trends/changes in measured leachate and groundwater levels or concentrations.</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p>If no, list exceptions and explain reason for increase/change (Type Here):</p>	
<p>1) Is one or more of the following risk reduction practices in place at the site:</p> <p>(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</p> <p>(b) There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or</p> <p>(c) The site meets the following two conditions (typically achieved after 15 years or longer of site operation):</p> <p style="margin-left: 20px;">i. The site has developed stable leachate mound(s) and stable leachate plume geometry/concentrations; and</p> <p style="margin-left: 20px;">ii. Seasonal and annual water levels and water quality fluctuations are well understood.</p>	<p><input checked="" type="radio"/> Yes <input type="radio"/> No</p>	<p>Note which practice(s):</p>	<p><input type="checkbox"/> (a)</p> <p><input type="checkbox"/> (b)</p> <p><input checked="" type="checkbox"/> (c)</p>
<p>9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</p>	<p><input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Not Applicable</p>	<p>If yes, list value(s) that are/have been exceeded and follow-up action taken (Type Here):</p>	

## 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:

1-Mar-19

## Recommendations:

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

<p><input checked="" type="radio"/> No changes to the monitoring program are recommended</p> <p><input type="radio"/> The following change(s) to the monitoring program is/are recommended:</p>	
<p><input checked="" type="radio"/> No Changes to site design and operation are recommended</p> <p><input type="radio"/> The following change(s) to the site design and operation is/are recommended:</p>	Type Here

<b>Name:</b>	Nyle McIlveen, P.Eng.		
<b>Seal:</b>	Add Image 		
<b>Signature:</b>		<b>Date:</b>	22-Mar-20
<b>CEP Contact Information:</b>	Nyle McIlveen, P./Eng.		
<b>Company:</b>	GHD		
<b>Address:</b>	347 Pido Road, Unit 29, Peterborough, Ontario K9J 6X7		
<b>Telephone No.:</b>	(705) 749-3317	<b>Fax No. :</b>	(705) 749-9248
<b>E-mail Address:</b>	nyle.mcilveen@ghd.com		
<b>Co-signers for additional expertise provided:</b>			
<b>Signature:</b>		<b>Date:</b>	
<b>Signature:</b>		<b>Date:</b>	Select 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)	Dummer Lake
Distance(s)	2.5 Km

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:	<input checked="" type="radio"/> Yes <input type="radio"/> No	If no, identify issues (Type Here):
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):	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> 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
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date

<b>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.</b>		<input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Not Applicable
<b>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:</b>		<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Applicable If no, specify below or provide details in an attachment.
<b>Surface Water Sampling Location</b>	<b>Description/Explanation for change (change in name or location, additions, deletions)</b>	<b>Date</b>
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
<b>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):</b>	<input checked="" type="radio"/> Yes <input type="radio"/> No	If no, specify (Type Here):



## Sampling and Monitoring Program Results/WDS Conditions and Assessment:

<b>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):</b>	<input checked="" type="radio"/> <b>Yes</b> <input type="radio"/> <b>No</b>
--	--

**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
Type Here	Type Here	Type Here
Type Here	Type Here	Type Here
Type Here	Type Here	Type Here
Type Here	Type Here	Type Here
Type Here	Type Here	Type Here
<b>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)?</b>	<input type="radio"/> <b>Yes</b> <input type="radio"/> <b>No</b>	If yes, specify (Type Here)

<p>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.</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>If no, list parameters and stations that is outside the expected range. Identify whether parameter concentrations show an increasing trend or are within a high historical range (Type Here)</p>
<p>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)):</p>	<p><input type="radio"/> Yes</p> <p><input checked="" type="radio"/> No</p> <p><input type="radio"/> Not Known</p> <p><input type="radio"/> Not Applicable</p>	
<p>9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</p>	<p><input type="radio"/> Yes</p> <p><input checked="" type="radio"/> No</p> <p><input type="radio"/> Not Applicable</p>	<p>If yes, list value(s) that are/have been exceeded and follow-up action taken (Type Here)</p>

## 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


Type Here

☐ The following change(s) to the monitoring program is/are recommended:

☒ No changes to the site design and operation are recommended

Type Here

☐ The following change(s) to the site design and operation is/are recommended:

<b>CEP Signature</b>		
<b>Relevant Discipline</b>	Civil engineering, hydrogeology	
<b>Date:</b>	22-Mar-20	
<b>CEP Contact Information:</b>	Nyle McIlveen, P.Eng.	
<b>Company:</b>	GHD	
<b>Address:</b>	347 Pido Road, Unit 29, Peterborough, Ontario K9J 6X7	
<b>Telephone No.:</b>	(705) 749-3317	
<b>Fax No. :</b>	(705) 749-9248	
<b>E-mail Address:</b>	nyle.mcilveen@ghd.com	
<b>Save As</b>		<b>Print Form</b>



# 2019 Groundwater Monitoring Report

Stoney Lake Road Transfer Station

Township of Douro-Dummer

(PC of A No. A340901)

County of Peterborough

**GHD** | 347 Pido Road Unit 29 Peterborough Ontario K9J 6X7 Canada  
11193449 | 01 | Report No. 1 | January 15, 2019



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## 1. Introduction

This report presents the results of the 2019 groundwater-monitoring program completed for the Stoney Lake Road Transfer Station in the Township of Douro-Dummer (formerly Township of Douro) in the County of Peterborough. The monitoring program was conducted in accordance with the scope of work as presented by our proposal dated January 15, 2009 as well as additional requirements outlined in the Ministry of the Environment, Conservation and Parks (MECP) review of AECOM Canada Ltd. "Stoney Lake Road Transfer Station, 2008 Annual Monitoring Report" and July 30, 2017 Memorandum.

## 2. Background

The Stoney Lake Road Transfer Station is situated along the north side of Stoney Lake Road (also known as County Road 6) 2.5km east of Highway 28. The Geologic Plan, Plate 1, illustrates the location of the landfill with respect to nearby roads and watercourses. The property is described as a 1.6 hectare (ha) refuse footprint situated within a 4.25 ha property in part of Lot 21, Concession 4 in the Township of Douro-Dummer.

The site is licensed under Amended Provisional Certificate of Approval (PC of A) No. A340901, issued in 2004, to receive municipal and solid waste, including large metal, brush, wood, tires, industrial, commercial and institutional waste, construction and demolition wastes. The site currently functions as a transfer station (Amended C of A 2007) and MECP Amendment dated March 5, 2013. A copy of the PC of A and its amendments is presented in Appendix A.

A MECP Memorandum dated July 30, 2015 provides commentary on the groundwater aspects of the 2013 monitoring program. Background data pertaining to the site was compiled prior to the commencement of the monitoring program in 2016. MECP comments were considered during the implementation of the 2019 sampling circuit.

Four (4) additional monitoring wells and two (2) landfill gas monitors (gas probes) were installed at the former landfill site in December 2014. Two (2) of the groundwater monitors replaced the background monitors while the two others were installed down gradient of the landfill in order to provide additional data. Well records for the monitors are included in Appendix B. The gas probes were advanced into the existing refuse. As indicated on the Well Records, a 0.3m thick clay layer was penetrated directly above the refuse that is interpreted to represent the cover material used for closure of the landfill.

Background data pertaining to the site was obtained from the AECOM Canada Ltd. (AECOM) 2008 report and the 2009 through to 2018 Geo-Logic Inc./GHD Reports. In general, the background data consisted of documents listed below:

1. Current PC of As issued by the MECP (Appendix A).





2. Excerpts from a report prepared by AECOM regarding details of the monitoring well construction and borehole records (Appendix B).
3. Monitoring program and sampling protocol established for the landfill site by the MECP Amended C of A No. A240901 dated September 24, 2003.
4. Reports prepared by AECOM dated 2007 and 2008 presenting the results of previous monitoring programs and Geo-Logic Inc./GHD 2009 through to 2018 reports.
5. MECP Memorandum by Mr. Greg Faaren, P.Geo. dated July 30, 2017.

## 3. Site Conditions

### 3.1 General Geology

The site is situated in an area within the physiographic region known as the Peterborough Drumlin Field (Chapman and Putnam, 1984). This region is characterized by northeast-to-southwest trending drumlin features. Bedrock underlying the site consists of limestone, with the minor shale of the Middle Ordovician Trenton-Black River Group.

Surface drainage at the site is southeast to towards the Galeburg Wetland. A minor tributary flows from the wetland into Sawers Creek, which eventually outlets into the Otonabee River.

### 3.2 Monitoring Program

#### 3.2.1 Groundwater

In the past, sixteen (16) monitoring wells were utilized within the well monitoring program. Monitors TW-2-1, TW-2-2, TW-3-1, TW-3-2, TW-4-1, TW-4-2, TW-5-1 and TW-5-2 were installed within and adjacent to the refuse perimeter. Monitors TW-6-1, TW-6-2, TW-7-1 and TW-7-2, were installed near the down-gradient property boundary. Monitors TW-9-1 and TW-9-2 were installed south of Stoney Lake Road. Monitors TW-8-1 and TW-8-2 were installed up-gradient of the refuse footprint to serve as background monitors. Deeper bedrock monitors are designated as “-1” while shallower monitors are designated as “-2”.

In late 2014, two new wells were installed to replace the background monitors, TW-8-1 (previously abandoned) and TW-8-2 (always dry). The new wells are identified as TW-8-1 (2014) and TW-8-2 (2014). Two new shallow down-gradient monitoring wells were installed east of the landfill. These monitors are identified as TW-10-2 and TW-11-2. The shallow monitors were completed at or near the bedrock/overburden interface.

In the past wells within the landfill are analyzed for the indicator list of Landfill Standards Guidelines (Schedule 5 Column 2) while the down-gradient wells were analyzed for the comprehensive list (Schedule 5 Column 1). The 2014 MECP memorandum indicated that all shallow wells should be analyzed for the parameters of Schedule 5 Column 3, the Comprehensive list for Surface water.



Monitoring wells TW-3-2 and TW-4-2 were reported dry in past monitoring programs and were confirmed dry in the 2019 monitoring circuits. Monitors TW-3-1 and 10-2 had too little water to sample in the fall monitoring program. Background monitor TW 8-2 was dry during 2019 fall circuit. It had been dry for the previous 2 years. Should it continue to be dry in 2020, it is recommended that a new overburden background monitor be established.

There are no residential wells included in the monitoring program. Installation information and construction particulars for the monitoring wells are presented in Appendix B. The locations of the monitors are depicted on the Plot Plan, Plate 3C.

### 3.2.2 Surface Water

The surface water monitoring component of the annual monitoring program uses four (4) stations. SW 3 is located near the southwest corner of the property and is considered a receiving area for a portion of the surface water runoff. SW 6 is located along the east side adjacent to TW6. SW 1 is located at the wetland culvert approximately 300m east along Stoney Lake Road. This station is considered to be the trigger sampling point to monitor the impact of the surface water flowing down-gradient and away from the landfill property. The MECP has acknowledged that SW-1 will comprise the primary downstream trigger location. SW 8 is located in the wetland area 200m north of Stoney Lake Road and approximately 0.5km to the east of the landfill. This location is considered to be the background surface water station. The surface water locations are depicted on the Plot Plan, Plate 3C.

### 3.2.3 Landfill Gas

The landfill gas monitoring network of groundwater monitors listed in section 3.2.1 (twice per year). The location of the groundwater monitors are depicted on the Plot Plan, Plate 3C. Two new landfill gas monitors were installed in December 2014. In addition, measurements of gas were conducted within the on-site buildings. The measurements did not yield any detectable concentrations within any of the buildings. The results of the gas monitoring are summarized in section 5.6.

## 3.3 Pattern of Groundwater Movement

Groundwater level monitoring was conducted during the two sampling circuits in 2019. The water level data was acquired on May 29 and October 28. The measurements are presented on Plate 5 and summarized in Tables 3.1 and 3.2. Elevation data in the past was obtained from the AECOM 2007 monitoring report. After the installation of the new monitoring wells, Ontario Land Surveyors J.B. Fleguel Surveyors from Lakefield, Ontario was retained to establish new elevations for all wells. The results of the survey work are summarized on the Plot Plan, Plate 3A. The historical water levels have been updated to reflect the new elevations.

The shallow overburden groundwater monitoring data for 2019 is presented on Table 3.1. The direction of groundwater flow follows the general topography of the ground surface as illustrated on the Plot Plan, Plate 3D. Water levels are within the range reported in previous monitoring programs. Historical data from AECOM (2007-2008) are included in the report in Appendix D.



Table 3.1 2019 Water Level Summary (Shallow Monitors)

MONITOR NO.	ELEVATION TOP OF CASING*	MONITOR WATER LEVEL ELEVATION (masl)	
		May 29, 2019	October 28, 2019
TW-2-2	245.16	241.80	240.24
TW-5-2	241.40	238.53	237.66
TW-6-2	240.35	238.39	237.59
TW-7-2	239.86	237.76	237.59
TW-8-2 (2014)	245.34	242.90	Dry
TW-9-2	238.70	237.39	237.19
TW-10-2	241.20	239.04	237.80
TW-11-2	242.09	238.19	237.04

Notes: All measurements are presented in metres. Monitor top of casing elevations provided by J.B. Fleguel Land Surveyors 2014.

The bedrock groundwater monitoring data for 2019 is presented on Table 3.2. Based on the data, the pattern of bedrock groundwater movement appears to be in a southerly direction following the general topography of the land surface as illustrated on the Plot Plan, Plate 3E. Historical data from AECOM Canada Ltd. (2007-2008) are included in Appendix D.

Table 3.2 2019 Water Level Summary (Bedrock Monitors)

MONITOR NO.	ELEVATION TOP OF CASING*	MONITOR WATER LEVEL ELEVATION (masl)	
		May 29, 2019	October 28, 2019
TW 2-1	245.05	239.61	238.02
TW 3-1	244.84	239.76	237.03
TW 4-1	245.74	238.94	237.74
TW 5-1	241.40	238.42	237.71
TW 6-1	240.57	238.44	237.59
TW 7-1	245.37	238.35	237.69
TW 8-1(2014)	239.66	---	237.63
TW 9-1	238.53	238.38	237.75

Notes: All measurements are presented in metres. \*Monitor top of casing elevations provided by J.B. Fleguel Land Surveyors.



### 3.4 Horizontal Hydraulic Gradient

Horizontal hydraulic gradient is the slope of the water table or potentiometric surface. It is the change in hydraulic head over the change in distance between the two monitoring wells or  $dh/dl$ . In mathematical terms, horizontal gradient is rise over run:

$$\begin{aligned} dh/dl &= \text{difference in head} / \text{horizontal distance between wells} \\ &= (h_2 - h_1) / L. \end{aligned}$$

All well locations were recorded using a handheld "Garmin" GPS unit and plotted on the Plot Plan, Plate 3C. The distances between the wells were measured using MNR Property Maps distance calibrator. Water level elevation was obtained from Table 3.1.

Three gradients for the June and October 2019 data sets were calculated for the shallow overburden wells. The average horizontal gradient for the shallow wells was 18.2 m/km in the May and 10.8 m/km in the October. The horizontal gradient for the deeper overburden wells was 4.8 m/km in May and 1.4 m/km in October of 2019. The results are summarized in Table 3.3.

Table 3.3 Hydraulic Gradient Monitoring Wells

Monitoring Wells	June / November	Groundwater Elevation (m)	Distance Between Wells (km)	Hydraulic Gradient (m/km)
<b>Shallow Aquifer</b>				
TW-2-2	May	242.80	0.199	22.2
TW-6-2		238.39		
TW-2-2	May	242.80	0.237	18.0
TW-5-2		238.53		
TW-2-2	May	242.80	0.371	14.6
TW-9-2		237.39		
Average-Shallow				18.2
<b>Deeper Aquifer</b>				
TW-2-1	May	239.64	0.199	6.0
TW-6-1		238.44		
TW-2-1	May	239.64	0.237	5.1
TW-5-1		238.42		
TW-2-1	May	239.64	0.371	3.4
TW-9-1		238.38		
Average - Deep				4.8
<b>Shallow Aquifer</b>				
TW-2-2	October	240.24	0.199	13.3
TW-6-2		237.59		
TW-2-2	October	240.24	0.237	10.9
TW-5-2		237.66		
TW-2-2	October	240.24	0.371	8.2



Table 3.3 Hydraulic Gradient Monitoring Wells

Monitoring Wells	June / November	Groundwater Elevation (m)	Distance Between Wells (km)	Hydraulic Gradient (m/km)
TW-9-2		237.19		
Average-Shallow				10.8
<b>Deeper Aquifer</b>				
TW-2-1	October	238.02	0.199	2.2
TW-6-1		237.59		
TW-2-1	October	238.02	0.237	1.3
TW-5-1		237.71		
TW-2-1	October	238.02	0.371	0.7
TW-9-1		237.75		
Average Deeper				1.4

## 4. Sampling/Monitoring Program

GHD followed the established sampling and monitoring protocol for the Stoney Lake Road Transfer Station. Details of this protocol are summarized in Appendix C. An overview of the protocol is presented as follows:

1. Fieldwork was carried out at ten (10) monitoring stations during the spring and fall season.
2. Four (4) surface water stations were sampled during the spring monitoring circuit. Two stations were monitored in September. The other stations were dry. Two (2) station were sampled in October. The other stations were dry.
3. Methane and hydrogen sulphide gas generation was measured at each well using a 4 gas meter during sampling periods as well as the two newly installed monitoring stations and the on-site buildings.
4. Water levels were recorded for each monitor prior to well purging.
5. Three to five measured casing volumes were then removed from each monitor in order to ensure that representative groundwater samples were obtained.
6. In-situ chemical analyses were carried out during the purging operation in order to determine a stabilized water quality condition. The in-situ testing included temperature, conductivity, and pH.
7. After the purging operation, representative samples of groundwater were collected in proper containers with appropriate preservatives where needed.
8. The water samples were then delivered to SGS Laboratories for detailed chemical testing.



## 5. Water Quality Data

### 5.1 General

Representative groundwater samples from each of the monitors were subjected to chemical testing for specified parameters. The bedrock monitoring wells located within the former landfill area were tested for the indicator list of parameters listed in Schedule 5 Column 2 of the Landfill Standards Guidelines. The remaining bedrock monitoring wells were tested for the comprehensive list of parameters listed in Schedule 5 Column 1 of the Landfill Standards Guidelines. All shallow wells (-2 wells) were analyzed for the parameters of Schedule 5 Column 3 (comprehensive surface water list) of the Landfill Standards Guidelines.

In addition, samples from TW-2-2 and TW-6-2 were analyzed for volatile organic compounds (VOCs).

The surface water stations were analyzed for the parameters listed in Column 3 of Schedule 5 of the Landfill Standards Guideline (Comprehensive List for Surface Water).

### 5.2 Groundwater Monitors

The sampled monitors are categorized as: up-gradient shallow background monitor TW-8-2(2014) and background bedrock monitor TW-8-1 (2014); landfill monitors (TW-2, TW-3 and TW-4); and down-gradient monitors (TW-5, TW-6, TW-7, TW-9, TW-10 and TW-11). Monitors TW-5, TW-6, and TW-11 are directly adjacent to the refuse area. As in past years, monitors in the refuse area or directly adjacent to it reported the majority of values with exceedances compared to the Ontario Drinking Water Standards (ODWS) with the exception of TW-2-1 which met all parameters during both circuits. Down-gradient monitoring wells TW-7-1, TW-9-1 and 9-2 yielded samples that met the ODWS criteria for both circuits.

Parameters that reported values above the ODWS in one or both sampling circuits included Iron Alkalinity, Total Dissolved Solids (TDS), Sulphate, Ammonia, Manganese, Boron, Chloride and Dissolved Organic Carbon (DOC). In general, these results are similar in concentration than from past monitoring programs. Future monitoring programs should continue to monitor these parameters to evaluate the potential for environmental concern.

Down-gradient shallow and deep wells were also compared to Provincial Water Quality Objectives (PWQO). The exceedance were similar to the parameters previously listed as exceeding the ODWS. Future monitoring programs should continue to monitor these parameters to evaluate the potential for environmental concern. The chemical results from the monitoring wells where samples were obtained have been summarized in Table 5.1 - 5.4. The data is presented with the ODWS for comparison purposes. The certificates of analysis are included in Appendix E. chemical comparison graphs are presented in Appendix D.



Table 5.1 May, 2019 Groundwater Quality Summary – Shallow Wells

PARAMETERS	Stony Lake Road Landfill Site Monitors								ODWS	PWQO
	TW 2-2	TW 5-2	TW 6-2	TW 7-2	TW 9-2	TW 10-2	TW 11-2	Background TW 8-2 2018		
<b>May 29, 2019</b>										
BOD	< 4	< 4	< 4	< 4	4	< 4	< 4	< 4	---	---
TSS	32	86	7	224	2210	355	437	35	---	---
Alkalinity	398	322	276	382	340	628	303	229	30-500	---
pH	7.47	7.33	8.04	7.07	7.96	7.49	7.50	8.18	6.5-8.5	6.5-8.5
Conductivity	882	2070	572	2140	448	1170	516	422	---	---
TDS	251	1900	489	1590	274	606	311	234	500	---
COD	< 8	16	< 8	11	< 8	35	< 8	< 8	---	---
Phosphorus	< 0.03	0.03	< 0.03	0.22	0.73	0.13	0.36	< 0.03	---	---
TKN	< 0.5	< 0.5	0.6	< 0.5	< 0.5	26.7	0.6	< 0.5	---	---
Ammonia	< 0.1	< 0.1	0.4	0.2	0.2	27.6	< 0.1	< 0.1	---	**3.3
Phenolics	0.001	0.003	<0.001	0.007	<0.001	0.004	0.002	< 0.001	---	0.005
Sulphate	6	880	23	520	15	8	9	8	500	--
Chloride	2	140	5	280	4	28	3	2	250	---
Nitrite	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	1.0	---
Nitrate	0.36	2.62	1.98	< 0.06	0.20	< 0.06	2.14	0.61	10	---
Mercury	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		
Arsenic	<0.0002	0.0003	<0.0002	0.0012	0.0004	0.0016	<0.0002	< 0.0002	0.002	0.05
Barium	0.0287	0.0254	0.114	0.128	0.487	0.398	0.0283	0.0293	200	---
Boron	0.160	49.6	0.080	1.25	0.026	0.431	0.047	0.013	1.0	0.2
Calcium	107	351	112	339	281	197	118	98.3	---	---
Cadmium	0.000003	0.000006	0.000007	0.000004	0.000064	0.000010	0.000003	< 0.000003	0.005	0.0002
Chromium	0.00013	0.00031	0.00012	0.00014	0.00401	0.00092	0.00016	0.00020	0.05	---
Cooper	0.0007	0.0051	0.0009	0.0012	0.0081	0.0020	0.0010	0.0007	1.0	0.005
Iron	0.106	0.440	0.011	8.41	2.82	41.3	0.067	0.020	0.3	0.3
Potassium	0.780	1.55	2.32	2.46	1.10	19.7	0.814	0.444	---	---
Magnesium	3.19	113	5.33	41.0	8.30	15.8	1.87	2.82	---	----
Manganese	8	0.0442	0.463	2.47	0.273	2.49	0.00169	0.00091	0.05	----
Sodium	2.34	108	7.51	127	3.00	28.2	2.61	2.86	200	---
Lead	0.00001	0.00015	0.00001	0.00001	0.00249	0.00129	0.00003	0.00002	0.01	0.005
Zinc	0.002	0.004	<0.002	0.004	0.017	0.019	0.004	0.003	5	0.02

All results in mg/L with the exception of Conductivity (uS/cm) and pH.

<0 **Highlighted** indicates an exceedance of the ODWS (Ontario Drinking Water Standards and/ or PWQO (Provincial water Quality Objectives).

\*\* Ammonia value based on 7.5 pH at 10° Celsius



Table 5.2 May, 2019 Groundwater Quality Summary – Deep Wells

PARAMETERS	Stony Lake Road Landfill Site Monitors								ODWS	PWQO
	TW 2-1	TW 3-1	TW 4-1	TW 5-1	TW 6-1	TW 7-1	TW 9-1	Background		
								TW-8-1 2018		
<b>May 29, 2019</b>										
Alkalinity	228	483	272	451	399	244	251	dry	30-500	---
pH	8.12	7.11	8.01	7.08	7.71	7.85	7.90		6.5-8.5	6.5-8.5
Conductivity	451	822	529	2570	817	528	544		---	---
TDS	260	389	280	2390	509	283	300		500	---
COD	< 8	78	< 8	32	< 8	< 8	< 8		---	---
Phosphorus					< 0.03	< 0.03	< 0.03		---	---
TKN					0.8	< 0.5	< 0.5		---	---
Ammonia	< 0.1	21.3	< 0.1	0.7	0.6	< 0.1	< 0.1		---	3.3**
Phenolics					< 0.002	< 0.002	< 0.002		---	0.005
Sulphate	3	9	9	950	12	18	27		500	--
Chloride	3	19	3	160	5	12	18		250	---
Nitrite					0.16	< 0.03	< 0.03		1.0	---
Nitrate	0.96	< 0.06	1.87	< 0.06	2.58	< 0.06	< 0.06		10	---
DOC	1	6	2	12	2	2	1		5	6
Mercury	< 0.01	0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01			
Arsenic	< 0.0002	0.0130	< 0.0002	0.0004	< 0.0002	< 0.0002	< 0.0002		0.002	0.05
Barium	0.0192	0.639	0.0190	0.0273	0.117	0.174	0.110		200	---
Boron	0.007	0.266	0.012	1.49	0.023	0.024	0.022		1.0	0.2
Calcium	102	135	120	475	115	102	114		---	---
Cadmium	0.000004	0.000009	<0.000003	<0.000003	0.000016	0.000003	<0.000003		0.005	0.0002
Chromium	0.00016	0.00371	0.00014	0.00025	0.00011	0.00012	0.00034		0.05	---
Cooper	0.0007	0.0009	0.0009	0.0023	0.0010	0.0018	0.0008		1.0	0.005
Iron	0.007	140	0.042	6.36	0.012	0.015	0.009		0.3	0.3
Potassium	0.671	13.9	0.820	4.92	2.33	1.21	1.24		---	---
Magnesium	2.06	10.0	1.88	48.0	3.65	4.86	5.29		---	---
Manganese	0.00011	0.646	0.00053	0.852	0.568	0.00239	0.00194		0.05	---
Sodium	2.19	18.6	2.75	82.9	4.20	8.40	8.59		200	---
Lead	0.00001	0.00049	0.00002	0.00002	< 0.003	< 0.003	< 0.003		0.01	0.005
Zinc	0.002	0.006	0.003	0.003	0.00002	0.00005	0.00001		5.0	0.03

All results in mg/L with the exception of Conductivity (uS/cm) and pH.

**Highlighted** indicates an exceedance of the ODWS (Ontario Drinking Water Standards and/

\*\* Ammonia value based on 7.5 pH at 10° Celsius





Table 5.3 October 2019 Groundwater Quality Summary – Shallow Wells

PARAMETERS	Stony Lake Road Landfill Site Monitors								ODWS	PWQO
	TW 2-2	TW 5-2	TW 6-2	TW 7-2	TW 9-2	TW 10-2	TW 11-2	Background TW 8-2 2018		
<b>October 28, 2019</b>										
BOD	<4	<4	<4	<4	<4	Dry	<4	Dry		
TSS	3	4	3	19	< 2		108		---	---
Alkalinity	<b>569</b>	493	415	345	215		<b>646</b>		30-500	---
pH	7.53	7.76	7.77	7.78	8.26		7.06		6.5-8.5	6.5-8.5
Conductivity	1480	3810	1350	1730	384		1560		---	---
TDS	<b>1140</b>	<b>3690</b>	<b>909</b>	<b>1320</b>	291		<b>891</b>		500	---
COD	25	45	11	13	< 8		51		---	---
Phosphorus	0.03	0.10	0.03	0.04	< 0.03		< 0.03		---	---
TKN	< 0.5	0.7	0.6	< 0.5	< 0.5		31.8			
Ammonia	< 0.1	< 0.1	0.7	0.2	0.1		<b>33.4</b>		---	<b>**3.3</b>
Phenolics	0.003	<b>0.008</b>	0.004	0.002	< 0.001		0.004		---	0.005
Sulphate	320	<b>2200</b>	140	460	10		170		500	--
Chloride	20	210	110	130	4		56		250	---
Nitrite	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03		< 0.03		1.0	---
Nitrate	< 0.06	5.89	0.15	< 0.06	0.09		< 0.06		10	---
Mercury	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01		< 0.01		---	---
Arsenic	0.0008	0.0005	< 0.0002	0.0007	< 0.0002		0.0005		0.002	0.05
Barium	0.125	0.0249	0.287	0.0965	0.210		0.404		200	---
Boron	0.236	<b>10.2</b>	0.359	<b>1.49</b>	0.011		<b>0.371</b>		1.0	0.2
Calcium	358	561	252	263	86.8		212		---	---
Cadmium	0.000019	0.000014	0.000012	0.000005	<0.000003		0.000011		0.005	0.0002
Chromium	0.00034	0.00033	0.00014	0.00015	0.00009		0.00041		0.05	---
Cooper	0.0008	0.0226	0.0019	0.0003	0.0007		0.0008		1.0	0.005
Iron	0.068	0.011	0.010	0.267	0.017		<b>8.11</b>		0.3	0.3
Potassium	1.01	2.61	4.39	2.48	0.723		29.2		---	---
Magnesium	14.8	210	15.1	30.5	2.87		24.5		---	----
Manganese	<b>2.41</b>	0.0529	<b>1.32</b>	<b>2.25</b>	0.00726		<b>1.52</b>		0.05	----
Sodium	15.8	<b>206</b>	36.6	123	3.09		49.9		200	---
Lead	0.00003	0.00063	0.00003	0.00003	0.00004		0.00004		0.01	0.005
Zinc	0.004	0.011	0.002	0.005	0.009		0.004		5.0	0.03

All results in mg/L with the exception of Conductivity (uS/cm) and pH.

**Highlighted** indicates an exceedance of the ODWS (Ontario Drinking Water Standards and/ or PWQO (Provincial water Quality Objectives)).

\*\* Ammonia value based on 7.5 pH at 10o Celsius



Table 5.4 October 2019 Groundwater Quality Summary – Deep Wells

PARAMETERS	Stony Lake Road Landfill Site Monitors								ODWS	PWQO
	TW 2-1	TW 3-1	TW 4-1	TW 5-1	TW 6-1	TW 7-1	TW 9-1	Background		
								TW-8-1 2018		
<b>October 28, 2019</b>										
Alkalinity	252	<b>dry</b>	436	413	<b>534</b>	231	237	247	30-500	---
pH	8.02		7.72	7.62	7.80	8.07	8.02	8.03	6.5-8.5	6.5-8.5
Conductivity	581		1360	2800	1270	513	543	522	---	---
TDS	334		<b>966</b>	<b>2670</b>	<b>806</b>	303	303	297	500	---
COD	< 8		24	25	16	8	< 8	< 8	---	---
Phosphorus	< 0.003		0.013	0.003	0.03	< 0.03	< 0.03	0.14	---	---
TKN					6.4	< 0.5	< 0.5	< 0.5	---	---
Ammonia	< 0.1		0.2	0.6	<b>5.4</b>	< 0.1	< 0.1	< 0.1	---	3.3**
Phenolics					< 0.002	< 0.002	< 0.002	< 0.002	---	0.005
Sulphate	7		340	<b>1100</b>	110	17	28	7	500	--
Chloride	8		43	170	55	13	18	7	250	---
Nitrite					< 0.03	< 0.03	< 0.03	< 0.03	1.0	---
Nitrate	3.71		1.33	< 0.06	0.08	< 0.06	< 0.06	1.21	10	---
DOC	< 1		<b>8</b>	<b>11</b>	<b>8</b>	< 1	< 1	< 1	5	6
Mercury					< 0.01	< 0.01	< 0.01	< 0.01		
Arsenic	< 0.0002		0.0004	< 0.0002	0.0006	< 0.0002	< 0.0002	0.0009	0.002	0.05
Barium	0.0230		0.0701	0.00597	0.393	0.0157	0.109	0.0611	200	---
Boron	0.008		0.090	0.374	0.145	0.002	0.025	0.015	1.0	0.2
Calcium	112		305	57.9	253	14.1	108	120	---	---
Cadmium	<0.000003		0.000004	<0.000003	0.000056	0.000003	0.000010	0.000017	0.005	0.0002
Chromium	0.00024		0.00039	< 0.00008	0.00032	<0.00008	0.00015	0.00127	0.05	---
Cooper	0.0006		0.0012	< 0.0002	0.0010	< 0.0002	0.0008	0.0027	1.0	0.005
Iron	0.129		0.077	<b>1.45</b>	0.221	< 0.007	0.007	<b>1.05</b>	0.3	0.3
Potassium	0.771		1.91	0.573	8.14	0.120	1.84	1.37	---	---
Magnesium	2.10		7.31	7.95	13.6	0.668	5.10	2.98	---	---
Manganese	0.00054		0.0313	0.117	<b>4.36</b>	0.00057	0.00340	0.0863	0.05	---
Sodium	4.62		31.0	11.7	38.0	1.30	9.64	3.34	200	---
Lead	0.00004		0.00011	< 0.00001	0.00034	0.00001	0.00002	0.00107	0.01	0.005
Zinc	0.003		0.004	< 0.002	0.003	< 0.002	0.003	0.022	5.0	0.03

All results in mg/L with the exception of Conductivity (uS/cm) and pH.

**Highlighted** indicates an exceedance of the ODWS (Ontario Drinking Water Standards) and/ or PWQO.

\*\* Ammonia value based on 7.5 pH at 10o Celsius

In accordance with the PC of A (September 24, 2003), monitors TW-2-2 and TW-6-2 were sampled for VOC analysis. All parameters tested were reported with values below their respective detection limits in both the spring and fall. Monitors that were analyzed for Column 1 parameters reported values below their respective detection limits in both the spring and fall. All values were within the ODWS.

This should be closely monitored to see if there is a reoccurrence in the 2019 monitoring program. The certificates of analysis are included in Appendix E.



### 5.3 Reasonable Use Criteria

At the request of the MECP, the transfer station was assessed for its conformance with Guideline B-7 as a reasonable use criteria (RUC) assessment. This monitoring report presents estimated criteria for significant contaminant indicators. The criteria establish the maximum acceptable concentrations of various parameters at the property boundary permitted by MECP Procedure B-7-1. An evaluation of the RUC criteria was conducted using the 2019 data. The criterion is based on the following equation.

$$X = B + F (W - B)$$

where: X = maximum acceptable concentration at property boundary

B = background concentration of parameter

F = factor of 0.5 for aesthetic parameter and 0.25 for health related parameter

W = ODWS value for each particular parameter

The RUC was applied to leachate parameters. Water quality for the monitors utilized the chemical results from the shallow overburden / shallow bedrock monitors at stations at the down-gradient locations (TW-6-2, TW-7-2, TW-9-2, TW-10-2 and TW-11-2) and the deeper bedrock monitoring stations (TW-6-1, TW-7-1 and TW-9-1). Background monitor TW-8-1 and TW-8-2 were established as the background monitors as they are located the farthest up-gradient of the site and the shallow groundwater movement has been established to flow away from this location. The RUC calculations for the site are presented in Tables 5.5 to 5.8.



Table 5.5 Evaluation of Reasonable Use Criteria – May 2019 (Overburden and Shallow Bedrock Monitors)

Parameter (mg/L)	ODWS (MAC or IMAC)	TW-8-2 May 2019	Monitoring Wells					Calculated RUP (mg/L)*
			TW-6-2	TW-7-2	TW-9-2	TW-10-2	TW-11-2	
Alkalinity	500	229	276	224	2210	355	437	364.50
Barium	1	0.0293	0.11	0.13	0.49	0.40	0.03	0.51
Boron	5	0.013	0.08	1.25	0.03	0.43	0.05	2.51
Chloride	250	2	5	280	4	28	3	126.00
Iron	0.3	0.02	0.01	8.41	2.82	41.30	0.07	0.16
Manganese	0.05	0.00091	0.46	2.47	0.27	2.49	0.00	0.03
TDS	500	234	489	1590	274	606	311	367.00
Nitrate	10	0.61	1.98	< 0.06	0.20	< 0.06	2.14	5.31
Sodium	200	2.86	7.51	127.00	3.00	28.20	2.61	101.43
Sulphate	500	8	23	520	15	8	9	254.00

\*RUC is calculated as background+Fx(ODWS-TW-8) where F=0.5 for aesthetic parameter and 0.25 for health related parameter. All results in mg/L with the exception of Conductivity (uS/cm) and pH. Highlighted indicates an exceedance.

Table 5.6 Evaluation of Reasonable Use Criteria – May 2019 (Bedrock Monitors)

Parameter (mg/L)	ODWS (MAC or IMAC)	TW-8-1 (Nov. 2018)	Monitoring Wells			Calculated RUP (mg/L)*
			TW-6-1	TW-7-1	TW-9-1	
Alkalinity	500	234.00	399	244	251	367.00
Barium	1	0.04	0.117	0.174	0.11	0.52
Boron	5	0.04	0.023	0.024	0.022	2.52
Chloride	250	2.00	5	12	18	126.00
Iron	0.3	0.14	0.012	0.015	0.009	0.22
Manganese	0.05	0.01	0.568	0.00239	0.00194	0.03
TDS	500	269.00	509	283	300	384.50
Nitrate	10	0.61	2.58	< 0.06	< 0.06	5.31
Sodium	200	1.90	4.2	8.4	8.59	100.95
Sulphate	500	4.00	12	18	27	252.00

\*RUC is calculated as background+Fx(ODWS-TW-8) where F=0.5 for aesthetic parameter and 0.25 for health related parameter. All results in mg/L with the exception of Conductivity (uS/cm) and pH. Highlighted indicates an exceedance.



Table 5.7 Evaluation of Reasonable Use Criteria – October 2019 (Overburden and Shallow Bedrock Monitors)

Parameter (mg/L)	ODWS (MAC or IMAC)	TW-8-2 May 2019	Monitoring Wells					Calculated RUP (mg/L)*
			TW-6-2	TW-7-2	TW-9-2	TW-10-2	TW-11-2	
Alkalinity	500	229	415	345	215	Dry	646	364.50
Barium	1	0.0293	0.287	0.0965	0.210		0.404	0.51
Boron	5	0.013	0.359	1.49	0.011		0.371	2.51
Chloride	250	2	110	130	4		56	126.00
Iron	0.3	0.02	0.10	0.267	0.017		8.11	0.16
Manganese	0.05	0.00091	1.32	2.25	0.00726		1.52	0.03
TDS	500	234	909	1320	291		891	367.00
Nitrate	10	0.61	<0.01	< 0.01	<0.01		<0.01	5.31
Sodium	200	2.86	36.6	123	3.09		49.9	101.43
Sulphate	500	8	140	460	10		170	254.00

\*RUC is calculated as background+Fx(ODWS-TW-8) where F=0.5 for aesthetic parameter and 0.25 for health related parameter. All results in mg/L with the exception of Conductivity (uS/cm) and pH. Highlighted indicates an exceedance.

Table 5.8 Evaluation of Reasonable Use Criteria – October 2019 (Bedrock Monitors)

Parameter (mg/L)	ODWS (MAC or IMAC)	TW-8-1 October 2019	Monitoring Wells			Calculated RUP (mg/L)*
			TW-6-1	TW-7-1	TW-9-1	
Alkalinity	500	247	534	231	237	373.50
Barium	1	0.0611	0.393	0.0157	0.11	0.53
Boron	5	0.015	0.145	0.002	0.03	2.51
Chloride	250	7	55	13	18	128.50
Iron	0.3	1.05	0.221	< 0.007	0.01	0.68
Manganese	0.05	0.0863	4.36	0.00057	0.00	0.07
TDS	500	297	806	303	303	398.50
Nitrate	10	1.21	0.08	< 0.06	< 0.06	5.61
Sodium	200	3.34	38	1.3	9.64	101.67
Sulphate	500	7	110	17	28	253.50

\*RUC is calculated as background+Fx(ODWS-TW-8) where F=0.5 for aesthetic parameter and 0.25 for health related parameter. All results in mg/L with the exception of Conductivity (uS/cm) and pH. Highlighted indicates an exceedance.

The shallow monitors yielded results that exceeded the RUC criteria in monitors TW-6-2, 7-2, 9-2, 10-2 and TW 11-2 for parameters including Alkalinity, Chloride, Iron, TDS and Manganese. This is similar to previous years. It is interpreted that the organics associated with the existing wetland that abuts the east and southern property limits is impacting the water quality at locations down-gradient of the refuse area. In addition, it is unclear if the farming operations that border the property to the north and west are contributing to the adverse water quality. Nevertheless, it is recommended that the existing monitoring program be continued in order to evaluate if off-site impacts are occurring.



The deeper monitors yielded groundwater samples with an RUC exceedance limited to 6-1 for TDS, Alkalinity and Manganese. TW 6-1 has in the past reported exceedances of the RUC. The data suggests that the existing refuse is having a minimal impact on the deeper bedrock aquifer complex.

## 5.4 Surface Water Monitors

Surface water samples were collected during spring, summer and fall sampling periods. In-field measurements were taken at the surface water station as presented in Table 5.9. SW-6 was dry during all sampling circuits while SW-3 was dry in August and November. SW-8 was dry in August. The certificates of analysis are included in Appendix E.

Table 5.9 2019 Surface Water field Measurements

Parameter	Field Measurement							
	SW-1			SW-3	SW-6	SW-8		
	May	Sep.	Oct.	May	May	May	Sep.	Oct.
Temperature (°C)	13.0	21.2	11.8	13.1	12.1	16.1	24.4	11.6
pH	7.74	7.38	7.71	7.95	7.63	7.78	8.45	7.90
Conductivity (us/cm)	324	7.49	411	586	656	480	323	305
Dissolved Oxygen (mg/L)	6.30	4.57	5.98	9.20	9.24	9.40	7.81	8.86
ORP	111	---	225	115	115	140	---	203

Guideline B-9 does not apply as the landfill is closed. Based on the fact that no groundwater source exists between the landfill and the wetland, Guideline B-9 is interpreted to be met. However, Guideline B-9 does not supersede PWQO as the landfill discharge must not impact the adjacent surface water feature.

As such, surface water quality at the landfill perimeter stations SW 3 and SW-6 as well as trigger station SW 1 were compared to the PWQO to assess the landfill compliance. The MOE "Monitoring and Reporting for Waste Disposal Sites Groundwater and Surface Water – Technical Guidance Document" (November 2010) indicates assessments should compare values to those on Table A and B of the document. The values on these charts are obtained from the Aquatic Protection Value (APV) and the Canadian Water Quality Objective (CWQO).

The surface water samples were submitted for analysis of Schedule 5 Column 3 of the Landfill Standards Guideline (Comprehensive List for Surface Water). The results of the analysis are included in Appendix E and the data are summarized in Table 5.10.



Table 5.10 2019 Landfill Perimeter and Trigger Station Surface Water Quality Results

Parameters	Surface Water Locations								APV	CWQO	PWQO
	SW-1			SW-3	SW-6	SW-8					
	May	Sep.	Oct.	May	May	May	Sep.	Oct.			
BOD	< 4	5	< 4	< 4	< 4	< 4	34	< 4			
TSS	14	13	2	2	3	8	83	3			
Alkalinity (mg/L)	204	273	164	251	417	195	168	139			---
pH	8.17	8.00	8.17	8.17	7.69	7.71	8.64	7.82		6.0-9.0	6.5-8.5
Conductivity	407	543	402	724	860	558	358	372			
TDS	206	329	286	426	491	303	300	274			
COD	19	27	27	14	17	19	70	30			
Phosphorus	< 0.003	0.037	0.014	0.137	0.036	0.028	0.286	0.026			3.3
TKN	< 0.5	0.9	< 0.5	< 0.5	2.4	0.7	1.7	< 0.5			
Ammonia	< 0.1	0.2	< 0.1	< 0.1	1.6	< 0.1	< 0.1	< 0.1			
Phenolics	0.003	0.006	< 0.001	0.004	0.003	0.004	0.009	0.003	0.04**	0.004	0.005
Sulphate	6	3	33	53	41	< 2	3	32			
Chloride	12	13	24	62	19	63	16	22	180	128	---
Nitrite	< 0.03	< 0.03	< 0.03	< 0.03	0.03	< 0.03	< 0.03	< 0.03		0.06	
Nitrate	< 0.06	< 0.06	< 0.06	< 0.06	0.52	< 0.06	< 0.06	1.65		2.9	
Mercury	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	0.26		
Arsenic	0.0002	0.0005	0.0005	0.0002	0.0004	0.0002	0.0026	0.0005	0.150	0.0005	
Barium	0.0608	0.0955	0.0599	0.0577	0.110	0.0513	0.0880	0.0605	2.30		
Boron	0.016	0.034	0.018	0.126	0.189	0.011	0.030	0.015	3.55	1.50	0.2
Calcium	70.8	117	81.0	113	164	74.8	71.6	68.9			
Cadmium	<0.00003	0.000019	0.000003	0.000003	0.000005	0.000006	0.000010	0.000098	0.00021	0.000017	0.0005
Chromium	0.00011	0.00021	0.00015	0.00024	0.00071	0.00015	0.00014	0.00017	0.064		
Copper	< 0.0002	0.0009	0.0005	0.0008	0.0008	< 0.0002	0.0006	0.0004	0.0069		0.005
Iron (mg/L)	0.071	1.51	0.106	0.064	1.05	0.067	1.23	0.036	1.00*	0.3	0.3
Potassium	0.581	0.660	2.06	1.68	10.4	1.30	8.64	1.97			
Magnesium	1.96	2.81	2.39	6.71	11.6	1.81	2.95	2.31			
Manganese	0.0193	0.639	0.0168	0.00770	1.35	0.0211	0.494	0.0101			
Sodium	6.56	7.64	10.9	28.4	21.2	35.3	5.86	8.62			
Lead	<0.00001	0.00009	0.00012	<0.00001	0.00016	0.00008	0.00038	0.00015	0.02		0.005
Zinc	0.002	0.009	<0.002	0.004	0.005	0.003	0.004	<0.002	0.089	0.03	0.02

**Highlighted** indicates exceedance of PWQO, \* USA EPA Criterion, \*\* Lowest observed effect criterion

All results in mg/L with the exception of Conductivity (uS/cm) and pH.

PWQO=Provincial Water Quality Objective, CWQO=Canadian Water Quality Objective, APV=Aquatic Protection Value.

Trigger location SW 1 experienced an exceedance of the PWQO for iron and Phenolics in the Sep.2 sampling period but not in May or October. Both times the background monitor SW-8 also exceeded the PWQO. Iron should be monitored during the 2021 program to see if a trend is developing.



## 5.5 Surface Water Trigger Mechanism

As in past reports, the surface water trigger criteria at SW-1 should comprise those listed in Table 5.10. An exceedance for any listed parameter at SW-1 should be defined as the numerical elevation of an analytical value above the trigger concentration calculated from the 75th percentile at the background station SW 8.

Three consecutive annual exceedances for any sampled parameters at SW-1 that is considered to be caused by the Stoney Lake Road Transfer Station should trigger the preparation of a contingency plan to be submitted to the MECP after the receipt of the third consecutive exceedance analysis. This should continue to be reviewed on an annual basis. The contingency plan is based on a three tier system as outlined below.

**Tier 1- Alert:** This is an alert level monitoring mode. If a parameter exceeds the PWQO for 3 consecutive sampling events, then the Tier 2 trigger monitoring mode would be initiated.

**Tier 2- Confirmation:** This mode includes increased monitoring which includes: increased sampling frequency; a confirmation of the exceedance; and a discussion with the concerned parties. Samples would be required to be taken monthly for 3 months from the background location and the location where the exceedance(s) occurred. The tier 2 monitoring is conducted to provide an assessment of whether an observed exceedance of the trigger is in fact due to landfill impact as a whole, or whether the exceedance of the trigger is partly or wholly explained by other factors. This will be achieved by considering trends in the trigger parameter concentrations at the trigger location in the context of:

- Trigger parameter concentrations at non-trigger locations, i.e. other sampling locations; and
- Non-trigger leachate indicator parameter concentrations at trigger and non-trigger locations.

If the exceedance is confirmed, discussions will be held with the municipality and the MECP to decide whether implementation of remedial measures is warranted. This meeting should take place within 6 months from the activation of the tier 2 trigger. The discussions will define the optimum course of action and review the remedial measures alternatives available to the municipality at that time.

The course of action should be commenced by the initiation of a detailed surface water/biological study to determine if the trigger exceedances caused acceptable or unacceptable quality/biological impacts on the receiving watercourse. The plan should provide recommendations for: 1) the site closure or continued operation with the design/construction of appropriate engineered facilities (such as leachate collection and treatment works, surface water drainage control, low permeability soil and geotextile capping on the refuse footprint); 2) the timing for the installation of the recommended facilities; and 3) the subsequent quality monitoring to confirm the acceptable water conditions. If acceptable impact is demonstrated by the surface water/biological study, the MECP would be requested to support the continuance of the routine sampling without mitigation regarding the specific trigger exceedance.





If however, unacceptable impact is demonstrated by the surface water/biological study, the implementation of the remedial plan should commence shortly after the receipt of the next exceedance analysis for the trigger parameter during any routine sampling survey.

**Tier 3- Compliance:** This mode initiates the implementation of the remedial measures and assesses the effectiveness of the implemented contingency works. The scope of the monitoring will be established following the remedial measures proposed to be undertaken.

SW-1 experienced an exceedance for iron and phenolics in the Sep. sampling. The spring and fall result did not experience an exceedance, therefore the surface water trigger criteria was not triggered. The background monitor also exceeded for phenolics and iron in the Sep. sampling. It is our professional opinion that the iron and phenolics exceedances are not related to the Stoney Lake Road Transfer Station and should not be considered as part of the trigger mechanism. It is our opinion that the trigger mechanism was not exceeded during the 2019 monitoring period.

## 5.6 Landfill Gas Monitoring

Landfill gas monitoring was conducted in May and October, at each monitoring well location using a 4 gas meter for methane and hydrogen sulphide. Hydrogen sulphide was also measured but none was detected in any of the wells or monitors. Methane was detected in TW-3-1 and TW-11-2 during the fall circuit but not in the spring. The level of methane detected ranged from 3- 9% by volume. The results of the monitoring are included in Table 5.11. New Methane gas probes were inserted into the landfill in December of 2015 within the refuse area above the water table. Readings for the probes ranged from 8 to 35%. Methane monitoring was also conducted at the on-site buildings. No methane gas was measured in any of the buildings.

Table 5.11 2019 Gas Monitoring

Monitor ID	Stoney Lake Road Transfer Station Monitors	
	May 2019 (% by volume)	October 2019 (% by volume)
TW-2-1	0	0
TW-2-2	0	0
TW-3-1	0	3
TW-3-2	0	0
TW-4-1	0	0
TW-4-2	0	0
TW-5-1	0	0
TW-5-2	0	0
TW-6-1	0	0
TW-6-2	0	0
TW-7-1	0	0
TW-7-2	0	0
TW 8-1 2014	0	0
TW-8-2 2014	0	0
TW-9-1	0	0
TW-9-2	0	0



Table 5.11 2019 Gas Monitoring

Monitor ID	Stoney Lake Road Transfer Station Monitors	
	May 2019 (% by volume)	October 2019 (% by volume)
TW-10-2	0	0
TW-11-2	0	9
GP-1	35	18
GP-2	20	8
Office	0	0
Sorting Building	0	0

\*Monitoring wells are screened at water table. Gas Probes (GP) are screened in the refuse area above the water table

The concentration limits specified in the C of A and MECP Regulations are:

- less than 2.5 percent methane gas in the subsurface at the property boundary,
- less than 1.0 percent methane in an on-site building, or its foundation, and
- less than 0.05 percent methane (i.e. not present) in a building, or its foundation, which is located off-site.

These detected levels are below the MECP guideline criteria.

## 6. Conclusions and Recommendations

This report presents the results of the 2019 groundwater monitoring program completed at the Stoney Lake Road Transfer Station in the Township of Douro-Dummer. It is our professional opinion that the groundwater level and chemical data do not indicate a significant anomaly from the results from previous years. Chloride levels in the refuse monitors at MW-2 and MW-5 seem to be trending upwards and is likely related to use of deicing agents during winter months for the site activities.

The majority of the parameters are within their acceptable limits with a few exceedances in the monitors located adjacent to the refuse area as determined by MECP Policy B-7.

Future monitoring programs should consider the following recommendations.

1. The monitoring wells located within the former landfill area should continue to be tested for the indicator list of parameters listed in Schedule 5 Column 2 of the Landfill Standards Guidelines. The remaining monitoring wells should continue to be tested for the comprehensive list of parameters listed in Schedule 5 Column 1 of the Landfill Standards Guidelines. All shallow wells (-2 wells) should continue to be analyzed for the parameters of Schedule 5 Column 3 (comprehensive surface water list) of the Landfill Standards Guidelines.
2. Surface water samples should be tested for the surface water comprehensive list of parameters listed in Schedule 5 Column 3 of the Landfill Standards Guidelines.



3. Sampling should continue for VOCs for the wells listed in the 2004 PC of A.
4. Surface water results should continue to be compared with PWQO criteria.
5. Groundwater, surface water and landfill gas sampling should continue at the same frequency as in 2019.
6. Background Monitor TW 8-2 was again dry in the fall of 2019. If it continues to be dry in 2020 it is recommended that a new overburden background monitor be established.

## 6.1 Signatures

We trust that this report meets with your immediate requirements. Should you have any questions, please contact our office.

Sincerely,

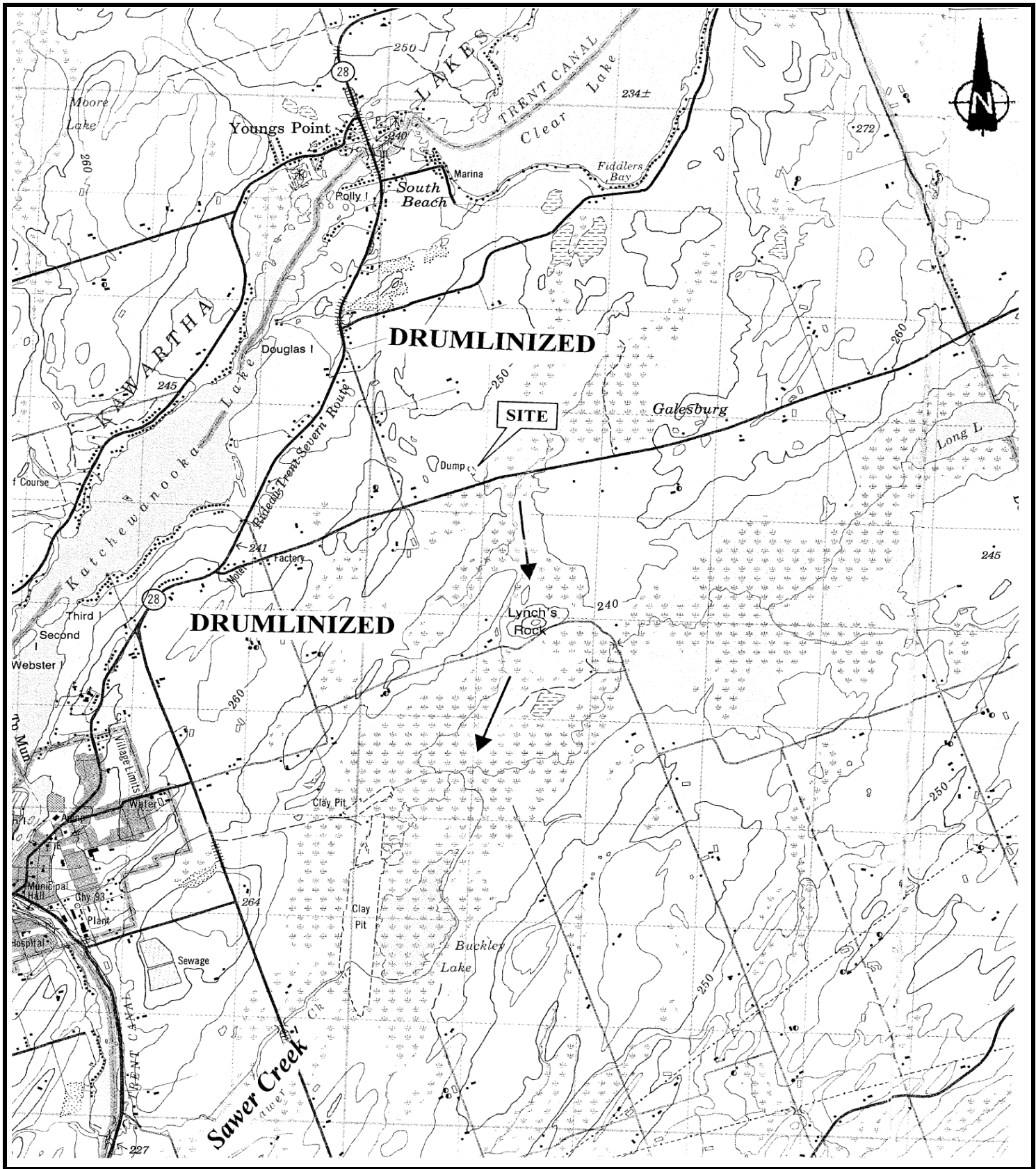
GHD

Steven Gagne, H.B.Sc.

Nyle McIlveen, P.Eng.



## Enclosures



Base map compiled from Energy, Mines and Resources Canada Map 31 D/8 dated 1985. Air photography dated 1981.

**Scale:**  
1:10000  
Coordinate System  
NAD 1983 UTM



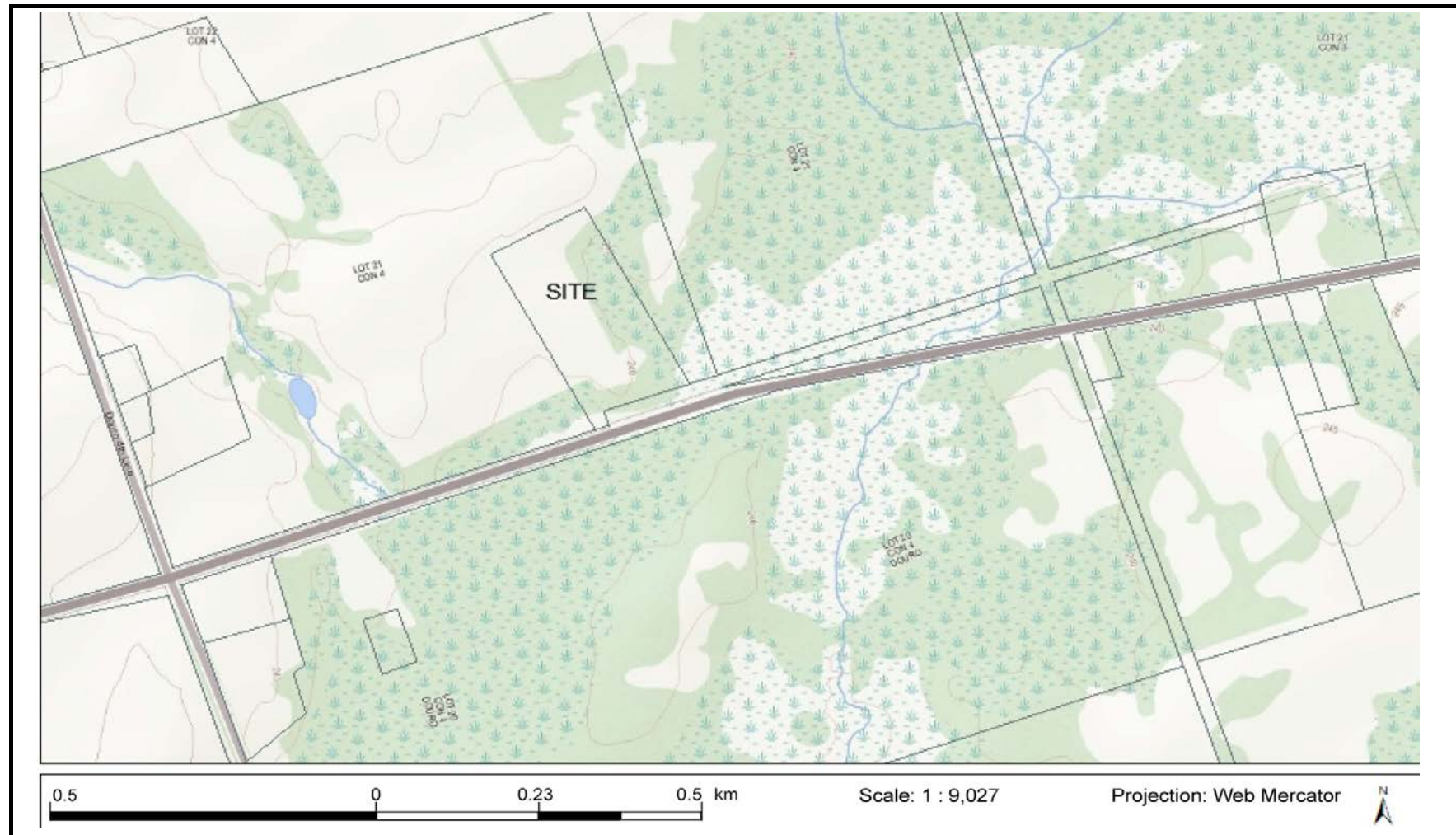
Stoney Lake Rd Transfer Station  
Part Lot 21, Concession 4  
Township of Douro-Dummer

11193449-01  
March 2020

**Geologic Plan**

**FIGURE 1**





Source: Ministry of Natural Resources and Forestry. © Queen's Printer for Ontario, 2015. Note: Property boundary is not a legal survey.

**Scale:**  
See Scale Bar  
Coordinate System:  
NAD 1983 UTM Zone 17

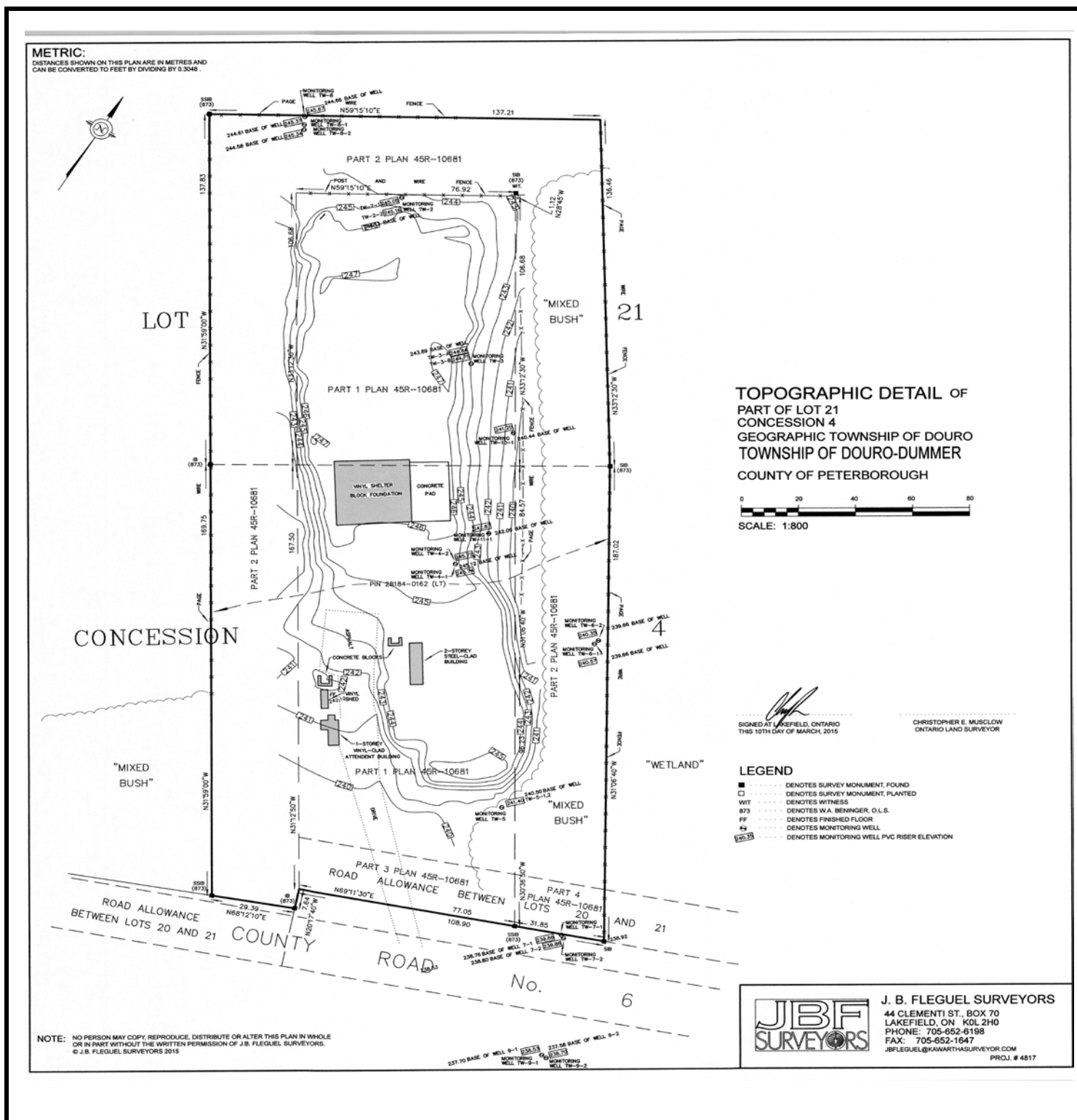


Part Lot 21, Concession 4 Douro  
Township of Douro-Dummer, Ontario  
Stoney Lake Road Transfer Station

**Site Plan**

11193449-01  
March 2020

**FIGURE 2**



Base map compiled from J.B. Fluegel Surveyors, 2015

**Scale:**  
Refer to Scale Bar  
Coordinate System  
NAD 1983 UTM



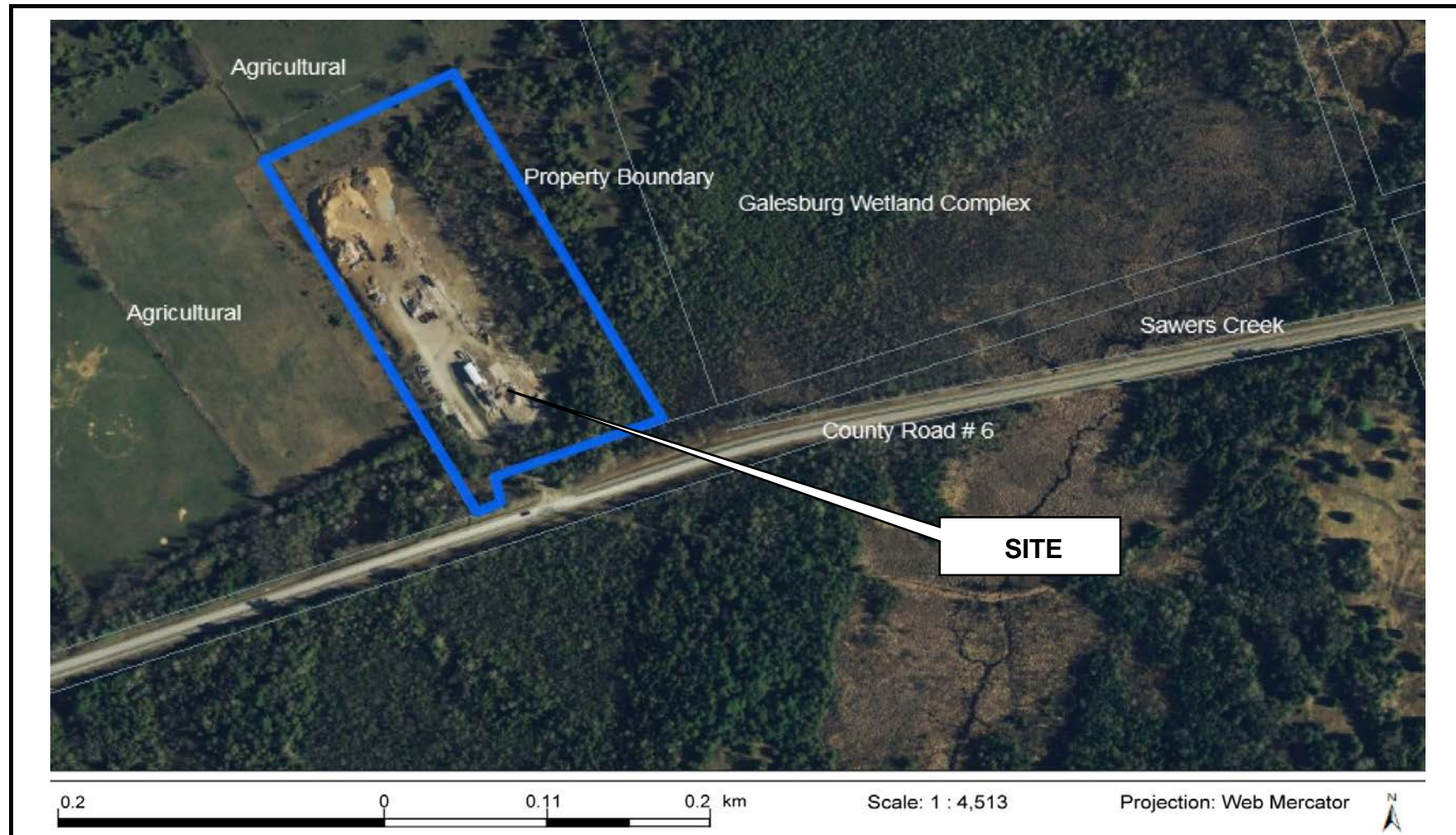
Stoney Lake Rd Transfer Station  
348 County Road #6  
Part Lot 21, Concession 4  
Township of Douro-Dummer

11193449-01  
March 2020

**Site Plan**

**FIGURE 3A**





Source: Ministry of Natural Resources and Forestry. © Queen's Printer for Ontario, 2015. Note: Property boundary is not a legal survey.

**Scale:**  
See Scale Bar  
Coordinate System:  
NAD 1983 UTM Zone 17



Part Lot 21, Concession 4 Douro  
Township of Douro-Dummer, Ontario  
Stoney Lake Road Transfer Station

11193449-01  
March 2020

**Property Boundary**

**FIGURE 3B**





Base Plan compiled from MNR mapping

**Scale:**  
NTS  
Coordinate System:  
NAD 1983 UTM Zone 17



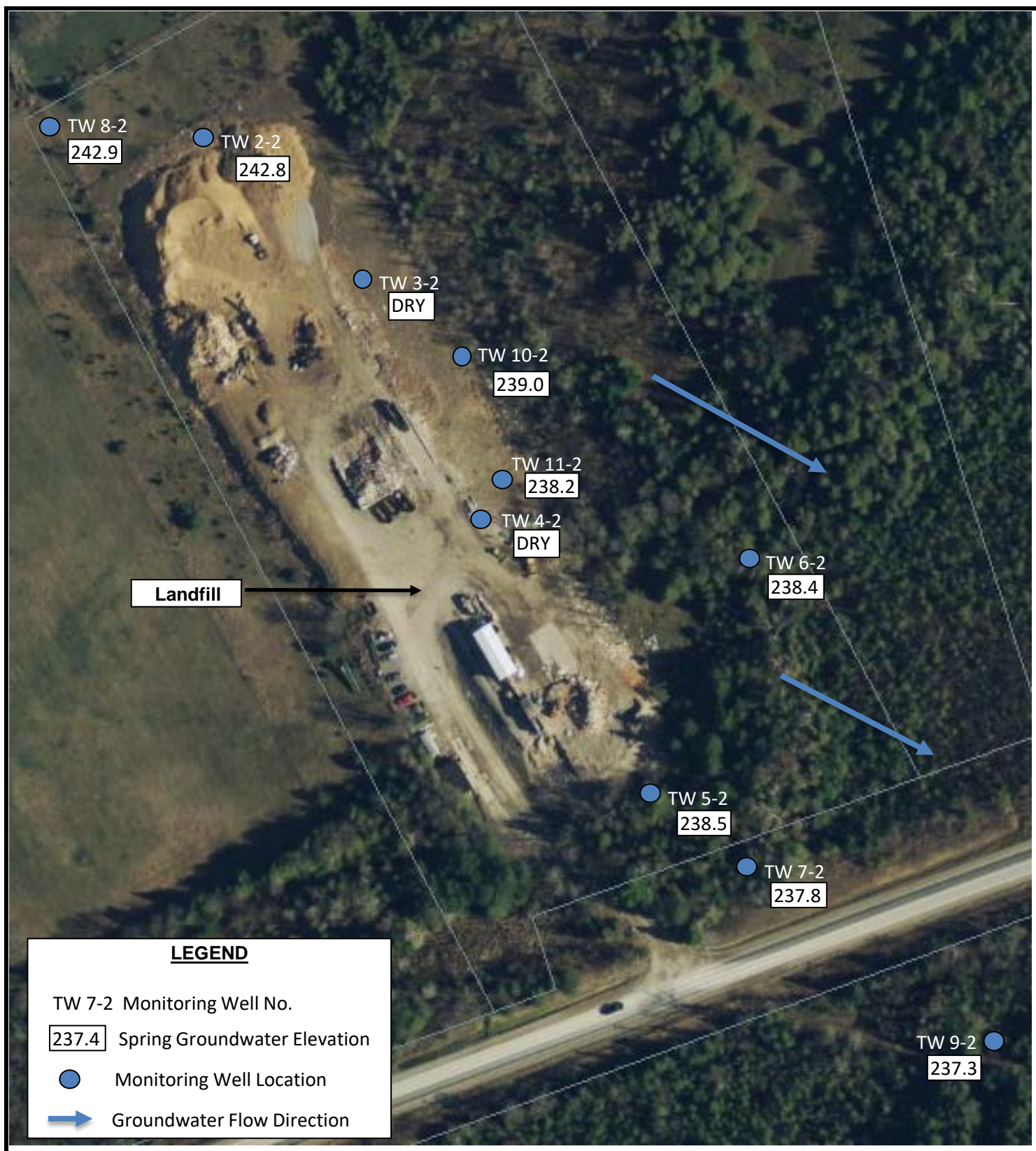
Stoney Lake Rd Transfer Station  
Part Lot 21, Concession 4  
Township of Douro-Dummer

11193449-01  
March 2020

**Monitoring Location**

**FIGURE 3C**





Base map compiled from J.B. Fluegel Surveyors, 2015

**Scale:**  
 Not To Scale  
 Coordinate System  
 NAD 1983 UTM



Stoney Lake Rd Transfer Station  
 Part Lot 21, Concession 4  
 Township of Douro-Dummer

11193449-01  
 March 2020

**Groundwater Flow**

**FIGURE 3D**





Base map compiled from J.B. Fluegel Surveyors, 2015

**Scale:**  
 NTS  
 Coordinate System  
 NAD 1983 UTM



Stoney Lake Rd Transfer Station  
 Part Lot 21, Concession 4  
 Township of Douro-Dummer

11193449-01  
 March 2020

**Groundwater Flow**

**FIGURE 3E**

**2019 FIELD MONITORING SUMMARY**  
 Stoney Lake Road Transfer Station  
 Township of Douro-Dummer, County of Peterborough  
 Project No. 11193449-01

May 29, 2019							
MONITORING WELL	TEMPERATURE (°C)	ELECTRICAL CONDUCTIVITY (uS/cm)	H2S	METHANE (% CH4)	pH	ORP	DO mg/L
TW-2-1	9.5	343	0	0	7.60	75.0	7.6
TW-2-2	9.1	365	0	0	7.85	76.0	5.4
TW-3-1	10.8	686	0	0	7.15	60.0	5.0
TW-3-2			0	0			
TW-4-1	9.7	400	0	0	7.40	189.0	7.5
TW-4-2			0	10			
TW-5-1	9.1	2130	0	0	6.81	20.0	5.7
TW-5-2	9.3	1708	0	0	7.31	118.0	7.5
TW-6-1	9.6	650	0	0	7.38	126.0	4.5
TW-6-2	8.6	517	0	0	7.71	118.0	4.2
TW-7-1	8.9	430	0	0	7.45	-14.0	10.3
TW-7-2	8.5	1694	0	0	7.03	-15.0	6.6
TW-8-1 (2014)			0	0			
TW-8-2 (2014)	10.1	404	0	0	7.56		5.7
TW-9-1	9.1	311	0	0	7.59	85.0	9.2
TW-9-2	10.8	362	0	0	7.82	115.0	4.1
TW-10-2	10.0	1000	0	0	6.70	25.0	6.6
TW-11-2	7.7	396	0	0	7.70	193.0	8.1
SW-1	13.0	324	0		7.74	111.0	6.3
SW-3	13.1	586	0		7.95	115.0	9.2
SW-6	12.1	656	0		7.63	115.0	9.2
SW-8	16.1	480	0		7.78	140.0	9.4

Notes:  
 (---) indicates no data

Plate 4A

**2019 FIELD MONITORING SUMMARY**  
 Stoney Lake Road Transfer Station  
 Township of Douro-Dummer, County of Peterborough  
 Project No. 11156055-01

October 28, 2019							
MONITORING WELL	TEMPERATURE (°C)	ELECTRICAL CONDUCTIVITY (uS/cm)	H2S	METHANE (% CH4)	pH	ORP	DO mg/L
TW-2-1	11.3	502	0	0	7.35	117.0	8.2
TW-2-2	12.0	1103	0	0	6.87	139.0	5.3
TW-3-1	too little to sample		0	3			
TW-3-2	Dry		0	3.8			
TW-4-1	12.1	1107	0	0	7.07	155.0	6.5
TW-4-2	Dry		0	0			
TW-5-1	10.9	221	0	0	6.65	122.0	6.9
TW-5-2	11.3	1058	0	0	6.55	165.0	7.2
TW-6-1	11.4	959	0	0	7.03	164.0	7.0
TW-6-2	11.3	1006	0	0	7.01	167.0	7.0
TW-7-1	11.7	395	0	0	6.72	118.0	6.3
TW-7-2	11.9	1751	0	0	6.35	162.0	5.2
TW-8-1 (2014)	12.1	413	0	0	7.23	118.0	7.2
TW-8-2 (2014)	Dry		0	0			
TW-9-1	12.5	410	0	0	6.42	179.0	6.3
TW-9-2	11.9	339	0	0	6.59	167.0	6.7
TW-10-2	Dry		0	0			
TW-11-2	10.9	1266	0	9	6.64	-5.8	5.8
SW-1	11.8	411	0		7.71	121.0	6.0
SW-3	dry						
SW-6	dry						
SW-8	7.9	305	0		7.90	126.0	8.9

Notes:  
 (---) indicates no data

Plate 4B

**2019**  
**Stoney Lake Road Transfer Station**  
**Township of Douro-Dummer, County of Peterborough**  
**Project No. 11193449-01**

		May 29, 2019		Oct. 28, 2019	
MONITORING WELL	TOP OF CASING ELEVATION	WATER LEVEL FROM TOP OF CASING	WATER LEVEL ELEVATION	WATER LEVEL FROM TOP OF CASING	WATER LEVEL ELEVATION
	(M)	(M)	(M)	(M)	(M)
TW-2-1	245.05	5.41	239.64	7.03	238.02
TW-2-2	245.16	2.36	242.80	4.92	240.24
TW-3-1	244.84	5.08	239.76	7.81	237.03
TW-4-1	245.74	6.80	238.94	8.00	237.74
TW-5-1	241.40	2.98	238.42	3.69	237.71
TW-5-2	241.40	2.87	238.53	3.74	237.66
TW-6-1	240.57	2.13	238.44	2.98	237.59
TW-6-2	240.35	1.96	238.39	2.76	237.59
TW-7-1	239.66	1.31	238.35	1.97	237.69
TW-7-2	239.86	2.10	237.76	2.27	237.59
TW-8-1 (2014)	245.37	---		7.74	237.63
TW-8-2	245.34	2.44	242.90	dry	---
TW-9-1	238.53	0.15	238.38	0.78	237.75
TW-9-2	238.20	0.81	237.39	1.01	237.19
TW-10-2	241.20	2.16	239.04	3.40	237.80
TW-11-2	242.09	3.90	238.19	5.05	237.04

Notes:

All measurements presented in metres.

(na) - indicates not available

PLATE 5

**EVALUATION OF REASONABLE USE CRITERIA, May 2019**  
**Stoney Lake Road Transfer Station**

**Overburden Wells**

PARAMETER	ODWS MAC	BACKGROUND AVERAGE	RUP MAC'S	MONITORS					BACKGROUND WELL
				TW 6-2	TW 7-2	TW 9-2	TW 10-2	TW 11-2	TW8-2
Alkalinity	500	229	364.50	276.00	224.00	2210.00	355.00	437.00	229
Barium	1	0.0293	0.51	0.11	0.13	0.49	0.40	0.03	0.0293
Boron	5	0.01	2.51	0.08	1.25	0.03	0.43	0.05	0.013
Chloride	250	2.00	126.00	5.00	280.00	4.00	28.00	3.00	2
Iron	0.3	0.02	0.16	0.01	8.41	2.82	41.30	0.07	0.02
Manganese	0.05	0.00	0.03	0.46	2.47	0.27	2.49	0.00	0.00091
TDS	500	234.00	367.00	489.00	1590.00	274.00	606.00	311.00	234
Nitrate	10	0.61	5.31	1.98	< 0.06	0.20	< 0.06	2.14	0.61
Sodium	200	2.86	101.43	7.51	127.00	3.00	28.20	2.61	2.86
Sulphate	500	8.00	254.00	23.00	520.00	15.00	8.00	9.00	8

Background Monitor was Dry. Values from last available data for TW-8-2

**Bedrock Wells**

PARAMETER	ODWS MAC	BACKGROUND AVERAGE	RUP MAC'S	MONITORS					BACKGROUND WELL
				TW 6-1	TW 7-1	TW 9-1			TW 8-1
Alkalinity	500	234	367.00	399	244	251			234.00
Barium	1	0.044	0.52	0.117	0.174	0.11			0.04
Boron	5	0.035	2.52	0.023	0.024	0.022			0.04
Chloride	250	2	126.00	5	12	18			2.00
Iron	0.3	0.141	0.22	0.012	0.015	0.009			0.14
Manganese	0.05	0.0121	0.03	0.568	0.00239	0.00194			0.01
TDS	500	269	384.50	509	283	300			269.00
Nitrate	10	0.61	5.31	2.58	< 0.06	< 0.06			0.61
Sodium	200	1.9	100.95	4.2	8.4	8.59			1.90
Sulphate	500	4	252.00	12	18	27			4.00

All results are represented in mg/L unless otherwise stated

ODWS - Ontario Drinking Water Standards, 2000

RUP - Reasonable Use Policy (Policy B-4)

Values exceed RUP.

**EVALUATION OF REASONABLE USE CRITERIA, October 2019**  
**Stoney Lake Road Transfer Station**

**Overburden Wells**

PARAMETER	ODWS MAC	BACKGROUND AVERAGE	RUP MAC'S	MONITORS					BACKGROUND WELL
				TW 6-2	TW 7-2	TW 9-2	TW 10-2	TW 11-2	TW8-2 (May 2019)
Alkalinity	500	229	364.50	415.00	345.00	215.00		646.00	229
Barium	1	0.0293	0.51	0.29	0.10	0.21		0.40	0.0293
Boron	5	0.01	2.51	0.36	1.49	0.01		0.37	0.013
Chloride	250	2.00	126.00	110.00	130.00	4.00		56.00	2
Iron	0.3	0.02	0.16	0.01	0.27	0.02		8.11	0.02
Manganese	0.05	0.00	0.03	1.32	2.25	0.01		1.52	0.00091
TDS	500	234.00	367.00	909.00	1320.00	291.00		891.00	234
Nitrate	10	0.61	5.31	0.15	< 0.06	0.09		< 0.06	0.61
Sodium	200	2.86	101.43	1.32	2.25	0.01		1.52	2.86
Sulphate	500	8.00	254.00	140.00	460.00	10.00		170.00	8

Background Monitor was Dry. Values from last available data for TW-8-2

**Bedrock Wells**

PARAMETER	ODWS MAC	BACKGROUND AVERAGE	RUP MAC'S	MONITORS					BACKGROUND WELL
				TW 6-1	TW 7-1	TW 9-1			TW 8-1
Alkalinity	500	247	373.50	534	231	237.00			247
Barium	1	0.0611	0.53	0.393	0.0157	0.11			0.0611
Boron	5	0.015	2.51	0.145	0.002	0.03			0.015
Chloride	250	7	128.50	55	13	18.00			7
Iron	0.3	1.05	0.68	0.221	< 0.007	0.01			1.05
Manganese	0.05	0.0863	0.07	4.36	0.00057	0.00			0.0863
TDS	500	297	398.50	806	303	303.00			297
Nitrate	10	1.21	5.61	0.08	< 0.06	< 0.06			1.21
Sodium	200	3.34	101.67	38	1.3	9.64			3.34
Sulphate	500	7	253.50	110	17	28.00			7

All results are represented in mg/L unless otherwise stated

ODWS - Ontario Drinking Water Standards, 2000

RUP - Reasonable Use Policy (Policy B-4)

Values exceed RUP.



# Appendix A

## MECP PCoA and Correspondence

Ministry of the Environment  
Environmental Assessment and  
Approvals Branch  
Floor 12A  
2 St Clair Ave W  
Toronto ON M4V 1L5  
Fax: (416) 314-8452  
Telephone: (416) 314-1081

Ministère de l'Environnement  
Direction des évaluations et des  
autorisations environnementales  
Étage 12A  
2 av St Clair O  
Toronto ON M4V 1L5  
Télécopieur : (416) 314-8452  
Téléphone : (416) 314-1081



August 22, 2008

David Clifford, CAO  
The Corporation of the Township of Douro-Dummer  
894 South St  
Post Office Box, No. 92  
Warsaw, Ontario  
K0L 3A0

Dear Sir/Madam:

**Re: Application for Approval of Waste Disposal Sites  
Amendment to CofA # A340901  
Douro-Dummer Township, County of Peterborough  
MOE Reference Number 2649-7HMJDA**

We acknowledge receipt of your application for approval dated August 15, 2008 and received on August 15, 2008 for the following:

Approval Type:	Waste Disposal Sites
Project Description:	This application is for an amendment to the existing CofA No. A340901 to increase the total amount of residual waste leaving the transfer station to 100 tonnes per day
Site Location:	Stoney Lake Road Landfill Lot 21, Concession 4, Douro Ward Douro-Dummer Township, County of Peterborough

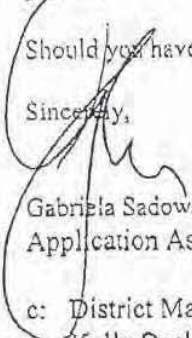
The Ministry's reference number for your application is 2649-7HMJDA. Please quote this number in any correspondence or enquiries regarding this application.

Please note that your submission has only been screened with respect to the presence of the supporting documentation normally required for this type of application, and did not include any technical analysis of the documentation, and therefore you may still be requested to provide some additional information during our detailed technical review of the application. In such a case, the Reviewer will contact you and/or your identified Project Technical Information Contact at this time.

Also, please note that a duplicate copy of the application and all supporting information should have been sent to the local District Office of the Ministry. If this has not been done, please do so as soon as possible.

Should you have any questions related to your application, please contact me at the above phone number.

Sincerely,



Gabriela Sadowska  
Application Assessment Officer

c: District Manager, MOE Peterborough  
Kelly Dechert, P. Eng., Totten Sims Hubicki Associates (1997) Limited, fax No.  
(905)668-0221

Page 2

TOTAL P.02



Ontario

Ministry of the Environment  
Ministère de l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL  
WASTE DISPOSAL SITE  
NUMBER A340901  
Notice No. 2  
Issue Date: February 13, 2008

The Corporation of the Township of Douro-Dummer  
894 South Street  
Post Office Box, No. 92  
Warsaw, Ontario  
K0L 3A0

Site Location: Stoney Lake Road Landfill  
Lot 21, Concession 4, Douro Ward  
Douro-Dummer Township, County of Peterborough

You are hereby notified that I have amended Provisional Certificate of Approval No. A340901 issued on September 11, 2003 for a waste disposal site (landfill/transfer), as follows:

I. The following Definitions are hereby added:

- (q) "trained personnel" means any operator at the Transfer Station who is knowledgeable and able to carry out any necessary duties, in the following through instruction and practice;
  - (i) relevant waste management legislation, regulations and guidelines;
  - (ii) occupational health and safety concerns pertaining to the waste to be handled;
  - (iii) any environmental concerns pertaining to the Transfer Station and wastes to be transferred;
  - (iv) emergency management procedures for the waste to be handled;
  - (v) use and operation of any equipment to be used;
  - (vi) operation and management of the Transfer Station, or areas within the Transfer Station, as per the specific job requirements of each individual operator, and which include procedures for receiving, screening, refusal, and handling of waste;
  - (vii) use of the Emergency Response Plan, and in the procedures to be employed in the event of an emergency;
  - (viii) Transfer Station specific operations and/or procedures; and
  - (ix) the requirements of this Certificate.
- (r) "dry waste" means municipal waste, limited to clean wood, concrete and masonry, bricks, cardboard, plaster and drywall, scrap metal, glass, plastic, shingles, ceramics and furniture from home and light commercial activity.
- (s) "municipal waste" means the definition that is specified in Regulation 347 of the Environmental Protection Act.



- (i) "*clean wood*" means waste that is wood or a wood product that is not contaminated with chromated-copper arsenate, ammoniacal copper arsenic pentachlorophenol, creosote or other wood preservative.
- (ii) "*residual waste*" means waste that is destined for final disposal and includes wood waste and tires.

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

- 9. Application for a Provisional Certificate of Approval for a Waste Disposal Site dated November 20, 2007, and signed by David Clifford, C.A.O., including the attached report entitled "Stoney Lake Road Transfer Station and Waste Processing Site. Design, Operations and Maintenance Report. November 2007."
- 10. e-mails from Kelly Dechert, Manager, Environmental Management Group Totten Sims Hubicki Associates to Senior Review Engineer Jim Chisholm dated December 12, 2007, January 4, 2008, January 10, 2008 (4:04pm) with attachment, January 18, 2008, and Feb. 4, 2008 (4:34pm).
- 11. e-mails from Senior Review Engineer Jim Chisholm to Kelly Dechert dated January 3, 2008, January 4, 2008 (2:33pm), January 10, 2008, January 11, 2008, January 18, 2008 (2:58pm), January 30, 2008 and Feb. 4, 2008 (4:17pm).
- 12. Letters signed by Kelly Dechert addressed to Senior Review Engineer Jim Chisholm dated December 12, 2007, January 3, 2008, January 15, 2008 and January 28, 2008.
- 13. Letter dated January 8, 2008 from Senior Review Engineer Jim Chisholm to David Clifford, C.A.O., the Corporation of the Township of Douro-Dummer.

III. Definition (p) is hereby revoked and replaced by the following Definition (p):

- p. "*Transfer Station*" means the operation and infrastructure comprising the processing of *dry waste* and the transfer station described in Items 7, 9, 10, 11, 12 and 13 of Schedule "A".

IV. Conditions numbers 25, 29, 30, 31, 38, 39 and 45 are hereby revoked and replaced by the following:

- 25. The *Transfer Station* shall be designed, developed, built, operated, maintained, and the management, processing and disposal of all *dry waste* shall be carried out, in accordance with the *EPA, Regulation 347*, and except as otherwise provided by this *Certificate*, the applications for this *Certificate*, dated February 14, 2007 and November 20, 2007, and the supporting documentation listed in Schedule "A". At no time shall the discharge of a contaminant that causes or is likely to cause an adverse effect be permitted.

29. Only *dry waste* shall be accepted at the *Transfer Station*.
30. No more than 800 tonnes of *dry waste* per day shall be accepted at the *Transfer Station*.
31. No more than 800 tonnes of *dry waste, residual waste* and processed materials, shall be stored or be present at the *Transfer Station* at any time. If for any reason waste and processed materials cannot be transferred from the *Transfer Station*, the *Transfer Station* shall cease accepting waste.
38. The Design and Operations Report shall consist of the report identified in item 9 of Schedule "A", and shall be retained, kept up to date through periodic revisions, and made available for inspection by *Ministry* staff. Changes to the Design and Operations Report shall be submitted to the *Director* for approval.
39. a) A training plan shall be developed and maintained for all *operators* of the *Transfer Station*. The scope of the training plan shall include information that adequately covers all of the items outlined in definition (q) of this Notice. Only *trained personnel* may be *operators* at the *Transfer Station*.
- b) The *Owner* shall maintain a written or electronic record at the *Transfer Station* of training that was provided including:
- (i) date of training;
  - (ii) name and signature of person who has been trained; and
  - (iii) description of the training provided and who it was delivered by.
- c) Training records shall be made available to a *Provincial Officer* upon request.
45. The Emergency Response Plan in the Design and Operations Report shall be implemented as required. The *Owner* shall provide copies of the Emergency Response Plan to the local Municipality and to the Fire Department within thirty (30) days of the date of issuance of this Notice.

V. The following sub clause to Condition 44 is hereby added:

- d. if at any time noise and vibration nuisances are generated at the *Transfer Station*, resulting in complaints received by this *Ministry* and validated by a *Provincial Officer*, the *Owner* shall take remedial action immediately.

VI. The following conditions are hereby added:

Mobile Grinding

54. Mobile grinding at the *Transfer Station* is restricted to grinding shingles and *cleun wood*.
55. Any mobile grinding services at the *Transfer Station* shall be provided by a mobile grinding



services provider who has a Certificate of Approval (Air and Noise) for the operation of the mobile grinder.

#### Residual Waste

56. a) The total amount of *residual waste* arising out of the processing operations and leaving the *Transfer Station* for final disposal shall not exceed 40 tonnes per day.
- b) *Residual waste* at the *Transfer Station* shall be stored in container bins.
- c) *Residual waste* shall be moved off-site from the *Transfer Station* within fourteen (14) days of its receipt.
- d) If *residual waste* contains putrescible waste, it shall be moved off-site from the *Transfer Station* within 72 hours of its receipt. If any adverse effects occur as a result of the presence of putrescible waste, the waste must be removed from the *Transfer Station* immediately.

The reasons for these amendments to the Certificate of Approval are as follows:

1. The reason for Definitions p, q, r, s, t and u is to define terms used throughout this *Certificate*.
2. The reason for Conditions 25, 29, 38, 39, 44 d), 45, 54, 55, and 56 is to ensure that the *Transfer Station* is operated in a manner which does not result in a nuisance or a hazard to the health and safety of the environment or people.
3. The reason for Conditions 30 and 31 is to specify the types of waste that may be accepted at the *Transfer Station*, the amount of wastes that may be processed at the *Transfer Station*, the amount of waste and processed material that may be stored at the *Transfer Station* and the maximum rate at which the *Transfer Station* may receive waste based on the Company's application and supporting documentation.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A340901 dated September 11, 2003

*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

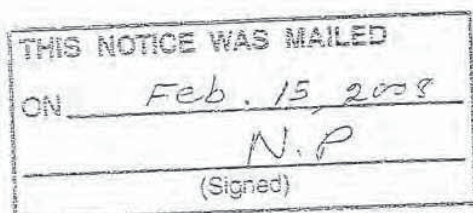
AND

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](http://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 13th day of February, 2008



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

IC/

c: District Manager, MOE Peterborough  
Kelly Dechert, P. Eng., Totten Sims Hubicki Associates (1997) Limited ✓





Ministry  
of the  
Environment

Ministère  
de  
l'Environnement

AMENDMENT TO PROVISIONAL CERTIFICATE OF APPROVAL  
WASTE DISPOSAL SITE

NUMBER A340901

Notice No. 1

Issue Date: May 24, 2007

The Corporation of the Township of Douro-Dummer  
894 South St  
Post Office Box, No. 92  
Warsaw, Ontario  
K0L 3A0

Site Location: Stoney Lake Road Landfill  
Lot 21, Concession 4, Douro Ward  
Douro-Dummer Township, County of Peterborough

*You are hereby notified that I have amended Provisional Certificate of Approval No. A340901 issued on September 11, 2003 for a waste disposal site (landfill/transfer), as follows:*

**I. Definition (i) is hereby revoked and replaced by the following Definitions (i).1 and (i).2:**

- (i).1 "Operator " means any person, other than the *Owner's* employees, authorized by the *Owner* as having the charge, management or control of any aspect of the site, and includes its successors or assigns;
- (i).2 "Owner " means any person that is responsible for the establishment or operation of the site being approved by this *Certificate*, and includes The Corporation of the Township of Douro-Dummer, its successors and assigns;

**II. The following Definitions are hereby added:**

- (m) "PA " means the *Pesticides Act*, R.S.O. 1990, c. P-11, as amend from time to time;
- (n) "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*.
- (o) "Reg. 347 " means Regulation 347, R.R.O. 1990, made under the *EPA*, as amended from time to time;
- (p) "Transfer Station " means the operation and infrastructure comprising the transfer station described in Item 7 of Schedule "A".

III. The following Items are hereby added to Schedule "A":

7. Application for a Provisional Certificate of Approval for a Waste Disposal Site dated February 14, 2007, and signed by David Clifford, C.A.O., including the attached report entitled "Stoney Lake Road Landfill Site Transfer Station: Design, Operations and Maintenance Report" and all supporting documentation.
8. Fax dated May 8, 2007 from Mike Mundell, M & M Disposal Service, to Andrew Neill, MOE, with an alternate disposal location.

IV. The following sub-conditions are hereby added:

23. (f) a detailed monthly summary of the type and quantity of all-incoming and outgoing wastes at the *Transfer Station* and the destination of all outgoing wastes;
- (g) any environmental and operational problems, that could negatively impact the environment, encountered during the operation of the *Transfer Station* and during the facility inspections and any mitigative actions taken;
- (h) any changes to the Emergency Response Plan, the Design and Operations Report and the Closure Plan that have been approved by the Director since the last *Annual Report*;
- (i) any recommendations to minimize environmental impacts from the operation of the *Transfer Station* and to improve *Transfer Station* operations and monitoring programs in this regard.

V. The following Conditions are hereby added:

Transfer Station

The following conditions apply to the operation of the *Transfer Station* only.

**Operations**

25. The *Transfer Station* shall be designed, developed, built, operated, maintained, and the management and disposal of all waste shall be carried out, in accordance with the *EPA , Regulation 347* , and except as otherwise provided by this *Certificate* , with the application for this *Certificate* , dated **February 14, 2007**, and the supporting documentation listed in Schedule "A". At no time shall the discharge of a contaminant that causes or is likely to cause an adverse effect be permitted.

**Hours of Operation**

26. Waste may be accepted at the *Transfer Station* between the hours of 8:00am and 5:00pm, Monday through Friday, except statutory holidays.



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

#### Service Area

28. Only waste that is generated within 50 kilometres of the *Site* shall be accepted at the *Transfer Station*.

#### Waste Types

29. Only solid non-hazardous waste limited to construction and demolition debris shall be accepted at the *Transfer Station* .

#### Waste Limits

30. No more than 100 tonnes of waste per day shall be accepted at the *Transfer Station* .
31. No more than 100 tonnes of waste shall be stored or be present at the *Transfer Station* at any time. If for any reason waste cannot be transferred from the *Transfer Station*, the *Transfer Station* shall cease accepting waste.

#### Signage

32. A sign shall be posted and maintained at the *Transfer Station* in a manner that is clear and legible, and shall include the following information:
- a. the name of the *Transfer Station* and *Owner* ;
  - b. this *Certificate* number;
  - c. the name of the *Operator* ;
  - d. the normal hours of operation;
  - e. the allowable and prohibited waste types;
  - f. a telephone number to which complaints may be directed;
  - g. a twenty-four (24) hour emergency telephone number (if different from above); and
  - h. a warning against dumping outside the *Transfer Station* .

#### Waste Inspection

33. All waste shall be inspected by *Trained personnel* prior to being accepted at the *Transfer Station* to ensure that the waste is of a type approved for acceptance under this *Certificate* .
34. In the event that any waste load is refused, a record shall be made in the daily log book of the reason the waste was refused and the origin of the waste, if known.

#### Incoming / Outgoing Waste

35. All incoming and outgoing wastes shall be inspected by *Trained personnel* prior to being

received, transferred and/or shipped to ensure wastes are being managed and disposed of in accordance with the *EPA* and *Reg. 347*.

#### Labelling

36. All waste storage containers at the *Transfer Station* shall have a label or sign clearly identifying the contents.

#### Vermin, etc.

37. The *Transfer Station* shall be operated and maintained such that vermin, vectors, dust, litter, odour and noise do not create a nuisance.

#### Design and Operations Report

38. The Design and Operations Report shall consist of the Item 7 in Schedule "A", and shall be retained, kept up to date through periodic revisions, and made available for inspection by *Ministry* staff. Changes to the Design and Operations Report shall be submitted to the *Director* for approval.

#### Training Plan

39. A training plan shall be developed and maintained for all employees that operate the *Transfer Station*. Only *Trained personnel* may operate the *Transfer Station* or carry out any activity required under this *Certificate*.
40. The *Owner* shall ensure that *Trained personnel* are available at all times during the hours of operation of this *Transfer Station*. *Trained personnel* shall supervise all transfer or processing of waste material at the *Transfer Station*.

#### Site Security

41. The *Transfer Station* shall be operated and maintained in a secure manner, such that unauthorized persons cannot enter the *Transfer Station*.

#### Site Inspection

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



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

#### Complaint Response

44. If at any time, the *Owner* receives complaints regarding the operation of the *Transfer Station*, 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 separate log book, along with the following information:
    - i. the nature of the complaint,
    - ii. if the complaint is odour or nuisance related, the weather conditions and wind direction at the time of the complaint;
    - iii. the name, address and telephone number of the complainant (if provided); and
    - iv. 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, notify the *District Manager* of the complaint within 48 hours of receiving the complaint, and forward a formal reply to the complainant; and
  - c. The *Owner* shall complete and retain on-site a report written within one (1) week of the complaint date, listing the actions taken to resolve the complaint and any recommendations for remedial measures, and managerial or operational changes to reasonably avoid the recurrence of similar incidents.

#### Emergency Response Plan

45. The Emergency Response Plan in Item 7 of Schedule "A" shall be implemented as required. The *Owner* shall provide copies of the Emergency Response Plan to the local Municipality and the Fire Department within thirty (30) days of the date of issuance of this Notice.
46. The Emergency Response Plan shall be kept up to date, and a copy shall be retained and accessible to all staff at all times. Changes to the Emergency Response Plan shall be submitted to the *Director* for approval.
47. The equipment, materials and personnel requirements outlined in the Emergency Response Plan shall be immediately available on the *Transfer Station* at all times. The equipment shall be kept

in a good state of repair and in a fully operational condition.

48. All staff that operate the *Transfer Station* shall be fully trained in the use of the contingency and Emergency Response Plan, and in the procedures to be employed in the event of an emergency.
49. The *Owner* shall immediately take all measures necessary to contain and clean up any spill or leak which may result from the operation of this *Transfer Station* and immediately implement the emergency response plan if required.

#### Closure Plan

50. A Closure Plan shall be submitted to the *Director* for approval, with a copy to the *District Manager*, no later than six (6) months before the planned closure date of the *Transfer Station*. The Closure Plan shall include, at a minimum, a description of the work that will be done to facilitate closure of the *Transfer Station* and a schedule for completion of that work.
51. The *Transfer Station* shall be closed in accordance with the approved Closure Plan.
52. Within 10 days after closure of the *Transfer Station*, the *Owner* shall notify the *Director*, in writing, that the *Transfer Station* is closed and that the approved Closure Plan has been implemented.

#### Log Book

53. A log shall be maintained, either electronically or in written format, and shall include the following information as a minimum:
  - a. the date;
  - b. quantity and source of waste received;
  - c. quantity of waste at the *Transfer Station* at the end of the operating week;
  - d. quantities and destination of each type of waste shipped from the *Transfer Station*;
  - e. a record of inspections required by this *Certificate*;
  - f. a record of any spills or process upsets at the site, the nature of the spill or process upset and the action taken for the clean up or correction of the spill, the time and date of the spill or process upset, and for spills, the time that the *Ministry* and other persons were notified of the spill in fulfilment of the reporting requirements in the *EPA*;
  - g. a record of any waste refusals which shall include; amounts, reasons for refusal and actions taken; and
  - h. the signature of the *Trained Personnel* conducting the inspection and completing the report.

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

1. The reason for Definitions (i).1, (i).2, (m), (n), (o) and (p) is to define terms used throughout this *Certificate*.



2. The reasons for sub-conditions 23(f), (g), (h) and (i) 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.
3. The reason for Conditions 25 and 37 is to ensure that the Transfer Station is operated in a manner which does not result in a nuisance or a hazard to the health and safety of the environment or people.
4. The reasons for Conditions 26 and 27 are to specify the hours of operation for the Transfer Station and a mechanism for amendment of the hours of operation, as required.
5. The reasons for Conditions 28, 29, 30 and 31 are to specify the approved service area from which waste may be accepted at the Transfer Station, the types of waste that may be accepted at the Transfer Station, the amounts of waste that may be stored and processed at the Transfer Station, and the maximum rate at which the Transfer Station may receive waste based on the Company's application and supporting documentation.
6. The reason for Conditions 32 is to ensure that users of the Transfer Station are fully aware of important information and restrictions related to Transfer Station operations and access under this Certificate of Approval.
7. The reasons for Conditions 33 and 34 are to ensure that all incoming wastes are inspected to ensure compliance with this *Certificate*, and to ensure that a record is made of any waste load refusal.
8. The reason for Conditions 35 and 36 is to ensure that all wastes are properly classified to ensure that they are managed, processed and disposed in accordance with O. Reg. 347, R.R.O. 1990 and in a manner that protects the health and safety of people and the public.
9. The reason for Condition 38 is to ensure that an up-to-date Design and Operations Report is maintained on-site at all times.
10. The reason for Condition 39 and 40 is to ensure that the Transfer Station is operated by properly Trained staff in a manner which does not result in a hazard or nuisance to the natural environment or any person.
11. The reason for Condition 41 is to ensure the controlled access and integrity of the Transfer Station by preventing unauthorized access when the Transfer Station is closed and no site attendant is on duty.
12. The reasons for Conditions 42 and 43 are to ensure that routine Transfer Station inspections are completed, and that detailed records of Transfer Station inspections are recorded and maintained for inspection and information purposes.



13. The reason for Condition 44 is to ensure that any complaints regarding Transfer Station operations at the Transfer Station are responded to in a timely manner.
14. The reasons for Conditions 45, 46, 47, 48 and 49 are to ensure that an Emergency Response Plan is developed and maintained at the Transfer Station and that staff are properly trained in the operation of the equipment used at the Transfer Station and emergency response procedures.
15. The reasons for Condition 50, 51 and 52 are to ensure that the Transfer Station is closed in accordance with Ministry standards and to protect the health and safety of the public and the environment.
16. The reasons for Condition 53 are to provide for the proper assessment of effectiveness and efficiency of site design and operation, their effect or relationship to any nuisance or environmental impacts, and the occurrence of any public complaints or concerns. Record keeping is necessary to determine compliance with this Certificate of Approval, the EPA and its regulations.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A340901 dated September 11, 2003

*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



Ministry of the  
Environment

Peterborough District Office  
300 Water Street  
Peterborough ON K9J 8M5  
Telephone: (705) 755-4300  
Fax: (705) 755-4321

Ministère de  
l'Environnement

Bureau de district de Peterborough  
300, rue Water  
Peterborough ON K9J 8M5  
Téléphone: (705) 755-4300  
Télécopieur: (705) 755-4321



June 21, 2006

Mr. David Clifford, CAO Clerk-Treasurer  
The Corporation of the Township of Douro-Dummer  
894 South Street, Box 92  
Warsaw, ON K0L 3A0

Dear Mr. Clifford:

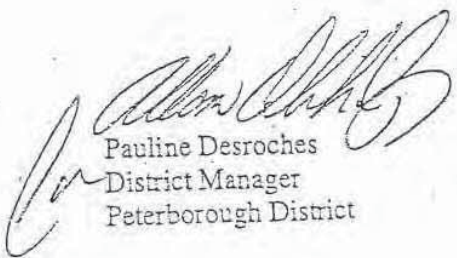
Re: Change to Schedule "B" of the Certificate of Approval No. A340901  
Stoney Lake Road Waste Disposal Site  
Lot 21, Concession 4, Township of Douro-Dummer, County of Peterborough

In accordance with the request of your consultant SGS Lakefield Research detailed in the annual reports for the Stoney Lake Road Waste Disposal Site, I am amending the required parameters detailed in Schedule "B" of the Certificate of Approval Numbered A340901

The authorization to make this change is detailed in Condition 20 of the above mentioned Certificate of Approval. The amendment deletes the parameters in Schedule "B" consisting of total cyanide, DO and fluorine. This amendment adds the parameter of dissolved organic carbon (DOC) to the Extended Suite Monitoring Wells.

If you have any questions or require additional information concerning the above, please do not hesitate to contact Mr. Dave Beretta, Provincial Officer at 705-755-4338, or the undersigned at 705-755-4315.

Yours truly,

  
Pauline Desroches  
District Manager  
Peterborough District

c: SGS Lakefield Research Limited  
P.O. Box 4300, Concession Street  
Lakefield, ON K0L 2H0

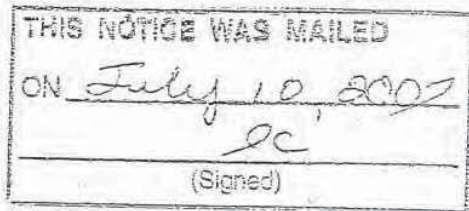
JUN 27 2006

Project Number: 06-1006-002	
Project Manager: CW	
To: CW	
Please....	And....
<input checked="" type="checkbox"/> Read	<input type="checkbox"/> Forward To:
<input type="checkbox"/> Act	<input type="checkbox"/> Return
<input type="checkbox"/> Approve	<input type="checkbox"/> Discard
<input type="checkbox"/>	<input type="checkbox"/> Review with Me
Notes:	

Tribunal at: Tel: (416) 314-4600, Fax: (416) 314-4506 or [www.ert.gov.on.ca](http://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 24th day of May, 2007



Tesfaye Gebrezghi, P.Eng.

Director

Section 39, *Environmental Protection Act*

AN/

c: District Manager, MOE Peterborough  
Chris Visser, Totten Sims Hubicki Associates (1997) Limited ✓

Senior Environmental Officer  
Peterborough District Office

File Storage Number: SIPB DO CO4 610 Lot 21, Concession 4, Douro Ward  
Mr. David Bucholtz, SGS Lakefield Research Limited, P.O. Box 4300, 185 Concession Street,  
Lakefield, ON K0L 2H0



Ministry of the Environment  
Eastern Region  
Peterborough District Office  
Peterborough Area Office  
2nd Floor South Tower  
300 Water St S  
Peterborough ON K9J 8M5  
Fax: (705) 755-4321  
Telephone: (705) 755-4300

Ministère de l'Environnement  
Direction régionale de l'Est  
Bureau du district de Peterborough  
Bureau du secteur de Peterborough  
2e étage tour sud  
300 rue Water S  
Peterborough ON K9J 8M5  
Télécopieur: (705) 755-4321  
Téléphone: (705) 755-4300



January 23, 2006

The Corporation of the Township of Douro-Dummer  
Attn: Mr. Dave Clifford, CAO  
PO Box 92  
Warsaw, Ontario K0L 3A0

RE: Ministry of the Environment  
Technical Support Section Comments - Groundwater  
Stoney Lake Road Waste Disposal Site  
Provisional Certificate of Approval Number A340901  
Lot: 21, Concession: 4, Douro Ward  
Douro-Dummer, County of Peterborough  
Reference Number 6141-6LBKAA

Dear Mr. Clifford:

Staff from the Ministry of the Environment's Eastern Region Technical Support Section have completed a review of the 2004 Annual Monitoring Report for the Stoney Lake Road Waste Disposal Site, produced by SGS Lakefield Research Limited, dated March 2005. Based upon a review of this document, Eastern Region Technical Support Section staff have made several comments and recommendations with respect to hydrogeological issues at the site. Please find attached for your review and action, a copy of the Ministry's technical support section comments, dated January 17, 2006.

It is requested that a written response be provided to this office by no later than February 28, 2006, identifying when and how the Ministry's recommendations will be implemented at the Stoney Lake Road Waste Disposal Site.

Should you have any questions or concerns regarding the information provided, please do not hesitate to contact the undersigned at 705-755-4331.

Yours truly,

Gary Muloin

#### Leachate Water Quality

TW2-II is located upgradient of the landfill in the shallow aquifer, but it is at the toe of fill area and it has been impacted by leachate. TW3-I is located within the fill area and it is screened in the deep aquifer.

Table 2 Leachate Water Quality

Parameter	TW3-I	TW2-II
Aquifer	Deep	Shallow
Chloride (mg/L)	48	7.8
Alkalinity (mg/L)	754	732
Hardness (mg/L as CaCO <sub>3</sub> )	526	671
Total Dissolved Solids (TDS) (mg/L)	679	834

Except for chloride in the shallow aquifer, the concentrations of leachate parameters are elevated when compared to the background water quality. TW2-2 was also sampled for VOCs and all of the parameters were below detection limits.

#### Downgradient Water Quality

The downgradient water quality is measure in TW6, which is located between the landfill and the wetland along the eastern property line.

Table 3 Downgradient Water Quality

Parameter	TW6-I	TW6-II
Aquifer	Deep	Shallow
Chloride (mg/L)	47	31
Alkalinity (mg/L)	689	712
Hardness (mg/L as CaCO <sub>3</sub> )	492	552
Total Dissolved Solids (TDS) (mg/L)	720	786

The concentrations of the typical landfill leachate parameters in TW6 are elevated. When downgradient water quality is compared to the leachate water quality in Table 2 there is little difference, which means the leachate is not being well attenuated over the 30 metre bufferlands prior to discharging to the wetland. It will be interesting to see if capping the landfill will result in the improvement of the water quality in TW6. TW6-2 was also sampled for VOCs and all of the samples were below detection limits.

#### Guideline B-7 and B-9

Guideline B-7 no longer applies to the site because it is closed. The water quality in TW6 is to be monitored closely for the next four (4) years to determine if capping the landfill will improve the quality of water at the downgradient property line. The consultant recommends that additional lands be acquired if the water quality does not improve in four years and I support this recommendation.



MEMORANDUM

17 January 2006

TO: G. Muloin  
Environmental Officer  
Peterborough District Office  
Eastern Region

FROM: S. Ryan  
Hydrogeologist  
Technical Support Section  
Eastern Region

RE: Stoney Lake Road Waste Disposal Site  
Lot 21 Concession IV Douro-Dummer Township (Douro)  
Certificate of Approval A340901

I have reviewed the *2004 Annual Report Stoney Lake Road Landfill* dated March 2005. The main purpose of the report and the review is to evaluate the site according to Guidelines B-7 and B-9. Based on my review I offer the following comments.

**Summary**

Based on my review I offer the following conclusions and recommendations.

- 1) Guideline B-7 Reasonable Use does not apply to the site because the landfill is closed.
- 2) Survey the location of any domestic wells in the area and determine whether they should be part of the annual monitoring program.
- 3) The extent of the leachate plume is delineated and within the monitoring well network.
- 4) The primary pathway for the leachate is from the fill area through the overburden and fractured bedrock into the adjacent wetland to the southeast.
- 5) The potential exists for surface water impacts to occur to the adjacent wetland.
- 6) The proposed groundwater monitoring program is acceptable including the recommended changes to the parameter list (removing flourene, cyanide and dissolved oxygen and adding dissolved organic carbon).
- 7) Include information on the cover and capping of the landfill in the 2005 annual report, including the restoration of monitoring wells that were buried in the cover material.
- 8) Given that groundwater discharges to surface water future reports should compare selected groundwater analytical results from key monitoring wells to PWQO.
- 9) Future annual reports should include a more detailed description of the geology and borehole logs.



June 23, 2005

Ontario Ministry of Environment  
Peterborough District Office  
Robinson Place, South Tower  
300 Water Street  
Peterborough, Ontario  
K9J 8M5

Attn: Mr. Dave Arnott  
Senior Environmental Officer

Re: Request for Clarification of Analytical Parameters  
Stoney Lake Road Waste Disposal Site, Township of Douro-Dummer  
Certificate of Approval No. A340901  
SGS Lakefield Reference No. 10058-013

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Dear Mr. Arnott:

On behalf of the Township of Douro-Dummer (Township), SGS Lakefield requests the clarification of the parameters for laboratory analysis of groundwater samples as approved in the Certificate of Approval for the Stoney Lake Waste Disposal Site. The specific parameters in question are flourene, total cyanide, and "DO" (assumed to refer to dissolved oxygen) which are listed in the approved monitoring program detailed in Schedule "B" of the Certificate of Approval dated September 11, 2003.

As neither flourene, dissolved oxygen, nor total cyanide are typical leachate indicator parameters for the analysis of groundwater, SGS Lakefield respectfully requests clarification on the requirement of these analytical parameters, and proposes that these parameters be removed from the approved monitoring program. SGS Lakefield further recommends that the parameter dissolved organic carbon be included in the approved monitoring program in place of "DO".

Lakefield Research



If you have any questions or comments regarding this request, please do not hesitate to contact the undersigned at (705) 652-2000 ext. 2058.

Best regards,

SGS LAKEFIELD RESEARCH LIMITED

Environmental Services

A handwritten signature in cursive script that reads 'Christine Wolf'.

Christine M. Wolf, B.A.Sc, EIT  
Project Technologist

CMW/njg

c.c. Dave Clifford, CAO, Township of Douro-Dummer

F:\Projects\10051-10100\10056-013 Storey Lk Rd 2005\Correspondence\Ltr to MOE re GW parameters 6-25-05.doc





Ontario

Ministry of the Environment  
Ministère de l'Environnement

CERTIFICATE OF APPROVAL  
AIR  
NUMBER 9365-5YWQFU

The Corporation of the Township of Douro-Dummer  
PO Box 92  
Warsaw, Ontario  
K0L 3A0

Site Location: Stony Lake Road Landfill  
Lot 21, Concession 4, Douro Ward  
Douro-Dummer Township, County of Peterborough

*You have applied in accordance with Section 9 of the Environmental Protection Act for approval of:*

- a passive landfill gas venting system serving a municipal landfill, consisting of four (4) vents, each having a diameter of 0.1 metre, extending 3.0 metres above grade;

all in accordance with the application for a Certificate of Approval (Air) and all supporting information dated August 21, 2003, signed by D. Clifford.

*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 works are located;

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

*This Notice must be served upon:*

The Secretary\*  
Environmental Review Tribunal

The Director  
Section 9, *Environmental Protection Act*

Page 1 - NUMBER 9365-5YWQFU

2300 Yonge St., 12th Floor  
P.O. Box 2382  
Toronto, Ontario  
M4P 1E4

AND

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](http://www.ert.gov.on.ca)

*The above noted works are approved under Section 9 of the Environmental Protection Act.*

DATED AT TORONTO this 13th day of May, 2004



Neil Parrish, P.Eng.  
Director  
Section 9, *Environmental Protection Act*

QN/

c: District Manager, MOE Peterborough  
Linda Elliott, SGS Lakefield Research Limited



Ontario

Ministry of the Environment  
Ministère de l'Environnement

AMENDED PROVISIONAL CERTIFICATE OF APPROVAL  
WASTE DISPOSAL SITE  
NUMBER A340901

The Corporation of the Township of Douro-Dummer  
894 South Street, Box 92  
Warsaw, Ontario K0L 3A0

Site Location: Stoney Lake Road Waste Disposal Site  
Lot 21, Concession 4  
Douro-Dummer Township, County of Peterborough

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

a 1.6 hectare landfill within a 4.25 hectare site

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

- (a) "Act" means the *Environmental Protection Act*, R.S.O. 1990, C.E-19, as amended;
- (b) "Buffer" means those lands between the limit of fill and the boundaries of the property owned by the Owner, that shall in no instance be less than 30 metres;
- (c) "Certificate" means this Provisional Certificate of Approval;
- (d) "Director" means Director, Environmental Assessment and Approvals Branch, Ontario Ministry of the Environment;
- (e) "District Manager" means District Manager, Peterborough District Office, Ontario Ministry of the Environment;
- (f) "Limit of Fill" means the area in which waste is approved for final disposal according to this Certificate;
- (g) "Ministry" and "MOE" means the Ontario Ministry of the Environment; and
- (h) "OWRA" means the *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, as amended;
- (i) "Owner" or "Operator" means the owner of a Site or the person responsible for managing the farming operations on a Site on behalf of the Owner;

Page 1 - NUMBER A340901



- (j) "FWQO" means the Provincial Water Quality Objectives included in the July 1994 publication entitled *Water Management Policies, Guidelines, Provincial Water Quality Objectives*, as amended from time to time;
- (k) "RUP" means the Reasonable Use Policy (Guideline B-7) of the Ministry of the Environment; and
- (l) "Site" means the 4.25 hectare property located at east half, lot 21, Concession 4, Township of Duoro-Dummer Township, County of Peterborough.

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

## TERMS AND CONDITIONS

### General

1. This Provisional Certificate of Approval supersedes and replaces Provisional Certificate Number A340901 issued September 17, 1982.
2. Except as otherwise provided by these Conditions, the Site shall be closed and maintained, and all clean-up, grading and seeding activities shall be undertaken in accordance with the Application for a Certificate of Approval for a Waste Disposal Site dated April 7, 2002, and supporting documentation, and plans and specifications listed in Schedule "A".
3. The requirements specified in this Certificate are requirements under the Act. Issuance of this Certificate in no way abrogates the Owner's legal obligations to take all reasonable steps to avoid violating other applicable provisions of this legislation and other legislation and regulations.
4. The 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 remainder of this Certificate shall not be affected in any way.
5. The Owner must ensure compliance with all terms and conditions of this Certificate. Any non-compliance constitutes a violation of the Act and is grounds for enforcement.
6. (a) The Owner shall, forthwith upon request of the Director, District Manager, or Provincial Officer (as defined in the Act), furnish any information requested by such persons with respect to compliance with this Certificate, including but not limited to, any records required to be kept under this Certificate; and



- (b) In the event the Owner provides the Ministry with information, records, documentation or notification in accordance with this Certificate (for the purposes of this condition referred to as "Information"),
- (i) the receipt of Information by the Ministry;
  - (ii) the acceptance by the Ministry of the Information's completeness or accuracy; or
  - (iii) the failure of the Ministry to prosecute the Owner, or to require the Owner to take any action, under this Certificate or any statute or regulation in relation to the Information;
- shall not be construed as an approval, excuse or justification by the Ministry of any act or omission of the Owner relating to the Information, amounting to non-compliance with this Certificate or any statute or regulation.
7. The Owner 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 OOWRA, or Section 19 or 20 of the Pesticides Act, R.S.O. 1990, as amended from time to time, of any place to which this Certificate relates; and,
  - (b) without restricting the generality of the foregoing, to:
    - (i) enter upon the premises where records required by the conditions of this Certificate are kept;
    - (ii) have access to and copy, at reasonable times, any records required by the conditions of this Certificate;
    - (iii) inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations required by the conditions of this Certificate; and
    - (iv) sample and monitor at reasonable times for the purposes of assuring compliance with the conditions of this Certificate.
8. Where there is a conflict between a provision of any document referred to in Schedule "A", and the conditions of this Certificate, the conditions in this Certificate shall take precedence. Where there is a conflict between the documents listed in Schedule "A", the document bearing the most recent date shall prevail.
9. Any information relating to this Certificate and contained in Ministry files may be made available to the public in accordance with the provisions of the *Freedom of Information and Protection of Privacy Act*, R.S.O. 1990, C. F-31.
10. All records and monitoring data required by the conditions of this Certificate must be kept on the Owner's premises for a minimum period of five (5) years from the date of their creation.



11. (a) The Owner shall notify the District Manager in writing within thirty (30) days of becoming aware of any of the following changes:
- (i) change of Owner/Operator of the Site or both; and
  - (ii) address of the new Owner or change of address.
- (b) In the event of any change in ownership of the Site, the Owner shall notify in writing the succeeding owner of the existence of this Provisional Certificate of Approval, and a copy of such notice shall be forwarded to the Director.

#### Certificate of Prohibition / Registration on Title

12. Pursuant to Section 197 of the Act, neither the Owner nor any person having an interest in the Site shall deal with the Site in any way without first giving a copy of this Certificate to each person acquiring an interest in the Site as a result of the dealing. The Owner shall:
- (a) Within sixty (60) calendar days of the date of this Certificate, submit to the Director for the Director's signature two (2) copies of a completed Certificate of Prohibition containing a registerable description of the Site, in accordance with Form 1 of O. Regulation 14/92 (Document General - Form 4 - *Land Registration Reform Act*); and
  - (a) Within ten (10) calendar days of receiving the Certificate of Prohibition signed by the Director, register the Certificate of Prohibition in the appropriate Land Registry Office on title to the Site and submit to the Director immediately following registration the duplicate registered copy.

#### Site Operations

13. The Site shall not receive waste for landfilling.
14. The Owner shall close the Site by:
- (a) removing all remaining waste from the surface of Site, including all litter accumulated outside the Limit of Fill;
  - (b) grading of the property;
  - (c) placement of final cover; and
  - (d) seeding of the cover material with vegetation as soon as practical;
- all as described in Item 2 of Schedule "A".
15. The Site closure shall be carried out in a manner which protects adjacent properties, nearby water courses and natural drainage paths from Site surface runoff.
16. (a) The Owner shall maintain the Site in a manner which ensures the health and safety of all persons and the protection of the environment through active prevention of any possible environmental adverse effects, including but not be limited to soil erosion into natural watercourses, litter, vectors and vermin.

- (b) If at any time problems such as vectors or vermin are generated at the Site, the Owner shall take appropriate, immediate remedial action to eliminate the problem.

#### Inspections

17. The Owner shall conduct Site inspections according to the following schedule:
- (a) every two (2) weeks for a six (6) month period following the application of final cover and vegetation;
  - (b) monthly for the period from six (6) to twelve (12) months following the application of final cover and vegetation;
  - (c) quarterly following one (1) year after application of final cover and vegetation; and
  - (d) at the discretion of the District Manager following two (2) years after application of final cover and vegetation.
18. The Site inspections shall consist of:
- (a) a visual inspection of
    - (i) integrity of the landfill cover;
    - (ii) buffer area and adjacent properties;
    - (iii) entrance gate and perimeter fencing;
    - (iv) monitoring wells;
    - (v) storm water system
  - (b) visual scan for evidence of leachate breakout/seepage; and
  - (c) litter pick-up
19. The Owner shall record the following information from the site inspection in a log book:
- (a) date of inspection;
  - (b) Site personnel conducting the inspection;
  - (c) areas inspected;
  - (d) deficiencies noted during the inspection;
  - (e) remedial action initiated as a result of noted deficiencies; and
  - (f) date that deficiencies were rectified.

#### Groundwater and Surface Water Monitoring

20. The Owner shall monitor groundwater and surface water according to the environmental monitoring program outlined in Schedule "B". Changes to Schedule "B" must be approved by the District Manager.
21. The Owner shall ensure that all monitoring wells which form part of any monitoring program are protected from damage. Any groundwater monitoring wells that are damaged shall be repaired, replaced forthwith or properly abandoned.



22. In the event that the results of the monitoring program show an exceedance of an indicator parameter trigger level, the Owner shall notify the District Manager as soon as reasonably possible and shall immediately conduct an investigation into the cause and the need for implementation of remedial or contingency actions in accordance with Schedule "C".

#### Annual Reports

23. By March 31 of each year, the Owner shall submit to the District Manager an annual monitoring report for the Landfill which shall include as a minimum, the following:
- (a) a drawing(s) of the Landfill indicating all groundwater and surface water monitoring locations;
  - (b) tables outlining monitoring locations, analytical parameters sampled and the frequency of sampling and measurements;
  - (c) an analysis and interpretation of the groundwater and surface water monitoring data, a review of the adequacy of the monitoring programs, conclusions of the monitoring data, and recommendations for any changes in monitoring programs that may be necessary;
  - (d) an assessment of surface water quality in respect to the PWQO; and
  - (e) an assessment of groundwater quality in relation to the Guideline and the Ontario Drinking Water Standard.
24. In the event that the results of the monitoring program are such that an off-site exceedance of the RUP, Ontario Drinking Water Standard or PWQO can reasonably be predicted to occur, the Owner shall include in the annual report:
- (a) the details of any such predicted off-site exceedance, including the assumptions upon which the prediction is based;
  - (b) a discussion of the modifications, if any, to intended operations which would be necessary to prevent the predicted off-site exceedance;
  - (c) a discussion of the modifications, if any, which should be made to the monitoring program; and
  - (d) a discussion of other mitigation measures or contingency actions, if any, which may be necessary to prevent off-site impacts.



Schedule "A"

*This Schedule "A" forms part of this Provisional Certificate of Approval.*

1. Application for a Provisional Certificate of Approval for a Waste Disposal Site signed by Mr. David Clifford, C.A.O. Clerk-Treasurer, Township of Douro-Dummer, dated April 07, 2002.
2. Closure Plan, Stoney Lake Road (North) Waste Disposal Site, prepared by Lakefield Research Limited, dated September 2000.
3. Township of Douro-Dummer, Report Addendum, prepared by Lakefield Research Limited, dated March 31, 2003.
4. Transfer/Deed of Land for Part of Lot 21, Concession 4, designated as Parts 1 & 2, Plan 45R-10681, dated February 27, 1996.
5. Memo from B.W. Metcalf, MOE, Water Resources Unit - Surface Water, Technical Support Section, Eastern Region, Re: Closure Plan review comments, dated March 19, 2001.
6. Memo from S. Ryan, MOE, Technical Support Section, Eastern Region, Re: Closure Plan review comments, dated June 13, 2001.

## Schedule "B"

### Groundwater Monitoring Program

Sampling Location	Parameters	Frequency
Short Suite Monitoring Wells: TW1-1, TW1-2, TW2-1, TW2-2, TW3-1, TW3-2, TW4-1, TW4-2, TW5-1, TW5-2	water level, pH, alkalinity, ammonia (Total), BOD, COD, calcium, chloride, conductivity, hardness, iron, magnesium, manganese, nitrate, nitrite, pH, potassium, sodium, TDS, TKN, TOC	semi-annual basis (spring and fall)
Extended Suite Monitoring Wells: TW6-1, TW6-2, TW7-1, TW7-2, TW8-2, TW9-1, TW9-2	short suite parameters plus: arsenic, barium, boron, chromium, DO, fluorene, lead, mercury, phenols, selenium, total cyanide, unionized ammonia, zinc	semi-annual basis (spring and fall)
VOC Monitoring Wells: TW2-2, TW6-2	In addition to the above noted parameters, these wells will also be analyzed for VOCs	semi-annual basis (spring and fall)

### Surface Water Monitoring Program

Sampling Location	Parameters	Frequency
SW1, SW3, SW4, SW8	pH, conductivity, dissolved oxygen, temperature, velocity, alkalinity, chloride, conductivity, iron, manganese, phenols	three times per year (spring runoff, low flow period and late fall flow period)

### Landfill Gas Monitoring

Sampling Location	Parameters	Frequency
TW-1, TW-2, TW-3, TW-4, TW-5	methane	semi-annually concurrent with groundwater sampling

DATE: 8/17/2009 10:00:01

Schedule "C"  
Contingency Plan

Tier I - "Alert"

If the downstream concentration of any of the defined trigger mechanism parameters exceeds the 75th percentile of the upstream results in a given sampling year, then the trigger is activated. If the exceedance occurs three sampling events in a row, then Tier II is activated.

Tier II - "Confirmation"

Sampling shall be conducted on a monthly basis for three (3) months. If the exceedance is confirmed, the Owner shall initiate discussion with the MOE to define the optimum course of remedial action with six (6) months of the activation of the Tier II trigger.

Tier II - "Compliance"

Implementation of the remedial actions as agreed upon with the MOE.



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

*The reason for Conditions 1, 3, 4, 5, 8, 9, 10 and 11 is to clarify the legal responsibilities and obligations imposed by this Provisional Certificate of Approval.*

*The reason for Condition 2 is to ensure that this Site is closed in accordance with the application submitted by the Owner, and not in a manner which the Director has not been asked to consider.*

*The reason for Conditions 6 and 7 is to ensure that appropriate Ministry staff have ready access to the Site in order to confirm that the Site has been closed and post-closure monitoring is undertaken according to this Certificate. The condition is supplementary to the powers afforded a Provincial Officer pursuant to the Act, the OWRA, and the Pesticides Act, as amended.*

*The reason for the Condition 12 is to prohibit any use being made of the lands after they cease to be used for waste disposal purposes within a period of twenty-five years from the year in which such land ceased to be used unless the approval of the Minister for the proposed use has been given. The purpose of this prohibition is to protect future occupants of the Site and the environment from any hazards which might occur as a result of waste being disposed of on the site. This prohibition and potential hazard should be drawn to the attention of future owners and occupants by the Certificate being registered on title.*

*The reason for Condition 13 is to clarify that the Owner is prohibited from depositing any additional waste on this Site.*

*The reason for Conditions 14, 15, 16, 17, 18, 19, 20, 21, 22 and 23 is to ensure that the Site is operated in a manner which does not result in a nuisance or a hazard to the health and safety of the environment or people.*

*This Provisional Certificate of Approval revokes and replaces Certificate(s) of Approval No. A340901 issued on September 17, 1982*

*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

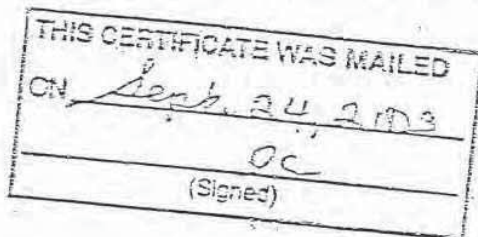
AND

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](http://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 11th day of September, 2003



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

VZ/

c: District Manager, MOE Peterborough  
Linda Elliot, SGS Lakefield Research Limited ✓



MEMORANDUM

July 30, 2014

TO: Chris Johnston  
Senior Environmental Officer  
Peterborough District Office  
Eastern Region

FROM: Greg Faaren  
Hydrogeologist  
Technical Support Section  
Eastern Region

RE: Stoney Lake Road Waste Disposal Site, 2013 Monitoring Report  
Lot 21, Concession IV, Geographic Region of Duoro  
Township of Duoro-Dummer, County of Peterborough, A340901

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Purpose

I have reviewed the hydrogeologically pertinent sections of the document entitled "2013 Groundwater Monitoring Report, Stoney Lake Road Transfer Station, Township of Douro-Dummer, County of Peterborough, Project No. G024388 E1" dated March 2014 and prepared by Geo-Logic Inc. (GLI). This report was provided on behalf of Township of Douro-Dummer to fulfill the requirements of the Provisional Environmental Compliance Approval (ECA) for the site. I offer the following comments for your consideration.

Summary

- The Stoney Lake Road waste disposal site was closed in 2003 and final cover was applied to the waste mound in 2005. The site is currently operated as a waste transfer station.
- The Ministry applies Guideline B-7 Reasonable Use to all operating waste disposal sites, and sites that closed post 1986. Therefore Guideline B-7 is applicable to the Stoney Lake Road waste disposal site. GLI did not complete a Guideline B-7 Reasonable Use assessment as part of the 2013 annual monitoring report. A Reasonable Use assessment should be conducted as part of each annual report.
- GLI reports that several exceedances of the Ontario Drinking Water Quality Standards, Objectives and Guidelines (ODWSOG) were in the downgradient monitoring wells at the site in 2013. As such, the site is not in conformance with Guideline B-7. It is recommended that additional investigations be conducted to determine the extent of the leachate plume. Consideration should also be given to acquiring lands for a Contamination Attenuation Zone (CAZ) to the east of the landfill.



- The primary pathway for leachate migration is within the overburden and shallow bedrock to the east and southeast of the waste mound. Leachate impacted groundwater flows to the east from the waste mound, and is likely discharging to Lyon's Creek. The extent of the leachate plume is not delineated. It is recommended that additional monitoring wells be installed downgradient of the waste mound to better assess the quality of the groundwater immediately prior to discharging to Lyon's Creek. It is also recommended that groundwater in these wells be analyzed for the same suite of parameters as the surface water samples and with detection limits commensurate with the Provincial Water Quality Objectives (PWQO).
- GLI reports that methane was detected at monitoring well TW4-1. GLI reports that methane was not detected in the remaining monitoring wells. It is my understanding that passive landfill gas vents have been installed at the site; however the location of the vents were not provided in the report. It is also unknown if any landfill gas monitoring was conducted at the vents. The locations of the methane vents should be shown on the attached site plan and any monitoring data from the vents should be included as part of the annual report.
- Methane monitoring was not conducted in the on-site building. Given the concentrations of methane observed in some of the on-site monitoring wells, methane monitoring should be conducted in the on-site building.
- GLI indicates that there are some potential issues with the elevations of some of the monitoring wells. As such, GLI recommends that all of the wells at the site be surveyed by a licensed surveyor in 2014. I have no objections to this recommendation.
- GLI notes that as the background well TW8-2 has been repeatedly dry, a new background well is to be established at the site in 2014. I have no objections to this recommendation.
- It is recommended that historical groundwater sampling data and methane monitoring data be included as part of each annual report. The data should be provided in both hard copy and electronic format as well. It is also recommended that detailed trend analysis be conducted on the data as part of each annual report.
- It is recommended that additional hydrogeological information such as hydraulic conductivities and horizontal hydraulic gradients be provided as part of each annual monitoring report. Details regarding the type of material used to cap the landfill must also be provided.
- It is recommended that the figures provided in the report include the limits of the landfill site boundaries to better show the location of the site with respect to the monitoring well network and nearby site features.
- GLI recommends sampling the groundwater from all monitoring wells two (2) times per year for the parameters listed in Column 1 and 2 of Schedule 5 of the Landfill Standards Guideline (MOE, 1998) and the parameters listed in the ECA for the site. The reporting frequency is to be annual. I have no objections to this recommendation.

- As per the MOE's November 2010 Monitoring and Reporting for Waste Disposal Sites Technical Guidance Document, a Monitoring and Screening checklist is to be submitted with all 2011 annual monitoring reports. In reviewing the Stoney Lake Road waste disposal site report, it is noted that the checklist was not included. It is recommended that the 2014 report, and all subsequent future reports include a completed and signed checklist.

#### Environmental Compliance Approval (ECA)

The Stoney Lake Road waste disposal site previously operated under Provisional ECA A341004, however, the site stopped accepting waste in 2003 and began closure activities at that time. Final capping was reportedly completed in 2005. The site is located in Lot 21, Concession IV, Geographic Region of Duoro, Township of Douro-Dummer. The site is licensed for a 1.6 ha landfill within a 4.25 ha site. A groundwater monitoring program was implemented for the site as part of the post closure plan. The site currently operates as a waste transfer station.

According to MOE's November 2010 Monitoring and Reporting for Waste Disposal Sites Technical Guidance Document, and as communicated by the ministry (through webinars and information distributed in coordination with the Ontario Waste Management Association both last year and earlier this year), a Monitoring and Screening checklist is to be submitted with all annual monitoring reports, commencing in 2011. In reviewing the Stoney Lake Road waste disposal site report, it is noted that the checklist was included but was not completed or signed.

#### Geology

The consultants previously described the geology of the site as:

- A sand till unit;
- A silt to clay unit; and
- A limestone bedrock unit (Trenton-Black River Group).

The depth of overburden at the site is variable but is typically less than 5 m in thickness.

#### Hydrogeology

GLI provides limited information regarding the physical hydrogeological characteristics of the site. GLI reports that groundwater flow occurs within the deeper overburden and shallow fractured bedrock. Groundwater flows to the east to southeast towards a local wetland. No information regarding the horizontal hydraulic gradients or hydraulic conductivities on-site was provided in the report.

GLI reports that there are currently fifteen (15) nested monitoring wells at the site, however in 2013 groundwater samples were unable to be collected from wells TW-3-2, TW-4-2, TW-8-1 and TW-8-2.

GLI indicates that there are some potential issues with the elevations of some of the monitoring wells. As such, GLI recommends that all of the wells at the site be surveyed by a licensed surveyor in 2014. GLI also notes that as the background wells TW8-2 has been repeatedly dry, a new background well is to be established at the site in 2014.



#### Background Water Quality

GLI has used monitoring wells TW8-1 and TW8-2 to represent background water quality for the site. These monitoring wells are located hydraulically upgradient of the waste piles and are considered representative of background conditions. GLI reports that groundwater samples were unable to be collected from wells TW8-1 and TW8-2 in 2013 as these wells were dry.

#### Leachate

GLI reports that monitoring wells TW2-2, TW3-1 and TW4-1 are showing elevated concentrations of several leachate indicator parameters. GLI reports that concentrations of one (1) or more of hardness, iron, manganese and dissolved organic carbon (DOC) exceeded the ODWSOG on at least one (1) occasion in 2013 from wells TW2-2, TW3-1 and TW4-1.

#### Downgradient Water Quality

The primary pathway for leachate migration is inferred to be within the deeper overburden and shallow bedrock in a northeasterly direction. GLI reports that concentrations of one (1) or more of alkalinity, DOC, iron, total dissolved solids (TDS) and manganese exceeded the ODWSOG on at least one (1) occasion in 2013 in monitoring wells TW5-1, TW5-2, TW6-1, TW6-2, TW7-2, TW9-1 and TW9-2. It is noted that monitoring wells TW6-1, TW6-2 and TW7-2 are located at the downgradient property boundary. The extent of the impacts beyond wells TW6-1, TW6-2 and TW7-2 is not known.

It is noted that historical data and trend analysis of the historical and current data were not provided in the report. Trend analysis is required to determine if concentrations of contaminants at this site are decreasing following capping of the landfill.

The results of the volatile organic compound (VOC) analyses conducted on the samples from the monitoring wells indicated that no VOCs were observed in any downgradient monitoring wells during the 2013 sampling events. As such, GLI reports that there were no exceedances of the ODWSOG for VOC parameters.

#### Groundwater/Surface Water Interaction

The site plans provided by GLI indicate that Lyon's Creek is located off-site to the northeast, east and southeast of the waste mound. GLI reports that groundwater flows towards Lyon's Creek. Therefore there is the potential that shallow groundwater discharges to the creek. The downgradient monitoring wells are showing leachate impacts and therefore there is the potential for groundwater to impact nearby surface water features.

#### Potable Groundwater Sampling

GLI indicates that there are no potable water wells located immediately downgradient of the landfill. There are also no water supply wells located between the landfill and Lyon's Creek. Therefore no residential water wells were sampled as part of the monitoring program.

#### Guideline B-7 Reasonable Use

GLI has not conducted a Reasonable Use assessment as previous MOE review comments dated January 17, 2006 indicated that Guideline B-9 was applicable to this site. Current Ministry policy indicates that Guideline B-7 applies to operating waste disposal sites and to site closed post 1986. Therefore Guideline B-7 Reasonable Use is applicable to the site. The data provided by GLI shows that several downgradient monitoring wells are showing leachate impacts at concentrations above the ODWSOG. Therefore the site is not in conformance with Guideline B-7.

#### Trigger Mechanisms/Contingency Plans

GLI indicates that groundwater is likely discharging to Lyon's Creek located to the northeast, east and southeast of the site. As such, GLI has provided trigger mechanisms and contingency plans based on surface water issues.

#### Final Cover

The landfill site was closed in 2003. Final capping of the landfill was completed in 2005, however details of the materials used for the capping were not provided.

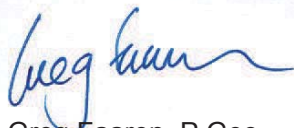
#### Landfill Gas Monitoring

Monitoring of the landfill gases generated at this site is conducted twice per year (i.e. spring and fall) by GLI. GLI reports that methane monitoring was conducted at the accessible monitoring wells. GLI reports that methane was detected at monitoring well TW4-2 (5 and 10 % by volume for the spring and fall monitoring events, respectively). GLI reports that methane was not detected in the remaining monitoring wells. However, it is noted that monitoring wells are not ideally suited for landfill gas monitoring.

It is my understanding that passive gas vents were previously installed at the site. However, the locations of these vents were not shown on the site plan provided. It is also unknown if methane monitoring was conducted at these vents. I also note that GLI does not indicate if methane monitoring was conducted in the on-site building.

#### Groundwater Monitoring

GLI recommends sampling the groundwater from all monitoring wells two (2) times per year (i.e. spring and fall) for the parameters listed in Column 1 and 2 of Schedule 5 of the Landfill Standards Guideline (MOE, 1998) and the parameters listed in the ECA for the site. The reporting frequency is to be annual.



Greg Faaren, P.Geo.  
GF/gl

c: Laurel Rudd  
File No. GW PB DD C4 01 03 (A340901)  
GF/IDS# 6346-9AYLHZ / 1783-9KHR4Z

ec: Gillian Dagg-Foster  
Jim Martherus

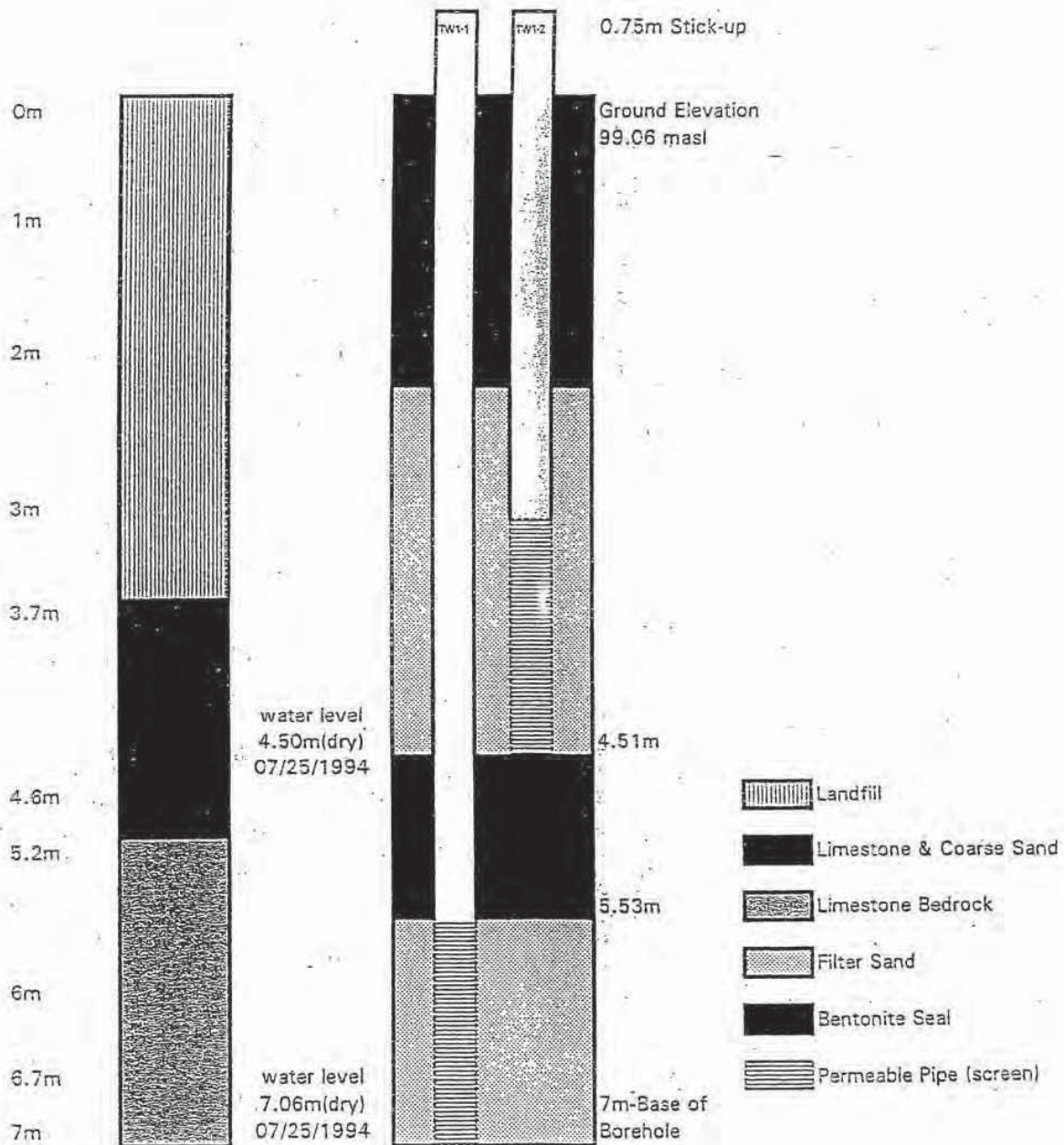
## Appendix B

### Monitoring Well Details and Borehole Data

Well Log and As-Built Diagrams for TW1 @Stoney Lake Road Landfill (Douro North)

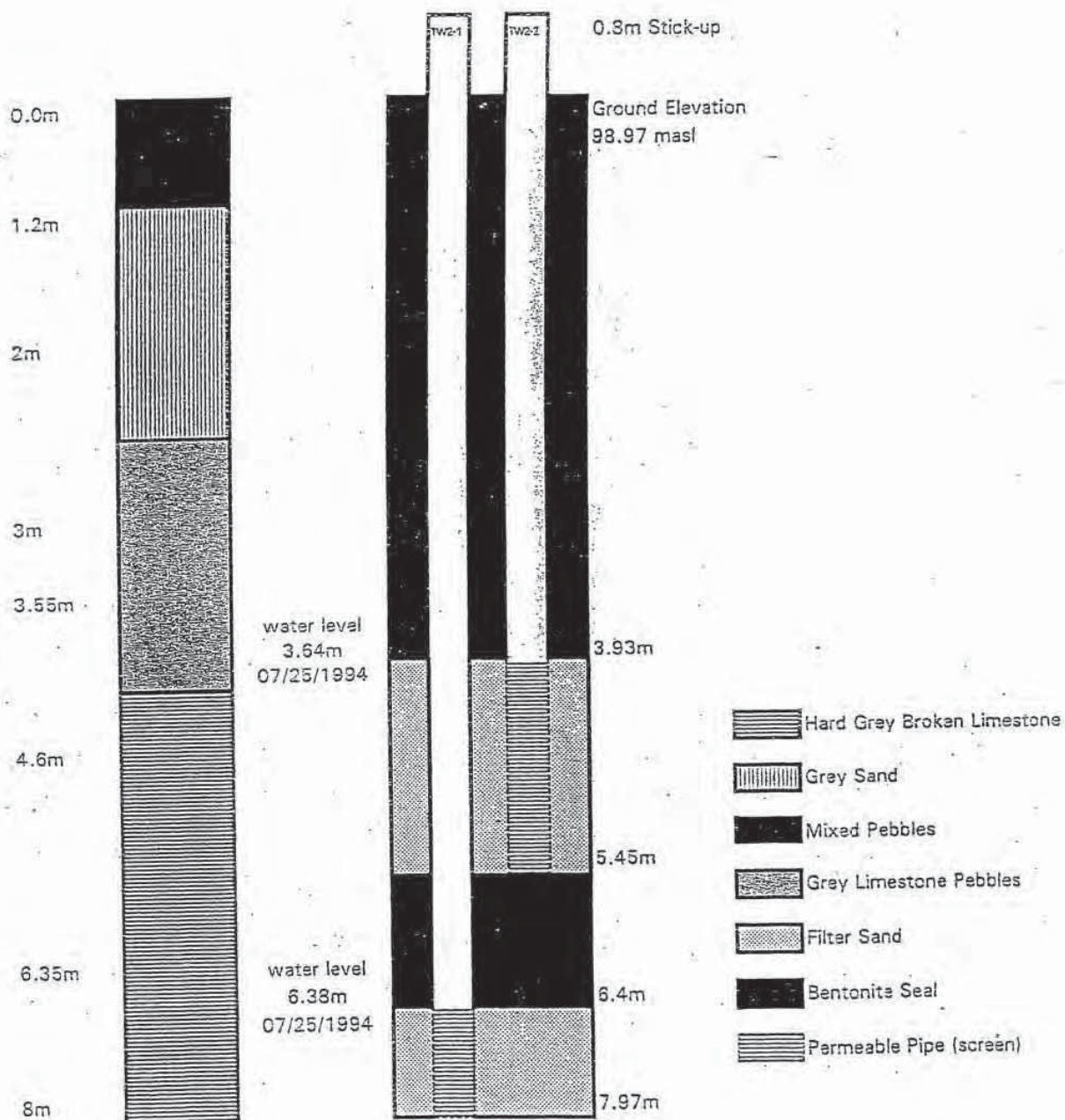
7777-096

Date Drilled: July 21 1994



Not to Scale

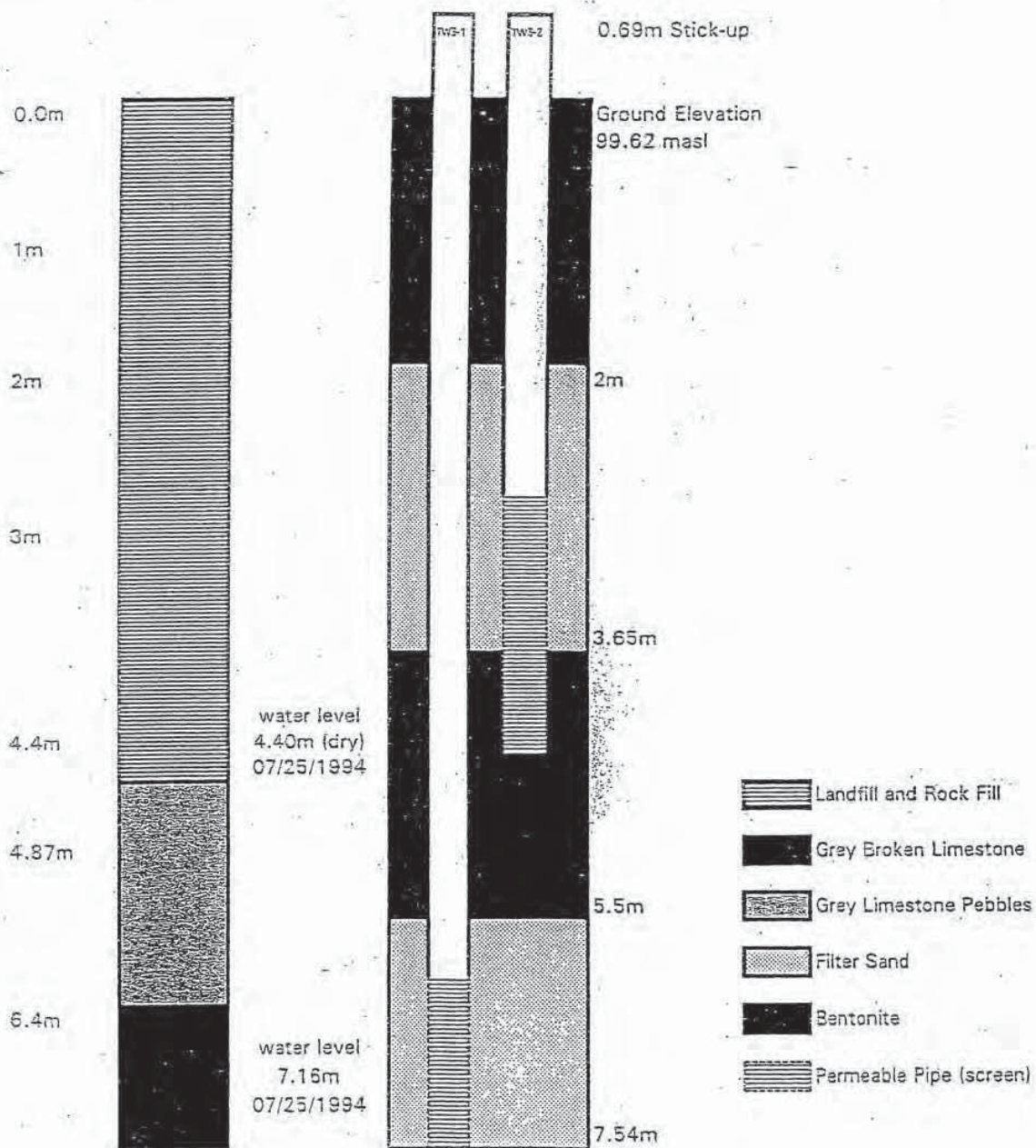
Well Log and As-Built Diagrams for TW2 @Stoney Lake Road Landfill (Douro North)  
 7777-096  
 Date Drilled: July 21 1994



Not to Scale

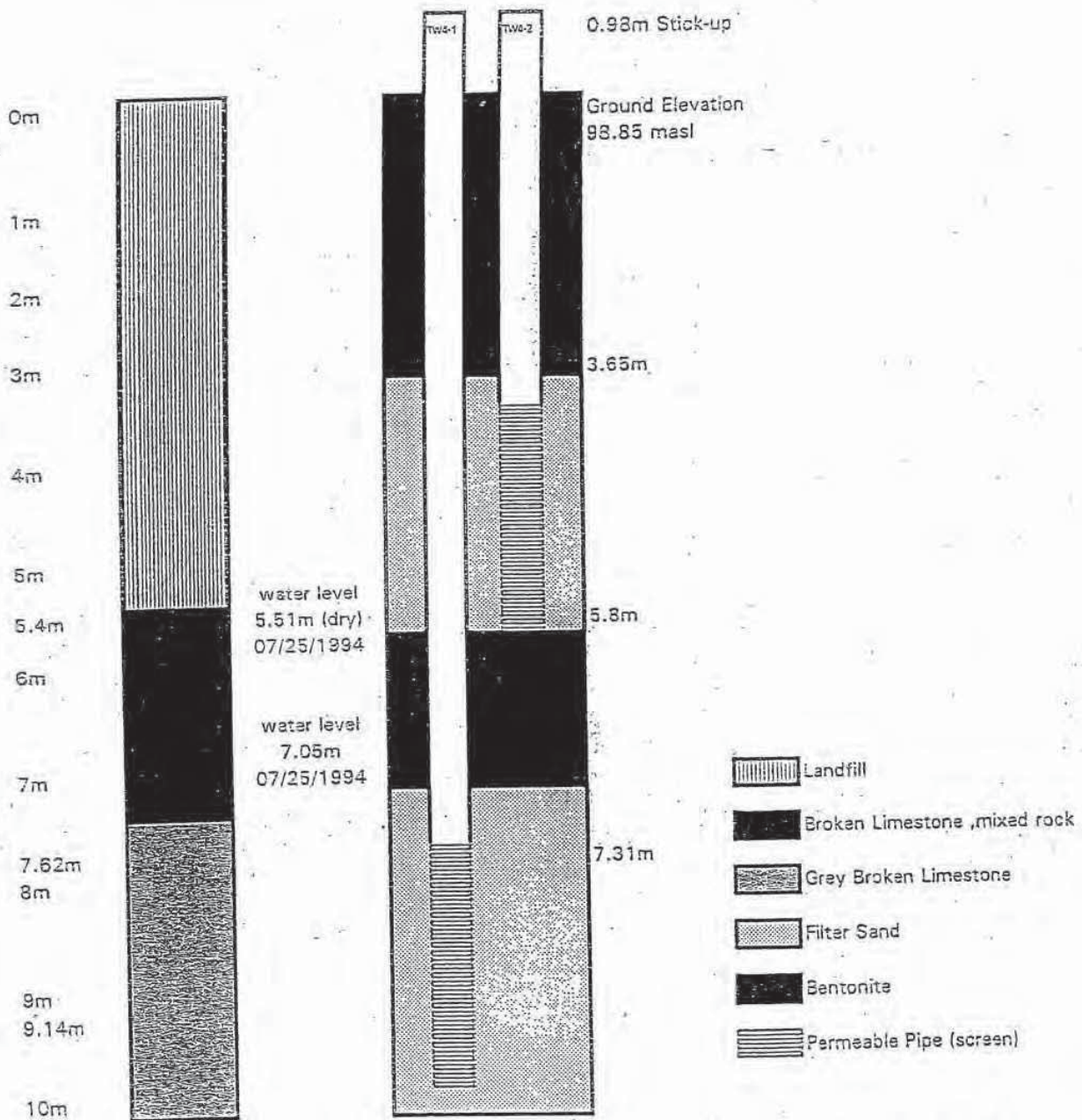


Well Log and As-Built Diagrams for TW3 @Stoney Lake Road Landfill (Douro North)  
 7777-096  
 Date Drilled: July 21 1994



Not to Scale

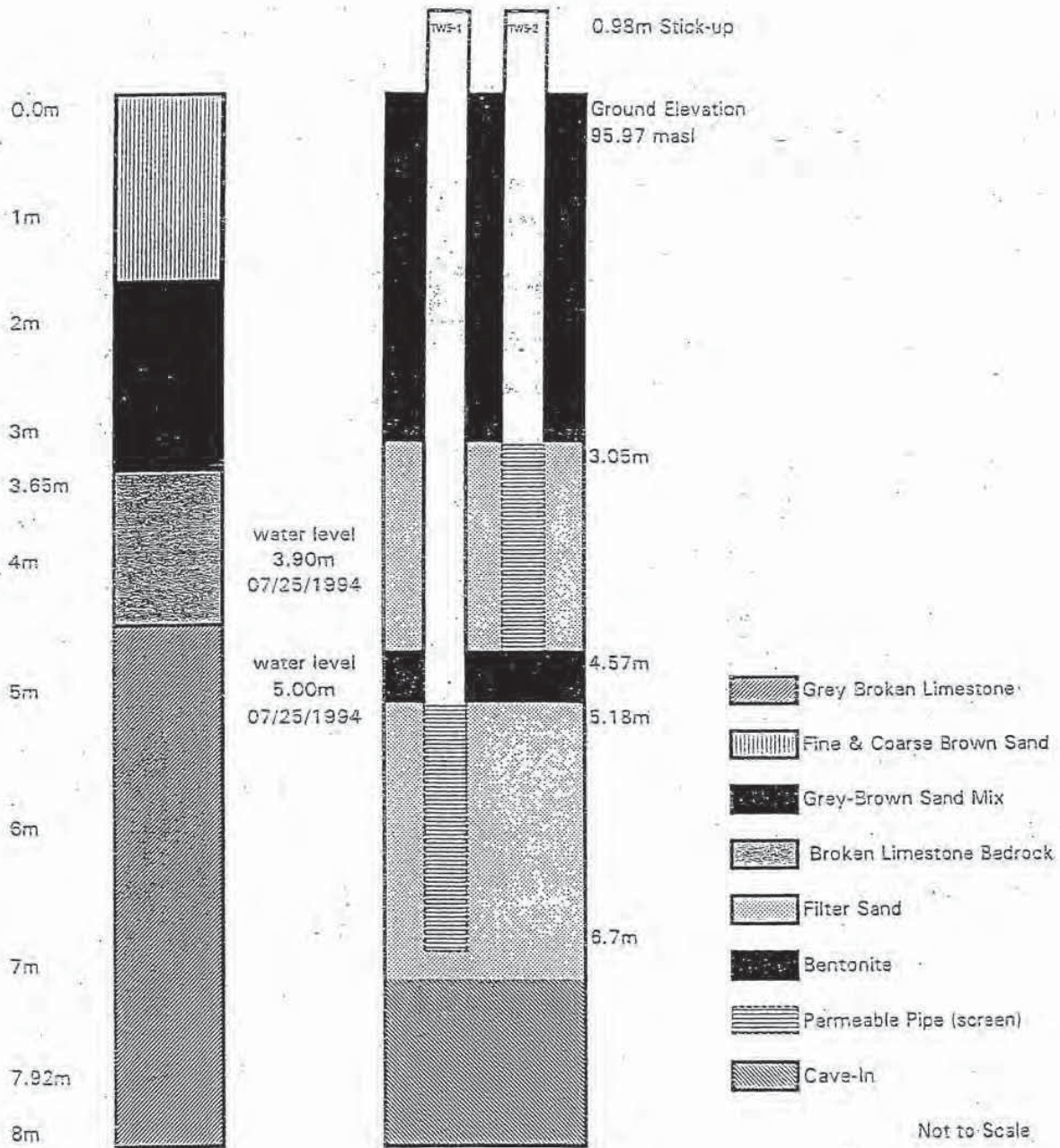
Well Log and As-Built Diagrams for TW4 @Stoney Lake Road Landfill (Douro North)  
 7777-096  
 Date Drilled: July 21 1994



Not to Scale



Well Log and As-Built Diagrams for TW5 @Stoney Lake Road Landfill (Douro North)  
 7777-096  
 Date Drilled: July 21 1994



<b>BOREHOLE LOG</b> # TW 5-1		PROJECT NAME DOURO NORTH LANDFILL SITE		LOGGED BY D. BUCHOLTZ	
DRILLING METHOD AUGERS		PROJECT No 7777-226	DATE DRILLED NOV 18, 1995	ELEVATION 95.258	SCALE NTS

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE TYPE	N VALUE	COMMENTS
0			protective locking casing			Stick-up is 0.86m
1		Organic	cement			Water measurement taken after completion of well installation
2		SAND loose brown	bentonite			Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
3			native fill			
4		BEDROCK fractured limestone	bentonite			Protective casing with lock was installed and cemented in place.
5			filter sand			1 1/4" PVC schedule 80 pipe and screen was installed.
6						Screen is 5' (1.52m) in length.
7						
8						
9						5.13m bottom of hole
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						

**LAKEFIELD  
RESEARCH  
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ENVIRONMENTAL SERVICES

185 CONCESSION STREET  
LAKEFIELD, ONTARIO, CANADA  
21, 1st AVENUE  
SCHUMACHER, ONTARIO, CANADA



<b>BOREHOLE LOG</b> # TW 6-2		<b>PROJECT NAME</b> DOURO NORTH LANDFILL SITE		<b>LOGGED BY</b> D. BUCHOLTZ	
<b>DRILLING METHOD</b> AUGERS		<b>PROJECT No</b> 7777-226	<b>DATE DRILLED</b> NOV 17, 1995	<b>ELEVATION</b> 95.024	<b>SCALE</b> NTS

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE		COMMENTS
				TYPE	N VALUE	
0			protective locking casing			Stick-up is 0.87m
1		Organic	cement bentonite			Water measurement taken after completion of well installation
2		SAND loose brown				Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
3			native fill			
4		BEDROCK fractured limestone				Protective casing with lock was installed and cemented in place.
5						2" PVC schedule 80 pipe and screen was installed.
6						Screen is 5' (1.52m) in length.
7						
8						
9						3.35m bottom of hole
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						

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21, 1st AVENUE  
SCHUMACHER, ONTARIO, CANADA



<b>BOREHOLE LOG</b> # TW 7-1		<b>PROJECT NAME</b> DOURO NORTH LANDFILL SITE		<b>LOGGED BY</b> D. BUCHOLTZ	
<b>DRILLING METHOD</b> AUGERS		<b>PROJECT No</b> 7777-225	<b>DATE DRILLED</b> NOV 20, 1995	<b>ELEVATION</b> 94.315	<b>SCALE</b> NTS

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE		COMMENTS
				TYPE	N VALUE	
0			protective locking casing			Stick-up is 0.92m
1		Organic SAND dark brown with Organics	cement bentonite			Water measurement taken after completion of well installation
2		Silt compact grey				Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
3		SAND grey wet loose				Protective casing with lock was installed and cemented in place.
4			native fill			1 1/4" PVC schedule 80 pipe and screen was installed.
5						Screen is 5' (1.52m) in length.
6		BEDROCK fractured limestone	bentonite			
7						
8			filter sand			
9						9.25m bottom of hole
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						


**LAKEFIELD  
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LAKEFIELD, ONTARIO, CANADA  
21, 1st AVENUE  
SCHUMACHER, ONTARIO, CANADA




<b>BOREHOLE LOG</b>		# TW 7-2	PROJECT NAME DOURO NORTH LANDFILL SITE		LOGGED BY D. BUCHOLTZ	
DRILLING METHOD AUGERS			PROJECT No 7777-226	DATE DRILLED NOV 20, 1995	ELEVATION 94.395	SCALE NTS

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS		SAMPLE TYPE   VALUE		COMMENTS
			protective locking casing				Stick-up is 1.02m
0		Organic	cement				Water measurement taken after completion of well installation
1		SAND dark brown with Organics	bentonite				Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
2		Silt compact grey					
3		SAND grey wet loose	filter sand				Protective casing with lock was installed and cemented in place.
4							2" PVC schedule 80 pipe and screen was installed.
5							Screen is 5' (1.52m) in length.
6		BEDROCK fractured limestone					4.27m bottom of hole
7							
8							
9							
10							
11							
12							
13							
14							
15							
16							
17							
18							
19							



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135 CONCESSION STREET  
LAKEFIELD, ONTARIO, CANADA

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<b>BOREHOLE LOG</b> # TW 8-1		PROJECT NAME DOURO NORTH LANDFILL SITE		LOGGED BY D. BUCHOLTZ	
DRILLING METHOD AUGERS		PROJECT No 7777-226	DATE DRILLED NOV 30, 1995	ELEVATION 100.094	SCALE NTS

DEPTH METERS	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE TYPE	COMMENTS
0		Organic	protective locking casing		Stick-up is 1.33m
1		CLAY dark brown	cement bentonite		Water measurement taken after completion of well installation
2		SAND grey with GRAVEL	native fill		Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
3			bentonite		Protective casing with lock was installed and cemented in place.
4					
5			native fill		1 1/4" PVC schedule 80 pipe and screen was installed.
6		BEDROCK fractured limestone			Screen is 5' (1.52m) in length.
7					
8			bentonite		
9					10.97m bottom of hole
10			filter sand		
11					
12					
13					
14					
15					
16					
17					
18					
19					

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ENVIRONMENTAL SERVICES

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<b>BOREHOLE LOG</b> # TW 8-2		<b>PROJECT NAME</b> DOURO NORTH LANDFILL SITE		<b>LOGGED BY</b> D. BUCHOLTZ	
<b>DRILLING METHOD</b> AUGERS		<b>PROJECT No</b> 7777-226	<b>DATE DRILLED</b> NOV. 30, 1995	<b>ELEVATION</b> 100.094	<b>SCALE</b> NTS

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS	SAMPLE		COMMENTS
				TYPE	VALUE	
0			protective locking casing			Stick-up is 1.33m
1		Organic	cement bentonite			Water measurement taken after completion of well installation
2		CLAY dark brown				Wells were dedicated at completion of drilling with Waterra tubing and foot valves.
3		SAND grey with GRAVEL				Protective casing with lock was installed and cemented in place.
4			native fill			2" PVC schedule 80 pipe and screen was installed.
5						Screen is 5' (1.52m) in length.
6		BEDROCK fractured limestone	bentonite			4.32m bottom of hole
7			filter sand			
8						
9						
10						
11						
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17						
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<b>BOREHOLE LOG</b> # <b>BH9-1</b>		<b>PROJECT NAME</b> TOWNSHIP OF DOURO STONEY LAKE ROAD LANDFILL		<b>LOGGED BY</b> D. BUCHOLTZ LAKEFIELD RESEARCH LIMITED	
<b>DRILLING METHOD</b> HOLLOW STEM AUGER		<b>PROJECT No</b> 7777-371	<b>DATE DRILLED</b> AUGUST 19, 1997	<b>GROUND ELEV.</b> N/A	<b>SCALE</b> NTS

DEPTH METERS	STRATIGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS		SAMPLE		COMMENTS
			PROTECTIVE CASING		TYPE	N VALUE	
0			CEMENT				Drilling commenced 08:00hrs, Aug 19/97  Well instrumented with dedicated inertic pump upon completion.  TW9-1 has 50MM PVC Schedule 40 riser pipe and 1.52m No.10 slotted screen
1		ORGANIC, overburden					
2		SILT, till, grey, wet	BENTONITE				
3							
4							
5							
6		BEDROCK, limestone					
7							
8			SILCA SAND				Water was encountered @ 8.84m (29ft) below grade.  Bottom of hole at 9.60m (31.5ft) below grade.
9							



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<b>BOREHOLE LOG</b> # <b>BH9-2</b>		<b>PROJECT NAME</b> TOWNSHIP OF DOURU STONEY LAKE ROAD LANDFILL		<b>LOGGED BY</b> D. BUCHOLTZ LAKEFIELD RESEARCH LIMITED	
<b>DRILLING METHOD</b> HOLLOW STEM AUGER		<b>PROJECT No</b> 7777-371	<b>DATE DRILLED</b> AUGUST 19, 1997	<b>GROUND ELEV.</b> N/A	<b>SCALE</b> NTS

DEPTH METERS	STRAT- IGRAPHY	STRATIGRAPHIC DESCRIPTION	CONSTRUCTION DETAILS		SAMPLE		COMMENTS
			TYPE	N VALUE	TYPE	VALUE	
0			PROTECTIVE CASING				Drilling commenced 13:30hrs. Aug 19/97  Well instrumented with dedicated inertia pump upon completion.  TW9-2 has 50MM PVC Schedule 40 riser pipe and 1.52m No.10 slotted screen  Water was encountered @ 1.83m (6ft) below grade.  Bottom of hole at 3.51m (11.5ft) below grade.
1		ORGANIC, overburden	CEMENT				
2		SILT, till, grey, wet	SILCA SAND				
3			BENTONITE				
4							
5							
6		BEDROCK, limestone					
7							
8							
9							



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195 CONCESSION STREET  
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**Well Owner's Information**

First Name <i>Clifford</i>	Last Name / Organization <i>Dave Clifford Township of Douro-Dummer</i>	E-mail Address	<input type="checkbox"/> Well Constructed by Well Owner
Mailing Address (Street Number/Name) <i>894 Smith Street</i>	Municipality <i>Warsaw</i>	Province <i>ON</i>	Postal Code <i>K0L3A0</i>
Telephone No. (inc. area code)			

**Well Location**

Address of Well Location (Street Number/Name) <i>348 County Rd 6</i>	Township	Lot	Concession
County/District/Municipality	City/Town/Village <i>Youngs Point</i>	Province <b>Ontario</b>	Postal Code
UTM Coordinates Zone <i>17N</i> Easting <i>720906</i> Northing <i>4926628</i>	Municipal Plan and Sublot Number	Other	

**Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)**

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft)
				From To
<i>BW</i>	<i>CL</i>	<i>GRAVEL</i>	<i>LOOSE</i>	0 1
<i>BN</i>	<i>SILT</i>	<i>CLAY</i>	<i>SOFT</i>	1 6
<i>Gly</i>	<i>CLAY</i>	<i>SILT</i>	<i>SOFT</i>	6 7
<i>BLK</i>	<i>FILL</i>			7 11

Annular Space			Results of Well Yield Testing			
Depth Set at (m/ft)	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)	Draw Down		Recovery	
From To			Time (min)	Water Level (m/ft)	Time (min)	Water Level (m/ft)
<i>0 5</i>	<i>PERMANENT</i>		Static Level			
<i>5 11</i>	<i>SPUD</i>		1		1	
			2		2	
			3		3	
			4		4	
			5		5	
			10		10	
			15		15	
			20		20	
			25		25	
			30		30	
			40		40	
			50		50	
			60		60	

Method of Construction	Well Use
<input type="checkbox"/> Cable Tool <input type="checkbox"/> Rotary (Conventional) <input type="checkbox"/> Rotary (Reverse) <input type="checkbox"/> Boring <input type="checkbox"/> Air percussion <input type="checkbox"/> Other, specify <i>Auger</i>	<input type="checkbox"/> Public <input type="checkbox"/> Domestic <input type="checkbox"/> Livestock <input type="checkbox"/> Irrigation <input type="checkbox"/> Industrial <input type="checkbox"/> Other, specify _____
<input type="checkbox"/> Diamond <input type="checkbox"/> Jetting <input type="checkbox"/> Driving <input type="checkbox"/> Digging	<input type="checkbox"/> Commercial <input type="checkbox"/> Municipal <input checked="" type="checkbox"/> Test Hole <input type="checkbox"/> Cooling & Air Conditioning <input type="checkbox"/> Not used <input type="checkbox"/> Dewatering <input type="checkbox"/> Monitoring

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft)		
			From To		
	<i>PLASTIC</i>		<i>10 6</i>	<input type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input checked="" type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input checked="" type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____	

Construction Record - Screen				Status of Well	
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft)		
			From To		
<i>2</i>	<i>PLASTIC</i>	<i>10</i>	<i>6 11</i>		

Water Details		Hole Diameter	
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	Depth (m/ft)	Diameter (cm/in)
		From To	
		<i>0 11</i>	<i>6</i>

Well Contractor and Well Technician Information			
Business Name of Well Contractor <i>Strata Soil Sampling</i>	Well Contractor's Licence No. <i>71741</i>		
Business Address (Street Number/Name) <i>165 Shields Court</i>	Municipality <i>Markham</i>		
Province <i>ON</i>	Postal Code <i>L3R 9U2</i>	Business E-mail Address	

Bus. Telephone No. (inc. area code) <i>(905) 940-7919</i>	Name of Well Technician (Last Name, First Name) <i>Baronette Thie</i>	Well Technician's Licence No. <i>9716</i>	Signature of Technician and/or Contractor <i>[Signature]</i>	Date Submitted <i>2015 01 23</i>
--	--	--	---	-------------------------------------

Map of Well Location			
Please provide a map below following instructions on the back.			
<i>SEE ATTACHED MAP (NW5)</i>			
Comments:			

Ministry Use Only	
Audit No. <i>200301</i>	Received
Date Package Delivered	Date Work Completed
<i>2014 12 12</i>	<i>2014 12 12</i>
Well owner's information package delivered <input type="checkbox"/> Yes <input type="checkbox"/> No	

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**Well Owner's Information**

First Name <b>Steve</b>	Last Name / Organization <b>Dave Clifford Township of Douro-Dummer</b>	E-mail Address	<input type="checkbox"/> Well Constructed by Well Owner
Mailing Address (Street Number/Name) <b>894 Smith Street</b>	Municipality <b>Narsaw</b>	Province <b>ON</b>	Postal Code <b>K101L3A10</b>
Telephone No. (inc. area code)			

**Well Location**

Address of Well Location (Street Number/Name) <b>348 Country Rd 6</b>	Township	Lot	Concession
County/District/Municipality	City/Town/Village <b>Vank's Point</b>	Province <b>Ontario</b>	Postal Code
UTM Coordinates NAD 83 <b>17 720 761 492 6788</b>	Municipal Plan and Sublot Number		Other

**Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)**

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	To
<b>Brown</b>	<b>Top Soil</b>		<b>Loose</b>	<b>0</b>	<b>2</b>
<b>Brown</b>	<b>Soil</b>	<b>Clay</b>	<b>Soft</b>	<b>2</b>	<b>8</b>
<b>Grey</b>	<b>Limestone</b>	<b>Bedrock</b>	<b>Bedrock</b>	<b>8</b>	<b>85</b>

Annular Space			Results of Well Yield Testing			
Depth Set at (m/ft) From	To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)	Draw Down		Recovery
<b>0</b>	<b>24</b>	<b>RENTONITE</b>		Time (min)	Water Level (m/ft)	Time (min)
<b>24</b>	<b>35</b>	<b>SAND</b>		Static Level		Water Level (m/ft)
				1		1
				2		2
				3		3
				4		4
				5		5
				10		10
				15		15
				20		20
				25		25
				30		30
				40		40
				50		50
				60		60

<b>Method of Construction</b>		<b>Well Use</b>	
<input type="checkbox"/> Cable Tool	<input type="checkbox"/> Diamond	<input type="checkbox"/> Public	<input type="checkbox"/> Commercial
<input type="checkbox"/> Rotary (Conventional)	<input type="checkbox"/> Jetting	<input type="checkbox"/> Domestic	<input type="checkbox"/> Municipal
<input type="checkbox"/> Rotary (Reverse)	<input type="checkbox"/> Driving	<input type="checkbox"/> Livestock	<input checked="" type="checkbox"/> Test Hole
<input type="checkbox"/> Boring	<input type="checkbox"/> Digging	<input type="checkbox"/> Irrigation	<input type="checkbox"/> Monitoring
<input checked="" type="checkbox"/> Air Percussion		<input type="checkbox"/> Industrial	<input type="checkbox"/> Cooling & Air Conditioning
<input type="checkbox"/> Other, specify		<input type="checkbox"/> Other, specify	

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From To		
			<b>+3 25</b>	<input type="checkbox"/> Water Supply	
				<input type="checkbox"/> Replacement Well	
				<input checked="" type="checkbox"/> Test Hole	
				<input type="checkbox"/> Recharge Well	
				<input type="checkbox"/> Dewatering Well	
				<input type="checkbox"/> Observation and/or Monitoring Hole	
				<input type="checkbox"/> Alteration (Construction)	
				<input type="checkbox"/> Abandoned, Insufficient Supply	
				<input type="checkbox"/> Abandoned, Poor Water Quality	
				<input type="checkbox"/> Abandoned, other, specify	
				<input type="checkbox"/> Other, specify	

Construction Record - Screen				Status of Well	
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From To		
<b>2</b>		<b>10</b>	<b>25 35</b>	<input type="checkbox"/> Water Supply	
				<input type="checkbox"/> Replacement Well	
				<input checked="" type="checkbox"/> Test Hole	
				<input type="checkbox"/> Recharge Well	
				<input type="checkbox"/> Dewatering Well	
				<input type="checkbox"/> Observation and/or Monitoring Hole	
				<input type="checkbox"/> Alteration (Construction)	
				<input type="checkbox"/> Abandoned, Insufficient Supply	
				<input type="checkbox"/> Abandoned, Poor Water Quality	
				<input type="checkbox"/> Abandoned, other, specify	
				<input type="checkbox"/> Other, specify	

Water Details		Hole Diameter		
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify	Depth (m/ft) From To	Diameter (cm/in)	
		<b>0 8</b>	<b>5</b>	
		<b>8 35</b>	<b>3.5</b>	

Well Contractor and Well Technician Information			
Business Name of Well Contractor <b>Strata Soil Sampling</b>	Well Contractor's Licence No. <b>7741</b>		
Business Address (Street Number/Name) <b>165 Shields Court</b>	Municipality <b>Markham</b>		
Province <b>ON</b>	Postal Code <b>L3R8R2</b>	Business E-mail Address	

Bus. Telephone No. (inc. area code) <b>905 940 7919</b>	Name of Well Technician (Last Name, First Name) <b>Marcelle Orie</b>
Well Technician's Licence No. <b>77416</b>	Signature of Technician and/or Contractor <b>[Signature]</b>
Date Submitted <b>2015 01 23</b>	

Map of Well Location			
Please provide a map below following instructions on the back.			
<p><b>SEE ATTACHED MAP (TW-8D)</b></p>			
Comments:			

Well owner's information package delivered <input type="checkbox"/> Yes <input type="checkbox"/> No	Date Package Delivered <b>2015 01 23</b>	Date Work Completed <b>2015 01 23</b>
<b>Ministry Use Only</b> Audit No. <b>200305</b> Received		

# Well Owner's Information

First Name <b>Steve</b>	Last Name / Organization <b>Dave Clifford Township of Douro-Dummer</b>	E-mail Address	<input type="checkbox"/> Well Constructed by Well Owner
Mailing Address (Street Number/Name) <b>894 South Street</b>	Municipality <b>Warsaw</b>	Province <b>ON</b>	Postal Code <b>K0L 3A0</b>

## Well Location

Address of Well Location (Street Number/Name) <b>348 County Rd 6</b>	Township	Lot	Concession
County/District/Municipality	City/Town/Village <b>Yolande Pt.</b>	Province <b>Ontario</b>	Postal Code
UTM Coordinates Zone Easting Northing <b>NAD 83 17 72 676599 26788</b>	Municipal Plan and Sublot Number	Other	

## Overburden and Bedrock Materials/Abandonment Sealing Record (see instructions on the back of this form)

General Colour	Most Common Material	Other Materials	General Description	Depth (m/ft) From	Depth (m/ft) To
BRN	TOP SOIL		LOOSE	0	2
BRN	SILT	CLAY	SOFT.	2	8
GLY	LIMESTONE		BEDROCK	8	15

Annular Space			
Depth Set at (m/ft) From	Depth Set at (m/ft) To	Type of Sealant Used (Material and Type)	Volume Placed (m³/ft³)
0	9	PORTLAND	
9	15	SAND	

<b>Method of Construction</b> <input type="checkbox"/> Cable Tool <input type="checkbox"/> Rotary (Conventional) <input type="checkbox"/> Rotary (Reverse) <input type="checkbox"/> Boring <input checked="" type="checkbox"/> Air percussion <input type="checkbox"/> Other, specify _____	<input type="checkbox"/> Diamond <input type="checkbox"/> Jetting <input type="checkbox"/> Driving <input type="checkbox"/> Digging	<b>Well Use</b> <input type="checkbox"/> Public <input type="checkbox"/> Domestic <input type="checkbox"/> Livestock <input type="checkbox"/> Irrigation <input type="checkbox"/> Industrial <input type="checkbox"/> Other, specify _____	<input type="checkbox"/> Commercial <input type="checkbox"/> Not used <input type="checkbox"/> Dewatering <input checked="" type="checkbox"/> Test Hole <input checked="" type="checkbox"/> Monitoring <input type="checkbox"/> Cooling & Air Conditioning
---	--	--	---

Construction Record - Casing				Status of Well	
Inside Diameter (cm/in)	Open Hole OR Material (Galvanized, Fibreglass, Concrete, Plastic, Steel)	Wall Thickness (cm/in)	Depth (m/ft) From	Depth (m/ft) To	
	PLASTIC		+3	10	<input type="checkbox"/> Water Supply <input type="checkbox"/> Replacement Well <input checked="" type="checkbox"/> Test Hole <input type="checkbox"/> Recharge Well <input type="checkbox"/> Dewatering Well <input type="checkbox"/> Observation and/or Monitoring Hole <input type="checkbox"/> Alteration (Construction) <input type="checkbox"/> Abandoned, Insufficient Supply <input type="checkbox"/> Abandoned, Poor Water Quality <input type="checkbox"/> Abandoned, other, specify _____ <input type="checkbox"/> Other, specify _____

Construction Record - Screen				Status of Well	
Outside Diameter (cm/in)	Material (Plastic, Galvanized, Steel)	Slot No.	Depth (m/ft) From	Depth (m/ft) To	
2	PLASTIC	10	10	15	<input type="checkbox"/> Other, specify _____

Water Details		Hole Diameter		
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	Depth (m/ft) From	Depth (m/ft) To	Diameter (cm/in)
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	0	8	5
Water found at Depth (m/ft)	Kind of Water: <input type="checkbox"/> Fresh <input type="checkbox"/> Untested <input type="checkbox"/> Gas <input type="checkbox"/> Other, specify _____	8	15	3.5

Business Name of Well Contractor <b>Strata Soil Sampling</b>	Well Contractor's Licence No. <b>71241</b>
Business Address (Street Number/Name) <b>65 Shields Court</b>	Municipality <b>Markham</b>
Province <b>ON</b>	Postal Code <b>L3R 9U2</b>
Business E-mail Address	

Bus. Telephone No. (inc. area code) <b>(905) 940-7919</b>	Name of Well Technician (Last Name, First Name) <b>FORNALLI JANE</b>
Well Technician's Licence No. <b>31716</b>	Signature of Technician and/or Contractor <i>[Signature]</i>
Date Submitted <b>2015/01/23</b>	

Results of Well Yield Testing			
After test of well yield, water was:		Draw Down	
<input type="checkbox"/> Clear and sand free <input type="checkbox"/> Other, specify _____		Time (min)	Water Level (m/ft)
If pumping discontinued, give reason:		Static Level	Recovery
Pump intake set at (m/ft)		1	1
Pumping rate (l/min / GPM)		2	2
Duration of pumping ____ hrs + ____ min		3	3
Final water level end of pumping (m/ft)		4	4
If flowing give rate (l/min / GPM)		5	5
Recommended pump depth (m/ft)		10	10
Recommended pump rate (l/min / GPM)		15	15
Well production (l/min / GPM)		20	20
Disinfected? <input type="checkbox"/> Yes <input type="checkbox"/> No		25	25
		30	30
		40	40
		50	50
		60	60

## Map of Well Location

Please provide a map below following instructions on the back.

**SEE ATTACHED MAP (TW-8)**

Comments:	Well owner's information package delivered <input type="checkbox"/> Yes <input type="checkbox"/> No	Date Package Delivered _____ Date Work Completed <b>2015/01/23</b>	<b>Ministry Use Only</b> Audit No. <b>Z 200304</b> Received _____
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# Appendix C

## Established Monitoring Program and Sampling Protocol



## SECTION I: GROUNDWATER MONITORING AND SAMPLING PROTOCOL

### 1.0 WATER LEVEL MEASUREMENTS

1. Prior to purging/sampling, water levels shall be measured by the wetted-taped method or with an electric depth gauge to the nearest 0.01 metres (or 0.01 feet).
2. MEASUREMENTS SHALL BE TAKEN WITHOUT THE REMOVAL OF THE DEDICATED SAMPLING DEVICE. (tubing and foot-valve arrangements).
3. MEASUREMENTS SHALL BE TAKEN FROM TOP OF THE MONITORED WELL. IN MOST CASES, THE MEASUREMENT WILL BE TAKEN FROM TOP OF THE PVC CASING AND NOT THE TOP OF THE PROTECTIVE CASING.
4. Measurements shall be recorded on FORM 1 for each specific monitor in the log book, indicating MEASURING POINT.
5. Rinse tip of measuring device with distilled water after taking measurement in each monitor.

### 2.0 PURGING PROCEDURE

1. Prior to sampling, each well shall be purged to remove the stagnant water within the casing.
2. THREE CASING VOLUMES SHALL BE REMOVED BY THE DEDICATED SAMPLERS OR BY BAILER FROM THE WELLS WITH MODERATE INFLOW. THE PURGED WATER SHALL BE MEASURED INTO A CALIBRATED CONTAINER AND THE VOLUME REMOVED SHALL BE RECORDED ON FORM 2 FOR THE SPECIFIC MONITOR IN THE LOG BOOK.
3. SLOW INFLOW MONITORS SHALL BE PURGED ENTIRELY DRY. THE VOLUME OF PURGED WATER SHALL BE RECORDED IN FORM 2 FOR THE SPECIFIC MONITOR ON THE LOG BOOK.

## SECTION I: GROUNDWATER MONITORING AND SAMPLING PROTOCOL

### 2.0 PURGING PROCEDURE (cont'd)

4. The volume of standing water in each monitor shall be calculated from the highest recorded static level and the total well depth and recorded on FORM 2. This volume will not appreciably change with seasonal fluctuations and may be used as the uniform standard in determining the purged volume during each sampling survey.
5. Conductivity, temperature and pH values shall be recorded after the removal of each casing volume to confirm stabilized quality conditions. When this field-measurement program is initiated, these quality results may be utilized to determine if the purged volume may be reduced to two casing volumes. Field monitoring equipment shall be calibrated each day prior to use, and results noted on FORM 6.

### 3.0 SAMPLING/SUBMISSION PROCEDURE

1. Suitable sample bottles (containing premeasured preservatives, as required) and QA/QC blanks shall be obtained from the analyzing laboratory in advance of the sampling program. The number and type of field and spiked blanks shall be determined by prior consultation with the laboratory representative.
2. Samples shall be collected the day following the purging exercise (to permit water-level recovery in the slower responding monitors) by means of the dedicated samplers in all monitor wells.
3. Sample collection shall be undertaken in the following sequence, as necessary:
  - Volatile organics
  - Pesticides/herbicides
  - Phenolics
  - Heavy metals
  - General chemistry



## SECTION I: GROUNDWATER MONITORING AND SAMPLING PROTOCOL

### 3.0 SAMPLING/SUBMISSION PROCEDURE (cont'd)

4. Samples collected for heavy-metal determinations (which include iron and manganese) shall be field filtered before placement into sample bottle containing the acid preservative. If appreciable sediment occurs in the sample and filtering cannot be undertaken, a sample shall be collected in a bottle without preservative, and the sediment shall be allowed to settle before a sample is decanted into a bottle without preservative for subsequent filtration and analysis by the laboratory.
5. Sample collected for volatile organics shall completely fill the sample bottle, with no air space permitted.
6. PLACE SAMPLES INTO A COOLER WITH PRE-FROZEN ICE PACKS AND DELIVER TO LABORATORY WITHIN 24 HOURS AFTER COMPLETION OF PROGRAM.
7. Sampling information shall be recorded on FORM 3 of the log book.
8. Each sample bottle shall be labelled to indicate the project name, well designation, time of sample collection, preservatives added and analyses to be performed.
9. If submitted to other than the MOE, a chain of custody form shall be completed and submitted together with the samples to the laboratory.

## SECTION II: SURFACE WATER MONITORING AND SAMPLING PROTOCOL

1. Water samples shall be collected upstream, opposite and downstream from the landfill side of the watercourse.
2. Sampling shall be preferably undertaken under baseflow conditions (to observe maximum quality impact). Thus, there shall be several days without precipitation antecedent to the sampling survey.
3. Sampling shall be preferably undertaken when the stream has a discernable flow. Sampling of pondings shall be discouraged unless representative of the local conditions.
4. Samples shall be collected at mid-depth in the stream (to prevent the uptake of bottom sediments) and preferably from the middle of the stream. Remove bottle cap when sampling point reached and point bottle opening opposite direction of flow.
5. Samples shall be directly collected into the sample bottles (with or without preservatives, as required) WITHOUT filtering.
6. Field measurements shall be taken of the temperature, conductivity, and pH at each sampling station when samples are collected for chemical analysis. Additionally, the stream and weather conditions shall be noted and the prevailing flow shall be determined by estimation of the stream depth, width and the current velocity.
7. Pertinent information on the stream conditions shall be recorded for each station during each site visit on FORM 4 of the log book.
8. Any digitally-metered instrument used to obtain field measurements (other than temperature) shall be calibrated before and after the sampling survey to ensure reliable results.

### SECTION III: COMBUSTIBLE GAS MONITORING PROTOCOL

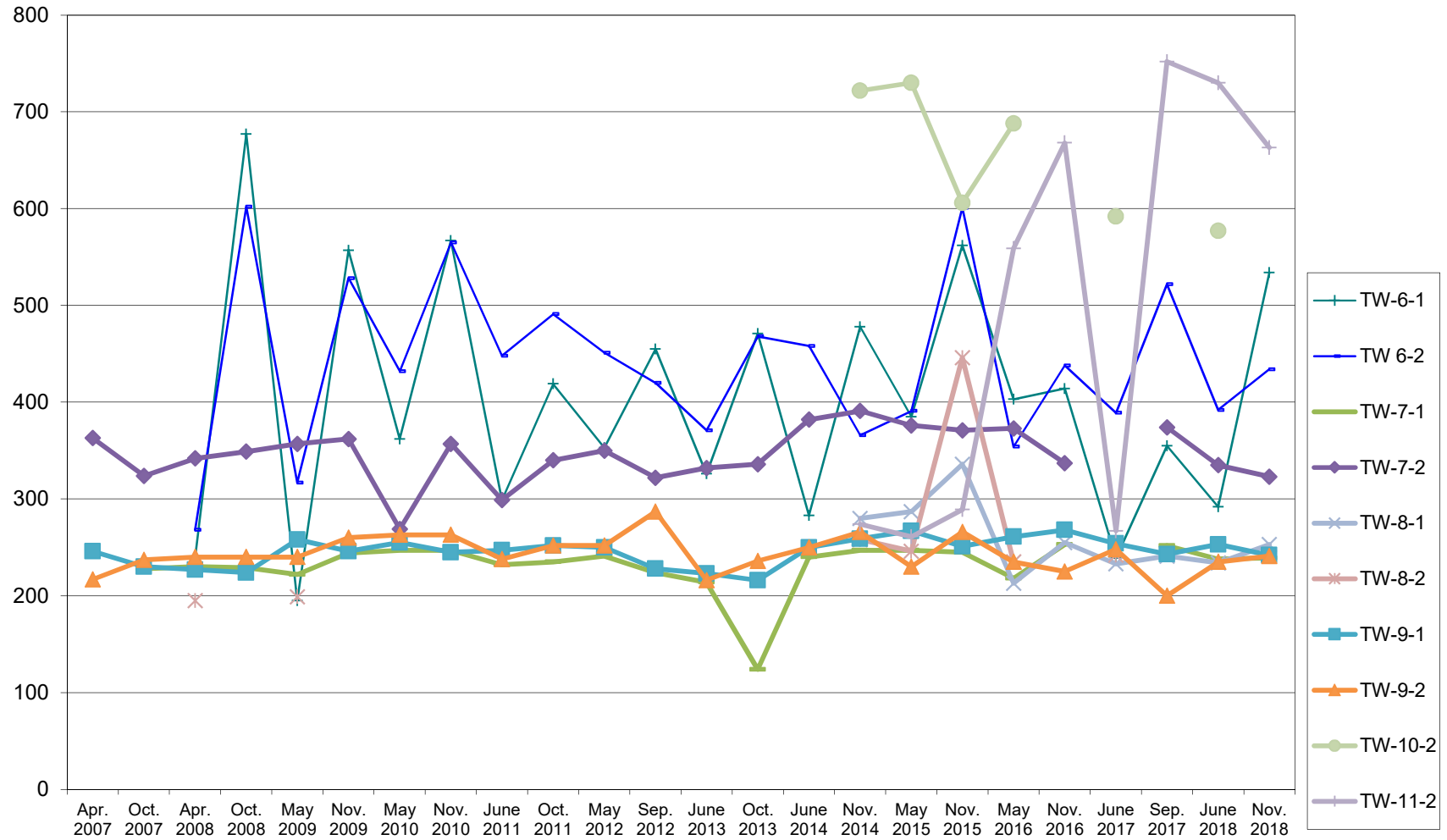
1. Prior to the field survey, the combustible gas detector shall be calibrated to ensure acceptable gas measurements.
2. When measuring the gas concentration in any probe, a specific sequence shall be followed:
  - i) Thoroughly purge by aspirating atmospheric air through instrument.
  - ii) Zero high-level (0-100 percent) and low-level (0-5 percent) detection scales.
  - iii) Aspirate gas from probe initially USING THE HIGH SCALE (0-100 percent) until a steady reading is observed on the scale.
  - iv) If a gas concentration below 5 percent is indicated, set to low-level scale (0-5 percent) and aspirate until a steady reading is observed on the scale.
  - v) Conclude test by purging instrument with atmospheric air.
3. Combustible gas presence/absence and concentrations shall be recorded on FORM 5 of the log book.

## Appendix D

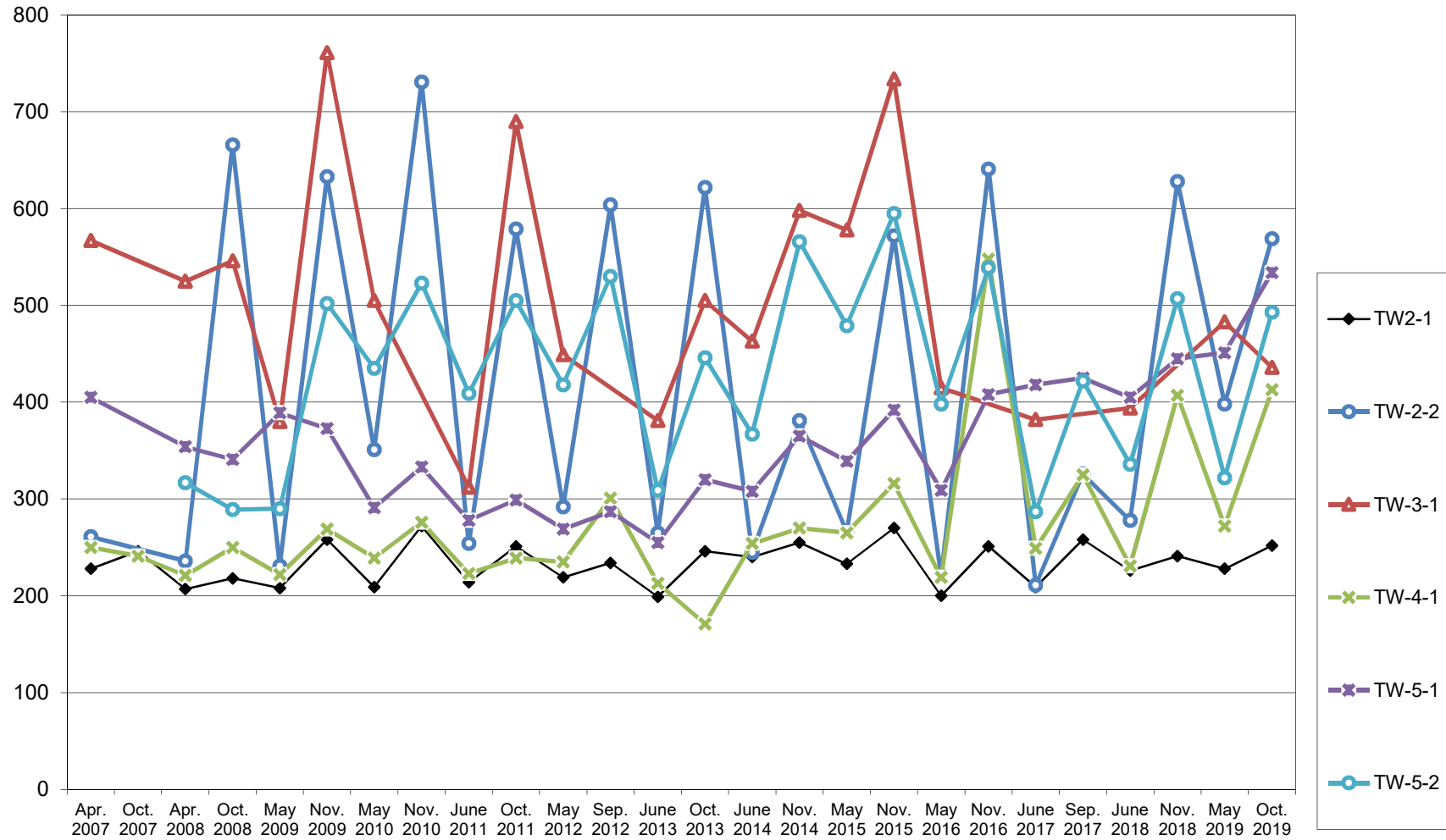
### Alkalinity, Iron and Chloride Graphs



**ALKALINITY LEVELS  
STONEY LAKE ROAD LAND FILL SITE  
DOWNGRADIENT and BACKGROUND MONITORS**

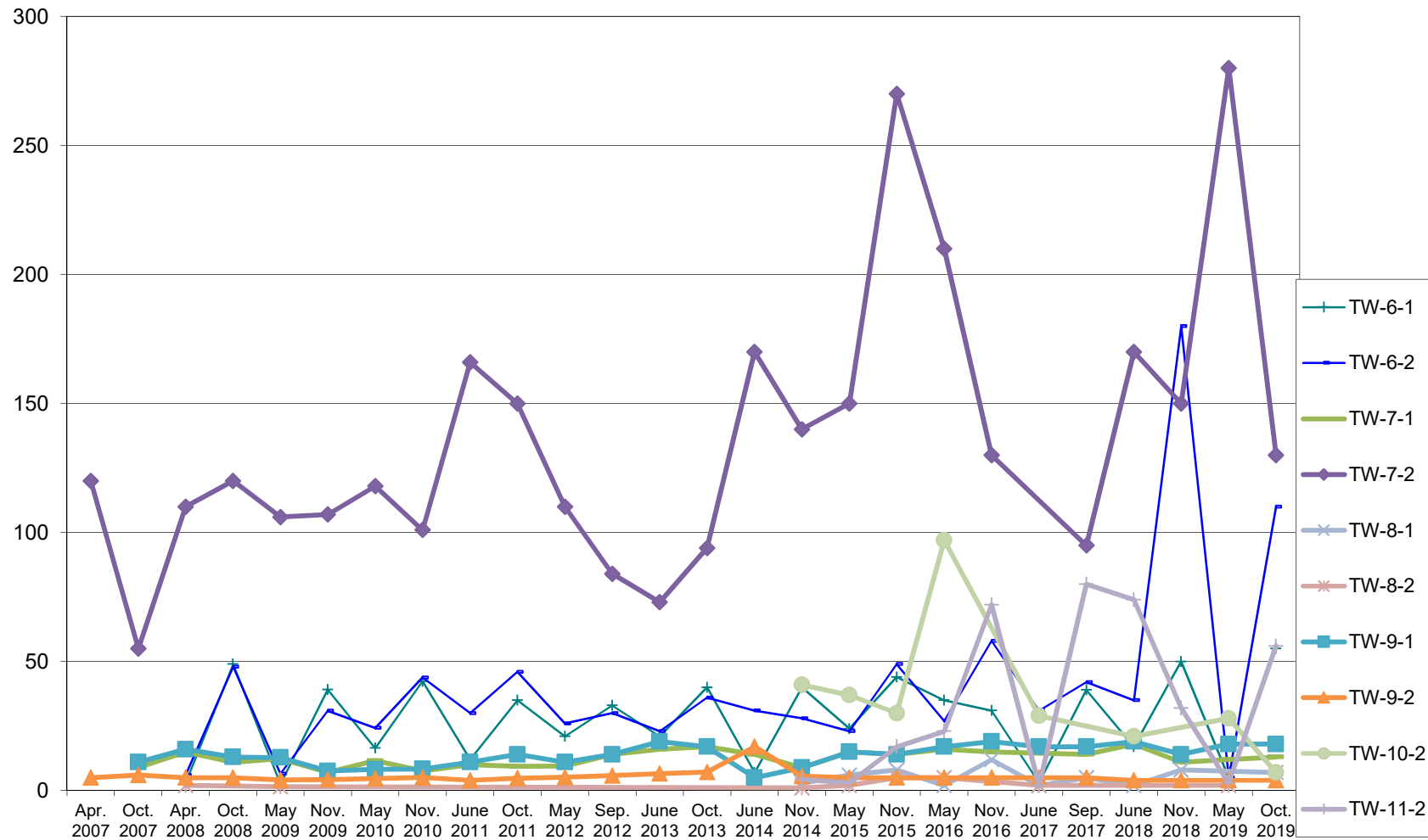


# **ALKALINITY LEVELS STONEY LAKE ROAD LAND FILL SITE REFUSE AREA**

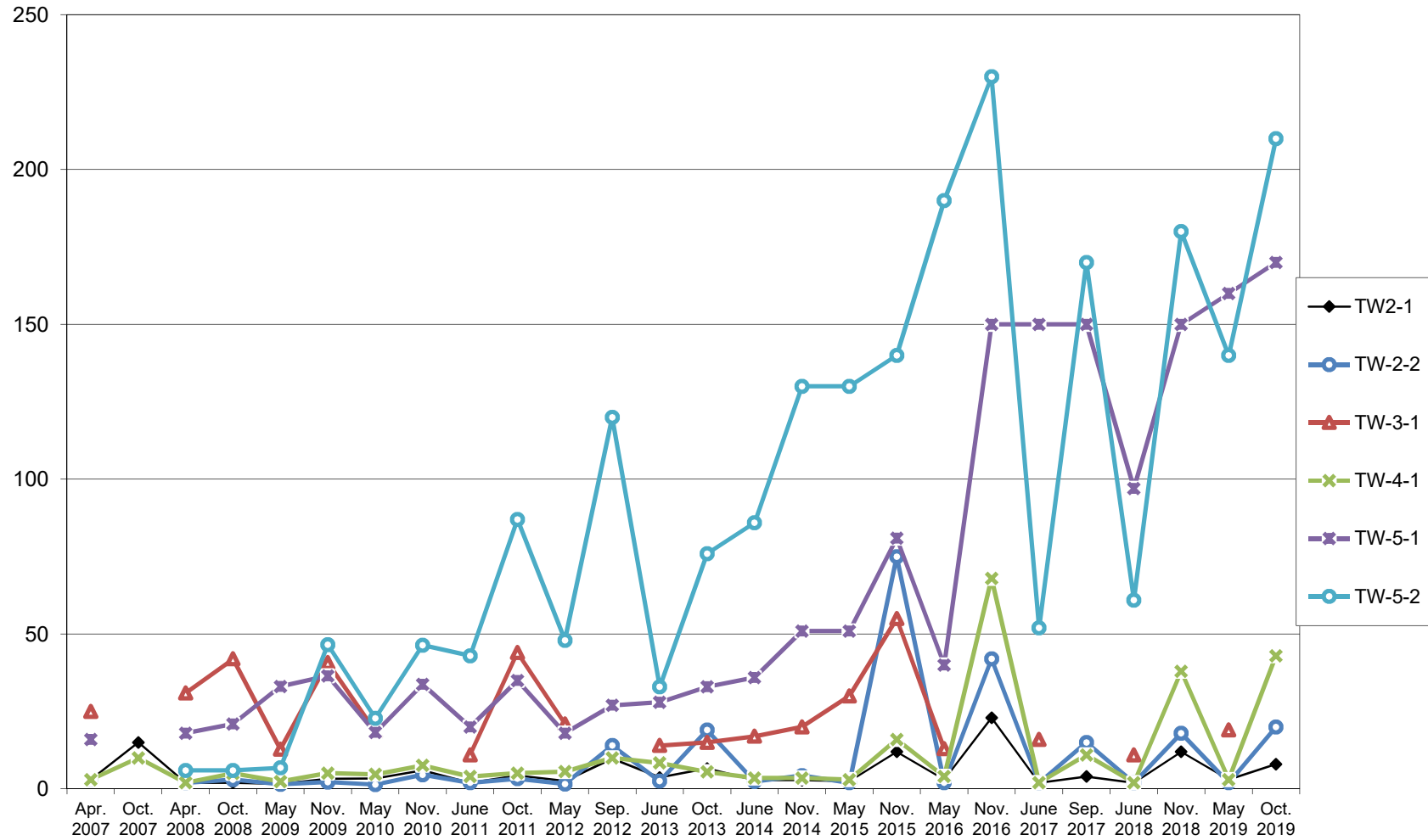




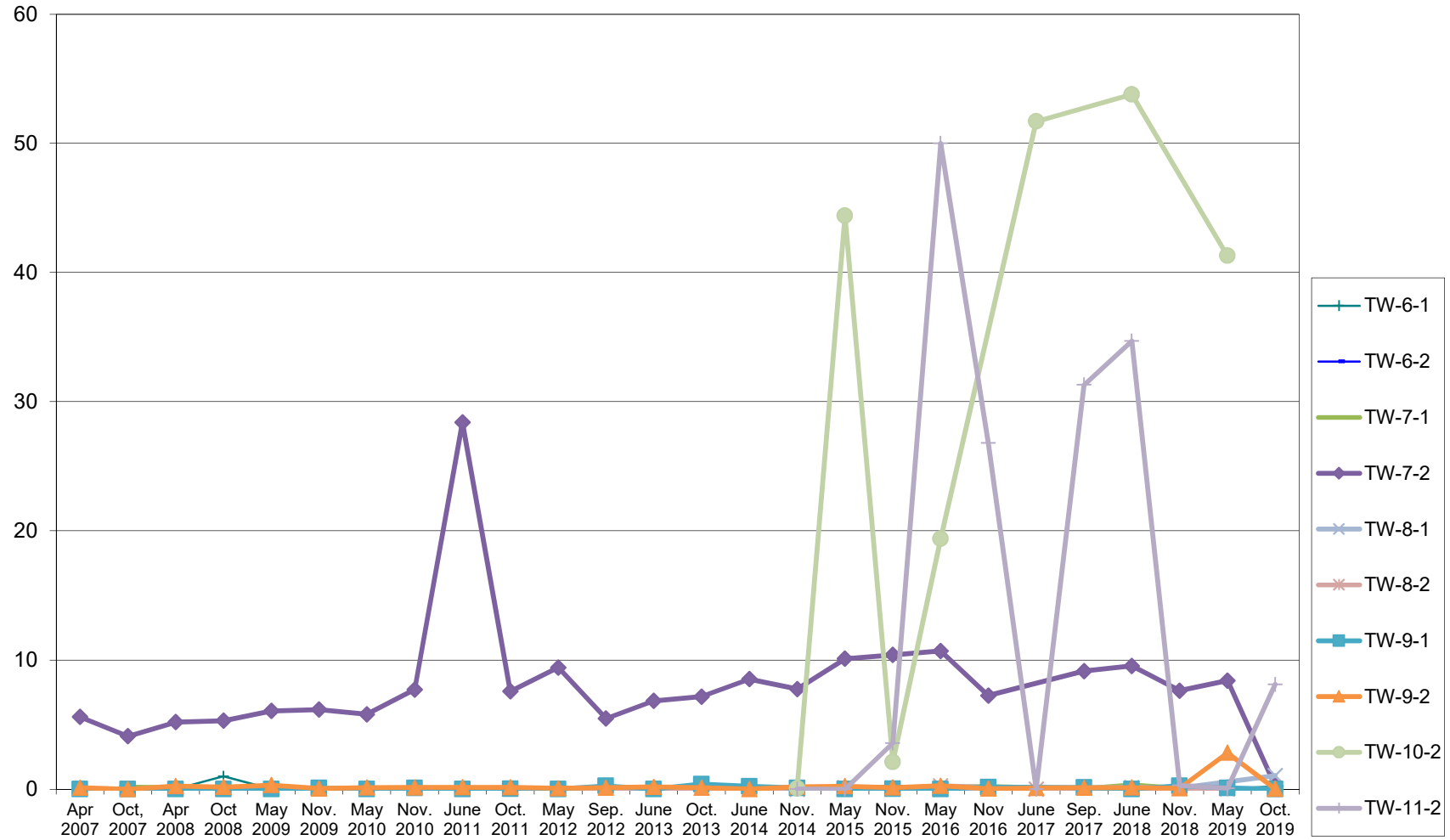
# **CHLORIDE LEVELS STONEY LAKE LAND FILL SITE DOWNGRADIENT and BACKGROUND MONITORS**



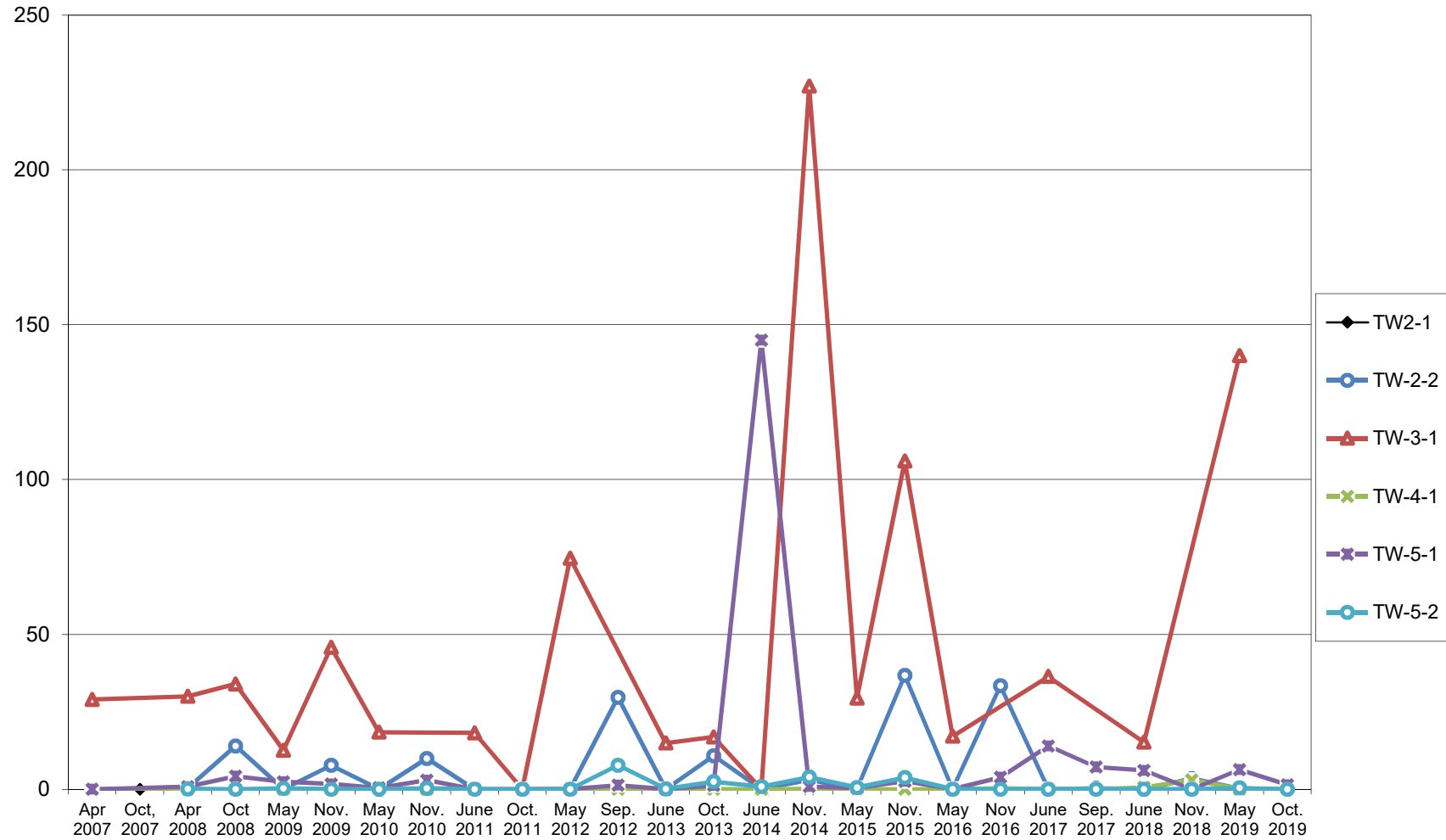
# CHLORIDE LEVELS STONEY LAKE LAND FILL SITE REFUSE AREA



**IRON LEVELS  
STONEY LAKE LAND FILL SITE  
DOWNGRADIENT and BACKGROUND MONITORS**



# IRON LEVELS STONEY LAKE LAND FILL SITE LANDFILL MONITORS



## Appendix E

### 2019 Water Quality Data



## FINAL REPORT

CA15634-MAY19 R1

PO#:735115229 11193449-01

Prepared for

**GHD**

## First Page

CLIENT DETAILS		LABORATORY DETAILS	
Client	GHD	Project Specialist	Brad Moore Hon. B.Sc
Address	347 Pido Rd., Unit #29 Peterborough, ON K9J 6Z8. Canada	Laboratory	SGS Canada Inc.
Contact	Gus Bolin	Address	185 Concession St., Lakefield ON, K0L 2H0
Telephone	705-749-3317	Telephone	705-652-2143
Facsimile		Facsimile	705-652-6365
Email	gus.bolin@ghd.com	Email	brad.moore@sgs.com
Project	PO#:735115229 11193449-01	SGS Reference	CA15634-MAY19
Order Number		Received	05/29/2019
Samples	Ground Water (3)	Approved	06/06/2019
		Report Number	CA15634-MAY19 R1
		Date Reported	06/06/2019

## COMMENTS

## SIGNATORIES

Brad Moore Hon. B.Sc

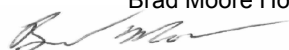




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# FINAL REPORT

CA15634-MAY19 R1

Client: GHD

Project: PO#:735115229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Galdi

PACKAGE: - BTEX (WATER)

Sample Number	5	7	8
Sample Name	TW9-1	TW-7-1	TW-6-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result
BTEX						
Benzene	ug/L	0.5		< 0.5	< 0.5	< 0.5
Toluene	ug/L	0.5		< 0.5	< 0.5	< 0.5

PACKAGE: - General Chemistry (WATER)

Sample Number	5	7	8
Sample Name	TW9-1	TW-7-1	TW-6-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result
General Chemistry						
Alkalinity	mg/L as CaCO3	2		251	244	399
Conductivity	uS/cm	2		544	528	817
Total Dissolved Solids	mg/L	30		300	283	509
Chemical Oxygen Demand	mg/L	8		< 8	< 8	< 8
Total Kjeldahl Nitrogen	as N mg/L	0.5		< 0.5	< 0.5	0.8
Ammonia+Ammonium (N)	as N mg/L	0.1		< 0.1	< 0.1	0.6
Dissolved Organic Carbon	mg/L	1		1	2	2



# FINAL REPORT

CA15634-MAY19 R1

Client: GHD

Project: PO#:735115229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	7	8
Sample Name	TW9-1	TW-7-1	TW-6-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result
Metals and Inorganics					
Phosphorus (total)	mg/L	0.03	< 0.03	< 0.03	< 0.03
Sulphate	mg/L	2	27	18	12
Nitrite (as N)	as N mg/L	0.03	< 0.03	< 0.03	0.16
Nitrate (as N)	as N mg/L	0.06	< 0.06	< 0.06	2.58
Arsenic (dissolved)	mg/L	0.0002	< 0.0002	< 0.0002	< 0.0002
Barium (dissolved)	mg/L	0.00002	0.110	0.174	0.117
Boron (dissolved)	mg/L	0.002	0.022	0.024	0.023
Calcium (dissolved)	mg/L	0.01	114	102	115
Cadmium (dissolved)	mg/L	0.000003	< 0.000003	0.000003	0.000016
Chromium (dissolved)	mg/L	0.00008	0.00034	0.00012	0.00011
Copper (dissolved)	mg/L	0.0002	0.0008	0.0018	0.0010
Iron (dissolved)	mg/L	0.007	0.009	0.015	0.012
Potassium (dissolved)	mg/L	0.009	1.24	1.21	2.33
Magnesium (dissolved)	mg/L	0.001	5.29	4.86	3.65
Manganese (dissolved)	mg/L	0.00001	0.00194	0.00239	0.568
Sodium (dissolved)	mg/L	0.01	8.59	8.40	4.20
Phosphorus (dissolved)	mg/L	0.003	< 0.003	< 0.003	< 0.003
Lead (dissolved)	mg/L	0.00001	0.00001	0.00005	0.00002
Zinc (dissolved)	mg/L	0.002	< 0.002	0.005	0.003



# FINAL REPORT

CA15634-MAY19 R1

Client: GHD

Project: PO#:735115229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

## PACKAGE: - Other (ORP) (WATER)

Sample Number	5	7	8
Sample Name	TW9-1	TW-7-1	TW-6-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result
Other (ORP)						
pH	no unit	0.05		7.90	7.85	7.71
Chloride	mg/L	1		18	12	5
Mercury (total)	µg/L	0.01		< 0.01	< 0.01	< 0.01

## PACKAGE: - Phenols (WATER)

Sample Number	5	7	8
Sample Name	TW9-1	TW-7-1	TW-6-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result
Phenols						
4AAP-Phenolics	mg/L	0.002		< 0.002	< 0.002	< 0.002

## PACKAGE: - VOCs (WATER)

Sample Number	5	7	8
Sample Name	TW9-1	TW-7-1	TW-6-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result
VOCs						
1,4-Dichlorobenzene	µg/L	0.5		< 0.5	< 0.5	< 0.5
Dichloromethane	µg/L	0.5		< 0.5	< 0.5	< 0.5
Vinyl Chloride	µg/L	0.2		< 0.2	< 0.2	< 0.2



QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0001-JUN19	mg/L as CaCO3	2	< 2	7	10	102	80	120	NA		
Alkalinity	EWL0583-MAY19	mg/L as CaCO3	2	< 2	0	10	97	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0002-JUN19	as N mg/L	0.1	<0.1	0	10	97	90	110	101	75	125



# FINAL REPORT

CA15634-MAY19 R1

## QC SUMMARY

### Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0620-MAY19	mg/L	1	<1	2	20	100	80	120	89	75	125
Sulphate	DIO0620-MAY19	mg/L	2	<2	2	20	104	80	120	92	75	125

### Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0026-JUN19	mg/L	0.03	<0.03	ND	20	96	80	120	102	75	125
Nitrate (as N)	DIO0026-JUN19	mg/L	0.06	<0.06	6	20	97	80	120	106	75	125
Nitrite (as N)	DIO0028-JUN19	mg/L	0.03	<0.03	ND	20	94	80	120	95	75	125
Nitrate (as N)	DIO0028-JUN19	mg/L	0.06	<0.06	0	20	98	80	120	106	75	125



FINAL REPORT

CA15634-MAY19 R1

QC SUMMARY

Carbon by SFA  
Method: SM 5310 | Internal ref.: ME-CA-ENVISFA-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Dissolved Organic Carbon	SKA0005-JUN19	mg/L	1	<1	0	20	108	90	110	101	75	125
Dissolved Organic Carbon	SKA0014-JUN19	mg/L	1	<1	3	20	99	90	110	112	75	125

Chemical Oxygen Demand  
Method: HACH 8000 | Internal ref.: ME-CA-ENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0588-MAY19	mg/L	8	<8	ND	20	100	80	120	98	75	125



FINAL REPORT

CA15634-MAY19 R1

QC SUMMARY

Conductivity  
Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0001-JUN19	uS/cm	2	< 2	2	10	99	90	110	NA		
Conductivity	EWL0583-MAY19	uS/cm	2	2	1	10	97	90	110	NA		

Mercury by CVAAS  
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0033-MAY19	ug/L	0.01	<0.01	ND	20	116	80	120	124	70	130



# FINAL REPORT

CA15634-MAY19 R1

## QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-1ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (dissolved)	EMS0218-MAY19	mg/L	0.0002	< 0.0002	5	20	98	90	110	102	70	130
Barium (dissolved)	EMS0218-MAY19	mg/L	0.00002	< 0.00002	1	20	98	90	110	83	70	130
Boron (dissolved)	EMS0218-MAY19	mg/L	0.002	< 0.002	1	20	97	90	110	NV	70	130
Calcium (dissolved)	EMS0218-MAY19	mg/L	0.01	< 0.01	1	20	99	90	110	NV	70	130
Cadmium (dissolved)	EMS0218-MAY19	mg/L	0.000003	< 0.000003	ND	20	95	90	110	87	70	130
Chromium (dissolved)	EMS0218-MAY19	mg/L	0.00008	< 0.00008	5	20	99	90	110	98	70	130
Copper (dissolved)	EMS0218-MAY19	mg/L	0.0002	< 0.0002	ND	20	94	90	110	NV	70	130
Iron (dissolved)	EMS0218-MAY19	mg/L	0.007	< 0.007	0	20	96	90	110	NV	70	130
Potassium (dissolved)	EMS0218-MAY19	mg/L	0.009	< 0.009	1	20	100	90	110	NV	70	130
Magnesium (dissolved)	EMS0218-MAY19	mg/L	0.001	< 0.001	2	20	106	90	110	NV	70	130
Manganese (dissolved)	EMS0218-MAY19	mg/L	0.00001	< 0.00001	0	20	101	90	110	NV	70	130
Sodium (dissolved)	EMS0218-MAY19	mg/L	0.01	< 0.01	ND	20	101	90	110	NV	70	130
Lead (dissolved)	EMS0218-MAY19	mg/L	0.00001	< 0.00001	4	20	97	90	110	97	70	130
Phosphorus (dissolved)	EMS0218-MAY19	mg/L	0.003	< 0.003	ND	20	97	90	110	NV	70	130
Zinc (dissolved)	EMS0218-MAY19	mg/L	0.002	< 0.002	ND	20	97	90	110	NV	70	130





FINAL REPORT

CA15634-MAY19 R1

QC SUMMARY

pH  
Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0001-JUN19	no unit	0.05	NA	0		100			NA		
pH	EWL0583-MAY19	no unit	0.05	NA	0		101			NA		

Phenols by SFA  
Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0025-JUN19	mg/L	0.002	<0.002	ND	10	94	90	110	90	75	125

Phosphorus by SFA  
Method: SM 4500-P J | Internal ref.: ME-CA-IENVISFA-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Phosphorus (total)	SKA0015-JUN19	mg/L	0.03	<0.03	7	10	102	90	110	99	75	125



FINAL REPORT

CA15634-MAY19 R1

QC SUMMARY

Solids Analysis  
Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0010-JUN19	mg/L	30	<30	1	20	100	90	110	NA		
Total Dissolved Solids	EWL0022-JUN19	mg/L	30	<30	0	20	100	90	110	NA		
Total Dissolved Solids	EWL0579-MAY19	mg/L	30	<30	ND	20	98	90	110	NA		

Total Nitrogen  
Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0001-JUN19	as N mg/L	0.5	<0.5	ND	10	102	90	110	94	75	125



QC SUMMARY

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-IENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,4-Dichlorobenzene	GCM0620-MAY19	ug/L	0.5	<0.5	ND	30	97	60	130	90	50	140
Benzene	GCM0620-MAY19	ug/L	0.5	<0.5	ND	30	96	60	130	91	50	140
Dichloromethane	GCM0620-MAY19	ug/L	0.5	<0.5	ND	30	81	60	130	77	50	140
Toluene	GCM0620-MAY19	ug/L	0.5	<0.5	ND	30	97	60	130	93	50	140
Vinyl Chloride	GCM0620-MAY19	ug/L	0.2	<0.2	ND	30	93	60	130	86	50	140

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

**Multielement Scan Qualifier:** as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

**Duplicate Qualifier:** for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

**Matrix Spike Qualifier:** for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.



# FINAL REPORT

CA15634-MAY19 R1

## QC SUMMARY

---

## LEGEND

## FOOTNOTES

**NSS** Insufficient sample for analysis.

**RL** Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

**NA** The sample was not analysed for this analyte

**ND** Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

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-- End of Analytical Report --



## FINAL REPORT

CA15635-MAY19 R1

PO# 73515229 11193449-01

Prepared for

**GHD**

## First Page

### CLIENT DETAILS

Client GHD

Address 347 Pido Rd., Unit #29, Peterborough  
Canada, K9J 6Z8  
Phone: 705-749-3317. Fax:

Contact Gus Bolin

Telephone 705-749-3317

Facsimile

Email gus.bolin@ghd.com

Project PO# 73515229 11193449-01

Order Number

Samples Ground Water (4)

### LABORATORY DETAILS

Project Specialist Brad Moore Hon. B.Sc

Laboratory SGS Canada Inc.

Address 185 Concession St., Lakefield ON, K0L 2H0

Telephone 705-652-2143

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SGS Reference CA15635-MAY19

Received 05/29/2019

Approved 06/06/2019

Report Number CA15635-MAY19 R1

Date Reported 06/06/2019

### COMMENTS

### SIGNATORIES

Brad Moore Hon. B.Sc

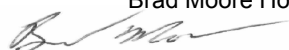




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# FINAL REPORT

CA15635-MAY19 R1

Client: GHD

Project: PO# 73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

## PACKAGE: - General Chemistry (WATER)

Sample Number	5	6	7	8
Sample Name	TW-2-1	TW-3-1	TW-4-1	TW-5-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result	Result
General Chemistry							
Alkalinity	mg/L as CaCO <sub>3</sub>	2		228	483	272	451
Conductivity	uS/cm	2		451	822	529	2570
Total Dissolved Solids	mg/L	30		260	389	280	2390
Chemical Oxygen Demand	mg/L	8		< 8	78	< 8	32
Ammonia+Ammonium (N)	as N mg/L	0.1		< 0.1	21.3	< 0.1	0.7
Dissolved Organic Carbon	mg/L	1		1	6	2	12

## PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	6	7	8
Sample Name	TW-2-1	TW-3-1	TW-4-1	TW-5-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result	Result
Metals and Inorganics							
Sulphate	mg/L	2		3	9	9	950
Nitrate (as N)	as N mg/L	0.06		0.96	< 0.06	1.87	< 0.06
Arsenic (dissolved)	mg/L	0.0002		< 0.0002	0.0130	< 0.0002	0.0004
Barium (dissolved)	mg/L	0.00002		0.0192	0.639	0.0190	0.0273
Boron (dissolved)	mg/L	0.002		0.007	0.266	0.012	1.49
Calcium (dissolved)	mg/L	0.01		102	135	120	475
Cadmium (dissolved)	mg/L	0.000003		0.000004	0.000009	< 0.000003	< 0.000003
Chromium (dissolved)	mg/L	0.00008		0.00016	0.00371	0.00014	0.00025
Copper (dissolved)	mg/L	0.0002		0.0007	0.0009	0.0009	0.0023



# FINAL REPORT

CA15635-MAY19 R1

Client: GHD

Project: PO# 73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

## PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	6	7	8
Sample Name	TW-2-1	TW-3-1	TW-4-1	TW-5-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result	Result
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### Metals and Inorganics (continued)

Iron (dissolved)	mg/L	0.007	0.007	140	0.042	6.36
Potassium (dissolved)	mg/L	0.009	0.671	13.9	0.820	4.92
Magnesium (dissolved)	mg/L	0.001	2.06	10.0	1.88	48.0
Manganese (dissolved)	mg/L	0.00001	0.00011	0.646	0.00053	0.852
Sodium (dissolved)	mg/L	0.01	2.19	18.6	2.75	82.9
Lead (dissolved)	mg/L	0.00001	0.00001	0.00049	0.00002	0.00002
Zinc (dissolved)	mg/L	0.002	0.002	0.006	0.003	0.003

## PACKAGE: - Other (ORP) (WATER)

Sample Number	5	6	7	8
Sample Name	TW-2-1	TW-3-1	TW-4-1	TW-5-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result	Result
-----------	-------	----	--------	--------	--------	--------

### Other (ORP)

pH	no unit	0.05	8.12	7.11	8.01	7.08
Chloride	mg/L	1	3	19	3	160
Mercury (total)	µg/L	0.01	< 0.01	0.01	< 0.01	< 0.01



# FINAL REPORT

CA15635-MAY19 R1

## QC SUMMARY

### Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0001-JUN19	mg/L as CaCO3	2	< 2	7	10	102	80	120	NA		
Alkalinity	EWL0576-MAY19	mg/L as CaCO3	2	< 2	1	10	101	80	120	NA		

### Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0016-JUN19	as N mg/L	0.1	<0.1	1	10	99	90	110	98	75	125
Ammonia+Ammonium (N)	SKA0239-MAY19	as N mg/L	0.1	<0.1	ND	10	101	90	110	107	75	125



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CA15635-MAY19 R1

## QC SUMMARY

### Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0620-MAY19	mg/L	1	<1	2	20	100	80	120	89	75	125
Sulphate	DIO0620-MAY19	mg/L	2	<2	2	20	104	80	120	92	75	125
Sulphate	DIO0625-MAY19	mg/L	2	<2	ND	20	103	80	120	97	75	125

### Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrate (as N)	DIO0026-JUN19	mg/L	0.06	<0.06	6	20	97	80	120	106	75	125
Nitrate (as N)	DIO0028-JUN19	mg/L	0.06	<0.06	0	20	98	80	120	106	75	125



FINAL REPORT

CA15635-MAY19 R1

QC SUMMARY

Carbon by SFA

Method: SM 5310 | Internal ref.: ME-CA-IENVISFA-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Dissolved Organic Carbon	SKA0005-JUN19	mg/L	1	<1	0	20	108	90	110	101	75	125

Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0588-MAY19	mg/L	8	<8	ND	20	100	80	120	98	75	125
Chemical Oxygen Demand	EWL0589-MAY19	mg/L	8	<8	6	20	100	80	120	99	75	125



QC SUMMARY

Conductivity  
Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0001-JUN19	uS/cm	2	< 2	2	10	99	90	110	NA		
Conductivity	EWL0576-MAY19	uS/cm	2	2	1	10	101	90	110	NA		

Mercury by CVAAS  
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0004-JUN19	ug/L	0.01	<0.01	ND	20	100	80	120	128	70	130



# FINAL REPORT

CA15635-MAY19 R1

## QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-1ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (dissolved)	EMS0218-MAY19	mg/L	0.0002	< 0.0002	5	20	98	90	110	102	70	130
Barium (dissolved)	EMS0218-MAY19	mg/L	0.00002	< 0.00002	1	20	98	90	110	83	70	130
Boron (dissolved)	EMS0218-MAY19	mg/L	0.002	< 0.002	1	20	97	90	110	NV	70	130
Calcium (dissolved)	EMS0218-MAY19	mg/L	0.01	< 0.01	1	20	99	90	110	NV	70	130
Cadmium (dissolved)	EMS0218-MAY19	mg/L	0.000003	< 0.000003	ND	20	95	90	110	87	70	130
Chromium (dissolved)	EMS0218-MAY19	mg/L	0.00008	< 0.00008	5	20	99	90	110	98	70	130
Copper (dissolved)	EMS0218-MAY19	mg/L	0.0002	< 0.0002	ND	20	94	90	110	NV	70	130
Iron (dissolved)	EMS0218-MAY19	mg/L	0.007	< 0.007	0	20	96	90	110	NV	70	130
Potassium (dissolved)	EMS0218-MAY19	mg/L	0.009	< 0.009	1	20	100	90	110	NV	70	130
Magnesium (dissolved)	EMS0218-MAY19	mg/L	0.001	< 0.001	2	20	106	90	110	NV	70	130
Manganese (dissolved)	EMS0218-MAY19	mg/L	0.00001	< 0.00001	0	20	101	90	110	NV	70	130
Sodium (dissolved)	EMS0218-MAY19	mg/L	0.01	< 0.01	ND	20	101	90	110	NV	70	130
Lead (dissolved)	EMS0218-MAY19	mg/L	0.00001	< 0.00001	4	20	97	90	110	97	70	130
Zinc (dissolved)	EMS0218-MAY19	mg/L	0.002	< 0.002	ND	20	97	90	110	NV	70	130



FINAL REPORT

CA15635-MAY19 R1

QC SUMMARY

pH  
Method: SM 4500 | Internal ref.: ME-CA-~~I~~ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0001-JUN19	no unit	0.05	NA	0		100			NA		
pH	EWL0576-MAY19	no unit	0.05	NA	0		100			NA		

Solids Analysis  
Method: SM 2540C | Internal ref.: ME-CA-~~I~~ENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0022-JUN19	mg/L	30	<30	0	20	100	90	110	NA		
Total Dissolved Solids	EWL0579-MAY19	mg/L	30	<30	ND	20	98	90	110	NA		



## QC SUMMARY

---

**Method Blank:** a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

**Duplicate:** Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

**LCS/Spike Blank:** Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

**Matrix Spike:** A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

**Reference Material:** a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

**RL:** Reporting limit

**RPD:** Relative percent difference

**AC:** Acceptance criteria

**Multielement Scan Qualifier:** as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

**Duplicate Qualifier:** for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

**Matrix Spike Qualifier:** for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

## LEGEND

## FOOTNOTES

**NSS** Insufficient sample for analysis.

**RL** Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

**NA** The sample was not analysed for this analyte

**ND** Non Detect

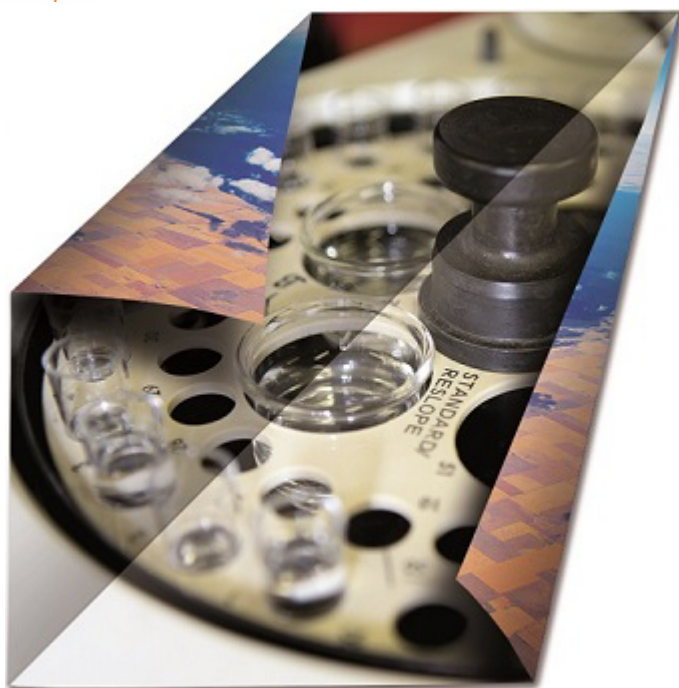
Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

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-- End of Analytical Report --



## FINAL REPORT

CA15633-MAY19 R

PO#:73515229 11193449-01

Prepared for

**GHD**

## First Page

### CLIENT DETAILS

Client GHD

Address 347 Pido Rd., Unit #29  
Peterborough, ON  
K9J 6Z8, Canada

Contact Gus Bolin

Telephone 705-749-3317

Facsimile

Email gus.bolin@ghd.com

Project PO#:73515229 11193449-01

Order Number

Samples Ground Water (8)

### LABORATORY DETAILS

Project Specialist Brad Moore Hon. B.Sc

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SGS Reference CA15633-MAY19

Received 05/29/2019

Approved 06/11/2019

Report Number CA15633-MAY19 R

Date Reported 06/11/2019

### COMMENTS

Bromomethane LCS; Recovery is outside control limits; the overall quality control for this analysis has been assessed and meets method acceptability criteria.

### SIGNATORIES

Brad Moore Hon. B.Sc

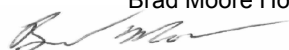




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# FINAL REPORT

CA15633-MAY19 R

Client: GHD

Project: PO#:73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerdali

PACKAGE: - BTEX (WATER)

Sample Number	10	12
Sample Name	TW-6-2	TW-2-2
Sample Matrix	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result
BTEX					
Benzene	ug/L	0.5		< 0.5	< 0.5
Ethylbenzene	ug/L	0.5		< 0.5	< 0.5
Toluene	ug/L	0.5		< 0.5	< 0.5
Xylene (total)	ug/L	0.5		< 0.5	< 0.5
o-xylene	ug/L	0.5		< 0.5	< 0.5
m/p-xylene	ug/L	0.5		< 0.5	< 0.5

PACKAGE: - General Chemistry (WATER)

Sample Number	5	6	7	8	9	10	11	12
Sample Name	TW-11-2	TW-10-2	TW-9-2	TW-8-2	TW-7-2	TW-6-2	TW-5-2	TW-2-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result	Result	Result	Result	Result
General Chemistry										
Biochemical Oxygen Demand (BOD5)	mg/L	2		< 4 †	< 4 †	4	< 4 †	< 4 †	< 4 †	< 4 †
Total Suspended Solids	mg/L	2		437	355	2210	35	224	7	86
Alkalinity	mg/L as CaCO3	2		303	628	340	229	382	276	322
Conductivity	uS/cm	2		516	1170	448	422	2140	572	2070
Total Dissolved Solids	mg/L	30		311	606	274	234	1590	489	1900
Chemical Oxygen Demand	mg/L	8		< 8	35	< 8	< 8	11	< 8	16
Total Kjeldahl Nitrogen	as N mg/L	0.5		0.6	26.7	< 0.5	< 0.5	< 0.5	0.6	< 0.5
Ammonia+Ammonium (N)	as N mg/L	0.1		< 0.1	27.6	0.2	< 0.1	0.2	0.4	< 0.1



# FINAL REPORT

CA15633-MAY19 R

Client: GHD

Project: PO#:73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	6	7	8	9	10	11	12
Sample Name	TW-11-2	TW-10-2	TW-9-2	TW-8-2	TW-7-2	TW-6-2	TW-5-2	TW-2-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result	Result	Result	Result	Result	Result
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## Metals and Inorganics

Phosphorus (total)	mg/L	0.03	0.36	0.13	0.73	< 0.03	0.22	< 0.03	0.03	< 0.03
Sulphate	mg/L	2	9	8	15	8	520	23	880	6
Nitrite (as N)	as N mg/L	0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N)	as N mg/L	0.06	2.14	< 0.06	0.20	0.61	< 0.06	1.98	2.62	0.36
Arsenic (dissolved)	mg/L	0.0002	< 0.0002	0.0016	0.0004	< 0.0002	0.0012	< 0.0002	0.0003	< 0.0002
Barium (dissolved)	mg/L	0.00002	0.0283	0.398	0.487	0.0293	0.128	0.114	0.0254	0.0287
Boron (dissolved)	mg/L	0.002	0.047	0.431	0.026	0.013	1.25	0.080	49.6	0.160
Calcium (dissolved)	mg/L	0.01	118	197	281	98.3	339	112	351	107
Cadmium (dissolved)	mg/L	0.000003	< 0.000003	0.000010	0.000064	< 0.000003	0.000004	0.000007	0.000006	< 0.000003
Chromium (dissolved)	mg/L	0.00008	0.00016	0.00092	0.00401	0.00020	0.00014	0.00012	0.00031	0.00013
Copper (dissolved)	mg/L	0.0002	0.0010	0.0020	0.0081	0.0007	0.0012	0.0009	0.0051	0.0007
Iron (dissolved)	mg/L	0.007	0.067	41.3	2.82	0.020	8.41	0.011	0.440	0.106
Potassium (dissolved)	mg/L	0.009	0.814	19.7	1.10	0.444	2.46	2.32	1.55	0.780
Magnesium (dissolved)	mg/L	0.001	1.87	15.8	8.30	2.82	41.0	5.33	113	3.19
Manganese (dissolved)	mg/L	0.00001	0.00169	2.49	0.273	0.00091	2.47	0.463	0.0442	0.0264
Sodium (dissolved)	mg/L	0.01	2.61	28.2	3.00	2.86	127	7.51	108	2.34
Lead (dissolved)	mg/L	0.00001	0.00003	0.00129	0.00249	0.00002	0.00001	0.00001	0.00015	0.00001
Zinc (dissolved)	mg/L	0.002	0.004	0.019	0.017	0.003	0.004	< 0.002	0.004	0.002



# FINAL REPORT

CA15633-MAY19 R

Client: GHD

Project: PO#:73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

## PACKAGE: - Other (ORP) (WATER)

Sample Number	5	6	7	8	9	10	11	12
Sample Name	TW-11-2	TW-10-2	TW-9-2	TW-8-2	TW-7-2	TW-6-2	TW-5-2	TW-2-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result	Result	Result	Result	Result	Result
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### Other (ORP)

pH	no unit	0.05		7.50	7.49	7.96	8.18	7.07	8.04	7.33	7.47
Chloride	mg/L	1		3	28	4	2	280	5	140	2
Mercury (total)	µg/L	0.01		< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

## PACKAGE: - Phenols (WATER)

Sample Number	5	6	7	8	9	10	11	12
Sample Name	TW-11-2	TW-10-2	TW-9-2	TW-8-2	TW-7-2	TW-6-2	TW-5-2	TW-2-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result	Result	Result	Result	Result	Result
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### Phenols

4AAP-Phenolics	mg/L	0.001		0.002	0.004	< 0.001	< 0.001	0.007	< 0.001	0.003	0.001
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## PACKAGE: - THMs (VOC) (WATER)

Sample Number	10	12
Sample Name	TW-6-2	TW-2-2
Sample Matrix	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result
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### THMs (VOC)

Bromodichloromethane	µg/L	0.5		< 0.5	< 0.5
Bromoform	µg/L	0.5		< 0.5	< 0.5
Dibromochloromethane	µg/L	0.5		< 0.5	< 0.5





# FINAL REPORT

CA15633-MAY19 R

Client: GHD

Project: PO#:73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

PACKAGE: - VOCs (WATER)

Sample Number	10	12
Sample Name	TW-6-2	TW-2-2
Sample Matrix	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result
VOCs				
Bromomethane	µg/L	0.5	< 0.5	< 0.5
Carbon tetrachloride	µg/L	0.2	< 0.2	< 0.2
Chloroethane	µg/L	5.0	< 5	< 5
Chloroform	µg/L	0.5	< 0.5	< 0.5
Chloromethane	µg/L	5.0	< 5	< 5
1,2-Dichlorobenzene	µg/L	0.5	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	< 0.5	< 0.5
1,1-Dichloroethane	µg/L	0.5	< 0.5	< 0.5
1,2-Dichloroethane	µg/L	0.5	< 0.5	< 0.5
1,1-Dichloroethylene	µg/L	0.5	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	< 0.5	< 0.5
trans-1,2-Dichloroethene	µg/L	0.5	< 0.5	< 0.5
cis-1,2-Dichloroethene	µg/L	0.5	< 0.5	< 0.5
cis-1,3-Dichloropropene	µg/L	0.5	< 0.5	< 0.5
trans-1,3-Dichloropropene	µg/L	0.5	< 0.5	< 0.5
Ethylenedibromide	µg/L	0.2	< 0.2	< 0.2
Dichloromethane	µg/L	0.5	< 0.5	< 0.5
Monochlorobenzene	µg/L	0.5	< 0.5	< 0.5
Styrene	µg/L	0.5	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	< 0.5	< 0.5
Tetrachloroethene	µg/L	0.5	< 0.5	< 0.5
Trichloroethylene	µg/L	0.5	< 0.5	< 0.5



FINAL REPORT

CA15633-MAY19 R

Client: GHD

Project: PO#:73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

PACKAGE: - VOCs (WATER)

Sample Number	10	12
Sample Name	TW-6-2	TW-2-2
Sample Matrix	Ground Water	Ground Water
Sample Date	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result
VOCs (continued)					
Vinyl Chloride	µg/L	0.2		< 0.2	< 0.2
Trichlorofluoromethane	µg/L	5.0		< 5	< 5
1,1,1-Trichloroethane	µg/L	0.5		< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5		< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5		< 0.5	< 0.5



# FINAL REPORT

CA15633-MAY19 R

## QC SUMMARY

### Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0576-MAY19	mg/L as CaCO3	2	< 2	1	10	101	80	120	NA		
Alkalinity	EWL0583-MAY19	mg/L as CaCO3	2	< 2	0	10	97	80	120	NA		
Alkalinity	EWL0600-MAY19	mg/L as CaCO3	2	< 2	5	10	104	80	120	NA		
Alkalinity	EWL0601-MAY19	mg/L as CaCO3	2	< 2	1	10	102	80	120	NA		

### Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0002-JUN19	as N mg/L	0.1	<0.1	0	10	97	90	110	101	75	125
Ammonia+Ammonium (N)	SKA0016-JUN19	as N mg/L	0.1	<0.1	1	10	99	90	110	98	75	125



# FINAL REPORT

CA15633-MAY19 R

## QC SUMMARY

### Anions by discrete analyzer

Method: US EPA 375.4 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Sulphate	DIO0041-JUN19	mg/L	2	<2	2	20	103	80	120	101	75	125
Chloride	DIO0625-MAY19	mg/L	1	<1	3	20	100	80	120	102	75	125
Sulphate	DIO0625-MAY19	mg/L	2	<2	ND	20	103	80	120	97	75	125

### Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0028-JUN19	mg/L	0.03	<0.03	ND	20	94	80	120	95	75	125
Nitrate (as N)	DIO0028-JUN19	mg/L	0.06	<0.06	0	20	98	80	120	106	75	125
Nitrite (as N)	DIO0032-JUN19	mg/L	0.03	<0.03	3	20	94	80	120	97	75	125
Nitrate (as N)	DIO0032-JUN19	mg/L	0.06	<0.06	0	20	98	80	120	106	75	125
Nitrite (as N)	DIO0033-JUN19	mg/L	0.03	<0.03	ND	20	95	80	120	100	75	125
Nitrate (as N)	DIO0033-JUN19	mg/L	0.06	<0.06	1	20	99	80	120	107	75	125



FINAL REPORT

CA15633-MAY19 R

QC SUMMARY

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0059-MAY19	mg/L	2	< 2	12	30	99	70	130	96	70	130

Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0588-MAY19	mg/L	8	<8	ND	20	100	80	120	98	75	125



FINAL REPORT

CA15633-MAY19 R

QC SUMMARY

Conductivity  
Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0576-MAY19	uS/cm	2	2	1	10	101	90	110	NA		
Conductivity	EWL0583-MAY19	uS/cm	2	2	1	10	97	90	110	NA		
Conductivity	EWL0601-MAY19	uS/cm	2	< 2	0	10	100	90	110	NA		

Mercury by CVAAS  
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0033-MAY19	ug/L	0.01	<0.01	ND	20	116	80	120	124	70	130



# FINAL REPORT

CA15633-MAY19 R

## QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Boron (dissolved)	EMS0018-JUN19	mg/L	0.002	< 0.002	3	20	97	90	110	NV	70	130
Arsenic (dissolved)	EMS0218-MAY19	mg/L	0.0002	< 0.0002	5	20	98	90	110	102	70	130
Barium (dissolved)	EMS0218-MAY19	mg/L	0.00002	< 0.00002	1	20	98	90	110	83	70	130
Boron (dissolved)	EMS0218-MAY19	mg/L	0.002	< 0.002	1	20	97	90	110	NV	70	130
Calcium (dissolved)	EMS0218-MAY19	mg/L	0.01	< 0.01	1	20	99	90	110	NV	70	130
Cadmium (dissolved)	EMS0218-MAY19	mg/L	0.000003	< 0.000003	ND	20	95	90	110	87	70	130
Chromium (dissolved)	EMS0218-MAY19	mg/L	0.00008	< 0.00008	5	20	99	90	110	98	70	130
Copper (dissolved)	EMS0218-MAY19	mg/L	0.0002	< 0.0002	ND	20	94	90	110	NV	70	130
Iron (dissolved)	EMS0218-MAY19	mg/L	0.007	< 0.007	0	20	96	90	110	NV	70	130
Potassium (dissolved)	EMS0218-MAY19	mg/L	0.009	< 0.009	1	20	100	90	110	NV	70	130
Magnesium (dissolved)	EMS0218-MAY19	mg/L	0.001	< 0.001	2	20	106	90	110	NV	70	130
Manganese (dissolved)	EMS0218-MAY19	mg/L	0.00001	< 0.00001	0	20	101	90	110	NV	70	130
Sodium (dissolved)	EMS0218-MAY19	mg/L	0.01	< 0.01	ND	20	101	90	110	NV	70	130
Lead (dissolved)	EMS0218-MAY19	mg/L	0.00001	< 0.00001	4	20	97	90	110	97	70	130
Zinc (dissolved)	EMS0218-MAY19	mg/L	0.002	< 0.002	ND	20	97	90	110	NV	70	130



FINAL REPORT

CA15633-MAY19 R

QC SUMMARY

pH  
Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0576-MAY19	no unit	0.05	NA	0		100			NA		
pH	EWL0583-MAY19	no unit	0.05	NA	0		101			NA		
pH	EWL0601-MAY19	no unit	0.05	NA	0		101			NA		

Phenols by SFA  
Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0025-JUN19	mg/L	0.001	<0.001	ND	10	94	90	110	90	75	125
4AAP-Phenolics	SKA0034-JUN19	mg/L	0.001	<0.001	ND	10	100	90	110	103	75	125





FINAL REPORT

CA15633-MAY19 R

QC SUMMARY

Phosphorus by SFA  
Method: SM 4500-P J | Internal ref.: ME-CA-IENVISFA-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Phosphorus (total)	SKA0015-JUN19	mg/L	0.03	<0.03	7	10	102	90	110	99	75	125

Solids Analysis  
Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0010-JUN19	mg/L	30	<30	1	20	100	90	110	NA		
Total Dissolved Solids	EWL0023-JUN19	mg/L	30	<30	1	20	99	90	110	NA		
Total Dissolved Solids	EWL0558-MAY19	mg/L	30	<30	3	20	93	90	110	NA		
Total Dissolved Solids	EWL0568-MAY19	mg/L	30	<30	5	20	94	90	110	NA		
Total Dissolved Solids	EWL0579-MAY19	mg/L	30	<30	ND	20	98	90	110	NA		
Total Dissolved Solids	EWL0594-MAY19	mg/L	30	<30	3	20	91	90	110	NA		



# FINAL REPORT

CA15633-MAY19 R

## QC SUMMARY

### Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0014-JUN19	mg/L	2	< 2	4	10	NV	90	110	NA		
Total Suspended Solids	EWL0016-JUN19	mg/L	2	< 2	4	10	NV	90	110	NA		
Total Suspended Solids	EWL0026-JUN19	mg/L	2	< 2	4	10	NV	90	110	NA		
Total Suspended Solids	EWL0587-MAY19	mg/L	2	< 2	2	10	NV	90	110	NA		
Total Suspended Solids	EWL0590-MAY19	mg/L	2	< 2	0	10	NV	90	110	NA		

### Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0001-JUN19	as N mg/L	0.5	<0.5	ND	10	102	90	110	94	75	125
Total Kjeldahl Nitrogen	SKA0013-JUN19	as N mg/L	0.5	<0.5	ND	10	100	90	110	116	75	125



# FINAL REPORT

CA15633-MAY19 R

## QC SUMMARY

### Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-IENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,1,2-Tetrachloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	91	50	140
1,1,1-Trichloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	97	60	130	74	50	140
1,1,2,2-Tetrachloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	104	60	130	104	50	140
1,1,2-Trichloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	98	60	130	119	50	140
1,1-Dichloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	93	60	130	73	50	140
1,1-Dichloroethylene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	82	60	130	58	50	140
1,2-Dichlorobenzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	101	60	130	72	50	140
1,2-Dichloroethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	95	60	130	87	50	140
1,2-Dichloropropane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	91	60	130	84	50	140
1,3-Dichlorobenzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	85	50	140
1,4-Dichlorobenzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	86	50	140
Benzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	98	60	130	90	50	140
Bromodichloromethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	98	60	130	91	50	140
Bromoform	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	101	60	130	90	50	140
Bromomethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	159	50	140	109	50	140
Carbon tetrachloride	GCM0613-MAY19	ug/L	0.2	<0.2	ND	30	99	60	130	82	50	140
Chloroethane	GCM0613-MAY19	ug/L	5.0	<5	ND	30	93	60	130	82	50	140
Chloroform	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	103	60	130	75	50	140
Chloromethane	GCM0613-MAY19	ug/L	5.0	<5	ND	30	99	60	130	76	50	140
cis-1,2-Dichloroethene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	80	50	140



# FINAL REPORT

CA15633-MAY19 R

## QC SUMMARY

Volatile Organics (continued)

Method: EPA 5030B/8260C | Internal ref.: ME-CA-1ENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
cis-1,3-Dichloropropene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	98	60	130	73	50	140
Dibromochloromethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	98	60	130	124	50	140
Dichloromethane	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	96	60	130	77	50	140
Ethylbenzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	105	60	130	95	50	140
Ethylenedibromide	GCM0613-MAY19	ug/L	0.2	<0.2	ND	30	97	60	130	125	50	140
m/p-xylene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	105	60	130	94	50	140
Monochlorobenzene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	93	50	140
o-xylene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	108	60	130	98	50	140
Styrene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	108	60	130	70	50	140
Tetrachloroethene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	100	60	130	110	50	140
Toluene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	102	60	130	92	50	140
trans-1,2-Dichloroethene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	93	60	130	71	50	140
trans-1,3-Dichloropropene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	104	60	130	76	50	140
Trichloroethylene	GCM0613-MAY19	ug/L	0.5	<0.5	ND	30	95	60	130	88	50	140
Trichlorofluoromethane	GCM0613-MAY19	ug/L	5.0	<5	ND	30	100	50	140	85	50	140
Vinyl Chloride	GCM0613-MAY19	ug/L	0.2	<0.2	ND	30	102	60	130	79	50	140

## QC SUMMARY

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**Method Blank:** a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

**Duplicate:** Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

**LCS/Spike Blank:** Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

**Matrix Spike:** A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

**Reference Material:** a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

**RL:** Reporting limit

**RPD:** Relative percent difference

**AC:** Acceptance criteria

**Multielement Scan Qualifier:** as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

**Duplicate Qualifier:** for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

**Matrix Spike Qualifier:** for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

## LEGEND

### FOOTNOTES

**NSS** Insufficient sample for analysis.

**RL** Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

**NA** The sample was not analysed for this analyte

**ND** Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated. This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at [http://www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm). The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

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-- End of Analytical Report --



## FINAL REPORT

CA15636-MAY19 R

PO#73515229 11193449-01

Prepared for

**GHD**

## First Page

### CLIENT DETAILS

Client GHD

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Project PO#73515229 11193449-01

Order Number

Samples Surface Water (4)

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SGS Reference CA15636-MAY19

Received 05/29/2019

Approved 06/10/2019

Report Number CA15636-MAY19 R

Date Reported 06/10/2019

### COMMENTS

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Brad Moore Hon. B.Sc

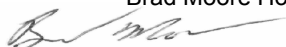






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# FINAL REPORT

CA15636-MAY19 R

Client: GHD

Project: PO#73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

## PACKAGE: - General Chemistry (WATER)

Sample Number	5	6	7	8
Sample Name	SW-1	SW-3	SW-6	SW-8
Sample Matrix	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result	Result
General Chemistry						
Biochemical Oxygen Demand (BOD5)	mg/L	2	< 4 †	< 4 †	< 4 †	< 4 †
Total Suspended Solids	mg/L	2	14	2	3	8
Alkalinity	mg/L as CaCO3	2	204	251	417	195
Conductivity	uS/cm	2	407	724	860	558
Total Dissolved Solids	mg/L	30	206	426	491	303
Chemical Oxygen Demand	mg/L	8	19	14	17	19
Total Kjeldahl Nitrogen	as N mg/L	0.5	< 0.5	< 0.5	2.4	0.7
Ammonia+Ammonium (N)	as N mg/L	0.1	< 0.1	< 0.1	1.6	< 0.1

## PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	6	7	8
Sample Name	SW-1	SW-3	SW-6	SW-8
Sample Matrix	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result	Result
Metals and Inorganics						
Sulphate	mg/L	2	6	53	41	< 2
Nitrite (as N)	as N mg/L	0.03	< 0.03	< 0.03	0.03	< 0.03
Nitrate (as N)	as N mg/L	0.06	< 0.06	< 0.06	0.52	< 0.06
Arsenic (total)	mg/L	0.0002	0.0002	0.0002	0.0004	0.0002
Barium (total)	mg/L	0.00002	0.0608	0.0577	0.110	0.0513
Boron (total)	mg/L	0.002	0.016	0.126	0.189	0.011
Calcium (total)	mg/L	0.01	70.8	113	164	74.8



# FINAL REPORT

CA15636-MAY19 R

Client: GHD

Project: PO#73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Galdi

PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	6	7	8
Sample Name	SW-1	SW-3	SW-6	SW-8
Sample Matrix	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL	Result	Result	Result	Result
Metals and Inorganics (continued)						
Cadmium (total)	mg/L	0.000003	< 0.000003	0.000003	0.000005	0.000006
Chromium (total)	mg/L	0.00008	0.00011	0.00024	0.00071	0.00015
Copper (total)	mg/L	0.0002	< 0.0002	0.0008	0.0008	< 0.0002
Iron (total)	mg/L	0.007	0.071	0.064	1.05	0.067
Potassium (total)	mg/L	0.009	0.581	1.68	10.4	1.30
Magnesium (total)	mg/L	0.001	1.96	6.71	11.6	1.81
Manganese (total)	mg/L	0.00001	0.0193	0.00770	1.35	0.0211
Sodium (total)	mg/L	0.01	6.56	28.4	21.2	35.3
Phosphorus (total)	mg/L	0.003	< 0.003	0.137	0.036	0.028
Lead (total)	mg/L	0.00001	< 0.00001	< 0.00001	0.00016	0.00008
Zinc (total)	mg/L	0.002	0.002	0.004	0.005	0.003



# FINAL REPORT

CA15636-MAY19 R

Client: GHD

Project: PO#73515229 11193449-01

Project Manager: Gus Bolin

Samplers: K. Gerald

## PACKAGE: - Other (ORP) (WATER)

Sample Number	5	6	7	8
Sample Name	SW-1	SW-3	SW-6	SW-8
Sample Matrix	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result	Result
Other (ORP)							
pH	no unit	0.05		8.17	8.17	7.69	7.71
Chloride	mg/L	1		12	62	19	63
Mercury (total)	µg/L	0.01		< 0.01	< 0.01	< 0.01	< 0.01

## PACKAGE: - Phenols (WATER)

Sample Number	5	6	7	8
Sample Name	SW-1	SW-3	SW-6	SW-8
Sample Matrix	Surface Water	Surface Water	Surface Water	Surface Water
Sample Date	29/05/2019	29/05/2019	29/05/2019	29/05/2019

Parameter	Units	RL		Result	Result	Result	Result
Phenols							
4AAP-Phenolics	mg/L	0.001		0.003	0.004	0.003	0.004



FINAL REPORT

CA15636-MAY19 R

QC SUMMARY

Alkalinity  
Method: SM 2320 | Internal ref.: ME-CA-ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0059-JUN19	mg/L as CaCO3	2	< 2	2	10	94	80	120	NA		
Alkalinity	EWL0069-JUN19	mg/L as CaCO3	2	< 2	0	10	102	80	120	NA		
Alkalinity	EWL0576-MAY19	mg/L as CaCO3	2	< 2	1	10	101	80	120	NA		
Alkalinity	EWL0601-MAY19	mg/L as CaCO3	2	< 2	1	10	102	80	120	NA		

Ammonia by SFA  
Method: SM 4500 | Internal ref.: ME-CA-ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0002-JUN19	as N mg/L	0.1	<0.1	0	10	97	90	110	101	75	125



# FINAL REPORT

CA15636-MAY19 R

## QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0620-MAY19	mg/L	1	<1	2	20	100	80	120	89	75	125
Sulphate	DIO0620-MAY19	mg/L	2	<2	2	20	104	80	120	92	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0028-JUN19	mg/L	0.03	<0.03	ND	20	94	80	120	95	75	125
Nitrate (as N)	DIO0028-JUN19	mg/L	0.06	<0.06	0	20	98	80	120	106	75	125
Nitrite (as N)	DIO0032-JUN19	mg/L	0.03	<0.03	3	20	94	80	120	97	75	125
Nitrate (as N)	DIO0032-JUN19	mg/L	0.06	<0.06	0	20	98	80	120	106	75	125
Nitrite (as N)	DIO0033-JUN19	mg/L	0.03	<0.03	ND	20	95	80	120	100	75	125
Nitrate (as N)	DIO0033-JUN19	mg/L	0.06	<0.06	1	20	99	80	120	107	75	125



FINAL REPORT

CA15636-MAY19 R

QC SUMMARY

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0059-MAY19	mg/L	2	< 2	12	30	99	70	130	96	70	130

Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0588-MAY19	mg/L	8	<8	ND	20	100	80	120	98	75	125



FINAL REPORT

CA15636-MAY19 R

QC SUMMARY

Conductivity  
Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0059-JUN19	uS/cm	2	< 2	1	10	99	90	110	NA		
Conductivity	EWL0069-JUN19	uS/cm	2	< 2	1	10	100	90	110	NA		
Conductivity	EWL0576-MAY19	uS/cm	2	2	1	10	101	90	110	NA		
Conductivity	EWL0601-MAY19	uS/cm	2	< 2	0	10	100	90	110	NA		

Mercury by CVAAS  
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0033-MAY19	ug/L	0.01	<0.01	ND	20	116	80	120	124	70	130





# FINAL REPORT

CA15636-MAY19 R

## QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-1ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (total)	EMS0219-MAY19	mg/L	0.0002	<0.0002	5	20	99	90	110	95	70	130
Barium (total)	EMS0219-MAY19	mg/L	0.00002	<0.00002	1	20	98	90	110	NV	70	130
Boron (total)	EMS0219-MAY19	mg/L	0.002	<0.002	0	20	96	90	110	NV	70	130
Calcium (total)	EMS0219-MAY19	mg/L	0.01	<0.01	3	20	97	90	110	130	70	130
Cadmium (total)	EMS0219-MAY19	mg/L	0.000003	<0.000003	ND	20	105	90	110	107	70	130
Chromium (total)	EMS0219-MAY19	mg/L	0.00008	<0.00008	8	20	101	90	110	NV	70	130
Copper (total)	EMS0219-MAY19	mg/L	0.0002	<0.0002	2	20	99	90	110	113	70	130
Iron (total)	EMS0219-MAY19	mg/L	0.007	<0.007	8	20	96	90	110	NV	70	130
Potassium (total)	EMS0219-MAY19	mg/L	0.009	<0.009	7	20	96	90	110	NV	70	130
Magnesium (total)	EMS0219-MAY19	mg/L	0.001	<0.001	4	20	98	90	110	116	70	130
Manganese (total)	EMS0219-MAY19	mg/L	0.00001	<0.00001	6	20	102	90	110	NV	70	130
Sodium (total)	EMS0219-MAY19	mg/L	0.01	<0.01	3	20	103	90	110	NV	70	130
Lead (total)	EMS0219-MAY19	mg/L	0.00001	<0.00001	2	20	100	90	110	95	70	130
Zinc (total)	EMS0219-MAY19	mg/L	0.002	<0.002	2	20	100	90	110	104	70	130



FINAL REPORT

CA15636-MAY19 R

QC SUMMARY

Metals in aqueous samples - ICP-OES  
Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Phosphorus (total)	EMS0219-MAY19	mg/L	0.003	0.003	15	20	92	90	110	NV	70	130

pH  
Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0059-JUN19	no unit	0.05	NA	0		100			NA		
pH	EWL0069-JUN19	no unit	0.05	NA	0		100			NA		
pH	EWL0576-MAY19	no unit	0.05	NA	0		100			NA		
pH	EWL0601-MAY19	no unit	0.05	NA	0		101			NA		



FINAL REPORT

CA15636-MAY19 R

QC SUMMARY

Phenols by SFA  
Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0025-JUN19	mg/L	0.001	<0.001	ND	10	94	90	110	90	75	125

Solids Analysis  
Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0010-JUN19	mg/L	30	<30	1	20	100	90	110	NA		
Total Dissolved Solids	EWL0558-MAY19	mg/L	30	<30	3	20	93	90	110	NA		
Total Dissolved Solids	EWL0579-MAY19	mg/L	30	<30	ND	20	98	90	110	NA		



FINAL REPORT

CA15636-MAY19 R

QC SUMMARY

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0014-JUN19	mg/L	2	< 2	4	10	NV	90	110	NA		
Total Suspended Solids	EWL0030-JUN19	mg/L	2	< 2	3	10	NV	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0001-JUN19	as N mg/L	0.5	<0.5	ND	10	102	90	110	94	75	125

## QC SUMMARY

---

**Method Blank:** a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

**Duplicate:** Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

**LCS/Spike Blank:** Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

**Matrix Spike:** A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

**Reference Material:** a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

**RL:** Reporting limit

**RPD:** Relative percent difference

**AC:** Acceptance criteria

**Multielement Scan Qualifier:** as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

**Duplicate Qualifier:** for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

**Matrix Spike Qualifier:** for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

## LEGEND

## FOOTNOTES

**NSS** Insufficient sample for analysis.

**RL** Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

**NA** The sample was not analysed for this analyte

**ND** Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

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-- End of Analytical Report --



## FINAL REPORT

CA14047-SEP19 R

11193449-01

Prepared for

**GHD**

## First Page

### CLIENT DETAILS

Client GHD

Address 347 Pido Rd., Unit #29, Peterborough  
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Facsimile

Email gus.bolin@ghd.com

Project 11193449-01

Order Number

Samples Surface Water (2)

### LABORATORY DETAILS

Project Specialist Brad Moore Hon. B.Sc

Laboratory SGS Canada Inc.

Address 185 Concession St., Lakefield ON, K0L 2H0

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SGS Reference CA14047-SEP19

Received 09/03/2019

Approved 09/10/2019

Report Number CA14047-SEP19 R

Date Reported 09/10/2019

### COMMENTS

### SIGNATORIES

Brad Moore Hon. B.Sc

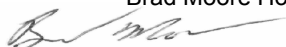






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# FINAL REPORT

CA14047-SEP19 R

Client: GHD

Project: 11193449-01

Project Manager: Gus Bolin

Samplers: G Bolin

PACKAGE: - General Chemistry (WATER)

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	02/09/2019	02/09/2019

Parameter	Units	RL	Result	Result
General Chemistry				
Biochemical Oxygen Demand (BOD5)	mg/L	2	5	34
Total Suspended Solids	mg/L	2	13	83
Alkalinity	mg/L as CaCO3	2	273	168
Conductivity	uS/cm	2	543	358
Total Dissolved Solids	mg/L	30	329	300
Chemical Oxygen Demand	mg/L	8	27	70
Total Kjeldahl Nitrogen	as N mg/L	0.5	0.9	1.7
Ammonia+Ammonium (N)	as N mg/L	0.1	0.2	< 0.1

PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	02/09/2019	02/09/2019

Parameter	Units	RL	Result	Result
Metals and Inorganics				
Sulphate	mg/L	2	3	3
Nitrite (as N)	as N mg/L	0.03	< 0.03	< 0.03
Nitrate (as N)	as N mg/L	0.06	< 0.06	< 0.06
Arsenic (total)	mg/L	0.0002	0.0005	0.0026
Barium (total)	mg/L	0.00002	0.0955	0.0880
Boron (total)	mg/L	0.002	0.034	0.030
Calcium (total)	mg/L	0.01	117	71.6



FINAL REPORT

CA14047-SEP19 R

Client: GHD

Project: 11193449-01

Project Manager: Gus Bolin

Samplers: G Bolin

PACKAGE: - Metals and Inorganics (WATER)

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	02/09/2019	02/09/2019

Parameter	Units	RL	Result	Result
Metals and Inorganics (continued)				
Cadmium (total)	mg/L	0.000003	0.000019	0.000010
Chromium (total)	mg/L	0.00008	0.00021	0.00014
Copper (total)	mg/L	0.0002	0.0009	0.0006
Iron (total)	mg/L	0.007	1.51	1.23
Potassium (total)	mg/L	0.009	0.660	8.64
Magnesium (total)	mg/L	0.001	2.81	2.95
Manganese (total)	mg/L	0.00001	0.639	0.494
Sodium (total)	mg/L	0.01	7.64	5.86
Phosphorus (total)	mg/L	0.003	0.037	0.286
Lead (total)	mg/L	0.00001	0.00009	0.00038
Zinc (total)	mg/L	0.002	0.009	0.004



FINAL REPORT

CA14047-SEP19 R

Client: GHD  
Project: 11193449-01  
Project Manager: Gus Bolin  
Samplers: G Bolin

PACKAGE: - Other (ORP) (WATER)

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	02/09/2019	02/09/2019

Parameter	Units	RL		Result	Result
Other (ORP)					
pH	no unit	0.05		8.00	8.64
Chloride	mg/L	1		13	16
Mercury (total)	µg/L	0.01		< 0.01	< 0.01

PACKAGE: - Phenols (WATER)

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	02/09/2019	02/09/2019

Parameter	Units	RL		Result	Result
Phenols					
4AAP-Phenolics	mg/L	0.001		0.006	0.009



FINAL REPORT

CA14047-SEP19 R

QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0020-SEP19	mg/L as CaCO3	2	< 2	3	10	103	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0013-SEP19	as N mg/L	0.1	<0.1	ND	10	99	90	110	99	75	125
Ammonia+Ammonium (N)	SKA0025-SEP19	as N mg/L	0.1	<0.1	0	10	100	90	110	NV	75	125



FINAL REPORT

CA14047-SEP19 R

QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0109-SEP19	mg/L	1	<1	1	20	100	80	120	109	75	125
Sulphate	DIO0109-SEP19	mg/L	2	<2	0	20	104	80	120	95	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0019-SEP19	mg/L	0.03	<0.03	6	20	101	80	120	106	75	125
Nitrate (as N)	DIO0019-SEP19	mg/L	0.06	<0.06	2	20	101	80	120	106	75	125



# FINAL REPORT

CA14047-SEP19 R

## QC SUMMARY

### Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0001-SEP19	mg/L	2	< 2	8	30	90	70	130	97	70	130

### Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0025-SEP19	mg/L	8	<8	6	20	98	80	120	103	75	125
Chemical Oxygen Demand	EWL0030-SEP19	mg/L	8	<8	9	20	96	80	120	100	75	125

### Conductivity

Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0020-SEP19	uS/cm	2	< 2	1	10	105	90	110	NA		



FINAL REPORT

CA14047-SEP19 R

QC SUMMARY

Mercury by CVAAS  
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0002-SEP19	ug/L	0.01	<0.01	ND	20	115	80	120	113	70	130





# FINAL REPORT

CA14047-SEP19 R

## QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-1ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (total)	EMS0205-AUG19	mg/L	0.0002	<0.0002	3	20	100	90	110	102	70	130
Barium (total)	EMS0205-AUG19	mg/L	0.00002	<0.00002	1	20	101	90	110	NV	70	130
Boron (total)	EMS0205-AUG19	mg/L	0.002	<0.002	3	20	101	90	110	NV	70	130
Calcium (total)	EMS0205-AUG19	mg/L	0.01	<0.01	1	20	101	90	110	NV	70	130
Cadmium (total)	EMS0205-AUG19	mg/L	0.000003	<0.000003	ND	20	100	90	110	93	70	130
Chromium (total)	EMS0205-AUG19	mg/L	0.00008	<0.00008	3	20	101	90	110	114	70	130
Copper (total)	EMS0205-AUG19	mg/L	0.0002	<0.0002	2	20	100	90	110	96	70	130
Iron (total)	EMS0205-AUG19	mg/L	0.007	<0.007	0	20	102	90	110	NV	70	130
Potassium (total)	EMS0205-AUG19	mg/L	0.009	<0.009	1	20	103	90	110	NV	70	130
Magnesium (total)	EMS0205-AUG19	mg/L	0.001	<0.001	3	20	106	90	110	NV	70	130
Manganese (total)	EMS0205-AUG19	mg/L	0.00001	<0.00001	0	20	99	90	110	NV	70	130
Sodium (total)	EMS0205-AUG19	mg/L	0.01	<0.01	2	20	96	90	110	NV	70	130
Lead (total)	EMS0205-AUG19	mg/L	0.00001	<0.00001	1	20	102	90	110	90	70	130
Phosphorus (total)	EMS0205-AUG19	mg/L	0.003	<0.003	11	20	103	90	110	NV	70	130
Zinc (total)	EMS0205-AUG19	mg/L	0.002	<0.002	3	20	99	90	110	112	70	130



FINAL REPORT

CA14047-SEP19 R

QC SUMMARY

pH  
Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0020-SEP19	no unit	0.05	NA	0		100			NA		

Phenols by SFA  
Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0021-SEP19	mg/L	0.001	<0.001	ND	10	109	90	110	113	75	125

Solids Analysis  
Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0006-SEP19	mg/L	30	<30	NV	20	93	90	110	NA		



FINAL REPORT

CA14047-SEP19 R

QC SUMMARY

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0023-SEP19	mg/L	2	< 2	0	10	NV	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0020-SEP19	as N mg/L	0.5	<0.5	1	10	101	90	110	123	75	125

## QC SUMMARY

---

**Method Blank:** a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

**Duplicate:** Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

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**Matrix Spike:** A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

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**RL:** Reporting limit

**RPD:** Relative percent difference

**AC:** Acceptance criteria

**Multielement Scan Qualifier:** as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

**Duplicate Qualifier:** for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

**Matrix Spike Qualifier:** for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

## LEGEND

## FOOTNOTES

**NSS** Insufficient sample for analysis.

**RL** Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

**NA** The sample was not analysed for this analyte

**ND** Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

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-- End of Analytical Report --



## FINAL REPORT

CA14878-OCT19 R

PO#73515229, 11192449-01, Stoney Lake Landfill

Prepared for

**GHD**

## First Page

### CLIENT DETAILS

Client GHD

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K9J 6Z8, Canada

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Email gus.bolin@ghd.com

Project PO#73515229, 11192449-01, Stoney Lake Landfill

Order Number

Samples Ground Water (4)

### LABORATORY DETAILS

Project Specialist Brad Moore Hon. B.Sc

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SGS Reference CA14878-OCT19

Received 10/29/2019

Approved 11/08/2019

Report Number CA14878-OCT19 R

Date Reported 11/08/2019

### COMMENTS

### SIGNATORIES

Brad Moore Hon. B.Sc

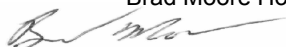




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# FINAL REPORT

CA14878-OCT19 R

Client: GHD

Project: PO#73515229, 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Bus Bolin

## PACKAGE: ODWS\_AO\_OG - BTEX (WATER)

L1 = ODWS\_AO\_OG / WATER / - - Table 4 - Drinking Water - Reg O.169\_03

Sample Number	5	6	7	8
Sample Name	TW-6-1	TW-7-1	TW-8-1	TW-9-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result
<b>BTEX</b>							
Benzene	ug/L	0.5		< 0.5	< 0.5	1.0	< 0.5
Toluene	ug/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5

## PACKAGE: ODWS\_AO\_OG - General Chemistry (WATER)

L1 = ODWS\_AO\_OG / WATER / - - Table 4 - Drinking Water - Reg O.169\_03

Sample Number	5	6	7	8
Sample Name	TW-6-1	TW-7-1	TW-8-1	TW-9-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result
<b>General Chemistry</b>							
Alkalinity	mg/L as CaCO3	2	500	534	231	247	237
Conductivity	uS/cm	2		1270	513	522	543
Total Dissolved Solids	mg/L	30	500	806	303	297	303
Chemical Oxygen Demand	mg/L	8		16	8	< 8	< 8
Total Kjeldahl Nitrogen	as N mg/L	0.5		6.4	< 0.5	< 0.5	< 0.5
Ammonia+Ammonium (N)	as N mg/L	0.1		5.4	< 0.1	< 0.1	< 0.1
Dissolved Organic Carbon	mg/L	1	5	8	< 1	< 1	< 1



# FINAL REPORT

CA14878-OCT19 R

Client: GHD

Project: PO#73515229, 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Bus Bolin

PACKAGE: ODWS\_AO\_OG - Metals and Inorganics  
(WATER)

L1 = ODWS\_AO\_OG / WATER / - - Table 4 - Drinking Water - Reg O.169\_03

Sample Number	5	6	7	8
Sample Name	TW-6-1	TW-7-1	TW-8-1	TW-9-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result
Metals and Inorganics							
Phosphorus (total)	mg/L	0.03		0.03	< 0.03	0.14	< 0.03
Sulphate	mg/L	2	500	110	17	7	28
Nitrite (as N)	as N mg/L	0.03		< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N)	as N mg/L	0.06		0.08	< 0.06	1.21	< 0.06
Arsenic (dissolved)	mg/L	0.0002		0.0006	< 0.0002	0.0009	< 0.0002
Barium (dissolved)	mg/L	0.00002		0.393	0.0157	0.0611	0.109
Boron (dissolved)	mg/L	0.002		0.145	0.002	0.015	0.025
Calcium (dissolved)	mg/L	0.01		253	14.1	120	108
Cadmium (dissolved)	mg/L	0.000003		0.000056	< 0.000003	0.000017	0.000010
Chromium (dissolved)	mg/L	0.00008		0.00032	< 0.00008	0.00127	0.00015
Copper (dissolved)	mg/L	0.0002	1	0.0010	< 0.0002	0.0027	0.0008
Iron (dissolved)	mg/L	0.007	0.3	0.221	< 0.007	1.05	0.007
Potassium (dissolved)	mg/L	0.009		8.14	0.120	1.37	1.84
Magnesium (dissolved)	mg/L	0.001		13.6	0.668	2.98	5.10
Manganese (dissolved)	mg/L	0.00001	0.05	4.36	0.00057	0.0863	0.00340
Sodium (dissolved)	mg/L	0.01	200	38.0	1.30	3.34	9.64
Phosphorus (dissolved)	mg/L	0.003		0.004	< 0.003	0.075	< 0.003
Lead (dissolved)	mg/L	0.00001		0.00034	< 0.00001	0.00107	0.00002
Zinc (dissolved)	mg/L	0.002	5	0.003	< 0.002	0.022	0.003



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Client: GHD

Project: PO#73515229, 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Bus Bolin

## PACKAGE: ODWS\_AO\_OG - Other (ORP) (WATER)

L1 = ODWS\_AO\_OG / WATER / - - Table 4 - Drinking Water - Reg O.169\_03

Sample Number	5	6	7	8
Sample Name	TW-6-1	TW-7-1	TW-8-1	TW-9-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result
Other (ORP)							
pH	no unit	0.05	8.5	7.80	8.07	8.03	8.02
Chloride	mg/L	1	250	55	13	7	18
Mercury (total)	µg/L	0.01		< 0.01	< 0.01	< 0.01	< 0.01

## PACKAGE: ODWS\_AO\_OG - Phenols (WATER)

L1 = ODWS\_AO\_OG / WATER / - - Table 4 - Drinking Water - Reg O.169\_03

Sample Number	5	6	7	8
Sample Name	TW-6-1	TW-7-1	TW-8-1	TW-9-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result
Phenols							
4AAP-Phenolics	mg/L	0.002		< 0.002	< 0.002	< 0.002	< 0.002

## PACKAGE: ODWS\_AO\_OG - VOCs (WATER)

L1 = ODWS\_AO\_OG / WATER / - - Table 4 - Drinking Water - Reg O.169\_03

Sample Number	5	6	7	8
Sample Name	TW-6-1	TW-7-1	TW-8-1	TW-9-1
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result
VOCs							
1,4-Dichlorobenzene	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5
Dichloromethane	µg/L	0.5		< 0.5	< 0.5	< 0.5	< 0.5
Vinyl Chloride	µg/L	0.2		< 0.2	< 0.2	< 0.2	< 0.2



EXCEEDANCE SUMMARY

				ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03 L1
Parameter	Method	Units	Result	

TW-6-1

Alkalinity	SM 2320	mg/L	534	500
Total Dissolved Solids	SM 2540C	mg/L	806	500
Manganese (dissolved)	SM 3030/EPA 200.8	µg/L	4.36	0.05
Dissolved Organic Carbon	SM 5310	mg/L	8	5

TW-8-1

Iron (dissolved)	SM 3030/EPA 200.8	µg/L	1.05	0.3
Manganese (dissolved)	SM 3030/EPA 200.8	µg/L	0.0863	0.05



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QC SUMMARY

Alkalinity  
Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0520-OCT19	mg/L as CaCO3	2	< 2	0	10	103	80	120	NA		

Ammonia by SFA  
Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0266-OCT19	as N mg/L	0.1	<0.1	6	10	99	90	110	99	75	125



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QC SUMMARY

Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0039-NOV19	mg/L	1	<1	1	20	94	80	120	103	75	125
Sulphate	DIO0039-NOV19	mg/L	2	<2	2	20	105	80	120	103	75	125

Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0602-OCT19	mg/L	0.03	<0.03	ND	20	100	80	120	101	75	125
Nitrate (as N)	DIO0602-OCT19	mg/L	0.06	<0.06	ND	20	102	80	120	106	75	125



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QC SUMMARY

Carbon by SFA

Method: SM 5310 | Internal ref.: ME-CA-|ENV|SFA-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Dissolved Organic Carbon	SKA0007-NOV19	mg/L	1	<1	1	20	91	90	110	107	75	125
Dissolved Organic Carbon	SKA0022-NOV19	mg/L	1	<1	4	20	101	90	110	88	75	125

Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-|ENV|EWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0529-OCT19	mg/L	8	<8	0	20	100	80	120	99	75	125
Chemical Oxygen Demand	EWL0551-OCT19	mg/L	8	<8	0	20	94	80	120	101	75	125
Chemical Oxygen Demand	EWL0554-OCT19	mg/L	8	<8	ND	20	96	80	120	99	75	125



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QC SUMMARY

Conductivity  
Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0520-OCT19	uS/cm	2	< 2	0	10	100	90	110	NA		

Mercury by CVAAS  
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0035-OCT19	ug/L	0.01	<0.01	ND	20	97	80	120	112	70	130





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## QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (dissolved)	EMS0012-NOV19	mg/L	0.0002	<0.0002	10	20	108	90	110	102	70	130
Barium (dissolved)	EMS0012-NOV19	mg/L	0.00002	<0.00002	1	20	98	90	110	NV	70	130
Boron (dissolved)	EMS0012-NOV19	mg/L	0.002	<0.002	2	20	97	90	110	NV	70	130
Calcium (dissolved)	EMS0012-NOV19	mg/L	0.01	<0.01	3	20	99	90	110	120	70	130
Cadmium (dissolved)	EMS0012-NOV19	mg/L	0.000003	<0.000003	ND	20	109	90	110	101	70	130
Chromium (dissolved)	EMS0012-NOV19	mg/L	0.00008	<0.00008	2	20	103	90	110	82	70	130
Copper (dissolved)	EMS0012-NOV19	mg/L	0.0002	<0.0002	14	20	109	90	110	103	70	130
Iron (dissolved)	EMS0012-NOV19	mg/L	0.007	<0.007	3	20	100	90	110	NV	70	130
Potassium (dissolved)	EMS0012-NOV19	mg/L	0.009	<0.009	2	20	100	90	110	NV	70	130
Magnesium (dissolved)	EMS0012-NOV19	mg/L	0.001	<0.001	3	20	99	90	110	78	70	130
Manganese (dissolved)	EMS0012-NOV19	mg/L	0.00001	<0.00001	5	20	107	90	110	NV	70	130
Sodium (dissolved)	EMS0012-NOV19	mg/L	0.01	<0.01	5	20	106	90	110	120	70	130
Lead (dissolved)	EMS0012-NOV19	mg/L	0.00001	<0.00001	11	20	95	90	110	87	70	130
Phosphorus (dissolved)	EMS0012-NOV19	mg/L	0.003	<0.003	6	20	98	90	110	NV	70	130
Zinc (dissolved)	EMS0012-NOV19	mg/L	0.002	<0.002	0	20	108	90	110	110	70	130
Boron (dissolved)	EMS0059-NOV19	mg/L	0.002	<0.002	4	20	95	90	110	NV	70	130
Arsenic (dissolved)	EMS0217-OCT19	mg/L	0.0002	<0.0002	6	20	101	90	110	NV	70	130
Barium (dissolved)	EMS0217-OCT19	mg/L	0.00002	<0.00002	2	20	96	90	110	NV	70	130
Boron (dissolved)	EMS0217-OCT19	mg/L	0.002	<0.002	10	20	106	90	110	NV	70	130
Calcium (dissolved)	EMS0217-OCT19	mg/L	0.01	<0.01	1	20	97	90	110	NV	70	130



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QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)  
Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Cadmium (dissolved)	EMS0217-OCT19	mg/L	0.000003	<0.000003	ND	20	100	90	110	107	70	130
Chromium (dissolved)	EMS0217-OCT19	mg/L	0.00008	<0.00008	12	20	101	90	110	105	70	130
Copper (dissolved)	EMS0217-OCT19	mg/L	0.0002	<0.0002	5	20	101	90	110	NV	70	130
Iron (dissolved)	EMS0217-OCT19	mg/L	0.007	<0.007	ND	20	99	90	110	NV	70	130
Potassium (dissolved)	EMS0217-OCT19	mg/L	0.009	<0.009	0	20	96	90	110	89	70	130
Magnesium (dissolved)	EMS0217-OCT19	mg/L	0.001	<0.001	6	20	96	90	110	NV	70	130
Manganese (dissolved)	EMS0217-OCT19	mg/L	0.00001	<0.00001	ND	20	101	90	110	NV	70	130
Sodium (dissolved)	EMS0217-OCT19	mg/L	0.01	<0.01	2	20	110	90	110	NV	70	130
Lead (dissolved)	EMS0217-OCT19	mg/L	0.00001	<0.00001	ND	20	91	90	110	91	70	130
Phosphorus (dissolved)	EMS0217-OCT19	mg/L	0.003	<0.003	5	20	97	90	110	NV	70	130
Zinc (dissolved)	EMS0217-OCT19	mg/L	0.002	<0.002	ND	20	102	90	110	111	70	130
Arsenic (dissolved)	EMS9005-NOV19	mg/L	0.0002	<0.0002	6	20	99	90	110	99	70	130
Barium (dissolved)	EMS9005-NOV19	mg/L	0.00002	<0.00002	2	20	93	90	110	NV	70	130
Boron (dissolved)	EMS9005-NOV19	mg/L	0.002	<0.002	4	20	91	90	110	NV	70	130
Calcium (dissolved)	EMS9005-NOV19	mg/L	0.01	<0.01	6	20	99	90	110	NV	70	130
Cadmium (dissolved)	EMS9005-NOV19	mg/L	0.000003	<0.000003	ND	20	100	90	110	98	70	130
Chromium (dissolved)	EMS9005-NOV19	mg/L	0.00008	<0.00008	3	20	105	90	110	111	70	130
Copper (dissolved)	EMS9005-NOV19	mg/L	0.0002	<0.0002	15	20	100	90	110	115	70	130
Iron (dissolved)	EMS9005-NOV19	mg/L	0.007	<0.007	17	20	97	90	110	NV	70	130
Potassium (dissolved)	EMS9005-NOV19	mg/L	0.009	<0.009	7	20	95	90	110	NV	70	130



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QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)  
Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-|ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Magnesium (dissolved)	EMS9005-NOV19	mg/L	0.001	<0.001	6	20	99	90	110	NV	70	130
Manganese (dissolved)	EMS9005-NOV19	mg/L	0.00001	<0.00001	6	20	97	90	110	NV	70	130
Sodium (dissolved)	EMS9005-NOV19	mg/L	0.01	<0.01	5	20	106	90	110	NV	70	130
Lead (dissolved)	EMS9005-NOV19	mg/L	0.00001	<0.00001	2	20	95	90	110	76	70	130
Phosphorus (dissolved)	EMS9005-NOV19	mg/L	0.003	<0.003	7	20	107	90	110	NV	70	130
Zinc (dissolved)	EMS9005-NOV19	mg/L	0.002	<0.002	14	20	97	90	110	88	70	130

pH  
Method: SM 4500 | Internal ref.: ME-CA-|ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0520-OCT19	no unit	0.05	NA	1		100			NA		



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QC SUMMARY

Phenols by SFA

Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0004-NOV19	mg/L	0.002	<0.002	7	10	109	90	110	107	75	125

Phosphorus by SFA

Method: SM 4500-P J | Internal ref.: ME-CA-IENVISFA-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Phosphorus (total)	SKA0264-OCT19	mg/L	0.03	<0.03	0	10	107	90	110	90	75	125

Solids Analysis

Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0519-OCT19	mg/L	30	<30	0	20	92	90	110	NA		
Total Dissolved Solids	EWL0521-OCT19	mg/L	30	<30	1	20	105	90	110	NA		



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QC SUMMARY

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0279-OCT19	as N mg/L	0.5	<0.5	1	10	94	90	110	106	75	125

Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-IENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,4-Dichlorobenzene	GCM0550-OCT19	ug/L	0.5	<0.5	ND	30	101	60	130	105	50	140
Benzene	GCM0550-OCT19	ug/L	0.5	<0.5	ND	30	100	60	130	105	50	140
Dichloromethane	GCM0550-OCT19	ug/L	0.5	<0.5	ND	30	99	60	130	104	50	140
Toluene	GCM0550-OCT19	ug/L	0.5	<0.5	ND	30	101	60	130	106	50	140
Vinyl Chloride	GCM0550-OCT19	ug/L	0.2	<0.2	ND	30	104	60	130	107	50	140

## QC SUMMARY

---

**Method Blank:** a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

**Duplicate:** Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

**LCS/Spike Blank:** Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

**Matrix Spike:** A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

**Reference Material:** a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

**RL:** Reporting limit

**RPD:** Relative percent difference

**AC:** Acceptance criteria

**Multielement Scan Qualifier:** as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

**Duplicate Qualifier:** for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

**Matrix Spike Qualifier:** for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

## LEGEND

## FOOTNOTES

**NSS** Insufficient sample for analysis.

**RL** Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

**NA** The sample was not analysed for this analyte

**ND** Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated. This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at [http://www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm). The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

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-- End of Analytical Report --



## FINAL REPORT

CA14876-OCT19 R

11192449-01, Stoney Lake Landfill

Prepared for

**GHD**



## First Page

### CLIENT DETAILS

Client GHD

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Project 11192449-01, Stoney Lake Landfill

Order Number

Samples Ground Water (3)

### LABORATORY DETAILS

Project Specialist Brad Moore Hon. B.Sc

Laboratory SGS Canada Inc.

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SGS Reference CA14876-OCT19

Received 10/29/2019

Approved 11/08/2019

Report Number CA14876-OCT19 R

Date Reported 11/08/2019

### COMMENTS

Temperature of Sample upon Receipt: 8 degrees C

Cooling Agent Present:Yes

Custody Seal Present:No

Chain of Custody Number:NA

### SIGNATORIES

Brad Moore Hon. B.Sc

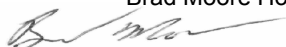




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# FINAL REPORT

CA14876-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: ODWS\_AO\_OG - General Chemistry

(WATER)

L1 = ODWS\_AO\_OG / WATER / - - Table 4 - Drinking Water - Reg O.169\_03

Sample Number	5	6	7
Sample Name	TW-2-1	TW-4-1	TW-5-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result
General Chemistry						
Alkalinity	mg/L as CaCO3	2	500	252	436	413
Conductivity	uS/cm	2		581	1360	2800
Total Dissolved Solids	mg/L	30	500	334	966	2670
Chemical Oxygen Demand	mg/L	8		< 8	24	25
Ammonia+Ammonium (N)	as N mg/L	0.1		< 0.1	0.2	0.6
Dissolved Organic Carbon	mg/L	1	5	< 1	8	11

PACKAGE: ODWS\_AO\_OG - Metals and Inorganics

(WATER)

L1 = ODWS\_AO\_OG / WATER / - - Table 4 - Drinking Water - Reg O.169\_03

Sample Number	5	6	7
Sample Name	TW-2-1	TW-4-1	TW-5-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result
Metals and Inorganics						
Sulphate	mg/L	2	500	7	340	1100
Nitrate (as N)	as N mg/L	0.06		3.71	1.33	< 0.06
Arsenic (dissolved)	mg/L	0.0002		< 0.0002	0.0004	< 0.0002
Barium (dissolved)	mg/L	0.00002		0.0230	0.0701	0.00597
Boron (dissolved)	mg/L	0.002		0.008	0.090	0.374
Calcium (dissolved)	mg/L	0.01		112	305	57.9
Cadmium (dissolved)	mg/L	0.00000		< 0.000003	0.000004	< 0.000003
		3				



FINAL REPORT

CA14876-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: ODWS\_AO\_OG - Metals and Inorganics  
(WATER)

Sample Number	5	6	7
Sample Name	TW-2-1	TW-4-1	TW-5-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019

L1 = ODWS\_AO\_OG / WATER / - - Table 4 - Drinking Water - Reg O.169\_03

Parameter	Units	RL	L1	Result	Result	Result
Metals and Inorganics (continued)						
Chromium (dissolved)	mg/L	0.00008		0.00024	0.00039	< 0.00008
Copper (dissolved)	mg/L	0.0002	1	0.0006	0.0012	< 0.0002
Iron (dissolved)	mg/L	0.007	0.3	0.129	0.077	1.45
Potassium (dissolved)	mg/L	0.009		0.771	1.91	0.573
Magnesium (dissolved)	mg/L	0.001		2.10	7.31	7.95
Manganese (dissolved)	mg/L	0.00001	0.05	0.00054	0.0313	0.117
Sodium (dissolved)	mg/L	0.01	200	4.62	31.0	11.7
Phosphorus (dissolved)	mg/L	0.003		< 0.003	0.013	0.003
Lead (dissolved)	mg/L	0.00001		0.00004	0.00011	< 0.00001
Zinc (dissolved)	mg/L	0.002	5	0.003	0.004	< 0.002



FINAL REPORT

CA14876-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: ODWS\_AO\_OG - Other (ORP) (WATER)

Sample Number	5	6	7
Sample Name	TW-2-1	TW-4-1	TW-5-1
Sample Matrix	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019

L1 = ODWS\_AO\_OG / WATER / - - Table 4 - Drinking Water - Reg O.169\_03

Parameter	Units	RL	L1	Result	Result	Result
Other (ORP)						
pH	no unit	0.05	8.5	8.02	7.72	7.62
Chloride	mg/L	1	250	8	43	170

## EXCEEDANCE SUMMARY

				ODWS_AO_OG / WATER / - - Table 4 - Drinking Water - Reg O.169_03 L1
Parameter	Method	Units	Result	

### TW-4-1

Total Dissolved Solids	SM 2540C	mg/L	966	500
Dissolved Organic Carbon	SM 5310	mg/L	8	5

### TW-5-1

Total Dissolved Solids	SM 2540C	mg/L	2670	500
Iron (dissolved)	SM 3030/EPA 200.8	µg/L	1.45	0.3
Manganese (dissolved)	SM 3030/EPA 200.8	µg/L	0.117	0.05
Dissolved Organic Carbon	SM 5310	mg/L	11	5
Sulphate	US EPA 375.4	mg/L	1100	500



FINAL REPORT

CA14876-OCT19 R

QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0520-OCT19	mg/L as CaCO3	2	< 2	0	10	103	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-1ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0266-OCT19	as N mg/L	0.1	<0.1	6	10	99	90	110	99	75	125



# FINAL REPORT

CA14876-OCT19 R

## QC SUMMARY

### Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0012-NOV19	mg/L	1	<1	2	20	103	80	120	107	75	125
Sulphate	DIO0012-NOV19	mg/L	2	<2	1	20	107	80	120	107	75	125
Sulphate	DIO0039-NOV19	mg/L	2	<2	2	20	105	80	120	103	75	125

### Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrate (as N)	DIO0592-OCT19	mg/L	0.06	<0.06	0	20	99	80	120	96	75	125
Nitrate (as N)	DIO0605-OCT19	mg/L	0.06	<0.06	0	20	101	80	120	109	75	125





FINAL REPORT

CA14876-OCT19 R

QC SUMMARY

Carbon by SFA  
Method: SM 5310 | Internal ref.: ME-CA-IENVISFA-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Dissolved Organic Carbon	SKA0007-NOV19	mg/L	1	<1	1	20	91	90	110	107	75	125

Chemical Oxygen Demand  
Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0529-OCT19	mg/L	8	<8	0	20	100	80	120	99	75	125
Chemical Oxygen Demand	EWL0551-OCT19	mg/L	8	<8	0	20	94	80	120	101	75	125

Conductivity  
Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0520-OCT19	uS/cm	2	< 2	0	10	100	90	110	NA		



# FINAL REPORT

CA14876-OCT19 R

## QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (dissolved)	EMS0012-NOV19	mg/L	0.0002	<0.0002	10	20	108	90	110	102	70	130
Barium (dissolved)	EMS0012-NOV19	mg/L	0.00002	<0.00002	1	20	98	90	110	NV	70	130
Boron (dissolved)	EMS0012-NOV19	mg/L	0.002	<0.002	2	20	97	90	110	NV	70	130
Calcium (dissolved)	EMS0012-NOV19	mg/L	0.01	<0.01	3	20	99	90	110	120	70	130
Cadmium (dissolved)	EMS0012-NOV19	mg/L	0.000003	<0.000003	ND	20	109	90	110	101	70	130
Chromium (dissolved)	EMS0012-NOV19	mg/L	0.00008	<0.00008	2	20	103	90	110	82	70	130
Copper (dissolved)	EMS0012-NOV19	mg/L	0.0002	<0.0002	14	20	109	90	110	103	70	130
Iron (dissolved)	EMS0012-NOV19	mg/L	0.007	<0.007	3	20	100	90	110	NV	70	130
Potassium (dissolved)	EMS0012-NOV19	mg/L	0.009	<0.009	2	20	100	90	110	NV	70	130
Magnesium (dissolved)	EMS0012-NOV19	mg/L	0.001	<0.001	3	20	99	90	110	78	70	130
Manganese (dissolved)	EMS0012-NOV19	mg/L	0.00001	<0.00001	5	20	107	90	110	NV	70	130
Sodium (dissolved)	EMS0012-NOV19	mg/L	0.01	<0.01	5	20	106	90	110	120	70	130
Lead (dissolved)	EMS0012-NOV19	mg/L	0.00001	<0.00001	11	20	95	90	110	87	70	130
Phosphorus (dissolved)	EMS0012-NOV19	mg/L	0.003	<0.003	6	20	98	90	110	NV	70	130
Zinc (dissolved)	EMS0012-NOV19	mg/L	0.002	<0.002	0	20	108	90	110	110	70	130
Arsenic (dissolved)	EMS9005-NOV19	mg/L	0.0002	<0.0002	6	20	99	90	110	99	70	130
Barium (dissolved)	EMS9005-NOV19	mg/L	0.00002	<0.00002	2	20	93	90	110	NV	70	130
Boron (dissolved)	EMS9005-NOV19	mg/L	0.002	<0.002	4	20	91	90	110	NV	70	130
Calcium (dissolved)	EMS9005-NOV19	mg/L	0.01	<0.01	6	20	99	90	110	NV	70	130
Cadmium (dissolved)	EMS9005-NOV19	mg/L	0.000003	<0.000003	ND	20	100	90	110	98	70	130



FINAL REPORT

CA14876-OCT19 R

QC SUMMARY

Metals in aqueous samples - ICP-MS (continued)  
Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-IENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chromium (dissolved)	EMS9005-NOV19	mg/L	0.00008	<0.00008	3	20	105	90	110	111	70	130
Copper (dissolved)	EMS9005-NOV19	mg/L	0.0002	<0.0002	15	20	100	90	110	115	70	130
Iron (dissolved)	EMS9005-NOV19	mg/L	0.007	<0.007	17	20	97	90	110	NV	70	130
Potassium (dissolved)	EMS9005-NOV19	mg/L	0.009	<0.009	7	20	95	90	110	NV	70	130
Magnesium (dissolved)	EMS9005-NOV19	mg/L	0.001	<0.001	6	20	99	90	110	NV	70	130
Manganese (dissolved)	EMS9005-NOV19	mg/L	0.00001	<0.00001	6	20	97	90	110	NV	70	130
Sodium (dissolved)	EMS9005-NOV19	mg/L	0.01	<0.01	5	20	106	90	110	NV	70	130
Lead (dissolved)	EMS9005-NOV19	mg/L	0.00001	<0.00001	2	20	95	90	110	76	70	130
Phosphorus (dissolved)	EMS9005-NOV19	mg/L	0.003	<0.003	7	20	107	90	110	NV	70	130
Zinc (dissolved)	EMS9005-NOV19	mg/L	0.002	<0.002	14	20	97	90	110	88	70	130

pH  
Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0520-OCT19	no unit	0.05	NA	1		100			NA		



QC SUMMARY

Solids Analysis  
Method: SM 2540C | Internal ref.: ME-CA-1ENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0519-OCT19	mg/L	30	<30	0	20	92	90	110	NA		

Method Blank: a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

Duplicate: Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

LCS/Spike Blank: Laboratory control sample or spike blank refer to a blank matrix to which a known amount of analyte has been added. Used to evaluate analyte recovery and laboratory accuracy without sample matrix effects.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate laboratory accuracy with sample matrix effects.

Reference Material: a material or substance matrix matched to the samples that contains a known amount of the analyte of interest. A reference material may be used in place of a matrix spike.

RL: Reporting limit

RPD: Relative percent difference

AC: Acceptance criteria

**Multielement Scan Qualifier:** as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

**Duplicate Qualifier:** for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

**Matrix Spike Qualifier:** for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.

## LEGEND

## FOOTNOTES

**NSS** Insufficient sample for analysis.

**RL** Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

**NA** The sample was not analysed for this analyte

**ND** Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

SGS provides criteria information (such as regulatory or guideline limits and summary of limit exceedances) as a service. Every attempt is made to ensure the criteria information in this report is accurate and current, however, it is not guaranteed. Comparison to the most current criteria is the responsibility of the client and SGS assumes no responsibility for the accuracy of the criteria levels indicated. This document is issued, on the Client's behalf, by the Company under its General Conditions of Service available on request and accessible at [http://www.sgs.com/terms\\_and\\_conditions.htm](http://www.sgs.com/terms_and_conditions.htm). The Client's attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any other holder of this document is advised that information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents.

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-- End of Analytical Report --



## FINAL REPORT

CA14875-OCT19 R

11192449-01, Stoney Lake Landfill

Prepared for

**GHD**

## First Page

### CLIENT DETAILS

Client GHD

Address 347 Pido Rd., Unit #29, Peterborough  
Canada, K9J 6Z8  
Phone: 705-749-3317. Fax:

Contact Gus Bolin

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Facsimile

Email gus.bolin@ghd.com

Project 11192449-01, Stoney Lake Landfill

Order Number

Samples Ground Water (6)

### LABORATORY DETAILS

Project Specialist Brad Moore Hon. B.Sc

Laboratory SGS Canada Inc.

Address 185 Concession St., Lakefield ON, K0L 2H0

Telephone 705-652-2143

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SGS Reference CA14875-OCT19

Received 10/29/2019

Approved 11/08/2019

Report Number CA14875-OCT19 R

Date Reported 11/08/2019

### COMMENTS

Temperature of Sample upon Receipt: 8 degrees C

Cooling Agent Present:Yes

Custody Seal Present:No

Chain of Custody Number:NA

### SIGNATORIES

Brad Moore Hon. B.Sc

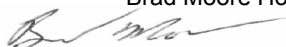




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# FINAL REPORT

CA14875-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

## PACKAGE: PWQO - BTEX (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	5	7
Sample Name	TW-2-2	TW-6-2
Sample Matrix	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result
BTEX					
Benzene	ug/L	0.5	100	< 0.5	< 0.5
Ethylbenzene	ug/L	0.5	8	< 0.5	< 0.5
Toluene	ug/L	0.5	0.8	< 0.5	< 0.5
Xylene (total)	ug/L	0.5		< 0.5	< 0.5
o-xylene	ug/L	0.5	40	< 0.5	< 0.5
m/p-xylene	ug/L	0.5	2	< 0.5	< 0.5

## PACKAGE: PWQO - General Chemistry (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	5	6	7	8	9	10
Sample Name	TW-2-2	TW-5-2	TW-6-2	TW-7-2	TW-9-2	TW-11-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result	Result	Result
General Chemistry									
Biochemical Oxygen Demand (BOD5)	mg/L	2		< 4 †	< 4 †	< 4 †	< 4 †	< 4 †	< 4 †
Alkalinity	mg/L as CaCO3	2		569	493	415	345	215	646
Conductivity	uS/cm	2		1480	3810	1350	1730	384	1560
Total Dissolved Solids	mg/L	30		1140	3690	909	1320	291	891
Chemical Oxygen Demand	mg/L	8		25	45	11	13	< 8	51
Total Kjeldahl Nitrogen	as N mg/L	0.5		< 0.5	0.7	0.6	< 0.5	< 0.5	31.8
Ammonia+Ammonium (N)	as N mg/L	0.1		< 0.1	< 0.1	0.7	0.2	0.1	33.4



# FINAL REPORT

CA14875-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: PWQO - Metals and Inorganics (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	5	6	7	8	9	10
Sample Name	TW-2-2	TW-5-2	TW-6-2	TW-7-2	TW-9-2	TW-11-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result	Result	Result
Metals and Inorganics									
Phosphorus (total)	mg/L	0.03		0.03	0.10	0.03	0.04	< 0.03	< 0.03
Sulphate	mg/L	2		320	2200	140	460	10	170
Nitrite (as N)	as N mg/L	0.03		< 0.03	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N)	as N mg/L	0.06		< 0.06	5.89	0.15	< 0.06	0.09	< 0.06
Arsenic (dissolved)	mg/L	0.0002		0.0008	0.0005	< 0.0002	0.0007	< 0.0002	0.0005
Barium (dissolved)	mg/L	0.00002		0.125	0.0249	0.287	0.0965	0.210	0.404
Boron (dissolved)	mg/L	0.002		0.236	10.2	0.359	1.49		0.371
Boron (dissolved)	mg/L	0.002						0.011	
Calcium (dissolved)	mg/L	0.01		358	561	252	263	86.8	212
Cadmium (dissolved)	mg/L	0.000003		0.000019	0.000014	0.000012	0.000005	< 0.000003	0.000011
Chromium (dissolved)	mg/L	0.00008		0.00034	0.00033	0.00014	0.00015	0.00009	0.00041
Copper (dissolved)	mg/L	0.0002		0.0008	0.0226	0.0019	0.0003	0.0007	0.0008
Iron (dissolved)	mg/L	0.007		0.068	0.011	0.010	0.267	0.017	8.11
Potassium (dissolved)	mg/L	0.009		1.01	2.61	4.39	2.48	0.723	29.2
Magnesium (dissolved)	mg/L	0.001		14.8	210	15.1	30.5	2.87	24.5
Manganese (dissolved)	mg/L	0.00001		2.41	0.0529	1.32	2.25	0.00726	1.52
Sodium (dissolved)	mg/L	0.01		15.8	206	36.6	123	3.09	49.9
Lead (dissolved)	mg/L	0.00001		0.00003	0.00063	0.00003	0.00003	0.00004	0.00004



# FINAL REPORT

CA14875-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

## PACKAGE: PWQO - Other (ORP) (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	5	6	7	8	9	10
Sample Name	TW-2-2	TW-5-2	TW-6-2	TW-7-2	TW-9-2	TW-11-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result	Result	Result
Other (ORP)									
pH	no unit	0.05	8.5	7.53	7.76	7.77	7.78	8.26	7.06
Chloride	mg/L	1		20	210	110	130	4	56
Mercury (total)	µg/L	0.01	0.2	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

## PACKAGE: PWQO - Phenols (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	5	6	7	8	9	10
Sample Name	TW-2-2	TW-5-2	TW-6-2	TW-7-2	TW-9-2	TW-11-2
Sample Matrix	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result	Result	Result	Result	Result
Phenols									
4AAP-Phenolics	mg/L	0.001	0.001	0.003	0.008	0.004	0.002	< 0.001	0.004

## PACKAGE: PWQO - THMs (VOC) (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	5	7
Sample Name	TW-2-2	TW-6-2
Sample Matrix	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result
THMs (VOC)					
Bromodichloromethane	µg/L	0.5	200	< 0.5	< 0.5
Bromoform	µg/L	0.5	60	< 0.5	< 0.5
Dibromochloromethane	µg/L	0.5	40	< 0.5	< 0.5



# FINAL REPORT

CA14875-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: PWQO - VOCs (WATER)

Sample Number	5	7
Sample Name	TW-2-2	TW-6-2
Sample Matrix	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result
VOCs					
Bromomethane	µg/L	0.5	0.9	< 0.5	< 0.5
Carbon tetrachloride	µg/L	0.2		< 0.2	< 0.2
Chloroethane	µg/L	5.0		< 5	< 5
Chloroform	µg/L	0.5		< 0.5	< 0.5
Chloromethane	µg/L	5.0		< 5	< 5
1,2-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	< 0.5
1,3-Dichlorobenzene	µg/L	0.5	2.5	< 0.5	< 0.5
1,4-Dichlorobenzene	µg/L	0.5	4	< 0.5	< 0.5
1,1-Dichloroethane	µg/L	0.5	200	< 0.5	< 0.5
1,2-Dichloroethane	µg/L	0.5	100	< 0.5	< 0.5
1,1-Dichloroethylene	µg/L	0.5	40	< 0.5	< 0.5
1,2-Dichloropropane	µg/L	0.5	0.7	< 0.5	< 0.5
trans-1,2-Dichloroethene	µg/L	0.5	200	< 0.5	< 0.5
cis-1,2-Dichloroethene	µg/L	0.5	200	< 0.5	< 0.5
cis-1,3-Dichloropropene	µg/L	0.5		< 0.5	< 0.5
trans-1,3-Dichloropropene	µg/L	0.5	7	< 0.5	< 0.5
Ethylenedibromide	µg/L	0.2	5	< 0.2	< 0.2
Dichloromethane	µg/L	0.5		< 0.5	< 0.5
Monochlorobenzene	µg/L	0.5		< 0.5	< 0.5
Styrene	µg/L	0.5	4	< 0.5	< 0.5
1,1,2,2-Tetrachloroethane	µg/L	0.5	70	< 0.5	< 0.5
Tetrachloroethene	µg/L	0.5		< 0.5	< 0.5
Trichloroethylene	µg/L	0.5	20	< 0.5	< 0.5



FINAL REPORT

CA14875-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: PWQO - VOCs (WATER)

Sample Number	5	7
Sample Name	TW-2-2	TW-6-2
Sample Matrix	Ground Water	Ground Water
Sample Date	28/10/2019	28/10/2019

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result
VOCs (continued)					
Vinyl Chloride	µg/L	0.2	600	< 0.2	< 0.2
Trichlorofluoromethane	µg/L	5.0		< 5	< 5
1,1,1-Trichloroethane	µg/L	0.5	10	< 0.5	< 0.5
1,1,2-Trichloroethane	µg/L	0.5	800	< 0.5	< 0.5
1,1,1,2-Tetrachloroethane	µg/L	0.5	20	< 0.5	< 0.5



EXCEEDANCE SUMMARY

				PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E L1
Parameter	Method	Units	Result	

TW-2-2

4AAP-Phenolics	SM 5530B-D	mg/L	0.003	0.001
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TW-5-2

4AAP-Phenolics	SM 5530B-D	mg/L	0.008	0.001
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TW-6-2

4AAP-Phenolics	SM 5530B-D	mg/L	0.004	0.001
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TW-7-2

4AAP-Phenolics	SM 5530B-D	mg/L	0.002	0.001
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TW-11-2

4AAP-Phenolics	SM 5530B-D	mg/L	0.004	0.001
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# FINAL REPORT

CA14875-OCT19 R

## QC SUMMARY

### Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0520-OCT19	mg/L as CaCO3	2	< 2	0	10	103	80	120	NA		
Alkalinity	EWL0527-OCT19	mg/L as CaCO3	2	< 2	1	10	95	80	120	NA		
Alkalinity	EWL0543-OCT19	mg/L as CaCO3	2	< 2	1	10	103	80	120	NA		

### Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0266-OCT19	as N mg/L	0.1	<0.1	6	10	99	90	110	99	75	125
Ammonia+Ammonium (N)	SKA0278-OCT19	as N mg/L	0.1	<0.1	ND	10	100	90	110	99	75	125

## QC SUMMARY

### Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0012-NOV19	mg/L	1	<1	2	20	103	80	120	107	75	125
Sulphate	DIO0012-NOV19	mg/L	2	<2	1	20	107	80	120	107	75	125
Sulphate	DIO0039-NOV19	mg/L	2	<2	2	20	105	80	120	103	75	125
Sulphate	DIO0044-NOV19	mg/L	2	<2	0	20	95	80	120	109	75	125

### Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0592-OCT19	mg/L	0.03	<0.03	2	20	96	80	120	99	75	125
Nitrate (as N)	DIO0592-OCT19	mg/L	0.06	<0.06	0	20	99	80	120	96	75	125
Nitrite (as N)	DIO0605-OCT19	mg/L	0.03	<0.03	ND	20	100	80	120	85	75	125
Nitrate (as N)	DIO0605-OCT19	mg/L	0.06	<0.06	0	20	101	80	120	109	75	125





FINAL REPORT

CA14875-OCT19 R

QC SUMMARY

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0054-OCT19	mg/L	2	< 2	4	30	93	70	130	89	70	130

Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0529-OCT19	mg/L	8	<8	0	20	100	80	120	99	75	125
Chemical Oxygen Demand	EWL0551-OCT19	mg/L	8	<8	0	20	94	80	120	101	75	125
Chemical Oxygen Demand	EWL0554-OCT19	mg/L	8	<8	ND	20	96	80	120	99	75	125



FINAL REPORT

CA14875-OCT19 R

QC SUMMARY

Conductivity  
Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0520-OCT19	uS/cm	2	< 2	0	10	100	90	110	NA		
Conductivity	EWL0527-OCT19	uS/cm	2	3	2	10	99	90	110	NA		
Conductivity	EWL0543-OCT19	uS/cm	2	< 2	3	10	99	90	110	NA		

Mercury by CVAAS  
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0035-OCT19	ug/L	0.01	<0.01	ND	20	97	80	120	112	70	130



# FINAL REPORT

CA14875-OCT19 R

## QC SUMMARY

Metals in aqueous samples - ICP-MS

Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Boron (dissolved)	EMS0059-NOV19	mg/L	0.002	<0.002	4	20	95	90	110	NV	70	130
Arsenic (dissolved)	EMS0217-OCT19	mg/L	0.0002	<0.0002	6	20	101	90	110	NV	70	130
Barium (dissolved)	EMS0217-OCT19	mg/L	0.00002	<0.00002	2	20	96	90	110	NV	70	130
Boron (dissolved)	EMS0217-OCT19	mg/L	0.002	<0.002	10	20	106	90	110	NV	70	130
Calcium (dissolved)	EMS0217-OCT19	mg/L	0.01	<0.01	1	20	97	90	110	NV	70	130
Cadmium (dissolved)	EMS0217-OCT19	mg/L	0.000003	<0.000003	ND	20	100	90	110	107	70	130
Chromium (dissolved)	EMS0217-OCT19	mg/L	0.00008	<0.00008	12	20	101	90	110	105	70	130
Copper (dissolved)	EMS0217-OCT19	mg/L	0.0002	<0.0002	5	20	101	90	110	NV	70	130
Iron (dissolved)	EMS0217-OCT19	mg/L	0.007	<0.007	ND	20	99	90	110	NV	70	130
Potassium (dissolved)	EMS0217-OCT19	mg/L	0.009	<0.009	0	20	96	90	110	89	70	130
Magnesium (dissolved)	EMS0217-OCT19	mg/L	0.001	<0.001	6	20	96	90	110	NV	70	130
Manganese (dissolved)	EMS0217-OCT19	mg/L	0.00001	<0.00001	ND	20	101	90	110	NV	70	130
Sodium (dissolved)	EMS0217-OCT19	mg/L	0.01	<0.01	2	20	110	90	110	NV	70	130
Lead (dissolved)	EMS0217-OCT19	mg/L	0.00001	<0.00001	ND	20	91	90	110	91	70	130



FINAL REPORT

CA14875-OCT19 R

QC SUMMARY

pH  
Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0520-OCT19	no unit	0.05	NA	1		100			NA		
pH	EWL0527-OCT19	no unit	0.05	NA	0		100			NA		
pH	EWL0543-OCT19	no unit	0.05	NA	1		100			NA		

Phenols by SFA  
Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0004-NOV19	mg/L	0.001	<0.001	7	10	109	90	110	107	75	125



FINAL REPORT

CA14875-OCT19 R

QC SUMMARY

Phosphorus by SFA  
Method: SM 4500-P J | Internal ref.: ME-CA-IENVISFA-LAK-AN-003

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Phosphorus (total)	SKA0264-OCT19	mg/L	0.03	<0.03	0	10	107	90	110	90	75	125

Solids Analysis  
Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0521-OCT19	mg/L	30	<30	1	20	105	90	110	NA		

Total Nitrogen  
Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0002-NOV19	as N mg/L	0.5	<0.5	0	10	97	90	110	87	75	125
Total Kjeldahl Nitrogen	SKA0279-OCT19	as N mg/L	0.5	<0.5	1	10	94	90	110	106	75	125



# FINAL REPORT

CA14875-OCT19 R

## QC SUMMARY

### Volatile Organics

Method: EPA 5030B/8260C | Internal ref.: ME-CA-IENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
1,1,1,2-Tetrachloroethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	102	60	130	102	50	140
1,1,1-Trichloroethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	97	60	130	97	50	140
1,1,2,2-Tetrachloroethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	102	60	130	98	50	140
1,1,2-Trichloroethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	97	50	140
1,1-Dichloroethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	94	60	130	93	50	140
1,1-Dichloroethylene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	97	60	130	96	50	140
1,2-Dichlorobenzene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	99	50	140
1,2-Dichloroethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	99	60	130	94	50	140
1,2-Dichloropropane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	101	50	140
1,3-Dichlorobenzene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	99	50	140
1,4-Dichlorobenzene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	100	50	140
Benzene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	100	50	140
Bromodichloromethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	101	50	140
Bromoform	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	100	60	130	95	50	140
Bromomethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	105	50	140	101	50	140
Carbon tetrachloride	GCM0011-NOV19	ug/L	0.2	<0.2	ND	30	101	60	130	101	50	140
Chloroethane	GCM0011-NOV19	ug/L	5.0	<5	ND	30	72	60	130	92	50	140
Chloroform	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	100	50	140
Chloromethane	GCM0011-NOV19	ug/L	5.0	<5	ND	30	112	60	130	118	50	140
cis-1,2-Dichloroethene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	102	60	130	101	50	140



# FINAL REPORT

CA14875-OCT19 R

## QC SUMMARY

Volatile Organics (continued)

Method: EPA 5030B/8260C | Internal ref.: ME-CA-IENVIGC-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
cis-1,3-Dichloropropene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	98	50	140
Dibromochloromethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	98	50	140
Dichloromethane	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	99	60	130	96	50	140
Ethylbenzene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	102	60	130	102	50	140
Ethylenedibromide	GCM0011-NOV19	ug/L	0.2	<0.2	ND	30	102	60	130	97	50	140
m/p-xylene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	103	60	130	101	50	140
Monochlorobenzene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	101	50	140
o-xylene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	102	60	130	102	50	140
Styrene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	103	60	130	102	50	140
Tetrachloroethene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	101	50	140
Toluene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	102	60	130	101	50	140
trans-1,2-Dichloroethene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	95	60	130	93	50	140
trans-1,3-Dichloropropene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	101	60	130	97	50	140
Trichloroethylene	GCM0011-NOV19	ug/L	0.5	<0.5	ND	30	102	60	130	100	50	140
Trichlorofluoromethane	GCM0011-NOV19	ug/L	5.0	<5	ND	30	111	50	140	109	50	140
Vinyl Chloride	GCM0011-NOV19	ug/L	0.2	<0.2	ND	30	104	60	130	103	50	140

## QC SUMMARY

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**Method Blank:** a blank matrix that is carried through the entire analytical procedure. Used to assess laboratory contamination.

**Duplicate:** Paired analysis of a separate portion of the same sample that is carried through the entire analytical procedure. Used to evaluate measurement precision.

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**RL:** Reporting limit

**RPD:** Relative percent difference

**AC:** Acceptance criteria

**Multielement Scan Qualifier:** as the number of analytes in a scan increases, so does the chance of a limit exceedance by random chance as opposed to a real method problem. Thus, in multielement scans, for the LCS and matrix spike, up to 10% of the analytes may exceed the quoted limits by up to 10% absolute and the spike is considered acceptable.

**Duplicate Qualifier:** for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

**Matrix Spike Qualifier:** for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.



## LEGEND

## FOOTNOTES

**NSS** Insufficient sample for analysis.

**RL** Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

**NA** The sample was not analysed for this analyte

**ND** Non Detect

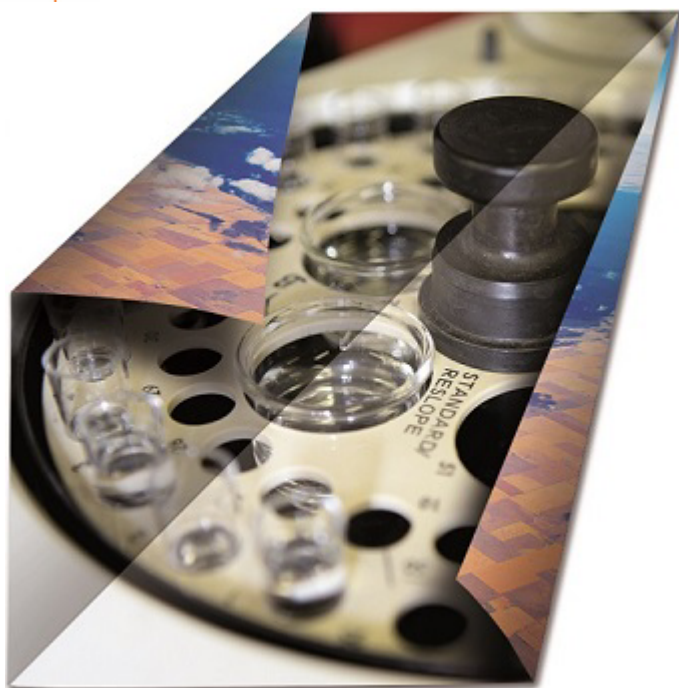
Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

Analysis conducted on samples submitted pursuant to or as part of Reg. 153/04, are in accordance to the Protocol for Analytical Methods Used in the Assessment of Properties under Part XV.1 of the Environmental Protection Act" published by the Ministry and dated March 9, 2004 as amended.

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This report must not be reproduced, except in full. This report supersedes all previous versions.

-- End of Analytical Report --



## FINAL REPORT

CA14877-OCT19 R

11192449-01, Stoney Lake Landfill

Prepared for

**GHD**

## First Page

### CLIENT DETAILS

Client GHD

Address 347 Pido Rd., Unit #29, Peterborough  
Canada, K9J 6Z8  
Phone: 705-749-3317. Fax:

Contact Gus Bolin

Telephone 705-749-3317

Facsimile

Email gus.bolin@ghd.com

Project 11192449-01, Stoney Lake Landfill

Order Number

Samples Surface Water (2)

### LABORATORY DETAILS

Project Specialist Brad Moore Hon. B.Sc

Laboratory SGS Canada Inc.

Address 185 Concession St., Lakefield ON, K0L 2H0

Telephone 705-652-2143

Facsimile 705-652-6365

Email brad.moore@sgs.com

SGS Reference CA14877-OCT19

Received 10/29/2019

Approved 11/05/2019

Report Number CA14877-OCT19 R

Date Reported 11/05/2019

### COMMENTS

Temperature of Sample upon Receipt: 7 degrees C

Cooling Agent Present:Yes

Custody Seal Present:Yes

Chain of Custody Number:NA

### SIGNATORIES

Brad Moore Hon. B.Sc

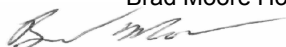




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# FINAL REPORT

CA14877-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: **PWQO - General Chemistry** (WATER)

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	28/10/2019	28/10/2019

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result
General Chemistry					
Biochemical Oxygen Demand (BOD5)	mg/L	2		< 4 †	< 4 †
Total Suspended Solids	mg/L	2		2	3
Alkalinity	mg/L as CaCO3	2		164	139
Conductivity	uS/cm	2		402	372
Total Dissolved Solids	mg/L	30		286	274
Chemical Oxygen Demand	mg/L	8		27	30
Total Kjeldahl Nitrogen	as N mg/L	0.5		< 0.5	< 0.5
Ammonia+Ammonium (N)	as N mg/L	0.1		< 0.1	< 0.1

PACKAGE: **PWQO - Metals and Inorganics** (WATER)

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	28/10/2019	28/10/2019

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result
Metals and Inorganics					
Sulphate	mg/L	2		33	32
Nitrite (as N)	as N mg/L	0.03		< 0.03	< 0.03
Nitrate (as N)	as N mg/L	0.06		< 0.06	1.65
Arsenic (total)	mg/L	0.0002	0.005	0.0005	0.0005
Barium (total)	mg/L	0.00002		0.0599	0.0605
Boron (total)	mg/L	0.002	0.2	0.018	0.015
Calcium (total)	mg/L	0.01		81.0	68.9



FINAL REPORT

CA14877-OCT19 R

Client: GHD

Project: 11192449-01, Stoney Lake Landfill

Project Manager: Gus Bolin

Samplers: Gus Bolin

PACKAGE: PWQO - Metals and Inorganics (WATER)

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	28/10/2019	28/10/2019

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Parameter	Units	RL	L1	Result	Result
Metals and Inorganics (continued)					
Cadmium (total)	mg/L	0.000003	0.0001	0.000003	0.000098
Chromium (total)	mg/L	0.00008		0.00015	0.00017
Copper (total)	mg/L	0.0002	0.001	0.0005	0.0004
Iron (total)	mg/L	0.007	0.3	0.106	0.036
Potassium (total)	mg/L	0.009		2.06	1.97
Magnesium (total)	mg/L	0.001		2.39	2.31
Manganese (total)	mg/L	0.00001		0.0168	0.0101
Sodium (total)	mg/L	0.01		10.9	8.62
Phosphorus (total)	mg/L	0.003	0.01	0.014	0.026
Lead (total)	mg/L	0.00001	0.001	0.00012	0.00015
Zinc (total)	mg/L	0.002	0.02	< 0.002	< 0.002



FINAL REPORT

CA14877-OCT19 R

Client: GHD  
Project: 11192449-01, Stoney Lake Landfill  
Project Manager: Gus Bolin  
Samplers: Gus Bolin

PACKAGE: PWQO - Other (ORP) (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result
Other (ORP)					
pH	no unit	0.05	8.5	8.17	7.82
Chloride	mg/L	1		24	22
Mercury (total)	µg/L	0.01	0.2	< 0.01	< 0.01

PACKAGE: PWQO - Phenols (WATER)

L1 = PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E

Sample Number	5	6
Sample Name	SW-1	SW-8
Sample Matrix	Surface Water	Surface Water
Sample Date	28/10/2019	28/10/2019

Parameter	Units	RL	L1	Result	Result
Phenols					
4AAP-Phenolics	mg/L	0.001	0.001	< 0.001	0.003



EXCEEDANCE SUMMARY

				PWQO / WATER / - - Table 2 - General - July 1999 PIBS 3303E L1
Parameter	Method	Units	Result	

SW-1

Phosphorous	SM 3030/EPA 200.8	µg/L	0.014	0.01
-------------	-------------------	------	-------	------

SW-8

Phosphorous	SM 3030/EPA 200.8	µg/L	0.026	0.01
4AAP-Phenolics	SM 5530B-D	mg/L	0.003	0.001





FINAL REPORT

CA14877-OCT19 R

QC SUMMARY

Alkalinity

Method: SM 2320 | Internal ref.: ME-CA-~~I~~ENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Alkalinity	EWL0527-OCT19	mg/L as CaCO3	2	< 2	1	10	95	80	120	NA		
Alkalinity	EWL0543-OCT19	mg/L as CaCO3	2	< 2	1	10	103	80	120	NA		

Ammonia by SFA

Method: SM 4500 | Internal ref.: ME-CA-~~I~~ENVISFA-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Ammonia+Ammonium (N)	SKA0266-OCT19	as N mg/L	0.1	<0.1	6	10	99	90	110	99	75	125



# FINAL REPORT

CA14877-OCT19 R

## QC SUMMARY

### Anions by discrete analyzer

Method: US EPA 325.2 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-026

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chloride	DIO0023-NOV19	mg/L	1	<1	1	20	96	80	120	96	75	125
Sulphate	DIO0023-NOV19	mg/L	2	<2	1	20	101	80	120	105	75	125
Sulphate	DIO0039-NOV19	mg/L	2	<2	2	20	105	80	120	103	75	125

### Anions by IC

Method: EPA300/MA300-Ions1.3 | Internal ref.: ME-CA-IENVIIC-LAK-AN-001

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Nitrite (as N)	DIO0605-OCT19	mg/L	0.03	<0.03	ND	20	100	80	120	85	75	125
Nitrate (as N)	DIO0605-OCT19	mg/L	0.06	<0.06	0	20	101	80	120	109	75	125



FINAL REPORT

CA14877-OCT19 R

QC SUMMARY

Biochemical Oxygen Demand

Method: SM 5210 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-007

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Biochemical Oxygen Demand (BOD5)	BOD0054-OCT19	mg/L	2	< 2	4	30	93	70	130	89	70	130

Chemical Oxygen Demand

Method: HACH 8000 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-009

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Chemical Oxygen Demand	EWL0554-OCT19	mg/L	8	<8	ND	20	96	80	120	99	75	125

Conductivity

Method: SM 2510 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Conductivity	EWL0527-OCT19	uS/cm	2	3	2	10	99	90	110	NA		
Conductivity	EWL0543-OCT19	uS/cm	2	< 2	3	10	99	90	110	NA		



QC SUMMARY

Mercury by CVAAS  
Method: SM 3112/SM 3112B | Internal ref.: ME-CA-IENVISPE-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Mercury (total)	EHG0035-OCT19	ug/L	0.01	<0.01	ND	20	97	80	120	112	70	130



FINAL REPORT

CA14877-OCT19 R

QC SUMMARY

Metals in aqueous samples - ICP-MS  
Method: SM 3030/EPA 200.8 | Internal ref.: ME-CA-ENVISPE-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Arsenic (total)	EMS0194-OCT19	mg/L	0.0002	<0.0002	ND	20	100	90	110	95	70	130
Barium (total)	EMS0194-OCT19	mg/L	0.00002	<0.00002	5	20	99	90	110	72	70	130
Boron (total)	EMS0194-OCT19	mg/L	0.002	<0.002	ND	20	96	90	110	NV	70	130
Calcium (total)	EMS0194-OCT19	mg/L	0.01	<0.01	2	20	96	90	110	113	70	130
Cadmium (total)	EMS0194-OCT19	mg/L	0.000003	<0.000003	ND	20	100	90	110	91	70	130
Chromium (total)	EMS0194-OCT19	mg/L	0.00008	<0.00008	9	20	103	90	110	NV	70	130
Copper (total)	EMS0194-OCT19	mg/L	0.0002	<0.0002	2	20	99	90	110	98	70	130
Iron (total)	EMS0194-OCT19	mg/L	0.007	<0.007	2	20	97	90	110	NV	70	130
Potassium (total)	EMS0194-OCT19	mg/L	0.009	<0.009	0	20	97	90	110	106	70	130
Magnesium (total)	EMS0194-OCT19	mg/L	0.001	<0.001	2	20	102	90	110	78	70	130
Manganese (total)	EMS0194-OCT19	mg/L	0.00001	<0.00001	4	20	98	90	110	94	70	130
Sodium (total)	EMS0194-OCT19	mg/L	0.01	<0.01	0	20	107	90	110	NV	70	130
Lead (total)	EMS0194-OCT19	mg/L	0.00001	<0.00001	ND	20	98	90	110	106	70	130
Phosphorus (total)	EMS0194-OCT19	mg/L	0.003	<0.003	ND	20	98	90	110	NV	70	130
Zinc (total)	EMS0194-OCT19	mg/L	0.002	<0.002	ND	20	105	90	110	118	70	130



FINAL REPORT

CA14877-OCT19 R

QC SUMMARY

pH  
Method: SM 4500 | Internal ref.: ME-CA-IENVIEWL-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
pH	EWL0527-OCT19	no unit	0.05	NA	0		100			NA		
pH	EWL0543-OCT19	no unit	0.05	NA	1		100			NA		

Phenols by SFA  
Method: SM 5530B-D | Internal ref.: ME-CA-IENVISFA-LAK-AN-006

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
4AAP-Phenolics	SKA0004-NOV19	mg/L	0.001	<0.001	7	10	109	90	110	107	75	125

Solids Analysis  
Method: SM 2540C | Internal ref.: ME-CA-IENVIEWL-LAK-AN-005

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Dissolved Solids	EWL0521-OCT19	mg/L	30	<30	1	20	105	90	110	NA		



FINAL REPORT

CA14877-OCT19 R

QC SUMMARY

Suspended Solids

Method: SM 2540D | Internal ref.: ME-CA-IENVIEWL-LAK-AN-004

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Suspended Solids	EWL0526-OCT19	mg/L	2	< 2	2	10	NV	90	110	NA		

Total Nitrogen

Method: SM 4500-N C/4500-NO3- F | Internal ref.: ME-CA-IENVISFA-LAK-AN-002

Parameter	QC batch Reference	Units	RL	Method Blank	Duplicate		LCS/Spike Blank			Matrix Spike / Ref.		
					RPD	AC (%)	Spike Recovery (%)	Recovery Limits (%)		Spike Recovery (%)	Recovery Limits (%)	
								Low	High		Low	High
Total Kjeldahl Nitrogen	SKA0279-OCT19	as N mg/L	0.5	<0.5	1	10	94	90	110	106	75	125

## QC SUMMARY

---

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**RPD:** Relative percent difference

**AC:** Acceptance criteria

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**Duplicate Qualifier:** for duplicates as the measured result approaches the RL, the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

**Matrix Spike Qualifier:** for matrix spikes, as the concentration of the native analyte increases, the uncertainty of the matrix spike recovery increases. Thus, the matrix spike acceptance limits apply only when the concentration of the matrix spike is greater than or equal to the concentration of the native analyte.



## LEGEND

## FOOTNOTES

**NSS** Insufficient sample for analysis.

**RL** Reporting Limit.

↑ Reporting limit raised.

↓ Reporting limit lowered.

**NA** The sample was not analysed for this analyte

**ND** Non Detect

Samples analysed as received. Solid samples expressed on a dry weight basis. "Temperature Upon Receipt" is representative of the whole shipment and may not reflect the temperature of individual samples.

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-- End of Analytical Report --

## Appendix F

# Monitoring and Screening Checklist

## Appendix D-Monitoring and Screening Checklist

### General Information and Instructions

**General Information: The checklist is to be completed, and submitted with the Monitoring Report.**

**Instructions:** A complete checklist consists of:

- (a) a completed and signed checklist, including any additional pages of information which can be attached as needed to provide further details where indicated.
- (b) completed contact information for the Competent Environmental Practitioner (CEP)
- (c) self-declaration that CEP(s) meet(s) the qualifications as set out below and in Section 1.2 of the Technical Guidance Document.

**Definition of Groundwater CEP:**

For groundwater, the CEP must have expertise in hydrogeology and meet one of the following:

- (a) the person holds a licence, limited licence or temporary licence under the *Professional Engineers Act*; or
- (b) the person holds a certificate of registration under the *Professional Geoscientists Act, 2000* and is a practicing member, temporary, member or limited member of the Association of Professional Geoscientists of Ontario. O. Reg. 66/08, s. 2..

**Definition of Surface water CEP:**

A CEP for surface water assessments is a scientist, professional engineer or professional geoscientist as described in (a) and (b) above with demonstrated experience and post-secondary education, either a diploma or degree, in hydrology, aquatic ecology, limnology, aquatic biology, physical geography with specialization in surface water, and/or water resource management.

The type of scientific work that a CEP performs must be consistent with that person's education and experience. If an individual has appropriate training and credentials in both groundwater and surface water and is responsible for both areas of expertise, the CEP may then complete and validate both sections of the checklist.

<b>Monitoring Report and Site Information</b>	
<b>Waste Disposal Site Name</b>	Stoney Lake Road Transfer Station
<b>Location (e.g. street address, lot, concession)</b>	Part Lot 21, Concession 4, Township of Douro-Dummer (Douro), County of Peterborough
<b>GPS Location (taken within the property boundary at front gate/ front entry)</b>	17 782228E 444585N
<b>Municipality</b>	Township of Douro-Dummer
<b>Client and/or Site Owner</b>	Corporation of the Township of Douro-Dummer
<b>Monitoring Period (Year)</b>	2019
This Monitoring Report is being submitted under the following:	
<b>Environmental Compliance Approval Number:</b>	Provisional Certificate of Approval A340901
<b>Director's Order No.:</b>	N/A
<b>Provincial Officer's Order No.:</b>	N/A
<b>Other:</b>	N/A

<b>Report Submission Frequency</b>	<input checked="" type="radio"/> <b>Annual</b> <input type="radio"/> <b>Other</b>	Specify (Type Here):	
<b>The site is:</b> (Operation Status)	<input type="radio"/> <b>Open</b> <input type="radio"/> <b>Inactive</b> <input checked="" type="radio"/> <b>Closed</b>		
<b>Does your Site have a Total Approved Capacity?</b>	<input type="radio"/> <b>Yes</b> <input checked="" type="radio"/> <b>No</b>		
<b>If yes, please specify Total Approved Capacity</b>		Units	
<b>Does your Site have a Maximum Approved Fill Rate?</b>	<input type="radio"/> <b>Yes</b> <input checked="" type="radio"/> <b>No</b>		
<b>If yes, please specify Maximum Approved Fill Rate</b>		Units	
<b>Total Waste Received within Monitoring Period (Year)</b>		Units	
<b>Total Waste Received within Monitoring Period (Year)</b> <i>Methodology</i>			
<b>Estimated Remaining Capacity</b>		Units	
<b>Estimated Remaining Capacity</b> <i>Methodology</i>			
<b>Estimated Remaining Capacity</b> <i>Date Last Determined</i>	Select Date		
<b>Non-Hazardous Approved Waste Types</b>	<input checked="" type="checkbox"/> Domestic <input checked="" type="checkbox"/> Industrial, Commercial & Institutional (IC&I) <input type="checkbox"/> Source Separated Organics (Green Bin) <input checked="" type="checkbox"/> Tires	<input type="checkbox"/> Contaminated Soil <input checked="" type="checkbox"/> Wood Waste <input type="checkbox"/> Blue Box Material <input type="checkbox"/> Processed Organics <input type="checkbox"/> Leaf and Yard Waste	<input type="checkbox"/> Food Processing/Preparation Operations Waste <input type="checkbox"/> Hauled Sewage Other: <div>Provide any other approved waste types not listed here</div>
<b>Subject Waste Approved Waste Classes: Hazardous &amp; Liquid Industrial</b> (separate waste classes by comma)			
<b>Year Site Opened</b> (enter the Calendar Year <u>only</u> )	1977	<b>Current ECA Issue Date</b>	9-Jun-16
<b>Is your Site required to submit Financial Assurance?</b>	<input type="radio"/> <b>Yes</b> <input checked="" type="radio"/> <b>No</b>		
<b>Describe how your Landfill is designed.</b>	<input checked="" type="radio"/> Natural Attenuation only <input type="radio"/> Fully engineered Facility <input type="radio"/> Partially engineered Facility		
<b>Does your Site have an approved Contaminant Attenuation Zone?</b>	<input type="radio"/> <b>Yes</b> <input checked="" type="radio"/> <b>No</b>		

<b>If closed, specify C of A, control or authorizing document closure date:</b>	22-May-96
<b>Has the nature of the operations at the site changed during this monitoring period?</b>	<div> <input type="radio"/> Yes </div> <div> <input checked="" type="radio"/> No </div>
<b>If yes, provide details:</b>	Type Here
<b>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)</b>	<div> <input type="radio"/> Yes </div> <div> <input checked="" type="radio"/> No </div>

## Groundwater WDS Verification:

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

### Sampling and Monitoring Program Status:

<p>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:</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>If no, list exceptions (Type Here):</p>	
<p>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):</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p> <p><input type="radio"/> Not Applicable</p>	<p>If no, list exceptions below or attach information.</p>	
Groundwater Sampling Location	Description/Explanation for change (change in name or location, additions, deletions)	Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	

3) a) Is landfill gas being monitored or controlled at the site?		<input checked="" type="radio"/> Yes <input type="radio"/> 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?		<input type="radio"/> Yes <input checked="" type="radio"/> 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:		<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> 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	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select Date	
Type Here	Type Here	Select 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):		<input checked="" type="radio"/> Yes <input type="radio"/> No	If no, specify (Type Here):

## Sampling and Monitoring Program Results/WDS Conditions and Assessment:

<p>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.</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>If no, the potential design and operational concerns/exceptions are as follows (Type Here):</p>	
<p>6) The site meets compliance and assessment criteria.</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>If no, list and explain exceptions (Type Here):</p>	
<p>7) The site continues to perform as anticipated. There have been no unusual trends/changes in measured leachate and groundwater levels or concentrations.</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>If no, list exceptions and explain reason for increase/change (Type Here):</p>	
<p>1) Is one or more of the following risk reduction practices in place at the site:</p> <p>(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</p> <p>(b) There is a predictive monitoring program in-place (modeled indicator concentrations projected over time for key locations); or</p> <p>(c) The site meets the following two conditions (typically achieved after 15 years or longer of site operation):</p> <p><i>i.</i> The site has developed stable leachate mound(s) and stable leachate plume geometry/concentrations; and</p> <p><i>ii.</i> Seasonal and annual water levels and water quality fluctuations are well understood.</p>	<p><input checked="" type="radio"/> Yes</p> <p><input type="radio"/> No</p>	<p>Note which practice(s):</p>	<p><input type="checkbox"/> (a)</p> <p><input type="checkbox"/> (b)</p> <p><input checked="" type="checkbox"/> (c)</p>
<p>9) Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</p>	<p><input type="radio"/> Yes</p> <p><input checked="" type="radio"/> No</p> <p><input type="radio"/> Not Applicable</p>	<p>If yes, list value(s) that are/have been exceeded and follow-up action taken (Type Here):</p>	



## 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:

10-Mar-20

## Recommendations:

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

<p><input type="radio"/> No changes to the monitoring program are recommended</p> <p><input checked="" type="radio"/> The following change(s) to the monitoring program is/are recommended:</p>	<p>The monitoring of Landfill Gases (methane) through existing groundwater monitors (four new installations completed in 2014) and two gas probes (installations completed in 2014) should be continued at twice per year during the designated spring and fall groundwater sampling campaigns.</p>
<p><input checked="" type="radio"/> No Changes to site design and operation are recommended</p> <p><input type="radio"/> The following change(s) to the site design and operation is/are recommended:</p>	<p>Type Here</p>

<b>Name:</b>	Nyle McIlveen, P.Eng.		
<b>Seal:</b>	Add Image 		
<b>Signature:</b>		<b>Date:</b> Mar 10-20	10-Mar-20
<b>CEP Contact Information:</b>	Nyle McIlveen, P./Eng.		
<b>Company:</b>	GHD		
<b>Address:</b>	347 Pido Road, Unit 29, Peterborough, Ontario K9J 6X7		
<b>Telephone No.:</b>	(705) 749-3317	<b>Fax No. :</b>	(705) 749-9248
<b>E-mail Address:</b>	nyle.mcilveen@ghd.com		
<b>Co-signers for additional expertise provided:</b>			
<b>Signature:</b>		<b>Date:</b>	
<b>Signature:</b>		<b>Date:</b>	Select 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):

<b>Name (s)</b>	Sawer Creek, Otonabee River (Trent Canal)
<b>Distance(s)</b>	0.3 and 7 km, respectively

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:	<input checked="" type="radio"/> Yes <input type="radio"/> No	If no, identify issues (Type Here):
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):	<input checked="" type="radio"/> Yes <input type="radio"/> No <input type="radio"/> 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
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date

<b>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.</b>		<input type="radio"/> Yes <input checked="" type="radio"/> No <input type="radio"/> Not Applicable
<b>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:</b>		<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> Not Applicable  If no, specify below or provide details in an attachment.
<b>Surface Water Sampling Location</b>	<b>Description/Explanation for change (change in name or location, additions, deletions)</b>	<b>Date</b>
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
Type Here	Type Here	Select Date
<b>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):</b>	<input checked="" type="radio"/> Yes <input type="radio"/> No	If no, specify (Type Here):

## Sampling and Monitoring Program Results/WDS Conditions and Assessment:

<b>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):</b>		<input type="radio"/> Yes  <input checked="" type="radio"/> No
<b>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:</b>		
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
Iron	PWQO 0.3 uS/cm Background monitor was dry during the sampling period that experienced the exceedance at the receiving water body.	Exceedance (2.97 uS/cm) was only one time in the summer. Samples taken in the spring and fall were within the PWQO.
Type Here	Type Here	Type Here
Type Here	Type Here	Type Here
Type Here	Type Here	Type Here
Type Here	Type Here	Type Here
<b>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)?</b>	<input checked="" type="radio"/> Yes  <input type="radio"/> No	If yes, specify (Type Here)

<p>7) <b>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.</b></p>	<p><input checked="" type="radio"/> <b>Yes</b></p> <p><input type="radio"/> <b>No</b></p>	<p>If no, list parameters and stations that is outside the expected range. Identify whether parameter concentrations show an increasing trend or are within a high historical range (Type Here)</p>
<p>8) <b>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)):</b></p>	<p><input checked="" type="radio"/> <b>Yes</b></p> <p><input type="radio"/> <b>No</b></p> <p><input type="radio"/> <b>Not Known</b></p> <p><input type="radio"/> <b>Not Applicable</b></p>	<p>Groundwater at monitoring well TW 6-2 is the closest monitor to the surface water receiver. It experienced one exceedance of the PWQO for Boron in the spring but not in the fall sampling circuit. Boron values in the receiving surface water location were well within the PWQO and similar to previous years. We believe this result to be an anomaly.</p>
<p>9) <b>Have trigger values for contingency plans or site remedial actions been exceeded (where they exist):</b></p>	<p><input type="radio"/> <b>Yes</b></p> <p><input checked="" type="radio"/> <b>No</b></p> <p><input type="radio"/> <b>Not Applicable</b></p>	<p>If yes, list value(s) that are/have been exceeded and follow-up action taken (Type Here)</p>

## 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.

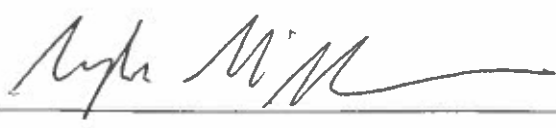
If any exceptions or potential concerns have been noted in the questions in the checklist attached to this declaration, it is my opinion that these exceptions and concerns are minor in nature or will be rectified for future monitoring events. Where this is not the case, the circumstances concerning the 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:

22-Mar-18

## Recommendations:

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

<p><input type="radio"/> No Changes to the monitoring program are recommended</p> <p><input checked="" type="radio"/> The following change(s) to the monitoring program is/are recommended:</p>	<p>If the background shallow groundwater monitor continues to be dry, it is recommended that the monitor be replaced.</p>
<p><input checked="" type="radio"/> No changes to the site design and operation are recommended</p> <p><input type="radio"/> The following change(s) to the site design and operation is/are recommended:</p>	<p>Type Here</p>

<b>CEP Signature</b>		
<b>Relevant Discipline</b>	Civil engineering, hydrogeology	
<b>Date:</b>	10-Mar-20	
<b>CEP Contact Information:</b>	Nyle McIlveen, P.Eng.	
<b>Company:</b>	GHD	
<b>Address:</b>	347 Pido Road, Unit 29, Peterborough, Ontario K9J 6X7	
<b>Telephone No.:</b>	(705) 749-3317	
<b>Fax No. :</b>	(705) 749-9248	
<b>E-mail Address:</b>	nyle.mcilveen@ghd.com	
<b>Save As</b>		<b>Print Form</b>





April 17, 2020

Reference PG-4812

Ms. Martina Chait-Hartwig, Temporary C.A.O.  
TOWNSHIP OF DOURO-DUMMER  
894 South Street  
WARSAW, Ontario  
K0L 3A0

**Re: Proposal and Cost Estimate  
2020 Groundwater Monitoring Program  
Annual Monitoring of Closed Landfill Sites**

Dear Ms. Chait-Hartwig:

GHD Limited (GHD) respectfully submits the following proposal for the annual monitoring of the closed landfill sites: Warsaw Road, Stoney Lake Road and Hall's Glen. It is our understanding that the request is for the 2020 monitoring and reporting years.

The general work scope for each site, as per the request for proposal, included the collection of surface and groundwater sample as per established protocol; general review of each site in accordance with the applicable closure plan; analysis of each sample collected by a licensed and qualified laboratory; field measurement of landfill gases and preparation of an annual report suitable for submission to the Ministry of the Environment, Conservation and Parks (MECP). The report is to include, but is not limited to, the results of the sampling and analysis, results of the measurements of landfill gases; recommendations relative to the site and future work and responding to any comments received for the MECP following the submission of the reports. Annual operations reviews will be prepared for the Stoney Lake and Hall's Genn Transfer Stations.

If GHD's proposal is successful the Township of Douro-Dummer (Township) will be provided with a copy of GHD's current WSIB Clearance Certificate, a copy of GHD's liability insurance and copies of required licenses and/or accreditations of the proponent as required.

The work is proposed to be conducted on a lump sum basis. A detailed work plan, price and a project schedule is provided on the following pages for each site for the 2020 monitoring program based on the existing monitoring programs.



### **WARSAW ROAD WASTE DISPOSAL SITE**

The work scope includes eight (8) monitoring stations sampled twice per year, four (4) residential wells sampled twice every 3 years (due in 2020) and seven (7) surface water stations to be monitored twice a year. The work will be carried out as in past monitoring circuits with in-situ field condition monitoring data collected as required and water samples collected from individual monitors using appropriate containers. In addition to the above work scope field measurements of landfill gas will be conducted during the two (2) sampling periods and an additional five (5) times annually.

It is estimated that the total costs to complete the planned work scope will be on the order of \$11,210 (excluding H.S.T.) for the 2020 monitoring period.

### **SCHEDULE**

The work scope schedule will be carried out as outlined in the 2019 AMR. This includes spring and autumn monitoring circuits with samples collected and additional field measurement of landfill gas. The annual report will be prepared and submitted in the early part of the following year.

### **STONEY LAKE WASTE DISPOSAL SITE**

The work scope includes sixteen (16) groundwater monitoring stations sampled twice per year, four (4) surface water stations to be sampled three (3) times a year and four (4) passive air vents monitored twice per year. It is our understanding from the 2012 Annual Report two (2) of the short list monitors are historically dry and therefore have been omitted from the chemical pricing provided below. Should samples be collected from these monitors they will be charged out at the respective rate. The work will be carried out as in past monitoring circuits with in-situ field condition monitoring data collected as required and water samples collected from individual monitors using appropriate containers.

Program will also include the preparation of the annual operations review of the transfer station, the installation of two background monitors and the re-surveying of all on-site monitors.

It is estimated that the total costs to complete the planned work scope will be on the order of \$12,420 (excluding H.S.T.) for the 2020 monitoring period. A breakdown of the estimated costs to complete each task of the monitoring program and operations report is outlined below. The estimated amounts presented include all professional and technical labour, laboratory charges, and related disbursements.



## SCHEDULE

The work scope schedule will be carried out as outlined in the 2020 AMR. This includes Spring and Fall monitoring circuits with samples collected and additional field work and sampling of surface water stations Summer. The annual report will be prepared and submitted in the later part of the monitoring year. The annual operations review will be completed in early part of the following year after receipt of necessary documentation from the township.

## **HALLS GLEN WASTE DISPOSAL SITE**

### STUDY APPROACH

The work scope includes thirteen (13)-monitoring stations with a total of twenty-seven (27) monitoring wells, four (4) residential wells and one (1) surface water station to be monitored twice a year. The work will be carried out as in past monitoring circuits with in-situ field condition monitoring data collected as required and water samples collected from individual monitors using appropriate containers. The preparation of the annual transfer station operations review is also included in the pricing.

It is estimated that the total costs to complete the planned work scope will be on the order of \$14,900 (excluding H.S.T.) for the 2020 monitoring period. A detailed breakdown of the estimated costs to complete each task of the monitoring program is outlined below. The estimated amounts presented include all professional and technical labour, laboratory charges, and related disbursements.

## SCHEDULE

The work scope schedule will be carried out as outlined in the 2020 AMR. This includes Spring and Fall monitoring circuits with samples collected and additional field work and sampling of surface water stations Summer. The annual report will be prepared and submitted in the later part of the monitoring year. The annual operations review will be completed in early part of the following year after receipt of necessary documentation from the township



## **TIME AND EXPENSE RATES**

### **COST ESTIMATE**

For additional items not covered we will provide a lump sum estimate or to carry out on a time-and-expense basis in accordance with the following rates:

Senior Engineer.....	\$250.00/hour
Hydrogeologist.....	\$180.00/hour
Environmental Technologist.....	\$85.00/hour
Junior Technologist.....	\$75.00/hour
Travel Expense.....	\$0.60/km

## **PRICING SUMMARY**

The total estimate for the 2020 monitoring year is \$38,530 excluding H.S.T.

We trust that this proposal meets your requirements. All work will be carried out by experienced personnel who are familiar with groundwater and environmental projects throughout Ontario. Should you have any questions regarding the planned work scope, related costs or scheduling, please contact our office.

Yours Truly,

A handwritten signature in black ink that reads "Steven Gagne".

Steven Gagne, H.B.Sc.

A handwritten signature in blue ink that reads "Nyle C. McIlveen".

Nyle C. McIlveen, P.Eng.

/sg

## Standard Terms for Professional Services

GHD Limited ("GHD") and Client (as set out below) agree that any professional services performed by GHD for Client, relating to the scope of work, will be on the following standard terms:

1. Invoices for services rendered will be issued monthly payable on receipt. Amounts due will be increased at the rate of 1 1/2 percent per month after 30 days. GHD reserves the right, without penalty, to discontinue services in the event of non-payment of undisputed amounts.
2. GHD maintains statutory workers compensation insurance, and professional, pollution, general, auto, and employers liability insurance which GHD deems adequate. Certificates of insurance shall be provided on request.
3. GHD's services are solely for Client's benefit and may not be relied upon by any third party without GHD's express written consent. Any use, change, or distribution of Work Product without the written consent of GHD shall be at Client's risk and will not give rise to liability of GHD.
4. GHD shall perform its professional services in the manner consistent with the level of care and skill ordinarily exercised by other professional firms acting under similar circumstances and at similar times. GHD makes no other warranty, implied or expressed.
5. GHD shall indemnify and hold harmless Client for its services to the extent GHD's neglect or willful misconduct causes liability for the Client. Neither party shall be liable for any consequential loss, injury or damages suffered by the other party, including but not limited to loss of use, earnings, and business interruption.
6. To the maximum extent permitted by law, GHD's liability and that of its employees, agents, directors, officers, and subcontractors to Client due to any negligent acts, errors or omissions, shall not exceed \$5,000 except as to damages resulting from the gross negligence or willful misconduct of GHD.
7. Client acknowledges that the pre-existing presence, if any, of pollutants, and other potentially hazardous conditions at the project site were not caused by or are not the responsibility of GHD, and that this contractual arrangement does not transfer any legal responsibilities for such conditions to GHD.
8. GHD may terminate this Agreement for nonpayment or other default by Client. Terms agreed to under this Agreement shall survive any such termination.
9. Client hereby agrees that this agreement may be assigned to another entity within the GHD group of companies that will be directly or indirectly wholly-owned by GHD Group Pty Ltd. (a "Related Entity"). Any such Related Entity shall assume all of GHD's liabilities, duties and obligations in, to, and under this Agreement. Client hereby agrees that this assignment may be effected without any further notice or action on the part of GHD. Upon request, Client agrees to execute and deliver any further documents as may be reasonably requested by GHD or its successor to evidence such consent and/or assignment.

These Terms and Conditions are hereby accepted this \_\_\_\_\_ day of \_\_\_\_\_, 201\_\_.

**Client Signature:**

\_\_\_\_\_  
Name of Company:

\_\_\_\_\_  
Per:

\_\_\_\_\_  
Title:

I have authority to bind the Corporation

**Overview:**

The Township of Douro-Dummer was part of a coordinated tender with the County of Peterborough and other local municipalities in order to secure the best price for surface treatment. Two tenders were received from Miller Paving Limited and Dufferin Construction.

The table below outlines the total tender cost compared to the funds budgeted to the 2020 surface treatment projects:

Description of Work	Miller Paving Limited Total Tender Cost	Dufferin Construction Total Tender Cost	Proposed Budgeted Funds
Ironwood Drive: County Road 4 to South Limit (sec. 206), approximately 0.5km			
Single surface treatment	\$9,246.00	\$15,745.00	\$9,125.00
Canal Road: County Road 4 to North Limit (sec. 167), approximately 0.7km			
Double surface treatment	\$26,040.00	\$24,645.00	\$25,550.00
<b>TOTAL</b>	<b>\$35,286.00</b>	<b>\$40,390.00</b>	<b>\$34,675.00</b>

**Conclusion:**

Dufferin Construction's total tender for Douro-Dummer was over the budgeted amount by \$5,715.00 and Miller Paving Limited's tender was over budget by \$611.00. Therefore, overall Miller Paving Limited was the lowest tender.

**Recommendation:**

That the Public Works-2020-02 report, dated April 24, 2020 regarding Surface Treatment Tender T-03-2020 be received, that Miller Paving Limited be awarded the 2020 Surface Treatment tender for the 2 capital works projects and further that the overtures be taken from the reserves.

**Financial Impact:**

The 2020 Surface Treatment budget is \$34,675.00. Miller Paving Limited's tendered price was \$35,286.00 which is \$611.00 over budget requiring an additional \$611.00 to be taken from the roads reserves added to the surface treatment budget in order to carry out this project.

**Strategic Plan Applicability:**

To enhance public transportation that is accessible and effective to support the needs of the community.

To ensure that the public works department operates efficiently and effectively.

**Sustainability Plan Applicability:**

To have an accessible transportation network that places priority on active and efficient modes of transportation.



**The Corporation of the County of Peterborough  
Bid Document**

**Request for Tender**

**Surface Treatment  
Tender #: T-03-2020**

**Tender Closing**

**Date: Tuesday March 26, 2020**

**Time: 2:00:00 p.m. (14:00:00 hours) local time**

**Location: The Corporation of the County of Peterborough  
County Court House  
470 Water Street  
Peterborough, Ontario K9H 3M3**

**Attn: Office of the Clerk**

**Late Bids Will Not Be Accepted.**

**The Corporation of the County of Peterborough reserves the right to accept or reject all or part of any Bid and also reserves the right to accept other than the lowest Bid and to cancel this Call for Bids and reserves the right to call for partial supply of any of the works at any time.**



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All purchases made by the Corporation of the County of Peterborough are done in accordance with our Purchasing of Goods and Services Policy (CORP-06), which covers the acquisition of all goods, services and construction projects (By-law 2013-68).

**Part “A” Information to Bidders**

**1. Intended Use and Schedule of Work**

The County of Peterborough, the Township of Douro-Dummer, the Township of Cavan Monaghan, the Township of Selwyn, the Municipality of Trent Lakes, and the Township of Havelock Belmont Methuen (the participating municipalities) are requesting tender submissions for Surface Treatment on various roads within the County of Peterborough.

The successful proponent for this Request for Tender (“RFT”) will enter into separate agreements for Surface Treatment Services with each of the participating municipalities. Where this RFT refers to the County specifically it is to be understood that the same terms, conditions and requirements apply to each of the participating municipalities.

All work must be completed no later than **Tuesday September 1, 2020.**

**2. Location**

See Part “C” Specifications for work locations.

**3. Applicable Document Fees**

Not required.

**4. Bid Deposit Requirements**

In addition to any other performance security requirements, a separate bid deposit document is required in one of, or a combination of, the following:

Certified cheque, bank draft, money order, bid bond, or irrevocable letter of credit or any combination, made payable to the Treasurer of the County of Peterborough in the amount of **ten percent (10%) of the total tendered price**, not including the H.S.T., **must be submitted with the Bid.**

The Bidder agrees that, if they should withdraw their bid or fail for any reason to execute the agreement or provide the required bonds or other documents required the County may retain the Bid deposit for the use of the County and may accept any other Bid, advertise for new quotations/tenders/proposals, or not accept any Bid as the County deems advisable.

**5. Performance Surety Requirements**

The successful bidder shall provide to the County, a Performance and Maintenance Security in one of the following forms, or a combination of item i.), ii.), iii.) and iv.), prior to the commencement of the work.

- i.) Certified cheque, bank draft, or money order, made payable to the Treasurer of the County of Peterborough in the amount of one hundred

## Surface Treatment

### Part "A"

### Information To Bidders

- (100%) percent of the total price bid. If the successful Bidder intends to provide a certified cheque, bank draft, or money order as a Performance Security, a signed letter from the Bidder's lending institution clearly stating that a certified cheque, bank draft, or money order for one hundred (100%) of total bid price may be obtained by the Bidder **must be submitted with the Bid.**
- ii.) Irrevocable Letter of Credit in the amount of one hundred (100%) percent of the total bid price. If the successful Bidder intends to provide an Irrevocable Letter of Credit as a Performance Security, a signed letter from the Bidder's lending institution clearly stating that an Irrevocable Letter of Credit for one hundred (100%) of total bid price may be obtained by the Bidder **must be submitted with the Bid.**
- iii.) Performance Bond and a Labour and Material Payment Bond **each** in the amount of one hundred percent (100%) of the Total Bid Price. If the successful Bidder intends to provide a Performance Bond and a Labour and Material Payment Bond **each** in the amount of one hundred percent (100%) of the Total Bid Price as a Performance Security, a completed "Agreement To Bond", as a surety that the Bidder can obtain the required Contract Performance Bond and Labour and Material Bond if they are the successful Bidder **must be submitted with the Bid.**
- iv.) A Maintenance Bond in the amount of five percent (5%) of the Total Bid Price for the duration of the warranty period.

An "Agreement to Bond" must be submitted with the Bid as a surety that the Bidder can obtain the required Contract Performance Bond, Labour and Material Bond and Maintenance Bond if they are the successful Bidder.

The Bonds shall be provided by a surety company authorized to do business in the Province of Ontario.

## 6. Tender Award

Tender award will be made based upon the lowest compliant bidder for the base tender bid. Once the lowest compliant bidder has been identified, the County and the participating Municipalities reserves the right to include any or all of the provisional items at any time during the award or construction process.

Each participating Township will be responsible to ensure appropriate approvals are secured and will be responsible to issue a Purchase Order to the successful bidder(s) for the specific location. Invoices must be sent to the Township or County identified as noted herein.

## 7. Other Public Agencies

Prior to submitting this Tender, it is of significant importance that all potential respondents be advised of the following:

## **Surface Treatment**

### **Part “A”**

### **Information To Bidders**

It must be clearly understood that by submitting a Tender in accordance with this document, the respective respondent is agreeing that other interested public agencies may review their Tender document and further, if a successful respondent is selected by the County and other public agencies deem it is in their best interest to join the County contract under the same terms and conditions, then one or more parties may join the County contract, if mutually agreed upon between the interested public agency and the successful bidder.

With the above agreement comes the realization that if other public agencies do join the County contract on a consortium basis, then the total dollar volume resulting from any potential contract could prove to be significantly higher than suggested in this document and respondents are requested to consider this information while preparing their responses and bring to their Tender the best possible economic benefits and returns for the County.

### **8. Inquiry**

Any questions regarding this tender should be submitted online (in English) through the “Submit Question” feature no later than **Thursday, March 19, 2020 at 2:00 p.m.**

Addenda will be issued if clarification is required. The County will be responsible for the issuing of all addenda. Bidders are responsible for checking for addenda.

### **9. Amendments to “Standard Terms and Conditions”**

Where Amendments to the County’s “Standard Terms and Conditions” are contained herein, it should be noted that these Amendments supersede any of the foregoing Terms and Conditions.

**Part “B” Standard Terms and Conditions**

**1. Definitions**

Bid	The document issued by the County in response to which Quotations/Tenders/Proposals are invited for the performance of the work or supply of equipment.
Bidder	A person (s), firm(s) or corporation(s) who has submitted a bid.
Company	The person(s), firm(s) or corporation(s) to whom the County has awarded the contract.
Contract	The purchase order authorizing the company to do the work, the Quotation/Tender/Proposal, the bonds or security (if any), the company's Quotation/Tender/Proposal, and change notices, appendices, and addenda (if any), Formal contract.
County	The County of Peterborough, its successors and assigns.
Equipment	The materials, machinery, assemblies, instruments, devices or articles as the case may be, or components thereof, which are the subject of the contract.
Notice of Award	Notice provided to the successful bidder of contract award.
Subcontractor	A person(s), firm(s) or corporation(s) having a contract with the company for any part of the work.
Work	All materials, equipment fixtures, services, supplies, and acts required to be done, furnished and/or performed by the company.

Where any word appears in ordinary case, its regularly applied meaning in the English language is intended.

**2. Acceptance of Terms**

Each Proponent, by submitting a proposal, represents that the Proponent has read and completely understands, and accepts all terms and conditions to those contained in this RFT. Any proposal that has alternative terms and conditions to those contained herewith shall be considered a counter offer to the County's request and shall be rejected.

**3. No Indemnities from the County of Peterborough**

Notwithstanding anything else in the Contract, any express or implied reference to the County providing indemnity or any other form of indebtedness or contingent liability that would directly or indirectly increase the indebtedness or



contingent liabilities of the County, whether at the time of execution of the contract or at any time during the Term, shall be void and of no legal effect.

**4. Force Majeure**

Neither Party shall be liable for damages caused by delay or failure to perform its obligations under the Contract where such delay or failure is caused by an event beyond its reasonable control if a reasonable business person applying due diligence in the same or similar circumstances under the same or similar obligations as those contained in the Contract would have put in place contingency plans to either materially mitigate or negate the effects of such event. Without limiting the generality of the foregoing, the parties agree that force majeure events shall include natural disasters and acts of war, insurrection and terrorism but shall not include shortages or delays relating to supplies or services. If a party seeks to excuse itself from its obligations under this Contract due to a force majeure event, that party shall immediately notify the other party of the delay or non-performance, the reason for such delay or non-performance and the anticipated period of delay for non-performance. If the anticipated or actual delay or non-performance exceeds fifteen (15) Business Days, the other party may immediately terminate the Contract by giving notice of termination and such termination shall be in addition to the other rights and remedies of the terminating party under the Contract, at law or in equity.

**5. Conflict of Interest**

The Supplier shall;

- a) Avoid any Conflict of Interest in the performance of its contractual obligations;
- b) Disclose to the County without delay any actual or potential Conflict of Interest that arises during the performance of its contractual obligations; and
- c) Comply with any requirements prescribed by the County to resolve any Conflict of Interest.

In addition to all other contractual rights or rights available at law or in equity, the County may immediately terminate the Contract upon giving notice to the Supplier where;

- a) The Supplier fails to disclose an actual or potential Conflict of Interest;
- b) The Supplier fails to comply with any requirements prescribed by the County to resolve a Conflict of Interest; or
- c) The Supplier's Conflict of Interest cannot be resolved. This paragraph shall survive any termination or expiry of the Contract.

**6. Errors and Omissions**

The County will not be held liable for any errors or omissions in any part of the RFT. While the County has used considerable effort to ensure an accurate representation in the RFT, the information contained in the RFT is supplied solely

as a guideline for the Proponents. The information is not guaranteed or warranted to be accurate by the County, nor is it necessarily comprehensive or exhaustive.

**7. Bid Closing Time**

One copy of the bid document, or as otherwise requested herein, properly signed and sealed and clearly marked as to its contents, shall arrive at the office of the Clerk of the County, County Court House, 470 Water Street, Peterborough, Ontario, K9H 3M3 no later than the specified time and closing date indicated on the cover page of the document. Late bids shall not be accepted; however they shall be time and date stamped and returned to the Bidder unopened.

The Peterborough County Court House time mechanism will be considered the official time when determining exact time of submission.

**8. Document Fees**

When a document fee is applicable, the Bidder must have previously purchased the respective document.

See Part "A" Information to Bidders, which forms part of this bid document.

**9. Bid Requirements**

Bidders are required to conform to the conditions listed below and those failing to do so may be subject to disqualification.

- a) Bids must be submitted on the bid form supplied by the County. Bid submissions must not be restricted by a statement added to the bid form or by a covering letter, or by alterations to the bid form supplied unless otherwise provided in the bid document.
- b) Bid submissions shall consist of "Part "D" Bid Form" and all other sections and requirements as requested within the bid document. See "Part "D" Bid Form" for all requirements requested within the bid document.
- c) The Bid Form shall be signed in the space(s) provided by a duly authorized official of the entity bidding. If a joint Bid is submitted, it shall be signed on behalf of each of the Bidders and if the signing authority for both Bidders is vested in one individual, they shall sign separately on their behalf. Signatures on behalf of non-incorporated bodies or by individuals shall be witnessed. In the case of an incorporated Company, the corporate seal should be affixed to the Bid Form adjacent to the authorized signature.
- d) All Bids are to be submitted in English only.
- e) Bids must be legible, written in ink or typewritten. Erasures, over-writing or strikeouts must be initialed by the person signing on behalf of the Company.
- f) Adjustments by telephone, facsimile (Fax), e-mail or letter to a bid already submitted will not be considered. A bidder desiring to make adjustments to

a bid must withdraw the bid and/or supersede it with a later bid submission prior to the specified bid closing time.

- g) Bids must be submitted in individually sealed envelopes and must clearly identify the name of the company, address of company, and Bid number on the outside of the envelope. Quotation/Tenders/Proposals received after closing time specified in the bid document will not be considered.

**Faxed Bid Submissions are not acceptable**

- h) Delivery of the Bid submission through a Courier Service shall be the responsibility of the Bidder and shall result in the submission being rejected where:
  - i. Bid submission is delivered to a location other than which is stated on the submission and fails to be delivered to the County of Peterborough's Office of the Clerk prior to the closing date and time; and/or
  - ii. Bid submission which is enclosed in the Courier Envelope that does not state, "Bid Document Enclosed" and is not removed from the Courier's Envelope prior to the closing date and time; and/or
  - iii. Bid submission is delivered later than the closing date and time.
- i) Each item in the bid document shall be a reasonable price for such item. Bids that contain prices which appear to be unbalanced as to affect adversely the interest of the County may be rejected. The County will be the sole judge in this matter.

**10. Bidder's Statement of Understanding**

It is understood that the Bidder has carefully examined all of the bid documents and has carefully examined the Work to be performed under the Contract if awarded. The Bidder also understands and accepts the said bid documents, and for the prices set forth in the Bid, hereby offers to furnish all labour, machinery, tools, apparatus and other means of implementation, and materials to complete the terms and conditions and requirements in strict accordance with the bid documents.

None of the conditions contained in the Bidder's (seller's) standard or general (printed) conditions of sale shall be of any effect unless explicitly agreed to by the County as set forth or specifically referred to therein.

The Bidder declares that their submission is not made in connection with any other bidder submitting an offer for the same commodity or commodities, and is in all respects fair and without collusion and fraud.

The contract shall be governed and interpreted in accordance with the laws of the Province of Ontario and the federal laws of Canada applicable therein.

**11. Clarification of Bid Documents**

No officer, agent or employee of the County is authorized to alter orally any portion of these documents. During the period prior to submission of

Quotations/Tenders/ Proposals, alterations will be issued to Bidders as written addenda. The Bidder shall list in its Bid all addenda that were considered when its Quotation/Tender/Proposal was prepared.

The County will issue all written addendum to the bid documents to each bidder or prospective Bidder via e-mail, fax or electronic posting.

Bidders are required to confirm receipt of each addendum. Although the County will make every reasonable effort to ensure that each Bidder receives all addenda issued, it is each Bidder's ultimate responsibility to ensure all addenda have been received.

## **12. Bid Deposit Requirements**

Bidders may be required to submit a bid deposit with each bid, which must be in the same envelope as the bid.

See Part "A" Information to Bidders, which form part of this bid document.

## **13. Performance Surety Requirements**

Performance surety binding the Company faithfully to fulfill the obligations of their bid as accepted, may be required by the County within ten (10) working days from the date of request.

See Part "A" Information to Bidders, which form part of this bid document.

## **14. Insurance Claims Policy (CORP-09) When Claims Involve Contracted Companies**

The County frequently enters into contracts with independent companies (contractors) who perform work on the County's behalf. The County's agreements with the contractors contain a strict requirement that they respond directly to claims for any damage or injury to members of the public that they may be held responsible for.

Upon receipt of information that a contractor had control over the accident location at the time of loss, the claim will be forwarded to the contractor for response. The contractor shall acknowledge receipt of the claim and identify a contact person who will be responsible for investigating the claim.

The contractor shall conduct an investigation and make a decision regarding the claim. If the contractor determines that they were responsible for the loss, they will resolve the claim with the claimant directly.

If the contractor determines their work met reasonable and appropriate construction standards, they may deny the claim. In this case, their communication to the claimant will provide the results of their investigation and clearly explain their decision. Should the claimant disagree with the contractor's decision and still wish to pursue the claim, they have the option of pursuing the contractor by proceeding with legal action.

**15. Insurance and Workplace Safety Insurance Board**

The successful bidder shall deliver a certified copy of the Firm's Public Liability and Property Damage Insurance, and where applicable the bidder shall carry standard automobile and non-owned automobile liability insurance Policy for the works, within ten (10) working days of receiving the Acceptance Notice. Coverage shall be at least \$5,000,000.00 in General Commercial Liability naming the County and participating Townships/ Municipalities as an additional insured under the policy. Additional coverage may be required.

See Part "A" Information to Bidders, which form part of this bid document for additional requirements.

The successful bidder will be required to submit proof of Workplace Safety Insurance Board Coverage, within ten (10) working days of receiving the Acceptance Notice and shall provide additional certificates as often as is deemed necessary by the County during the term of the contract to ensure continued good standing with the Workplace Safety & Insurance Board.

Failure to provide such proof shall result in cancellation of the Contract.

**16. Proof of Ability**

The Bidder may be required to show, in terms of experience and facilities, evidence of its ability, as well as that of any proposed subcontractor, to perform the work by the specified delivery date.

**17. Document and Site Review**

Bidders may be required to attend a mandatory document and site visit with the Owner.

See Part "A" Information to Bidders, which form part of this bid document.

The Submission of a Bid shall indicate that the bidder agrees and warrants that he has examined the site and all conditions relevant thereto, and all the separate documents, drawings, specifications and addenda and that the bid submitted covers the cost of all the items required in the contract. No claims for extras will be entertained on account of conditions, which could be observed on the site at the time bids were submitted.

See Part "C" Specifications, which form part of this bid document.

**18. Mandatory Requirement**

Proposals must meet all mandatory requirements as contained herein. Proposals that do not meet the mandatory requirements will not be considered for further evaluation. Statements that include the words "shall", "must", or "will" are considered to be mandatory.

Statements that include the words "should" or "may", while not mandatory, are considered highly desirable by the County. Failure to comply with requirements that are highly desirable may reflect negatively on the proponent's ability to

**19. Pricing Requirement**

Prices shall be in Canadian Funds, quoted separately for each item stipulated F.O.B. the point specified therein.

All prices bid shall include applicable taxes, customs duty, excise tax, freight, insurance and all other charges of every kind attributable to the work. Harmonized Sales Tax shall be shown as extra, unless otherwise specified. If the Bidder intends to manufacture or fabricate any part of the work outside of Canada, it shall arrange its shipping procedures so that its agent or representative in Canada is the Importer of record for customs purposes.

Except as may be provided in Part "C" Specifications, in the Quotation/Tender/Proposal document, the prices bid shall not be subject to adjustment for any cost of the work to the Company.

In the event of any discrepancy between the unit price and the extension, the unit price shall govern.

**20. Terms of Payment**

Unless progress payments or any alternate payment terms are specified in the contract, the contract price may be invoiced after delivery and shall be payable 30 days from receipt of invoice. The effect of any alternative payment terms, stated clearly in the bid submission will be considered in the evaluation of bids. The County shall have the right to withhold from any sum otherwise payable to the Company such amount as may be sufficient to remedy any defect or deficiency in the work, pending correction of the same.

**21. Terms of Payment – For Construction Projects**

Payment for materials supplied and work completed shall be on a monthly basis at the rate of 90%, providing for a 10% holdback in accordance with the Construction Lien Act, 2019, or its latest edition.

After performance acceptance of the work, and in accordance with the Construction Lien Act, 2019, or its latest edition, the holdback will be paid (after the hold back period and in the absence of no claims), to the Company upon receipt of a Statutory Declaration that all accounts and labour have been paid in full, receipt of a Workplace Safety & Insurance Certificate of Clearance and receipt of all "As Built" drawings and maintenance manuals, where applicable. Upon inspection and correction of any deficiencies at the end of the maintenance period, to the satisfaction of the Director or designate the Performance Sureties will be returned to the Company.

All payments will be made within twenty eight (28) days from receipt of an approved invoice. All invoices must be approved by the Director or designate.

**22. Delivery**

Time shall be material and of the essence of the contract.

All bids shall be F.O.B. Destination, Peterborough, Ontario unless otherwise noted in the bid document. The Company shall be responsible for arranging its work so that completion shall be as specified in the contract.

**23. Patents and Copyrights**

The Company shall at its expense, defend all claims, actions or proceedings against the County based on any allegations that the work or any part of the work constitutes an infringement of any patent, copyright or other proprietary right and shall pay to the County all costs, damages, charges and expenses, including its legal fees.

The Company shall pay all royalties and patent license fees required for the work.

If the work or any part thereof is in any action or proceeding held to constitute an infringement, the Company shall forthwith either secure for the County the right to continue using the work, or shall at the Company's expense, replace the infringing items with non-infringing work or modify them so that the work no longer infringes.

**24. Assignment**

The Company shall not assign the contract or any portion thereof without the prior written consent of the County.

**25. Occupational Health and Safety Act**

The successful bidder, for purposes of the Ontario Occupational Health and Safety Act, shall be designated as the Constructor for this project and shall assume all of the responsibilities of the Constructor as set out in that Act and its regulations. The foregoing shall apply notwithstanding that the successful bidder has been referred to as the 'Company' in this and any other related document.

The Company acknowledges that they have read and understood the Occupational Health and Safety Act together with the County's Health and Safety Policies and Procedures.

The Company covenants and agrees to observe strictly and faithfully the provisions of the said Occupational Health and Safety Act and all regulations and rules promulgated there under together with the County's Health and Safety Policies and Procedures.

The Company agrees to indemnify and save the County harmless for damages or fines arising from any breach or breaches of the said Occupational Health and Safety Act and/or the County's Health and Safety Policies and Procedures.

The Company agrees to assume full responsibility for the enforcement of the said Occupational Health and Safety Act and the County's Health and Safety Policies and Procedures and to ensure compliance therewith.

The Company further acknowledges and agrees that any breach or breaches of the Occupational Health and Safety Act and/or the County's Health and Safety Policies and Procedures whether by the Company or any of its sub-contractors

may result in the Company and/or sub-contractor being removed from the site and in the immediate termination of this contract herein and the forfeiture of all sums owing to the Company by the County.

The Company shall allow access to the work site on demand to representatives of the County to inspect work sites to ensure compliance with the Contract and the County's Policies and Procedures.

The Company agrees that any damages or fines that may be assessed against the County by reason of a breach or breaches of the Occupational Health and Safety Act by the Company or any of its sub-contractors will entitle the County to set-off the damages so assessed against any monies that the County may from time to time owe the Company under this contract or under any other contract whatsoever.

Where any portion of the work or services in this Contract is contracted to a sub-contractor, the Company agrees that the provisions of this section will apply to the sub-contractor and the Company will enforce said provisions.

The Company shall provide a list of all controlled hazardous materials or products containing hazardous materials, all physical agents or devices or equipment producing or omitting physical agents and any substance, compound, product or physical agent that is deemed to be or contains a designated substance in accordance with the Workplace Hazardous Materials Information System (WHMIS) as defined under the Ontario Occupational Health & Safety Act and shall provide appropriate Material Health & Safety Data sheets for these substances used for the performance of the required work, all prior to the performance of said work.

Where hazardous materials, physical agents and/or designated substances are used in the performance of the required work, the Company shall ensure that the requirements of the Ontario Occupational Health & Safety Act and associated regulations are complied with.

The County reserves the right to cancel any contract for non-compliance with the terms set out herein, health and safety regulations, the Environmental Protection Act, associated regulations and other applicable legislation.

## **26. Laws, Regulations, Permits, Fees and Licences**

The Company shall comply with relevant federal, provincial and municipal statutes, regulations and by-laws pertaining to the work and its performance. The Company shall be responsible for ensuring compliance by its suppliers and subcontractors.

The contract shall be governed by and construed in accordance with the laws of the Province of Ontario and the federal laws of Canada applicable therein.

The Company shall pay for all permits, licenses and fees, and give all notices and comply with all by-laws and regulations of the County and any other governing body.

The Respondent agrees that in the event the County is required to pay damages for any matter relating to or arising from a material breach of this RFT, whether



based upon an action or claim in contract, warranty, equity, negligence, intended conduct or otherwise, including any action or claim arising from the acts or omissions, neglect or otherwise of the County, the aggregate amount of damages recoverable against the County shall be no greater than the proposal preparation costs that the Respondent seeking damages from the County can demonstrate it incurred.

**27. Substitutes and Alternates**

Unless qualified by the provision "No Substitute", the use of the name of a manufacturer, brand, make or catalogue designation in specifying an item does not restrict bidders to that manufacturer, brand, make or catalogue designation identification. This is used simply to indicate the character, quality and/or performance of the goods and/or services desired, but the goods and/or services on which bids are submitted must be of such character, quality and/or performance that it will serve the purpose for which it is to be used as well as that specified. In submitting a bid on goods and/or services other than as specified, the bidder must furnish complete data and identification with respect to the alternate goods and/or services they proposes to furnish.

Consideration will be given to bids submitted on alternate goods and/or services to the extent that such action is deemed to serve the best interests of the County. If the bidder does not indicate that the goods and/or services they proposes to furnish is other than specified, it will be construed to mean that the bidder proposes to furnish the exact goods and/or services as described in the bid document.

**28. Quantities**

Where quantities are shown as approximate, they are not guaranteed to be accurate and are furnished without any liability on behalf of the County and shall be used as a basis for comparison only.

**29. Samples**

Samples when required must be submitted strictly in accordance with instructions. If samples are requested subsequent to the opening of the bid, they shall be delivered within three (3) working days following request, unless additional time is granted. Samples must be submitted free of charge and will be returned at the bidder's expense, if so requested, provided they have not been destroyed by tests, or provided they are not required for comparison purposes.

The acceptance of samples by the County shall be at its sole discretion and any such acceptance shall in no way be construed to imply relief of the Company from its obligations under the contract.

**30. Quotation/Tender/Proposal Procedures**

Quotation/Tender/Proposal will be called, received, evaluated, accepted and processed in accordance with the County's Purchasing Policies.

**31. Contract Award**

The County reserves the right to award by item, or part thereof, groups of items, or parts thereof, or all items of the bid, and to award contracts to one or more bidders submitting identical Bids as to price; to accept or reject any Bids in whole or in part; to waive irregularities and omissions. The County also reserves the right to enter into negotiations with the lowest compliant bidder if the price bid is over the budgeted amount of the project. Should the County be unable to reach an agreement with the lowest compliant bidder, the County reserves the right to enter into negotiations with the next lowest compliant bidder, or to cancel the call. If in so doing, the best interests of the County will be served. No liability shall accrue to the County for its decision in this regard.

The lowest or any bid may not necessarily be accepted as the County of Peterborough reserves the right to reject any or all bids. Bids shall be irrevocable for 90 days after the official closing time and the County may at any time within that period without notice, accept a Bid whether any other Bid has been previously accepted or not.

Proponents are solely responsible for their own expenses in preparing a response to this RFT. If the County elects to reject any or all proposals, the County will not be liable to any Proponent for any claims, whether for costs or damages incurred by the Proponent in preparing the proposal, loss of anticipated profit, or any other matter.

Award of this contract is subject to appropriate funding acceptable to the County.

The Notice of Award to the successful bidder shall constitute notice of acceptance of contract. This acceptance shall be conditional on the bidder providing all documentation, security and certifications as required by the Bid Document within ten (10) working days of the date that the notice of award is placed in the mail or delivered to the bidder. The bidder to whom the contract is awarded will be issued a purchase order, or a blanket purchase order may be required to execute a contract in triplicate within ten (10) working days from the date of notice of award by the County.

Notwithstanding and without restricting the generality of the statements above, the County of Peterborough shall not be required to award or accept a tender, and may choose to either cancel the call for tenders or recall the tenders at a later date:

- a) When only one Bid has been received as the result of a tender call;
- b) Where the lowest responsive and responsible bidder exceeds the available project budget for the supplies or services;
- c) When all Bids received fail to comply with the specifications of the tenders terms and conditions;
- d) When a change in the scope of work or specifications is required

**32. Contract Cancellation**

The County shall have the right, which may be exercised from time to time to cancel any uncompleted or unperformed portion of the work or part thereof. In

the event of such cancellation, the County and the Company shall negotiate a settlement.

- a) If the Company; commits any act of bankruptcy; or if a receiver is appointed on account of its insolvency or in respect of any of its property; or if the Company makes a general assignment for the benefit of its creditors; then, in any such case, the County may, without notice; terminate the contract.
- b) If the Company; fails to comply with any request, instruction or order of the County; or fails to pay its accounts; or fails to comply with or persistently disregard statutes, regulations, by-laws or directives of relevant authorities relating to the work; or fails to prosecute the work with the skill and diligence; or assigns or sublets the contract or any portion thereof without the County's written consent; or refuses to correct defective work; or is otherwise in default in carrying out its part of any of the terms, conditions and obligations of the contract, then, in any such case, the County may, upon expiration of ten (10) days from the date of written notice to the Company, terminate the contract.
- c) Any termination of the contract by the County, as aforesaid, shall be without prejudice to any other rights or remedies the County may have.
- d) If the County terminates the contract, it is entitled to:
  - i. Take possession of all of the work in progress and finish the work by whatever means the County may deem appropriate under the circumstances;
  - ii. Withhold any further payments to the Company until its liability to the County is ascertained;
  - iii. Recover from the Company loss, damage and expense incurred by the County by reason of the Company's default (which may be deducted from any monies due or becoming due to the Company, any balance to be paid by the Company to the County).

The County shall not be liable to the Company for loss of anticipated profit on the cancelled portion or portions of the work.

### **33. Availability of Labour and Escalation**

The bidder shall fully inform themselves regarding availability of labour in the area relative to the requirements of the schedule. The bidder shall make their own assessment of escalation in costs and increased labour costs and include all of these costs in their bid.

### **34. Correction of Defects**

If at any time prior to one year (or specified warranty/guarantee period if longer than one year) after the actual delivery date of the equipment any part of the equipment becomes defective or is deficient or fails due to defect in design, material or workmanship, or otherwise fails to meet the requirements of the contract, then the Company, upon request, shall make good every such defect,

deficiency or failure without cost to the County. The Company shall pay all transportation costs for parts and/or equipment both ways between the Company's factory or repair depot and the point of use.

**35. Disclosure**

The names of bidders and total bid prices will be made available at the public Quotation/Tender opening. After the Quotation/Tender opening, requests may be submitted to the County for the results, and only the names of bidders and total bid prices as read out at the Quotation/Tender opening will be given in the reply.

Request for Proposals are formally opened in public and only the name of the bidders submitting responses to the Request for Proposal will be read. Details of the proposals or any financial information will not be publicly disclosed at the opening.

**36. Debriefing**

For RFT(s) where contract is in excess of \$100,000, Proponents are entitled to a debriefing meeting with the County after award notification has been made. A request for a debriefing meeting must be received by the RFT contact within sixty (60) calendar days of award notification.

Debriefing meetings will be held in person at the County of Peterborough's offices.

The County will address a Proponent's specific questions in relation to their submission. Questions unrelated to the RFT will not be responded to during the debriefing and will be noted as out of scope

**37. Bid Protest Procedures**

Subsequent to a debriefing meeting where a Proponent believes that the competitive process has not been conducted in accordance with the process requirements contained herein, the Proponent may file a bid protest. The Proponent shall prepare in writing and submit the challenge within ten (10) days of the dispute to the RFT contact citing the clause in the RFT that the Proponent is in dispute. The RFT contact shall have five (5) days to investigate and respond to the protest. If the Bid protest is not resolved by the RFT contact, it will be forwarded on to the Deputy Treasurer of the County by the RFT contact, allowing the Deputy Treasurer of the County of Peterborough ten (10) days to investigate and respond to the Bid protest. Where the Deputy Treasurer of the County is unable to resolve the protest, the Deputy Treasurer will forward the protest to the Director of Finance/Treasurer. The Director of Finance/Treasurer of the County of Peterborough, at the Director of Finance/Treasurer's discretion will conduct an investigation of the competitive process. The Director of Finance/Treasurer's findings and any resolution shall be final and will be communicated to the Proponent and kept on file.

Any decided remedy in regards to Bid dispute award of costs will be limited to the amounts to prepare the tender and any mandatory site meeting expenses with the corresponding documentation or receipts.

**38. Conflict of interest and Prohibited Conduct**

a) Conflict of interest

The County may disqualify a proponent for any conduct, situation or circumstances, determined by the County, in its sole and absolute discretion, to constitute a Conflict of Interest, as defined above (Part B, section 5).

b) Disqualification for Prohibited Conduct

The County may disqualify a proponent, rescind an invitation to negotiate or terminate a contract subsequently entered into if the County determines that the proponent has engaged in any conduct prohibited by this RFT.

c) Respondent Not to Communicate with Media

Respondents must not at any time directly or indirectly communicate with the media in relation to this RFT or any agreement entered into pursuant to this RFT without first obtaining the written permission of the RFT Contact.

d) No Lobbying

Respondents must not, in relation to this RFT or the evaluation and selection process, engage directly or indirectly in any form of political or other lobbying whatsoever to influence the selection of the successful respondent (s).

e) Illegal or Unethical Conduct

Respondents must not engage in any illegal business practices, including activities such as bid –rigging, price-fixing, bribery, fraud, coercion or collusion. Respondents must not engage in any unethical conduct, including lobbying or other inappropriate communications; offering gifts to any employees, officers, agents, elected or appointed officials or other representatives of the County; deceitfulness; submitting quotations containing misrepresentations or other misleading or inaccurate information; or any other conduct that compromises or may be seen to compromise the competitive process provided for in this RFT.

f) Past Performance or Past Conduct

The County may prohibit a supplier from participating in a procurement process based on past performance or based in inappropriate conduct in a prior procurement process, including but not limited to the following;

- i. Illegal or unethical conduct as described above
- ii. The refusal of the supplier to honour its submitted pricing or other commitments; or
- iii. Any conduct situation or circumstance determined by the County, in its sole and absolute discretion, to have constituted an undisclosed Conflict of Interest.

**39. Freedom of Information**

All information obtained by the Company in connection with this bid is the property of the County of Peterborough and must be treated as confidential. It

may not be used for any purpose other than for replying to this bid, and for fulfillment of any subsequent contract. Any Company who requires that the information in its bid be kept confidential must explicitly advise the County of that fact.

The Company may declare confidentiality of their bid; however, the County is required by law to adhere to the requirements of the Municipal Freedom of Information and Protection of Privacy Act, as amended.

Personal information contained on this bid form is collected under the authority of Section 29(2) of the Municipal Freedom of Information and Protection of Privacy Act, R.S.O. 1990, c.M.56 as amended and will be used to purchase goods and/or services and for the execution of contractual documents. If you have any questions about the collection, use or disclosure of this information by the County of Peterborough, please contact the CAO or Clerk, County of Peterborough, 470 Water Street, Peterborough, Ontario K9H 3M3 (705-743-0380).

#### **40. Complaints**

Any complaint on the process and procedures as outlined in the County's Purchasing Bylaw (as amended) to define the procedures with respect to the procurement of goods and services by the Corporation of the County of Peterborough shall be in writing and shall be submitted to the Director of Finance/Treasurer for review and response.

A complaint on the process and procedures related to the award of a tender, proposal or quotation must be submitted within seven (7) working days of the date of the award.

#### **41. Accessibility**

The County of Peterborough is committed to the accessibility principles of preventing and removing barriers in accessing goods and services for people with disabilities and is bound by the Standards under the Accessibility for Ontarians with Disabilities Act, 2005 as may be amended from time to time.

Regulations enacted under the Act apply to every designated public sector organization and other third parties that provide goods and services to the members of the public.

The Supplier covenants and agrees to ensure that the Deliverables provided hereunder are consistent with the Ontario Human Rights Code ("OHRC"), the Ontarians Disabilities Act, 2001 ("ODA") and the Accessibility for Ontarians with Disabilities Act, 2005("AODA") and their respective regulations in order to achieve accessibility for Ontarians with disabilities. Without limiting the generality of the foregoing, the Supplier covenants and agrees to comply with the County's accessibility standards, policies, practices and procedures, as same may be in effect during the term of the Agreement and apply to the Deliverables to be provided hereunder by the Supplier.

**42. Human Rights**

The County is committed to hosting a work environment in which everyone is treated with respect, and no one is subject to discrimination. This commitment stems from the County's own philosophy and the County's obligations under the Ontario Human Rights Code. During the term of the Contract, the Supplier shall ensure that its employees and subcontractors behave in a manner that is appropriate, respectful and consistent with the provisions of the Ontario Human Rights Code.

Any breach of the Ontario Human Rights Code by the Supplier, its employees or subcontractor will result in the removal of that person from the County's premises. In addition, the breach of these conditions by the Supplier, its employees and subcontractors could result in the termination of the Contract and/or the barring of the Supplier and its subcontractors from entering into subsequent contracts with the County.

**43. Video Surveillance**

While on County of Peterborough property visitors, guests, and service providers may be recorded by video surveillance equipment installed throughout the premise. The Personal Information recorded by such equipment is the property of the County of Peterborough and will be collected, stored, and destroyed in accordance with all appropriate provincial and federal laws and in accordance with the County's Video Surveillance Systems Policy.

**Part “C” Specifications**

**Special Provisions General**

**1. Scope of Work**

<b>Surface Treatment for the County of Peterborough</b>
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The scope of work for each road for the County of Peterborough is outlined below.

**County Road No. 44:** from County Road No. 6 easterly for approximately 3.20 km, application of a double surface treatment over granular “A”

**County Road No. 48:** from 200 m east of Preston Road easterly for approximately 2.05 km, application of a double surface treatment over granular “A”

**County Road No. 504:** from 700 m east of County Road No. 52 easterly to McCoy Road for approximately 5.00 km, application of a double surface treatment over granular “A”

**County Road No. 507:** from Salmon Lake Road northerly to Haliburton Boundary for approximately 3.009km, application of a double surface treatment over granular “A”

**County Road No. 20:** from County Road No. 18 to County Road No. 23 for approximately 9.00 km, application of a double surface treatment over existing granular “A”.

The County of Peterborough reserves the right to call for partial supply of any of the works listed above subject to County of Peterborough Council 2020 budget approval.

<b>Surface Treatment for the Township of Douro-Dummer</b>
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The scope of work for each road for the Township of Douro-Dummer within the County of Peterborough is outlined below.

**Daleview Road:** from County Road No. 4 to Division Road for approximately 0.7 km, application of a double surface treatment over granular “A”

**Ironwood Drive:** from County Road No. 4 to South Limit for approximately 0.5 km, application of a single surface treatment over existing surface treatment

**Canal Road:** from County Road No. 4 to North Limit for approximately 0.7 km, application of a double surface treatment over existing granular “A”

The Township of Douro-Dummer reserves the right to call for partial supply of any of the works listed above subject to Township Council 2020 budget approval.



<b>Surface Treatment for the Municipality of Trent Lakes</b>
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The scope of work for each road for the Municipality of Trent Lakes within the County of Peterborough is outlined below.

**Bear Creek Road to End of Elim Lodge Road:** for approximately 4.1 km, application of a single surface treatment over existing surface treatment

**Allen’s Alley:** for approximately 2.1 km, application of a single surface treatment over existing surface treatment

**Allen’s Road:** for approximately 1.9 km, application of a single surface treatment over existing surface treatment

**Sumcot Drive:** for approximately 1.9 km, application of a single surface treatment over existing surface treatment

**Mill Line Road:** for approximately 2.7 km, application of a single surface treatment over existing surface treatment

**Crowes Line Road:** for approximately 1.8 km, application of a single surface treatment over existing surface treatment

**Kennedy Drive:** from approximately 4.0 km, application of a single surface treatment over existing surface treatment

The Municipality of Trent Lakes reserves the right to call for partial supply of any of the works listed above subject to Municipal Council 2020 budget approval.

<b>Surface Treatment for the Township of Cavan Monaghan</b>
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The scope of work for each road for the Township of Cavan Monaghan within the County of Peterborough is outlined below.

**Morton Line:** from County Road No. 10 westerly for approximately 1 km, application of a double surface treatment over existing granular “A”

**Morton Line:** from 1426 Morton Line easterly for approximately 800 m, application of a double surface treatment over existing granular “A”

**Morton Line:** from CPR crossing westerly for approximately 1.6 km, application of a double surface treatment over existing granular “A”

**Beardsmore Road:** from Worboy Court southerly for approximately 1.0 km, application of a double surface treatment over existing granular “A”

**Dranoel Road:** from Hwy 7A to Dranoel Drive for approximately 320 m, application of a double surface treatment over existing granular “A”

**Dranoel Drive:** from Hwy 7A to Dranoel Road for approximately 505 m, application of a double surface treatment over existing granular “A”

**Syer Line:** from Tapley ¼ Line to west CPR Bridge for approximately 800 m, application of a double surface treatment over existing granular “A”

**Larmer Line:** from County Road No. 10 to Hwy 115 Bridge for approximately 1.3 km, application of a double surface treatment over existing granular “A”

**Ava Cresent:** for approximately 500 m, application of a single surface treatment over existing granular “A”

**Deyell Line:** from T-Way Drive to Hutchison Drive for approximately 1.3 km, application of a double surface treatment over existing granular “A”

The Township of Cavan Monaghan reserves the right to call for partial supply of any of the works listed above subject to Township Council 2020 budget approval.

<b>Surface Treatment for the Township of Selwyn</b>
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The scope of work for each road for the Township of Selwyn within the County of Peterborough is outlined below.

**Myers Cres:** for approximately 1.01 km, application of a single surface treatment over existing surface treatment

**Mystic Meadow:** for approximately 0.35 km, application of a single surface treatment over existing surface treatment

**Mystic Cres:** for approximately 0.27 km, application of a single surface treatment over existing surface treatment

**Cedarvale Cres:** for approximately 0.59 km, application of a single surface treatment over existing surface treatment

**Teraview Heights:** for approximately 0.79 km, application of a single surface treatment over existing surface treatment

**Garmondale Ave:** for approximately 0.17 km, application of a single surface treatment over existing surface treatment

**Gazelle Trail:** for approximately 0.70 km, application of a single surface treatment over existing surface treatment

**Antelope Trail:** for approximately 2.04 km, application of a single surface treatment over existing surface treatment

**Impala Hills:** for approximately 0.25 km, application of a single surface treatment over existing surface treatment

**Kudu Court:** for approximately 0.15 km, application of a single surface treatment over existing surface treatment

**Eland Court:** for approximately 0.05 km, application of a single surface treatment over existing surface treatment

**Sable Court:** for approximately 0.10 km, application of a single surface treatment over existing surface treatment

**Ermatinger St:** for approximately 0.79 km, application of a single surface treatment over existing surface treatment

**Caroline St:** for approximately 0.93 km, application of a single surface treatment over existing surface treatment

**Duggan:** for approximately 0.14 km, application of a single surface treatment over existing surface treatment (of the 2.80 km, 100 m will be double surface treatment)

**Brick Road:** from Skyline southerly for approximately 0.73 km, application of a single surface treatment over existing surface treatment

**Beachwood Dr:** for approximately 1.13 km, application of a single surface treatment over existing surface treatment

**Berrie Rd:** for approximately 2.80 km, application of a single surface treatment over existing surface treatment

**9<sup>th</sup> Line:** for approximately 3.02 km, application of a single surface treatment over existing surface treatment

**15<sup>th</sup> Line:** from Newcomb Lane to Jopling for approximately 2.44 km, application of a single surface treatment over existing surface treatment

**Jopling Line:** from 15<sup>th</sup> Line to 14<sup>th</sup> Line for approximately 1.44 km, application of a single surface treatment over existing surface treatment

**Murphy Road:** for approximately 1.47 km, application of a single surface treatment over existing surface treatment

**McCue Rd:** for approximately 0.14 km, application of a single surface treatment over existing surface treatment

**Hilliard St:** from Woodland to 5<sup>th</sup> Line for approximately 1.48 km, application of a single surface treatment over existing surface treatment

**Pinehurst Ave:** for approximately 1.52 km, application of a single surface treatment over existing surface treatment

**Fairbairn St:** from 3<sup>rd</sup> Line to City Limits for approximately 1.15 km, application of a single surface treatment over existing surface treatment

**15<sup>th</sup> Line:** from Newcomb to North School Rd for approximately 1.10 km, application of a double surface treatment over existing granular “A”

**Strickland St:** for approximately 1.11 km, application of a double surface treatment over existing granular “A”

The Township of Selwyn reserves the right to call for partial supply of any of the works listed above subject to Township Council 2020 budget approval.

## **2. Specifications**

The Ontario Provincial Standard Specifications (OPSS) form part of the Contract Document but are not reproduced herein. The Contractor is responsible for obtaining and having on site a current issue of the OPSS. The OPSS is the standard specification for this contract. The Special Provisions for Tender Items

will take precedence over the OPSS where a conflict arises between the two specifications. Applicable OPSS and the related Special Provision (SP) are identified for each Tender Item in the "OPSS SPEC" column of Part "D" Schedule of Items & Prices documents. The particular revision in effect at the time the contract is advertised shall apply.

It shall be the Contractor's responsibility to obtain the latest edition of the Ontario Provincial Standard Specifications and Drawings. Only the municipal and provincial common standards in OPS Volumes 1 to 4 and municipal-oriented specifications in OPS Volumes 7 and 8 apply to this Contract, unless specified otherwise in the Contract Documents. The Ontario Provincial Standards in effect immediately prior to the call for Tenders for this Contract shall apply for the duration of the Contract.

### **3. Site Preparation**

It shall be the Contractor's responsibility to conduct site preparation under any item of this contract through the construction zone and on all roads. There will be no additional payment for site preparation as required and may include but not necessarily limited to:

- cost of the Performance Bond and Liability Insurance as required under this Contract;
- supplying a foreman or a representative on the job at all times and layout;
- security protection of the Contractor's materials during the course of the Contract;
- removal, salvage, storage and reinstallation of all road signage located within the project limits;
- supply and placing temporary stop signs at side road locations;
- moving onto the site and setting up the Contractor's office, storage facilities, plant, etc., and moving off the site and removal of the Contractor's office, storage facilities, plant, etc.;
- supply of portable sanitary toilet facilities.;
- install two County supplied construction information signs per road section

### **4. OPS General Conditions**

Wherever in this Contract reference is made to the General Conditions it shall be interpreted as meaning the OPS General Conditions of contract (OPSS MUNI 100), November 2018.

## **5. Definitions**

Wherever the word "Corporation", "Owner", "Authority", "Inspector" or "Contract Administrator" appears in this Contract, it shall be interpreted as meaning the County of Peterborough.

Wherever the word "Ministry" or "M.T.O." appears, it shall be deemed to mean the Ministry of Transportation, Ontario.

Wherever the word "Director" appears in the Contract, it shall be deemed to mean the Director of Public Works, County of Peterborough or their designate.

## **6. Warranty**

For the purposes of Part "C" Specifications of the Contract Documents, the **warranty period shall be 24 months** from the date of Total Performance of the Work or such longer periods as may be specified for certain Products or Work.

## **7. Schedule**

The work is to commence within 10 days of signing the Formal Contract and must be completed by **Tuesday September 1, 2020**. The Contractor shall provide a Work Schedule at the Pre-construction meeting.

## **8. Protection of Public and Traffic General**

All traffic control procedures and devices shall conform to the requirements of the following references:

- a) The Ministry of Transportation, Ontario "Ontario Traffic Manual Book 7" most recent edition.

The Contractor shall submit a traffic control plan to the County for review prior to starting work. The Contractor shall include TC-1, TC-1A, Rb-90A and Rb-90B signs as part of the traffic control plan and these signs shall be maintained in the field throughout the course of the work until the line painting has been completed. There will be no additional claim for payment for these signs as required.

The Contractor will be responsible for maintaining vehicular traffic. The Contractor shall avoid the blocking of vehicular or pedestrian traffic for a longer period than is necessary for proper construction of the work.

The Contractor is advised of the County of Peterborough's By-law for Reduced Speed Limits in Designated Construction Zones. There will be no additional payment for signs as may be required.

Barricades, warning signs, lanterns, lights, and all necessary detour signs within the limits of the Contract, shall be maintained throughout the course of the work, all at the expense of the Contractor and to the satisfaction of the Director of Public Works. Detour signing, in the event detours are required and/or permitted,

outside of the Contract Limits shall also be carried out by, and at the expense of, the Contractor.

## **9. Spills Reporting and Containment**

Spills or discharges of pollutants or contaminants under the control of the Contractor, and spills or discharges of pollutants or contaminants that are a result of the Contractor's operations that cause or are like to cause adverse effects shall forthwith be reported to the Spills Action Centre at 1-800-268-6060 and to the Director of Public Works. Such spills or discharges and their adverse effects shall be defined in the Environmental Protection Act R.S.O. 1990.

All spills or discharges of liquid, other than accumulated rain water, from luminaries, internally illuminated signs, lamps and liquid type transformers under the control of the Contractor, and all spills or discharges for this equipment that are a result of the Contractor's operations shall, unless otherwise indicated in the Contract, be assumed to contain PCB's and shall forthwith be reported to the Director of Public Works.

This reporting will not relieve the Contractor of their legislated responsibilities regarding such spills or discharges.

In the case of a spill, the Contractor shall use every effort required to contain the spill as may be required to mitigate adverse effects on the environment.

Upon satisfactory containment of the spill and upon direction from the Spills Action Centre and the Director of Public Works, the Contractor shall complete any clean-up of the spill as may be directed.

There will be no additional payment for costs associated with spill containment and clean-up, as may be required.

## **10. Layout**

OPSS General Condition GC7.02 shall be followed. The Contractor shall at their own expense set all stakes necessary to properly define the location, alignment, elevation, and grade of the work to facilitate proposed construction to the satisfaction of the County.

## **11. Operational Constraints**

Surface treatment operations shall not be carried out when the air temperature at the work location is less than 10 degrees Celsius, or when the road surface is wet, or when rain is imminent as determined by the Contractor.

## 12. Supply of Materials

All materials necessary for the proper completion of the work shall be supplied by the Contractor, except as specifically noted. The payment provided in the contract shall be deemed to include full compensation for the supply of all such materials.

## 13. Liquidated Damages

Time shall be the essence of this Contract.

Work on this Contract may commence ten (10) calendar days after signing of the contract agreement. The Contractor shall diligently complete their work on this Contract to completion on or before **the date identified in Part C, Section 7 - Schedule**.

If the time above specified is not sufficient to permit completion of the work by the Contractor working a normal number of hours each day or week on a single daylight shift basis, it is expected that, subject to local By-laws affecting hours of work, additional and/or augmented daylight shifts will be required throughout the life of the Contract to the extent deemed necessary by the Contractor to insure that the work will be completed within the time limit specified. Any additional costs occasioned by compliance with these Provisions will be considered to be included in the prices bid for the various items of work and no additional compensation will be allowed therefore.

It is agreed by the parties to the Contract that in case all the work called for under the Contract is not finished or completed within the dates included; a loss or damage will be sustained by the Owner. Since it is and will be impracticable and extremely difficult to ascertain and determine the actual loss or damage which the Owner will suffer in the event of and by reason of such delay, the parties hereto agree that the Contractor will pay to the Owner the sum of **\$2,500.00 (Two Thousand Five Hundred Dollars)** as liquidated damages for each and every calendar days' delay in finishing the work in excess of the required completion date prescribed. It is agreed that this amount is an estimate of the actual loss or damage to the Owner, which will accrue during the period in excess of the prescribed completion date.

The Owner may deduct any amount under this paragraph from any monies that may be due or payable to the Contractor on any account whatsoever. The liquidated damages payable under this paragraph are in addition to and without prejudice to any other remedy, action or other alternative that may be available to the Owner.

An application by the Contractor for extension of time shall be made to the Director of Public Works in writing **at least fifteen days prior to the date of completion** fixed by the contract.

All bonds or other surety furnished to the Owner by the Contractor shall be amended where necessary at the expense of the Contractor to provide coverage

beyond the date of any time granted, and the Contractor shall furnish the Owner with evidence of such amendment of the bonds or other surety.

Any extension of time that may be granted, in writing, to the Contractor shall be so granted and accepted without prejudice to any rights of the Owner whatsoever under this contract, and all such rights shall continue in full force and effect after the time limited in this contract for the completion of the work and whenever in this contract power and authority is given to the Owner or the Director or any person to take any action consequent upon the act, default, neglect, delay, non-observance or non-performance by the Contractor in respect of the work or contract, or any portion thereof such powers or authorities may be exercised from time to time and not only in the event of the happening of such contingencies before the time limited in this contract for the completion of the work but also in the event of the same happening after the time so limited in the cause of the Contractor being permitted to proceed with the execution of other work under an extension of time granted by the County.

#### **14. Contractor's Responsibility**

The Contractor's attention is drawn to Section GC7 of OPSS General Conditions of Contract "Contractor's Responsibility". Should the Contractor cease operations, under no circumstances shall sub-contractors be allowed to continue to work on the site unless an authorized representative of the Contractor is present on the site at all times. The Contractor shall notify the Director in writing of the names and positions of the person or persons representing the contractor.

#### **15. Co-Ordination Meetings**

The Contractor shall attend such meetings as may be required by the Director to co-ordinate services affected by the Contract.

#### **16. Measurement of Payment**

For purposes of this Contract, items shall be paid according to "Measured Quantity". Units for each item are as specified in the Special Provisions or OPSS.

#### **17. Dust Control**

Section GC7 of OPSS General Conditions of Contract is hereby modified to include the following:

The Contractor shall take such steps as may be required to prevent dust nuisance resulting from their operations either within the right-of-way or elsewhere or by public traffic where it is the Contractor's responsibility to maintain a roadway through the work.



The Contractor shall be responsible for ensuring all loose stone is swept off roadway and disposed of. This includes water for dust control. There will be no additional claim for payment for sweeping as required.

The cost of all preventive measures shall be borne by the Contractor including where water or calcium chloride is used to reduce the dust caused by traffic on a roadway which is the Contractor's responsibility to maintain for public traffic seven days a week. There will be no additional claim for payment for dust control as required.

### **18. Discrepancies and Conflicts**

Discrepancies and conflicts shall be brought to the attention of the Director prior to commencement of work on that portion of work. No additional payment will be made for correction of errors made in this regard.

### **19. Utilities**

Sections GC2.01 and GC7.12.02 of the General Conditions are deleted in their entirety and are replaced by the following:

The Contractor shall be responsible for the protection of all utilities at the job site during the time of construction.

The Authority will be responsible for the relocation of utilities where required. However, no claims will be considered which are based on delays or inconvenience resulting from the relocation not being completed before the start of this Contract. The location and depth of underground utilities shown on the Contract drawings are based on the investigations made by the Authority. It is, however, the Contractor's responsibility to contact the appropriate agencies for further information in regard to the exact location of all utilities, to exercise the necessary care in construction operations and to take such other precautions as are necessary to safeguard the utilities from damage.

The Contractor is responsible for verification of the location and type of other utilities within the contract limits and which may be encountered during construction.

### **20. Sign and Mailbox Maintenance**

The Contractor shall be responsible for the maintenance of all signs and all mailboxes during the construction period and for the re-installation of the same at the completion of the contract according to the applicable OTM Book for signs and current Canada Post regulations governing mailboxes.

**21. Disposal of Surplus or Unsuitable Material**

OPSS 180 applies except as amended below:

Materials which are either unsuitable or surplus to the requirements of the Contract, and which are to be disposed of, shall be disposed of outside the right-of-way in waste disposal areas arranged for by the Contractor. Disposal shall be such as not to be unsightly or potentially unsightly when viewed from the highway, and shall be carried out in an environmentally acceptable manner and shall avoid any environmentally sensitive areas identified in the contract.

For disposal sites off the contract, written permission for the owner of the property upon which there is to be disposal, shall be obtained and filed with the Director of Public Works prior to any disposal and shall save the Authority harmless from all claims that may arise from such disposal. Should the property be Crown Land, such permission shall be obtained from the Ministry of Natural Resources.

The Contractor shall make contact with the local Municipality to ensure conformity with any applicable fill By-law prior to disposal of any surplus materials.

**22. Submitting Payment Certificates**

Separate payment certificates shall be submitted by the Contractor to the County of Peterborough, the Township of Douro-Dummer, the Township of Cavan Monaghan, the Township of Selwyn, the Township of Havelock-Belmont-Methuen and the Municipality of Trent Lakes and shall show the holdback, taxes and totals for the work completed for each road.

**Special Provisions Tender Items**

**23. Surface Treatment - County of Peterborough**

OPSS 304, OPSS 1006 and OPSS 1103 apply except as amended below:

Double Surface Treatment on County Road No. 44 (8.0 m wide) shall conform to OPSS 304 and will be over granular "A" with HF 150-SP Asphalt Emulsion (OPSS 1103) with Class 2 Aggregate (OPSS 1006). The Contractor shall be responsible for determining application rates of both aggregate and emulsion according to OPSS 304 and must provide the rates to the County in writing 7 Business Days prior to the start of the work.

Double Surface Treatment on County Road No. 48 (11.0 m wide) shall conform to OPSS 304 and will be over granular "A" with HF 150-SP Asphalt Emulsion (OPSS 1103) with Class 2 Aggregate (OPSS 1006). The Contractor shall be responsible for determining application rates of both aggregate and emulsion according to OPSS 304 and must provide the rates to the County in writing 7 Business Days prior to the start of the work.

Double Surface Treatment on County Road No. 504 (8.0 m wide) shall conform to OPSS 304 and will be over granular “A” with HF 150-SP Asphalt Emulsion (OPSS 1103) with Class 2 Aggregate (OPSS 1006). The Contractor shall be responsible for determining application rates of both aggregate and emulsion according to OPSS 304 and must provide the rates to the County in writing 7 Business Days prior to the start of the work.

Double Surface Treatment on County Road No. 507 (8.0 m wide) shall conform to OPSS 304 and will be over granular “A” with HF 150-SP Asphalt Emulsion (OPSS 1103) with Class 2 Aggregate (OPSS 1006). The Contractor shall be responsible for determining application rates of both aggregate and emulsion according to OPSS 304 and must provide the rates to the County in writing 7 Business Days prior to the start of the work.

Double Surface Treatment on County Road No. 20 (10 m wide) shall conform to OPSS 304 and will be over granular “A” with HF 150-SP Polymer Modified Asphalt Emulsion (OPSS 1103) with Class 2 Aggregate (OPSS 1006). The Contractor shall be responsible for determining application rates of both aggregate and emulsion according to OPSS 304 and must provide the rates to the County in writing 7 Business Days prior to the start of the work.

The County shall be completing preparatory works (e.g. ditching, brushing, etc.) on County Road No. 44, 48, 504 and 507 with alternative resources and are outside of the scope of this contract, which are required to be completed prior to mobilizing to these sites to complete the surface treatment. No additional payment shall be claimed for delays associated with the completion these works prior to mobilization.

The Contractor shall advise the County in writing the source of liquid asphalts and emulsions for approval 7 Business Days prior to commencement of the work. Emulsified asphalts shall be according to OPSS 1103 for the particular type and grade when tested according to the test methods designed in the tables indicated.

The Contractor will provide the County with certificates from an independent laboratory confirming that the aggregate and emulsion used in the work meets the material specifications referenced in OPSS 304 and OPSS 1006 7 Business Days prior to commencing work. The Contractor is also responsible for providing the County with compatibility tests 7 Business Days prior to commencing work according to OPSS 1103 for the emulsion to be used with the Class 2 Aggregate or Class 6 Aggregate. Costs associated with this testing shall be borne by the Contractor.

The County will conduct Quality Assurance testing of both the aggregate and emulsion on an as-required basis. The location of the laboratory for delivery of samples will be mutually agreed upon by the County and the Contractor at the pre-construction meeting. The Contractor will provide samples when requested by the County according to OPSS 304. The County will arrange and pay for all laboratory testing. If samples fail to meet the specifications, the Contractor will be required to remove and replace the unsuitable material at their expense.

The Contractor shall convoy traffic around the worksite, in accordance with OTM Book 7. Convoying will be maintained until the freshly placed surface treatment is able to carry traffic without damage.

Payment will be by square meter (sq. m) of surface treatment. The unit price for the work includes the emulsion and aggregates. The supply and application of the aggregate is to be included in the item unit price. Payment under this item shall be full compensation for labour, equipment and material to do the work at the Tender Unit Price.

#### **24. Roadway Pulverizing - County of Peterborough**

OPSS 206, OPSS 301, OPSS 314, OPSS 330 and OPSS 501 apply except as amended below:

On County Road No. 44, the area to be pulverized is approximately 8.0 m wide (grass line to grass line). The existing surface treatment has an average depth of approximately 25 mm.

On County Road No. 48, the area to be pulverized is approximately 11.0 m wide (grass line to grass line) that is existing surface treatment which has an average depth of approximately 25 mm.

On County Road No. 504, the area to be pulverized is approximately 8.0 m wide (grass line to grass line) that is existing surface treatment which has an average depth of approximately 25 mm.

On County Road No. 507, the area to be pulverized is approximately 8.0 m wide (grass line to grass line) that is existing surface treatment which has an average depth of approximately 25 mm.

On County Road No. 20, the area to be pulverized is approximately 10.0 m wide (shoulder line to shoulder line).

The Contractor will be required to pulverize the existing roadway platform (i.e. existing surface and shoulders) to a total depth of 200 mm, shape, grade and compact in accordance with OPSS 301 and OPSS 330 prior to the surface treatment. A water truck shall be used to aid in achieving compaction.

While processing the existing surface, the Contractor shall ensure that the existing asphalt materials at the surface and the granular base are thoroughly mixed to the specified depth.

The processing shall be completed to the same station for the full surface width prior to closing down operations each day.

The placement of granular shall begin no later than 3 days after completion of pulverizing (weather dependant).

Measurement for payment of this tender item shall be made by the square meter (sq. m) of actual horizontal surface pulverized and shall be full compensation for

all work described above. Payment under this item shall be full compensation for labour, equipment and material to do the work at the Tender Unit Price.

**25. Granular "A" - County of Peterborough**

OPSS 314, OPSS 501 and OPSS 1010 apply with the following amendments:

This item covers the granular materials for the restoration of the cross section and profile, including fine grading, prior to the surface treatment on County Roads No. 44, 48, 504, 507 and 20.

The Contractor must provide the Director of Public Works 7 Business Days prior to commencement of the work with test results indicating that the material to be supplied meets current Ministry Specifications. The testing must be performed by a Certified Laboratory. The costs associated with the testing shall be borne by the Contractor.

Under this item the Contractor will place prior to the surface treatment approximately 6,200 tonnes of granular "A" on County Road No. 44, approximately 4,200 tonnes of granular "A" on County Road No. 48, approximately 9,600 tonnes of granular "A" on County Road No. 504, approximately 5,800 tonnes of granular "A" on County Road No. 507 and approximately 20,000 tonnes of granular "A" on County Road No. 20 to restore the road cross section and profile and compact to 100% of Standard Proctor Maximum Dry Density (SPMDD) to ensure a proper granular base prior to surface treatment. The Contractor must provide the Director of Public Works with compaction test results indicating that the compaction of granular "A" meets OPS Specifications prior to the placement of the surface treatment. The testing must be by a Certified Laboratory. The costs associated with testing shall be borne by the Contractor. The placement of granular "A" shall be completed to the same station for the full surface width prior to closing down operations each day.

The Contractor shall begin surface treatment **no later than 1 week** of the completion of granular "A" placement (weather dependent).

The Contractor shall restore all entrances, driveways, Township/County side roads and Fire Routes with granular "A" to blend existing gravel to the new surface treatment profile and provide a safe platform to merge onto these County Roads. No extra payment will be made for this.

In areas where gravel entrance ways are affected by the construction operation the Contractor will be required to place granular "A" to allow passage each day and to restore the entrances to original condition. No extra payment will be made for this.

Payment shall be made for these items for the supply, placing, grading and compacting of granular "A". The Contractor will be responsible for dust control during the normal working day and over weekends. Payment for dust control will be included in this item.

At its discretion, the County of Peterborough may increase/decrease the quantity of granular "A" for the restoration of the cross section on these County Roads. Additional granular "A" may be placed in areas as directed by the Director of Public Works, under this tender item to improve road profile and ensure a proper granular base prior to surface treatment.

Measurement for payment of this tender item shall be made by the tonnes of granular "A" placed. Payment under this item shall be full compensation for labour, equipment and material to do the work at the Tender Unit Price.

## **26. Pavement Markings - County of Peterborough**

OPSS 710 and OPSS 1716 apply except as amended below:

The Contractor shall make an inventory of all existing pavement markings within the limits of each project, including centerline, edge line, parking stalls, stop bars, cross walks, hatching and all symbols. The inventory will include line type, colour, width, location and total length. The inventory shall be submitted to the County for review prior to the removal of any existing pavement.

The contractor will be required to implement a Quality Control program per OPSS 1716. At the County's request, the contractor will provide data sheets for batches used on County roads confirming compliance with OPSS 1716. The volatile compound (VOC) must comply with the Canadian Environmental Protection Act of less than 150g/L.

**Within two (2) weeks after** the final completion of the surface treatment of all the County Roads, written notice from the Contractor will be given to the County indicating a schedule for the Contractor to reinstate **only the centerline pavement markings** based on the pre-construction inventory.

The area to be line painted shall be thoroughly cleaned using a rotary power broom to remove all sand, dirt and other debris. Areas inaccessible to a rotary power broom shall be manually cleaned. There will be no additional payment for sweeping and is to be included in the item unit price.

All lines shall be painted once. The contractor shall be responsible for all premarking prior to application of pavement markings. All new layout and painting of existing areas shall conform to the latest issue of the Ontario Traffic Manual Book 11, Pavement, Hazard and Delineation Markings and/or as directed by the Director. There will be no additional payment for premarking and is to be included in the item unit price.

Measurement for payment for this Tender item shall be per linear meter of road. Payment under this item shall be full compensation for labour, equipment and material to do the work at the Tender Unit Price.

## **27. Durable Pavement Markings - County of Peterborough**

OPSS 710, OPSS 1713 and OPSS 1714 apply except as amended below:

The Contractor shall make an inventory of all existing pavement markings within the limits of each project, including centerline, edge line, parking stalls, stop bars, cross walks, hatching and all symbols. The inventory will include line type, colour, width, location and total length. The inventory shall be submitted to the County for review prior to the removal of any existing pavement.

The Contractor will be required to implement a Quality Control program per OPSS 1713 and/or 1714. At the County's request, the Contractor will provide data sheets for batches used on County roads confirming compliance with OPSS 1713 or 1714. The volatile compound (VOC) must comply with the Canadian Environmental Protection Act level of less than 150 gL.

Within two (2) weeks after the final completion of the surface treatment of all the County Roads, written notice from the Contractor will be given to the County indicating a schedule for the Contractor to reinstate the centreline (broken or solid 10 cm durable yellow paint) and edge lines (10 cm durable white paint) for the entire alignment. The exact layout will be determined after the Contractor has submitted the inventory of the existing paint lines.

The area to be line painted shall be thoroughly cleaned using a rotary power broom to remove all sand, dirt and other debris. Areas inaccessible to a rotary power broom shall be manually cleaned. There will be no additional payment for sweeping which is to be included in the item unit price.

All lines shall be painted once. The Contractor shall be responsible for all pre-marking prior to application of pavement markings. All new layout and painting of existing areas shall conform to the latest issue of the Ontario Traffic Manual Book 11, Pavement, Hazard and Delineation Markings and/or as directed by the Director. There will be no additional payment for pre-marking which is to be included in the item unit price.

Measurement for payment for this Tender item shall be per metre. Payment under this item shall be full compensation for labour, equipment and material to do the work at the Tender Unit Price.

## **28. Re-grading of Ditch Line – County of Peterborough**

All in accordance with OPSS 206, except as amended below:

The bid price shall include disposal of all unsuitable materials offsite, and grading of ditch side slopes to match adjacent ground and adjustments as needed to ensure positive drainage to the main cross culverts.

The ditch lines to be re-graded are shown on the Contract Drawings. These locations are approximate and will be confirmed in field by the Contract Administrator.

Payment will be by measured linear metres in the field.

The unit price tendered shall include all costs for labor, material and equipment to regrade the ditches and move the excavated material offsite.

**Table 1: North Re-grading of Ditch Line Locations**

Starting Station	End Station	Approximate Length
10+800	11+120	320 m
11+835	11+890	55 m
13+160	13+360	200 m
14+635	14+880	245 m
14+960	15+620	660 m
16+515	16+600	85 m
16+910	16+930	20 m
17+080	17+110	30 m

**Table 2: South Re-grading of Ditch Line Locations**

Starting Station	End Station	Approximate Length
10+135	10+640	505 m
10+680	10+760	80 m
11+160	11+190	30 m
11+360	11+470	110 m
11+640	11+760	120 m
11+760	11+820	60 m
11+940	12+140	200 m
12+200	12+320	120 m
12+400	12+920	520 m
13+000	13+440	440 m
14+200	14+480	280 m
14+960	15+600	640 m
15+960	16+440	480 m
16+520	16+600	80 m
16+680	16+980	300 m
17+080	17+100	20 m
17+440	17+680	240 m
17+680	18+800	1120 m

**29.200 mm Ø Perforated Sub-Drain c/w Filter Sock – County of Peterborough**

All in accordance with OPSS 206, 405, 510 and 180, except as amended below:



As per OPSS 405.07.06.02.02, each 100 metre section shall be fitted with galvanized rodent gates. The excavation and bedding for the pipe sub-drain shall be paid for under this item. CCTV inspection of this item is not required.

The excavation on County Road 20 shall provide proper depth and width for the 200 mm Ø pipe Sub-Drain. Sub-drain shall be located at the bottom of the road granulars.

The approximate location of the sub-drain locations are shown on the Contract Drawings. These locations are approximate and will be confirmed in field by the Contract Administrator.

All sub-drain is to be installed on the south side of County Road 20.

Connections and Outlets as per OPSD 206.05. The locations of the outlets are to be determined in the field. A minimum of 15 outlets are expected.

Payment will be by measured linear metres in the field.

The Tender Unit Price bid for this item shall be full compensation for labor, equipment, and materials required to excavate and dispose of the material offsite.

**Table 3: Sub-drain Location Stations**

<b>Starting Station</b>	<b>End Station</b>	<b>Approximate Length</b>
10+640	10+680	40 m
10+980	11+160	180 m
11+190	11+360	170 m
11+560	11+600	40 m
11+620	11+640	20 m
12+140	12+200	60 m
13+440	13+960	520 m
14+480	14+600	120 m
14+660	14+960	300 m
15+740	15+960	220 m
16+440	165+00	60 m
16+600	16+680	80 m
17+160	17+440	280 m

**30.750 mm CSP Culvert – County of Peterborough**

This item shall include the excavation and placement of the 750 mm Type II galvanized CSP culvert, including frost taper and clay seal. This item shall conform to OPSS 421, OPSS 1801 and the Contract Drawings. The culvert is located at STA 10+478

This special provision covers the installation of the CSP culvert. Work shall include excavation, removal and disposal of the existing culvert, placement of granular bedding, installation of the new culvert and granular backfill to underside of road subgrade, substrate, geotextile, frost taper and reinstatement of the road granulars.

All culverts, including any necessary hardware and collars, shall be purchased by the Contractor. The Contractor will be responsible for delivering the culverts to the project site.

Bedding and cover shall conform to OPSD 802.010, 802.013, 802.014, 802.020, 802.023 and 802.024. Granular "A" shall be used for the bedding and cover. Clear stone, when required and as determined by the County, shall be used for bedding. Backfill for this shall be granular "B". The road bed disturbed shall be replaced with 150 mm of granular "A" and 450 mm of granular "B". Granulars used for the installation of the culverts shall be included in the unit price of the culverts.

The Contractor shall determine whether or not a frost treatment is required for each cross culvert replacement. If the Contractor determines that a frost treatment is required, the frost treatment shall be constructed to OPSD 803.030 and 803.031 and shall be included in the unit price of the culverts.

Dewatering, environmental protection, temporary erosion and sediment control and construction staging shall be included in the unit price.

Rip rap per OPSD 810.010 shall be included at the culvert outlet.

The culvert shall be approximately 20 m in length. The existing culvert inverts are approximately 267.0 m (North) and 267.5 m (South). The inverts will be field set to provide minimum cover at the south side and slope at 3.0% to the north side.

### **31. Surface Treatment - Township of Douro-Dummer**

OPSS 304, OPSS 1006 and OPSS 1103 apply except as amended below:

Single Surface Treatment shall conform to OPSS 304 and will be over existing surface treatment with HF 150-SP Polymer Modified Asphalt Emulsion (OPSS 1103) with ¼" washed traprock (OPSS 1006). The Contractor shall be responsible for determining application rates of both aggregate and emulsion according to OPSS 304 and must provide the rates to the Township in writing 7 Business Days prior to the start of the work. The Contractor is also responsible for providing the Township with compatibility tests 7 Business Days prior to

commencing work according to OPSS 1103 for the emulsion with the ¼" washed traprock. Costs associated with this testing shall be borne by the Contractor.

Double Surface Treatment shall conform to OPSS 304 and will be over granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion (OPSS 1103) with Class 2 and Class 6 Aggregate (OPSS 1006). The Contractor shall be responsible for determining application rates of both aggregate and emulsion according to OPSS 304 and must provide the rates to the Township in writing 7 Business Days prior to the start of the work. The Contractor is also responsible for providing the Township with compatibility tests 7 Business Days prior to work according to OPSS 1103 for the emulsion with the Class 2, Class 6 Aggregate. Costs associated with this testing shall be borne by the Contractor.

The Contractor shall advise the Township in writing the source of liquid asphalts and emulsions for approval 7 Business Days prior to commencement of the work. Emulsified asphalts shall be according to OPSS 1103 for the particular type and grade when tested according to the test methods designed in the tables indicated.

The Contractor will provide the Township with certificates from an independent laboratory confirming that the aggregate and emulsion used in the work meets the material specifications referenced in OPSS 304 and OPSS 1006 7 Business Days prior to commencing work. Costs associated with this testing shall be borne by the Contractor.

The Township will conduct Quality Assurance testing of both the aggregate and emulsion on an as-required basis. The location of the laboratory for delivery of samples will be mutually agreed upon by the Township and the Contractor at the pre-construction meeting. The Contractor will provide samples when requested by the Township according to OPSS 304. The Township will arrange and pay for all laboratory testing. If samples fail to meet the specifications, the Contractor will be required to remove and replace the unsuitable material at their expense.

The Contractor shall convoy traffic around the worksite, in accordance with OTM Book 7. Convoying will be maintained until the freshly placed surface treatment is able to carry traffic without damage.

The Township shall be completing preparatory works on these roads with alternative resources and are outside of the scope of this contract, which are required to be completed prior to mobilizing to these sites to complete the surface treatment. No additional payment shall be claimed for delays associated with the completion of these works prior to mobilization.

Payment will be by square meter (sq. m) of surface treatment. The unit price for the work includes the emulsion and aggregates. The supply and application of the aggregate is to be included in the item unit price. Payment under this item shall be full compensation for labour, equipment and material to do the work at the Tender Unit Price.

**32. Surface Treatment - Municipality of Trent Lakes**

OPSS 304, OPSS 1006 and OPSS 1103 apply except as amended below:

Single Surface Treatment shall conform to OPSS 304 and will be over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion (OPSS 1103) with washed Class 6 Aggregate (OPSS 1006). The Contractor shall be responsible for determining application rates of both aggregate and emulsion according to OPSS 304 and must provide the rates to the Municipality in writing 7 Business Days prior to the start of the work.

Double Surface Treatment shall conform to OPSS 304 and will be over granular "A" with HP 200P Polymer Modified Asphalt Emulsion (OPSS 1103) with Class 3 and washed Class 6 Aggregate (OPSS 1006). The Contractor shall be responsible for determining application rates of both aggregate and emulsion according to OPSS 304 and must provide the rates to the Municipality in writing 7 Business Days prior to the start of the work.

The Contractor shall advise the Municipality in writing the source of liquid asphalts and emulsions for approval 7 Business Days prior to commencement of the work. Emulsified asphalts shall be according to OPSS 1103 for the particular type and grade when tested according to the test methods designed in the tables indicated.

The Contractor will provide the Municipality with certificates from an independent laboratory confirming that the aggregate and emulsion used in the work meets the material specifications referenced in OPSS 304 and OPSS 1006 7 Business Days prior to commencing work. The Contractor is also responsible for providing the Municipality with compatibility tests 7 Business Days prior to commencing work according to OPSS 1103 for the emulsion with the Class 3 and washed Class 6 Aggregate. Costs associated with this testing shall be borne by the Contractor.

The Municipality will conduct Quality Assurance testing of both the aggregate and emulsion on an as-required basis. The location of the laboratory for delivery of samples will be mutually agreed upon by the Municipality and the Contractor at the pre-construction meeting. The Contractor will provide samples when requested by the Municipality according to OPSS 304. The Municipality will arrange and pay for all laboratory testing. If samples fail to meet the specifications, the Contractor will be required to remove and replace the unsuitable material at their expense.

The Contractor shall convoy traffic around the worksite, in accordance with OTM Book 7. Convoying will be maintained until the freshly placed surface treatment is able to carry traffic without damage.

The Municipality shall be completing preparatory works on these roads with alternative resources and are outside of the scope of this contract, which are required to be completed prior to mobilizing to these sites to complete the surface treatment. No additional payment shall be claimed for delays associated with the completion of these works prior to mobilization.

Payment will be by square meter (sq. m) of surface treatment. The unit price for the work includes the emulsion and aggregates. The supply and application of the aggregate is to be included in the item unit price. Payment under this item shall be full compensation for labour, equipment and material to do the work at the Tender Unit Price.

**33. Surface Treatment - Township of Cavan Monaghan**

OPSS 304, OPSS 1006 and OPSS 1103 apply except as amended below:

Double Surface Treatment shall conform to OPSS 304 and will be over granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion (OPSS 1103) with Class 2 and Class 6 Aggregate (OPSS 1006). The Contractor shall be responsible for determining application rates of both aggregate and emulsion according to OPSS 304 and must provide the rates to the Township in writing 7 Business Days prior to the start of the work. The Contractor is also responsible for providing the Township with compatibility tests 7 Business Days prior to work according to OPSS 1103 for the emulsion with the Class 2 and Class 6 Aggregate. Costs associated with this testing shall be borne by the Contractor.

The Contractor shall advise the Township in writing the source of liquid asphalts and emulsions for approval 7 Business Days prior to commencement of the work. Emulsified asphalts shall be according to OPSS 1103 for the particular type and grade when tested according to the test methods designed in the tables indicated.

The Contractor will provide the Township with certificates from an independent laboratory confirming that the aggregate and emulsion used in the work meets the material specifications referenced in OPSS 304 and OPSS 1006 7 Business Days prior to commencing work. Costs associated with this testing shall be borne by the Contractor.

The Township will conduct Quality Assurance testing of both the aggregate and emulsion on an as-required basis. The location of the laboratory for delivery of samples will be mutually agreed upon by the Township and the Contractor at the pre-construction meeting. The Contractor will provide samples when requested by the Township according to OPSS 304. The Township will arrange and pay for all laboratory testing. If samples fail to meet the specifications, the Contractor will be required to remove and replace the unsuitable material at their expense.

The Contractor shall convoy traffic around the worksite, in accordance with OTM Book 7. Convoying will be maintained until the freshly placed surface treatment is able to carry traffic without damage.

The Township shall be completing preparatory works on these roads with alternative resources and are outside of the scope of this contract, which are required to be completed prior to mobilizing to these sites to complete the surface treatment. No additional payment shall be claimed for delays associated with the completion of these works prior to mobilization.

Payment will be by square meter (sq. m) of surface treatment. The unit price for the work includes the emulsion and aggregates. The supply and application of the aggregate is to be included in the item unit price. Payment under this item shall be full compensation for labour, equipment and material to do the work at the Tender Unit Price.

**34. Surface Treatment - Township of Selwyn**

OPSS 304, OPSS 1006 and OPSS 1103 apply except as amended below:

Single Surface Treatment shall conform to OPSS 304 and will be over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion (OPSS 1103) with ¼” washed trap rock (OPSS 1006). The Contractor shall be responsible for determining application rates of both aggregate and emulsion according to OPSS 304 and must provide the rates to the Township in writing 7 Business Days prior to the start of the work. The Contractor is also responsible for providing the Township with compatibility tests 7 Business Days prior to work according to OPSS 1103 for the emulsion with the ¼” washed traprock supplied by the Township of Selwyn. Costs associated with this testing shall be borne by the Contractor.

Double Surface Treatment shall conform to OPSS 304 and will be over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion (OPSS 1103) with 3/8” Aggregate (OPSS 1006). The Contractor shall be responsible for determining application rates of both aggregate and emulsion according to OPSS 304 and must provide the rates to the Township in writing 7 Business Days prior to the start of the work. The Contractor is also responsible for providing the Township with compatibility tests 7 Business Days prior to work according to OPSS 1103 for the emulsion with the 3/8” Aggregate supplied by the Township of Selwyn. Costs associated with this testing shall be borne by the Contractor.

The Contractor shall advise the Township in writing the source of liquid asphalts and emulsions for approval 7 Business Days prior to commencement of the work. Emulsified asphalts shall be according to OPSS 1103 for the particular type and grade when tested according to the test methods designed in the tables indicated.

The Contractor will provide the Township with certificates from an independent laboratory confirming that the aggregate and emulsion used in the work meets the material specifications referenced in OPSS 304 and OPSS 1006 7 Business Days prior to commencing work. Costs associated with this testing shall be borne by the Contractor.

The Township will conduct Quality Assurance testing of both the aggregate and emulsion on an as-required basis. The location of the laboratory for delivery of samples will be mutually agreed upon by the Township and the Contractor at the pre-construction meeting. The Contractor will provide samples when requested by the Township according to OPSS 304. The Township will arrange and pay for

all laboratory testing. If samples fail to meet the specifications, the Contractor will be required to remove and replace the unsuitable material at their expense.

The Contractor shall convoy traffic around the worksite, in accordance with OTM Book 7. Convoying will be maintained until the freshly placed surface treatment is able to carry traffic without damage.

The Township shall be completing preparatory works on these roads with alternative resources and are outside of the scope of this contract, which are required to be completed prior to mobilizing to these sites to complete the surface treatment. No additional payment shall be claimed for delays associated with the completion of these works prior to mobilization.

Payment will be by kilogram of asphalt emulsion. The unit price for the work for the Township of Selwyn includes the binder emulsion. The 3/8" Aggregate will be supplied by the Township of Selwyn from Selwyn's Preston Pit on Preston Road but not delivered to the job site. The delivery and application of the 3/8" Aggregate is to be included in the item unit price. Payment under this item shall be full compensation for labour, equipment and material to do the work at the Tender Unit Price.

Payment will be by kilogram of asphalt emulsion. The unit price for the work for the Township of Selwyn includes the binder emulsion. The 1/4" washed traprock will be supplied by the Township of Selwyn from Selwyn's Preston Pit on Preston Road but not delivered to the job site. The delivery and application of the 1/4" washed traprock is to be included in the item unit price. Payment under this item shall be full compensation for labour, equipment and material to do the work at the Tender Unit Price.

### **35. Fog Seal - County of Peterborough**

OPSS 1103 and OPSS 1106 apply except as amended below:

Fog Sealing shall be defined as the single application of emulsion followed by a single application of Class 4 aggregate. Fog seal is to be applied on County Road No. 44, 48, 504, 507 and 20.

Fog sealing of roads in this contract shall be completed immediately after the completion of the surface treatment on a daily basis as directed by the Contract Administrator. If weather inhibits the fog seal placement prior to the end of each day, the fog seal shall be placed as soon as possible, weather permitting. If traffic is allowed on the completed surface treatment prior to the fog seal application, the roadway shall be swept prior to the fog seal application.

The emulsion shall be CSS-1H or SS-1H and shall conform to OPSS 1103, or an approved equivalent.

The aggregate shall meet the requirements of Class 4 in Table 1 of OPSS 1106.

The pressure distributor shall be designed and manufactured to spray binder on the road surface. The pressure distributor shall be capable of applying emulsion

at the specified rates and in a continuous and uniform manner both longitudinally and transversely for a full lane width.

The mechanical aggregate spreader shall be designed and manufactured to be self-propelled and capable of continuously and uniformly distributing aggregate at the specified application rate.

The County will conduct Quality Assurance testing of both the aggregate and emulsion on an as-required basis. The location of the laboratory for delivery of samples will be mutually agreed upon by the County and the Contractor at the pre-construction meeting. The Contractor will provide samples when requested by the County according to OPSS 1103. The County will arrange and pay for all laboratory testing. If samples fail to meet the specifications, the Contractor will be required to remove and replace the unsuitable material at their expense.

The Contractor shall convoy traffic around the worksite, in accordance with OTM Book 7. Convoying will be maintained until the freshly placed surface treatment is able to carry traffic without damage.

Emulsion application temperatures shall be according to OPSS 1103. The emulsion shall be uniformly sprayed on the road at an application rate of 0.4 to 0.6 L/m<sup>2</sup>. The emulsion shall be diluted with water prior to spraying at rate of approximately 70% emulsion 30% water.

The aggregate shall be uniformly applied at a rate of 3 to 5 kg/m<sup>2</sup>. No traffic shall be permitted on the surface until the contractor has deemed that the seal will remain unaffected by public traffic.

Payment will be by square meters of area fog sealed. The supply and application of the cover aggregate is to be included in the item unit price. Payment under this item shall be full compensation for labour, equipment and material to do the work at the Tender Unit Price.

### **36. Replacement of Cross Culverts – Provisional Item - County Road No. 48**

OPSS 421 applies except as amended below:

There are two cross culverts to be replaced on County Road No. 48.

The installation of the new cross culverts shall be a "footprint" and at the same grade of the existing cross culverts.

The existing corrugated steel culvert (CSP) located approximately 220 m east of Preston Road shall be replaced with a 800 mm diameter x 20.0 m Type II galvanized CSP maintaining the existing grade and alignment.

The existing CSP located approximately 542 m east of Preston Road shall be replaced with a 800 mm diameter x 26.0 m Type II galvanized CSP maintaining existing grade and alignment.



All culverts, including any necessary hardware and collars, shall be purchased by the Contractor. The Contractor will be responsible for delivering the culverts to the project site.

Bedding and cover shall conform to OPSD 802.010, 802.013, 802.014, 802.020, 802.023 and 802.024. Granular "A" shall be used for the bedding and cover. Clear stone, when required and as determined by the County, shall be used for bedding. Backfill for this shall be granular "B". The disturbed road bed shall be replaced with 150 mm of granular "A" and 450 mm of granular "B". Granulars used for the installation of the culverts shall be included in the unit price of the culverts.

The Contractor shall determine whether or not a frost treatment is required for each cross culvert replacement. If the Contractor determines that a frost treatment is required, the frost treatment shall be constructed to OPSD 803.030 and 803.031 and shall be included in the unit price of the culverts.

Dewatering, environmental protection, temporary erosion and sediment control and construction staging shall be included in the unit price. Installation of turtle exclusion fencing prior to May 15<sup>th</sup> for the replacement of the cross culverts on County Road No. 48 shall be included in the unit price of the culverts. All permits required from the applicable Conservation Authority (i.e. ORCA, Crowe Valley) will be obtained by the County prior to commencement of the works.

Payment shall be by meter and the unit price tendered shall include all costs for labour, material and equipment to remove and dispose of existing culverts and to purchase and install the new culverts.

### **37. Surface Treatment - Provisional Item - Township of Douro-Dummer**

OPSS 304, OPSS 1006 and OPSS 1103 apply except as amended below:

Single Surface Treatment shall conform to OPSS 304 and will be over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion (OPSS 1103) with ¼" washed traprock (OPSS 1006). The Contractor shall be responsible for determining application rates of both aggregate and emulsion according to OPSS 304 and must provide the rates to the Township in writing 7 Business Days prior to the start of the work. The Contractor is also responsible for providing the Township with compatibility tests 7 Business Days prior to commencing work according to OPSS 1103 for the emulsion with the ¼" washed traprock. Costs associated with this testing shall be borne by the Contractor.

Double Surface Treatment shall conform to OPSS 304 and will be over granular "A" with HP 200P Polymer Modified Asphalt Emulsion (OPSS 1103) with Class 2 and Class 6 Aggregate (OPSS 1006), Class 6 Aggregate (OPSS 1006) and ¼" washed traprock or Class 2 Aggregate (OPSS 1006) and ¼" washed traprock. The Contractor shall be responsible for determining application rates of both aggregate and emulsion according to OPSS 304 and must provide the rates to the Township in writing 7 Business Days prior to the start of the work. The

Contractor is also responsible for providing the Township with compatibility tests 7 Business Days prior to work according to OPSS 1103 for the emulsion with the Class 2, Class 6 Aggregate and ¼” washed traprock. Costs associated with this testing shall be borne by the Contractor.

The Contractor shall advise the Township in writing the source of liquid asphalts and emulsions for approval 7 Business Days prior to commencement of the work. Emulsified asphalts shall be according to OPSS 1103 for the particular type and grade when tested according to the test methods designed in the tables indicated.

The Contractor will provide the Township with certificates from an independent laboratory confirming that the aggregate and emulsion used in the work meets the material specifications referenced in OPSS 304 and OPSS 1006 7 Business Days prior to commencing work. Costs associated with this testing shall be borne by the Contractor.

The Township will conduct Quality Assurance testing of both the aggregate and emulsion on an as-required basis. The location of the laboratory for delivery of samples will be mutually agreed upon by the Township and the Contractor at the pre-construction meeting. The Contractor will provide samples when requested by the Township according to OPSS 304. The Township will arrange and pay for all laboratory testing. If samples fail to meet the specifications, the Contractor will be required to remove and replace the unsuitable material at their expense.

The Contractor shall convoy traffic around the worksite, in accordance with OTM Book 7. Convoying will be maintained until the freshly placed surface treatment is able to carry traffic without damage.

The Township shall be completing preparatory works on these roads with alternative resources and are outside of the scope of this contract, which are required to be completed prior to mobilizing to these sites to complete the surface treatment. No additional payment shall be claimed for delays associated with the completion of these works prior to mobilization.

Payment will be by square meter (sq. m) of surface treatment. The unit price for the work includes the emulsion and aggregates. The supply and application of the aggregate is to be included in the item unit price. Payment under this item shall be full compensation for labour, equipment and material to do the work at the Tender Unit Price.

### **38. Roadway Pulverizing – Provisional Item – The Township of Havelock Belmont Methuen**

OPSS 206, OPSS 301, OPSS 314, OPSS 330 and OPSS 501 apply except as amended below:

On Burnt Dam Road, the area to be pulverized is approximately 6.0 m wide. The existing surface treatment has an average depth of approximately 25 mm.

## **Surface Treatment Part “C”**

## **Specifications**

On North School Road, the area to be pulverized is approximately 6.0 m wide that is existing surface treatment which has an average depth of approximately 25 mm.

On 8<sup>th</sup> Concession, the area to be pulverized is approximately 6.0 m wide that is existing surface treatment which has an average depth of approximately 25 mm.

The Contractor will be required to pulverize the existing roadway platform (i.e. existing surface and shoulders) to a total depth of 150 mm, shape, grade and compact in accordance with OPSS 301 and OPSS 330 prior to the surface treatment. A water truck shall be used to aid in achieving compaction.

While processing the existing surface, the Contractor shall ensure that the existing asphalt materials at the surface and the granular base are thoroughly mixed to the specified depth.

The processing shall be completed to the same station for the full surface width prior to closing down operations each day.

The placement of granular shall begin no later than 3 days after completion of pulverizing (weather dependant).

Measurement for payment of this tender item shall be made by the square meter of actual horizontal surface pulverized and shall be full compensation for all work described above. Payment under this item shall be full compensation for labour, equipment and material to do the work at the Tender Unit Price.

### **39. Surface Treatment - Provisional Item – Township of Havelock Belmont Methuen**

**Burnt Dam Road:** for approximately 0.50 km, application of a double surface treatment over existing granular “A”

**North School Road:** from County Road No. 46 to Baker Road for approximately 0.50 km, application of a double surface treatment over existing granular “A”

**8<sup>th</sup> Concession:** from MTO Highway No. 7 to County Road No. 42 for approximately 1.00 km, application of a double surface treatment over existing granular “A”

The Township of Havelock Belmont Methuen reserves the right to call for partial supply of any of the works listed above subject to Township Council 2020 budget approval.

OPSS 304, OPSS 1006 and OPSS 1103 apply except as amended below:

Double Surface Treatment shall conform to OPSS 304 and will be over granular “A” with HF 150-SP Polymer Modified Asphalt Emulsion (OPSS 1103) with Class 6 Aggregate (OPSS 1006). The Contractor shall be responsible for determining application rates of both aggregate and emulsion according to OPSS 304 and must provide the rates to the Township in writing 7 Business Days prior to the start of the work. The Contractor is also responsible for providing the Township

with compatibility tests 7 Business Days prior to work according to OPSS 1103 for the emulsion with the Class 6 Aggregate. Costs associated with this testing shall be borne by the Contractor.

The Contractor shall advise the Township in writing the source of liquid asphalts and emulsions for approval 7 Business Days prior to commencement of the work. Emulsified asphalts shall be according to OPSS 1103 for the particular type and grade when tested according to the test methods designed in the tables indicated.

The Contractor will provide the Township with certificates from an independent laboratory confirming that the aggregate and emulsion used in the work meets the material specifications referenced in OPSS 304 and OPSS 1006 7 Business Days prior to commencing work. The Contractor is also responsible for providing the Township with compatibility tests 7 Business Days prior to commencing work according to OPSS 1103 for the emulsion with the Class 2 and Class 6 Aggregate. Costs associated with this testing shall be borne by the Contractor.

The Township will conduct Quality Assurance testing of both the aggregate and emulsion on an as-required basis. The location of the laboratory for delivery of samples will be mutually agreed upon by the Township and the Contractor at the pre-construction meeting. The Contractor will provide samples when requested by the Township according to OPSS 304. The Township will arrange and pay for all laboratory testing. If samples fail to meet the specifications, the Contractor will be required to remove and replace the unsuitable material at their expense.

The Contractor shall convoy traffic around the worksite, in accordance with OTM Book 7. Convoying will be maintained until the freshly placed surface treatment is able to carry traffic without damage.

The Township shall be completing preparatory works on these roads with alternative resources and are outside of the scope of this contract, which are required to be completed prior to mobilizing to these sites to complete the surface treatment. No additional payment shall be claimed for delays associated with the completion of these works prior to mobilization.

Payment will be by square meter (sq. m) of surface treatment. The unit price for the work includes the emulsion and aggregates. The supply and application of the aggregate is to be included in the item unit price. Payment under this item shall be full compensation for labour, equipment and material to do the work at the Tender Unit Price.

#### **40. Surface Treatment – Provisional Item -Township of Selwyn**

**5<sup>th</sup> Line:** from Centre Line to Lakefield Road for approximately 1.45 km, application of a single surface treatment over existing surface treatment

**6<sup>th</sup> Line:** from Centre Line to Lakefield Road for approximately 3.28 km, application of a single surface treatment over existing surface treatment

OPSS 304, OPSS 1006 and OPSS 1103 apply except as amended below:

Single Surface Treatment shall conform to OPSS 304 and will be over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion (OPSS 1103) with ¼" washed trap rock (OPSS 1006). The Contractor shall be responsible for determining application rates of both aggregate and emulsion according to OPSS 304 and must provide the rates to the Township in writing 7 Business Days prior to the start of the work. The Contractor is also responsible for providing the Township with compatibility tests 7 Business Days prior to work according to OPSS 1103 for the emulsion with the ¼" washed traprock supplied by the Township of Selwyn. Costs associated with this testing shall be borne by the Contractor.

Double Surface Treatment shall conform to OPSS 304 and will be over existing surface treatment with HF 150-SP Polymer Modified Asphalt Emulsion (OPSS 1103) with 3/8" Aggregate (OPSS 1006). The Contractor shall be responsible for determining application rates of both aggregate and emulsion according to OPSS 304 and must provide the rates to the Township in writing 7 Business Days prior to the start of the work. The Contractor is also responsible for providing the Township with compatibility tests 7 Business Days prior to work according to OPSS 1103 for the emulsion with the 3/8" Aggregate supplied by the Township of Selwyn. Costs associated with this testing shall be borne by the Contractor.

The Contractor shall advise the Township in writing the source of liquid asphalts and emulsions for approval 7 Business Days prior to commencement of the work. Emulsified asphalts shall be according to OPSS 1103 for the particular type and grade when tested according to the test methods designed in the tables indicated.

The Contractor will provide the Township with certificates from an independent laboratory confirming that the aggregate and emulsion used in the work meets the material specifications referenced in OPSS 304 and OPSS 1006 7 Business Days prior to commencing work. Costs associated with this testing shall be borne by the Contractor.

The Township will conduct Quality Assurance testing of both the aggregate and emulsion on an as-required basis. The location of the laboratory for delivery of samples will be mutually agreed upon by the Township and the Contractor at the pre-construction meeting. The Contractor will provide samples when requested by the Township according to OPSS 304. The Township will arrange and pay for all laboratory testing. If samples fail to meet the specifications, the Contractor will be required to remove and replace the unsuitable material at their expense.

The Contractor shall convoy traffic around the worksite, in accordance with OTM Book 7. Convoying will be maintained until the freshly placed surface treatment is able to carry traffic without damage.

The Township shall be completing preparatory works on these roads with alternative resources and are outside of the scope of this contract, which are required to be completed prior to mobilizing to these sites to complete the surface treatment. No additional payment shall be claimed for delays associated with the completion of these works prior to mobilization.

Payment will be by kilogram of asphalt emulsion. The unit price for the work for the Township of Selwyn includes the binder emulsion. The 3/8" Aggregate will be supplied by the Township of Selwyn from Selwyn's Preston Pit on Preston Road but not delivered to the job site. The delivery and application of the 3/8" Aggregate is to be included in the item unit price. Payment under this item shall be full compensation for labour, equipment and material to do the work at the Tender Unit Price.

Payment will be by square meter (sq. m) of surface treatment. The 1/4" washed traprock will be supplied by the Township of Selwyn from Selwyn's Preston Pit on Preston Road but not delivered to the job site. The delivery and application of the 1/4" washed traprock is to be included in the item unit price. Payment under this item shall be full compensation for labour, equipment and material to do the work at the Tender Unit Price.

**41. Final Grading of Granular "A" of All Roads - Provisional Item -  
Township of Cavan Monaghan**

OPSS 301, OPSS 314, OPSS 501, OPSS 506 and OPSS 1010 apply with the following amendments:

The Township shall be completing preparatory works on all roads and are outside of the scope of this contract, which are required to be completed prior to mobilizing to these sites to complete the surface treatment. No additional payment shall be claimed for delays associated with the completion of these works prior to mobilization.

The final grade and slope of the finished granular surface prior to surface treatment application shall meet the tolerances as per OPSS 314 specifications for Granular "A". The completed cross section and profile must be uniform and consistent all in accordance with OPSS 301.

Payment for the final grading item shall be by the square meter and shall be full compensation for labour and equipment to do the work at the Tender Unit Price.

**43. Grinding/Milling for Road Repair Work on County Road No. 48 - County  
of Peterborough**

All in accordance with OPSS MUNI 510, except as amended below:

On County Road No. 48, the hot mix asphalt patch as directed by the County shall be grinded/milled to a minimum width of 7.0 meters, length of 130.0 meters and depth of 90 mm and left in place. The Contractor shall reshape, grade and compact the grinded/milled material in accordance with OPSS 301 and OPSS 330 prior to the 50 mm HL3 PG58-34. A water truck shall be used to aid in achieving compaction. The existing Hot Mix at the area of repair is approximately 90 mm in depth. All Limits of Paving shall be milled to a minimum width of 0.5 metre for step joints unless otherwise directed by the County.

Measurement for payment for cold milling/grinding shall be by the area in square Meters of actual horizontal surface grinded/milled.

Payment under this item shall be full compensation for labour, equipment and material to do the work at the Tender Unit Price.

**44. Hot Mix Asphalt HL3 PG58-34 (50 mm) for Road Patch Repair on County Road No. 48 - County of Peterborough**

OPSS 310, OPSS 1003, OPSS 1150 and MUNI 1101 apply with the following amendments:

Road repair work at sta. 1+400 to sta. 1+530 full width on County Road No. 48 with HL3 PG 58-34 (50 mm). The commercial entrance at 911 #3320 shall be included and paved as per CSAS-31 to property line.

The Contractor shall use a current Ministry of Transportation Ontario design mix for hot mix asphalt HL3 PG58-34, if available. If a current mix design is unavailable, the Contractor will be responsible for producing a mix design.

Samples shall be taken under the direction and presence of the County.

The Contractor shall take a **minimum of one (1) sample set for the tonnage laid**. A sample set shall consist of three (3) samples. The distribution of the three (3) samples obtained shall be; one (1) sample for the County, one (1) sample for the Contractor and one (1) sample as a referee. Timing will be to the satisfaction of the County. The samples are to be provided to the County by the Contractor, on site. The County shall receive and store the referee sample.

Where the asphalt test results fail to meet the requirements of OPSS 310, table 7 and 8 the Contractor shall conduct remedial action per OPSS 310.

Payment shall be by the tonne at the Tender Unit Price tendered and shall be full compensation for labour, equipment and materials to supply, haul, place and compact the asphalt.

**45. Contingency - County of Peterborough Roads**

Payment under this item is for any unforeseen County of Peterborough works that may arise during construction. Work is to be undertaken only with prior approval of the Contract Administrator.

**Part "D" Bid Form**

**The Corporation of the County of Peterborough**

**County Court House  
470 Water Street  
Peterborough, Ontario K9H 3M3**

**Tender No. T-03-2020**

**Surface Treatment**

**Documents to be enclosed with this Bid Form.**

- ☐ **Part D Bid Document Signed & Sealed**
- ☐ **Bid Deposit**
- ☐ **Performance Surety Commitment Requirements**
- ☐ **Certificate of Insurance (upon award)**
- ☐ **WSIB Clearance (upon award)**



**1. Bidders Information Form**

**Bidders must complete this form and include with the Bid Submission**  
**Please ensure all information is legible.**

1.	Company Name	
2.	Respondent's Main Contact Individual	
3.	Address (incl. Postal Code)	
4.	Office Phone #	
5.	Toll Free #	
6.	Fax #	
7.	e-mail address	
8.	HST Account #	

**Acknowledgement to Receipt of Addenda:**

**This will acknowledge receipt of the following addenda and, that the pricing quoted includes the provision set out in such addendum(s)**

**Addendum #**

**Date Received**

# \_\_\_\_\_

\_\_\_\_\_

# \_\_\_\_\_

\_\_\_\_\_

# \_\_\_\_\_

\_\_\_\_\_

☐ Check here if No Addenda received.

\_\_\_\_\_  
**Respondent**

\_\_\_\_\_  
**Signature**

\_\_\_\_\_  
**Date**

**2. Declaration of Accessibility Compliance**

<b>Company Name:</b>	
<b>Print Name:</b>	
<b>Title:</b>	<b>Dated:</b>

I/ we acknowledge that as a Contractor/Consultant of the County of Peterborough we are bound to comply with all accessibility Standards under the Accessibility for Ontarians with Disabilities Act, 2005 as amended from time to time.

I/we declare that I/we have read, understand and will meet or exceed all enacted accessibility Standards as amended from time to time.

I/we further declare that I/we will undertake to ensure all sub-contractors hired by us in completion of our work will also comply with the above Standards."

**3. Schedule of Items and Prices**

(All unit prices are not to include H.S.T.)

The undersigned agrees to supply and deliver the goods and services as specified and required in accordance with Parts "A", "B", "C" and "D" of the Tender for the following prices:

**Note: The County reserves the right to reject any or all tenders or to accept any tender should it be deemed in the interest of the County to do so. The other Townships/ Municipalities reserve the right to accept or reject their portion of the tender.**

**Tender award will be made based upon the lowest compliant bidder for each participant. Once the lowest compliant bidder has been identified, the County reserves the right to include any or all of the provisional items at any time during the award or construction process.**

**Each participating Township will be responsible to ensure appropriate approvals are secured and will be responsible to issue a Purchase Order to the successful bidder(s) for the specific location. Invoices must be sent to the Township or County identified as noted herein.**

**The County will be releasing Total Bid Prices per location upon tender closing.**

**The County reserves the right to cancel any or all items.**

Description	OPSS, Spec	Units	Estimated Quantity	Unit Price	Total Price
<b>The County of Peterborough</b>					
<b>County Road No. 44: from County Road No. 6 easterly for approximately 3.20 km</b>					
Double Surface Treatment (8.0 m wide) over existing granular "A" with HF 150-SP Asphalt Emulsion with Class 2 Aggregate	304, 1006, 1103 SP23	sq. m	25, 600	\$_____	\$_____
Roadway Pulverizing (8.0 m wide)	206, 301, 314, 330, 501 SP24	sq. m	25, 600	\$_____	\$_____
Granular "A" Restore Cross Section	314, 501, 1010 SP25	tonnes	6, 200	\$_____	\$_____
<b>County Road No. 48: from 200 m east of Preston Road easterly for approximately 2.05 km</b>					

**Surface Treatment  
Part "D"**

**Bid Form**

Description	OPSS, Spec	Units	Estimated Quantity	Unit Price	Total Price
Double Surface Treatment (11.0 m wide) over existing granular "A" with HF 150-SP Asphalt Emulsion with Class 2 Aggregate	304, 1006, 1103 SP23	sq. m	22, 100	\$_____	\$_____
Roadway Pulverizing (11.0 m wide)	206, 301, 314, 330, 501 SP24	sq. m	22, 100	\$_____	\$_____
Hot Mix HL3 PG58-34 (50 mm) for Road Patch Repair	310, 1003, 1150, MUNI 1101, SP43	sq. m	930	\$_____	\$_____
Grinding/Milling (7.0 m wide x 50 mm deep) for Road Repair Work including Reshaping, Grading and Compacting	510 SP42	sq. m	910	\$_____	\$_____
Granular "A" Restore Cross Section	314, 501, 1010 SP25	tonnes	5,200	\$_____	\$_____
<b>County Road No. 504: from 700 m east of County Road No. 52 easterly to McCoy Road approximately 5.00 km</b>					
Double Surface Treatment (8.0 m wide) over existing granular "A" with HF 150-SP Asphalt Emulsion with Class 2 Aggregate	304, 1006, 1103 SP23	sq. m	40, 000	\$_____	\$_____
Roadway Pulverizing (8.0 m wide)	206, 301, 314, 330, 501 SP24	sq. m	40, 000	\$_____	\$_____
Granular "A" Restore Cross Section	314, 501, 1010 SP25	tonnes	9, 600	\$_____	\$_____
<b>County Road No. 507: from Salmon Lake Road To Haliburton Boundary for approximately 3.09 km</b>					
Double Surface Treatment (8.0 m wide) over existing granular "A" with HF 150-SP Asphalt Emulsion with Class 2 Aggregate	304, 1006, 1103 SP23	sq. m	24, 100	\$_____	\$_____
Roadway Pulverizing (8.0 m wide)	206, 301, 314, 330, 501	sq. m	24, 100	\$_____	\$_____

**Surface Treatment  
Part "D"**

**Bid Form**

Description	OPSS, Spec	Units	Estimated Quantity	Unit Price	Total Price
	SP24				
Granular "A" Restore Cross Section	314, 501, 1010 SP25	tonnes	5, 800	\$_____	\$_____
<b>County Road No. 20: from County Road No. 18 to County Road No, 23 for approximately 9.00 km</b>					
Double Surface Treatment (10.0 m wide) over existing granular "A" with HF 150-SP Asphalt Emulsion with Class 2 Aggregate	304, 1006, 1103 SP23	sq. m	90, 000	\$_____	\$_____
Roadway Pulverizing (10.0 m wide)	206, 301, 314, 330, 501 SP24	sq. m	90, 000	\$_____	\$_____
Re-grading of Ditch Line	421 SP28	m	7,000	\$_____	\$_____
200 mm Subdrain Installation	421 SP29	m	2,100	\$_____	\$_____
750 mm dia. X 20.0 m Type II Galvanized	421 SP30	m	20	\$_____	\$_____
Durable Pavement Markings	710, 1716, SP27	m	27,000	\$_____	\$_____
Granular "A" Restore Cross Section	314, 501, 1010 SP25	tonnes	22,000	\$_____	\$_____
<b>Fog Seal</b>					
Fog Seal County Road No. 44	1103, 1106 SP35	sq. m	25, 600	\$_____	\$_____
Fog Seal County Road No. 48	1103, 1106 SP35	sq. m	16, 750	\$_____	\$_____
Fog Seal County Road No. 504	1103, 1106 SP35	sq. m	40, 000	\$_____	\$_____
Fog Seal County Road No. 507	1103, 1106 SP35	sq. m	24, 100	\$_____	\$_____
Fog Seal County Road No. 20	1103, 1106 SP35	sq. m	90, 000	\$_____	\$_____
<b>Pavement Markings</b>					

**Surface Treatment  
Part "D"**

**Bid Form**

Description	OPSS, Spec	Units	Estimated Quantity	Unit Price	Total Price
Pavement Markings	710, 1716, SP26	m	5,250	\$_____	\$_____
<b>Contingency - County of Peterborough Roads</b>					
Contingency	SP45	LS	100%	\$50,000	\$50,000
"County of Peterborough" Sub Total					\$_____
H.S.T. Registration # _____				H.S.T.	\$_____
<b>Total Tendered Price (basis of award)</b> *Tender will be awarded to the lowest, compliant total tendered price bidder.					\$_____

<b>The Township of Douro-Dummer</b>					
<b>Ironwood Drive: from County Road No. 4 to South limit for approximately 0.5 km</b>					
Single Surface Treatment (6.5 m wide) over existing surface treatment with HF 150-SP Polymer Modified Asphalt Emulsion with ¼" washed traprock	304, 1006, 1103 SP31	sq. m	3, 350	\$_____	\$_____
<b>Canal Road: from County Road No. 4 to North Limit for approximately 0.7 km</b>					
Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103 SP31	sq. m	4, 650	\$_____	\$_____
"Douro-Dummer" Sub Total					\$_____
H.S.T. Registration # _____				H.S.T.	\$_____
<b>Total Tendered Price (basis of award)</b> *Tender will be awarded to the lowest, compliant total tendered price bidder.					\$_____

<b>The Municipality of Trent Lakes</b>					
<b>Bear Creek Road: from Bear Creek Road to end of Elim Lodge Road for approximately 4.1 km</b>					
Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103 SP32	sq. m	28, 700	\$_____	\$_____
<b>Allen's Alley: for approximately 2.1 km</b>					
Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103 SP32	sq. m	14, 700	\$_____	\$_____
<b>Allen's Road: for approximately 1.9 km</b>					
Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103 SP32	sq. m	13, 300	\$_____	\$_____
<b>Sumcot Drive: for approximately 1.9 km</b>					
Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103 SP32	sq. m	13, 300	\$_____	\$_____
<b>Mill Line Road: for approximately 2.7 km</b>					
Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200 P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103 SP32	sq. m	18, 900	\$_____	\$_____
<b>Crowes Line Road: for approximately 1.8 km</b>					
Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified	304, 1006, 1103 SP32	sq. m	12, 600	\$_____	\$_____



**Surface Treatment  
Part "D"**

**Bid Form**

Asphalt Emulsion with washed Class 6 Aggregate					
<b>Kennedy Drive: for approximately 4.0 km</b>					
Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103 SP32	sq. m	28, 000	\$_____	\$_____
"Municipality of Trent Lakes" Sub Total					\$_____
H.S.T. Registration # _____				H.S.T.	\$_____
<b>Total Tendered Price (basis of award)</b> *Tender will be awarded to the lowest, compliant total tendered price bidder.					\$_____

<b>The Township of Cavan Monaghan</b>					
<b>Morton Line: from County Road No. 10 westerly for approximately 1 km</b>					
Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103 SP33	sq. m	1, 650	\$_____	\$_____
<b>Morton Line: from 1426 Morton Line easterly for approximately 800 m</b>					
Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103 SP33	sq. m	5, 200	\$_____	\$_____
<b>Beardsmore Road: from Worboy Court southerly for approximately 1.0 km</b>					
Double Surface Treatment (6.7 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103 SP33	sq. m	6, 700	\$_____	\$_____
<b>Dranoel Road: from Hwy 7A to Dranoel Drive for approximately 320 m</b>					
Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103 SP33	sq. m	2, 080	\$_____	\$_____
<b>Dranoel Drive: from Hwy 7A to Dranoel Road for approximately 505 m</b>					
Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103 SP33	sq. m	3, 285	\$_____	\$_____
<b>Syer Line: from Tapley ¼ Line to West CPR Bridge for approximately 800 m</b>					

**Surface Treatment  
Part "D"**

**Bid Form**

Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150- SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103 SP33	sq. m	5, 200	\$_____	\$_____
<b>Larmer Line: from County Road No. 10 to Hwy 115 Bridge for approximately 1.30 km</b>					
Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150- SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103 SP33	sq. m	8, 450	\$_____	\$_____
<b>Deyell Line: from T-Way Drive to Hutchison Drive for approximately 1.30 km</b>					
Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150- SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103 SP33	sq. m	8, 450	\$_____	\$_____
<b>"Township of Cavan Monaghan" Sub Total</b>					<b>\$_____</b>
H.S.T. Registration # _____				H.S.T.	\$_____
<b>Total Tendered Price (basis of award)</b> *Tender will be awarded to the lowest, compliant total tendered price bidder.					<b>\$_____</b>

<b>The Township of Selwyn</b>					
<b>Myers Cres: for approximately 1.01 km</b>					
Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103 SP34	sq. m	7, 010	\$_____	\$_____
<b>Mystic Meadow: for approximately 0.35 km</b>					
Single Surface Treatment (6 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103 SP34	sq. m	2, 100	\$_____	\$_____
<b>Mystic Cres: for approximately 0.27 km</b>					
Single Surface Treatment (6 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103 SP34	sq. m	1, 620	\$_____	\$_____
<b>Cedarvale Cres: for approximately 0.59 km</b>					
Single Surface Treatment (6 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103 SP34	sq. m	3, 540	\$_____	\$_____
<b>Teraview Heights: for approximately 0.79 km</b>					
Single Surface Treatment (6 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103 SP34	sq. m	4, 740	\$_____	\$_____
<b>Garmondale Ave: for approximately 0.17 km</b>					
Single Surface Treatment (6 m wide) over existing surface treatment with HP 200P Polymer Modified	304, 1006, 1103 SP34	sq. m	1, 020	\$_____	\$_____

**Surface Treatment  
Part "D"**

**Bid Form**

Asphalt Emulsion with ¼" traprock					
<b>Gazelle Trail: for approximately 0.70 km</b>					
Single Surface Treatment (7.5 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103 SP34	sq. m	4, 550	\$_____	\$_____
<b>Antelope Trail: for approximately 2.04 km</b>					
Single Surface Treatment (6.5 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103 SP34	sq. m	13, 260	\$_____	\$_____
<b>Impala Hills: for approximately 0.25 km</b>					
Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103 SP34	sq. m	1, 750	\$_____	\$_____
<b>Kudu Court: for approximately 0.15 km</b>					
Single Surface Treatment (6.8 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103 SP34	sq. m	1, 020	\$_____	\$_____
<b>Eland Court: for approximately 0.05 km</b>					
Single Surface Treatment (6.8 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103 SP34	sq. m	340	\$_____	\$_____
<b>Sable Court: for approximately 0.10 km</b>					
Single Surface Treatment (6.5 m wide) over existing surface treatment with HP 200P Polymer Modified	304, 1006, 1103 SP34	sq. m	650	\$_____	\$_____

**Surface Treatment  
Part "D"**

**Bid Form**

Asphalt Emulsion with 1/4" traprock					
<b>Ermatinger St: for approximately 0.79 km</b>					
Single Surface Treatment (7.5 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 1/4" traprock	304, 1006, 1103 SP34	sq. m	5, 925	\$_____	\$_____
<b>Caroline St: for approximately 0.93 km</b>					
Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 1/4" traprock	304, 1006, 1103 SP34	sq. m	6, 510	\$_____	\$_____
<b>Duggan: for approximately 0.14 km</b>					
Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103 SP34	sq. m	840	\$_____	\$_____
<b>Brick Road: from Skyline southerly for approximately 0.73 km</b>					
Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103 SP34	kg	5, 110	\$_____	\$_____
<b>Beachwood Dr: for approximately 1.13 km</b>					
Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103 SP34	sq. m	7, 910	\$_____	\$_____
<b>Berrie Rd: for approximately 2.80 km</b>					
Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified	304, 1006, 1103 SP34	sq. m	19, 600	\$_____	\$_____

**Surface Treatment  
Part "D"**

**Bid Form**

Asphalt Emulsion with 3/8" Aggregate					
<b>9<sup>th</sup> Line: for approximately 3.02 km</b>					
Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103 SP34	sq. m	18, 120	\$_____	\$_____
<b>15<sup>th</sup> Line: from Newcomb to Jopling for approximately 1.48 km</b>					
Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103 SP34	sq. m	17, 812	\$_____	\$_____
<b>Jopling Road: from 15<sup>th</sup> Line to 14<sup>th</sup> Line for approximately 1.44 km</b>					
Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103 SP34	sq. m	10, 080	\$_____	\$_____
<b>Murphy Road: for approximately 1.47 km</b>					
Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103 SP34	sq. m	10, 290	\$_____	\$_____
<b>McCue Rd: for approximately 0.14 km</b>					
Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103 SP34	sq. m	770	\$_____	\$_____
<b>Hilliard St: from Woodland to 5<sup>th</sup> Line for approximately 1.48 km</b>					
Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified	304, 1006, 1103 SP34	sq. m	11, 100	\$_____	\$_____

**Surface Treatment  
Part "D"**

**Bid Form**

Asphalt Emulsion with 3/8" Aggregate					
<b>Pinehurst Ave: for approximately 1.52 km</b>					
Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103 SP34	sq. m	9, 120	\$_____	\$_____
<b>Fairbairn St: from 3<sup>rd</sup> Line to City Limits for approximately 1.15 km</b>					
Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103 SP34	sq. m	8, 050	\$_____	\$_____
<b>15<sup>th</sup> Line: from Newcomb to North School for approximately 1.10 km</b>					
Double Surface Treatment (7.5 m wide) over existing granular "A" with HF 150- SP Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103 SP34	sq. m	16, 500	\$_____	\$_____
<b>Strickland St: for approximately 1.11 km</b>					
Double Surface Treatment (7.5 m wide) over existing granular "A" with HF 150- SP Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103 SP34	sq. m	16, 650	\$_____	\$_____
<b>"Township of Selywn" Sub Total</b>					<b>\$_____</b>
H.S.T. Registration # _____				H.S.T.	\$_____
<b>Total Tendered Price (basis of award)</b> *Tender will be awarded to the lowest, compliant total tendered price bidder.					<b>\$_____</b>



**Surface Treatment  
Part "D"**

**Bid Form**

<p><b>"County of Peterborough" Total Tendered Price (basis of award)</b></p> <p>*Tender will be awarded to the lowest, compliant total tendered price bidder.</p>	<p>\$_____</p>
<p><b>"Township of Douro-Dummer" Total Tendered Price (basis of award)</b></p> <p>*Tender will be awarded to the lowest, compliant total tendered price bidder.</p>	<p>\$_____</p>
<p><b>"Township of Trent Lakes" Total Tendered Price (basis of award)</b></p> <p>*Tender will be awarded to the lowest, compliant total tendered price bidder.</p>	<p>\$_____</p>
<p><b>"Township of Cavan Monaghan" Total Tendered Price (basis of award)</b></p> <p>*Tender will be awarded to the lowest, compliant total tendered price bidder.</p>	<p>\$_____</p>
<p><b>"Township of Selwyn" Total Tendered Price (basis of award)</b></p> <p>*Tender will be awarded to the lowest, compliant total tendered price bidder.</p>	<p>\$_____</p>

**Provisional items:**

Tender award will be made based upon the lowest compliant bidder for the base tender bid. Once the lowest compliant bidder has been identified the County reserves the right to include any or all of the provisional items at any time during the award or construction process.

**Note:** Bidders may bid on all locations or individual locations. The County reserves the right to award this contract on a total basis or split order basis, whichever is in the best interest of the County.

**4. Provisional Items:**

Description	OPSS, Spec	Units	Estimated Quantity	Unit Price	Total Price
<b>The County of Peterborough</b>					
<b>County Road No. 48: from 280m east of Preston Road easterly for approximately 2.05 km</b>					
<b>Removal and Replacement of Cross Culvert (including pipe cost)</b>					
800 mm dia. X 20.0 m Type II Galvanized	421 SP36	m	20	\$_____	\$_____
800 mm dia. X 26.0 m Type II Galvanized	421 SP36	m	26	\$_____	\$_____
<b>County Road No. 504: from 280m east of Preston Road easterly for approximately 2.05 km</b>					
<b>Removal and Replacement of Cross Culvert (including pipe cost)</b>					
800 mm dia. X 20.0 m Type II Galvanized	421 SP36	m	20	\$_____	\$_____
800	421 SP36	m	26	\$_____	\$_____
<b>County Road No. 507: from 280m east of Preston Road easterly for approximately 2.05 km</b>					
<b>Removal and Replacement of Cross Culvert (including pipe cost)</b>					
800 mm dia. X 20.0 m Type II Galvanized	421 SP36	m	20	\$_____	\$_____
	421 SP36	m	26	\$_____	\$_____

<b>The Township of Douro-Dummer</b>					
<b>Daleview Road: from County Road No. 4 to Division Road for approximately 0.70 km</b>					
Double Surface Treatment (6.5 m) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103 SP37	sq. m	4, 550	\$_____	\$_____

<b>The Township of Cavan Monaghan</b>					
Final Grading of Granular "A" of All Roads	301, 314, 501, 506, 1010 SP41	sq. m	45, 865	\$_____	\$_____

<b>The Township of Havelock Belmont Methuen</b>					
<b>Burnt Dam Road: for approximately 0.50 km</b>					
Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP39	sq. m	3, 250	\$_____	\$_____
Double Surface Treatment (6.5 m wide) over existing granular "A" with HP 200P Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103 SP39	sq. m	3, 250	\$_____	\$_____
Roadway Pulverizing (6.5 m wide)	206, 301, 314, 330, 501 SP38	sq. m	3, 250	\$_____	\$_____
<b>North School Road: for approximately 0.50 km</b>					
Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with	304, 1006, 1103 SP39	sq. m	3, 250	\$_____	\$_____

**Surface Treatment  
Part "D"**

**Bid Form**

Class 2 & Class 6 Aggregate					
Double Surface Treatment (6.5 m wide) over existing granular "A" with HP 200P Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103 SP39	sq. m	3, 250	\$_____	\$_____
Roadway Pulverizing (6.5 m wide)	206, 301, 314, 330, 501 SP38	sq. m	3, 250	\$_____	\$_____
<b>8<sup>th</sup> Concession: for approximately 1.00 km</b>					
Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103 SP39	sq. m	6, 500	\$_____	\$_____
Double Surface Treatment (6.5 m wide) over existing granular "A" with HP 200P Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103 SP39	sq. m	6, 500	\$_____	\$_____
Roadway Pulverizing (6.5 m wide)	206, 301, 314, 330, 501 SP38	sq. m	6, 500	\$_____	\$_____

The Township of Selwyn					
<b>5<sup>th</sup> Line: from Centre Line to Lakefield Road for approximately 1.45 km</b>					
Single Surface Treatment (7 m wide) over existing surface treatment with HF 150-SP Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103 SP40	sq. m	16, 200	\$_____	\$_____
<b>6<sup>th</sup> Line: from Centre Line to Lakefield Road for approximately 3.28 km</b>					
Single Surface Treatment (6 m wide) over existing surface treatment with HF 150-SP Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103 SP40	sq. m	31, 500	\$_____	\$_____

To the Corporation of the County of Peterborough, Hereafter called the "County":

I/We \_\_\_\_\_ the  
undersigned declare:

1. That the several matters stated in the said Bid are in all respects true accurate and complete.
2. That I/We have read and fully understand all information, terms and conditions contained within the Bid Document, including: Part "A" Information to Bidders; Part "B" Standard Terms and Conditions; Part "C" Specifications and Part "D" Bid Form.
3. That I/We do hereby Bid and offer to enter into a Contract to Supply and Deliver all materials mentioned and described or implied therein including in every case freight, duty, currency exchange, H.S.T. in effect on the date of the acceptance of bid, and all other charges on the provisions therein set forth and to accept in full payment therefore, in accordance with the prices and terms set forth in the Bid herein.
4. That this Bid is irrevocable for Ninety (90) Days and prices for as long as stated elsewhere in the Bid Document, and that the County may at any time within that period without notice, accept this Bid whether any other Bid has been previously accepted or not.
5. That the awarding of the Contract, by the County is based on this submission, which shall be an acceptance of this Bid.
6. That if the Bid is accepted, I/We agree to furnish all documentation, security and certifications as required by the Bid Document and to execute the attached formal contract (Appendix A) in triplicate, within Ten (10) Working Days after notification of award. I/We understand that any acceptance by the County is fully conditional upon the receipt of said documentation, security and certifications by the County within Ten (10) Working Days. If I/We fail to do so, the County may accept the next lowest or any Bid or to advertise for new bids, or to carry out completion of the works in any other way they deem best
7. That I/We agree to save the County, its agents, or employees, harmless from liability of any kind for the use of any composition, secret process, invention, article or appliance furnished or used in the performance of the Contract of which the Bidder is not the patentee, assignee, or licensee.

**Surface Treatment  
Part "D"**

**Bid Form**

The undersigned affirms that they are duly authorized to execute this bid.

Bidder's Signature and Seal: \_\_\_\_\_

Position: \_\_\_\_\_

Witness: \_\_\_\_\_

Position: \_\_\_\_\_

(If Corporate Seal is not available, documentation should be witnessed)

Dated at the \_\_\_\_\_ of \_\_\_\_\_  
(Town/City)

This \_\_\_\_\_ Day Of \_\_\_\_\_ 2020.

**The Corporation of the County of Peterborough**

**Contract No. T-03-2020**

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**Appendix A: Articles of Agreement**

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**The Corporation of the County of Peterborough**

**Contract No. T-03-2020**

**Articles of Agreement**

**This Agreement** made the \_\_\_\_\_ day of \_\_\_\_\_, 2020.

**Between**

The Corporation of the County of Peterborough  
hereinafter called the "Municipality"

**and**

**Company Name**

hereinafter called the "Contractor"

In consideration of the covenants and agreements hereinafter set forth and other good and valuable consideration, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

**1. The Work**

The Contractor shall:

- (a) Perform the Work required by the Contract Documents for Contract No. T-03-2020 for surface treatment services on various roads with the County of Peterborough; and
- (b) Do and fulfill everything indicated by the Contract Documents; and
- (c) Complete the Work **no later than Tuesday September 1, 2020<sup>1</sup>**, subject with the provisions of the Contract Documents.

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<sup>1</sup>

**2. Contract Documents**

The following is an exact list of the Contract Documents referred to in  
“# 1. The Work” of this Agreement.

1. This Agreement;
2. Tender issued by the County of Peterborough: **T-03-2020**
3. Supplementary Appendices
4. Addenda No. \_ Through \_.
5. Drawing Nos. ;
6. Tender offer of the Contractor
7. Ontario Provincial Standards **(as stated in tender)**;
8. OPSS Traffic Standards ;

### **3. Contract Price**

The Contract Price is \_\_\_\_\_ (\$ \_\_\_\_\_) in Canadian funds, which price shall be subject to adjustments as may be required in accordance with the provisions of the Contract Documents. *(The correct amount will be copied from the Bid Form at the time of final contract preparation)*

### **4. Time Schedule**

The Contractor shall perform the Services with the utmost dispatch and, subject to delays beyond its control, shall complete the Services in accordance with the Tender.

### **5. Payment**

- A) Provided that the Contractor is not in default under the Contract Documents, the Municipality shall pay the Contractor in Canadian funds for the performance of the Contract, based upon the progress estimate by the Director of Public Works.
- B) Subject to applicable legislation and the provisions of the Contract Documents and in accordance with legislation and statutory regulations respecting holdback percentages, the Municipality shall:
  - i.) Make monthly payments to the Contractor on account of the Work performed based upon the progress estimates by the Director of Public Works;
  - ii.) Pay to the Contractor the unpaid balance of all holdback monies when permitted by law to do so; and
  - iii.) Upon Completion of the Contract, pay to the Contractor the unpaid balance of monies then due.
- C) In the case of a contractor who is a non-resident of Canada, the applicable provisions of the Income Tax Act (Canada) shall apply.

## 6. Rights and Remedies

- A) The duties and obligations imposed by the Contract Documents and the rights and remedies available thereunder shall be in addition to and not a limitation of any duties, obligations, rights and remedies otherwise imposed or available by law.
- B) No action or failure to act by the Municipality or the Contractor shall constitute a waiver of any right or duty afforded under the Contract, nor shall any such action or failure to act constitute an approval of or acquiescence in any breach thereunder, except as may be specifically agreed in writing.

## 7. Implied Contract

No implied contract of any kind whatsoever by or on behalf of the Municipality shall arise or be implied from anything in this contract contained, nor from any position or situation of the parties at any time, if being clearly understood that the express covenants and agreements herein contained made by the Municipality shall be the only covenants and agreements upon which any right against the Municipality may be founded.

## 8. Warranty Period

For the purposes of Part "B" Standard Terms of Conditions of the Contract Documents, the warranty period shall be **12 months** from the date of Total Performance of the Work or such longer periods as may be specified for certain Products or work.

## 9. Bid Deposit

For the purposes of Part "B" Standard Terms and Conditions of the Contract Document, the bid deposit delivered to the Municipality with the bid documents is acknowledged to be \$\_\_\_\_\_ (**10% of total tendered price**).

## 10. Liquidated Damages

For the purposes of Part "C" General Special Provisions of the Contract Documents, the amount per day for liquidated damages is **\$2,500.00 (Two Thousand five hundred Dollars)**.

## 11. Receipt of and Addresses for Notices

Any notices, requests, demands or other communications (a "notice") required or permitted to be given hereunder shall be in writing and delivered by hand or telecopy as follows:

The Corporation of the County of Peterborough, 470 Water Street, Peterborough, Ontario, K9H 3M3, Facsimile No. (705) 876-1730

The Contractor at .....

or at such other address as may from time to time be designated by notice given in the manner herein provided. Such notice shall be deemed to have been given when delivered, provided that if notice is delivered by telecopier or by hand on a day other than a Working Day or after 3:00 p.m. on a Working Day, then the same shall be deemed to have been given on the next Working Day.

## **12. Law of the Contract**

The law of the Province of Ontario shall govern the interpretation of the Contract Documents referred to in #2 of this Agreement.

## **13. Language of the Contract**

This Agreement is drawn in English at the request of all parties hereto; ce marché est rédigé en anglais à la demande de toutes les parties.

## **14. Succession**

The General Conditions of the Contract hereto annexed, and the other aforesaid Contract Documents, are to be read into and form part of this Agreement and the whole shall constitute the Contract between the parties and subject to law and the provisions of the Contract Documents shall inure to the benefit of and be binding upon the parties hereto, their respective heirs, legal representatives, successors and assigns.

## **15. Severability**

Each provision of this Agreement shall be valid and enforceable to the fullest extent permitted by law. If any provision of this Agreement or the application thereof to any person or circumstance is determined to be invalid or unenforceable to any extent:

- A) The remainder of this Agreement or the application of such provision to any other person or circumstance shall not be affected thereby; and
- B) The parties shall negotiate in good faith to amend this Agreement to implement the provisions set forth.

## **16. Termination**

If the Contractor fails in the Municipality's reasonable opinion to give satisfactory service to the Municipality in accordance with the terms of this Agreement and the Tender forms and specifications attached to this Agreement, or if for any other reason the Contractor's services are no longer required, then the

Municipality may terminate this Agreement on giving 60 days' notice in writing to the Contractor.

#### **17. Termination for Non-Compliance**

In the event that it should come to the attention of the Municipality that:

- The Contractor has failed to comply with any terms of this Agreement; or
- The Contractor has failed to comply with any terms of any applicable license, law, regulation; or
- The Contractor or any employee of the Contractor has conducted themselves in an inappropriate or unbecoming manner;

then the Municipality may notify the contractor in writing of the Municipality's concern, and if the matter is not corrected to the satisfaction of the Municipality within five (5) days of such notice, then the Municipality may unilaterally terminate this Agreement and the Contractor shall have no recourse against the Municipality by reason of such termination save and except for the collection of any outstanding payment obligations due to the date of termination only.

#### **18. Arbitration and Mediation**

Despite anything contained in this Agreement to the contrary, in the event that a dispute or difference arises with respect to this Agreement that cannot be resolved by negotiation between the parties and the parties agree that they do not wish to terminate this Agreement, then in such event the parties agree to use the services of an experienced, qualified mediator to attempt to resolve their dispute or difference and, failing agreement on the procedure to be followed, the mediation shall be conducted in accordance with the "Rules of Procedure for the Conduct of Mediations" of the Arbitration and Mediation Institute of Ontario.

#### **19. Indemnity**

The Contractor shall be responsible for and shall give adequate attention to the faithful prosecution and completion of all matters pursuant to this Agreement. In addition to the protection provided, the Contractor shall promptly indemnify and save harmless the Municipality from all suits and actions for damages and costs to which the Municipality might be put by reason of injury to or death of persons and damage to property resulting from negligence, breach, fault, act, omission, default, carelessness or any other cause in the performance of this work. The indemnity obtained in this Agreement shall not be prejudiced by, and shall survive, the termination of this Agreement.

**In witness whereof** the parties hereto have executed this Agreement under their respective corporate seals and by the hands of their proper officer's thereunto duly authorized.

Dated at \_\_\_\_\_, this \_\_\_\_\_ day of \_\_\_\_\_, 2020.

**Company Name**

	Per:		
		(signature)	(print name – title)
Witness as to Signature Or Seal Affixed Contractor		I/we have the authority to bind the Corporation or Business	

	Per:		
		(signature)	(print name – title)

Dated at Peterborough, this \_\_\_\_\_ day of \_\_\_\_\_, 2020.

**The Corporation of the County of Peterborough**

\_\_\_\_\_  
Warden, J. Murray Jones

\_\_\_\_\_  
Manager Legislative Services/Clerk, Lynn  
Fawn, AMCT

# T-03-2020 - Surface Treatment

Opening Date: March 16, 2020 11:15 AM

Closing Date: April 7, 2020 2:00 PM

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## Vendor Details

Company Name:	Dufferin Construction Company, A division of CRH Canada Group Inc.
Does your company conduct business under any other name? If yes, please state:	Dufferin Construction Company, A division of CRH Canada Group Inc.
Address:	585 Michigan Drive, Unit #1 Oakville, Ontario L6L 0G1
Contact:	Helen Gregor
Email:	helen.gregor@ca.crh.com
Phone:	905-842-2741 40303
Fax:	905-842-9278
HST#:	100969906RT0001

## Submission Details

Created On:	Wednesday March 18, 2020 09:54:22
Submitted On:	Tuesday April 07, 2020 08:59:16
Submitted By:	Helen Gregor
Email:	helen.gregor@ca.crh.com
Transaction #:	f45e36d4-1eb7-4591-99ce-dd16e5828d14
Submitter's IP Address:	174.88.37.222

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Schedule of Prices

The Bidder hereby Bids and offers to enter into the Contract referred to and to supply and do all or any part of the Work which is set out or called for in this Bid, at the unit prices, and/or lump sums, hereinafter stated. HST is additional.

\* Denotes a "MANDATORY" field

Do not enter \$0.00 dollars unless you are providing the line item at zero dollars to the County.

If the line item and/or table is "NON-MANDATORY" and you are not bidding on it, leave the table and/or line item blank. Do not enter a \$0.00 dollar value.

The County reserves the right to cancel any or all items.

## Peterborough County - Combined

County Road No. 44: from County Road No. 6 easterly for approximately 3.20 km

County Road No. 48: from 200 m east of Preston Road easterly for approximately 2.05 km

County Road No. 504: from 700 m east of County Road No. 52 easterly to McCoy Road approximately 5.00 km

County Road No. 507: from Salmon Lake Road To Haliburton Boundary for approximately 3.09 km

County Road No. 20: from County Road No. 18 to County Road No. 23 for approximately 9.00 km

Fog Seal

Pavement Markings

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
CR 44 from County Road No. 6 easterly for approximately 3.20 km	Double Surface Treatment (8.0 m wide) over existing granular "A" with HF 150-SP Asphalt Emulsion with Class 2 Aggregate	304, 1006, 1103, SP 23	sq. m	25600	\$4.7000	\$ 120,320.00
CR 44 from County Road No. 6 easterly for approximately 3.20 km	Roadway Pulverizing (8.0 m wide)	206, 301,314, 330, 501, SP24	sq. m	25600	\$1.0000	\$ 25,600.00
CR 44 from County Road No. 6 easterly for approximately 3.20 km	Granular "A" Restore Cross Section	314, 501, 1010, SP25	tonnes	6200	\$20.8000	\$ 128,960.00
CR 48 from 200 m east of Preston Road easterly for approximately 2.05 km	Double Surface Treatment (11.0 m wide) over existing granular "A" with HF 150-SP Asphalt Emulsion with Class 2 Aggregate	304, 1006, 1103, SP 23	sq. m	22100	\$4.6000	\$ 101,660.00
CR 48 from 200 m east of Preston Road easterly for approximately 2.05 km	Roadway Pulverizing (11.0 m wide)	206, 301, 314, 330, 501, SP 24	sq. m	22100	\$0.9000	\$ 19,890.00
CR 48 from 200 m east of Preston Road easterly for approximately 2.05 km	Hot Mix HL3 PG58-34 (50 mm) for Road Patch Repair & Commercial Entrance	310, 1003, 1150, MUNI 1101, SP 45	sq. m	930	\$21.9000	\$ 20,367.00
CR 48 from 200 m east of Preston Road easterly for approximately 2.05 km	Grinding/Milling (7.0 m wide x 50 mm deep) for Road Repair Work including Reshaping, Grading and Compacting	510, SP 44	sq. m	910	\$9.3000	\$ 8,463.00
CR 48 from 200 m east of Preston Road easterly for approximately 2.05 km	300 mm dia. X 14.0 m Type II Galvanized entrance culvert	421, SP 32	m	14	\$380.0000	\$ 5,320.00
CR 48 from 200 m east of Preston Road easterly for approximately 2.05 km	Re-grading of Ditch Line	421, SP 31	m	50	\$51.9000	\$ 2,595.00
CR 48 from 200 m east of Preston Road easterly for approximately 2.05 km	Granular "A" Restore Cross Section	314, 501, 1010, SP 25	tonnes	5,200	\$20.8000	\$ 108,160.00
CR 504 from 700 m east of County Road No. 52 easterly to McCoy Road approximately 5.00 km	Double Surface Treatment (8.0 m wide) over existing granular "A" with HF 150-SP Asphalt Emulsion with Class 2 Aggregate	304, 1006, 1103, SP 23	sq. m	40000	\$4.8000	\$ 192,000.00
CR 504 from 700 m east of County Road No. 52 easterly to McCoy Road approximately 5.00 km	Roadway Pulverizing (8.0 m wide)	206, 301,314, 330, 501, SP24	sq. m	40000	\$0.9000	\$ 36,000.00
CR 504 from 700 m east of County Road No. 52 easterly to McCoy Road approximately 5.00 km	Granular "A" Restore Cross Section	314, 501, 1010, SP25	tonnes	9600	\$20.7000	\$ 198,720.00
CR 507 from Salmon Lake Road To Haliburton Boundary for approximately 3.09 km	Double Surface Treatment (8.0 m wide) over existing granular "A" with HF 150-SP Asphalt Emulsion with Class 2 Aggregate	304, 1006, 1103, SP 23	sq. m	24000	\$4.7000	\$ 112,800.00
CR 507 from Salmon Lake Road To Haliburton Boundary for approximately 3.09 km	Roadway Pulverizing (8.0 m wide)	206, 301,314, 330, 501, SP24	sq. m	24100	\$1.0000	\$ 24,100.00
CR 507 from Salmon Lake Road To Haliburton Boundary for approximately 3.09 km	Granular "A" Restore Cross Section	314, 501, 1010, SP25	tonnes	5800	\$20.6000	\$ 119,480.00
CR 20 from County Road No. 18 to County Road No. 23 for approximately 9.00 km	Double Surface Treatment (10.0 m wide) over existing granular "A" with HF 150-SP Asphalt Emulsion with Class 2 Aggregate	304, 1006, 1103, SP 23	sq. m	90000	\$4.3000	\$ 387,000.00
CR 20 from County Road No. 18 to County Road No. 23 for approximately 9.00 km	Roadway Pulverizing (10.0 m wide)	206, 301, 314, 330, 501, SP 24	sq. m	90000	\$0.8000	\$ 72,000.00
CR 20 from County Road No. 18 to County Road No. 23 for approximately 9.00 km	Re-grading of Ditch Line	421, Sp 28	m	7000	\$26.4000	\$ 184,800.00
CR 20 from County Road No. 18 to County Road No. 23 for approximately 9.00 km	200 mm Subdrain Installation	421, SP 29	m	2100	\$56.3000	\$ 118,230.00
CR 20 from County Road No. 18 to County Road No. 23 for approximately 9.00 km	750 mm dia. X 20.0 m Type II Galvanized	421, SP 30	m	20	\$902.0000	\$ 18,040.00
CR 20 from County Road No. 18 to County Road No. 23 for approximately 9.00 km	Durable Pavement Markings	710, 1713, 1714, SP 27	m	27000	\$3.9500	\$ 106,650.00
CR 20 from County Road No. 18 to County Road No. 23 for approximately 9.00 km	Granular "A" Restore Cross Section	314, 501, 1010, SP 25	tonnes	22000	\$20.9000	\$ 459,800.00
Peterborough County - Fog Seal	Fog Seal County Road No. 44	1103, 1106, SP 37	sq. m	25600	\$1.0000	\$ 25,600.00
Peterborough County - Fog Seal	Fog Seal County Road No. 48	1103, 1106, SP 37	sq. m	16750	\$1.0000	\$ 16,750.00
Peterborough County - Fog Seal	Fog Seal County Road No. 504	1103, 1106, SP 37	sq. m	40000	\$1.0000	\$ 40,000.00
Peterborough County - Fog Seal	Fog Seal County Road No. 507	1103, 1106, SP 37	sq. m	24100	\$1.0000	\$ 24,100.00
Peterborough County - Fog Seal	Fog Seal County Road No. 20	1103, 1106, SP 37	sq. m	90000	\$1.0000	\$ 90,000.00
Peterborough County - Pavement Markings	Pavement Markings	710, 1716, SP 26	m	5250	\$1.2000	\$ 6,300.00
Subtotal:						\$ 2,773,705.00

## Douro-Dummer Township

Ironwood Drive: from County Road No. 4 to South limit for approximately 0.5 km

Canal Road: from County Road No. 4 to North Limit for approximately 0.7 km

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
Ironwood Drive: from County Road No. 4 to South limit for approximately 0.5 km	Single Surface Treatment (6.5 m wide) over existing surface treatment with HF 150-SP Polymer Modified Asphalt Emulsion with ¼" washed traprock	304, 1006, 1103, SP 33	sq. m	3350	\$4.7000	\$ 15,745.00
Canal Road: from County Road No. 4 to North Limit for approximately 0.7 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 33	sq. m	4650	\$5.3000	\$ 24,645.00
Subtotal:						\$ 40,390.00

## Selwyn Township

Myers Cres: for approximately 1.01 km

Mystic Meadow: for approximately 0.35 km

Mystic Cres: for approximately 0.27 km

Cedarvale Cres: for approximately 0.59 km

Teraview HeighGarmondale Ave: for approximately 0.17 km

Garmondale Ave: for approximately 0.17 km

Gazelle Trail: for approximately 0.70 km

Antelope Trail: for approximately 2.04 km

Impala Hills: for approximately 0.25 km

Kudu Court: for approximately 0.15 km

Eland Court: for approximately 0.05 km

Sable Court: for approximately 0.10 km

Duggan: for approximately 0.14 km

Jopling Road: from 15th Line to 14th Line for approximately 1.44 km

Murphy Road: for approximately 1.47 km

McCue Rd: for approximately 0.14 km

Hilliard St: from Woodland to 5th Line for approximately 1.48 km

Pinehurst Ave: for approximately 1.52 km

Fairbairn St: from 3rd Line to City Limits for approximately 1.15 km

15th Line: from Newcomb to North School for approximately 1.10 km

Strickland St: for approximately 1.11 km

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
Myers Cres: for approximately 1.01 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103, SP 36	sq. m	7010	\$2.2000	\$ 15,422.00
Mystic Meadow: for approximately 0.35 km	Single Surface Treatment (6 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103, SP 36	sq. m	2100	\$2.2000	\$ 4,620.00
Mystic Cres: for approximately 0.27 km	Single Surface Treatment (6 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103, SP 36	sq. m	1620	\$2.2000	\$ 3,564.00
Cedarvale Cres: for approximately 0.59 km	Single Surface Treatment (6 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103, SP 36	sq. m	3540	\$2.2000	\$ 7,788.00
Teraview Heights: for approximately 0.79 km	Single Surface Treatment (6 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103, SP 36	sq. m	4740	\$2.2000	\$ 10,428.00
Garmondale Ave: for approximately 0.17 km	Single Surface Treatment (6 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103, SP 36	sq. m	1020	\$2.2000	\$ 2,244.00
Gazelle Trail: for approximately 0.70 km	Single Surface Treatment (7.5 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103, SP 36	sq. m	4550	\$2.2000	\$ 10,010.00

Antelope Trail: for approximately 2.04 km	Single Surface Treatment (6.5 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 1/4" traprock	304, 1006, 1103, SP 36	sq. m	13260	\$2.2000	\$ 29,172.00
Impala Hills: for approximately 0.25 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 1/4" traprock	304, 1006, 1103, SP 36	sq. m	1750	\$2.2000	\$ 3,850.00
Kudu Court: for approximately 0.15 km	Single Surface Treatment (6.8 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 1/4" traprock	304, 1006, 1103, SP 36	sq. m	1020	\$2.2000	\$ 2,244.00
Eland Court: for approximately 0.05 km	Single Surface Treatment (6.8 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 1/4" traprock	304, 1006, 1103, SP 36	sq. m	340	\$2.2000	\$ 748.00
Sable Court: for approximately 0.10 km	Single Surface Treatment (6.5 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 1/4" traprock	304, 1006, 1103, SP 36	sq. m	650	\$2.2000	\$ 1,430.00
Duggan: for approximately 0.14 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	840	\$2.2000	\$ 1,848.00
Jopling Road: from 15th Line to 14th Line for approximately 1.44 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	1080	\$2.2000	\$ 2,376.00
Murphy Road: for approximately 1.47 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	10290	\$2.2000	\$ 22,638.00
McCue Rd: for approximately 0.14 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	770	\$2.2000	\$ 1,694.00
Hilliard St: from Woodland to 5th Line for approximately 1.48 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	11100	\$2.2000	\$ 24,420.00
Pinehurst Ave: for approximately 1.52 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	9120	\$2.2000	\$ 20,064.00
Fairbairn St: from 3rd Line to City Limits for approximately 1.15 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	8050	\$2.2000	\$ 17,710.00
15th Line: from Newcomb to North School for approximately 1.10 km	Double Surface Treatment (7.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	16500	\$3.9000	\$ 64,350.00
Strickland St: for approximately 1.11 km	Double Surface Treatment (7.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	16500	\$3.9000	\$ 64,350.00
Subtotal:						\$ 310,970.00

**Municipality of Trent Lakes**

**Bear Creek Road: from Bear Creek Road to end of Elim Lodge Road for approximately 4.1 km**

**Allen's Alley: for approximately 2.1 km**

**Allen's Road: for approximately 1.9 km**

**Sumcot Drive: for approximately 1.9 km**

**Mill Line Road: for approximately 2.7 km**

**Crowes Line Road: for approximately 1.8 km**

**Kennedy Drive: for approximately 4.0 km**

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
Bear Creek Road: from Bear Creek Road to end of Elim Lodge Road for approximately 4.1 km	Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103, SP 34	sq. m	28700	\$2.7000	\$ 77,490.00
Allen's Alley: for approximately 2.1 km	Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103, SP 34	sq. m	14700	\$2.7000	\$ 39,690.00
Allen's Road: for approximately 1.9 km	Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103, SP 34	sq. m	13300	\$2.7000	\$ 35,910.00
Sumcot Drive: for approximately 1.9 km	Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103, SP 34	sq. m	13300	\$2.7000	\$ 35,910.00
Mill Line Road: for approximately 2.7 km	Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200 P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103, SP 34	sq. m	18900	\$2.7000	\$ 51,030.00
Crowes Line Road: for approximately 1.8 km	Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103, SP 34	sq. m	12600	\$2.7000	\$ 34,020.00
Kennedy Drive: for approximately 4.0 km	Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103, SP 34	sq. m	28000	\$2.7000	\$ 75,600.00
Subtotal:						\$ 349,650.00

## Cavan Monaghan Township

Morton Line: from County Road No. 10 westerly for approximately 1 km

Morton Line: from 1426 Morton Line easterly for approximately 800 m

Beardsmore Road: from Worboy Court southerly for approximately 1.0 km

Dranoel Road: from Hwy 7A to Dranoel Drive for approximately 320 m

Dranoel Drive: from Hwy 7A to Dranoel Road for approximately 505 m

Syer Line: from Tapley ¼ Line to West CPR Bridge for approximately 800 m

Larmer Line: from County Road No. 10 to Hwy 115 Bridge for approximately 1.30 km

Deyell Line: from T-Way Drive to Hutchison Drive for approximately 1.30 km

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
Morton Line: from County Road No. 10 westerly for approximately 1 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 35	sq. m	1650	\$5.9000	\$ 9,735.00
Morton Line: from 1426 Morton Line easterly for approximately 800 m	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 35	sq. m	5200	\$5.9000	\$ 30,680.00
Beardsmore Road: from Worboy Court southerly for approximately 1.0 km	Double Surface Treatment (6.7 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 35	sq. m	6700	\$5.9000	\$ 39,530.00
Dranoel Road: from Hwy 7A to Dranoel Drive for approximately 320 m	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 35	sq. m	2080	\$5.9000	\$ 12,272.00
Dranoel Drive: from Hwy 7A to Dranoel Road for approximately 505 m	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 35	sq. m	3285	\$5.9000	\$ 19,381.50
Syer Line: from Tapley ¼ Line to West CPR Bridge for approximately 800 m	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 35	sq. m	5200	\$5.9000	\$ 30,680.00
Larmer Line: from County Road No. 10 to Hwy 115 Bridge for approximately 1.30 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 35	sq. m	8450	\$5.9000	\$ 49,855.00
Deyell Line: from T-Way Drive to Hutchison Drive for approximately 1.30 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 35	sq. m	8450	\$5.9000	\$ 49,855.00
Subtotal:						\$ 241,988.50

## County - Provisional

County Road No. 48: 280m east of Preston Road - Removal and Replacement of Cross Culvert (including pipe cost)

Removal and Replacement of Cross Culvert (including pipe cost) - Removal and Replacement of Cross Culvert (including pipe cost)

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
County Road No. 48: 280m east of Preston Road - Removal and Replacement of Cross Culvert (including pipe cost)	800 mm dia. X 20.0 m Type II Galvanized	421, SP 38	m	20	\$902.0000	\$ 18,040.00
County Road No. 48: 544m east of Preston Road - Removal and Replacement of Cross Culvert (including pipe cost)	800 mm dia. X 26.0 m Type II Galvanized	421, SP 38	m	26	\$780.0000	\$ 20,280.00
Subtotal:						\$ 38,320.00

## Cavan Monaghan Provisional

Granular Grading

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
All Roads listed in the Pricing Schedule for the Township of Cavan Monaghan	Final Grading of Granular "A" of All Roads	301, 314, 501, 506, 1010, SP 43	sq. m	45865	\$0.6000	\$ 27,519.00
Subtotal:						\$ 27,519.00

## Douro-Dummer Provisional

Daleview Road: from County Road No. 4 to Division Road for approximately 0.70 km

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
Daleview Road: from County Road No. 4 to Division Road for approximately 0.70 km	Double Surface Treatment (6.5 m) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1003, SP 39	sq. m	4550	\$5.3000	\$ 24,115.00
Subtotal:						\$ 24,115.00

## H-B-M Provisional

### The Township of Havelock-Belmont-Methuen Provisional Items:

Burnt Dam Road: from Preston Road to Sugar Bush Road for approximately 0.50 km

Simpson Road: from 11th Line North to Township Boundary for approximately 0.50 km

8th Line: from Browns Line to Civic Address 911 #274 for approximately 1.00 km

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
Burnt Dam Road: from Preston Road to Sugar Bush Road for approximately 0.50 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 41	sq. m	3250	\$6.2000	\$ 20,150.00
Burnt Dam Road: from Preston Road to Sugar Bush Road for approximately 0.50 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HP 200P Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 41	sq. m	3250	\$6.2000	\$ 20,150.00
Burnt Dam Road: from Preston Road to Sugar Bush Road for approximately 0.50 km	Roadway Pulverizing (6.5 m wide)	206, 301, 314, 330, 501, SP 40	sq. m	3250	\$1.5000	\$ 4,875.00
Simpson Road: from 11th Line North to Township Boundary for approximately 0.50 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 41	sq. m	3250	\$6.2000	\$ 20,150.00
Simpson Road: from 11th Line North to Township Boundary for approximately 0.50 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HP 200P Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 41	sq. m	3250	\$6.2000	\$ 20,150.00
Simpson Road: from 11th Line North to Township Boundary for approximately 0.50 km	Roadway Pulverizing (6.5 m wide)	206, 301, 314, 330, 501, SP 40	sq. m	3250	\$1.5000	\$ 4,875.00
8th Line: from Browns Line to Civic Address 911 #274 for approximately 1.00 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 41	sq. m	6500	\$6.2000	\$ 40,300.00
8th Line: from Browns Line to Civic Address 911 #274 for approximately 1.00 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HP 200P Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 41	sq. m	6500	\$6.2000	\$ 40,300.00
8th Line: from Browns Line to Civic Address 911 #274 for approximately 1.00 km	Roadway Pulverizing (6.5 m wide)	206, 301, 314, 330, 501, SP 40	sq. m	6500	\$1.2000	\$ 7,800.00
Subtotal:						\$ 178,750.00

Selwyn - Provisional

Ermatinger St: for approximately 0.79 km

Caroline St: for approximately 0.93 km

Brick Road: from Skyline southerly for approximately 0.73 km

Beachwood Dr: for approximately 1.13 km

Berrie Rd: for approximately 2.80 km

9th Line: for approximately 3.02 km

15th Line: from Newcomb to Jopling for approximately 1.48 km

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
Ermatinger St: for approximately 0.79 km	Single Surface Treatment (7.5 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 1/4" traprock	304, 1006, 1103, SP 36	sq. m	5925	\$2.2000	\$ 13,035.00
Caroline St: for approximately 0.93 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 1/4" traprock	304, 1006, 1103, SP 36	sq. m	6510	\$2.2000	\$ 14,322.00
Brick Road: from Skyline southerly for approximately 0.73 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	5110	\$2.2000	\$ 11,242.00
Beachwood Dr: for approximately 1.13 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	7910	\$2.2000	\$ 17,402.00
Berrie Rd: for approximately 2.80 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	19600	\$2.2000	\$ 43,120.00
9th Line: for approximately 3.02 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	18120	\$2.2000	\$ 39,864.00
15th Line: from Newcomb to Jopling for approximately 1.48 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	17812	\$2.2000	\$ 39,186.40
Subtotal:						\$ 178,171.40

Summary Table

Bid Form	Amount
Peterborough County - Combined	\$ 2,773,705.00
Douro-Dummer Township	\$ 40,390.00
Selwyn Township	\$ 310,970.00
Municipality of Trent Lakes	\$ 349,650.00
Cavan Monaghan Township	\$ 241,988.50
HST (13%)	\$ 483,171.46
Total Contract Amount:	\$ 4,199,874.96

Bid Questions

Please provide answers to the following questions.

Can you please provide your HST number? 100969906RT0001

Specifications



## Disclosure of Information and Freedom of Information

The Bidder hereby consents to the disclosure, on a confidential basis, of this Bid by the County to the County's advisers retained for the purpose of evaluating or participating in the evaluation of this Bid.

The Municipal Freedom of Information and Protection of Privacy Act, as amended, ("MFIPPA") applies to records provided to the County by a Bidder, and may require disclosure of such records to third parties.

The following chart is provided for Bidders to list all records supplied in confidence by the Bidder to the County pursuant to this procurement process (e.g. their Bid or any accompanying documentation). It is intended to assist the County in determining what aspects of the Bid are non-confidential (i.e., contain publicly available information), and what aspects are confidential. Confidential aspects either contain:

- - trade secrets, commercial, financial, scientific or technical information, that is supplied in confidence, the disclosure of which would involve harm (per section 10 of MFIPPA); or
- - personal information (per section 14 of MFIPPA).

☒ We will not be submitting for Disclosure of Information and Freedom of Information

Record *	Full Disclosure *	Partial Disclosure *	Identify portions of Record (e.g. pages or sections) that are supplied in confidence and the exemption(s) or exclusion(s) under MFIPPA being relied upon *

All references stated shall be for the same or similar scope as the one described in this Bid.

For newly formed business entity including, corporations, partnerships and sole proprietors or a Contractor teaming arrangement you shall state below in the Client Column that you were not the "Contractor" for the named project and should state whose past experience on the named project is relevant to that reference.

## References Schedule

The Bidder is to identify 3 recent client engagements that involve work that is substantially similar to the Work described in the RFT, and complete the information set out below.

Description	Reference #1 *	Reference #2 *	Reference #3 *
Client name	City of Kawartha Lakes	Township of Oro-Medonte	City of Barrie
Address	Lindsay	Oro-Medonte	Barrie
Contact Information (name/phone/email):	Juan Rojas - 705-324-9411	Brad Robinson - 705-487-2171	Daniel Vink
Date, length, value of contract	2018 - 4 Months - \$4,462,685.00	2018-3 Months - \$1,582,000.00	2019 - 3 Months - \$1,700,000.00
Description of work	Urban & Arterial Road Resurfacing	Various Road Resurfacing	Hurst Drive Resurfacing/Reconstruction

## Sub-Contractors

The Bidder shall state all Subcontractor(s) and type of Work proposed to be used for this project. Bidders shall not indicate "TBD" (To Be Determined) or "TBA" (To Be Announced) or similar wording and shall not indicate multiple choices of Subcontractor names for any Subcontractor category in their list of Subcontractors.

The Bidder shall state only one (1) subcontractor for each type of work.

## Subcontractors Schedule

The Bidder is to identify all subcontractors (if any) and complete the information set out below.

☒ By clicking here I confirm that there are no Subcontractor(s) and the Bidder shall perform the project with their "OWN FORCES".

New Column	Subcontractor 1	Subcontractor 2	Subcontractor 3
Subcontractor name	Rotomill Inc	Upper Canada Road Services	
Address	Orangeville	Markham	
Contact Information (name/phone/email):	John Lapenna - 519-941-7686	Kevin Guidolin - 416-550-3358	
Description of work	Pulverizing	Line Painting	

## Documents

It is your responsibility to make sure the uploaded file(s) is/are not defective or corrupted and are able to be opened and viewed by the Owner. If the attached file(s) cannot be opened or viewed, your Bid Call Document may be rejected.

## BONDING UPLOAD SECTION

Bidders shall submit with their on-line bid either an e-Bond.

**Note: A scanned pdf copy of Bid Bond is not acceptable.**

- [Bid Bond](#) - CRH2020-118CountyofPeterboroughBB\_75697.pdf - Monday April 06, 2020 20:39:48

Declarations

I am duly authorized by the undersigned company (the "Bidder"), including the persons, firms, corporations, and advisors joining in the submission of this Bid, to execute this Declaration and Certification. Terms not defined herein are defined in the RFT.

Addenda and Form of Agreement

The Bidder is deemed to have read and accepted all addenda to the RFT issued by the County to date, and the Form of Agreement. The Bidders understands that the onus remains on the Bidder to have made any necessary amendments to its Bid based on the addenda and to consider the Form of Agreement in framing its Bid.

Offer

The Bidder has carefully examined the RFT and has a clear and comprehensive knowledge of the Work. By submitting the Bid, the Bidder understands the provisions of the RFT, and offers to perform and deliver the Work in accordance therewith at the pricing set out in the Pricing Schedule.

It is the responsibility of the Bidder to seek clarification from the RFT Contact or its own advisors on any matter it considers to be unclear – including any indemnity and insurance requirements in the Form of Agreement.

The Bidder understands that no performance or delivery of the Work will commence until the County has entered into a contract with a successful Bidder.

Bid Irrevocable

The Bidder agrees that its Bid shall be irrevocable for 90 days following the Bid Submission Deadline.

Execution of Agreement

The Bidder understands that in the event its Bid is selected by the County, in whole or in part, the Bidder agrees to finalize and execute the agreement in the form set out in the RFT in accordance with the terms of the RFT.

☒ I have the authority to bind the Bidder. - Darryl Prout, Estimator/Project Coordinator, Dufferin Construction Company, A division of CRH Canada Group Inc.

The Bidder has reviewed the definitions of Unfair Advantage and Conflict of Interest set out in Section 2.1 (Definitions) of the Bid Document. If the boxes below are left blank, the Bidder shall be deemed to declare that (a) it has had no Unfair Advantage in preparing its Bid and (b) there is no foreseeable actual or potential Conflict of Interest in performing the contractual obligations contemplated in the Bid Document.

If either or both of the statements below apply, check the YES option:

- The Bidder declares that there is an actual or potential Unfair Advantage relating to the preparation of its Bid.
- The Bidder declares that there is an actual or potential Conflict of Interest in performing the contractual obligations contemplated in the Bid Document.

☒ Yes ☒ No

The Bidder acknowledges and agrees that the addendum/addenda below form part of the Bid Document

Please check the box in the column "I have reviewed this addendum" below to acknowledge each of the addenda.

File Name	I have reviewed the below addendum and attachments (if applicable)	Pages
Addendum Two Wed April 1 2020 04:03 PM	<input checked="" type="checkbox"/>	1
Addendum One Wed March 18 2020 10:10 AM	<input checked="" type="checkbox"/>	3

# T-03-2020 - Surface Treatment

Opening Date: March 16, 2020 11:15 AM

Closing Date: April 7, 2020 2:00 PM

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## Vendor Details

Company Name: Miller Paving Limited  
505 Miller Avenue  
Address: Markham, Ontario L6G 1B2  
Contact: Tanika Greig  
Email: tanika.greig@millergroup.ca  
Phone: 905-726-9518 231  
Fax: 905-726-4180  
HST#:

## Submission Details

Created On: Tuesday March 31, 2020 12:54:57  
Submitted On: Tuesday April 07, 2020 13:13:33  
Submitted By: Tanika Greig  
Email: tanika.greig@millergroup.ca  
Transaction #: e72611a7-b80e-4ec1-a485-2c078f553244  
Submitter's IP Address: 66.135.101.162

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Schedule of Prices

The Bidder hereby Bids and offers to enter into the Contract referred to and to supply and do all or any part of the Work which is set out or called for in this Bid, at the unit prices, and/or lump sums, hereinafter stated. HST is additional.

\* Denotes a "MANDATORY" field

Do not enter \$0.00 dollars unless you are providing the line item at zero dollars to the County.

If the line item and/or table is "NON-MANDATORY" and you are not bidding on it, leave the table and/or line item blank. Do not enter a \$0.00 dollar value.

The County reserves the right to cancel any or all items.

## Peterborough County - Combined

County Road No. 44: from County Road No. 6 easterly for approximately 3.20 km

County Road No. 48: from 200 m east of Preston Road easterly for approximately 2.05 km

County Road No. 504: from 700 m east of County Road No. 52 easterly to McCoy Road approximately 5.00 km

County Road No. 507: from Salmon Lake Road To Haliburton Boundary for approximately 3.09 km

County Road No. 20: from County Road No. 18 to County Road No. 23 for approximately 9.00 km

Fog Seal

Pavement Markings

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
CR 44 from County Road No. 6 easterly for approximately 3.20 km	Double Surface Treatment (8.0 m wide) over existing granular "A" with HF 150-SP Asphalt Emulsion with Class 2 Aggregate	304, 1006, 1103, SP 23	sq. m	25600	\$5.6000	\$ 143,360.00
CR 44 from County Road No. 6 easterly for approximately 3.20 km	Roadway Pulverizing (8.0 m wide)	206, 301,314, 330, 501, SP24	sq. m	25600	\$1.1500	\$ 29,440.00
CR 44 from County Road No. 6 easterly for approximately 3.20 km	Granular "A" Restore Cross Section	314, 501, 1010, SP25	tonnes	6200	\$26.5000	\$ 164,300.00
CR 48 from 200 m east of Preston Road easterly for approximately 2.05 km	Double Surface Treatment (11.0 m wide) over existing granular "A" with HF 150-SP Asphalt Emulsion with Class 2 Aggregate	304, 1006, 1103, SP 23	sq. m	22100	\$5.6000	\$ 123,760.00
CR 48 from 200 m east of Preston Road easterly for approximately 2.05 km	Roadway Pulverizing (11.0 m wide)	206, 301, 314, 330, 501, SP 24	sq. m	22100	\$1.1500	\$ 25,415.00
CR 48 from 200 m east of Preston Road easterly for approximately 2.05 km	Hot Mix HL3 PG58-34 (50 mm) for Road Patch Repair & Commercial Entrance	310, 1003, 1150, MUNI 1101, SP 45	sq. m	930	\$36.2500	\$ 33,712.50
CR 48 from 200 m east of Preston Road easterly for approximately 2.05 km	Grinding/Milling (7.0 m wide x 50 mm deep) for Road Repair Work including Reshaping, Grading and Compacting	510, SP 44	sq. m	910	\$22.0000	\$ 20,020.00
CR 48 from 200 m east of Preston Road easterly for approximately 2.05 km	300 mm dia. X 14.0 m Type II Galvanized entrance culvert	421, SP 32	m	14	\$358.4000	\$ 5,017.60
CR 48 from 200 m east of Preston Road easterly for approximately 2.05 km	Re-grading of Ditch Line	421, SP 31	m	50	\$12.1500	\$ 607.50
CR 48 from 200 m east of Preston Road easterly for approximately 2.05 km	Granular "A" Restore Cross Section	314, 501, 1010, SP 25	tonnes	5,200	\$26.5000	\$ 137,800.00
CR 504 from 700 m east of County Road No. 52 easterly to McCoy Road approximately 5.00 km	Double Surface Treatment (8.0 m wide) over existing granular "A" with HF 150-SP Asphalt Emulsion with Class 2 Aggregate	304, 1006, 1103, SP 23	sq. m	40000	\$5.6000	\$ 224,000.00
CR 504 from 700 m east of County Road No. 52 easterly to McCoy Road approximately 5.00 km	Roadway Pulverizing (8.0 m wide)	206, 301,314, 330, 501, SP24	sq. m	40000	\$1.1500	\$ 46,000.00
CR 504 from 700 m east of County Road No. 52 easterly to McCoy Road approximately 5.00 km	Granular "A" Restore Cross Section	314, 501, 1010, SP25	tonnes	9600	\$26.5000	\$ 254,400.00
CR 507 from Salmon Lake Road To Haliburton Boundary for approximately 3.09 km	Double Surface Treatment (8.0 m wide) over existing granular "A" with HF 150-SP Asphalt Emulsion with Class 2 Aggregate	304, 1006, 1103, SP 23	sq. m	24000	\$5.6000	\$ 134,400.00
CR 507 from Salmon Lake Road To Haliburton Boundary for approximately 3.09 km	Roadway Pulverizing (8.0 m wide)	206, 301,314, 330, 501, SP24	sq. m	24100	\$1.1500	\$ 27,715.00
CR 507 from Salmon Lake Road To Haliburton Boundary for approximately 3.09 km	Granular "A" Restore Cross Section	314, 501, 1010, SP25	tonnes	5800	\$26.5000	\$ 153,700.00
CR 20 from County Road No. 18 to County Road No. 23 for approximately 9.00 km	Double Surface Treatment (10.0 m wide) over existing granular "A" with HF 150-SP Asphalt Emulsion with Class 2 Aggregate	304, 1006, 1103, SP 23	sq. m	90000	\$5.6000	\$ 504,000.00
CR 20 from County Road No. 18 to County Road No. 23 for approximately 9.00 km	Roadway Pulverizing (10.0 m wide)	206, 301, 314, 330, 501, SP 24	sq. m	90000	\$1.1500	\$ 103,500.00
CR 20 from County Road No. 18 to County Road No. 23 for approximately 9.00 km	Re-grading of Ditch Line	421, Sp 28	m	7000	\$12.1500	\$ 85,050.00
CR 20 from County Road No. 18 to County Road No. 23 for approximately 9.00 km	200 mm Subdrain Installation	421, SP 29	m	2100	\$72.0000	\$ 151,200.00
CR 20 from County Road No. 18 to County Road No. 23 for approximately 9.00 km	750 mm dia. X 20.0 m Type II Galvanized	421, SP 30	m	20	\$2,243.7500	\$ 44,875.00
CR 20 from County Road No. 18 to County Road No. 23 for approximately 9.00 km	Durable Pavement Markings	710, 1713, 1714, SP 27	m	27000	\$4.1500	\$ 112,050.00
CR 20 from County Road No. 18 to County Road No. 23 for approximately 9.00 km	Granular "A" Restore Cross Section	314, 501, 1010, SP 25	tonnes	22000	\$26.5000	\$ 583,000.00
Peterborough County - Fog Seal	Fog Seal County Road No. 44	1103, 1106, SP 37	sq. m	25600	\$1.2500	\$ 32,000.00
Peterborough County - Fog Seal	Fog Seal County Road No. 48	1103, 1106, SP 37	sq. m	16750	\$1.2500	\$ 20,937.50
Peterborough County - Fog Seal	Fog Seal County Road No. 504	1103, 1106, SP 37	sq. m	40000	\$1.2500	\$ 50,000.00
Peterborough County - Fog Seal	Fog Seal County Road No. 507	1103, 1106, SP 37	sq. m	24100	\$1.2500	\$ 30,125.00
Peterborough County - Fog Seal	Fog Seal County Road No. 20	1103, 1106, SP 37	sq. m	90000	\$1.2500	\$ 112,500.00
Peterborough County - Pavement Markings	Pavement Markings	710, 1716, SP 26	m	5250	\$2.2500	\$ 11,812.50
Subtotal:						\$ 3,364,697.60

## Douro-Dummer Township

Ironwood Drive: from County Road No. 4 to South limit for approximately 0.5 km

Canal Road: from County Road No. 4 to North Limit for approximately 0.7 km

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
Ironwood Drive: from County Road No. 4 to South limit for approximately 0.5 km	Single Surface Treatment (6.5 m wide) over existing surface treatment with HF 150-SP Polymer Modified Asphalt Emulsion with ¼" washed traprock	304, 1006, 1103, SP 33	sq. m	3350	\$2.7600	\$ 9,246.00
Canal Road: from County Road No. 4 to North Limit for approximately 0.7 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 33	sq. m	4650	\$5.6000	\$ 26,040.00
Subtotal:						\$ 35,286.00

## Selwyn Township

Myers Cres: for approximately 1.01 km

Mystic Meadow: for approximately 0.35 km

Mystic Cres: for approximately 0.27 km

Cedarvale Cres: for approximately 0.59 km

Teraview HeighGarmondale Ave: for approximately 0.17 km

Garmondale Ave: for approximately 0.17 km

Gazelle Trail: for approximately 0.70 km

Antelope Trail: for approximately 2.04 km

Impala Hills: for approximately 0.25 km

Kudu Court: for approximately 0.15 km

Eland Court: for approximately 0.05 km

Sable Court: for approximately 0.10 km

Duggan: for approximately 0.14 km

Jopling Road: from 15th Line to 14th Line for approximately 1.44 km

Murphy Road: for approximately 1.47 km

McCue Rd: for approximately 0.14 km

Hilliard St: from Woodland to 5th Line for approximately 1.48 km

Pinehurst Ave: for approximately 1.52 km

Fairbairn St: from 3rd Line to City Limits for approximately 1.15 km

15th Line: from Newcomb to North School for approximately 1.10 km

Strickland St: for approximately 1.11 km

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
Myers Cres: for approximately 1.01 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103, SP 36	sq. m	7010	\$2.2500	\$ 15,772.50
Mystic Meadow: for approximately 0.35 km	Single Surface Treatment (6 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103, SP 36	sq. m	2100	\$2.2500	\$ 4,725.00
Mystic Cres: for approximately 0.27 km	Single Surface Treatment (6 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103, SP 36	sq. m	1620	\$2.2500	\$ 3,645.00
Cedarvale Cres: for approximately 0.59 km	Single Surface Treatment (6 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103, SP 36	sq. m	3540	\$2.2500	\$ 7,965.00
Teraview Heights: for approximately 0.79 km	Single Surface Treatment (6 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103, SP 36	sq. m	4740	\$2.2500	\$ 10,665.00
Garmondale Ave: for approximately 0.17 km	Single Surface Treatment (6 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103, SP 36	sq. m	1020	\$2.2500	\$ 2,295.00
Gazelle Trail: for approximately 0.70 km	Single Surface Treatment (7.5 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with ¼" traprock	304, 1006, 1103, SP 36	sq. m	4550	\$2.2500	\$ 10,237.50

Antelope Trail: for approximately 2.04 km	Single Surface Treatment (6.5 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 1/4" traprock	304, 1006, 1103, SP 36	sq. m	13260	\$2.2500	\$ 29,835.00
Impala Hills: for approximately 0.25 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 1/4" traprock	304, 1006, 1103, SP 36	sq. m	1750	\$2.2500	\$ 3,937.50
Kudu Court: for approximately 0.15 km	Single Surface Treatment (6.8 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 1/4" traprock	304, 1006, 1103, SP 36	sq. m	1020	\$2.2500	\$ 2,295.00
Eland Court: for approximately 0.05 km	Single Surface Treatment (6.8 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 1/4" traprock	304, 1006, 1103, SP 36	sq. m	340	\$2.2500	\$ 765.00
Sable Court: for approximately 0.10 km	Single Surface Treatment (6.5 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 1/4" traprock	304, 1006, 1103, SP 36	sq. m	650	\$2.2500	\$ 1,462.50
Duggan: for approximately 0.14 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	840	\$2.2500	\$ 1,890.00
Jopling Road: from 15th Line to 14th Line for approximately 1.44 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	1080	\$2.2500	\$ 2,430.00
Murphy Road: for approximately 1.47 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	10290	\$2.2500	\$ 23,152.50
McCue Rd: for approximately 0.14 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	770	\$2.2500	\$ 1,732.50
Hilliard St: from Woodland to 5th Line for approximately 1.48 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	11100	\$2.2500	\$ 24,975.00
Pinehurst Ave: for approximately 1.52 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	9120	\$2.2500	\$ 20,520.00
Fairbairn St: from 3rd Line to City Limits for approximately 1.15 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	8050	\$2.2500	\$ 18,112.50
15th Line: from Newcomb to North School for approximately 1.10 km	Double Surface Treatment (7.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	16500	\$4.5000	\$ 74,250.00
Strickland St: for approximately 1.11 km	Double Surface Treatment (7.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	16500	\$4.5000	\$ 74,250.00
Subtotal:						\$ 334,912.50

**Municipality of Trent Lakes**

**Bear Creek Road: from Bear Creek Road to end of Elim Lodge Road for approximately 4.1 km**

**Allen's Alley: for approximately 2.1 km**

**Allen's Road: for approximately 1.9 km**

**Sumcot Drive: for approximately 1.9 km**

**Mill Line Road: for approximately 2.7 km**

**Crowes Line Road: for approximately 1.8 km**

**Kennedy Drive: for approximately 4.0 km**

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
Bear Creek Road: from Bear Creek Road to end of Elim Lodge Road for approximately 4.1 km	Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103, SP 34	sq. m	28700	\$2.7600	\$ 79,212.00
Allen's Alley: for approximately 2.1 km	Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103, SP 34	sq. m	14700	\$2.7600	\$ 40,572.00
Allen's Road: for approximately 1.9 km	Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103, SP 34	sq. m	13300	\$2.7600	\$ 36,708.00
Sumcot Drive: for approximately 1.9 km	Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103, SP 34	sq. m	13300	\$2.7600	\$ 36,708.00
Mill Line Road: for approximately 2.7 km	Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200 P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103, SP 34	sq. m	18900	\$2.7600	\$ 52,164.00
Crowes Line Road: for approximately 1.8 km	Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103, SP 34	sq. m	12600	\$2.7600	\$ 34,776.00
Kennedy Drive: for approximately 4.0 km	Single Surface Treatment (7.0 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with washed Class 6 Aggregate	304, 1006, 1103, SP 34	sq. m	28000	\$2.7600	\$ 77,280.00
Subtotal:						\$ 357,420.00



**Cavan Monaghan Township**

Morton Line: from County Road No. 10 westerly for approximately 1 km

Morton Line: from 1426 Morton Line easterly for approximately 800 m

Beardsmore Road: from Worboy Court southerly for approximately 1.0 km

Dranoel Road: from Hwy 7A to Dranoel Drive for approximately 320 m

Dranoel Drive: from Hwy 7A to Dranoel Road for approximately 505 m

Syer Line: from Tapley ¼ Line to West CPR Bridge for approximately 800 m

Larmer Line: from County Road No. 10 to Hwy 115 Bridge for approximately 1.30 km

Deyell Line: from T-Way Drive to Hutchison Drive for approximately 1.30 km

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
Morton Line: from County Road No. 10 westerly for approximately 1 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 35	sq. m	1650	\$5.6000	\$ 9,240.00
Morton Line: from 1426 Morton Line easterly for approximately 800 m	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 35	sq. m	5200	\$5.6000	\$ 29,120.00
Beardsmore Road: from Worboy Court southerly for approximately 1.0 km	Double Surface Treatment (6.7 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 35	sq. m	6700	\$5.6000	\$ 37,520.00
Dranoel Road: from Hwy 7A to Dranoel Drive for approximately 320 m	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 35	sq. m	2080	\$5.6000	\$ 11,648.00
Dranoel Drive: from Hwy 7A to Dranoel Road for approximately 505 m	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 35	sq. m	3285	\$5.6000	\$ 18,396.00
Syer Line: from Tapley ¼ Line to West CPR Bridge for approximately 800 m	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 35	sq. m	5200	\$5.6000	\$ 29,120.00
Larmer Line: from County Road No. 10 to Hwy 115 Bridge for approximately 1.30 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 35	sq. m	8450	\$5.6000	\$ 47,320.00
Deyell Line: from T-Way Drive to Hutchison Drive for approximately 1.30 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 35	sq. m	8450	\$5.6000	\$ 47,320.00
Subtotal:						\$ 229,684.00

**County - Provisional**

County Road No. 48: 280m east of Preston Road - Removal and Replacement of Cross Culvert (including pipe cost)

Removal and Replacement of Cross Culvert (including pipe cost) - Removal and Replacement of Cross Culvert (including pipe cost)

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
County Road No. 48: 280m east of Preston Road - Removal and Replacement of Cross Culvert (including pipe cost)	800 mm dia. X 20.0 m Type II Galvanized	421, SP 38	m	20	\$1,600.0000	\$ 32,000.00
County Road No. 48: 544m east of Preston Road - Removal and Replacement of Cross Culvert (including pipe cost)	800 mm dia. X 26.0 m Type II Galvanized	421, SP 38	m	26	\$1,600.0000	\$ 41,600.00
Subtotal:						\$ 73,600.00

**Cavan Monaghan Provisional**

Granular Grading

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
All Roads listed in the Pricing Schedule for the Township of Cavan Monaghan	Final Grading of Granular "A" of All Roads	301, 314, 501, 506, 1010, SP 43	sq. m	45865	\$1.5000	\$ 68,797.50
Subtotal:						\$ 68,797.50

**Douro-Dummer Provisional**

Daleview Road: from County Road No. 4 to Division Road for approximately 0.70 km

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
Daleview Road: from County Road No. 4 to Division Road for approximately 0.70 km	Double Surface Treatment (6.5 m) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1003, SP 39	sq. m	4550	\$5.6000	\$ 25,480.00
Subtotal:						\$ 25,480.00

**H-B-M Provisional****The Township of Havelock-Belmont-Methuen Provisional Items:**

Burnt Dam Road: from Preston Road to Sugar Bush Road for approximately 0.50 km

Simpson Road: from 11th Line North to Township Boundary for approximately 0.50 km

8th Line: from Browns Line to Civic Address 911 #274 for approximately 1.00 km

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
Burnt Dam Road: from Preston Road to Sugar Bush Road for approximately 0.50 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 41	sq. m	3250	\$5.6000	\$ 18,200.00
Burnt Dam Road: from Preston Road to Sugar Bush Road for approximately 0.50 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HP 200P Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 41	sq. m	3250	\$5.6000	\$ 18,200.00
Burnt Dam Road: from Preston Road to Sugar Bush Road for approximately 0.50 km	Roadway Pulverizing (6.5 m wide)	206, 301, 314, 330, 501, SP 40	sq. m	3250	\$3.5000	\$ 11,375.00
Simpson Road: from 11th Line North to Township Boundary for approximately 0.50 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 41	sq. m	3250	\$5.6000	\$ 18,200.00
Simpson Road: from 11th Line North to Township Boundary for approximately 0.50 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HP 200P Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 41	sq. m	3250	\$5.6000	\$ 18,200.00
Simpson Road: from 11th Line North to Township Boundary for approximately 0.50 km	Roadway Pulverizing (6.5 m wide)	206, 301, 314, 330, 501, SP 40	sq. m	3250	\$3.5000	\$ 11,375.00
8th Line: from Browns Line to Civic Address 911 #274 for approximately 1.00 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HF 150-SP Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 41	sq. m	6500	\$5.6000	\$ 36,400.00
8th Line: from Browns Line to Civic Address 911 #274 for approximately 1.00 km	Double Surface Treatment (6.5 m wide) over existing granular "A" with HP 200P Polymer Modified Asphalt Emulsion with Class 2 & Class 6 Aggregate	304, 1006, 1103, SP 41	sq. m	6500	\$5.6000	\$ 36,400.00
8th Line: from Browns Line to Civic Address 911 #274 for approximately 1.00 km	Roadway Pulverizing (6.5 m wide)	206, 301, 314, 330, 501, SP 40	sq. m	6500	\$3.5000	\$ 22,750.00
Subtotal:						\$ 191,100.00

Selwyn - Provisional

Ermatinger St: for approximately 0.79 km

Caroline St: for approximately 0.93 km

Brick Road: from Skyline southerly for approximately 0.73 km

Beachwood Dr: for approximately 1.13 km

Berrie Rd: for approximately 2.80 km

9th Line: for approximately 3.02 km

15th Line: from Newcomb to Jopling for approximately 1.48 km

Area	Description	OPSS, Spec	Units	Estimated Quantity	Unit Price *	Total Price
Ermatinger St: for approximately 0.79 km	Single Surface Treatment (7.5 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 1/4" traprock	304, 1006, 1103, SP 36	sq. m	5925	\$2.2500	\$ 13,331.25
Caroline St: for approximately 0.93 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 1/4" traprock	304, 1006, 1103, SP 36	sq. m	6510	\$2.2500	\$ 14,647.50
Brick Road: from Skyline southerly for approximately 0.73 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	5110	\$2.2500	\$ 11,497.50
Beachwood Dr: for approximately 1.13 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	7910	\$2.2500	\$ 17,797.50
Berrie Rd: for approximately 2.80 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	19600	\$2.2500	\$ 44,100.00
9th Line: for approximately 3.02 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	18120	\$2.2500	\$ 40,770.00
15th Line: from Newcomb to Jopling for approximately 1.48 km	Single Surface Treatment (7 m wide) over existing surface treatment with HP 200P Polymer Modified Asphalt Emulsion with 3/8" Aggregate	304, 1006, 1103, SP 36	sq. m	17812	\$2.2500	\$ 40,077.00
Subtotal:						\$ 182,220.75

Summary Table

Bid Form	Amount
Peterborough County - Combined	\$ 3,364,697.60
Douro-Dummer Township	\$ 35,286.00
Selwyn Township	\$ 334,912.50
Municipality of Trent Lakes	\$ 357,420.00
Cavan Monaghan Township	\$ 229,684.00
HST (13%)	\$ 561,860.02
Total Contract Amount:	\$ 4,883,860.12

Bid Questions

Please provide answers to the following questions.

Can you please provide your HST number? R122497878

Specifications

## Disclosure of Information and Freedom of Information

The Bidder hereby consents to the disclosure, on a confidential basis, of this Bid by the County to the County's advisers retained for the purpose of evaluating or participating in the evaluation of this Bid.

The Municipal Freedom of Information and Protection of Privacy Act, as amended, ("MFIPPA") applies to records provided to the County by a Bidder, and may require disclosure of such records to third parties.

The following chart is provided for Bidders to list all records supplied in confidence by the Bidder to the County pursuant to this procurement process (e.g. their Bid or any accompanying documentation). It is intended to assist the County in determining what aspects of the Bid are non-confidential (i.e., contain publicly available information), and what aspects are confidential. Confidential aspects either contain:

- - trade secrets, commercial, financial, scientific or technical information, that is supplied in confidence, the disclosure of which would involve harm (per section 10 of MFIPPA); or
- - personal information (per section 14 of MFIPPA).

☒ We will not be submitting for Disclosure of Information and Freedom of Information

Record *	Full Disclosure *	Partial Disclosure *	Identify portions of Record (e.g. pages or sections) that are supplied in confidence and the exemption(s) or exclusion(s) under MFIPPA being relied upon *

All references stated shall be for the same or similar scope as the one described in this Bid.

For newly formed business entity including, corporations, partnerships and sole proprietors or a Contractor teaming arrangement you shall state below in the Client Column that you were not the "Contractor" for the named project and should state whose past experience on the named project is relevant to that reference.

## References Schedule

The Bidder is to identify 3 recent client engagements that involve work that is substantially similar to the Work described in the RFT, and complete the information set out below.

Description	Reference #1 *	Reference #2 *	Reference #3 *
Client name	Municipality of Clarington	County of Haliburton	Dysart Et Al
Address	40 Temperance Street, Bomanville Ontario, L1C 3A6	11 Newcastle Street, PO Box 399, Minden Ontario, K0M 2K0	13 Maple Avenue, PO Box 389, Haliburton Ontario, K0M 1S0
Contact Information (name/phone/email):	Brett Novak, 905-263-2291, bnovak@clarington.net	Sylvin Cloutier, 705-286-1333, scloutier@county.haliburton.on.ca	Rob Camelon, 705-457-1740, rcamelon@dysartetel.ca
Date, length, value of contract	2019 Season, 2.4 Million	2019 Season, 1.8 Million	2019 Season, 1.2 Million
Description of work	High float resurfacing	Surface Treatment	Road Resurfacing

## Sub-Contractors

The Bidder shall state all Subcontractor(s) and type of Work proposed to be used for this project. Bidders shall not indicate "TBD" (To Be Determined) or "TBA" (To Be Announced) or similar wording and shall not indicate multiple choices of Subcontractor names for any Subcontractor category in their list of Subcontractors.

The Bidder shall state only one (1) subcontractor for each type of work.

## Subcontractors Schedule

The Bidder is to identify all subcontractors (if any) and complete the information set out below.

☒ By clicking here I confirm that there are no Subcontractor(s) and the Bidder shall perform the project with their "OWN FORCES".

New Column	Subcontractor 1	Subcontractor 2	Subcontractor 3
Subcontractor name	Drain Bros		
Address	2130 8th line Road North, Dourro Dummer, Ontario, K0L 2H0		
Contact Information (name/phone/email):	Brian Shorey, 705-639-2301, brian@drainbros.ca		
Description of work	Grading, Paving, Pipe installation		

## Documents

It is your responsibility to make sure the uploaded file(s) is/are not defective or corrupted and are able to be opened and viewed by the Owner. If the attached file(s) cannot be opened or viewed, your Bid Call Document may be rejected.

## BONDING UPLOAD SECTION

Bidders shall submit with their on-line bid either an e-Bond.

**Note: A scanned pdf copy of Bid Bond is not acceptable.**

- [Bid Bond](#) - BidBond\_78451.pdf - Tuesday March 31, 2020 12:57:34

## Declarations

I am duly authorized by the undersigned company (the "**Bidder**"), including the persons, firms, corporations, and advisors joining in the submission of this Bid, to execute this Declaration and Certification. Terms not defined herein are defined in the RFT.

## Addenda and Form of Agreement

The Bidder is deemed to have read and accepted all addenda to the RFT issued by the County to date, and the Form of Agreement. The Bidders understands that the onus remains on the Bidder to have made any necessary amendments to its Bid based on the addenda and to consider the Form of Agreement in framing its Bid.

## Offer

The Bidder has carefully examined the RFT and has a clear and comprehensive knowledge of the Work. By submitting the Bid, the Bidder understands the provisions of the RFT, and offers to perform and deliver the Work in accordance therewith at the pricing set out in the Pricing Schedule.

It is the responsibility of the Bidder to seek clarification from the RFT Contact or its own advisors on any matter it considers to be unclear – including any indemnity and insurance requirements in the Form of Agreement.

The Bidder understands that no performance or delivery of the Work will commence until the County has entered into a contract with a successful Bidder.

## Bid Irrevocable

The Bidder agrees that its Bid shall be irrevocable for 90 days following the Bid Submission Deadline.

## Execution of Agreement

The Bidder understands that in the event its Bid is selected by the County, in whole or in part, the Bidder agrees to finalize and execute the agreement in the form set out in the RFT in accordance with the terms of the RFT.

☒ I have the authority to bind the Bidder. - Peter Linton, General Manager, Miller Paving Limited

The Bidder has reviewed the definitions of Unfair Advantage and Conflict of Interest set out in Section 2.1 (Definitions) of the Bid Document. If the boxes below are left blank, the Bidder shall be deemed to declare that (a) it has had no Unfair Advantage in preparing its Bid and (b) there is no foreseeable actual or potential Conflict of Interest in performing the contractual obligations contemplated in the Bid Document.

If either or both of the statements below apply, check the YES option:

- The Bidder declares that there is an actual or potential Unfair Advantage relating to the preparation of its Bid.
- The Bidder declares that there is an actual or potential Conflict of Interest in performing the contractual obligations contemplated in the Bid Document.

☒ Yes ☒ No

The Bidder acknowledges and agrees that the addendum/addenda below form part of the Bid Document

Please check the box in the column "**I have reviewed this addendum**" below to acknowledge each of the addenda.

File Name	I have reviewed the below addendum and attachments (if applicable)	Pages
<b>Addendum Two</b> Wed April 1 2020 04:03 PM	<input checked="" type="checkbox"/>	1
<b>Addendum One</b> Wed March 18 2020 10:10 AM	<input checked="" type="checkbox"/>	3

**Synopsis of Report:** As per the Development Charges Act 1997 S.O. 1997, Chapter 27 the Treasurer is to provide to Council a Development Charges Financial Statement yearly.

**Overview:**

A statement must include, for the preceding year,

- (a) statements of the opening and closing balances of the reserve funds and of the transactions relating to the funds;
- (b) statements identifying,
  - (i) all assets whose capital costs were funded under a development charge by-law during the year,
  - (ii) for each asset mentioned in subclause (i), the manner in which any capital cost not funded under the by-law was or will be funded;
- (c) a statement as to compliance with subsection 59.1 (1); and
- (d) any other information that is prescribed. 2015, c. 26, s. 7 (1).

Please find attached the 2019 Development Charges Annual Report.

**Conclusion:**

This attached report satisfies the requirements of the 2019 Development Charges Financial Statement.

**Recommendation:**

That the Treasurer-2020-08 report, dated April 24, 2020 regarding the 2019 Development Charges Financial Statement be received and that the statement be made available to the public by posting it on the Township web-page.

**Financial Impact:**

NA

**Strategic Plan Applicability:**

NA

**Sustainability Plan Applicability:**

NA

Dvelopment Charges Annual Report  
Year Ending December 31, 2019

Account	Purpose	Beginning Balance	Amounts Received	Amounts Transferred to Capital Projects	Project/Asset	Other Funding	Yr End Balance	Amount Refunded
05-00-0000-0901	Corporate	\$ 6,079.44	\$ 2,420.46	\$ -			\$ 8,499.90	0
05-04-0410-0901	Fire	\$ 5,351.24	\$ 4,797.41	\$ 5,000.00	Pumper (2018)	Reserves	\$ 5,148.65	0
					S79 Daleview RD \$30423.08 + S138 Douro 5th Line \$44083.83 +			
05-06-0600-0901	Public Works	\$ 56,750.32	\$ 46,164.90	\$ 100,000.00	S147 Douro 9th Line \$25493.09	Tax Revenue	\$ 2,915.22	0
05-16-1600-0901	Parks & Recreation	\$ 1,289.23	\$ 3,662.00	\$ 6,000.00	TRCK A0014 - Pick up Truck 2017	Reserves	\$ (1,048.77)	0
05-16-1640-0901	Library	\$ 5,617.27	\$ 8,988.00	\$ 14,000.00	Books - LTHR A0032		\$ 605.27	0

As Per the Development Charges Act Sub-Section 59.1 (1)  
The Township did not impose, directly or indirectly, a charge related to a development or a requirement to construct a service related to development, except as permitted by this Act or another Act. 2015, c. 26, s. 8.

Interest  
Accruals



**Overview:**

The Municipal Act states that the Treasurer of a municipality shall in each year on or before March 31 provide to the council of the municipality an itemized statement on remuneration and expenses paid in the previous year. Despite the Municipal Freedom of Information and Protection of Privacy Act this statement is public record.

**Financial Impact:**

Year - 2019		Shelagh Landsman	Jim Jones	Heather Watson	Karl Moher	Tom Watt
COUADJ	Committee of Adjustment	\$95			\$570	
COUPSB	Police Service Board					
COUHON	Council Honorarium	\$20,023	\$28,898	\$20,208	\$22,180	\$20,208
EMERPR	Emergency Preparedness	\$90			\$120	
COUHRL	Council Committee Pay					
	Total Honorarium Paid	\$20,208	\$28,898	\$20,208	\$22,870	\$20,208
COUMIL	Council Mileage	\$2,202	\$296	\$1,180	\$833	\$264
COUCNF	Council Conference	\$870		\$435		\$435
CSPALL	Training Session	\$73		\$73	\$145	
	BENEFITS	0		\$2,569		
	Total Remuneration	\$23,353	\$29,194	\$24,940	\$23,848	\$20,907

**Recommendation:**

That the Treasurer-2020-10 report, dated April 28, 2020 regarding 2019 Council Remuneration Statement be received for information.

**Overview:**

Over the years, staff have been trying to update some of the older Township policies to bring them up-to-date/current. Attached is an old policy, Years of Service Recognition, that is currently in effect, but is a out dated (due to staff currently working from home during the emergency situation, I do not have access to the policy number).

**Conclusion:**

One of the Township's most valuable resource is our staff. It is important to recognize the commitment and loyalty of the Township employees. In reviewing the various recognition policies of other municipalities in the area, please find attached an updated draft Years of Service Recognition Policy that has the following updates:

- References full-time staff
- Includes a monetary provision starting at five (5) years and going forward on five-year intervals
- Increased monetary provision for the years of service
- Removes reference to voucher and items that can be selected as a gift.
- Removes the engraved plaque
- Includes a provision for a retirement gift and places a maximum value on the retirement reception.

**Recommendation:**

That the Clerk/Planning-2020-20 report, dated April 6, 2020, regarding a draft Years of Service Recognition Policy and that the draft Years of Service Recognition Policy be adopted as Policy HR-9 and replace the previous version.

**Financial Impact:** Depending on the year, there would be a cost to the Township to recognize a certain full-time employee(s) depending on their years of service. Removing the engraved plaque will save the Township money as they are quite expensive to order.

**Strategic Plan Applicability:** n/a

**Sustainability Plan Applicability:** n/a

**Report Approval Details**

Document Title:	Policy - Years of Service Recognition.docx
Attachments:	- Draft - Years of Service Recognition Policy.docx- Old - Years of Service Policy.pdf
Final Approval Date:	Apr 6, 2020

This report and all of its attachments were approved and signed as outlined below:

Martina Chait-Hartwig

**Report Approval Details**

Document Title:	Policy - Years of Service Recognition.docx
Attachments:	- Old - Years of Service Policy.pdf - Draft - Years of Service Recognition Policy.pdf
Final Approval Date:	Apr 29, 2020

This report and all of its attachments were approved and signed as outlined below:

Martina Chait-Hartwig

## *Years of Service* Recognition Policy

Approved By: Council  
Approval Date:  
Effective Date:  
Revision Date:

### **Policy Statement**

To recognize long service council members and staff with the  
Township of Douro-Dummer

**Purpose:** this policy will provide criteria for recognizing council members and staff that have achieved specific lengths of service with the Township of Douro-Dummer (including the former Township of Douro and Township of Dummer).

**Application:** This policy applies to all members of council and staff.

**Definitions:** None

**Exclusions:** None

**References & Related Policies:** None

**Consequences of Non-Compliance:** None

**Review Cycle:** this policy shall be reviewed every 5 years by council.

## Procedures

The following steps shall be adhered to in order to implement this policy:

-For members of council and staff that have achieved significant levels of service with the Township of Douro-Dummer the following shall be the recognition that is provided to members of council and staff that qualify:

- **25 years of service:** A Certificate of Recognition and a \$250.00 voucher towards the purchase of a watch, figurine, painting, or other material item selected by the member of council or employee.
- **30 years of service:** A Certificate of Recognition to recognize the length of service.
- **35 years of service:** A Certificate of Recognition and a \$350.00 voucher towards the purchase of a watch, figurine, painting, or other material item selected by the member of council or employee.
- **Every 5 years thereafter:** A Certificate of Recognition and a voucher in the amounts listed below, towards the purchase of a watch, figurine, painting, or other material item selected by the member of council or employee.
  - 40 years of service- \$400.00
  - 45 years of service- \$450.00
  - 50 years of service- \$500.00
- The municipality shall also provide the necessary engraving or engraved plate to recognize the years of service that have been achieved.

Employee Recognition:

This policy shall provide a process for recognizing long term full-time employees with the Township of Douro-Dummer. It shall be the policy of this Township to recognize employees who have served with the municipality for 25 years, 30 years, 35 years, 40 years, 45 years, and 50 years.

Service with the municipality shall include service with the former municipalities of the Township of Douro and the Township of Dummer.

Employee recognition shall be the following:

25 years of Service: A \$250.00 voucher towards the purchase of either a watch, figurine, or painting, selected by the employee.

30 years of Service: A Certificate of Recognition of this milestone shall be presented by the Reeve.

35 years of Service: A Certificate of Recognition of this milestone shall be presented by the Reeve and a \$350.00 voucher towards the purchase of a watch, figurine, or painting, selected by the employee.

Every 5 years after 35 years of Service: A certificate of Recognition of the respective milestone of service shall be presented by the Reeve. In addition, a monetary contribution to a memento, to be selected by council, recognizing this event shall be presented to the employee. The monetary contribution shall be as follows:

40 years of Service- \$400.00

45 years of Service- \$450.00

50 years of Service- \$500.00

The municipality shall also provide the necessary engraving or engraved plate to recognize the years of service that have been reached.

## Staff Recognition Policy

Approved By: Council  
Approval Date:  
Effective Date:  
Revision Date:

### Policy Statement

To recognize the loyalty and dedication of employees retiring from the municipality and employees who have a significant length of service with the Municipality.

**Purpose:** This policy is to recognize the loyalty and dedication of employees retiring from the municipality and employees who have a significant length of service with the Township of Douro-Dummer (including the former Township of Douro and Township of Dummer).

**Application:** This policy applies to all full-time employees.

**Definitions:** None

**Exclusions:** This Staff Recognition Policy is not retroactive.

**References & Related Policies:** N/A

**Consequences of Non-Compliance:** N/A

**Review Cycle:** This policy will be reviewed on an as needed basis.

## Procedures

The following steps shall be adhered to in order in implement this policy:

### **Retirement:**

All full-time employees of the Township of Douro-Dummer will receive a retirement cash gift based on their years of service at a rate of \$10 per year plus \$200 as well as a certificate of recognition signed by the Mayor.

A reception for the retiring employee will be organized, at which time the gift and certificate will be presented valued at a maximum of \$500.

### **Years of Service Recognition:**

All full-time employees of the Township will be recognized for their length of service with a cash gift and an unframed certificate of recognition signed by the Mayor. The gift/cash value and certificate will be presented to the employee at a Council meeting or other such event as deemed appropriate by Council. The value of the gift/cash value will be determined by the years of service:

- **5 years of service:** A Certificate of Recognition and \$150.00
- **10 years of service:** A Certificate of Recognition and \$200.00
- **15 years of service:** A Certificate of Recognition and \$250.00
- **20 years of service:** A Certificate of Recognition and \$300.00
- **25 years of service:** A Certificate of Recognition and \$350.00
- **30 years of service:** A Certificate of Recognition and \$400.00
- **35 years of service:** A Certificate of Recognition and \$450.00
- **40 years of service:** A Certificate of Recognition and \$500.00
- **45 years of service:** A Certificate of Recognition and \$550.00
- **50 years of service:** A Certificate of Recognition and \$600.00



- Covid-19 Pandemic commenced in early March 2020 – the activation of the EOC, the creation of new policies, resolution of health and safety concerns, move to work at home set up for most employees, communications to Council, the public and staff have occupied a very large amount of time over the past two months. The pandemic has changed the way that the corporation functions and many new plans and processes have had to be put in place.
- Completed township roads tour to review issues and projects prior to Harold's retirement
- Interviews for the Manager of Public Works (12-month contract) position started but were put on hold because of Covid-19
- A Temporary Manager of Public Works was put into place
- Annual Performance Review process for all staff is almost complete
- Worked with the Parks and Recreation Department and Peterborough GreenUp on expanding the Sustainable Urban Neighbourhoods project to the Back Dam Park
- Continued to work with WSCS on Service and Organizational Review process
- Attended a number of meetings – multiple Staff & Management Team meetings, weekly Emergency Operations Control group, Peterborough Public Health information briefing, weekly calls with local OPP detachment, bi-weekly calls with Peterborough and the Kawarthas Economic Development, County-wide Waste Management
- Liaise with GHD regarding well monitoring reports and 2020 monitoring plan
- RFP process for the Curbside Pick-up and Roll Off Bins was completed and awarded to Waste Connections of Canada
- Reviewing RFP submissions for joint multi-Township and County Legal services procurement – report to be available shortly
- Received report from WSP regarding additional studies requested in regards to the Edwards Pit, report and results have been sent to Cambium Inc. for peer review prior to presenting the findings to Council.

- Continuing work on the process to implement the electronic agenda management system, including working on templates. Completed and recorded a zoom training session on report writing in eScribe for staff
- Continued work on a comprehensive list of ongoing matters/RFPs/Agreements (matters that need renewing/updating, etc.)
- Development Deposits – updated necessary development deposit accounts
- Staff have responded to various inquiries and virtually attended meetings regarding planning, minor variances, rezonings
- Following updates on the processing of planning during the COVID-19 pandemic
- Participated in Service Delivery and Organizational Review, individual interview, survey, etc.
- Followed up on installation of audio equipment for council chambers
- Prepared minutes, agendas, by-laws for Council,
- Updated Procedural; By-law regarding virtual attendance during emergency situations
- Staff Performance Reviews
- Submitted annual Weed Inspectors Form to Ministry
- Working from home setup
- Training/implementation of virtual zoom meetings and YouTube Livestreaming of Council meetings
- Attended various electronic (telephone, zoom) meetings for Emergency Operations Centre, planning pre-consultations
- Virtually attend weekly AMO web-castings regarding COVID-19 tips/tricks/discussions
- Working on staff recognition policy
- Working with DataFix regarding the PIN template letters for the 2022 election process
- Will be attending virtual MDS training

### Report Approval Details

Document Title:	Clerk-Planning - January 2020.docx
Attachments:	
Final Approval Date:	Feb 24, 2020

This report and all of its attachments were approved and signed as outlined below:

Martina Chait-Hartwig

**Report Approval Details**

Document Title:	Clerk-Planning - March-April 2020.docx
Attachments:	
Final Approval Date:	Apr 27, 2020

This report and all of its attachments were approved and signed as outlined below:

Martina Chait-Hartwig

### **Taxes**

Interim Billing was completed. With very little assistance this year Carol Anne was able to complete the interim billing.

The Final Tax Rate By-law is complete and is being presented to Council at the May 5<sup>th</sup>, 2020 budget meeting. Once the By-law is passed the final billing can proceed.

There is one account in tax registration with four more pending due to the COVID virus. Twenty-four accounts were sent demand letter from Howell Fleming.

Our PAP program continues to grow with 1082 monthly accounts and 442 due date accounts. This is approximately 25% of all tax accounts. In addition to this approximately 620 per month more electronic payments are received and uploaded into the Diamond system.

### **Financial**

The 2019 audit seems to be proceeding well. This year has been a bit of a challenge because of having to scan and upload all of the required documents that the auditor would normally find for themselves, look at and file back. This has been well over 100 documents to date. The final step in the audit is to put the 2019 asset in service, balance all of the WIP accounts and complete the asset continuity schedule.

The annual development charges report is complete.

The annual council remuneration report is complete.

Application has been made through Canada Summer Jobs for student funding. We have not heard yet if have been successful.

The 2020 budget process had a slow start this year but it is nearing completion. There are several capital purchases and projects budgeted for in 2020.

I continue to try and provide monthly financial reports to Managers and Council.

### **Computers**

The new PC's and laptops are up and running. Laptop were set up and deployed to all staff in order to allow working from home. Thank you to Peggy for working with MicroAge getting all the laptops working.

### **Payroll**

All year end procedures were completed and the payroll module closed for 2019. 136 T4's were issued. Mandatory deductions will be reconciled and annual reports submitted.

Two employees retired. All paper was submitted to Manulife and OMERS.

This report is regarding March & April monthly update from Douro-Dummer Fire Services

**Overview:**

- Training in March included Wildland firefighting and High Angle for SRU members.
  - Training was put on hold mid March during onset of COVID-19
  - Training in April started out with online Accessibility for firefighters and we did Pump Operations by Platoons limiting to 4 firefighters and an Officer.
- Meeting with LCS about residences and future layout of new and existing buildings
- Attended Peterborough County Chiefs Meeting
- Deputy Chief's Mutual Aid Meeting in Donwood
- Planning and held EOC meetings – declaration of Emergency
- Planning and working through issues due to impacts of COVID-19
- Submit Naloxone Reporting - quarterly
- Submit PPE inventory to province – weekly
- Adjust response protocols for Corona Virus (2019-nCoV) screening - ongoing
- Service Delivery Review – Meetings and provide answers and documents as requested to consultants
- In February, we attended 26 calls for help, resulting in 32 station responses and 53 fire apparatus deployments plus automatic aid response. Compared to February 2019, we had 25 calls for help
- In March, we attended 40 calls for help, resulting in 55 station responses and 98 apparatus deployments, plus automatic aid response. Compared to March 2019, we had 31 calls for help.
- So far in April (up to 22<sup>nd</sup>) we have 39 calls for help, resulting in 8 station responses and 118 apparatus deployments, plus automatic aid response.
- As a comparative number, but not including station assist type of calls, January had 17 medical calls, resulting in just over 56% of calls, February had 18 medical calls, resulting in just under 70% of calls, and March had 23 medical calls, resulting in 60% of calls. So far in April we had 17 medical calls, resulting in 42.5% of calls. In April open air burning related issues has resulted in 17 responses as well, so far.



- Developed work plans for continuity of operations
- Continuation of staff meetings, conference calls, video tutorials
- Ongoing webinars, newsletters
- Research & staying abreast on Parks, Recreation and Facilities Industry on adapting and the impact of Covid-19
- Consideration for long-term effects, loss of revenue, impact on programming, staffing levels, restoration of public confidence, and changes to procedures
- Ongoing reconciliation of outstanding accounts, invoices, refunds, payments
- Ongoing emails, inquiries from public, user groups, suppliers
- Correspondence with grant opportunities, consultants, and committees

## **Departmental Update:**

### **1. Roads Division:**

#### **a. Attended the following teleconferences:**

- Management team meeting
- EOC team meeting
- Local Public Works Pandemic Response
- Waste Management Pandemic Working Group

#### **b. Operational:**

- Winter maintenance activities – Sanding as required
- Staff completed maintenance on equipment when time permits. All winter apparatus, plows and wings have been removed
- Load Restriction signs were removed May 1, 2020
- Patching various roads as needed
- Grading when weather permits – all roads within the township have been graded at least once
- Project brushing completed on Cooney Island Rd, Oke Rd, and Ninth Line Douro
- Spot brushing is currently underway at Fourth Line South Dummer, Douro Eighth Line Road North & South, Douglas Rd, Young's Point, Transfer Station
- Preparing sweeping equipment for sweeping operations and the installation of water tanks on trucks
- Sweeping commenced in Donwood on April 20 and continuing throughout the township, this generally takes 2 weeks to complete (weather dependent)
- Speed limit signs installed on Indacom Drive
- Installation of 911 signs and street signs as needed
- Emergency culvert replacement on Carlow Line due to culvert failure
- Plugged culverts at Twelfth Line Road Dummer and Douro Fourth Line Road due to beavers
- GPS installations on trucks/equipment has been delayed due to COVID-19
- MESH is moving forward, gathering information required by GO EVO
- Parks employee temporarily transferred to Roads due to COVID-19 – unable to hire part time staff, this helps with road staff complement



**c. Training:**

- Annual mandatory training for Public Works staff which includes WHMIS, AODA and Human Rights Code training is currently underway

**d. Health & Safety:**

- COVID-19 in the workplace: Ensuring that all necessary Health & Safety precautions are being consistently done such as: all staff equipped with the proper Personal Protective Equipment (PPE), hand sanitizer and wipes for vehicles and sanitizing products are located in the depot.

**2. Waste Management Division:**

- On March 24, 2020 the Halls Glen Transfer Station was closed for health and safety reasons due COVID-19
- Transfer station attendant temporarily relocated to public works to assist with cleaning of vehicles, equipment and depot
- Attendant completing spring cleaning at transfer station grounds

**The Corporation of the Township of Douro-Dummer**

**By-Law No. 2020-26**

**Being a By-Law**

**to provide for the adoption of tax rates and to further provide  
for penalty and interest in default of payment for 2020**

**Whereas** the Municipal Act, 2001, S.O. 2001, c.25 Section 290 (1) provides that a local municipality shall in each year prepare and adopt a budget including estimates of all sums required during the year for the purposes of the municipality; and

**Whereas** the Municipal Act, 2001, S.O. 2001, c.25 Section 312 (2) provides that for the purposes of raising the general local municipality levy, a local municipality shall, each year, pass a by-law levying a separate tax rate, as specified in the by-law, on the assessment in each property class in the local municipality rate-able for local municipality purposes; and

**Whereas** the Municipal Act, 2001, S.O., 2001, c. 25 Section 312 (6) (2) provides that the tax rates on the different classes of property must be in the same proportion to each other as the tax ratios established under Section 308 for the property classes are to each other; and

**Whereas** certain regulations requires reductions in certain tax rates for certain classes or subclasses of property; and

**Now Therefore** the Council of the Corporation of the Township of Douro-Dummer hereby enacts as follows:

1. That the estimates of all sums required during the year 2020 for the purposes of the municipality requiring a levy of **\$5,486,498.08** be hereby adopted.
2. That the tax rates in Schedule A be applied against the whole of the assessment for real property for Municipal, Education and County purposes.
3. That every owner shall be taxed according to the municipal tax rates in this by-law and such tax rates shall become due and payable in two installments as follows:

50% of the final Residential and Commercial/Industrial levy becomes due and payable on the 30<sup>th</sup> day of June 2020 and the balance of the final levy, rounded up to the next whole dollar shall become due and payable on the 30<sup>th</sup> day of September 2020 and non-payment of the amount, as noted, on the dates stated in accordance with this section shall constitute default. Any adjustments for the 2020 taxation year, either increases or decreases, shall be applied to the calculated installments and the net amount adjusted accordingly.

4. On all taxes of the levy, which are in default on the 1<sup>st</sup> day of default, a penalty of 1.25% shall be added and thereafter a penalty of 1.25% per month, or part thereof will be added each and every month, the default continues, until December 31<sup>st</sup>, 2020.
5. Penalties and interest added in default shall become due and payable and shall be collected as if the same had originally been imposed and formed part of such unpaid tax levy.

6. The collector may mail or cause the same to be mailed to the residence or place of business of such person indicated on the last revised assessment roll, a written or printed notice specifying the amount of taxes payable.
7. That taxes are payable to the Township of Douro-Dummer.

Passed in open council this 5<sup>th</sup> day of May, 2020

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Mayor, J. Murray Jones

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Clerk, Crystal McMillan

Schedule 'A' to By-law 2020-26

2020	FINAL	Upper	Curbside	Depot	Total	MUN	EDUC	TOTAL
	SCHEDULE A	Tier			County	RATE	RATE	RATE
		general						
CFN	COMM. PAYMENT IN LIEU (FULL)	0.00361369	0.00021652	0.00001751	0.00384772	0.00393591	0.00980000	0.01758363
CJN	COM TAXABLE-VL SHARED PIL	0.00252958	0.00015156	0.00001226	0.0026934	0.00259869	0.00980000	0.01509209
CTN	COMMERCIAL TAXABLE:FULL	0.00361369	0.00021652	0.00001751	0.00384772	0.00393591	0.00980000	0.01758363
CGN	COMMERCIAL PIL GENERAL	0.00361369	0.00021652	0.00001751	0.00384772	0.00393591	0.00980000	0.01758363
CUN	COMM TAX:VACANT/EXCESS LAND	0.00252958	0.00015156	0.00001226	0.0026934	0.00275514	0.00980000	0.01524854
CVN	COMM PAYINLIEU:FULL VACANT UNI	0.00252958	0.00015156	0.00001226	0.0026934	0.00275514	0.00980000	0.01524854
CXN	COMM TAX - VACANT LAND	0.00252958	0.00015156	0.00001226	0.0026934	0.00275514	0.00980000	0.01524854
CYN	COMM PAY IN LIEU FULL VAC LAND	0.00252958	0.00015156	0.00001226	0.0026934	0.00275514	0.00980000	0.01524854
XTN	NEW CONSTRUCTION	0.00361369	0.00021652	0.00001751	0.00384772	0.00393591	0.00980000	0.01758363
E N	EXEMPT NO SUPPORT				0			0
FTEP	FARM TAXABLE FULL ENG PUBLIC	0.00082234	0.00004927	0.00000398	0.00087559	0.00089567	0.00038250	0.00215376
FTES	FARM TAX FULL ENGLISH SEPARATE	0.00082234	0.00004927	0.00000398	0.00087559	0.00089567	0.00038250	0.00215376
FTFS	FARM TAX FULL FRENCH SEPARATE	0.00082234	0.00004927	0.00000398	0.00087559	0.00089567	0.00038250	0.00215376
IFN	INDUSTRIAL PAYINLIEU FULL	0.00507614	0.00030414	0.0000246	0.00540488	0.00552877	0.01250000	0.02343365
IHN	INDUSTRIAL TAX:FULL SHARED PIL	0.00507614	0.00030414	0.0000246	0.00540488	0.00552877	0.01250000	0.02343365
ITN	INDUSTRIAL TAXABLE FULL	0.00507614	0.00030414	0.0000246	0.00540488	0.00552877	0.01250000	0.02343365
IUN	INDUST TAX VACANT UNIT/EXCESS	0.00329949	0.00019769	0.00001599	0.00351317	0.00359370	0.01250000	0.01960687
XUN	COMM TAX NEW EXCESS LAND	0.00252958	0.00015156	0.00001226	0.0026934	0.00275514	0.00980000	0.01524854
IXN	INDUST TAX VACANT LAND	0.00329949	0.00019769	0.00001599	0.00351317	0.00359370	0.01250000	0.01960687
JTN	INDUST TAX - NEW CONSTRUCTION	0.00507614	0.00030414	0.0000246	0.00540488	0.00552877	0.00980000	0.02073365
JUN	INDUST TAX - NEW EXCESS LANE	0.00329949	0.00019769	0.00001599	0.00351317	0.00359370	0.00980000	0.01690687
PTN	PIPELINE TAX FULL	0.00308739	0.00018498	0.00001496	0.00328733	0.00336269	0.00980000	0.01645002
RFEP	RES/FARM PAY IN LIEU E P	0.00328936	0.00019708	0.00001594	0.00350238	0.00358266	0.00153000	0.00861504
RGN	RES/FARM PAYINLIEU GENERAL	0.00328936	0.00019708	0.00001594	0.00350238	0.00358266	0.00153000	0.00861504
RTEP	RES/FARM TAX:FULL ENGLISH PUB.	0.00328936	0.00019708	0.00001594	0.00350238	0.00358266	0.00153000	0.00861504
RTES	RES/FARM TAX:FULL ENGLISH SEP.	0.00328936	0.00019708	0.00001594	0.00350238	0.00358266	0.00153000	0.00861504
RTFP	RES/FARM TAX:FULL FRENCH PUB.	0.00328936	0.00019708	0.00001594	0.00350238	0.00358266	0.00153000	0.00861504
RTFS	RES/FARM TAX: FULL FR. SEPARATE	0.00328936	0.00019708	0.00001594	0.00350238	0.00358266	0.00153000	0.00861504
RTN	RES/FARM TAX: FULL NO SUPPORT	0.00328936	0.00019708	0.00001594	0.00350238	0.00358266	0.00153000	0.00861504
TTEP	MANAGED FOREST TAX FULL EP	0.00082234	0.00004927	0.00000398	0.00087559	0.00089567	0.00038250	0.00215376
TTES	MANAGED FOREST TAX FULL ES	0.00082234	0.00004927	0.00000398	0.00087559	0.00089567	0.00038250	0.00215376
TTFP	MANAGED FOREST TX FULL FP	0.00082234	0.00004927	0.00000398	0.00087559	0.00089567	0.00038250	0.00215376
TTFS	MANAGED FOREST TX FULL FS	0.00082234	0.00004927	0.00000398	0.00087559	0.00089567	0.00038250	0.00215376
	MINIMUM TAX BILL					15.00		



April 21, 2020

To: Municipalities of Ontario – by email

**Re: A Resolution to Request the Province of Ontario Review the Farm Property Class Tax Rate Programme in Light of Economic Competitiveness Concerns between Rural and Urban Municipalities**

Please be advised that at its March 10, 2020 meeting, the Council of the Township of Mapleton carried the following Resolution 2020-04-14:

WHEREAS the Province of Ontario implemented changes to property assessment and introduced taxation reform which came into effect in 1998;  
AND WHEREAS prior to 1998 farm properties were subject to taxation at the base residential tax rate and qualified farmers applied annually to the province to be reimbursed 75% of the farm portion of the taxes paid to the local municipality;  
AND WHEREAS the province changed the method of delivering farmer's rebates by creating the Farm Property Class Tax Rate Programme under the jurisdiction of the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA);  
AND WHEREAS rather than apply annually and wait for property tax rebates, the delivery of the programme shifted to local municipal governments and onto the property tax system;  
AND WHEREAS eligible farmland assessment values are now locally subsidized by 75% of their full current value assessment (CVA) to produce a lower weighted assessment base which is used for tax rate setting purposes;  
AND WHEREAS the effect of the locally subsidized weighted assessment shifts an increased burden of tax onto all other property classes within the municipality;  
AND WHEREAS these taxation reforms were originally supposed to be revenue neutral and offset by funding from the Ontario Municipal Partnership Fund (OMPF) and its predecessor the Community Reinvestment Fund (CRF);  
AND WHEREAS the province has been reducing support from the Ontario Municipal Partnership Fund while the cost of the farm tax rebate programme is continuously increasing;  
AND WHEREAS an economically competitive agricultural industry provides affordable food and agricultural products to all Ontarians and is a provincial objective that should be cost shared amongst all of its citizens;  
AND WHEREAS the cost of this programme disproportionately falls upon property taxpayers in rural municipalities;  
AND WHEREAS higher property taxes in rural municipalities is creating economic competitiveness issues between rural and urban municipalities;

(over for page two)



Page 2 of 2, Mapleton Resolution

Re: Prov. Review of Farm Property Class Tax Rate Programme

AND WHEREAS the province hasn't undertaken a review of this programme since it was implemented in 1998;

NOW THEREFORE the Council of the Township of Mapleton requests that:

1. The Province of Ontario undertake a review of the Farm Property Tax Class Rate Programme to determine:
  - a. The appropriateness of the cost of the Farm Property Tax Class Rate Programme falling disproportionately amongst rural residential and business property owners when the benefit of an economically competitive agricultural industry and affordable food and agricultural products is a provincial objective that should be shared amongst all taxpayers in Ontario;
  - b. The adequacy of funding being provided to rural municipalities to offset the cost of the Farm Property Tax Class Rate Programme;
  - c. The differences between the amount of property taxes paid in rural and urban municipalities and the root causes of those differences;
  - d. Economic competitiveness concerns with disproportionately higher average property taxes being paid in rural municipalities;
  - e. Other methods of delivering the farm tax rebate programme to farmland owners where the cost can be shared province-wide.

AND BE IT FURTHER RESOLVED THAT this motion be sent to Hon. Doug Ford, Premier of Ontario, Hon. Steve Clark, Minister of Municipal Affairs and Housing, Hon. Rod Phillips, Minister of Finance, Hon. Ernie Hardeman, Minister of Agriculture, Food & Rural Affairs, MPP Randy Pettapiece, Hon. Ted Arnott, all Ontario Municipalities, Rural Ontario Municipal Association (ROMA) and Association of Municipalities of Ontario (AMO).

Attached you will find the County of Wellington Committee Report dated January 16, 2020 regarding the 'Farm Property Class Tax Rate Programme' for review and consideration.

Should you have any questions or concerns, please contact the undersigned.

Sincerely

Larry Wheeler  
Deputy Clerk

Attach. (1)



# COUNTY OF WELLINGTON

## COMMITTEE REPORT

**To:** Chair and Members of the Administration, Finance and Human Resources Committee  
**From:** Ken DeHart, County Treasurer  
**Date:** Thursday, January 16, 2020  
**Subject:** Farm Property Class Tax Rate Programme

### Background:

The Province of Ontario implemented changes to property assessment and introduced taxation reform which came into effect in 1998. Prior to this, farm properties were subject to taxation at the base residential tax rate and farmers applied annually to the Minister of Finance to be reimbursed 75% of the farm portion of taxes paid to the local municipality.

As part of assessment reform, the Province changed the method of delivering farmer's rebates by creating the Farm Property Class Tax Rate Programme under the jurisdiction of the Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA). Under the new programme, rather than apply annually and wait for property tax rebates, delivery of the programme shifted to local municipal governments and onto the property tax system. Eligible farmland assessment values are now discounted by -75% of their full current value assessment (CVA) to produce a lower weighted assessment base which is used for tax rate setting purposes. With residential tax rates being the benchmark ratio of 1.0, farmlands have been set in legislation to have a 0.25 ratio or lower. The effect of the discounted weighted assessment shifts an increased burden of tax onto all other property classes in the County by way of increasing the benchmark tax rate. Doing so has a pronounced effect on the residential sector which comprises 78% of the County's levy base. By comparison, farmland taxes comprise 7% of the total levy base.

	2019 CVA	% raw CVA	WTD CVA	% Wtd CVA	2019 Levy	% of Levy
<b>Residential</b>	<b>12,584,607,345</b>	<b>68.02%</b>	<b>12,584,474,157</b>	<b>77.91%</b>	<b>77,709,877</b>	<b>77.91%</b>
Multi Residential	86,932,592	0.47%	165,171,925	1.02%	1,019,946	1.02%
<b>Farmland</b>	<b>4,499,862,369</b>	<b>24.32%</b>	<b>1,124,965,592</b>	<b>6.96%</b>	<b>6,946,730</b>	<b>6.96%</b>
Commercial	863,761,038	4.67%	1,287,867,708	7.97%	7,952,660	7.97%
Industrial	368,081,028	1.99%	882,959,280	5.47%	5,452,326	5.47%
Pipeline	41,303,954	0.22%	92,933,897	0.58%	573,872	0.58%
Managed Forest	55,959,714	0.30%	13,989,929	0.09%	86,389	0.09%
County Total	18,500,508,040	100.00%	16,152,362,486	100.00%	99,741,800	100.00%

### Challenges facing Rural Municipalities

Shifting of farmland discounted assessment onto residential taxpayers is specific to rural municipalities. Schedule A shows the difference between raw (unweighted) assessment roll values and resulting weighted assessment in Wellington County as compared to a typical urban municipality. In 2019 the residential tax class comprised 68.02% of Wellington County's assessment base, but the residential class pays 77.91% of property taxes once tax ratios are factored in. The farmland ratio of 0.25 has the effect of increasing the residential tax burden by approximately 10% across the County.

Conversely, in an urban municipality with very little farm tax class, the residential assessment base of 78.50% is reduced to 66.27% of total weighted assessment used for tax rate setting purposes. A reduction of more than 12% off the residential tax burden. This causes Wellington County economic competitiveness issues for the County's southern municipalities that border a number of urban municipal centres. Tax policy treatment greatly favours urban municipalities in Ontario.

Since the cost of providing the Farm Property Class Tax Rate Programme was downloaded by the province in 1998; provincial funds have been allocated annually to rural municipalities to offset the tax loss. This was supposed to be a revenue neutral allocation. However, each year transfer amounts from the Ontario Municipal Partnership Fund (OMPF) continue to decline. The Table below shows that a total tax levy of \$34,669,691 was necessary in order to provide the farmland tax incentive rebate benefiting 5,807 farm property owners in Wellington. The OMPF allocation county-wide in 2019 was \$7,065,800 leaving a shortfall of more than \$27 million in levy which is shifted onto every other property owner in Wellington County. This translates to \$754 per property in the County or 15.7% of total taxes for the typical homeowner. This is a significant amount of additional property tax burden that our residents continue to bear annually and which are subject to increase depending on market value of farmlands.

In essence, County residents are providing the -75% rebate instead of the Province for the Farm Property Class Tax Rate Programme, creating significant financial hardship amongst our ratepayers and limiting the County's economic competitiveness with neighbouring jurisdictions.

**WELLINGTON COUNTY - 2019 FARMLAND PROPERTIES**  
**OMPF FUNDING TO MITIGATE COST OF FARM PROPERTY CLASS TAX REBATE**

<b>Municipality</b>	<b>Municipal Rebates</b>	<b>Municipal OMPF Grant</b>	<b>Municipal Levy Impact</b>	<b>County Rebate* Distribution</b>	<b>Total Additional Levy Required</b>
Puslinch	\$ 232,040	\$ 415,700	\$ (183,660)	\$ 2,846,353	\$ 2,662,693
Guelph/Eramosa	\$ 1,137,235	\$ 490,300	\$ 646,935	\$ 3,120,713	\$ 3,767,649
Erin	\$ 890,468	\$ 593,300	\$ 297,168	\$ 2,852,697	\$ 3,149,866
Centre Wellington	\$ 1,987,127	\$ 319,600	\$ 1,667,527	\$ 5,553,231	\$ 7,220,758
Mapleton	\$ 5,235,570	\$ 837,400	\$ 4,398,170	\$ 1,961,338	\$ 6,359,507
Minto	\$ 1,446,483	\$ 1,604,600	\$ (158,117)	\$ 1,153,001	\$ 994,884
Wellington North	\$ 2,900,554	\$ 1,296,800	\$ 1,603,754	\$ 1,844,780	\$ 3,448,534
Wellington County	\$ 20,840,213	\$ 1,508,100	\$ 19,332,113		
<b>Total</b>	<b>\$ 34,669,691</b>	<b>\$ 7,065,800</b>	<b>\$ 27,603,891</b>	<b>\$ 19,332,113</b>	<b>\$ 27,603,891</b>

**Additional levy required to provide farm rebate after OMPF grant**

<b>Total Properties **</b>	36,607	<b>Tax per property</b>	<b>\$754</b>
<b>Less # of Farms</b>	5,807		
	30,800	<b>Excluding farms</b>	<b>\$896</b>
<b>Population</b>	<b>97,610</b>	<b>Tax per resident</b>	<b>\$283</b>

\* County farm rebate distribution based on local municipal levy % share

\*\* excludes special/exempt properties



## Farm Application Deadline Requirements

Another challenge faced by rural municipalities is how the farm application and deadline requirements are administered by OMAFRA (now by AgriCorp). In any given year, many farm owners do not submit their applications within the specified deadline. The result is that many bona fide farm properties end up 'flipping' out of the discounted farm class and into the full residential tax class upon the next roll return. The assessment of these farm values are no longer discounted when calculating total weighted assessment, which is used for tax rate setting purposes.

This creates two distinct ongoing problems for rural municipalities. One is that the benchmark residential tax rate is lower than it otherwise would be; and two, upon approval of the late applications by OMAFRA, municipalities must refund the -75% difference in farm taxes retroactive to January of the current or sometimes even the preceding taxation year. There is no administrative or monetary penalty for late applications. Each year Wellington County finds approximately \$20,000,000 of farmland valuation excluded from the farmland discount programme due to late applications.

This year staff identified a major anomaly with farmland assessment loss of close to \$90,000,000. Upon enquiry, it was reasoned that the extremely high change in farm CVA was due to administrative changes as programme delivery shifted from OMAFRA to AgriCorp. County staff expect that most of the outstanding farm applications will be approved and revert back to the farm tax rate during 2020. Staff have included an additional \$300,000 in estimated property tax write-offs into the 2020 budget to set aside additional funds in preparation for the County's share of potential write-offs as tabled below:

### 2019 FARMLAND CVA CHANGE OVER TO RESIDENTIAL RT CLASS

(Between September 25 in-year growth and final November 2019 growth)

Possible write-off amounts IF all properties revert back to AGRICORP approved FTIP

	PUSLINCH	GET	ERIN	CTR WELL	MPLTN	MINTO	WN	COUNTY
Est Prop Count	-20	-24	-26	-18	-22	-19	-28	-157
Farm CVA Loss	8,500,000	17,500,000	13,000,000	10,000,000	19,000,000	5,000,000	16,500,000	89,500,000
Res Tax Rate	0.00167135	0.00260652	0.00295749	0.00321969	0.00476387	0.00544891	0.00481749	0.00617506
Res Taxes	14,206	45,614	38,447	32,197	90,514	27,245	79,489	552,668
Farm Tax Rate	0.00041784	0.00065163	0.00073938	0.00080492	0.00119097	0.00136223	0.00120437	0.00154376
Farm Taxes	3,552	11,404	9,612	8,049	22,628	6,811	19,872	138,167
<b>Potential w/o *</b>	<b>(\$10,655)</b>	<b>(\$34,211)</b>	<b>(\$28,835)</b>	<b>(\$24,148)</b>	<b>(\$67,885)</b>	<b>(\$20,433)</b>	<b>(\$59,616)</b>	<b>(\$414,501)</b>
							<b>Grand Total*</b>	<b>(\$660,285)</b>

\* excludes Education Tax Component

## Farmland Property Assessment Valuation

The Municipal Property Assessment Corporation (MPAC) is responsible for placing current market value assessment (CVA) on all properties in Ontario. The most recent province-wide reassessment updating the base year to January 1, 2016 was returned for the 2017 tax year. As mandated by the Province, any assessment increases are phased-in over a 4-year cycle. MPAC reported the average farmland increase province-wide was 64% and residential CVA increased by 18%. By comparison, Wellington County CVA has increased by 68% and 13% respectively.

In the 2016 Assessment Update Summary, MPAC reports they have strengthened the accuracy and equity of farm valuations by improved sales verification processes of bona fide farmer-to-farmer sales along with undertaking a comprehensive review of vacant farmland sales as far back as January 2008. They report that upward trends continue to increase provincially as demand for farmland outweighs the supply and non-agricultural buyers continue to purchase farmlands creating competition. Agri-Food Canada reported the net worth of an average farm was expected to reach \$2.8 million in 2017.

Staff conducted a preliminary review of open market farm sales in Wellington County during 2018 and 2019. The data reveals that the current 2016 base year CVA of farm properties sold continue to be under-assessed by 27.43%. Sale prices ranged from \$26,000 to \$4,200,000.

<b>Wellington County</b>	<b>2019 Farm Sales</b>	<b>2018 Farm Sales</b>	<b>Total Sales</b>
Number of valid farm sales	97	108	205
Total CVA of farm sales	90,515,500	89,366,400	179,881,900
Combined sale prices	130,333,790	117,533,356	247,867,146
Difference sales to assessment	39,818,290	28,166,956	67,985,246
As a percentage	30.55%	23.97%	27.43%

\* source MPAC Municipal Connect

### **Assessment Act Considerations**

Current value assessment is defined as “the amount of money the fee simple, if unencumbered, would realize if sold at arm’s length by a willing seller to a willing buyer.” For farm properties, the province has clearly indicated that farm properties are to be treated different from the concept of current value. Section 19(5) of the Assessment Act requires that current value of the land and buildings should only be used when sales are for farm-purposes only and reflect the productivity of the land for farming purposes.

MPAC assessment methods must only consider farmer-to-farmer sales. In this case, the Assessment Act requires MPAC to exclude any sales to persons whose principal occupation is other than farming. This has the effect of excluding any other type of buyer and highest and best-use considerations from current value assessment.

From a land productivity perspective, land classes are adjusted for their productivity. For example, Class 1 farmlands are the most productive for crops, while on the other end of the scale, Class 6 is for swamp and scrublands that are the least productive. Lands in Wellington County and in particular, the southern portion of the County sell for far more per acre than what farms are assessed at for farm purposes. Analysis undertaken with regard to current assessment appeals shows that the best lands (Class 1) are currently being assessed in the \$14,000 to \$16,000 per acre range for farms. Sales of larger land holdings are selling in the range of \$20,000 to \$25,000 per acre range.

The intent of Section 19(5) of the Assessment Act is to limit and protect farm property from current value considerations outside of farming. This means that generally speaking, farms are naturally under-assessed from general market considerations – providing favourable assessments to the farming community in comparison to true market value.

### Other Assessment Considerations

- Farm owners who reside on the property do pay a residential tax component for their home plus one acre of land at the farmland rate. However, the valuation is based on a replacement cost method that produces a much lower value (\$223,125) than non-farm residences (\$424,187) as shown here on the average (County) property value and tax comparison.

#### Average 2019 Farm and Residential Value and Taxes

2019 farm house CVA	223,125	<b>2019 Average Residential Property CVA</b>	<b>\$424,187</b>
2019 Farmland CVA	901,900		
<b>Average 2019 total farm CVA</b>	<b>\$1,125,025</b>		
2019 farm house taxes	\$2,526		
2019 farmland taxes	\$2,553		
<b>2019 total farm taxes</b>	<b>\$5,079</b>	<b>2019 Average residential taxes</b>	<b>\$4,803</b>

- As seen above, while the average farm value is assessed at over 2.6x the value of the average residential property, overall taxes are comparable.
- According to MPAC's 2019 Market Change Profile report, of the 6,465 properties classified as farms, 1,892 are owned and/or occupied by non-farmers. Although the property owners are not engaged in farm activity or business, their properties are valued as if they are. These non-farmers benefit from lower residential structure values and lower land values, which translate to lower taxes simply by nature of leasing their land to a bona fide local farmer. This treatment can be perceived as rather unfair to typical residential property owners in Wellington County.
- Many owners of farmland also enjoy other property tax discounts if they are eligible to enter into either the Managed Forest Tax Incentive Programme (0.25 ratio) or the Conservation Land Programme which is fully exempt from property taxes.
- In order to receive the farm class tax discount, the owner must have a Farm License and be in the business of farming. Municipal taxes paid are then able to be written off as a business expense on annual income tax returns. Whereas residential property owners are not able to do so.

### Impacts of Assessment Increases on the Farming Community

Being predominantly a rural community with strong roots planted in farm trades, Wellington County farmers observed significant increases in their farmland valuation. It is acknowledged that farmland values have increased significantly in the County of Wellington. In the 2012 base year valuation, farmland made up 19.8% of the County's assessment base and 5.4% of the taxable assessment base. For the 2016 base year valuation, farmland now makes up 25.1% of the Wellington County assessment base and 7.2% of the taxable assessment base.

Recently, groups such as the Christian Farmers Federation of Ontario (see correspondence received on this agenda) and the Ontario Federation of Agriculture began approaching local Councils to lower the farmland ratio below 0.25 in order to help offset property tax increases. Their efforts have been successful in some municipalities. Schedule B lists the municipalities that have implemented farmland ratio reductions in Ontario as reported to BMA Consultants in the 2019 Municipal Study Report.

When reviewing the list of municipalities on Schedule B, the majority of those municipalities have very little farmland valuation. Many of the urban municipalities that have granted farm ratio reductions have a much higher commercial and industrial base and farmland makes up a much lower percentage of their assessment base than Wellington County.

Many of the other Counties and rural municipalities that have granted ratio reductions (Brant, Chatham-Kent, Dufferin, Grey, Lambton and Oxford) are located further away from the GTA. These municipalities generally have lower residential assessment values and are not competing with GTA municipalities for business to the same extent as Wellington County.

### Property Taxes as a Percentage of Income

- OMAFRA reported that in 2018, Wellington County farmers generated \$804,000,000 of revenue at the farm gate. The table below shows farm property taxes as a percentage of farm income to be 1.49%. Average household income in Wellington County for the same period was \$118,474. Average property tax as a percentage of residential income was significantly higher at 4.02%.

<b>Average Farm and Residential Assessment and Taxation</b>	<b>2018</b>
County average residential value	409,368
Total average property taxes *	4,764
Average income	118,474
<b>Portion of residential income devoted to property taxes</b>	<b>4.02%</b>
 Total farm taxes paid in Wellington County *	 11,971,488
County farmers income **	804,000,000
<b>Portion of farm income devoted to property taxes</b>	<b>1.49%</b>

\* total taxes include County, local and Education

### Closing Comments

Farmland values have been increasing significantly in the County of Wellington, much like other areas of the province. However, there does not appear to be an imbalance in the level of property tax burden shared by the local farming community in comparison to the average residential taxpayer in Wellington County. Under current legislation, farmland benefits from favourable property tax and assessment treatment.

The County's current assessment base cannot bear a further shift from farmland taxes onto other property types and maintain its economic competitiveness. Wellington County does not have a comparable commercial and industrial assessment base to neighbouring urban municipalities that would support such a shift without significantly burdening our residential and business class owners. Provincial grants such as the Ontario Municipal Partnership Fund, which were originally setup to compensate rural municipalities for the loss in farm taxes has been declining, leaving Wellington County taxpayers to support the industry without adequate province-wide cost sharing.

Wellington County is supportive of its local farming community. We recognize the importance of the agricultural industry on the County and in the Province of Ontario. Wellington supports the farming communities' interests in remaining economically competitive. The County is supportive of returning

the responsibility of funding the farm property class tax rebate programme back to the Province where it could be shared province-wide. Residents in urban municipalities, while retaining the benefits of cheap food and agricultural products, are not contributing financially to the economic competitiveness of the industry.

**Recommendation:**

That the Farm Property Class Tax Rate Programme report be received for information; and

That Wellington County support agricultural industry efforts in lobbying the Province to provide adequate funding to rural municipalities; and

That County Council pass a resolution in support of returning the responsibility of administering the Farm Property Class Tax Rate Programme back to the Province.

Respectfully submitted,

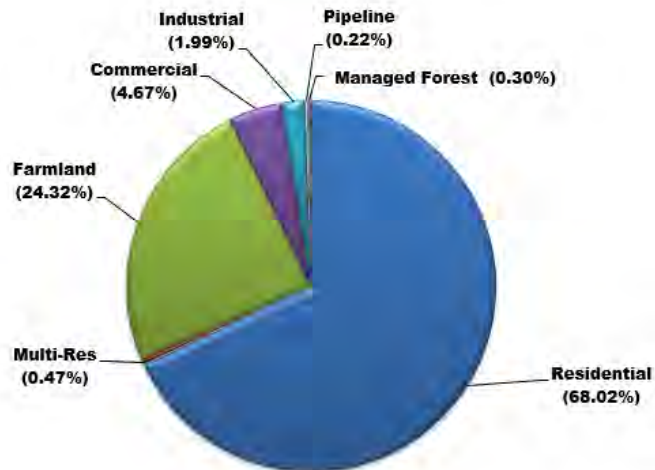
A handwritten signature in black ink, appearing to read 'Ken DeHart', with a stylized flourish at the end.

Ken DeHart, CPA, CGA  
County Treasurer

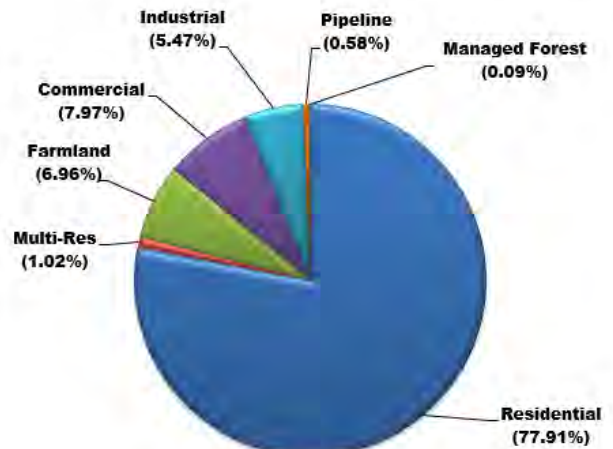
# SCHEDULE A

## Farm Property Class Tax Rate Programme

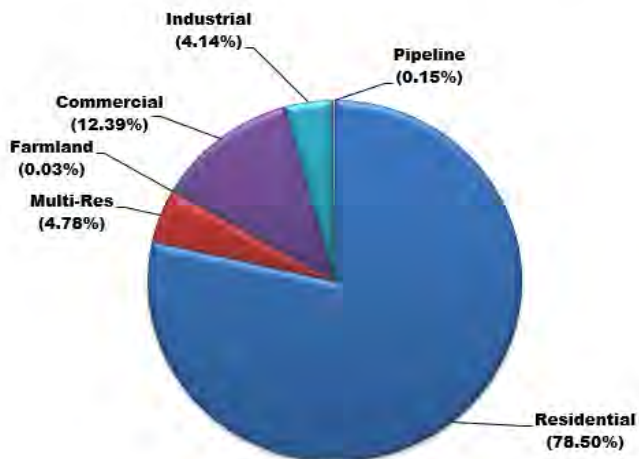
Unweighted Assessment by Property Tax Class 2019  
(Share of Property Value - Wellington - Rural)



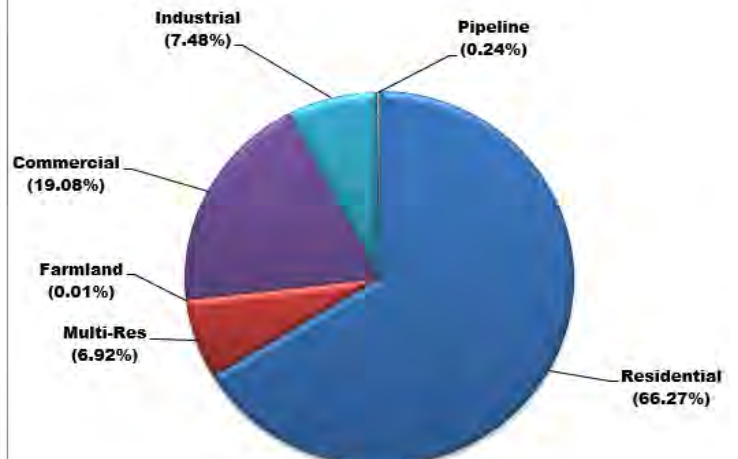
Weighted Assessment by Property Tax Class 2019  
(Share of Property Taxes - Wellington - Rural)



Unweighted Assessment by Property Tax Class 2019  
(Share of Property Value - Urban)



Weighted Assessment by Property Tax Class 2019  
(Share of Property Taxes - Urban)



## SCHEDULE B

### Farm Property Class Tax Rate Programme

#### Municipalities with Farmland Ratio Reductions Implemented - 2019

Municipality *	Ratio	Farmland CVA **
Brant County	0.2400	1,319,886,818
Caledon	0.1708	998,099,123
Chatham-Kent	0.2200	5,281,633,220
Dufferin County	0.2300	1,174,945,084
Durham Region	0.2000	2,416,491,305
Greater Sudbury	0.2000	30,618,833
Grey County	0.2400	2,659,127,624
Halton Region	0.2000	971,078,709
Hamilton	0.1767	1,390,781,027
Kingston	0.2125	81,575,403
Lambton County	0.2260	4,794,630,528
London	0.1028	425,488,846
North Bay	0.1500	605,465
Ottawa	0.2000	1,561,813,865
Oxford County	0.2350	5,665,102,027
Prince Edward County	0.2319	401,646,726
Sarnia	0.2260	181,579,114
Average Ratio & CVA	0.2036	1,726,770,807
<b>Wellington County</b>	<b>0.2500</b>	<b>4,464,961,956</b>

\* 2019 BMA Study Report - participating municipalities

\*\* from MPAC Provincial Market Change Profile Report



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**DISTRICT OF PARRY SOUND**

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Website: [www.armourtownship.ca](http://www.armourtownship.ca)

April 29, 2020

Honourable Doug Ford  
Premier of Ontario  
Legislative Building  
Queen's Park  
Toronto, ON M7A 1A1

Re: Support Resolution - High Speed Internet Connectivity in Rural Ontario

At its meeting held on April 28, 2020, the Council of the Township of Armour passed Resolution #6 supporting our Councillor Rod Ward's letter regarding the need to make substantial investments in high-speed internet connectivity in the rural areas of Ontario.

A copy of Council's Resolution #6 dated April 28, 2020 and Councillor Ward's letter is attached for your consideration.

Sincerely,

Charlene Watt  
Deputy Clerk

Cc: MPP Norm Miller, MP Scott Aitchison and Ontario Municipalities

Enclosures





## CORPORATION OF THE TOWNSHIP OF ARMOUR

### RESOLUTION

**Date:** April 28, 2020

**Motion #** 6

That the Council of the Township of Armour supports the letter, dated April 15, 2020 from Councillor Rod Ward, on the need to make substantial investments in high-speed internet connectivity in rural areas. Furthermore, that this resolution and the letter be circulated to Scott Aitchison, MP for Parry Sound-Muskoka, Norm Miller, MPP for Parry Sound-Muskoka and all Ontario municipalities requesting their support.

**Moved by:**

Blakelock, Rod	<input type="checkbox"/>
Brandt, Jerry	<input checked="" type="checkbox"/>
MacPhail, Bob	<input type="checkbox"/>
Ward, Rod	<input type="checkbox"/>
Whitwell, Wendy	<input type="checkbox"/>

**Seconded by:**

Blakelock, Rod	<input checked="" type="checkbox"/>
Brandt, Jerry	<input type="checkbox"/>
MacPhail, Bob	<input type="checkbox"/>
Ward, Rod	<input type="checkbox"/>
Whitwell, Wendy	<input type="checkbox"/>

Carried / Defeated

**Declaration of Pecuniary Interest by:**

**Recorded vote requested by:**

Recorded Vote:

Blakelock, Rod  
Brandt, Jerry  
MacPhail, Bob  
Ward, Rod  
Whitwell, Wendy

For	Opposed
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

April 15, 2020

To whom it may concern,

The COVID-19 pandemic in Ontario has highlighted both our positive responses to a crisis, and some definite shortcomings in infrastructure, systems and services which need to be addressed on a long-term basis. Setting priority on solving these issues will be a challenge, given the differing agendas and the strained budgets. Solving fundamental issues should focus on the most basic needs as a starting point. One of the clear needs in a rural community such as the Almaguin Highlands, highlighted further by recent events, is the need for proper high-speed internet connectivity. Healthcare and education are both going down a path where appropriate connectivity is assumed. Like many models that move outward from metropolitan areas, this assumption is lost on rural areas. For the vast majority of households in our community, true high-speed connectivity simply does not exist. For the vast majority of future strategies in healthcare and education, there is an assumption that it does exist.

Even in areas in the Almaguin Highlands which have 'high-speed' internet, the overall infrastructure is still limited. It is certainly not designed to deal with a sudden huge peak in demand. Whereas the capacity in large urban centres is built to handle the added throughput, there are clear limitations here. The best way to explain it is a comparison to hydro. Imagine if everyone went home at the same time and turned their lights on, but because there wasn't enough hydro capacity overall, all lights were 50% dimmer than normal and some appliances simply didn't work. We no longer have to imagine what happens with internet speed during peak usage. Suddenly during the COVID pandemic, people are working from home who have never worked from home. Kids are trying to do courses on-line. People who are not working are turning on-line to stay connected. Video-conferencing, which was a totally foreign concept to many, is now part of daily routine. Any idea how much internet bandwidth video uses? It's no wonder we hit a wall.

The future of healthcare sees patients being monitored and cared for in their own homes, through the use of technology. The future of education sees students doing much of their learning on-line. The future of business and commerce sees the ability to function outside the 'bricks and mortar' of an office location. Malls disappear and on-line shopping is the norm. For some, that future has already arrived. Our area has already been drastically affected by cutbacks in the area of healthcare and education through gradual decreases in budgets and services. Technology offers us the ability to level the playing field to a great extent. High-speed connectivity cannot be seen as a luxury or a nice-to-have, any more than hydro should be seen that way. In order to solve some other problems (i.e. skyrocketing budgets in healthcare and education) the wise investment is in providing connectivity for every resident in the province.

A handwritten signature in dark ink, appearing to read 'Rod Ward', is positioned above the printed name.

Rod Ward  
Councillor  
Armour Township

**The Corporation of the Township of Douro-Dummer**

**By-law Number 2020 – 27**

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Being a By-law of The Corporation of the Township of Douro-Dummer to confirm the proceedings of the special and regular electronic meetings of Council held on the 5th day of May, 2020.

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**The Municipal Council of the Corporation of the Township of Douro-Dummer Enacts as follows:**

1. **That** the action of the Council at its special and regular electronic meetings held on May 5, 2020 in respect to each motion, resolution, and other action passed and taken by the Council at its said meeting is, except where prior approval of the Local Planning Appeal Tribunal is required, hereby approved, ratified, and confirmed.
2. **That** the Mayor and the proper officers of the Township are hereby authorized to do all things necessary to obtain approvals where required, and to execute all documents as may be necessary in that behalf and the Clerk is hereby authorized and directed to affix the Corporate Seal to all such documents.

Passed in Open Council this 5th day of May, 2020.

\_\_\_\_\_  
Mayor, J. Murray Jones

\_\_\_\_\_  
Clerk, Crystal McMillan