

**DEUX RIVIERES WASTE DISPOSAL SITE
CORPORATION OF THE UNITED
TOWNSHIPS OF HEAD, CLARA AND MARIA**

2010 / 2011 BIENNIAL REPORT

Prepared by:

Jp2g Consultants Inc.
Engineers • Planners • Project Managers
Project No. 2006024M
and
AECOM
File No. 60246826-8.1

May 2012



Jp2g Consultants Inc.

ENGINEERS • PLANNERS • PROJECT MANAGERS

EXECUTIVE SUMMARY

The Deux Rivières Waste Disposal Site is located on Lots 23 and 24, Concession B, in the geographic Township of Clara, in the Township of Head, Clara and Maria. The 2010/2011 Operations and Monitoring Report provides a brief description of the site's approval status and as required to satisfy Condition 26 of the Provisional Certificate of Approval No. A412407, dated March 27, 1980 as amended under Notice No. 1 September 24, 2001; a notice dated November 27, 2003; Notice No. 3 July 19, 2006, and Notice No. 2 March 5, 2010 (should be No. 4).

Site Development and Operations

Site operations in 2008/2009 can be summarized as follows:

- The Certificate approved a total site capacity of 12,175m³ as detailed in the Site Development and Operations Plan dated December, 2001;
- The Township decided that the expansion of this site for additional landfill capacity would not be a cost-effective part of the overall waste management system and in June 2007 provided public notice that the site was to close effective September 20, 2007;
- In Fall 2007 the total landfilled capacity was completed and a final cover was applied;
- On June 12, 2008 the Township filed an application to amend the Certificate for Site Closure;
- On March 5, 2010 the MOE issued an amended Certificate as Notice No. 2 (note the Certificate had already received amendments under Notices 1 to 3)
- The Township in consultation with MNR completed the plan of survey and transfer of lands from the Crown involving Letters of Patent completed March 23, 2010 as required under Condition 16;
- The Certificate of Requirement/ Registration on Title as per Conditions 17, 18 and 19 was filed with MOE June 2010;
- On September 29, 2011 the Township filed an application to amend the Certificate to reflect the new site size;
- An amended Environmental Compliance Approval No. A412407 was issued May 2, 2012.

Environmental Monitoring

The results of the 2010/2011 monitoring program are presented in a report prepared by AECOM entitled "Deux Rivières Landfill Site 2010-2011 Monitoring Results", dated May 2012, which is attached to this report as Part 2. Reference should be made to the AECOM Report for a discussion on the results and for recommendations related to future monitoring.

Recommendations

- The Township will continue its efforts to complete the Certificate of Requirement/Registration on Title as per Conditions of the C of A 17, 18 and 19 now Conditions 1(14) and 1(15) of the ECA dated May 2, 2012.

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DRAWING 1: EXISTING CONDITIONS PLAN 2007
PLAN 49R-16962

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PART 2 – 2010/2011 MONITORING REPORT

Part 1

2010/2011 Site Development and Operations

1.0 INTRODUCTION

The Corporation of the United Townships of Head, Clara and Maria (the Township) retained Jp2g Consultants Inc. to complete the 2010/2011 Biennial Report for the Deux Rivières Waste Disposal Site. The completion of the report is required to satisfy Condition 26 of the Provisional Certificate of Approval Number A412407 last amended March 5, 2010, (now Condition 6(4) of the ECA dated May 2, 2012) for the use and operation of a 0.442 hectare landfill site within a total site area of 1.4 hectares and a contaminant attenuation zone of 14.89 hectares. The site is located on Lots 23 and 24, Concession B, geographic Township of Clara in the Townships of Head, Clara and Maria.

1.1 Background

In May 2001 Jp2g Consultants Inc. submitted an Application to amend the Certificate to reflect current MOE guidelines as requested by the Ministry. Notice No. 1 dated September 24, 2001 amended the Certificate which acknowledged a theoretical maximum volumetric capacity for the site at 12,192m³, conditional upon the development of more detailed design and operational requirements for review by the MOE (Condition 14).

An amendment to the Certificate was issued November 27, 2003 in response to a MOE review of the "Site Development and Operations Plan" dated December 2001 and subsequent correspondence from Jp2g Consultants Inc. and Gartner Lee Limited during the review period.

Specific conditions under the amended Certificate required the Township's action.

17. By July 31, 2004 the Owner to complete the survey of the landfilling area and Site Area to be purchased from MNR, complete the transfer of ownership, and provide the Director with a copy proof of registration.
 - The Ministry was advised that this timeline was not achievable, and in correspondence from Nafiseh Pourhassani (EAAB) dated August 6, 2004, it was agreed that a December 31, 2005 deadline was more reasonable.
 - Jp2g filed a formal request to Mr. Ian Parrott dated December 21, 2005 to extend the deadline to December 31, 2006.
 - Notice No. 3 dated July 19, 2006 extended the deadline to December 31, 2006, however through correspondence with the Ontario Land Surveyor and MNR this timeline could not be achieved.
 - Notice dated March 5, 2010 revoked Conditions 14-22 and extended the deadline to June 30, 2010 under a revised Condition 16.

22. At least one (1) year prior to the anticipated closure of the Site, the Owner shall submit a closure, post-closure monitoring, maintenance inspection and reporting program to the Director for approval.
 - On June 12, 2008 the Township filed an application to amend the Certificate for Site Closure (MOE Reference No. 3814-7FQJ9Q)
 - On March 5, 2010 the MOE issued an amended Certificate as Notice No. 2 (note the Certificate had already been issued amendments under Notices 1 to 3) approving site closure.

17-19. Certificate of Requirement/Registration on Title

- Under Notice dated March 5, 2010 revised Conditions 17 to 19 a completed Certificate of Requirement and registrable description of the site to be sent to the Director by June 30, 2012 and then registered on title.
- In June 2010 the documentation was filed with the Director.
- As the site size was changing under an amended Certificate the MOE advised to resubmit after the amendment was received.

1.2 Scope

Condition 26 of the Provisional Certificate of Approval last amended March 5, 2010 for the Deux Rivieres Waste Disposal Site, required that the Township submit a Biennial Report documenting the site operations and environmental monitoring of the Site by May 31, 2006 and by May 31 every two (2) years thereafter. The 2010/2011 Biennial Report includes a summary of site development, operations, compliance issues, and the surface water quality monitoring results presented in this report as follows:

- Part 1 Site Development and Operations
- Part 2 Environmental Quality Monitoring

2.0 SITE DEVELOPMENT

Historically the Deux Rivieres Waste Disposal Site operation involved a trench and cover method of landfilling. Covering was to occur once per week.

Development of the site in proceeded in accordance with the approved design drawings contained in the "Site Development and Operations Plan", dated December 2001 as follows:

- Drawing 2 "Landfill Phasing and Sequencing" dated December 2001, plotted December 20, 2001
- Drawing 3 "Final Contours and Section" dated November 2001, plotted December 20, 2001

In December 2005 the site was nearing its approved site capacity of 12,192 m³ so the regular household waste was collected in the municipal waste truck and hauled to the Bissett Creek Waste Disposal Site. The Deux Rivieres Site continued to accept construction and demolition waste. Upon receipt of funding assistance the Township collected all bulky waste from the Bissett Creek and Stonecliffe Waste Disposal Sites and landfilled it at Deux Rivieres to achieve the final approved contours. The application of 0.6m of final cover and topsoil was completed in the Fall of 2007 as shown on **Drawing 1** enclosed.

As reported in the Site Closure Plan (Jp2g 2008) the limits of the landfill site based on the Ontario Land Surveyor plan reflected a 1.493 ha area encompassing the squared limits around the 0.442 ha landfilling area and a total site area of 16,383 ha (including the 0.912 ha portion of Brent Road. The recent amendments to the Certificate reflected the 0.442 ha landfilling area within a total site area of 1.4 ha Part 4 and a CAZ of 14.89 ha as Parts 1-3 and 5. A copy of **Plan 49R-16962** is enclosed.

3.0 SITE OPERATIONS

The operational portion of this report is based on documentation provided by the Township and a file review undertaken by Jp2g Consultants Inc.

3.1 Closure of the Landfill Site

A topographic survey of the waste disposal area was conducted by Jp2g Consultants Inc. in Fall 2007. The survey information has been used to prepare **Drawing No. 1: Existing Conditions Plan** to show the location of waste placement and landfill contours to date based on the application of final cover. Effective September 30, 2007 the site no longer received any material.

3.2 Closed Site Inspections

An MOE Site Inspection Report dated June 23, 2010 requested that the Township address erosion and lack of vegetation on the waste mound. The Township applied additional earth. Jp2g filed a response dated July 29, 2010, correspondence found in **Appendix A**. Concurrent with the July 2011 monitoring event Jp2g conducted a waste mound survey, photographs are included in **Appendix B**. Generally the natural vegetation had stabilized the slope of the closed waste mound. One area exhibited erosion, it is recommended that the Township apply additional earth cover. Jp2g will complete the waste mound inspection concurrently with the monitoring event and maintain records for the 2012-2013 Biennial Report.

3.3 Compliance Issues

A table in **Appendix C** summarizes compliance with Conditions of the Certificate of Approval A412407 dated March 27, 1980 as amended September 24, 2001, November 27, 2003, July 19, 2006 and March 5, 2010. An MOE Site Inspection Report dated August 4, 2010 was filed with the municipality requesting comment on how Conditions 16 and 17 can be addressed. MOE was advised that Letters of Patent was completed March 23, 2010 and a Certificate of Requirement filed with the Director in June 2010. An application to EAAB was filed requesting an amendment to reflect the site size including the CAZ on September 29, 2011. Correspondence found in **Appendix A**. The only outstanding issue under amended ECA Conditions 1 (14) and 1(15) yet to be resolved is the following requirements.

- Certificate of Requirement submission to the Director for approval
- Registration on Title

4.0 ENVIRONMENTAL QUALITY MONITORING


The information required to address the environmental quality monitoring reporting requirements of Condition 19 is based on the report entitled "Deux Rivières Landfill Site 2010-2011 Groundwater Monitoring Results" dated May 2012, prepared by AECOM. This report is found in **Part 2** of this Annual Report.

5.0 RECOMMENDATIONS

The Township will continue their efforts to finalize the Certificate of Requirement/Registration on Title as required under Conditions 1(14) and 1(15) of the ECA dated May 2, 2012.

Report prepared by:
Jp2g Consultants Inc.
Engineers • Planners • Project Managers








for Perry Larochelle
Technical Field Representative


Kevin Mooder, MCIP, RPP
VP Environmental Services

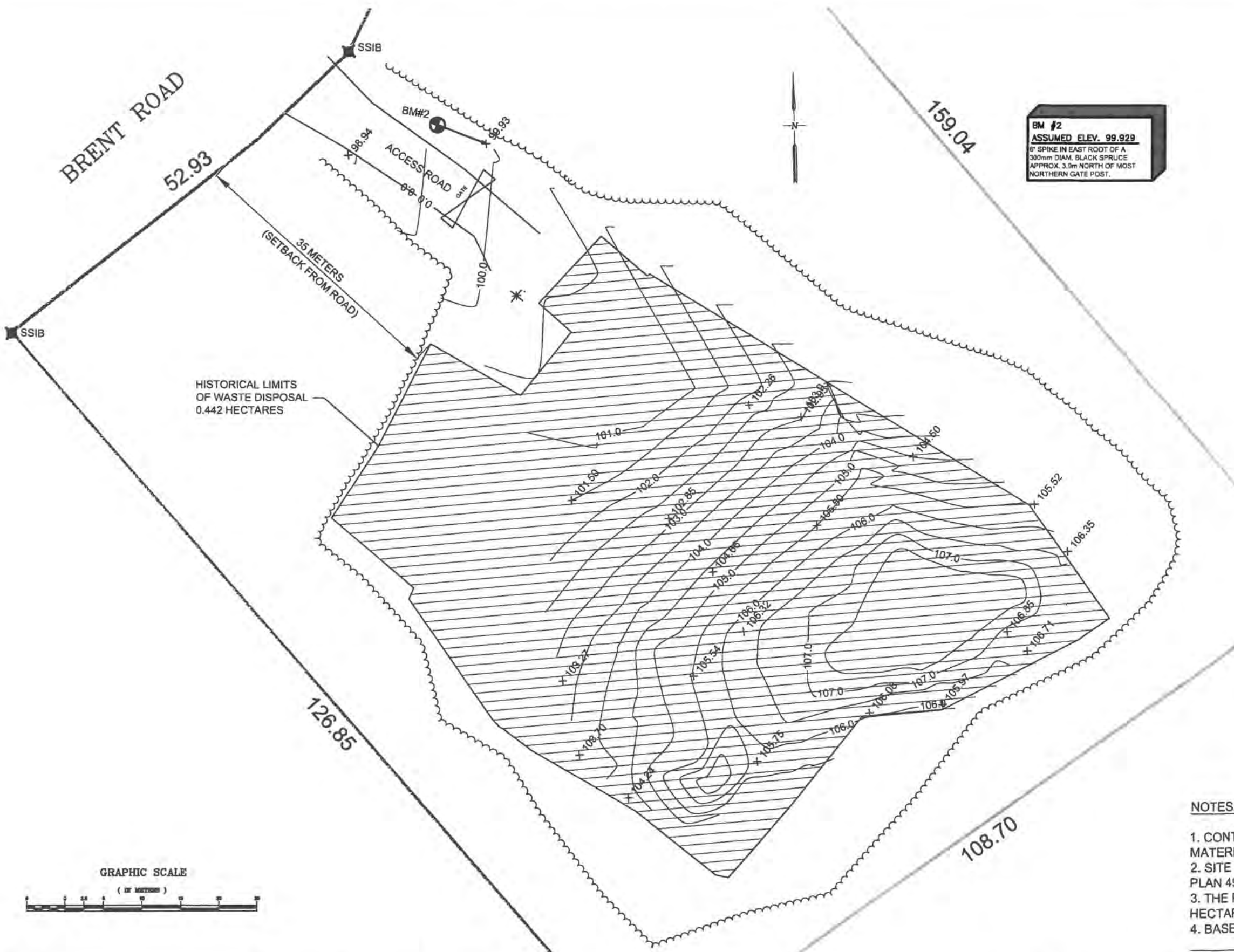
DRAWINGS

**Drawing 1 – Existing Conditions Plan 2007
Plan 49R-16962**

LEGEND

	EXISTING WASTE FILL AREA
	EXISTING TREE LINE
	EXISTING CONTOURS 2007
	BENCH MARK
	LIMIT OF PROPOSED 1.49 HECTARE SITE
	SPOT ELEVATION

1. CONTOURS BASED ON APPLICATION OF FINAL COVER MATERIAL FALL 2007.
2. SITE LIMITS AS PER KASPRZAK OLS SURVEY, PART 4, PLAN 49R - COMPRISES 1.493 HECTARES.
3. THE PROPOSED BUFFER AREA ENCOMPASSES 14.89 HECTARES OF CROWN LAND.
4. BASED ON SURVEY BY JP2G CONSULTANTS, FALL 2007.



D	30-MAY-68	AG	ACCU G.L.S. SURVEY
No.	DATE	BY	SERVICES



ENGINEERS ■ PLANNERS ■ PROJECT MANAGERS

DESIGNED	KJM
DRAWN	EA
CHECKED	KJM
APPROVED	KJM
SCALE	1:250
(2'x3' SHEET ONLY)	

SITE CLOSURE PLAN 2007

DATE	MAY, 2008
PROJECT	20060241
PLOTTED	21-MAY-08
REVISION	No.: 0
1	

APPENDIX A

MOE CORRESPONDENCE



Solid Non-Hazardous Waste Disposal Site Inspection Report

Client:	The Corporation of the Township of Head, Clara and Maria Mailing Address: 15 Township Hall Rd, Stonecliffe, Ontario, Canada, K0J 2L0 Physical Address: 15 Township Hall Rd, Head, Clara and Maria, Township, County of Renfrew, Ontario, Canada, K0J 2K0 Telephone: (613)586-2526, FAX: (613)586-2596, email: twpshcm@webhart.net Client #: 5050-4WZLAU, Client Type: Municipal Government		
Inspection Site Address:	Deux Rivières Waste Disposal Site Address: 201 Brent Rd, Head, Clara and Maria, Township, County of Renfrew District Office: Ottawa GeoReference: Map Datum: NAD27, Zone: 17, Accuracy Estimate: 10 -100 metres eg. Topographic Map, Method: Map, UTM Easting: 707300, UTM Northing: 5123770, ,		
Contact Name:	Melinda Reith	Title:	Clerk-Treasurer
Contact Telephone:	(613)586-2526 ext	Contact Fax:	613-586-2596
Last Inspection Date:	2006/12/04		
Inspection Start Date:	2010/06/15	Inspection Finish Date:	2010/06/15
Region:	Eastern		

1.0 INTRODUCTION

A waste disposal site inspection was conducted pursuant to O.Reg. 347 and the Environmental Protection Act. Non-compliance issues noted with respect to Condition 15 of the Certificate in regards to final cover was identified during the inspection.

A closure plan for the site was recently approved on March 5, 2010. The landfill has been closed to the public since the year 2007.

2.0 INSPECTION OBSERVATIONS

Certificate of Approval Number(s):

A412407 ("The Certificate"), last amended by Notice No.2, dated March 5, 2010.

2.1 FINANCIAL ASSURANCE:

N/A

2.2 APPROVED AREA OF THE SITE:

The township operated a 0.4 ha landfilling area within a 1.4 hectare site.

2.3 APPROVED CAPACITY:

The total site capacity approved was 12, 175 cubic metres.

2.4 ACCESS CONTROL:

Access was secured by gate and by large boulders.

2.5 COVER MATERIAL:

Under Site Closure, Condition 15, the Site shall be capped and closed in accordance with item 12 ("closure plan") of the Certificate's Schedule "A". Under the closure plan, final closure of the waste mound involves the application of 0.6m of earth cover and 0.15m of topsoil or equivalent over an area of approximately 0.44 ha. The consultant states under that report that the cover material was applied prior to the approval of the site closure plan. The final cover design allows for some infiltration of water into the landfill, resulting in an accelerated biodegradation of waste.

During the inspection evidence of erosion either from surface water run-off or a leachate seep was observed within approximately 10 metres from the entrance to the site (see photo "Inspections 008") attached.

Also, at the highest elevation of the landfill, top soil and vegetation was lacking. Sand was visible. (see photo "Inspections 010") attached.

Consistent with Condition 21 of the Certificate, the Owner should take prompt action to remedy the deficiencies noted above.

2.6 WASTE BURNING:

No evidence of waste burning. Site is secured.

2.7 GROUNDWATER/SURFACEWATER IMPACT:

Ministry Technical Support reviews are pending.

2.8 LEACHATE CONTROL SYSTEM:

Natural attenuation site.

2.9 METHANE GAS CONTROL SYSTEM:

No methane gas control system.

2.10 OTHER WASTES:

N/A - site is closed.

3.0 REVIEW OF PREVIOUS NON-COMPLIANCE ISSUES

N/A

4.0 SUMMARY OF INSPECTION FINDINGS (HEALTH/ENVIRONMENTAL IMPACT)

Was there any indication of a known or anticipated human health impact during the inspection and/or review of relevant material, related to this Ministry's mandate ?

No

Specifics:

Was there any indication of a known or anticipated environmental impact during the inspection and/or review of relevant material ?

No

Specifics:

Was there any indication of a known or suspected violation of a legal requirement during the inspection and/or review of relevant material which could cause a human health impact or environmental impairment ?

Yes

Specifics: Some deficiencies related to final cover application was observed during the inspection. The deficiencies should be remedied to ensure compliance with Condition 15 of the Certificate. Increased leachate generation due to increased permeability of the landfill could cause environmental impairment.

Was there any indication of a potential for environmental impairment during the inspection and/or the review

of relevant material ?

No

Specifics:

Was there any indication of minor administrative non-compliance?

No

Specifics:

5.0 ACTION(S) REQUIRED

By September 1, 2010, the Township should take prompt action to remedy the deficiencies noted under Section 2.5 above, in regards to final cover. By the same date, the Township should provide a status report to the undersigned detailing the remedies implemented to address Section 2.5 above.

6.0 OTHER INSPECTION FINDINGS

N/A

7.0 INCIDENT REPORT

Applicable
4845-86JNKN

8.0 ATTACHMENTS

inspections 007.jpg; inspections 008.jpg; inspections 009.jpg; inspections 010.jpg

PREPARED BY: Environmental Officer:

Name:

Lance Larkin

District Office:

Ottawa District Office

Date:

2010/06/18

Signature



REVIEWED BY: District Supervisor:

Name:

Paul Kehoe


District Office:

Ottawa District Office

Date:

2010/06/23

Signature:

A handwritten signature in black ink, reading "Paul Kehoe." The signature is written in a cursive style with a large initial "P" and a period at the end.

File Storage Number:

SI RE CL COB 610

Note:

"This inspection report does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they may apply to this facility. It is, and remains, the responsibility of the owner and/or the operating authority to ensure compliance with all applicable legislative and regulatory requirements"



July 29, 2010

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

lance.larkin@ontario.ca

Attention: Mr. Lance Larkin
Sr. Environmental Officer

Re: **Deux Rivières Closed WDS**
Certificate No. A412407
Our Project No. 2006024K

Dear Sir:

We acknowledge receipt of the Site Inspection Report dated June 23, 2010 filed with the Township on July 7, 2010.

In regards to Section 5.0 Action Required, please accept this letter on behalf of the Township to report on the status of the final cover material by September 1, 2010

Final Cover Conditions in Certificate

In response to a June 12, 2008 Application to amend the Certificate for approval of site closure, Notice No. 2 Amendment to the Certificate A412407 dated March 5, 2010 was issued. The following conditions will be addressed in the 2010/2011 Bi-Annual Report required under Condition 26.

15. Jp2g will provide a statement that the site has been capped and closed as per the Site Closure Plan. The approved design included the application of a 0.6m thickness of earth cover material and a minimum of 0.15m of topsoil or other material to sustain plant growth. Given the limited availability of local topsoil sources and the highly acidic natural sands we respectfully submit that the sparse growth of grasses on the waste mound is anticipated. In consultation with the municipality we will assess the feasibility of enhancing the vegetative growth, ie. applying ditching materials or additional seeding if necessary.
20. Quarterly site inspections to be completed as follows:


Jp2g will conduct an inspection of the final cover integrity concurrent with the spring sampling event (see attached photos). The Township to conduct the remaining three (3) inspections over the course of the year.
21. The isolated area of erosion does not require immediate attention, and can be remedied when the municipality has equipment and earth material readily available to the site's location. The Township will apply additional cover material to remedy the erosion by September 1, 2010.
22. The Township to maintain a log book of the inspections and remedial actions taken.

Survey and Certificate of Requirement

In reference to Conditions 16 and 17, I would advise that the Township solicitor Mr. Bill Instance filed all required documentation to the Director in June 2010 and is awaiting a reply.

Trusting this is satisfactory.

Yours very truly,
Jp2g Consultants Inc.
Engineers & Planners & Project Managers



Kevin J. Mooder, MCIP, RPP

KJM/dr

Encl.

c.c.: - Melinda Reith
twpshcm@xplornet.com



Closed Waste Disposal Site Inspection Report

Client:	The Corporation of the Township of Head, Clara and Maria Mailing Address: 15 Township Hall Rd, Stonecliffe, Ontario, Canada, K0J 2L0 Physical Address: 15 Township Hall Rd, Head, Clara and Maria, Township, County of Renfrew, Ontario, Canada, K0J 2K0 Telephone: (613)586-2526, FAX: (613)586-2596, email: twpshcm@webhart.net Client #: 5050-4WZLAU, Client Type: Municipal Government		
Inspection Site Address:	Deux Rivières Waste Disposal Site Address: 201 Brent Rd, Head Clara and Maria, Township, County of Renfrew District Office: Ottawa GeoReference: Map Datum: NAD27, Zone: 17, Accuracy Estimate: 10 -100 metres eg. Topographic Map, Method: Map, UTM Easting: 707300, UTM Northing: 5123770, ,		
Contact Name:	Melinda Reith	Title:	CAO
Contact Telephone:	(613)586-2526 ext	Contact Fax:	
Last Inspection Date:	2010/06/15		
Inspection Start Date:	2011/08/03	Inspection Finish Date:	2011/08/03
Region:	Eastern		

1.0 INTRODUCTION

A waste disposal site inspection was conducted pursuant to O.Reg. 347 and the Environmental Protection Act. Non-compliance issues noted with respect to Certificate of Approval (COA) Conditions (16) and (17) in regards to the establishment of a contaminant attenuation zone was identified.

A closure plan for the site was approved on March 5, 2010. The landfill has been closed to the public since the year 2007.

2.0 INSPECTION OBSERVATIONS

Certificate of Approval Number(s): ☒ Yes ☐ No
 A412407

2.1 FINANCIAL ASSURANCE

N/A

2.2 CLOSURE PLAN

A closure plan for the site was approved on March 5, 2010. The landfill has been closed to the public since the year 2007.

2.3 ACCESS CONTROL

Access was secured by gate and by large boulders.

Certificate No A412407 states under Condition 14 that the Site shall no longer receive or dispose of any wastes. Compliance was observed.

2.4 FINAL COVER

Deficiencies with final cover were noted during the last inspection. During this year's inspection it was observed that the site had over 95% vegetative cover. No immediate concerns noted. See section (8.0) inspection photos below.

2.5 LEACHATE CONTROL SYSTEM

Monitored natural attenuation is applied to this site.

2.6 METHANE GAS CONTROL SYSTEM

No methane gas control system in place.

2.7 MONITORING PROGRAMS:

Monitored natural attenuation is applied to this site.

2.8 GROUND WATER/SURFACE WATER IMPACTS

With respect to groundwater aspects, two private groundwater supply wells (referred to as "Hunt Camp" and "Clouthier Logging Camp") exist offsite and monitoring at these locations has been required under the COA. These locations represent the nearest groundwater users to the landfill site. Sampling at these locations have been removed from the sampling program as approved by the Ministry in the March 5, 2010 COA amendment.

With respect to ground water aspects, the Town must ensure the following:

Spring #1 is located directly downgradient of the landfill footprint and is a point of groundwater discharge from the aquifer to the nearby Cotnam Creek. It has been proposed that sampling from Spring #1 be discontinued. The ministry does not agree with this recommendation. This monitoring location should continue to be sampled as presently required when water levels allow so. This location represents the only groundwater monitoring point for the site required under the COA. Spring #1 represents an important compliance point for determining the quality of groundwater discharging to Cotnam Creek.

The following is excerpted from the Ministry's technical memorandum concerning surface water aspects dated April 13, 2011 (attached):

1. A comparison of upstream water quality versus downstream indicates that the Deux Rivieres landfill is not impacting water quality in Cotnam Creek, at this time. Results must be viewed with caution as this is based on only two sampling events.
2. Under previous review I recommended that every effort be made to obtain samples at times in the year other than under high flow conditions, if sufficient flow existed. This issue was addressed during this monitoring period, sampling was conducted in May and in July.
3. Under previous review I recommended that TSS be included in future monitoring efforts. TSS was included in 2008 but not in 2009. TSS should be included in future reporting.
4. Un-ionized ammonia was not calculated in previous monitoring reports. Un-ionized ammonia is determined based on total ammonia-N concentrations and field temperature and pH and the percentages of un-ionized ammonia should be calculated and must be included in the data set reported in the annual reports. This was not addressed.
5. Surface water quality and quantity data must continue to be collected to document the nature and extent of leachate generated from the landfill and its effect on the quality of the downstream surface water regime, in particular, Cotnam Creek. The current monitoring program is adequate with the addition of the above mentioned recommendations.
6. The consultant states that with the establishment of the Contaminant Attenuation Zone, the point of compliance will be SW2, where the surface water flows off-site. As clarified under previous review, regardless of the proposed CAZ boundary, leachate generated from the landfill cannot be permitted to contaminate any stretch of Cotnam Creek. A CAZ is intended to protect neighbouring groundwater supplies. It is an improper application of Policy B7 to allow impairment of surface water bodies within a CAZ.

2.9 Registration On Title:

The Township has not established an approved subsurface contaminant attenuation zone and is in non-compliance with Certificate No. A412407.

Condition (18) of the certificate states that within ten (10) calendar days of receiving the Certificate of Requirement authorized by the Director, register the Certificate of Requirement in the appropriate Land Registry Office on title to the Site and submit to the Director the duplicate registered copy immediately following registration.

Condition (18) has not been met since Conditions (16) and (17) have not been complied with.

3.0 REVIEW OF PREVIOUS NON-COMPLIANCE ISSUES

There are no remaining non-compliance issues related to the previous inspection report.

4.0 SUMMARY OF INSPECTION FINDINGS (HEALTH/ENVIRONMENTAL IMPACT)

Was there any indication of a known or anticipated human health impact during the inspection and/or review of relevant material, related to this Ministry's mandate ?

No

Specifics:

Was there any indication of a known or anticipated environmental impact during the inspection and/or review of relevant material ?

No

Specifics:

Was there any indication of a known or suspected violation of a legal requirement during the inspection and/or review of relevant material which could cause a human health impact or environmental impairment ?

Yes

Specifics:

Condition (16) states that by June 30, 2010, the *Owner* shall submit to the *Director* for approval:

i) a completed plan of survey for the *Site* including buffer zones and attenuation lands purchased or to be purchased from the Ministry of Natural Resources; and

ii) documents showing land ownership of surveyed property.

The above plan has not been submitted.

Condition (17) states that by June 30, 2010, the *Owner* shall submit to the *Director*, for his/her review, two (2) copies of a completed Certificate of Requirement and a registerable description of the *Site*.

The above has not been submitted.

Based on the above, the Township is in non-compliance with s.186(3) of the Ontario Environmental Protection Act.

Was there any indication of a potential for environmental impairment during the inspection and/or the review of relevant material ?

No

Specifics:

Was there any indication of minor administrative non-compliance?

No

Specifics:


5.0 ACTION(S) REQUIRED

1. Subject to Certificate No. A412407, by September 1, 2011, arrange to have a meeting or teleconference with the undersigned to discuss an action plan to address compliance with Conditions (16) and (17) of the Certificate.

6.0 OTHER INSPECTION FINDINGS

By October 1, 2011, submit to the undersigned a copy of the records kept pursuant to Certificate of Approval No. A412407, Condition 22.

7.0 INCIDENT REPORT

Applicable
1426-8KENJF 

8.0 ATTACHMENTS

03-08-11_1545.jpg; 03-08-11_1546.jpg; 03-08-11_1547.jpg; 03-08-11_1548.jpg; Apr 13 11 fig-II-Deux Rivières WDS-11.pdf

PREPARED BY:

Environmental Officer:

Name: Lance Larkin
District Office: Ottawa District Office
Date: 2011/08/04
Signature



REVIEWED BY:

District Supervisor:

Name: Tara MacDonald
District Office: Ottawa District Office
Date: 2011/08/04

Signature:



File Storage Number: SI RE CL C08 610

Note:

"This inspection report does not in any way suggest that there is or has been compliance with applicable legislation and regulations as they may apply to this facility. It is, and remains, the responsibility of the owner and/or the operating authority to ensure compliance with all applicable legislative and regulatory requirements"



HUCKABONE • O'BRIEN • INSTANCE • BRADLEY • LYLE • LLP

LAWYERS

F. Allan Huckabone, Q.C. (Retired)
Matthew J. Bradley
Dwight Montgomery

Delbert A. O'Brien, Q.C., Juris D. (Retired)
Tracy Lyle

M.Wm. Instance
Mark Huckabone

August 31, 2010

Please Reply To PEMBROKE Office

E-Mail: williami@hsolawyers.com

Direct Line 613-735-2345

Ext. 322

The Corporation Of The United Townships
Of Head, Clara & Maria
Attention: Ms. Melinda Reith
15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Dear Ms. Reith:

RE: DEUX RIVIERES WASTE DISPOSAL SITE

We provided the Ministry with the draft documents for registration in June 2010, but they have yet to be reviewed by the Ministry and as such we have not been able to register them. Although there was a deadline for registration the Ministry has indicated that we met the deadline by submitting the documents for their approval. I will keep you informed in this matter.

Yours very truly,

M.W. Instance

MWI/cee



Ministry of
Natural Resources

Land Management Section
P.O. Box 7000
300 Water Street, 5th Floor South
Peterborough, Ontario
K9J 8M5

Ministère des
Richesses naturelles

Section Gestion des terres
C.P. 7000
300 rue Water, 5th étage Sud
Peterborough (Ontario)
K9J 8M5

PUROLATOR

File No. 177874

May 19, 2010

MEMORANDUM TO:

Land Registrar
Ministry of Government Services
Pembroke, Ontario

SUBJECT: Parts 1, 2, 3, 4 and 5, Location CL 14460, Plan 49R-16962,
Geographic Township of Clara

Enclosed, in duplicate, are Letters Patent covering the lands referenced above. Upon registration of this document without fee or charge, please forward the copy showing registration details to the Patentee as provided for in Section 37.(3) of the Public Lands Act.

Thank you.

Steven Ferguson
Provincial Lands Specialist – Crown Land Registry
Telephone: (705) 755-5995
Fax: (705)-755-2181

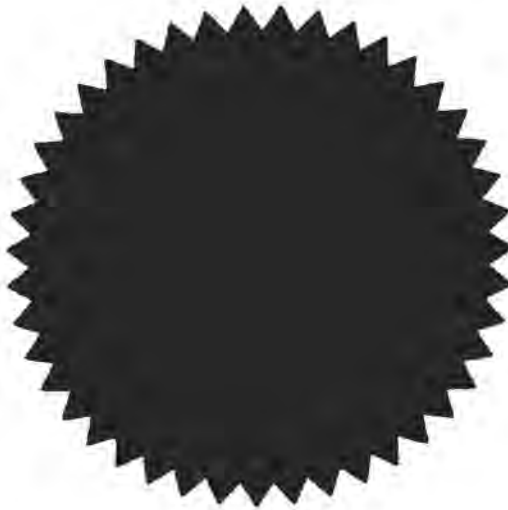
/lo

c.c. District Manager, Pembroke

c.c. Mining Recorder, Southern Ontario Mining Division, MNDMF, Sudbury

c.c. Patentee, The Corporation of the Townships of Head, Clara & Maria

c.c. Manager, MNR Base Data Infrastructure Unit, 2nd Floor North, Peterborough



David C. Onley



Ontario

**Province of Ontario
Province de l'Ontario**

Elizabeth the Second, by the Grace of God
of the United Kingdom, Canada and Her
other Realms and Territories Queen, Head of
the Commonwealth, Defender of the Faith.

Elizabeth Deux, par la grâce de Dieu, Reine du
Royaume-Uni, du Canada et de ses autres
royaumes et territoires, Chef du Common-
wealth, Défenseur de la Foi.

**To all to whom these Presents shall
Come, Greeting:**

**À tous ceux et celles qui prendront
connaissance des présentes :**

KNOW YE that, under the authority of the PUBLIC LANDS ACT,
in consideration of the sum of SEVEN HUNDRED AND FIFTY DOLLARS
well and truly paid to Our use at or before the sealing of these
Our Letters Patent, WE HAVE GRANTED, and by these Presents DO
GRANT, unto

THE CORPORATION OF THE TOWNSHIPS OF HEAD, CLARA & MARIA, in
fee simple

All those Parcels or Tracts of Land more particularly
described in the attached Schedule.

SAVING, EXCEPTING and RESERVING unto Us, Our Heirs and
Successors, all ores, mines or minerals which are or shall
hereafter be found on or under the Land hereby granted.

ALSO SAVING, EXCEPTING and RESERVING the free use, passage
and enjoyment of, in, over and upon all navigable waters which
shall or may hereafter be found on or under, or be flowing
through or upon, any part of the Land hereby granted, and
RESERVING ALSO the right of access to the shores of all rivers,
streams and lakes for all vessels, boats and persons.

ALSO SAVING, EXCEPTING and RESERVING the surface rights only
in and over any public or colonization roads or any highways
crossing the said Land at the date of these Letters Patent.

SCHEDULE

All of Location CL 14460,
Being part of Lots 23 and 24, Concession B,
Geographic Township of Clara,
Municipal Township of Head, Clara & Maria,
County of Renfrew,
Containing 16.383 hectares, more or less,
Designated as Parts 1 to 5, all inclusive,
On Reference Plan 49R-16962.
Part of P.I.N. 57014-0023 (R)

ALSO SAVING, EXCEPTING and RESERVING the surface rights only in ten per cent of the acreage hereby granted for roads and the right to lay out the same where the Crown or its officers may deem necessary.

ALSO SAVING, EXCEPTING and RESERVING all timber and trees standing, being or hereafter found growing upon the said Land, together with the right to enter thereon to remove the said timber or otherwise deal therewith pursuant to the provisions of the Crown Forest Sustainability Act or any other Act substituted therefore.

ALSO RESERVING a free and uninterrupted Right-of-Way for all persons, animals and vehicles in, over, along and upon Part 2, Plan 49R-16962, Geographic Township of Clara, Municipal Townships of Head, Clara and Maria, County of Renfrew.

The Land hereby granted is subject to the provisions of Section 65 of the Public Lands Act.

GIVEN under the Great Seal of Our Province of Ontario,

WITNESS: THE HONOURABLE DAVID C. ONLEY,

LIEUTENANT GOVERNOR OF OUR PROVINCE OF ONTARIO.

At Our City of Toronto in Our said Province this twenty-third day of March in the year of Our Lord two thousand and ten and in the fifty-ninth year of Our Reign.

BY COMMAND



Steven Ferguson
Provincial Lands Specialist - Crown Land Registry
Land Management Section
Ministry of Natural Resources

Ref. No. 162901

Main Office File No. 177874

Land Registrar,
Ministry of Government Services,
will mail duplicate to:

The Corporation of the Townships of Head, Clara & Maria
15 Township Hall Road
Stonecliffe, Ontario
K0J 2K0

Kevin Mooder

From: Kevin Mooder <kmooder@jp2g.com>
Sent: Thursday, September 01, 2011 2:08 PM
To: 'Larkin, Lance (ENE)'; twpshcm@xplornet.com
Subject: RE: Deux Rivieres WDS A412407 Inspection
Attachments: 2010 letters patent - clara site.pdf

Lance,

On behalf of the municipality and in consultation with Melinda Reith, Clerk I provide the following response to the Site inspection Report:

- Condition 16 has been satisfied as per the Township's solicitor letter dated August 31, 2010 (attached)
- I believe that Mr Instance was awaiting a reply from the Director in order to satisfy Condition 17, however I understand he may be on holiday so the Township will confirm.

Regarding the TSS groundwater and surface water review comments, I would advise that they have been filed with our field technician and the project hydrogeologist

Trusting this is satisfactory

Kevin J. Mooder, MCIP, RPP
Senior Planner, Vice-President
Environmental Services

Jp2g Consultants Inc.
1150 Morrison Drive, Suite 410
Ottawa, ON K2H 8S9
Tel: (613) 828-7800
Fax: (613) 828-2600
E-mail: kmooder@jp2g.com

From: Larkin, Lance (ENE) [<mailto:Lance.Larkin@ontario.ca>]
Sent: Friday, August 12, 2011 4:16 PM
To: twpshcm@xplornet.com
Cc: Kevin Mooder
Subject: Deux Rivieres WDS A412407 Inspection

Please review the attached Deux Rivieres Waste Disposal Site Inspection Report and attachments.

In addition, I've attached MOE's Technical Support Memorandum prepared by Shawn Trimper dated January 28, 2011 for your review.

If you have any questions or concerns, please do not hesitate to contact me at 613-521-3450, ext. 229.

Lance Larkin

Senior Environmental Officer
Ministry of the Environment, Ottawa District Office
2430 Don Reid Drive, Ottawa, ON K1H 1E1
tel: 613-521-3450 ext. 229, fax: 613-521-5437
toll free: 1 800-860-219

Agent principal de l'environnement
Ministère de l'Environnement, District d'Ottawa
2430, promenade Don Reid, Ottawa (Ontario) K1H 1E1
tél. : 613-521-3450 poste 229, téléc. : 613-521-5437
sans frais : 1-800-860-2195



September 29, 2011

Ministry of Environment
EAAB
Floor 12A, 2 St. Clair Avenue West
Toronto, ON M4V 1L5

Attention: Tesfaye Gebrezghi, P.Eng.
Supervisor Waste

Re: Deux Rivières Closed Landfill Site
Certificate No. A412407
Corporation of the United Townships of Head Clara & Maria
Our Project No. 2006024L

Dear Sir:

Under the current Certificate of Approval No. A412407 last amended March 5, 2010 the site is described as a 0.442 ha Waste Disposal Site (Landfill) within a total site area of 1.4 ha. This amendment was issued approving the closure of the site, and acknowledged that the municipality was in the process of purchasing the lands for the closed waste disposal site and a contaminant attenuation zone from the Crown.

As required under Condition 16 enclosed find the following for Director approval:

- Plan of Survey Plan 49R-16962 registered April 21, 2009
- letters of Patent dated March 23, 2010 indicating Parts 1-5 inclusive are owned by the municipality.

In this regard the site may best be described as a 0.442 ha landfilling area within a total site area of 1.493 ha (Part 4 49R-16962) and a buffer/CAZ of 14.89 ha (Parts 1, 2, 3 and 5 49R-16962). Trusting an amended Certificate will be issued to reflect the site description.

As required under Condition 17 enclosed find a copy of the Certificate of Requirement filed with EAAB by the Townships' lawyer in June 2010. Please advise if we are required to reissue or if this is satisfactory.

Yours very truly,

Jp2g Consultants Inc.
Engineers • Planners • Project Managers

Kevin Mooder, MCIP RPP
Sr. Project Manager

KJM/jlp

c.c. Melinda Reith, Clerk
Lance Larkin, MOE Ottawa

APPENDIX B

FINAL COVER INSPECTION 2011



Site Entrance



Waste Mound



Erosion on Waste Mound



Vegetated Waste Mound

APPENDIX C

COMPLIANCE SUMMARY TABLE

Certificate A412407 last amended March 5, 2010
Compliance Summary

	Condition (summary text)	Statement of Compliance
1.	Definitions 1.1 to 1.9.	Understood
2.	Site shall be designed and operated in accordance with the documents listed in Schedule "A" and with the conditions of the Certificate. Should there be discrepancies with the documents, the most recent date shall take precedence.	Understood
3.	Requirements under the EPA RSO 1990	Understood
4.	Requirements of the Certificate are severable	Understood
5.	The Applicant shall ensure compliance with all terms and conditions of the Certificate	Understood
6a.	The Applicant shall furnish forthwith, upon request of the MOE, any information requested with respect to compliance with the Certificate	Understood
6b.	After providing the information, without action by the Ministry shall not be construed as an approval, etc.	Understood
7.	The Applicant shall allow Ministry personnel or authorized representatives to carry out inspections	Understood
8.	Correspondence refer to Provisional Certificate of Approval No. A412407	Understood
9.	Applicant to notify Director of changes within 30 days	Understood
10.	In the event of any change in ownership the Applicant shall inform the owner in writing of the Certificate	Understood
11.	Information made available in accordance with the provisions of the Freedom of Information and Protection of Privacy Act	Understood
12.	Records required by the Certificate to be kept on Owner's premises for a minimum of 2 years	Understood
13.	The theoretical maximum volumetric capacity of the site is 12,192m ³	Understood
14.	The Site shall no longer receive or dispose of any wastes	Closed since Fall 2007
15.	The Site shall be closed in accordance with the Site Closure Plan May 2008	In compliance
16.	By June 30, 2010 the Owner shall submit to the Director a completed plan of survey for the site and documents showing land ownership	Completed
17.	By June 30, 2010 the Owner shall submit to the director a completed Certificate of Requirement	Completed
18.	Within 10 days of receiving the Certificate of Requirement by the Director it shall be registered on title to the Site and a copy to the Director	Under review
19.	No person shall deal with the Site in any way without first giving a copy of the Certificate including all amending Notices to each person acquiring an interest in the Site as a result of the dealing	Understood
20.	Inspection shall be conducted on a quarterly basis to assess the following: (a) presence of leachate seeps (b) support of vegetation by the final cover (c) occurrences of erosion (d) waste material protruding from the cap, and (e) any other notable deficiencies	Understood
21.	If any deficiency or issue is observed as part of the inspections the Owner shall take prompt action to remedy	Understood

	Condition (summary text)	Statement of Compliance
22.	A record of the inspections shall be kept in a log book that includes: (a) name and signature of inspector (b) date and time of inspection (c) date and time of inspection (d) results of inspection and list of any deficiencies (e) recommendations for remedial action, and (f) the date, time and description of action taken	Understood
23.	The Owner shall implement the environmental monitoring program detailed in Schedule "B" of the Certificate	As amended under ECA May 2, 2012
24.	In the event of off-site exceedances of the PWQO the Owner shall notify the District Manager in writing within 2 weeks of the monitoring results. The notification shall address the reasons, assessment of remedial actions required and work program.	Understood
25.	The environmental monitoring program and trigger mechanism may be amended as follows: 2.5.1 Owner request changes to the District Manager in a separate letter accompanying the Bi-Annual Report 2.5.2 Within 14 days of receiving written approval from the District Manager, the Owner shall file a request to the Director 2.5.3 In the event other changes to the environmental monitoring program are proposed outside recommendations in the bi-annual report, the Owner shall follow current procedures for approval to amend the Certificate	Understood
26.	By May 31, 2006 and every 2 years thereafter the Owner shall submit to the District Manager a report.	Understood

The reader is referred to the actual Certificate of Approval for details. This compliance table does not reflect the amended ECA dated May 2, 2012 as it was prepared for the 2010/2011 Biennial Report.

Part 2

2010/2011 Monitoring Report

Jp2g Consultants Inc.

Deux Rivières Landfill Site – 2010-2011 Groundwater Monitoring Results

Prepared by:

AECOM

300 – 300 Town Centre Boulevard

Markham, ON, Canada L3R 5Z6

www.aecom.com

905 477 8400 tel

905 477 1456 fax

Project Number:

60246826 – 8.1

Date:

May, 2012

May 24, 2012

Mr. Kevin Mooder
Jp2g Consultants Inc.
1150 Morrison Drive
Suite 410
Ottawa, ON K2H 8S9

Dear Mr. Mooder:

Project No: 60246826–8.1

Regarding: Deux Rivières Landfill Site – 2010-2011 Monitoring Results

The purpose of this letter is to report the results of the 2010-2011 monitoring program at the Deux Rivières Landfill site as required under Condition 26 of the Amended Certificate of Approval (C of A) dated March 5, 2010 (appended to this report). The site was closed with final cover completed in the fall of 2007. The Township acquired the Contaminant Attenuation Zone (CAZ) shown on Figure 1 in March 2010. The monitoring program was conducted according to Condition 23 of the C of A dated March 5, 2010. Groundwater and surface water comments provided by the Ministry of the Environment (MOE) regarding the Deux Rivières 2008/2009 monitoring report are attached.

1. Methodology

Visual inspections of the site were conducted in April 2010 and June 2011. For groundwater, Condition 23 of the C of A dated March 5, 2010 requires that only Spring #1 be monitored, which was found to be inactive during both the 2010 and 2011 site visits. Surface water sampling at SW1, SW2, SW3 and SW4 was conducted on April 28, 2010 and June 2, 2011. Photos taken of the site during the reporting period are appended to this report.

Experienced Jp2g technicians using field methodologies that were established by AECOM (formerly Gartner Lee) conducted all monitoring activities during 2010 and 2011. Exova Accutest Laboratories Limited, located in Ottawa, Ontario, conducted all laboratory analysis.

The samples were placed immediately in a chilled cooler for transport to the laboratory. The samples were delivered to the laboratory within 24 hours of collection. Field measurements of pH, conductivity, dissolved oxygen and water temperature were collected at the time of sampling. All water quality data are appended to this report.

2. Results and Discussion

2.1 2010 – 2011 Groundwater Monitoring

Spring #1 is located approximately 200 m northwest and downgradient of the landfill near Cotnam Creek (Figure 1) and was dry during the April 2010 and June 2011 site visits. In April 2010, Ottawa received only 75% of the normal average precipitation for the month. Historical groundwater sampling locations are shown on Figure 1.

2.2 2010 – 2011 Surface Water Monitoring

The four surface water stations established along Cotnam Creek (SW1, SW2, SW3 and SW4), are shown on Figure 1. These surface water sampling stations were established in 2006 based on the requirements of the Certificate of Approval. SW4 is located about 480 m west of the site and was established as a background station upstream of the site. SW3 is located at the western CAZ boundary, and is upstream of the site. SW2, located at the northern CAZ boundary, and SW1, located about 300 m north of the site, are both downstream of the site. In 2009, it was noted that SW4 was dry and that the creek had shifted. A replacement station (SW4A, upstream and located about 240 m west of the site) was established and sampled beginning in July 2009 (Figure 1). COD phenols and TSS were not analyzed as part of the 2010-2011 sampling events. These parameters should be included in the monitoring program going forward. As recommended by the MOE, unionized ammonia was calculated for the 2010 and 2011 surface water samples (results attached).

Visual observations at each surface water station in April 2010 and June 2011 did not indicate any staining along the banks of Cotnam Creek. In 2010 and 2011, the water quality at the closest upstream (SW3) and downstream (SW2) surface water stations to the landfill was very similar with no exceedances of the Provincial Water Quality Objectives (PWQO), indicating landfill leachate is not affecting Cotnam Creek. Also, no exceedances of the PWQO were recorded at downstream station SW1 in 2010 and 2011. In June 2011, total phosphorus was noted to exceed the PWQO at SW4A and the TKN result was elevated. These results are considered to be anomalous as the blind duplicate was taken at this location in June 2011 and it did not have elevated total phosphorus or TKN results. It should also be noted that this surface water station is upstream of the site and therefore any exceedances are not considered to be landfill related.

3. Proposed Monitoring Program

The proposed 2012-2013 monitoring program is presented in the following table and is based on amended Environmental Compliance Approval (ECA) dated May 2, 2012.

The surface water locations SW1, SW2, SW3 and SW4A should continue to be sampled in 2012 and 2013. Surface water sampling should be conducted from downstream to upstream to avoid disturbance of the streambed prior to sampling. Surface water sampling should be conducted in such a manner that does not allow sediment to be collected with the samples.

Monitoring Location	Sampling Frequency	Analytical Parameters
<u>Surface Water</u> SW1, SW2, SW3, SW4(A)	Once per year (spring)	<ul style="list-style-type: none"> • Major and minor ions (Ca, Na, Cl, SO₄, K, Mg, B) • Trace Metals (Fe, Mn, Cd, Cu, Sr, Zn) • Nitrogen species (NO₃, NO₂, NH₃, TKN) • General Parameters (alkalinity, conductivity, TDS, total phosphorus, COD, phenols, TSS) • Field measurements of flow, pH, conductivity, water temperature, dissolved oxygen

4. Recommendations

Based on the above discussion, we recommend that monitoring program continue at the site in 2012 and 2013 as outlined in Section 3, and that COD, phenols and TSS are included in the sample analysis for these monitoring events.

We trust this letter report meets with your needs at this time. Should you have any questions or comments, please contact the undersigned at extension 378, (905) 477-8400.

Sincerely,
AECOM Canada Ltd.



Spencer Bootsma, B.Sc.
Environmental Scientist

MEW:mm
Encl.



Marie Wardman, P. Eng.
Senior Geological Engineer



Statement of Qualifications and Limitations

The attached Report (the "Report") has been prepared by AECOM Canada Ltd. ("Consultant") for the benefit of the client ("Client") in accordance with the agreement between Consultant and Client, including the scope of work detailed therein (the "Agreement").

The information, data, recommendations and conclusions contained in the Report (collectively, the "Information"):

- is subject to the scope, schedule, and other constraints and limitations in the Agreement and the qualifications contained in the Report (the "Limitations");
- represents Consultant's professional judgement in light of the Limitations and industry standards for the preparation of similar reports;
- may be based on information provided to Consultant which has not been independently verified;
- has not been updated since the date of issuance of the Report and its accuracy is limited to the time period and circumstances in which it was collected, processed, made or issued;
- must be read as a whole and sections thereof should not be read out of such context;
- was prepared for the specific purposes described in the Report and the Agreement; and
- in the case of subsurface, environmental or geotechnical conditions, may be based on limited testing and on the assumption that such conditions are uniform and not variable either geographically or over time.

Consultant shall be entitled to rely upon the accuracy and completeness of information that was provided to it and has no obligation to update such information. Consultant accepts no responsibility for any events or circumstances that may have occurred since the date on which the Report was prepared and, in the case of subsurface, environmental or geotechnical conditions, is not responsible for any variability in such conditions, geographically or over time.

Consultant agrees that the Report represents its professional judgement as described above and that the Information has been prepared for the specific purpose and use described in the Report and the Agreement, but Consultant makes no other representations, or any guarantees or warranties whatsoever, whether express or implied, with respect to the Report, the Information or any part thereof.

Without in any way limiting the generality of the foregoing, any estimates or opinions regarding probable construction costs or construction schedule provided by Consultant represent Consultant's professional judgement in light of its experience and the knowledge and information available to it at the time of preparation. Since Consultant has no control over market or economic conditions, prices for construction labour, equipment or materials or bidding procedures, Consultant, its directors, officers and employees are not able to, nor do they, make any representations, warranties or guarantees whatsoever, whether express or implied, with respect to such estimates or opinions, or their variance from actual construction costs or schedules, and accept no responsibility for any loss or damage arising therefrom or in any way related thereto. Persons relying on such estimates or opinions do so at their own risk.

Except (1) as agreed to in writing by Consultant and Client; (2) as required by-law; or (3) to the extent used by governmental reviewing agencies for the purpose of obtaining permits or approvals, the Report and the Information may be used and relied upon only by Client.

Consultant accepts no responsibility, and denies any liability whatsoever, to parties other than Client who may obtain access to the Report or the Information for any injury, loss or damage suffered by such parties arising from their use of, reliance upon, or decisions or actions based on the Report or any of the Information ("improper use of the Report"), except to the extent those parties have obtained the prior written consent of Consultant to use and rely upon the Report and the Information. Any injury, loss or damages arising from improper use of the Report shall be borne by the party making such use.

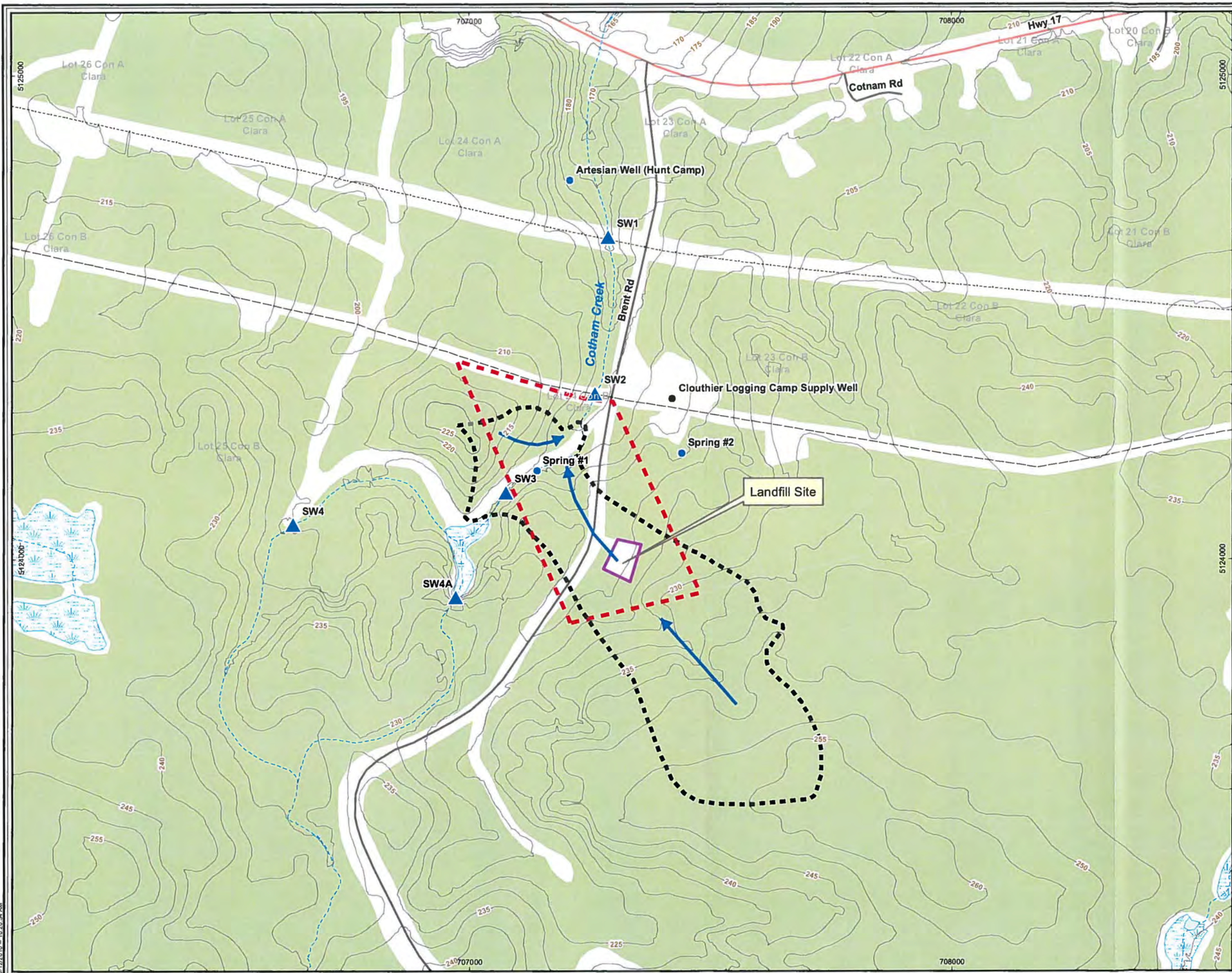
This Statement of Qualifications and Limitations is attached to and forms part of the Report and any use of the Report is subject to the terms hereof.

Attachments

- **Figure 1. Site Plan**
- **Table A1. Groundwater Quality Data**
- **Table B1. Private Well Water Quality Data**
- **Table C1. Surface Water Quality Data**
- **MOE Certificate of Approval Amendment March 5, 2010**
- **2008/2009 Monitoring Report MOE Groundwater and Surface Water Comments**
- **Photos of Deux Rivieres Site**

Figure 1. Site Plan

Map Document: (N:\projects\06-aecom\60147234-08\2010\FinalGIS\Spatial\MXD\WorkingMXD\60147234-08_SitePlan.mxd)
05/12/2010 10:20:54 AM



Legend

- ▲ Surface Water Sampling Location
- Spring
- ➡ Shallow Groundwater Flow
- ▭ Landfill Site Boundary
- - - Contaminant Attenuation Zone
- ▨ Groundwater Infiltration Area
- - - Intermittent Stream
- Permanent Stream
- Waterbody
- Cartographic Wetland
- Railway
- - - Transmission Line
- - - Pipeline

Basemapping from Ontario Ministry of Natural Resources

0 37.5 75 150 225 300
m
1:7,500
UTM Zone 17N, NAD 83

This drawing has been prepared for the use of AECOM's client and may not be used, reproduced or relied upon by third parties, except as agreed by AECOM and its client, as required by law or for use by governmental reviewing agencies. AECOM accepts no responsibility, and denies any liability whatsoever, to any party that modifies this drawing without AECOM's express written consent.

Deux Rivières Landfill
for Jp2g Consultants Inc.

Site Plan

May 2012
Project 60246826-8.1

AECOM

Figure 1

Table A1. Groundwater Quality Data

**Table A1: Deux Rivières Landfill
Groundwater Quality Data**

Monitor Number		Spring # 1				
Date Sampled	PWQO	12-Jun-02	4-Jun-04	18-May-05	25-May-06	14-May-07
<u>Parameters</u>						
Fluoride			Not Flowing	Not Flowing	Not Flowing	Not Flowing
Chloride		<1				
Nitrite		<0.10				
Nitrate		<0.10				
Sulphate		6				
Calcium		2				
Magnesium		1				
Sodium		<2				
Potassium		<1				
Aluminum						
Barium						
Boron	0.20	<0.05				
Cadmium	0.0002					
Chromium	0.100					
Cobalt						
Conductivity uS/cm						
Copper	0.005	<0.001				
Iron	0.30	0.22				
Lead	f(Alk)					
Manganese		0.040				
Nickel	0.052					
Silicon						
Silver	0.0001					
Strontium		0.012				
Zinc	0.030					
Hardness						
Alkalinity as CaCO ₃		<5				
TKN		0.40				
Ammonia	f(pH, Temp)	0.07				
Organic Nitrogen		0.330				
Un-ionized Ammonia	0.02					
Phenols	0.001	<0.001				
Ion Balance		N/A				
COD		37				
DOC						
Total Phosphorous	0.02					
TDS		15				
<u>Field Measured</u>						
Water Temp. (°C)		12.1				
Conductivity (microS/cm)		22				
pH (pH units)	6.5 - 8.5	4.23				
Dissolved Oxygen (DO)	f(Temp)	7.48				
Flow (liters/sec)		0.40				

Notes:

All values reported in mg/L unless otherwise noted
PWQO = Provincial Water Quality Objectives
Shaded values exceed PWQO
nd = not detected
ns = not sampled

**Table A1: Deux Rivières Landfill
Groundwater Quality Data**

Monitor Number		Spring # 1				
Date Sampled	PWQO	9-May-08	22-Jul-09	24-Apr-10	2-Jun-11	
<u>Parameters</u>						
Fluoride			Not	Not	Not	
Chloride		1	Active	Active	Active	
Nitrite		<0.10				
Nitrate		<0.10				
Sulphate		4				
Calcium		1				
Magnesium		<1				
Sodium		<2				
Potassium		2				
Aluminum						
Barium						
Boron	0.20	<0.01				
Cadmium	0.0002	<0.0001				
Chromium	0.100					
Cobalt						
Conductivity uS/cm		24				
Copper	0.005	0.001				
Iron	0.30	0.59				
Lead	f(Alk)					
Manganese		0.100				
Nickel	0.052					
Silicon						
Silver	0.0001					
Strontium		0.010				
Zinc	0.030	<0.01				
Hardness						
Alkalinity as CaCO ₃		<5				
TKN		0.55				
Ammonia	f(pH, Temp)	<0.02				
Organic Nitrogen		≤ 0.55				
Un-ionized Ammonia	0.02					
Phenols	0.001	<0.001				
Ion Balance		N/A - LC				
COD		39				
DOC						
Total Phosphorous	0.02	<0.01				
TDS		16				
<u>Field Measured</u>						
Water Temp. (°C)		17.0				
Conductivity (microS/cm)		27				
pH (pH units)	6.5 - 8.5	6.33				
Disolved Oxygen (DO)	f(Temp)	9.91				
Flow (liters/sec)		0.05				

Notes:

All values reported in mg/L unless otherwise noted
PWQO = Provincial Water Quality Objectives
Shaded values exceed PWQO
nd = not detected
ns = not sampled

**Table A1: Deux Rivières Landfill
Groundwater Quality Data**

Monitor Number		Spring # 2				
Date Sampled	PWQO	12-Jun-02	28-May-03	18-May-05	25-May-06	14-May-07
<u>Parameters</u>						
Fluoride						
Chloride		1	1	<1	<1	1
N-NO2 (Nitrite)		<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		0.29	0.42	<0.10	0.26	0.13
Sulphate		8	7	8	8	7
Calcium		10	11	13	10	10
Magnesium		2	2	2<1	2	2
Sodium		4	2	2	<2	<2
Potassium		<1	<1		<1	<1
Aluminum						
Barium						
Boron	0.20	<0.05	<0.05	<0.01	<0.01	<0.01
Cadmium	0.0002		<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.100					
Cobalt						
Conductivity			90	93	86	79
Copper	0.005	<0.001	0.001	0.002	<0.001	0.003
Iron	0.30	0.06	0.10	0.26	0.09	0.55
Lead	f(Alk)					
Manganese		<0.01	0.022	0.060	0.010	0.120
Nickel	0.052					
Silicon						
Silver	0.0001					
Strontium		0.049	0.046	0.049	0.040	0.057
Zinc	0.030		0.018	0.040	0.010	0.020
Hardness						
Alkalinity as CaCo3		31	36	43	35	33
TKN		0.13	0.09	0.15	0.12	0.09
N-NH3 (Ammonia)	f(pH, Temp)	0.09	<0.02	0.11	0.05	0.03
Organic Nitrogen		0.040	≤0.09	0.040	0.070	0.060
Un-ionized Ammonia	0.02					
Phenols	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ion Balance		N/A	N/A	N/A-LC	N/A - LC	N/A - LC
COD		12	<5	<5	<5	<5
DOC						
Total Phosphorous	0.02		0.04	0.06	<0.01	0.12
TDS		53	59	61	56	51
<u>Field Measured</u>						
Water Temp. (°C)		8.2	8.6	7.6	9.1	8.2
Conductivity (microS/cm)		59	103	75	65	64
pH (pH units)	6.5 - 8.5	7.10	7.88	8.43	8.24	6.37
Disolved Oxygen (DO)	f(Temp)	8.80	8.98	6.69	5.46	8.58
Flow (liters/sec)		1.00	0.13	0.70	0.50	1.00

Notes:

All values reported in mg/L unless otherwise noted
PWQO = Provincial Water Quality Objectives
Shaded values exceed PWQO
nd = not detected
ns = not sampled

**Table A1: Deux Rivieres Landfill
Groundwater Quality Data**

Monitor Number		Spring # 2		
Date Sampled	PWQO	9-May-08	22-Jul-09	
<u>Parameters</u>				
Fluoride				
Chloride		1	<1	
N-NO2 (Nitrite)		<0.10	<0.10	
N-NO3 (Nitrate)		0.14	<0.10	
Sulphate		7	7	
Calcium		11	8	
Magnesium		2	1	
Sodium		<2	<2	
Potassium		<1	<1	
Aluminum				
Barium				
Boron	0.20	<0.01	<0.01	
Cadmium	0.0002	<0.0001	<0.0001	
Chromium	0.100			
Cobalt				
Conductivity		84	85	
Copper	0.005	<0.001	<0.001	
Iron	0.30	0.04	0.13	
Lead	f(Alk)			
Manganese		0.01	0.02	
Nickel	0.052			
Silicon				
Silver	0.0001			
Strontium		0.040	0.046	
Zinc	0.030	<0.01	<0.01	
Hardness				
Alkalinity as CaCo3		32	36	
TKN		0.15	<0.10	
N-NH3 (Ammonia)	f(pH, Temp)	0.08	<0.02	
Organic Nitrogen		0.07	<0.10	
Un-ionized Ammonia	0.02			
Phenols	0.001	<0.001	<0.001	
Ion Balance		N/A - LC	N/A-LC	
COD		<5	<5	
DOC				
Total Phosphorous	0.02	0.01	0.02	
TDS		55	55	
<u>Field Measured</u>				
Water Temp. (°C)		6.3	9.5	
Conductivity (microS/cm)		67	72	
pH (pH units)	6.5 - 8.5	6.46	8.2	
Dissolved Oxygen (DO)	f(Temp)	7.51	9.07	
Flow (liters/sec)		0.03	0.28	

Notes: All values reported in mg/L unless otherwise noted
PWQO = Provincial Water Quality Objectives
Shaded values exceed PWQO
nd = not detected
ns = not sampled

**Table B1. Private Well Water
Quality Data**

**Table B1: Deux Rivieres Landfill
Private Well Water Quality Data**

Monitor Number		Hunt Camp				
Date Sampled	ODWS	12-Jun-02	28-May-03	09-Jun-04	25-May-06	14-May-07
<u>Parameters</u>						
Fluoride	1.50					
Chloride	250	2	7	7	1	1
Nitrite	1.00	<0.10	<0.10	<0.50	<0.10	<0.10
Nitrate	10.00	0.25	0.32	0.50	0.28	0.27
Sulphate	500.00	8	17	13	8	7
Calcium		9	26	30	8	9
Magnesium		2	7	7	2	2
Sodium	200.000	2	13	10	<2	<2
Potassium		<1	1	2	<1	1
Aluminum	0.100					
Barium	1.00					
Boron	5.00	<0.05	<0.05	0.04	<0.01	<0.01
Cadmium	0.0050		<0.0001		<0.0001	<0.0001
Chromium	0.050					
Cobalt						
Copper	1.000	<0.001	0.016	0.004	<0.001	<0.001
Conductivity (microS/cm)					75	78
Iron	0.30	<0.01	0.04	0.22	<0.03	<0.03
Lead	0.010					
Manganese	0.050	<0.01	<0.005	<0.01	<0.01	<0.01
Nickel						
Silicon						
Silver	0.0001					
Strontium		0.045	0.775	0.672	0.043	0.042
Zinc	5.00		<0.005		<0.01	<0.01
Hardness	80 - 100					
Alkalinity as CaCo3	30 - 500	28	103	114	27	31
TKN		<0.05	0.11	0.60	<0.05	0.24
Ammonia	f(pH, Temp)	<0.02	<0.02	<0.02	0.03	<0.02
Organic Nitrogen	0.15	<0.05	<0.11	<0.60	<0.02	≤ 0.24
Phenols	0.001	<0.001	<0.001	<0.001	<0.001	<0.001
Ion Balance		N/A	0.94	0.92	N/A-LC	N/A-LC
COD		<5	<5	<5	<5	<5
DOC						
Total Phosphorous	0.03		0.03		<0.01	0.07
TDS	500	51	158	170	49	51
<u>Field Measured</u>						
Water Temp. (°C)	15.0	6.6	9.1	10.0	7.4	7.0
Conductivity (microS/cm)		57	365		53	64
pH (pH units)	6.5 - 8.5	8.23	8.85	7.47	8.12	7.99
Dissolved Oxygen (DO)	f(Temp)	9.96	5.28			8.72
Flow (liters/sec)		8			12	6

Notes:

All values reported in mg/L unless otherwise noted
PWQO = Provincial Water Quality Objectives
Shaded values exceed PWQO
nd = not detected
ns = not sampled

**Table B1: Deux Rivieres Landfill
Private Well Water Quality Data**

Monitor Number		Hunt Camp		
		09-May-08	22-Jul-09	
<u>Date Sampled</u>	ODWS			
<u>Parameters</u>				
Fluoride	1.50			
Chloride	250	1	1	
Nitrite	1.00	<0.10	<0.10	
Nitrate	10.00	0.24	0.17	
Sulphate	500.00	7	7	
Calcium		9	9	
Magnesium		2	2	
Sodium	200.000	<2	4	
Potassium		1	1	
Aluminum	0.100			
Barium	1.00			
Boron	5.00	<0.01	<0.01	
Cadmium	0.0050	<0.0001	<0.0001	
Chromium	0.050			
Cobalt				
Copper	1.000	<0.001	<0.001	
Conductivity (microS/cm)		77	74	
Iron	0.30	<0.03	0.04	
Lead	0.010			
Manganese	0.050	<0.01	0.030	
Nickel				
Silicon				
Silver	0.0001			
Strontium		0.041	0.044	
Zinc	5.00	<0.01	0.010	
Hardness	80 - 100			
Alkalinity as CaCo3	30 - 500	31	28	
TKN		<0.10	<0.10	
Ammonia	f(pH, Temp)	0.02	<0.02	
Organic Nitrogen	0.15			
Phenols	0.001	<0.001	<0.001	
Ion Balance		N/A - LC	N/A-LC	
COD		<5	<5	
DOC				
Total Phosphorous	0.03	<0.01	<0.01	
TDS	500	50	48	
<u>Field Measured</u>				
Water Temp. (°C)	15.0	7.3	6.7	
Conductivity (microS/cm)		68	73	
pH (pH units)	6.5 - 8.5	6.74	8.40	
Dissolved Oxygen (DO)	f(Temp)	10.24	9.50	
Flow (liters/sec)			4	

Notes:

All values reported in mg/L unless otherwise noted
PWQO = Provincial Water Quality Objectives
Shaded values exceed PWQO
nd = not detected
ns = not sampled

**Table B1: Deux Rivières Landfill
Private Well Water Quality Data**

Private Well		Clouthier Logging Camp				
Date Sampled	ODWS	28-May-03	9-Jun-04	25-May-06	14-May-07	9-May-08
Parameters						
Chloride	250	7	7	6	8	4
Fluoride	1.50					
Nitrite	1.00	<0.10	<0.50	<0.10	<0.10	<0.10
Nitrate	10.00	0.32	0.50	0.49	0.39	0.75
Phosphate						
Sulphate	500	17	13	12	20	13
Calcium		26	30	30	27	33
Magnesium		7	7	7	7	8
Sodium	200	13	10	9	17	12
Potassium		1	2	2	1	2
Aluminium	0.100					
Barium	1.000					
Beryllium						
Boron	5.00	<0.05	0.04	0.04	0.08	0.04
Cadmium	0.005	<0.0001		<0.0001	<0.0001	<0.0001
Chromium	0.050					
Cobalt						
Copper	1.000	0.016	0.004	0.003	0.008	0.020
Conductivity (microS/cm)				259	277	272
Iron	0.300	0.04	0.22	0.07	<0.03	<0.03
Lead	0.010					
Manganese	0.050	<0.005	<0.01	<0.01	<0.01	<0.01
Molybdenum						
Nickel						
Total P		0.030		<0.01	0.030	<0.01
Silicon						
Silver						
Strontium		0.775	0.672	0.646	0.924	0.764
Sulphur						
Thallium						
Titanium						
Vanadium						
Zinc	5.000	<0.005		<0.01	<0.01	<0.01
Zirconium						
Hardness	80 - 100					
Alkalinity as CaCO3	30 - 500	103	114	115	108	115
TKN		0.11	0.60	0.08	0.08	0.60
Ammonia		<0.02	<0.02	0.06	0.07	0.25
Organic Nitrogen	0.15	≤0.11	<0.60	0.02	0.01	0.01
Phenols		<0.001	<0.001	<0.001	<0.001	<0.001
BOD						
COD		<5	<5	<5	<5	<5
TDS	500	158	170	168	180	177
Ion Balance		0.94	0.92	0.92	0.95	1.05
Field Measured						
Water Temp. (°C)	15.0	9.1	10.0	9.8	9.9	7.7
Conductivity (microS/cm)		365(243Lab)	(261Lab)	202	235	256
pH (pH units)	6.5 - 8.5	8.85	7.47	7.73	6.45	6.75
DO		5.28				

Notes:

All values reported in mg/L unless otherwise noted
 ODWS = Ontario Drinking Water Standards
 Shaded values exceed ODWS
 nd = not detected
 ns = not sampled

**Table B1: Deux Rivieres Landfill
Private Well Water Quality Data**

Private Well		Clouthier Logging Camp				
Date Sampled	ODWS	22-Jul-09	28-Apr-10			
<u>Parameters</u>			No Longer Sampled			
Chloride	250	6				
Fluoride	1.50					
Nitrite	1.00	<0.10				
Nitrate	10.00	0.55				
Phosphate						
Sulphate	500	16				
Calcium		34				
Magnesium		8				
Sodium	200	15				
Potassium		2				
Aluminium	0.100					
Barium	1.000					
Beryllium						
Boron	5.00	0.06				
Cadmium	0.005	<0.0001				
Chromium	0.050					
Cobalt						
Copper	1.000	0.011				
Conductivity (microS/cm)		282				
Iron	0.300	0.05				
Lead	0.010					
Manganese	0.050	<0.01				
Molybdenum						
Nickel						
Total P		<0.01				
Silicon						
Silver						
Strontium		0.872				
Sulphur						
Thallium						
Titanium						
Vanadium						
Zinc	5.000	<0.01				
Zirconium						
Hardness	80 - 100					
Alkalinity as CaCO3	30 - 500	118				
TKN		<0.10				
Ammonia		<0.02				
Organic Nitrogen	0.15					
Phenols		<0.001				
BOD						
COD		<5				
TDS	500	183				
Ion Balance		1.05				
<u>Field Measured</u>						
Water Temp. (°C)	15.0	13.3				
Conductivity (microS/cm)		243				
pH (pH units)	6.5 - 8.5	8.0				
DO						

Notes:

All values reported in mg/L unless otherwise noted
ODWS = Ontario Drinking Water Standards
Shaded values exceed ODWS
nd = not detected
ns = not sampled

Table C1. Surface Water
Quality Data

**Table C1: Deux Rivières Landfill
Surface Water Quality Data**

Monitor Number		SW 1				
Date Sampled	PWQO	25-May-06	14-May-07	09-May-08	22-Jul-09	28-Apr-10
<u>Parameters</u>						
Fluoride						
Chloride		7	2	2	1	3
N-NO ₂ (Nitrite)		<0.10	<0.10	<0.10	<0.10	<0.10
N-NO ₃ (Nitrate)		0.60	0.44	0.33	0.24	0.30
Sulphate		6	7	7	7	11
Calcium		9	8	7	9	9
Magnesium		2	2	2	2	2
Sodium		3	2	<2	3	3
Potassium		<1	1	1	1	1
Aluminum						
Barium						
Boron	0.200	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.100					
Cobalt						
Conductivity		98	76	66	72	73
Copper	0.005	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	0.30	<0.03	0.05	0.08	0.07	<0.03
Lead	f(Alk)					
Manganese		<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	0.052					
Silicon						
Silver	0.0001					
Strontium		0.046	0.040	0.035	0.045	0.045
Zinc	0.030	<0.01	<0.01	<0.01	<0.01	<0.01
Hardness as CaCO ₃						
Alkalinity as CaCO ₃		28	29	23	28	27
TKN		0.15	0.22	0.10	<0.10	<0.10
N-NH ₃ (Ammonia)	f(pH, Temp)	0.02	0.03	<0.02	<0.02	<0.02
Organic Nitrogen		0.13	0.19	≤ 0.10	<0.10	<0.10
Un-ionized Ammonia	0.02					<0.0002
Phenols	0.001	<0.001	<0.001	<0.001	<0.001	
Ion Balance		N/A-LC	N/A-LC	N/A-LC	N/A-LC	
COD		<5	<5	<5	<5	
DOC						
Total Phosphorous	0.02	<0.01	0.06	<0.01	<0.01	<0.01
TSS		64	49	43	47	
TDS				3		48
<u>Field Measured</u>						
Water Temp. (°C)		8.3	8.1	7.5	9.3	10.1
Conductivity (microS/cm)		55	61	58	65	71
pH (pH units)	6.5 - 8.5	8.57	6.81	6.92	8.50	7.7
Dissolved Oxygen (DO)	f(Temp)	6.97	9.35	11.08	10.13	7.1
Flow (liters/sec)		3	6	15	14	5.0

Notes: All values reported in mg/L unless otherwise noted
PWQO = Provincial Water Quality Objectives
Shaded values exceed PWQO
nd = not detected
ns = not sampled

**Table C1: Deux Rivieres Landfill
Surface Water Quality Data**

Monitor Number		SW 1				
Date Sampled	PWQO	02-Jun-11				
<u>Parameters</u>						
Fluoride						
Chloride		7				
N-NO2 (Nitrite)		<0.10				
N-NO3 (Nitrate)		0.47				
Sulphate		6				
Calcium		12				
Magnesium		2				
Sodium		4				
Potassium		<1				
Aluminum						
Barium						
Boron	0.200	<0.01				
Cadmium	0.0002	<0.0001				
Chromium	0.100					
Cobalt						
Conductivity		90				
Copper	0.005	<0.001				
Iron	0.30	<0.03				
Lead	f(Alk)					
Manganese		<0.01				
Nickel	0.052					
Silicon						
Silver	0.0001					
Strontium		0.050				
Zinc	0.030	<0.01				
Hardness as CaCo3						
Alkalinity as CaCo3		28				
TKN		<0.10				
N-NH3 (Ammonia)	f(pH, Temp)	<0.02				
Organic Nitrogen		<0.10				
Un-ionized Ammonia	0.02	<0.0008				
Phenols	0.001					
Ion Balance						
COD						
DOC						
Total Phosphorous	0.02	<0.01				
TSS						
TDS		58				
<u>Field Measured</u>						
Water Temp. (°C)		8.2				
Conductivity (microS/cm)		72				
pH (pH units)	6.5 - 8.5	8.4				
Disolved Oxygen (DO)	f(Temp)	10.65				
Flow (liters/sec)		2.0				

Notes:

All values reported in mg/L unless otherwise noted
PWQO = Provincial Water Quality Objectives
Shaded values exceed PWQO
nd = not detected
ns = not sampled

**Table C1: Deux Rivières Landfill
Surface Water Quality Data**

Monitor Number		SW2				
Date Sampled	PWQO	25-May-06	14-May-07	9-May-08	9-May-08	22-Jul-09
<u>Parameters</u>						
Fluoride						
Chloride		3	1	1	1	2
N-NO2 (Nitrite)		<0.10	<0.10	<0.10	<0.10	<0.10
N-NO3 (Nitrate)		<0.10	<0.10	<0.10	<0.10	<0.10
Sulphate		7	6	6	6	7
Calcium		7	6	5	5	8
Magnesium		1	2	1	1	2
Sodium		3	<2	<2	<2	<2
Potassium		1	1	1	1	1
Aluminum						
Barium						
Boron	0.200	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.100					
Cobalt						
Conductivity		74	56	51	51	62
Copper	0.005	0.001	<0.001	<0.001	<0.001	<0.001
Iron	0.30	1.06	0.08	0.15	0.15	0.07
Lead	f(Alk)					
Manganese		0.260	<0.01	<0.01	<0.01	<0.01
Nickel	0.052					
Silicon						
Silver	0.0001					
Strontium		0.040	0.032	0.030	0.030	0.041
Zinc	0.030	0.010	<0.01	<0.01	<0.01	<0.01
Hardness as CaCo3						
Alkalinity as CaCo3		25	21	15	15	24
TKN		2.33	0.35	0.18	0.18	<0.10
N-NH3 (Ammonia)	f(pH, Temp)	0.07	0.05	<0.02	<0.02	<0.02
Organic Nitrogen		2.26	0.30	≤ 0.18	≤ 0.18	<0.10
Un-ionized Ammonia	0.02					
Phenols	0.001	<0.001	<0.001	0.003	0.003	<0.001
Ion Balance		N/A-LC	N/A-LC	N/A-LC	N/A-LC	N/A-LC
COD		33	<5	9	9	<5
DOC						
Total Phosphorous	0.02	0.11	0.03	<0.01	<0.01	<0.01
TSS				<2	<2	
TDS		48	36	33	33	40
<u>Field Measured</u>						
Water Temp. (°C)		18.5	11.0	9.9	9.9	9.9
Conductivity (microS/cm)		55	45	42	42	54
pH (pH units)	6.5 - 8.5	7.85	6.80	6.87	6.87	8.30
Disolved Oxygen (DO)	f(Temp)	6.81	9.09	11.19	11.19	9.86
Flow (liters/sec)		0.50	6	12	12	14

Notes:

All values reported in mg/L unless otherwise noted
PWQO = Provincial Water Quality Objectives
Shaded values exceed PWQO
nd = not detected
ns = not sampled

**Table C1: Deux Rivieres Landfill
Surface Water Quality Data**

Monitor Number		SW2				
Date Sampled	PWQO	28-Apr-10	02-Jun-11			
<u>Parameters</u>						
Fluoride						
Chloride		<1	<1			
N-NO2 (Nitrite)		<0.10	<0.10			
N-NO3 (Nitrate)		<0.10	<0.10			
Sulphate		6	6			
Calcium		7	5			
Magnesium		2	1			
Sodium		2	<2			
Potassium		1	<1			
Aluminum						
Barium						
Boron	0.200	<0.01	<0.01			
Cadmium	0.0002	<0.0001	<0.0001			
Chromium	0.100					
Cobalt						
Conductivity		57	43			
Copper	0.005	<0.001	<0.001			
Iron	0.30	<0.03	0.07			
Lead	f(Alk)					
Manganese		<0.01	<0.01			
Nickel	0.052					
Silicon						
Silver	0.0001					
Strontium		0.036	0.026			
Zinc	0.030	<0.01	<0.01			
Hardness as CaCo3						
Alkalinity as CaCo3		21	16			
TKN		<0.10	0.15			
N-NH3 (Ammonia)	f(pH, Temp)	<0.02	<0.02			
Organic Nitrogen			<0.10			
Un-ionized Ammonia	0.02	<0.0005	<0.0004			
Phenols	0.001					
Ion Balance						
COD						
DOC						
Total Phosphorous	0.02	<0.01	<0.01			
TSS						
TDS		37	28			
<u>Field Measured</u>						
Water Temp. (°C)		13.3	15.6			
Conductivity (microS/cm)		56	34			
pH (pH units)	6.5 - 8.5	8.0	7.9			
Disolved Oxygen (DO)	f(Temp)	7.41	9.98			
Flow (liters/sec)		5.0	1.5			

Notes:

All values reported in mg/L unless otherwise noted
PWQO = Provincial Water Quality Objectives
Shaded values exceed PWQO
nd = not detected
ns = not sampled

**Table C1: Deux Rivières Landfill
Surface Water Quality Data**

Monitor Number		SW 3				
Date Sampled	PWQO	25-May-06	14-May-07	9-May-08	22-Jul-09	28-Apr-10
<u>Parameters</u>						
Fluoride						
Chloride		<1	1	1	<1	<1
Nitrite		<0.10	<0.10	<0.10	<0.10	<0.10
Nitrate		<0.10	<0.10	<0.10	<0.10	<0.10
Sulphate		7	6	6	7	6
Calcium		2	5	5	7	7
Magnesium		<1	1	1	2	2
Sodium		<2	<2	<2	<2	2
Potassium		<1	<1	<1	1	1
Aluminum						
Barium						
Boron	0.200	<0.01	<0.01	<0.01	<0.01	<0.01
Cadmium	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Chromium	0.100					
Cobalt						
Conductivity		33	51	47	62	57
Copper	0.005	<0.001	<0.001	<0.001	<0.001	<0.001
Iron	0.30	0.39	0.22	0.05	0.07	<0.03
Lead	f(Alk)					
Manganese		0.010	0.010	<0.01	<0.01	<0.01
Nickel	0.052					
Silicon						
Silver	0.0001					
Strontium		0.019	0.034	0.027	0.041	0.037
Zinc	0.030	0.020	<0.01	<0.01	<0.01	<0.01
Hardness as CaCo3						
Alkalinity as CaCo3		6	19	17	24	23
TKN		0.22	0.23	0.30	<0.10	0.15
Ammonia	f(pH, Temp)	0.09	<0.02	<0.02	<0.02	<0.02
Organic Nitrogen		0.130	≤ 0.23	≤ 0.30	<0.10	≤ 0.15
Un-ionized Ammonia	0.02					<0.0002
Phenols	0.001	<0.001	<0.001	<0.001	<0.001	
Ion Balance		N/A - LC	N/A-LC	N/A-LC	N/A-LC	
COD		16	8	5	9	
DOC						
Total Phosphorous	0.02	<0.01	0.09	<0.01	0.02	<0.01
TSS				<2		
TDS		22	33	31	40	37
<u>Field Measured</u>						
Water Temp. (°C)		13.2	9.7	9.9	9.4	12.1
Conductivity (microS/cm)		24	40	39	54	56
pH (pH units)	6.5 - 8.5	8.06	6.20	6.79	8.20	7.7
Disolved Oxygen (DO)	f(Temp)	7.21	9.44	12.02	8.87	6.97
Flow (liters/sec)		0.05	4.50	12	13	5.0

Notes:

All values reported in mg/L unless otherwise noted
PWQO = Provincial Water Quality Objectives
Shaded values exceed PWQO
nd = not detected
ns = not sampled

**Table C1: Deux Rivieres Landfill
Surface Water Quality Data**

Monitor Number		SW 3				
Date Sampled	PWQO	02-Jun-11				
<u>Parameters</u>						
Fluoride						
Chloride		<1				
Nitrite		<0.10				
Nitrate		<0.10				
Sulphate		6				
Calcium		5				
Magnesium		1				
Sodium		2				
Potassium		<1				
Aluminum						
Barium						
Boron	0.200	<0.01				
Cadmium	0.0002	<0.0001				
Chromium	0.100					
Cobalt						
Conductivity		42				
Copper	0.005	<0.001				
Iron	0.30	0.07				
Lead	f(Alk)					
Manganese		<0.01				
Nickel	0.052					
Silicon						
Silver	0.0001					
Strontium		0.026				
Zinc	0.030	<0.01				
Hardness as CaCo3						
Alkalinity as CaCo3		17				
TKN		<0.10				
Ammonia	f(pH, Temp)	<0.02				
Organic Nitrogen		<0.10				
Un-ionized Ammonia	0.02	<0.0002				
Phenols	0.001					
Ion Balance						
COD						
DOC						
Total Phosphorous	0.02	0.01				
TSS						
TDS		27				
<u>Field Measured</u>						
Water Temp. (°C)		12.0				
Conductivity (microS/cm)		34				
pH (pH units)	6.5 - 8.5	7.6				
Disolved Oxygen (DO)	f(Temp)	9.34				
Flow (liters/sec)		1.0				

Notes:

All values reported in mg/L unless otherwise noted
PWQO = Provincial Water Quality Objectives
Shaded values exceed PWQO
nd = not detected
ns = not sampled

**Table C1: Deux Rivieres Landfill
Surface Water Quality Data**

Monitor Number		SW4				
Date Sampled	PWQO	25-May-06	14-May-07	9-May-08	22-Jul-09	
<u>Parameters</u>					Re-located to SW 4A	
Fluoride						
Chloride		<1	1	1		
N-NO2 (Nitrite)		<0.10	<0.10	<0.10		
N-NO3 (Nitrate)		<0.10	<0.10	<0.10		
Sulphate		6	5	5		
Calcium		3	3	3		
Magnesium		1	1	1		
Sodium		<2	<2	<2		
Potassium		<1	<1	<1		
Aluminum						
Barium						
Boron	0.200	<0.01	<0.01	<0.01		
Cadmium	0.0002	<0.0001	<0.0001	<0.0001		
Chromium	0.100					
Cobalt						
Conductivity		33	33	32		
Copper	0.005	<0.001	<0.001	<0.001		
Iron	0.30	0.29	0.23	0.22		
Lead	f(Alk)					
Manganese		0.030	<0.01	<0.01		
Nickel	0.052					
Silicon						
Silver	0.0001					
Strontium		0.024	0.021	0.017		
Zinc	0.030	<0.01	<0.01	<0.01		
Hardness as CaCo3						
Alkalinity as CaCo3		7	6	9		
TKN		0.34	0.35	0.48		
N-NH3 (Ammonia)	f(pH, Temp)	0.04	<0.02	0.12		
Organic Nitrogen		0.30	≤ 0.35	0.36		
Un-ionized Ammonia	0.02					
Phenols	0.001	<0.001	<0.001	<0.001		
Ion Balance		N/A - LC	N/A - LC	N/A - LC		
COD		25	20	17		
DOC						
Total Phosphorous	0.02	<0.01	0.02	<0.01		
TSS				<2		
TDS		22	22	21		
<u>Field Measured</u>						
Water Temp. (°C)		15.7	10.4	9.9		
Conductivity (microS/cm)		25	25	23		
pH (pH units)	6.5 - 8.5	7.84	6.60	6.85		
Dissolved Oxygen (DO)	f(Temp)	6.00	8.83	9.63		
Flow (liters/sec)		2.0	3.0	9		

Notes:

All values reported in mg/L unless otherwise noted
PWQO = Provincial Water Quality Objectives
Shaded values exceed PWQO
nd = not detected
ns = not sampled

**Table C1: Deux Rivieres Landfill
Surface Water Quality Data**

Monitor Number		SW 4A				
Date Sampled	PWQO	22-Jul-09	28-Apr-10	02-Jun-11	02-Jun-11	
<u>Parameters</u>					SW 5 Duplicate	
Fluoride						
Chloride		<1	<1	<1	<1	
N-NO2 (Nitrite)		<0.10	<0.10	<0.10	<0.10	
N-NO3 (Nitrate)		0.22	0.13	<0.10	<0.10	
Sulphate		11	7	7	6	
Calcium		8	8	6	6	
Magnesium		2	2	1	1	
Sodium		<2	2	<2	<2	
Potassium		1	1	<1	<1	
Aluminum						
Barium						
Boron	0.200	<0.01	<0.01	<0.01	<0.01	
Cadmium	0.0002	<0.0001	<0.0001	<0.0001	<0.0001	
Chromium	0.100					
Cobalt						
Conductivity		65	64	55	54	
Copper	0.005	<0.001	<0.001	<0.001	<0.001	
Iron	0.30	<0.03	<0.03	<0.03	<0.03	
Lead	f(Alk)					
Manganese		<0.01	<0.01	<0.01	<0.01	
Nickel	0.052					
Silicon						
Silver	0.0001					
Strontium		<0.043	0.042	0.028	0.030	
Zinc	0.030	<0.01	<0.01	<0.01	<0.01	
Hardness as CaCo3						
Alkalinity as CaCo3		26	24	21	20	
TKN		<0.10	<0.10	1.40	<0.10	
N-NH3 (Ammonia)	f(pH, Temp)	<0.02	<0.02	<0.02	<0.02	
Organic Nitrogen			<0.10	≤1.40	<0.10	
Un-ionized Ammonia	0.02		<0.0002	<0.0002	<0.0002	
Phenols	0.001	<0.001				
Ion Balance		N/A-LC				
COD		<5				
DOC						
Total Phosphorous	0.02	<0.01	<0.01	0.10	<0.01	
TSS						
TDS		42	42	36	35	
<u>Field Measured</u>						
Water Temp. (°C)		8.0	8.2	10.0		
Conductivity (microS/cm)		58	64	43		
pH (pH units)	6.5 - 8.5	8.20	7.7	7.8		
Disolved Oxygen (DO)	f(Temp)	9.42	6.65	11.45		
Flow (liters/sec)		8.6	5.0	1.0		

Notes:

All values reported in mg/L unless otherwise noted
PWQO = Provincial Water Quality Objectives
Shaded values exceed PWQO
nd = not detected
ns = not sampled

**MOE Certificate of Approval
Amendment March 5, 2010**

Mar 16/10



Ministry of the Environment
Ministère de l'Environnement

**AMENDMENT TO PROVISIONAL CERTIFICATE OF
APPROVAL
WASTE DISPOSAL SITE
NUMBER A412407
Notice No. 2
Issue Date: March 5, 2010**

The Corporation of the Township of Head, Clara and Maria
15 Township Hall Rd
Stonecliffe, Ontario
K0J 2L0

Site Location: Deux Rivières Waste Disposal Site
201 Brent Rd
Head, Clara and Maria Township, County of Renfrew

You are hereby notified that I have amended Provisional Certificate of Approval No. A412407 issued on March 27, 1980 and amended on September 24, 2001, November 27, 2003, July 19, 2006 for a closed 0.442 hectare Waste Disposal Site (Landfill) within a total site area of 1.4 hectares, as follows:

- I. This Notice of Amendment approves the closure of the Deux Rivières Waste Disposal Site in accordance with the *Site Closure Plan* dated May 2008 and amended as Item 12 of Schedule "A".
- II. Conditions 14 through 22 are hereby revoked.
- III. The following Conditions are hereby added to this Certificate:

Site Closure

14. The *Site* shall no longer receive or dispose of any wastes.
15. The *Site* shall be capped and closed in accordance with the document entitled "*Deux Rivières Waste Disposal Site. Site Closure Plan, Corporation of the United Townships of Head, Clara and Maria*", dated May 2008 and prepared by Jp2g Consultants Inc., amended as Item 12 of this *Certificate*'s Schedule "A".

16. By June 30, 2010, the *Owner* shall submit to the *Director* for approval:
- i) a completed plan of survey for the *Site* including buffer zones and attenuation lands purchased or to be purchased from the Ministry of Natural Resources; and
 - ii) documents showing land ownership of surveyed property.

Certificate of Requirement/Registration on Title

17. By June 30, 2010, the *Owner* shall submit to the *Director*, for his/her review, two (2) copies of a completed Certificate of Requirement and a registerable description of the *Site*.
18. Within ten (10) calendar days of receiving the Certificate of Requirement authorized by the *Director*, register the Certificate of Requirement in the appropriate Land Registry Office on title to the *Site* and submit to the *Director* the duplicate registered copy immediately following registration.
19. Pursuant to Section 197 of the *Environmental Protection Act*, neither the *Owner* nor any person having an interest in the Property shall deal with the *Site* in any way without first giving a copy of this *Certificate*, including all amending notices, to each person acquiring an interest in the *Site* as a result of the dealing.

Closed Site Inspections

20. Once closure of the *Site* is complete, an inspection of the *Site* shall be conducted on a quarterly basis to assess the following:
- (a) the presence of leachate seeps;
 - (b) support of vegetation by the final cover;
 - (c) occurrences of erosion on the slopes of the cover material;
 - (d) waste material is protruding from the cap; and
 - (e) any other notable deficiencies and issues.
21. If any deficiency or issue is observed as part of the quarterly inspections required by condition 20, the *Owner* shall take prompt action to remedy the deficiency or issue.
22. A record of the inspections shall be kept in a log book that includes:
- (a) the name and signature of person that conducted the inspection;
 - (b) the date and time of the inspection;
 - (c) the results of the inspection and list of any deficiencies discovered;
 - (d) recommendations for remedial action; and
 - (e) the date, time and description of actions taken.

Post Closure Monitoring and Care

23. The *Owner* shall implement the environmental monitoring program detailed in Schedule "B" of this *Certificate* .
24. In the event that the results of the monitoring program indicate off-site exceedances of the Provincial Water Quality Objectives, the *Owner* shall notify the *District Manger* in writing within two (2) weeks of receipt of the monitoring results. The notification shall address reasons for the exceedances, assessment of remedial actions required, a schedule for remediation and the need to implement other contingency measures as may be appropriate to bring the *Site* back into compliance.
25. The environmental monitoring programs and trigger mechanisms detailed in this *Certificate* may be amended and revised as follows:
 - 25.1 The *Owner* may request to make changes to the monitoring program(s) to the *District Manager* in accordance with the recommendations of the bi-annual report as described in Condition No. 26. The *Owner* shall make clear reference to the proposed changes in separate letter that shall accompany the annual report.
 - 25.2 Within fourteen (14) days of receiving the written correspondence from the District Office confirming that the District Office is in agreement with the proposed changes to the environmental monitoring program(s), the *Owner* shall forward a letter identifying the proposed changes and a copy of the correspondences from the *District Manager* and all other correspondences and responses related to the changes to the *Director* requesting the *Certificate* be amended to approve the proposed changes to the environmental monitoring plan prior to implementation.
 - 25.3 In the event any other changes to the environmental monitoring program are proposed outside of the recommendation of the annual report, the *Owner* shall follow current ministry procedures for seeking approval for amending the *Certificate* .

Bi-Annual Report

26. By May 31, 2006 and by May 31 every two (2) years thereafter, the *Owner* shall submit to the *District Manager*, a report detailing the analyses of the previous two (2) calendar years of monitoring results which shall include, as a minimum, the following:
 - (a) a summary of findings, conclusions and recommendations;
 - (b) an updated Site Plan should there be changes to the monitoring network;
 - (c) an assessment of environmental monitoring data;
 - (d) an assessment of the need for implementing the contingency plan;
 - (e) the results of remedied issues in accordance with condition 21;
 - (f) an assessment of the *Site* 's compliance with the Ministry's Guideline B-7;
 - (g) an assessment of the surface water quality with respect to the *Ministry* 's Provincial

- (h) Water Quality Objectives; and recommendations with respect to any changes to environmental monitoring program.

IV. The following item is hereby added to Schedule "A":

12. Document entitled "*Deux Rivières Waste Disposal Site, Site Closure Plan, Corporation of the United Townships of Head, Clara and Maria*", dated May 2008 and prepared by Jp2g Consultants Inc.

V. The following Schedule "B" is hereby added to this Certificate :

SCHEDULE "B"

This Schedule "B" forms part of this *Certificate* and details the *Site*'s environmental monitoring program.

<u>Monitoring Locations</u>	<u>Sampling Frequency</u>	<u>Analytical Parameters</u>
<u>Surface Water</u> SW1, SW2, SW3, SW4	Once per year (Spring)	<ul style="list-style-type: none"> • Major and minor ions (Ca, Na, Cl, SO₄, K, Mg, B) • Trace metals (Fe, Mn, Cd, Cu, Sr, Zn) • Nitrogen species (NO₃, NO₂, NH₃, TKN) • General parameters (alkalinity, conductivity, TDS, total phosphorus, COD, phenols, TSS) • Field measurements of flow, pH, conductivity, water temperature, dissolved oxygen
<u>Groundwater</u> Spring #1	Once per year (Spring)	<ul style="list-style-type: none"> • Major and minor ions (Ca, Na, Cl, SO₄, K, Mg, B) • Trace metals (Fe, Mn, Cd, Cu, Sr, Zn) • Nitrogen species (NO₃, NO₂, NH₃, TKN) • General parameters (alkalinity, conductivity, TDS, total phosphorus, COD, phenols,

		TSS) ● Field measurements of flow, pH, conductivity, water temperature, dissolved oxygen
--	--	---

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

The reasons for Conditions 14, 15 and 16 are to ensure the Site is closed and is done so in the manner which the Director has been asked to consider.

The reasons for Conditions 17, 18 and 19 are to ensure the property, once acquired from the Ministry of Natural Resources, is properly registered on title and to ensure that any person(s) having an interest in the Site are aware of its use as a Waste Disposal Site and the requirements of this Certificate.

The reason for Conditions 20, 21 and 22 is to ensure that Site inspections are carried out to visually assess the performance of the Site's final cover.

The reasons for Conditions 23, 24, 25, 26 and Schedule "B" are to approve the Site's environmental monitoring program and require periodical reporting on the program and the assessment of any collected data.

This Notice shall constitute part of the approval issued under Provisional Certificate of Approval No. A412407 dated March 27, 1980

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

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

The Notice should also include:

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

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

This Notice must be served upon:

The Secretary*

The Director

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

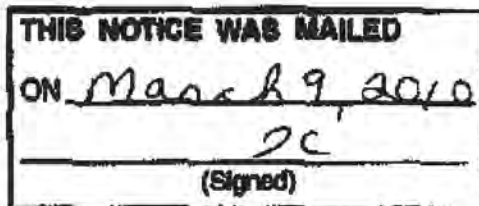
AND

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

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

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

DATED AT TORONTO this 5th day of March, 2010



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

DL/

c: District Manager, MOE Ottawa
Kevin J. Mooder, Jp2g Consultants Inc. ✓

2008/2009 Monitoring Report
MOE Groundwater and Surface
Water Comments

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

January 28, 2011

TO: Lance Larkin
Sr. Environmental Officer
Ottawa District Office
Eastern Region

FROM: Shawn Trimper
Hydrogeologist
Technical Support Section
Eastern Region

RE: Deux Rivières WDS
2008/2009 Bi-annual Monitoring and Operating Report
Townships of Head, Clara, and Maria
County of Renfrew
Certificate of Approval A412407

Purpose

I have reviewed the 2008/2009 Bi-Annual Report for the Deux Rivières WDS dated May 2010 completed by Jp2g Consultants Inc. The purpose of my review was to evaluate the results and interpretations of the 2008/2009 monitoring program and to determine site compliance with MOE Guideline B-7.

Summary

- The Deux Rivières WDS is a closed landfill site. The site closed in 2007 and the Certificate of Approval (COA) was amended in March of 2010 for site closure. Guideline B-7 applies to all operating WDS and those WDS closed after 1986, thus Guideline B-7 applies to the Deux Rivières WDS.
- The Deux Rivières WDS is a small landfill site (12,175 m³) and the groundwater monitoring program is limited.
- The landfill currently exists as a 0.4 hectare footprint located on a 1.4 hectare site. The COA requires the municipality to acquire additional lands for use as a buffer and to serve as the contaminant attenuation zone (CAZ). The municipality is in the process of acquiring a large parcel of crown land located primarily downgradient of the site. The size of the parcel being acquired is not presented in the report, but is estimated to be over 10 hectares.

- The municipality should acquire those proposed additional lands and amend their COA to meet the conditions and legally recognize these additional lands as part of the bufferlands and CAZ.
- The proposed additional lands include the suspected groundwater discharge point (unnamed spring), thus the intent of Guideline B-7 will be met.
- The Township must conduct closed site inspections as per Condition 20 through 22 and ensure reporting is completed as per conditions 23 through 26. The Township has indicated its understanding regarding this matter.
- Groundwater monitoring locations identified as Spring #2, the Hunt Camp, and the Clouthier Logging Camp have been removed from the groundwater sampling program as approved by the Ministry in the March 5, 2010 COA amendment.
- I do not agree with the recommendation to discontinue sampling at Spring #1 and sampling should continue at this location as currently required by the COA.

Site Description

The Deux Rivières Waste Disposal Site is located on Lots 23 and 24, Concession B, in the geographic Township of Clara. The 0.4 hectare landfill site is located on a 1.4 hectare parcel of land. The site is owned by the United Townships of Head, Clara, and Maria which is leased from the Ministry of Natural Resources under a land use permit. The site is surrounded by Crown Land and the surrounding landscape consists primarily of forest and vacant land.

Certificate of Approval

The Deux Rivières Waste Disposal Site operates under Certificate of Approval No. A412407, issued in 1980. The site began receiving waste in the mid-1970s. A site capacity of 12,175m³ was approved in December of 2001. The site capacity was reached in the fall of 2007 and a final cover was applied. The Certificate of Approval was amended in March of 2010 for site closure.

Geology

The regional area is characterized by hilly Canadian Shield topography. The landfill is located on the west side of a local topographic rise. The geology of the area consists of sand and gravel overburden deposits underlain by Precambrian bedrock. No bedrock outcrops are present at the site. Test pitting at the site has determined overburden to be at least 3 metres in thickness and to be sandy in composition.

Hydrogeology

Shallow groundwater flow is inferred to be westerly and to occur within the porous overburden. A surface water course (Cotnam Creek) is located approximately 200 metres west of the site.

Flow in the creek is reported to be intermittent and it is thought that shallow groundwater likely discharges to the creek during wet periods.

Background Water Quality

Due to the small size and remote location of the landfill, no groundwater monitors have been installed at the site. Similar sized landfills located in similar geological conditions have been used to determine expected background water quality for the purpose of contaminant attenuation zone calculations. Elevated manganese and iron is thought to be common in the area and to be naturally present in local groundwater. This is acceptable given the small size and remote location of the site.

Leachate

Due to the small size and remote location of the site no groundwater monitors have been installed at the site. Similar sized landfills located in similar geological conditions have been used to determine expected leachate characteristics for the purpose of contaminant attenuation zone calculations. Manganese and iron have been removed from leachate analysis due to its anthropogenic presence in the area. This treatment is acceptable given the small size and remote location of the site.

Downgradient Water Quality

No discernable leachate impacts have been noted in the current or previously presented monitoring reports. Minor leachate impacts are possibly present for samples collected from Spring #1 in 2002 and 2008 which show pH values below the range prescribed by the PWQO.

Regulatory Compliance

MOE Guideline B-7 applies to the Deux Rivieres landfill site. Shallow groundwater is thought to discharge on-site to Cotnam Creek and surface water quality monitoring is conducted in this area. A conservative buffer area has also been implemented at the site to ensure groundwater compliance is maintained. Given that groundwater discharges to surface water, the intent of Guideline B-7 is met.

The Township is required to obtain ownership of the site and buffer lands as required under condition 16 of the Certificate of Approval. This transfer is to be conducted by June 30, 2010. Additional requirements in regards to land ownership must be completed as described by conditions 16 through 19 of the Certificate of Approval. The Township has indicated its understanding regarding this matter. The size of the parcel is not presented in the report, but I have estimated the parcel to be over 10 hectares in size.

The Township must conduct closed site inspections as per Condition 20 through 22 and ensure reporting is completed as per conditions 23 through 26. The Township has indicated its understanding regarding this matter.

Groundwater – Surface water Interaction

Shallow groundwater is thought to discharge to the Cotnam Creek during wet periods and is an area of potential groundwater – surface water interaction. Monitoring is currently conducted at the point of groundwater discharge (Spring #1) and at the downstream locations near the point of discharge (SW3) and at the property boundary (SW2). The current monitoring system adequately assesses the level of impact caused to surface water due to groundwater interactions. No substantiated impacts have been observed to date. Spring #1 has been found to be dry during the majority of sampling events and groundwater – surface water interactions are not always able to be assessed. The current program in place is satisfactory given the small size and remote location of the landfill.

Landfill Gas

Due to the small size and remote location of the landfill the monitoring of landfill gases is not required.

Trigger Mechanisms and Contingency Plans

No specified triggers are in place due to the small size and remote location of the landfill site. A highly conservative buffer area of over 10 hectares is currently implemented (pending land transfer agreement) to eliminate the likelihood of impacts occurring off-site. The current program is adequate and satisfactory.

Groundwater Monitoring Program

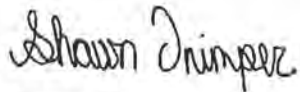
No groundwater monitors have been developed on the site.

The existence of 2 naturally occurring groundwater discharge springs (Spring #1 and Spring #2) serve as the only required groundwater monitoring locations on-site required under the COA for the 2008/2009 monitoring program.

Spring #1 is located directly downgradient of the landfill footprint and is a point of groundwater discharge from the aquifer to the nearby Cotnam Creek. It has been proposed that sampling from Spring #1 be discontinued. I do not agree with this recommendation. This monitoring location should continue to be sampled as presently required when water levels allow so. This location represents the only groundwater monitoring point for the site required under the COA. Spring #1 represents an important compliance point for determining the quality of groundwater discharging to Cotnam Creek.

Spring #2 is located upgradient of the landfill. Results from this location have shown no signs of leachate impacts as expected due to its upgradient location. Spring #2 has been removed from the sampling program as approved by the Ministry in the March 5, 2010 COA amendment.

Two private groundwater supply wells (referred to as "Hunt Camp" and "Clouthier Logging Camp") exist offsite and monitoring at these locations has been required under the COA. These locations represent the nearest groundwater users to the landfill site. Sampling at these locations have been removed from the sampling program as approved by the Ministry in the March 5, 2010 COA amendment.



Shawn Trimper, EIT
ST/gl

cc: Peter Taylor
Paul Kehoe

c: FC/File GW 03-03 RENF (A412407)
STIDS #1707-867P9E

Ministry of the Environment

P.O. Box 22032
Kingston, Ontario
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MEMORANDUM

April 13, 2011

TO: Lance Larkin
Senior Environmental Officer
Ottawa District Office
Eastern Region

FROM: Laurel Grills
Surface Water Evaluator
Technical Support Section
Eastern Region

RE: Deux Rivieres Waste Disposal Site - Corporation of the United
Townships of Head, Clara and Maria 2008/2009 Bi-Annual Report

I have reviewed the 2008/2009 Annual Report dated May, 2010 and provide the following comments, relative to surface water impact concerns, for your consideration.

Background

The Deux Rivieres Waste Disposal Site operates under Provisional Certificate of Approval No. A412407. The site has been in operation for over 30 years. A Site Closure Plan has been submitted dated May, 2008. It was concluded that the Deux Rivieres site would be closed due to its relatively small size and limited landfilling capacity. The site was closed with final cover completed in the fall of 2007.

Site Description and Surface Water Features

The Deux Rivieres landfill is a small site located in a remote area in Part Lots 23 and 24, Concession B in the United Townships of Head, Clara, Maria, Renfrew County, geographic Township of Clara. The site is located on Crown lands. The surrounding landscape is characterized by shallow overburden overlying Pre-Cambrian bedrock. Shallow groundwater flow is inferred to be in a northerly direction.

Surface Water Quality Monitoring Program

Four surface water monitoring stations were established in 2006 along Cotnam Creek, (SW1 to SW4). SW4 is located west of the site upstream of the landfill and is considered the background station. SW4A is a replacement station for SW4 which was dry in 2009. SW3 is located immediately upstream of the landfill footprint. SW2 is located immediately downstream of the

landfill at the northern site boundary and SW1 is located further downstream approximately 300 metres north of the site. Sampling was conducted on two occasions in the two year period, on May 9, 2008 and on July 22, 2009.

Conclusions and Recommendations

I offer the following conclusions and recommendations:

1. A comparison of upstream water quality versus downstream indicates that the Deux Rivieres landfill is not impacting water quality in Cotnam Creek, at this time. Results must be viewed with caution as this is based on only two sampling events.
2. Under previous review I recommended that every effort be made to obtain samples at times in the year other than under high flow conditions, if sufficient flow existed. This issue was addressed during this monitoring period, sampling was conducted in May and in July.
3. Under previous review I recommended that TSS be included in future monitoring efforts. TSS was included in 2008 but not in 2009. TSS should be included in future reporting.
4. Un-ionized ammonia was not calculated in previous monitoring reports. Un-ionized ammonia is determined based on total ammonia-N concentrations and field temperature and pH and the percentages of un-ionized ammonia should be calculated and must be included in the data set reported in the annual reports. This was not addressed.
5. Surface water quality and quantity data must continue to be collected to document the nature and extent of leachate generated from the landfill and its effect on the quality of the downstream surface water regime, in particular, Cotnam Creek. The current monitoring program is adequate with the addition of the above mentioned recommendations.
6. The consultant states that with the establishment of the Contaminant Attenuation Zone, the point of compliance will be SW2, where the surface water flows off-site. As clarified under previous review, regardless of the proposed CAZ boundary, leachate generated from the landfill cannot be permitted to contaminate any stretch of Cotnam Creek. A CAZ is intended to protect neighbouring groundwater supplies. It is an improper application of Policy B7 to allow impairment of surface water bodies within a CAZ.

If you have any questions or comments regarding the above, I would be pleased to discuss them with you.



Laurel Grills
LG/gl

c: File SW- 05 - 04 (Brudenell, Lyndoch and Raglan Township)
Shawn Kinney
Lg

Photos of Deux Rivieres Site



SW 1 Area



SW 1



SW 2 Area



SW 2



Inlet From Spring 2



Inlet From Spring 2



Spring 1 Area



Spring 1 Area



SW 3 Area



SW 3 Area



SW 4 Area



SW 4