

THE CORPORATION OF THE TOWNSHIP OF PUSLINCH 2016 COUNCIL MEETING

<u>A G E N D A</u>

DATE: Wednesday, May 4, 2016 CLOSED MEETING: 12:45 P.M. REGULAR MEETING: 1:00 P.M.

≠ Denotes resolution prepared

- 1. Call the Meeting to Order
- 2. Disclosure of Pecuniary Interest & the General Nature Thereof.
- 3. Adoption and Receipt of Minutes of the Previous Meeting.≠
 - (a) Council Meeting April 20, 2016
 - (b) Closed Council Meeting April 20, 2016
- 4. Business Arising Out of the Minutes.

5. **PUBLIC MEETINGS**

1. Rezoning Application file D14/FRA – Ned & Lily Krayishnik, Concession 1, Part Lots 6 & 7, municipally known as 6637 and 6643 Concession 2.

*note this Public Information Meeting will be held on Thursday, May 19, 2016 at 7:00 p.m. at the Municipal Complex – 7404 Wellington Rd. 34

(a) Notice of Complete Application & Notice of the Public Meeting

6. **COMMUNICATIONS**

1. Nestle Waters Canada

(a) Golder and Associates 2015 Annual Monitoring Report for Nestle Waters Canada Aberfoyle Site dated March 2016.≠



2. Meadows of Aberfoyle

- (a) Banks Groundwater Engineering Limited Meadows of Aberfoyle 2015 Annual Monitoring Report – Permit to Take Water No. 5626-7WLQ3W dated March 21, 2016.≠
- (b) Correspondence from Harden Environmental Services Ltd. regarding PPTW Meadows of Aberfoyle (MOE Ref. #5626-7WLQ3W) dated April 12, 2016.≠

3. Victoria Park Valley Golf Club - 7660 Maltby Road East

- (a) R. J. Burnside & Associates Limited 2015 PTTW Monitoring Report Victoria Park Valley Golf Club dated April 2016.≠
- (b) Correspondence from Harden Environmental Services Ltd. regarding 2015 Monitoring Report: Victoria Park Valley Golf Club dated April 19, 2016.≠

Capital Paving Inc. Wellington Pit, Licence No. 20085 6660 Wellington Rd 34

- (a) Groundwater Science Corp. 2015 Groundwater Monitoring Summary, Wellington Pit, Licence No. 20085, Part Lots 7 and 8, Concession 3, Township of Puslinch dated March 24, 2016.≠
- (b) Correspondence from Harden Environmental Services Ltd. regarding Capital Paving Inc. , Wellington Pit, License 20085, Puslinch File: E10 CAP-Wellington Licence 20085 dated April 11, 2016.≠

5. University of Guelph /Dufferin Aggregates Mill Creek Pit, Licence 5738 7115 Concession 2

(a) Correspondence from Dufferin Aggregates regarding Monthly Monitoring Report, Mill Creek Pit, License #5738, (March 2016), Township of Puslinch, Wellington County dated April 14, 2016.

Mr. Stan Denhoed, Harden Environmental Services Ltd. has advised that he has reviewed the monthly report and that he has no comments at this time.



6. Mini Lakes Mobile Home Community

- (a) Stantec Consulting Ltd. Mini Lakes Mobile Home Community 2015 Operation and Maintenance Report date March 28, 2016. ≠
- (b) Correspondence from GMBlue Plan Engineering regarding Mini Lakes Mobile Home Community – 2015 Annual Operation and Maintenance Report dated April 22, 2016.≠
- (c) Stantec Consulting Ltd. Mini Lakes Mobile Home Community Quarterly Monitoring Program 4th Quarter 2015 Report dated March 24, 2016.≠
- (d) Correspondence from GMBlue Plan Engineering regarding Mini Lakes Wastewater Treatment Plant Effluent Monitoring Report, 4th Quarter (2015) dated April 19, 2016.≠

7. Jennifer Kovach Bridge Memorial

(a) Ontario Ministry of Transportation – Traffic Office - Bridge Dedications for Fallen Officers.

8. Noise By-Law Exemption

(a) Application for Noise By-Law Exemption Carrie Sponga dated April 18, 2016.≠

9. Share the Road ≠

- (a) Correspondence with Aldo Salis, Manager of Development Planning, Planning & Development Department, County of Wellington regarding Share the Road dated March 17, 2016.
- (b) South Georgian Bay Trail Map
- (c) County of Wellington Active Transportation Mapping Puslinch
- (d) TAC Automated Speed Guideline Calculations
 - i. Watson Rd. 40km Zone to Railway Tracks
 - ii. Watson Rd. Maltby to Hume



10. Aberfoyle Public School

(a) Correspondences from Aberfoyle Public School students regarding use of the outdoor skating area dated April 2, 2016.

Note: Copies have been provided to the Optimist Club of Puslinch.

11. Intergovernmental Affairs ≠

(a) Various correspondence for review.

7. DELEGATIONS / PRESENTATIONS ≠

None.

8. **REPORTS**

1. Puslinch Fire and Rescue Services

None.

2. Finance Department

- (a) Report FIN-2016-009 Ontario Regulation 284/09 2016 Budget. ≠
- (b) Report FIN-2016-010 Township General Surplus 2015≠
- (c) Report FIN-2016-012 2015 Development Charges ≠
- (d) Report FIN-2016-013 2015 Annual Building Permit Report ≠

3. Administration Department

None.

4. Planning and Building

None .

5. Roads & Parks Department

(a) Puslinch Community Centre Trails - Verbal Update



- (b) Correspondence from GMBlueplan regarding Sound Levels Assessment 10 Maple Leaf Lane, Puslinch, ON dated April 28, 2016 with attachments.≠
- (c) Report PW-2016-001 Tender Results 2016 Annual Road Rehabilitation and Culvert Upgrades - *Note to be provided under separate cover on Monday, May 2, 2016

6. Recreation Department

None.

7. Mayor's Updates

None.

9. NOTICES OF MOTION

None.

10. **COMMITTEE MINUTES**

(a) Recreation Committee- March 15, 2016

11. MUNICIPAL ANNOUCEMENTS

12. UNFINISHED BUSINESS

13. CLOSED ITEMS ≠

- (a) Confidential Verbal Report from Karen Landry regarding litigation or potential litigation, advice that is subject to solicitor- client privilege, including communications necessary for that purpose and a proposed or pending acquisition or disposition of land by the municipality or local board – Plan 386.
- (b) Confidential Verbal Report from Karen Landry, CAO/Clerk, regarding litigation or potential litigation, including matters before administrative tribunals affecting the municipality or local board – 599 Arkell Rd.



14. <u>**BY-LAWS**</u>≠

 (a) A by-law to amend By-law 19/85, as amended by rezoning Part of Lot 8, Concession 2,from Agricultural (A) Zone to the Agricultural Site Specific (A-63) Zone and (A-64) Zone –Brad Coles (Label It!) - 6691 Ellis Road– Resolution No. 2016-173.

15. CONFIRMING BY-LAW ≠

(a) By-law to confirm the proceedings of Council for the Corporation of the Township of Puslinch.

16. **ADJOURNMENT** ≠



<u>MINUTES</u>

DATE: Wednesday, April 20, 2016 TIME: 6:15 p.m.

The April 20, 2016 Regular Council Meeting was held on the above date and called to order at 6:15 p.m. in the Council Chambers, Aberfoyle.

1. ATTENDANCE:

Mayor Dennis Lever Councillor Matthew Bulmer Councillor Susan Fielding Councillor Ken Roth Councillor Wayne Stokley

STAFF IN ATTENDANCE:

- 1. Karen Landry, CAO/Clerk
- 2. Donna Tremblay, Deputy Clerk
- 3. Paul Creamer, Director of Finance/Treasurer
- 4. Don Creed, Director of Public Works and Parks
- 5. Robert Kelly, Chief Building Official

OTHERS IN ATTENDANCE

- 1. Doug Smith
- 2. Bev Wozinak
- 3. K. Lever
- 4. Gene and Marion Hunter
- 5. Douglas Stewart
- 6. Diane Paron
- 7. Paul Leombruni

2. DISCLOSURE OF PECUNIARY INTEREST & THE GENERAL NATURE THEREOF:

None.

3. ADOPTION OF THE MINUTES:

- (a) Special Council Meeting March 31, 2016
- (b) Council Meeting April 6, 2016
- (c) Closed Council Meeting –April 6, 2016

Resolution No. 2016-161: Moved by Councillor Roth and Seconded by Councillor Bulmer

That the minutes of the following meetings be adopted as written and distributed:

- (a) Special Council Meeting March 31, 2016
- (b) Council Meeting April 6, 2016, by amending Council Resolution No. 2016-143 to remove "**at** a cost of \$312.50" and replace it with the following "**to** a cost of \$312.50". as amended
- (c) Closed Council Meeting April 6, 2016

CARRIED

4. BUSINESS ARISING OUT OF THE MINUTES:

None.



5. PUBLIC MEETINGS:

1. 2016 Housekeeping Amendment to Zoning By-Law 19/85.

*note this Public meeting will be held on Thursday, April 21, 2016 at 7:00 p.m. at the Municipal Complex – 7404 Wellington Rd. 34

- (a) Notice of Public Meeting
- (b) Report- County of Wellington Planning Department 2016 Housekeeping Amendment to Zoning By-Law 19/85 - Township wide Zoning By-Law Amendment dated February 18, 2016.

6. **COMMUNICATIONS:**

1. Puslinch Baseball Diamonds

(a) Correspondence from Mr. James Seeley regarding Puslinch Ball Diamonds dated March 30, 2016. ≠

Councillor Bulmer requested that a copy of the correspondence be provided to the Recreation Committee.

Resolutior	No.	201	6-162:

Moved by Councillor Bulmer and Seconded by Councillor Roth

That Council receive the correspondence from Mr. James Seeley regarding Puslinch Ball Diamonds dated March 30, 2016.

CARRIED

2. Request for Signage – Watson Rd. South – Wellington Rd. 34 & Hume Rd.

(a) Correspondence from Diane Greene regarding cyclists on Watson Rd. dated March 31, 2016.≠

Resolution No. 2016-163:

Moved by Councillor Roth and Seconded by Councillor Bulmer

That Council receive the correspondence from Diane Green regarding cyclists on Watson Rd dated March 31, 2016.

CARRIED

3. Request to Waive Fees/Use of Facilities

(a) Correspondence from Optimist Club of Puslinch regarding use of Puslinch Community Centre on Saturday, October 22, 2016 for an Adult Spelling bee dated April 11, 2016.≠

Moved by Councillor Bulmer and Seconded by Councillor Roth

That Council receives the correspondence from Mr. Vince Klimkosz regarding the Optimist Club of Puslinch use of the Puslinch Community Centre on Saturday, October 22, 2016 for an Adult Spelling bee dated April 11, 2016; and

That Council authorizes a 40% reduction in the rental rate of \$479.00 for the use of the Archie MacRobbie Hall on Saturday, October 22, 2016 from 9:00 a.m. to 4:00 p.m.; and



That Council request that staff work with the Optimist Club in promotion of the event including use of the electronic sign and Township website; and

That Staff advise the Optimist Club of Puslinch of the rental rate reduction and promotion of the event; and

That Staff advise the Optimist Club of Puslinch that altering the day of use from Saturday to Sunday would result in greater savings.

CARRIED

(b) Correspondence from Aberfoyle Agricultural Society regarding use of Optimist Recreation Centre Rink Pad on Friday, September 9, 2016.≠

Resolution No. 2016-165:

Moved by Councillor Roth and Seconded by Councillor Bulmer

That Council receives the correspondence from Mr. Vince Klimkosz regarding Agricultural Society Fall Fair request to use Optimist Centre Rink Pad on Friday, September 9, 2016; and

That Council approves the gratuitous use by the Agricultural Society Fall Fair of the Optimist Centre Rink Pad on Friday, September 9, 2016; and

That staff advise the Aberfoyle Agricultural Society of approval.

CARRIED

4. Nestle Waters Canada

(a) Correspondence from Nestle Waters Canada regarding Aberfoyle Permit to Take Water Renewal Application dated April 12, 2016.

Councillor Stokley requested that the Township provide a comment that the time limit of the permit be for 5 years and not the requested 10 year limit.

Resolution No. 2016-166	Moved by Councillor Bulmer and	
	Seconded by Councillor Roth	

That Council receive the correspondence from Nestle Waters Canada regarding the Aberfoyle Permit to Take Water Renewal Application dated April 12, 2016.

CARRIED

5. Burn Permit

(a) Correspondence from Paul Leombruni dated April 12, 2016.

Resolution No. 2016-167:	Moved by Councillor Roth and	Moved by Councillor Roth and	
	Seconded by Councillor Bulmer		

That Council receive the correspondence from Paul Leombruni dated April 12, 2016.

CARRIED



6. Intergovernmental Affairs≠

(a) Various correspondence for review.

Resolution No. 2016-168:

Moved by Councillor Bulmer and Seconded by Councillor Roth

That the correspondence items listed on the Council Agenda for April 20, 2016 Council meeting be received.

CARRIED

7. DELEGATIONS/PRESENTATIONS

1. Ms. Daina Makinson, Puslinch Recreation Committee Member and Mr. Neil Arsenault, Puslinch Library Branch Supervisor regarding presentation and future location of Township of Puslinch Trophy Book.

Ms. Makinson provided those in attendance with a history of the development of the booked and thanked past and present members of the Recreation Committee, staff and the photographer, Holly Land for their assistance in development of the book.

Mr. Arsenault provided thanks to the Recreation Committee for development of the trophy book. Mr. Arsenault advised that the Puslinch Library will catalogue and it will be added to the reference section and will remain at the Puslinch Library Branch for viewing.

2. Mr. Gary Will - Presentation – 2016 Puslinch Volunteer of the Year Award

Mayor and Members of Council presented Mr. Gary Will with the 2016 Puslinch Volunteer of the Year Award.

CARRIED

3. Ms. Sally Slumskie, Partner and Mr. Thomas DiCarlo, Manager at BDO Canada LLP regarding 2015 Township of Puslinch Financial Statements.

<u>Resolution No. 2016-169:</u>	Moved by Councillor Fielding and
	Seconded by Councillor Stokley

That Council receive the presentation from Ms. Sally Slumskie, Partner and Mr. Thomas DiCarlo, Manager at BDO Canada LLP regarding 2015 Township of Puslinch Financial Statements; and

That Council receive the Final Year End Letter to Council regarding the Audit of the amended Financial Statements for the year ended December 31, 2015, from BDO Canada LLP dated April 20, 2016.

CARRIED

4. Mr. Vince Klimkosz regarding Agricultural Society Fall Fair request to use Optimist Centre Rink Pad on Friday, September 9, 2016 and Optimist Club of Puslinch Adult Spelling Bee on Saturday, October 22, 2016.

Mr. Klimkosz advised that he was unable to attend the meeting.



8. **REPORTS:**

1. Puslinch Fire and Rescue Services

(a) Puslinch Fire and Rescue Services Monthly Report – March, 2016

Resolution No. 2016-170: Moved by Councillor Stokley and Seconded by Councillor Fielding

That Council receive the Puslinch Fire and Rescue Services Response Report for March, 2016.

CARRIED

2. Finance Department

(a) BDO Canada LLP Final Report to Members of Council dated April 20, 2016 and The Corporation of the Township of Puslinch Draft Financial Statements for the year ended December 31, 2016. ≠

See Agenda Item 7.3

(b) Report FIN-2016-008 – 2016 First Quarter Financial Summary.≠

Resolution No. 2016-171:	Moved by Councillor Fielding and
	Seconded by Councillor Stokley

That Council receive Report FIN-2016-008 1st Quarter Financial Summary.

CARRIED

3. Administration Department

(a) Report - Wellington Source Water Protection –Kyle Davis, Risk Management Official regarding Source Protection Contract Position dated April 1, 2016.≠

Council requested clarification from Mr. Davis with respect how time will be monitored between the duties of the position, which municipalities will be contributing funds for the positon and whether funding will be available should the necessity of the position become full-time after the Source Protection Municipal Implementation Funding (SPMIF) is no longer available to the municipalities.

Karen Landry CAO/Clerk advised that she has spoken with Mr. Davis regarding the contract position, Mr. Davis has advised that given the scope of work involved with implementation of source protection program that there is an immediate need for the contract position and that Mr. Davis is aware that should the need be for a full-time position after the contract period that he will be required to return to Council with a further report.

Resolution No. 2016-172:

Moved by Councillor Stokley and Seconded by Councillor Fielding

That Council receive the Report from Wellington Source Water Protection –Kyle Davis, Risk Management Official regarding Source Protection Contract Position dated April 1, 2016.

CARRIED



4. Planning and Building Department

 (a) Report - County of Wellington Planning Department – Amending By-Law D14/COL (Coles Label It!) Zoning By-Law Amendment - 6691 Ellis Road (Part Lot 8, Concession 2), Puslinch.≠

Councillor Bulmer requested that the Puslinch Heritage Committee be thanked for their review and comments towards the application.

Resolution No. 2016-173:	Moved by Councillor Fielding and	
	Seconded by Councillor Stokley	

That Council receive the Report from the County of Wellington Planning Department – Amending By-Law D14/COL (Coles Label It!) Zoning By-Law Amendment - 6691 Ellis Road (Part Lot 8, Concession 2), Puslinch; and

That Council enact a by-law to amend By-Law Number 19/85, as amended, by rezoning Part of Lot 8, Concession 2, from Agricultural (A) Zone to AGRICULTURAL SITE SPECIFIC (A-63) ZONE and (A-64) ZONE, as specifically outlined in the draft Zoning By-Law Amendment prepared by the County of Wellington dated March 22, 2016.

CARRIED

(b) Chief Building Official Report – March 2016 ≠

Resol	lution	No.	2016-174:

Moved by Councillor Stokley and Seconded by Councillor Fielding

That Council receive the Chief Building Official Report for March, 2016.

CARRIED

5. Roads & Parks Department

None.

6. Recreation Department

None.

7. Mayor's Updates

(a) The Treatment of Confidential Information.

Mayor Lever expressed his concerns to members of council regarding the release of confidential information council received regarding the announcement of the Highway 6 By-Pass project.

9. NOTICE OF MOTION:

None.

10. COMMITTEE MINUTES

- (a) Planning & Development Advisory Committee March 8, 2016
- (b) Committee of Adjustments March 8, 2016



Resolution No. 2016-175:

Moved by Councillor Fielding and Seconded by Councillor Stokley

That Council hereby receives the following minutes as information:

- (a) Planning & Development Advisory Committee March 8, 2016
- (b) Committee of Adjustments March 8, 2016

CARRIED

11. MUNICIPAL ANNOUNCEMENTS

COP Committee

Councillor Stokley advised that he attended the presentation from CAA on distracted driving at Duff's Church on April 13, 2016. Councillor Fielding advised that she attended the presentation from the Wellington Dufferin Guelph Public Health Nurse on alcohol issues in the Township. Councillors Stokley and Fielding indicated that they were informative presentations and the event was well attended.

Recreation Committee Meeting

Councillor Stokley advised that there will be recommendations coming forward to Council from the April 19, 2016 Recreation Committee with respect to a delegations from Graham Williams and his request for a basketball Court at Boreham Park and the YMCA/YWCA of Guelph with respect to developing a relationship with the Township to provide March Break and Professional Development Day Camps as well as adult programming and pickle ball.

Green Legacy Tree Distribution Day

Councillor Bulmer advised that Green Legacy Tree Distribution Day will be taking place on Saturday, April 23, 2016 at the Green Shed on the Puslinch Community Centre Grounds. The event starts at 8:00 a.m. and donations for the food bank are welcomed. Councillor Bulmer advised that Councillor Stokley will be assisting with distribution of the trees.

Optimist Club of Puslinch Roadside Clean Up Day

Councillor Bulmer advised that the Optimist Club of Puslinch will be holding the Roadside Clean Up day on Saturday, May 7th. Councillor Bulmer acknowledged the efforts of township staff with the event including the production of the promotional flyer.

CANWarn Training

Councillor Roth advised that both himself and Karen Landry, CAO/Clerk attended a Emergency Management Training session with respect to CANWarn Training at the Aboyne Hall on Friday, April 15, 2016.

Rotary Club – South Guelph - Volunteer Award Presentation

Mayor Lever advised that he attended the Rotary Club of South Guelph Volunteer Awards Presentation on Sunday, April 10, 2016. Mayor Lever advised that there were 10 groups who received awards with the Puslinch Pioneer and Sunrise Equestrian Centre receiving awards. Mayor Lever advised that each of the 10 award recipients were requested to bring 10 volunteers to the awards ceremony and each award winner received a \$1,000 donation to their organization.



Community Based Strategic Plan

Karen Landry, CAO/Clerk advised that the Township has received the final copy of the Community Based Strategic Plan. Ms. Landry advised that a copy of the Plan would be posted to the township's website on Monday, April 25th and that a presentation will be made at the May 18th Council meeting by the Consultant. Township staff will be advising all parties who requested that they be notified once the final plan was available.

12. UNFINISHED BUSINESS

None.

13. CLOSED MEETING

Council was in closed session from 6:17 p.m. to 6:41 p.m. Council recessed from 6:42 p.m. to 7:00 p.m.

- (a) Confidential Verbal Report from Karen Landry regarding litigation or potential litigation, advice that is subject to solicitor- client privilege, including communications necessary for that purpose and a proposed or pending acquisition or disposition of land by the municipality or local board Plan 386.
- (b) Confidential Verbal Report from Karen Landry, CAO/Clerk, regarding litigation or potential litigation, including matters before administrative tribunals affecting the municipality or local board 599 Arkell Rd.
- (c) Confidential Verbal Report from Karen Landry, CAO/Clerk, regarding personal matters about an identifiable individual, including municipal or local board employees 2016 Ontario Senior of the Year Nominations.

Resolution No. 2016-176:

Moved by Councillor Stokley and Seconded by Councillor Fielding

That Council shall go into closed session under Section 239 of the Municipal Act for the purpose of:

- (a) Confidential Verbal Report from Karen Landry regarding litigation or potential litigation, advice that is subject to solicitor- client privilege, including communications necessary for that purpose and a proposed or pending acquisition or disposition of land by the municipality or local board – Plan 386.
- (b) Confidential Verbal Report from Karen Landry, CAO/Clerk, regarding litigation or potential litigation, including matters before administrative tribunals affecting the municipality or local board – 599 Arkell Rd.
- (c) Confidential Verbal Report from Karen Landry, CAO/Clerk, regarding personal matters about an identifiable individual, including municipal or local board employees – 2016 Ontario Senior of the Year Nominations.

CARRIED

Resolution No. 2016-177: Moved by Councillor Stokley and Seconded by Councillor Fielding

That Council move into open session.

CARRIED



(a) Confidential Verbal Report from Karen Landry regarding litigation or potential litigation, advice that is subject to solicitor- client privilege, including communications necessary for that purpose and a proposed or pending acquisition or disposition of land by the municipality or local board – Plan 386.

<u>Resolution No. 2016-178:</u> Moved by Councillor Fielding and Seconded by Councillor Stokley

That Council receive the Confidential Verbal Report from Karen Landry regarding litigation or potential litigation, advice that is subject to solicitor- client privilege, including communications necessary for that purpose and a proposed or pending acquisition or disposition of land by the municipality or local board – Plan 386; and

That staff proceed as directed.

CARRIED

(b) Confidential Verbal report from Karen Landry, CAO/Clerk, regarding litigation or potential litigation, including matters before administrative tribunals affecting the municipality or local board – 599 Arkell Rd.

Resolution No. 2016-179: Moved by Councillor Stokley and Seconded by Councillor Fielding

That Council receive the Confidential Verbal report from Karen Landry, CAO/Clerk, regarding litigation or potential litigation, including matters before administrative tribunals affecting the municipality or local board – 599 Arkell Rd.

CARRIED

(c) Confidential Verbal Report from Karen Landry, CAO/Clerk, regarding personal matters about an identifiable individual, including municipal or local board employees – 2016 Ontario Senior of the Year Nominations

Resolution No. 2016-180: Moved by Councillor Fielding and Seconded by Councillor Stokley

That Council receive the Confidential Verbal Report from Karen Landry, CAO/Clerk, regarding personal matters about an identifiable individual, including municipal or local board employees – 2016 Ontario Senior of the Year Nominations; and

That staff proceed as directed.

CARRIED

14. <u>BY-LAWS</u>:

- (a) A by-law to amend By-law 19/85, as amended by rezoning Part of Lot 6, Concession 1,from Agricultural (A-43) Zone to the Agricultural (A) Zone–Todd Noonan and Debbie McIntosh– Resolution No. 2016-152.
- (b) A by-Law to authorize the Mayor and Clerk to execute an Agreement with Her Majesty The Queen in Right of Canada regarding a Contribution Agreement for the Canada 150 Community Infrastructure Program ("CIP 150"). **Resolution No. 2016-229**
- (c) A by-law to authorize the Mayor and Clerk to execute an Agreement with the YMCA-YWCA of Guelph – 2016 Summer Camp. **Resolution No. 2016-095**.

Resolution 2016-181: Moved by Councillor Stokley and



Seconded by Councillor Fielding

That the following By-laws be taken as read three times and finally passed in open Council:

- (a) By-law 025/16 being a by-law to amend By-law 19/85, as amended by rezoning Part of Lot 6, Concession 1, from Agricultural (A-43) Zone to the Agricultural (A) Zone–Todd Noonan and Debbie McIntosh.
- (b) By-Law **026/16** being a by-law to authorize the Director of Finance/Treasurer to execute an Agreement with Her Majesty The Queen in Right of Canada regarding a Contribution Agreement for the Canada 150 Community Infrastructure Program ("CIP 150").
- (c) By-Law **027/16** being a by-law to authorize the Mayor and Clerk to execute an Agreement with the YMCA-YWCA of Guelph 2016 Summer Camp.

CARRIED

15. CONFIRMING BY-LAW

(a) By-Law to confirm the proceedings of Council for the Corporation of the Township of Puslinch

Resolution 2016-182: Moved by Councillor Fielding and Seconded by Councillor Stokley

That the following By-law be taken as read three times and finally passed in open Council:

(a) By-Law **028/16** being a by-law to confirm the proceedings of Council for the Corporation of the Township of Puslinch at its meeting held on the 20th day of April, 2016.

CARRIED

16. ADJOURNMENT:

Resolution No. 2016-183: Moved by Councillor Stokley and Seconded by Councillor Fielding

That Council hereby adjourns at 8:38 p.m.

CARRIED

Dennis Lever, Mayor

Karen Landry, CAO/Clerk



THE TOWNSHIP OF PUSLINCH NOTICE OF COMPLETE APPLICATION & NOTICE OF THE PUBLIC MEETING

TAKE NOTICE that pursuant to the requirements of the Planning Act, R.S.O., 1990, as amended, the Township of Puslinch has received a complete application to amend Zoning By-law 19/85. The file number assigned to this application is **D14/KRA**.

AND TAKE NOTICE that the Council of the Township of Puslinch will hold a **Public Meeting** on **Thursday the 19th of May, 2016** at **7:00 p.m.** in the Council Chambers at 7404 Wellington Road 34, pursuant to the requirements of Section 34 of the Planning Act, R.S.O., 1990, as amended.

THE LANDS SUBJECT to the application are known as Part Lots 6 & 7, Concession 1, municipally known as 6637 Concession 2 and 6643 Concession 2, Township of Puslinch. The subject lands are shown on the inset map.

THE PURPOSE AND EFFECT of the application is to amend Township of Puslinch Zoning By-law 19/85 to rezone the lands from Agricultural (A) to an Agricultural (A-_) Site Specific Zone to permit a second dwelling on a property for farm help. The existing dwelling is located on the lands at 6643 Concession 2, that is subsequently proposed to be severed and adjoined to the lands located at 6637 Concession 2, to satisfy conditions of related County of Wellington Consent File B71/15.

ORAL OR WRITTEN SUBMISSIONS may be made by the public either in support or in opposition to the proposed Zoning By-law Amendment. Any person may attend the public meeting and make and oral submission or direct a written submission to the Township Clerk at the address below. All those present at the public meeting will be given the opportunity to make an oral submission, however; it is requested that those who wish to address Council notify the Township Clerk in advance of the public meeting.

TAKE NOTICE that if a person or public body does not make an oral submission at a public meeting or make a written submission to the Township of Puslinch before the Zoning By-law is passed, the person or public body is not entitled to appeal the decision of the Council of the Township of Puslinch to the Ontario Municipal Board.

AND TAKE NOTICE that if a person or public body does not make an oral submission at a public meeting or make a written submission to the Township of Puslinch before the Zoning By-law is passed, the person or public body may not be added as a party to the hearing of an appeal before the Ontario Municipal Board unless, in the opinion of the Board, there are reasonable grounds to do so.

REQUEST FOR NOTICE OF DECISION regarding the Zoning By-law amendment must be made in written format to the Township Clerk at the address shown below.

ADDITIONAL INFORMATION regarding the proposed amendment is available for review between 9:00 a.m. and 4:30 p.m. at the Township of Puslinch Municipal Office as of the date of this notice.

Dated at the Township of Puslinch on this 22nd day of March 2016.

Karen Landry CAO/Clerk Township of Puslinch 7404 Wellington Road 34 Guelph, Ontario N1H 6H9 Phone (519) 763-1226 admin@puslinch.ca



March 2016

2015 ANNUAL MONITORING REPORT

Nestlé Waters Canada Aberfoyle Site

Submitted to: Nestlé Waters Canada 101 Brock Road South Guelph, Ontario N1H 6H9

REPORT

Report Number: 13-1152-0250 (1000) Distribution:

2 Copies - Nestlé Waters Canada2 Copies - Ministry of Environment and Climate Change1 Copy - Golder Associates Ltd.





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APPENDICES

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APPENDIX B TW3-80 Borehole Log

APPENDIX C TW3-80 Water Taking

APPENDIX D Groundwater Level Monitoring

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APPENDIX G Stream Temperature Monitoring

APPENDIX H Biological Monitoring



1.0 INTRODUCTION

Golder Associates Ltd. (Golder) was retained by Nestlé Waters Canada (Nestlé) to conduct the annual monitoring program and report preparation for the Nestlé Aberfoyle Site as required by Amended Permit To Take Water (PTTW) Number 1381-95ATPY issued by the Ministry of the Environment and Climate Change (MOECC). The PTTW is included in Appendix A. The PTTW was issued on December 19, 2013 and expires on July 31, 2016. The location of the Aberfoyle Spring/Plant (Site) is provided on Figure 1.1.

The PTTW authorizes water taking from two on-Site bedrock wells located on Lot 23, Concession 7, Geographic Township of Puslinch, Wellington County, Ontario. Water from TW3-80 is taken for the purpose of bottling water. Although it has not been used, water from TW2-11 is permitted for taking for miscellaneous purposes such as providing water to the on-Site pond for firefighting purposes.

A summary of the PTTW Conditions and where the information can be found in this report are outlined in Table 1:

Condition Number	Condition Description	Report Section
3.2, 3.3, 3.4	Identifies use, rates, time and total takings allowed.	3.1.1, 4.1, Appendix C
4.1	Maintain a daily record of all water takings including date, volume of water taken and rate at which it was taken.	Appendix C
4.2, 4.3, 4.6	Establish the specified groundwater and surface water monitoring programs including monitoring requirements and monitoring timing.	3.1.2, 3.1.3
4.4	Undertake wetland monitoring and redd surveys and submit results to Director.	Appendix H
4.5	If monthly water takings exceed 83,700,000 L, then multi-level piezometer data for selected wells must be submitted to the Director within 30 days of the end of the calendar month.	4.1
4.7	Notify the Director of monitoring locations that become inaccessible or abandoned and provide a recommendation for replacement.	3.1.2.1, 3.1.3.1
4.8	Prepare and submit an annual monitoring report to the Director, which presents and interprets the data collected under the conditions of the PTTW.	This report
4.9	Submit details of the bottling operations to the Director.	4.1
5.1	Notify the local District Office of any complaint arising from the taking of water and proposed action to rectify the complaint.	4.1
5.2	Supply water to anyone with a water supply (in effect prior to this taking) that has been negatively impacted.	Not applicable

Table 1: Permit To Take Water Conditions

Golder began monitoring at the Site in May 2014. Prior to that, monitoring was undertaken by Conestoga Rovers and Associates (CRA) and Nestlé. The MOECC has requested that the reporting follow the same outline and presentation as previous reports. As such, background information from the 2013 annual report (CRA, 2014) continues to be included/summarized within the current report (i.e., background and geologic interpretations are as per previous investigations). No new geologic characterization was performed as part of the 2015 work.

The report has been structured as follows:

Section 1.0:	Introduction including site location, history, and construction details for supply well TW3-80.
Section 2.0:	Regional setting including a description of topography, drainage, physiography, geology and hydrogeology (as per previous CRA (2014) reporting).
Section 3.0:	Summary of 2015 field program including a description of field activities conducted in 2015.
Section 4.0:	Monitoring Program Results including a summary and analysis of the data collected in 2015.
Section 5.0:	Conclusions from the 2015 monitoring program.
Section 6.0:	Recommendations from the 2015 monitoring program.

1.1 Historical Summary

TW3-80 was constructed in April 1980 for a proposed fish farming operation. In December 2000, the Perrier Group of America, a Nestlé Company, purchased the Site. Numerous permits have been issued for TW3-80 since that time allowing for water taking for bottling water purposes. Additional investigations have occurred over the years to help establish whether the water supply is sustainable and if there are any impacts to the natural environment. These additional investigations have been requirements of previous permits and have been completed to the satisfaction of the MOECC. No additional studies were required in 2015.

Most recently, PTTW Number 1381-95ATPY was issued in December 2013, which also allows for water taking from TW2-11 for miscellaneous purposes (such as providing water to the on-Site pond for firefighting purposes) but not bottling water. The combined water taking from TW3-80 and TW2-11 is restricted to 3,600,000 L per day (951,019 USgpd).

1.2 Construction Details for Supply Well TW3-80

The borehole log for TW3-80 (Appendix B) indicates a clayey silt till is present to a depth of 12.2 m (40 ft), and is underlain by 2.4 m (8 ft) of fine to medium sand. Bedrock was encountered at a depth of 14.6 m (48 ft) and the well was drilled 27.7 m (91 ft) into the bedrock. The original well was completed to a depth of 42.4 m (139 ft). Based on established nomenclature at the time the well was drilled, CRA (2014) interprets that the bedrock through which TW3-80 was drilled consists of the Guelph Formation dolostone (14.6 to 24.4 m or 48 to 80 ft) and into the Amabel Formation (Eramosa Member and Unsubdivided Member) (24.4 to 42.4 m or 80 to 139 ft). Based on work conducted by the Ontario Geological Survey (i.e., Brunton, 2008, 2009) changes to the bedrock nomenclature have been proposed/revised. Based on the proposed/revised nomenclature, CRA (2014) has interpreted TW3-80 to have been drilled through the Guelph, Eramosa, Goat Island Formations and possibly into the Gasport Formation.

It should be noted that the stratigraphy at TW3-80 is consistent with that of other wells in the area.





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When the well was initially constructed in 1980, 305 mm (12 inch) diameter steel casing was installed through the overburden and approximately 0.6 m (2 ft) into the top of rock to a depth of 15.2 m (50 ft). CRA (2014) indicates that the casing was cemented in place. The remainder of the well was completed as a 305 mm (12 inch) diameter open hole.

The bottom portion of the well was sealed in 1999 to pump water with more favourable natural water quality from within the Guelph and Amabel Formations. The work involved filling the lower 11.3 m (37 ft) portion of the open hole with gravel and bentonite grout and then sealing it with a cement cap. The revised finished depth is now 31.1 m (102 ft).

To comply with Nestlé water well construction standards, a liner was installed in the well in 2002. The work involved installing a 250 mm (10 inch) diameter stainless steel liner inside the 305 mm (12 inch) steel casing, and grouting it in place to a depth of 28.4 m (93 ft). The revised open interval of TW3-80 is now 28.4 m (93 ft) to 31.1 m (102 ft) below ground surface. Based on the well details from CRA (2014), a schematic of the well construction is included on Figure 1.2.

2.0 **REGIONAL SETTING**

CRA provides a description of the regional and local topography, drainage, physiography, and overburden and bedrock geology/hydrogeology for the Site. The following sections provide a summary of the Site conditions as described in the 2013 Annual Report (CRA, 2014).

2.1 **Topography and Drainage**

The Site is located within the Mill Creek Subwatershed (Figure 2.1) which forms part of the larger Grand River Watershed. Part of Mill Creek is located north of the Nestlé property and generally flows in a southwesterly direction within the study area. A tributary of Mill Creek, referred to as Aberfoyle Creek, flows through the Site, also in a southwesterly direction and converges with Mill Creek west of the Nestlé property. Aberfoyle Creek is located approximately 150 m to the northwest of TW3-80 at its nearest point. Mill Creek and Aberfoyle Creek are shown on Figure 2.1 along with other surface water and wetland features, which are described below.

As shown on Figure 2.1 several ponds exist, both natural and man-made, within a 1 km radius of the Nestlé property. One such pond, referred to as the Aberfoyle Mill Pond, is located east of the Site and discharges water to Aberfoyle Creek. Some small on-Site ponds exist on the Nestlé property. Most of the other ponds in the area appear to be man-made and are off-stream ponds (i.e., not connected to streams). Some of the ponds are the result of aggregate extraction below the water table.

In addition to the ponds in the area, several wetland areas are also present within a 1 km radius of the Nestlé property (Figure 2.1). Most of these wetlands are considered part of the Mill Creek Puslinch Wetland Complex and are considered provincially significant wetlands. Wetlands are present within the northwest part of the Nestlé property.

Surface topography is shown on Figure 2.1. Within a 1 km radius of the Nestlé property, ground surface elevations typically range from 310 to 330 masl (metres above sea level) with the lows occurring along Aberfoyle Creek and Mill Creek. CRA (2014) notes that the streambed elevation of the portion of Aberfoyle Creek that traverses the northwestern portion of the Site is approximately 311 masl (+/- 0.5 m).

2.2 Physiography

The existing landforms and most of the surficial soils in the area were created/deposited during the most recent glacial period, specifically the recession of the Lake Ontario ice lobe. During the recession of the Lake Ontario ice lobe three distinct end moraines were formed in the area: the Paris Moraine, the Galt Moraine and the Moffat Moraine (from oldest to youngest as defined by Karrow (1987)). Chapman and Putnam (1984) define this physiographic region as the eastern limb of the Horseshoe Moraines which is characterized by northeast-southwest trending bands of hummocky terrain containing three distinct moraines. The Paris Moraine is situated to the north of the Site and the Galt Moraine is situated to the south of the Site. These moraines are primarily composed of till and form the major drainage divides for the Mill Creek Subwatershed. The Nestlé property is situated mainly within an outwash gravel plain situated between the two moraines. The outwash gravel plain was likely formed by glacial meltwater associated with a halt in the ice retreat during the formation of the Galt Moraine.

2.3 Geology and Hydrogeology

The following sections provide a summary of the regional and local geology and hydrogeology. The regional interpretation has been summarized from CRA (2014) which was based on published mapping and information contained in the Mill Creek Subwatershed Study (CH2M Gore & Storrie, 1996) and the detailed geologic information has been obtained from logging of the stratigraphy by CRA at locations where monitoring wells have been installed as part of previous field investigations. It should be noted that the bedrock interpretation follows the existing nomenclature and not the revised nomenclature.

CRA (2014) prepared two cross-sections (A-A' and B-B'), and a third section which is an enlargement of part of cross-section B-B'. These sections are included on Figures 2.2 and 2.3a/b, respectively. The locations of the sections are shown on Figure 2.4. Hydrogeologic cross-section A-A' is oriented northwest to southeast through the Site crossing Aberfoyle Creek and including supply well TW3-80. Hydrogeologic cross-section B-B' is oriented southwest to northeast adjacent to the north side of Aberfoyle Creek within the Nestlé property. The section extends to the Nestlé owned property at 46 Gilmour Road.

2.3.1 Regional Overburden Geology and Hydrogeology

The surficial overburden geology, as mapped by the Ontario Geological Survey (OGS) is shown on Figure 2.4. The surficial overburden at the Site is characterized by the following units:

- Peat and muck;
- Outwash gravel;
- Ice-contact gravel: kames and eskers; and
- Stony, sandy silt till (Wentworth Till).

Regionally, the Paris and Galt moraines, located north and south of the Site, respectively, are comprised of Wentworth Till. Karrow (1987) describes the till as a buff-coloured, stony, sandy silt till. Located between the moraines are younger outwash gravel deposits and ice-contact gravel deposits. Deposits along parts of Aberfoyle Creek and Mill Creek are mapped as peat and muck. There are no bedrock outcrops within the study area.



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The coarse grained deposits, between the moraines, generally overlie the Wentworth Till. In some areas, particularly the central part of the Mill Creek Subwatershed, the till is not present and the coarse grained deposits are continuous to bedrock. The surficial coarse grained deposits are thinner and separated from the bedrock by the underlying till in the upper and lower reaches of the Mill Creek Subwatershed. Occasional subsurface coarse grained deposits exist at various depths as lenses or discontinuous layers within or between till units (CH2M Gore & Storrie, 1996).

The overburden ranges in thickness from 15 m (50 ft) in low-lying areas of the subwatershed near Mill Creek and Aberfoyle Creek to 35 m (115 ft) along the crests of the Paris and Galt Moraines, (Drift Thickness Map P.535, M.A., Vos, 1968; CH2M Gore & Storrie, 1996).

The Mill Creek Subwatershed Study (CH2M Gore & Storrie, 1996) summarizes the hydraulic conductivity values of the various units as follows: sand and gravel deposits ranging from 3.7×10^{-4} to 2×10^{-1} cm/sec with the wide variability believed to be due to variable proportions of silt within the sand and gravel deposits, and; Wentworth Till ranging from 1×10^{-6} to 1×10^{-3} cm/sec.

2.3.2 Local Overburden Geology and Hydrogeology

Locally, within a 1 km radius of the Site, the overburden is typically 15 m (50 ft) to 20 m (65 ft) thick and consists mainly of outwash gravel or ice-contact gravel deposits. As previously discussed, these coarse grained deposits are situated between the moraines and are elongated in a southwest to northeast direction. The Wentworth Till is mapped as the surficial deposit along the moraines to the southeast (approximately 500 m) and northwest (approximately 2 to 2.5 km) of TW3-80.

A review of the cross-sections (Figures 2.2 and 2.3a/b) with the surficial geology mapping (Figure 2.4) indicates that the surficial deposits correspond well with those identified by regional mapping with the exception of the area around TW3-80. Outwash gravel is mapped as the surficial deposit in this area, however during drilling the first unit encountered was till. CRA (2014) indicates that this discrepancy may exist because the majority of the surficial sand and gravel deposit at the Site was removed during aggregate operations conducted by a previous Site owner.

Moving along cross-section A-A' (Figure 2.2) from northwest to southeast indicates that from approximately County Road 34 to Maple Leaf Lane coarse grained materials (sand and gravel, silty sand) exist that extend to bedrock. The geology from around Maple Leaf Lane to the northwest part of the Nestlé property changes to layered sands (or sand and gravel) and silt till and the area to the southeast, including TW3-80, consists of a thick till unit with some coarse grain materials either above or below the till.

Moving along cross-section B-B' (Figure 2.3) from southwest to northeast indicates that at the Nestlé property, the geology consists of sand and gravel grading to sand and silt overlying sandy silt till with sand and gravel deposits observed within or at the base of the till in some locations. Northeast of the Nestlé property the ground elevations increase in the area of the Galt Moraine. The geology in this area consists mainly of a thick till unit.



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Horizontal hydraulic conductivity testing of coarse grained materials is summarized by CRA (2014) as follows:

- MW1B-07 (predominantly screened across silty sand) 1.2 x 10⁻² cm/sec (which is on the high side of the range that would typically be expected for silty sand (10⁻⁵ to almost 10⁻¹ cm/sec, Freeze and Cherry, 1979);
- MW2E-07 (upper sand and gravel) 2.3 cm/sec; and
- MW2D-07 (lower sand and gravel) 3.0 x 10⁻² cm/sec.

Horizontal hydraulic conductivity of the till unit is summarized by CRA (2014) as follows:

- MW1C-04 3.2 x 10⁻⁵ cm/sec;
- MW1A-07 4.6 x 10⁻⁴ cm/sec; and
- Grain size samples 6.4 x 10⁻⁷ cm/sec to 1.6 x 10⁻³ cm/sec.

Vertical hydraulic conductivity testing in boreholes advanced adjacent to Aberfoyle Creek is summarized by CRA (2014) as follows:

- Permeable (shallow upper 2 m) soils (ranging in composition from sand with silt, to sand and gravel) 4.5 x 10⁻⁴ to 5.8 x 10⁻² cm/sec; and
- Lower permeability materials in the deeper portions (ranging in composition from sandy, silty, gravel (till) to sandy gravel with some silt (till)) 1.3 x 10⁻⁷ to 2.1 x 10⁻⁵ cm/sec.

Water levels were measured by CRA after TW3-80 had been shut-down for 3.4 days in October 2010. CRA (2014) interpretation of the non-pumping condition overburden groundwater levels is presented on Figure 2.5, which indicates that the direction of groundwater flow in the overburden is generally to the southwest, with local components of flow to the west and south toward Aberfoyle Creek. CRA (2014) indicates that this flow configuration is similar to the pattern previously presented for the October 2004 and November 2006 shutdowns.

2.3.3 Regional Bedrock Geology and Hydrogeology

The regional bedrock geology is shown on Figure 2.6.

The bedrock hydrogeologic units underlying the Site, which are relevant to this study, are summarized by CRA (2014) as follows (from top to bottom):

- Guelph Aquifer;
- Eramosa Aquitard;
- Amabel Aquifer; and
- Cabot Head Formation.

As previously discussed, the bedrock nomenclature has been revised based on work by the OGS over recent years (i.e., Brunton 2008, 2009). The need to update to the revised nomenclature has been recognized but is not part of the scope for this monitoring report which used the previous nomenclature and interpretations in CRA (2014) for consistency. CRA (2014) provides the following descriptions of the bedrock hydrogeologic units of interest.



Guelph Aquifer

The Guelph Formation is the upper bedrock aquifer unit in the study area and typically consists of brown to grey dolostone. The Guelph Formation is characterized by relatively thick bedding and a medium to fine crystalline texture (Telford, 1976, 1979). Regionally, the thickness of the Guelph Aquifer is on the order of 15 m (50 ft) at a location approximately 3.2 km northeast of the Site and ranges up to 30 m (100 ft) at the western edge of Puslinch Township (CH2M Gore & Storrie, 1996).

Eramosa Aquitard

The Eramosa Aquitard unit consists of dark brown or black bituminous dolostone that is thin bedded and has a fine crystalline texture. Due to its low vertical hydraulic conductivity, it is recognized regionally as an aquitard. Based on the CRA (2014) interpreted cross-sections, the Eramosa Aquitard is estimated to range in thickness from approximately 6 m to 12 in the area of the Site.

Amabel Aquifer

The Amabel Aquifer consists of blue-grey to buff dolostone that is massive in structure and has a fine crystalline texture. Biothermal and/or reefal structures as well as associated fossiliferous beds are relatively common. Wells in the vicinity of the Nestlé Site are generally not drilled through the entire Amabel Aquifer, however the thickness of the Amabel is reported to be 35 m (115 ft) approximately 3.2 km northeast of the Site, and 30 m (100 ft) to 35 m (115 ft) thick in the Cambridge area, which is 15 km southwest of the Site (Telford, 1979). Nestlé's supply well (TW3-80) obtains water from this aquifer.

In the revised nomenclature system, the Amabel Aquifer unit interpreted by CRA generally corresponds from top to bottom to the: Goat Island, Gasport, and Irondequoit Formations.

Cabot Head Aquitard

The Cabot Head Formation is composed of green and grey shale with interbedded limestone. It is generally accepted that the shales of the Cabot Head Formation are an aquitard underlying the Amabel aquifer.

2.3.4 Local Bedrock Geology and Hydrogeology

The bedrock surface is somewhat irregular, but generally dips to the southwest. The bedrock elevation in the vicinity of the Nestlé property declines from approximately 305 masl northeast of the Site to 295 masl southwest of the Site. Bedrock topography mapping by Telford (1979) indicates a north-south trending regional bedrock valley occurs near the Site. This valley is relatively well defined north of Aberfoyle, but is broader and less well defined in the area south of Aberfoyle (CH2M Gore & Storrie, 1996). It has also been observed that the drainage pathway of Mill Creek generally follows this buried bedrock valley over a large part of the subwatershed (CH2M Gore & Storrie, 1996).

Additional information on the bedrock units is presented below based on observations during local drilling and testing.



Guelph Aquifer

Logging of bedrock cores by CRA indicates that the Guelph Aquifer is a buff or light brown to grey microcrystalline dolostone with a low to moderate degree of fracturing and weathering with rock quality designation (RQD) values typically ranging from 83 to 100 percent. The upper 0.3 m (1 ft) to 0.6 m (2 ft) is noted to be highly fractured and weathered. CRA also notes thin black styolites, occasional vugs/vuggy zones and occasional fossils were also observed in this unit. Based on data from eight locations, CRA notes that the Guelph Aquifer is typically less than 5.0 m (16 ft) thick in the vicinity of the Site, which is thin, relative to the regional scale information.

In the vicinity of the Site, the bedrock surface elevation (top of the Guelph) ranges from about 295.1 to 308.9 masl. CRA also notes the presence of bedrock valley that corresponds reasonably well to the location presented in the Mill Creek Subwatershed Plan (CH2M Gore & Storrie, 1996).

Horizontal hydraulic conductivity testing at wells completed in the Guelph Aquifer is summarized by CRA (2014) as follows:

- MW2C-07 7.7 x 10⁻⁵ cm/sec; and
- MW3C-07 1.1 x 10⁻² cm/sec.

CRA (2014) has also interpreted the potentiometric surface of water levels in the Guelph Aquifer under non-pumping conditions observed after a 3.4 day shut-down in October 2010. The interpretation is shown on Figure 2.7 with the groundwater flow direction identified in a southwest, south and southeast direction which is reported to be similar to the pattern previously presented for the October 2004 and November 2006 shutdowns.

Eramosa Aquitard

Logging of bedrock cores at the Site by CRA indicates that the Eramosa is a microcrystalline shaley limestone that is typically dark grey, thin-bedded, has a bituminous odour, and exhibits a low to moderate degree of fracturing and weathering with RQD values ranging from 70 to 100 percent. CRA also notes occasional vugs/vuggy zones and occasional to frequent styolites. The upper contact with the Guelph Aquifer is gradational and the lower 3 m (10 ft) of the Eramosa contains alternating beds of dark grey and black, shale and limestone.

In the vicinity of the Site, the elevation of the top of the Eramosa ranges from approximately 293.4 to 300.6 masl. The thickness of the Eramosa ranges from 8.3 m (27 ft) to 12.8 m (42 ft) based on the detailed logging.

Horizontal hydraulic conductivity testing at wells completed in the Eramosa is summarized by CRA (2014) as follows:

- MW2B-07 4.9 x 10⁻⁵ cm/sec; and
- MW3B-07 1.5 x 10⁻³ cm/sec.

Amabel Aquifer

No boreholes were drilled through the entire Amabel Aquifer, however five of the wells penetrating the Amabel contain rock core that is interpreted by CRA to be microcrystalline to crystalline, dolomitic limestone with a low to moderate degree of fracturing and low degree of weathering. CRA also notes that it is typically light grey, buff or brown in the upper portion and light to dark grey in the lower portion with bedding that is relatively massive with typical RQD values ranging from 98 to 100 percent. Thin black styplites occur occasionally to

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frequently and vugs/vuggy zones occur occasionally and appear to be more prominent in the lower portion of the boreholes. Occasional fossils are also present in this unit.

In the vicinity of the Site, the upper surface of the Amabel ranges from approximately 282.0 to 290.1 masl. Although TW3-80 does not penetrate the thickness of the Amabel Aquifer, CRA interprets the thickness to be about 53.9 m based on the water well record for TW1-00, formerly located about 6.1 m northeast of the supply well (since abandoned).

Horizontal hydraulic conductivity testing at wells completed in the Amabel is summarized by CRA (2014) as follows:

- MW3A-07 4.3 x 10⁻⁵ cm/sec; and
- MW2A-07 1.0 x 10⁻³ cm/sec.

CRA (2014) has also interpreted the potentiometric surface of water levels in the Amabel under non-pumping conditions observed after a 3.4 day shut-down in October 2010. The interpretation is shown on Figure 2.8 with the groundwater flow direction to the southwest in the vicinity of supply well TW3-80 which is reported to be similar to the pattern previously presented for the October 2004 and November 2006 shutdowns.

2.4 Source Water Protection

As a result of the Clean Water Act, communities in Ontario are required to develop source protection plans in order to protect their municipal sources of drinking water. These plans identify risks to local drinking water sources and develop strategies to reduce or eliminate these risks. Potential and existing risks for a municipal source are identified within wellhead protection areas (WHPA). A WHPA is an area projected to ground surface that reflects the zone in an aquifer where groundwater is flowing to a municipal drinking water source (pumping well). The Nestlé Aberfoyle property and well TW3-80 are located more than 2.6 km from the closest WHPAs, which include the City of Guelph WHPA to the northwest and the Freelton WHPA to the southeast and east.

3.0 SUMMARY OF 2015 FIELD PROGRAM

This section describes the field activities performed in 2015 associated with PTTW Number 1381-95ATPY (for TW3-80 and TW2-11).

3.1 Groundwater and Surface Water Monitoring Program

The field activities included completion of a monitoring program including maintaining a record of water taking and measurement of groundwater levels, mini-piezometer levels, surface water levels, flows and temperatures. Monitoring events were conducted during the third week of each month by Golder. The monitoring program includes the following instrumentation:

- 2 production wells (TW3-80, TW2-11);
- 16 monitoring well nests with a total of 38 monitors;
- 7 surface water stations;
- 9 mini-piezometer nests with a total of 18 monitors;



- 6 temperature stations; and
- 11 private wells.

The monitoring locations are shown on Figures 3.1 through 3.3. Previous wells that have been decommissioned or are no longer part of the monitoring program are shown on Figure 3.4. All of the existing monitoring locations and the decommissioned or unused wells are shown on Figure 3.5.

3.1.1 Water Taking

Water taking from TW3-80 in 2015 was measured using a Krohne magnetic flow meter that is wired to an Allen-Bradley industrial Programmable Logic Controller. The instantaneous water flow (USgpm) and volume (US gallons) are recorded. The flow meter was most recently calibrated on February 20, 2015 by Endress+Hauser (per Nestlé).

The daily volumes taken from supply well TW3-80 in 2015 are provided in Appendix C. No water was taken from TW2-11.

3.1.2 Groundwater Monitoring Program

Groundwater levels have been measured at various locations for varying periods of time on and off Site since December 1980. Following the purchase of the Site by the Perrier Group of America, a monitoring program was initiated in December 2000. Modifications to the monitoring program have been made over time as a result of PTTW requirements, well abandonments, physical inaccessibility to wells, and changes in property ownership.

The monitoring locations for the 2015 groundwater monitoring program are shown on Figures 3.1 and 3.2 and are summarized as follows:

Overburden Monitors

TW1-93, TW1-99, MW10A-09, MW2D-07, MW2E-07, MW4C-07, MW-S, PCC-S, PCC-I

Bedrock Monitors

Guelph Monitors

MW-D, MW-I, PCC-D, MW2C-07, MW4B-07, MW6B-08, MW7B-08, MW8B-08, MW10B-09, MW14C-11, 8 MLL (67-08317), 2 Brock Road North, 58 Brock Road South, 7404 Road 34 (67-07589), Y, MW15B-12, MW16B-12, MW17B-12, MW18B-12

Eramosa Monitors

MW2B-07, MW14B-11, I (67-07389)

Amabel Monitors

TW3-80 (Production Well), TW2-11, Fireflow, MW2A-07, MW4A-07, MW6A-08, MW7A-08, MW8A-08, MW10C-09, MW10D-09, MW14A-11, B (67-07383), M1 (67-13755), PW5 Meadows of Aberfoyle (67-1197), 67-08740, W2 (67-13335), MW15A-12, MW16A-12, MW17A-12, MW18A-12.

CRA (2014) notes that some private wells are open across multiple bedrock units (for example private wells with a finished depth in the Amabel are typically open across the Guelph and Amabel). Wells constructed in this





manner have been grouped with the lowermost unit in which they are installed. It should be noted that water levels measured in wells open to multiple aquifer units represent a composite water level.

Water levels were measured and dataloggers downloaded at all locations during the third week of each month. Where required by the PTTW, dataloggers were used to record water levels at 60-minute intervals. The groundwater levels measured in 2015 are presented in Appendix D.

3.1.2.1 Missing Data

The following table provides a list and description of missing data from the 2015 groundwater monitoring. Some of the missing data is due to inaccessibility.

Monitoring Location	Missing Data	Comment
l Well (50 Brock Road)	Manual water level in March	Not accessible (house was locked)
2 Brock Road	Manual water level in April and May	Not accessible (buried under tires)
TW1-93	Transducer water levels for the first half of March	Transducer issue
MW10C-09	Transducer water levels from mid-October to mid-November	Transducer issue (fail)
PCC-S	Transducer water levels from mid-September to mid-October	Transducer issue (shift)

Table 2: Missing Groundwater Data from the 2015 Monitoring

3.1.3 Surface Water Monitoring Program

The surface water monitoring program includes the following components:

- Surface water levels;
- Stream flow;
- Water levels in nested mini-piezometers; and
- Temperature at the sediment-water interface.

The 2015 surface water monitoring locations are shown on Figure 3.3 and summarized below.

Surface Water Levels

Measurement of surface water levels was initiated in December 2001 as part of Nestlé's monthly monitoring program. In 2015, surface water levels were measured at the following locations:

- Aberfoyle Creek
 - SW1 located within the upstream part of the Nestlé property
 - SW2 located within the downstream part of the Nestlé property
 - SW3 located at Gilmour Road, upstream of the Nestlé property
- Mill Creek





- SW4 located on Mill Creek at Maple Leaf Lane, upstream of the confluence with Aberfoyle Creek.
- SW5 located on Mill Creek at McLean Road, downstream of the Nestlé property.
- Ponds:
 - SW9 located in the Dufferin Aggregates owned pond located southeast of the Nestlé property.
 - SW10 located in the Dufferin Aggregates owned pond at the entrance to the Nestlé property.

Water levels were measured at all locations during the third week of each month. At SW1 and SW2, dataloggers were used to record water levels at 60-minute intervals, which were also downloaded once a month. The surface water levels for 2015 are presented in Appendix E.

Stream Flow

Measurement of surface water flow was initiated in December 2001 as part of Nestlé's monthly monitoring program. Surface water flow was measured at SW1 (upstream part of Nestlé property) and SW2 (downstream part of Nestlé property) in Aberfoyle Creek during the third week of each month in 2015. Stream flow velocities were measured using a Valeport electromagnetic flow meter and the surface water flows were calculated using the cross-sectional area-velocity method. The surface water flow calculations for 2015 are presented in Appendix F.

In addition, the monthly surface water elevations ("stage") and stream flow measurements ("discharge") collected in 2015 were used to establish the stage-discharge relationships (rating curves) at SW1 and SW2. The rating curves were used to estimate stream flow from the continuous water level measurements at SW1 and SW2.

Mini-Piezometers

Mini-piezometers were initially installed in 2004 with additional mini-piezometers being installed since that time. In 2015, water levels were measured in mini-piezometers at six locations each containing a shallow and a deep monitor. For background purposes, one mini-piezometer nest (MP11S-08/D-04) has been installed in the bank, adjacent to a tributary of Aberfoyle Creek upstream of the Nestlé property. Mini-piezometer nests are located along Aberfoyle Creek on the Nestlé property to Mill Creek downstream of the confluence of the two creeks as follows (see locations on Figure 3.3):

- MP16S/D-08
- MP6S-08/D-04
- MP12S/D-04
- MP14S/D-07
- MP8S/D-04
- MP19S/D-12
- MP17S/D-11
- MP18S/D-11





Water levels were measured and dataloggers downloaded at all locations during the third week of each month. Dataloggers were used to record water levels at 60-minute intervals. The water levels measured in 2015 are presented in Appendix E.

Temperature

Measurement of surface water temperature began in 2005. In 2015, surface water temperature was measured at six locations along Aberfoyle Creek. The most upstream location is situated at Brock Road with the remainder of the sites located on the Nestlé property downstream of Brock Road. Beginning upstream and moving downstream, the stream temperature sites are as follows (see locations on Figure 3.3):

- ST6-08
- ST1-05
- ST2-05
- ST3-05
- ST4-05
- ST5-05

Air temperature is also measured in a shaded area at ST1-05 at 30-minute intervals with a Stowaway Tidbit® datalogger.

The dataloggers are located at the sediment-water interface with temperature data measured and logged at 30-minute intervals using Stowaway Tidbit® dataloggers. Two dataloggers are installed at each site.

C. Portt and Associates Ltd. (2011) conducted a review of the appropriateness of the methodology for the temperature monitoring program. The report was approved by the MOE in October 2011 and recommendations from the report were implemented by CRA at that time, and continued by Golder since May 2014. The temperature data is analyzed by C. Portt and Associates using ThermoStat software. A report on the surface water temperature is included as Appendix G.

3.1.3.1 Missing Data

The following table provides a list and description of missing data from the 2015 surface water monitoring. Some of the missing data is due to winter conditions.

Monitoring Location	Missing Data	Comment
SW1	Manual flow in February	Frozen
SW2	Manual flow in January and February	Frozen
SW4	Manual water level in January and February	Frozen
SW5	Manual water level in February	Frozen
SW9	Manual water level in January, February and March	Frozen
SW10	Manual water level in January, February and March	Frozen
MP6S-08/D-04	Manual water level in February	Frozen

 Table 3: Missing Surface Water Data from the 2015 Monitoring



Monitoring Location	Missing Data	Comment
MP8S-04/D-04	Manual water level in January and February	Frozen
MP11S-08/D-04	Manual water level in January, February and March	Frozen
MP12S-04/D-04	Manual water level in January and February	Frozen
MP14S-07/D-07	Manual water level in January and February	Frozen
MP17S-11/D-11	Manual water level in January and February	Frozen
MP18S-11/D-11	Manual water level in January and February	Frozen
MP19S-12/D-12	Manual water level in January, February and March	Frozen

3.2 Biological Monitoring

Core wildlife monitoring and redd surveys (salmonid spawning) were undertaken on the Nestlé property as was recommended in the '2014 Biological Monitoring Report (Beacon Environmental and C. Portt and Associates). Core wildlife monitoring was completed by Beacon Environmental and the redd surveys were completed by C.Portt and Associates. A copy of the 2015 Biological Monitoring Report is included in Appendix H.

3.3 Surveying

Mini-piezometer nests and surface water monitoring locations were surveyed in 2015 to validate the reference elevations for the surface water monitoring portion of the program due to the potential for mini-piezometers and other shallow installations such as T-bars to heave. The water elevation data for these stations was corrected back to April 2014.

3.4 **Precipitation**

A combined record of precipitation was compiled from the Waterloo Wellington and Kitchener Waterloo meteorological stations since a complete record was not available from either station. The annual normal (1981-2010) precipitation from the Waterloo Wellington Station is 916.5 mm. The total precipitation measured in 2015 was 769.8 mm, which is 16% below the normal. More than 10% below normal precipitation occurred in 2012 and 2015 with more than 10% above normal precipitation occurring in 2011 and 2013. Total precipitation has been on a decline over the past three years. The following table provides a summary of the annual precipitation. Annual precipitation is also shown graphically on Figure 3.6 along with the 30-year normal.

Year	Precipitation (mm)	% Difference from Normal
2009	944.2	3.0
2010	834.1	-9.0
2011	1043.7	13.9
2012	798.7	-12.9
2013	1080.4	17.9
2014	920.2	0.4
2015	769.8	-16.0
Normal (1981-2010)	916.5	

Table 4: Annual Precipitation



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Monthly precipitation was more than 10% above normal in June, October and December 2015 and more than 10% below normal in January, February, March, May, July, September and November 2015. There was less than 1 mm of precipitation recorded in July 2015. The monthly precipitation for 2015 is included in Table 5.

Month	Precipitation (mm)	Normal (mm)	% Difference from Normal
January	53.0	65.2	-18.7
February	48.2	54.9	-12.2
March	18.2	61.0	-70.2
April	70.8	74.5	-5.0
Мау	66.1	82.3	-19.7
June	124.3	82.4	50.8
July	0.6	98.6	-99.4
August	83.9	83.9	0.0
September	55.9	87.8	-36.3
October	92.0	67.4	36.5
November	62.8	87.1	-27.9
December	94	71.2	32.0

Table 5: Monthly Precipitation in 2015

4.0 MONITORING PROGRAM RESULTS

4.1 Water Taking for TW3-80 and TW2-11

Water taking at the Nestlé Aberfoyle site in 2015 was governed by PTTW 1381-95ATPY, which permits water to be taken from two wells as outlined in Table 6.

Source	Maximum Rate	Maximum Number of Hours of Water Taking per Day	Maximum Daily Water Taking	Maximum Number of Days of Water Taking per Year
TW3-80	2,500 L/min (660 USgpm)	24	3,600,000 L/day (951,019 USgpd)	365
TW2-11	475 L/min (125 USgpm)	24	684,000 L/day (180,694 USgpd)	365
Total			3,600,000 L/day (951,019 USgpd)	

Table 6: Permitted Water Takings at Aberfoyle

The daily water taking at TW3-80 ranged from 0 L/day to 3,105,437 L/day (820,370 USgpd) or 86% of the permitted taking and was less than the daily amount allowed on the PTTW. The average daily taking was 2,088,668 L/day (551,767 USgpd). The daily water takings for 2015 are tabulated in Table C1 in Appendix C.




The total volume of water taken in 2015 from TW3-80 was 762,363,664 L (201,395,269 US gal). The total volume of water taken each year from 2001 to 2015 is presented on Figure 4.1. In 2015, the total volume taken accounted for approximately 58% of the permitted volume. Since 2002, the groundwater taking has ranged from approximately 43% to 67% of the permitted taking.

The monthly water takings in 2015 from TW3-80 ranged from 38,928,664 L (10,283,870 US gal) or 35% of permitted taking in December to 78,285,913 L (20,680,960 US gal) or 72% of the permitted taking in June. The monthly water takings for the past 5 years are presented on Figure 4.2. In 2015, the monthly water takings generally increased from January to June and then decreased during the remainder of the year.

Condition 4.5 of the PTTW indicates that if the monthly amount of water taken exceeds 83,700,000 L, then multi-level piezometer (MP6, MP12, MP11 and MW2) data shall be submitted to the MOECC. The monthly threshold of 83,700,000 L represents 75% of the permitted monthly water taking, based on a 31-day month. As shown on Figure 4.2, the monthly water takings in 2015 were less than the 83,700,000 L threshold, and therefore no multi-level piezometer data was submitted to the MOECC during the year.

No water was taken from TW2-11 in 2015.

Condition 4.9 of the PTTW requires details of the bottling operations such as location and name of facilities where water is delivered in bulk containers, if bulk water is containerized at the receiving location, the size of the containers into which the water is transferred and total volume of water transported in bulk to each remote facility. Nestlé has indicated that no water was shipped in bulk (container greater than 20 litres) in 2015.

As per Condition 5.1, Nestlé has indicated that no complaints arising from the taking of water authorized under this PTTW were received in 2015.

4.2 Groundwater Monitoring Program

The groundwater level data measured manually in 2015 at the monitoring wells is tabulated in Table D1 in Appendix D. Hydrographs prepared using both manual measurements and transducer data are also provided in Appendix D. The hydrographs include the daily pumping volumes at TW3-80 and daily precipitation as recorded at a combination of the Kitchener/Waterloo and Waterloo Wellington 2 meteorological stations.

4.2.1 TW3-80

Water levels and average daily pumping rates for TW3-80, along with daily precipitation, between 2011 and 2015 are shown on Figure D1.

Water levels measured in 2015 at TW3-80 range from approximately 299 to 311 masl (or approximately 5.4 to 17.4 m below ground surface) under pumping and non-pumping conditions. These variations in water levels are mainly due to changes in the pumping rate and are within the historical range of water levels observed at TW3-80.

Operation records of TW3-80 indicate that the well is seldom shut-down for significant periods of time and as such, there are few non-pumping water levels available. Based on previous shutdowns, CRA (2014) indicates that the non-pumping water levels are approximately 311 to 313 masl or 3.5 to 5.5 m below ground surface. The estimated non-pumping water levels observed in 2015 are slightly lower than the non-pumping water levels observed in 2015 are slightly lower than the non-pumping water levels observed during the previous four years. The slightly lower water levels in 2015 are the result of the increased pumping and below normal precipitation during the first five months of the year and essentially no precipitation in



July. TW3-80 was shut down at the end of November/beginning of December for approximately three days, at which time the water level recovered to approximately 311 masl.

The lower water levels, or estimated pumping levels in 2015, range from approximately 299 to 303 masl. Based on a static water level of 313 masl, the estimated drawdown at the well in 2015 ranged from approximately 10 to 14 m. CRA (2014) indicates that the total available drawdown to the top of the pump intake is about 20.7 m (based on a static water elevation of 313 masl and a top of pump intake elevation of approximately 292.3 m masl).

The 2015 water levels show a slight decline compared to the historical water levels as shown on Figure D1 which is attributed to the slight increase in water taking and the below normal precipitation. Overall the water levels are stable and the groundwater taking at the TW3-80 does not appear to have caused a long-term decline in the aquifer.

4.2.2 Amabel Aquifer

Hydrographs for other wells completed in the Amabel Aquifer are included on Figures D2 through D18 in Appendix D. It should be noted that private wells installed in the Amabel Aquifer are constructed as open hole installations and are therefore also open through the Guelph Aquifer and the Eramosa Aquitard.

A review of the hydrographs of wells completed in the Amabel Aquifer, specifically with continuous data, indicate the following:

- To the north, northwest and northeast of TW3-80, the water levels measured within this aquifer in 2015 are approximately 1 m lower than the average water level over the past five years. To the south, southwest and southeast of TW3-80, the water levels measured within this aquifer in 2015 are approximately 0.5 m lower than the average water level over the past five years. The water levels are within the range measured over the past five years. The water levels are within the range measured over the past five years. The water levels in the Amabel aquifer in 2015 are similar to the low water levels observed in 2012 which was also during a year of below normal precipitation. Water levels in nearby monitoring wells MW2A-07 and MW4A-07 in the summer of 2015 are slightly lower than those observed in 2012 due to increased pumping at TW3-80 and no measured precipitation in July.
- Water levels in the Amabel aquifer around the Site are affected mainly by pumping of TW3-80. The amount of influence varies based on distance away from TW3-80 and existing hydrogeologic conditions. Typically wells further away from TW3-80 show less effect from pumping. With the exception of MW6A-08, MW10C/D-09, MW15A-12 and MW16A-12 all of the water levels in the wells generally increased during the second half of the year as water takings decreased. Of the wells that did not have an increasing water level trend, only MW10C/D-09 continued to show a declining trend while water levels in the other wells were relatively stable. The reason for the declining trend in MW10C/D-09 is unknown as the well is more than 1.2 km northeast of TW3-80.
- Water levels in the Amabel aquifer are influenced by pumping of TW3-80 over the short term and by recharge (or total precipitation) over the long term. This is evident with the water levels generally correlating with the precipitation trends (i.e. lower water levels correlate with below normal precipitation while higher water levels correlate with above normal precipitation). Similar low water levels occurred in 2012 and 2015. Total precipitation was approximately 13% below normal in 2012 and 16% below normal in 2015 while total pumping accounted for approximately 44% and 58% of the permitted volume in 2012 and 2015, respectively. Despite the increased pumping and decreased precipitation in 2015 the water levels in the Amabel aquifer are generally similar or higher in 2015 compared to 2012 with the exception of the wells



close to TW3-80 (MW2A-07 and MW4A-07) where the water levels were generally less than 1 m lower. The wells closer to TW3-80 are influenced by the slightly higher pumping rate in 2015.

- During brief shutdowns on March 15 and from November 30 to December 2, there is a rise in water levels in the wells monitored within this aquifer. During the November/December shutdown, water levels in nearby MW2A-07 rose almost 3 m. In general, water levels to the north and northeast rose approximately 1 m or less while the rise in water levels to the northwest, west, southwest and south ranged from less than 0.5 m to over 2 m.
- The closest monitoring well in the same aquifer as TW3-80 is MW2A-07, located approximately 150 m northwest of TW3-80 by Aberfoyle Creek. In 2015, the difference between high and low water levels at MW2A-07 was approximately 2 m to 3 m with approximately 2 m of fluctuation in the high (estimated non-pumping) water levels over the year. For comparison, wells located further away (upgradient MW6A-08, MW8A-08, MW10C-09 and MW10D-09; downgradient MW15A-12, MW16A-12 and MW17A-12 (see Figure 3.1 for locations)) showed only minor difference between high and low water levels and approximately 0.5 to 1.5 m of fluctuation over the year. Some of the fluctuation over the year at MW2A-07 is likely due to pumping variations.
- There appears to be a better hydraulic connection between TW3-80 and MW7A-08 (located approximately 1,050 m north of TW3-80) compared to the connection between TW3-80 and MW14A-11 (located approximately 750 m northwest of TW3-80) and TW3-80 and MW18A-12 (located approximately 750 m southwest of TW3-80). This may also indicate that the zone of influence extends further upgradient toward MW7-08 as opposed to downgradient toward MW18-12. This interpreted hydraulic connection is consistent with previous years.

The highest pumping volumes occurred during the months of May, June and July. To review the groundwater flow pattern under these circumstances, a potentiometric surface of the Amabel Aquifer was prepared (Figure 4.3) based on the water levels measured during July 21, 2015 monthly monitoring event. A review of the potentiometric surface on July 21, 2015, indicates groundwater flow toward TW3-80 from the northeast, north and northwest. The greater hydraulic connection with the area toward MW7-08 is evident in the potentiometric surface under pumping conditions.

4.2.3 Eramosa Aquitard

Hydrographs for wells completed in the Eramosa Aquitard are included on Figure D19 in Appendix D. This unit is typically considered an aquitard and as such only three wells are monitored within this unit including one private well ("I"). The two monitoring wells (MW2B-07 and MW14B-11) are sealed within the Eramosa Aquitard but, like other private wells, "I" is constructed as an open hole that is also open to the Guelph Aquifer. Overall, the Guelph Aquifer is more permeable than the Eramosa Aquitard and as such the water levels are representative of conditions in the Guelph Aquifer.

A review of the hydrographs of wells completed in the Eramosa Aquitard, specifically with continuous data, indicate the following:

Water levels measured within this aquitard in 2015 are within the range measured over the past five years and appear to be stable although the high water levels in MW2B-07 are slightly lower than the average high water level over that same time period.



- Although the Eramosa is considered an aquitard, water levels in these wells respond to pumping at TW3-80 (i.e. up to 2 m at the closest monitoring well MW2B-07).
- A review of water levels in the closest monitoring well (MW2B-07) to TW3-80, indicates that the difference between high and low water levels was approximately 2 m with approximately 2 m of fluctuation in the high (estimated non-pumping) water levels in 2015. This is somewhat damped relative to water levels in the Amabel Aquifer at this location (MW2A-07) where high to low water levels vary by 2 m to 3 m and fluctuate over the year by 2 m.

4.2.4 Guelph Aquifer

Hydrographs for wells completed in the Guelph Aquifer are included on Figures D20 through D30 in Appendix D.

A review of the hydrographs of wells completed in the Guelph Aquifer, specifically with continuous data, indicate the following:

- Water levels measured in this aquifer in 2015 are within the range measured over the past five years and appear stable. Water levels in wells closer to TW3-80 such as MW2C-07, MW4B-07, MW7B-08, MW-D and MW-I were slightly lower than water levels observed in 2014, while water levels in the other wells were generally similar to last year but showed a slight decline over the year. The water levels observed in the Guelph aquifer in 2015 are slightly higher than the water levels observed in 2012 when precipitation was also below normal.
- Water levels in the Guelph aquifer around the Site are affected from pumping at TW3-80 (i.e. there is hydraulic connection between the Amabel and Guelph aquifers). The amount of influence varies based on distance away from TW3-80 and existing hydrogeologic conditions. Typically wells further away from TW3-80 show less effect from pumping.
- The increase in pumping in 2015 compared to 2012 does not result in lower water levels in 2015, indicating that the long term water level trend is reflective of recharge (or total precipitation).
- There is a slight rise in water levels measured in the wells within the Guelph Aquifer in April and June that is not due to changes in pumping at TW3-80 but may be due to spring recharge and above normal precipitation, respectively.
- During the November/December shutdown, water levels in MW2C-07 and MW7B-08 rose approximately 1 m. In general, a rise in water levels in off-Site wells completed in the Guelph aquifer were not evident or less than 0.2 m.
- In 2015, the water levels in well MW2C-07 (closest well to TW3-80 in the Guelph Aquifer) had a difference of less than 1 m between high and low water levels with approximately 1 m of fluctuation in the high (estimate non-pumping) water levels over the year. This is somewhat damped relative to water levels in the Amabel Aquifer at this location (MW2A-07) where high to low water levels vary by 2 m to 3 m and fluctuate over the year by 2 m.



- Wells located further away from TW3-80 (upgradient MW6B-08, MW8B-08 and MW10B-09; downgradient MW15B-12, MW16B-12 and MW17B-12 (see Figure 3.1 for locations)) showed only a minor difference between high and low water levels and approximately 0.5 m of fluctuation over the year.
- There appears to be a better hydraulic connection between TW3-80 and MW7B-08 (located approximately 1,050 m north of TW3-80) compared to the connection between TW3-80 and MW4B-07 (located approximately 330 m northwest of TW3-80). This is also consistent with previous analyses.

The potentiometric surface of the Guelph Aquifer is also plotted (Figure 4.4) based water levels measured on July 21, 2015 following three months of the highest pumping. A review of the potentiometric surface on July 21, 2015, indicates groundwater flow toward TW3-80 from the northeast, north and northwest. The greater hydraulic connection with the area toward MW7-08 is evident in the potentiometric surface under pumping conditions.

4.2.5 Overburden

Hydrographs for wells completed in the overburden are included on Figures D31 through D35 in Appendix D. The intermediate and deep overburden wells are installed in the till, in sand and gravel within or below the till, or deep within the surficial sand and gravel aquifer. Shallow overburden wells are typically installed in the upper portion of the surficial sand gravel.

A review of the hydrographs of wells completed in the overburden indicates the following:

- Water levels measured within the overburden in 2015 are within the range measured over the past five years.
- Water levels in the overburden are affected both by natural events (recharge) and pumping at TW3-80, although the response to pumping in the overburden is damped compared to the Amabel Aquifer and appears to be less than 1 m in nearby monitoring wells (i.e. MW2D/E-07 approximately 150 m northwest of TW3-80).
- Water levels in the overburden fluctuated by 0.5 to 1 m in 2015 and generally declined during the year. A rise in water levels during the spring and significant precipitation events (i.e. end of October) was observed.
- Water levels in the overburden in the summer of 2015 are higher than the water levels observed in the summer of 2012 when precipitation was also below normal.

The potentiometric surface of the overburden is plotted (Figure 4.5) based water levels measured on July 21, 2015 following three months of the highest pumping. A review of the potentiometric surface on July 21, 2015, indicates that groundwater flow is generally in a south to southwest direction with potentially some flow towards Aberfoyle Creek.

4.2.6 Vertical Gradients

Vertical gradients between the Amabel Aquifer and the Guelph Aquifer are plotted on Figures D36 through D46 in Appendix D for multi-level monitoring wells completed in both units.



In general, a damped response in the Guelph Aquifer relative to the response in the Amabel Aquifer is evident based on a review of the graphs for the multi-level monitoring well locations. At locations where the downward gradient increases when pumping increases, is due to the fact that water levels in the Amabel Aquifer respond more to pumping than the water levels in the Guelph Aquifer.

A description of the gradients at the site is as follows (note that a positive value corresponds to a downward gradient and a negative value corresponds to an upward gradient):

- MW2A/C-07 downward gradient that increases with increased pumping. In January and December there are brief periods when the gradient is upward and each time the gradient reversals coincide with reduced pumping.
- MW4A/C-07 downward gradient that increases with increased pumping.
- MW6A/B-08 downward gradient that has increased over the past three years that does not directly correlate with changes in pumping.
- MW7A/B-08 downward gradient that increases with increased pumping. The downward gradient is reduced and reversed for a brief period in July and August and is not related to pumping.
- MW8A/B-08 upward gradient that reverses to a downward gradient with increased pumping.
- MW10B/C-09 downward gradient that does not change with increased pumping.
- MW14A/C-11 downward gradient that increases with increased pumping.
- MW15A/B-12 upward gradient that does not change with increased pumping.
- MW16A/B-12 downward gradient that does not change with increased pumping.
- MW17A/B-12 downward gradient that increases slightly with increased pumping. During times of no pumping (i.e. January, March and December) the gradient reverses to upward.
- MW18A/B-12 upward gradient that changes to a downward gradient with increased pumping.

4.3 Surface Water Monitoring Program

The surface water monitoring program includes measurement of mini-piezometer and surface water levels, surface water flow and surface water temperature. The surface water level data measured in 2015 is tabulated in Appendix E along with hydrographs of the water levels and the surface water flow data is tabulated and graphed in Appendix F. The hydrographs also include the daily pumping volumes at TW3-80 and daily precipitation as recorded at a combination of the Kitchener/Waterloo and Waterloo Wellington 2 meteorological stations.

4.3.1 Mini-Piezometer Water Levels

Hydrographs for the mini-piezometer locations are presented on Figures E1 through E9 in Appendix E with "a" figures including data for the last 5 years (2011 to 2015) and "b" figures including data for the current year (2015).

A review of the hydrographs for the mini-piezometers indicates the following:



- Water levels measured in the mini-piezometers in 2015 are within the range measured over the past five years (where five years of data is available). The water levels in September and October are some of the lowest observed to date due to the below normal precipitation recorded in 2015, particularly in July 2015. The water levels observed in the summer of 2015 are generally similar or higher than the water levels observed in the summer of 2012 when precipitation was also below normal.
- The MP11 mini-piezometer nest located at the Nestlé Gilmour Road property is considered to represent background conditions. However, the water level changes at this location are more subtle or muted than at other locations. This may be due to the fact that the nest is constructed in organic material on the bank beside the stream (as opposed to in the stream similar to the other mini-piezometer nests) and the nest is located on a tributary of Aberfoyle Creek (as opposed to the main branch of Aberfoyle Creek). The changes in water levels over 2015 were less than 14 cm. The water levels were relatively stable in 2015 with a slight decrease in April and May and slight increase in September and October. These changes in water level are influenced by natural climatic conditions. The vertical gradient at the MP11 nest is consistently upward in 2015 similar to previous years.
- There are six mini-piezometer nests situated on the Nestlé property (MP16, MP6, MP12, MP14, MP8, MP19) and two located downstream of the confluence of Aberfoyle Creek and Mill Creek (MP17, MP18). The mini-piezometer nests located upgradient of TW3-80 (MP16, MP6, MP12) all showed fluctuations of approximately 0.7 m while the mini-piezometer nests downgradient of TW3-80 showed fluctuations of approximately 0.5 m. The exception to this trend is at MP19, where a fluctuation of approximately 0.7 m was also observed. MP19 is located in a low lying area not in the creek. The larger fluctuation at this location may be due to more focused recharge in the spring. Changes in water levels correspond more with natural events rather than changes in pumping in TW3-80 and as such are mainly due to precipitation, snow melt and evaporation. The increase in fluctuation of water levels at the three wells immediately upgradient of TW3-80 is mainly due to a greater increase in water levels during the spring melt.
- Shallow gradients observed in the mini-piezometers are shown on Figures 10a, b and c. The gradients have been re-assessed based on the new elevation survey data. Beginning upstream and moving downstream, the gradients are as follows:
 - MP11 strong upward gradient with a decrease in April and May.
 - MP16 no gradient and relatively constant.
 - MP6 weak gradient that alternates between upward and downward throughout the year.
 - MP12 weak downward gradient.
 - MP14 weak to moderate upward gradient during the first half of the year (with the exception of a downward gradient at the end of February/beginning of March) and a weak downward gradient during the second half of the year.
 - MP8 weak to strong upward gradient with a reversal to a downward gradient at the end of April/beginning of May.
 - MP19 weak to moderate upward gradient that reverses to a downward gradient from mid-September to the end of the year.

- MP17 weak gradient that alternates between upward and downward throughout the year.
- MP18 weak downward gradient that reverses to an upward gradient at the end of April/beginning of May, and again during the first half of June.
- The changes in vertical gradients do not appear to be related to pumping trends.

The water levels in the mini-piezometers on July 21, 2015 are plotted on Figure 4.6 which is toward the end of the three months of highest pumping. Review of the water levels on July 21, 2015 indicates that there is little to no gradient at most of the mini-piezometers. These gradients are similar to those observed in the past with only minor to no influence with well pumping.

4.3.2 Surface Water Levels

Hydrographs for the surface water level monitoring locations are included on Figures E11 through E17 in Appendix E with "a" figures including data for the last 5 years (2011 to 2015) and "b" figures including data for the current year (2015).

A review of the hydrographs for the surface water level monitoring locations indicates the following:

- In general, surface water levels at the off-site stations (SW3, SW4 and SW5) were higher in the spring and lower in the summer. The water levels are within the range of historical water levels.
- Surface water levels in the creeks are relatively stable over time with no overall increasing or decreasing trend observed.
- Surface water levels at the on-site stations (SW1 and SW2) generally follow a similar trend with higher water levels in the spring followed by lower water levels in the summer and higher water levels again in the fall. The fluctuations in the water levels at SW1 (upgradient) are greater than the fluctuation at SW2 (downgradient) which is similar to water levels measured in the mini-piezometers in the same areas. The changes in water levels at SW1 and SW2 are mainly due to natural events (i.e. precipitation, snow melt and evaporation).
- Water levels at SW9 and SW10 are measured in ponds on the neighbouring property. These ponds may represent water table conditions. In general, the water levels in these ponds have been declining for the past two years. It is our understanding that no discharge from aggregate washing at the sand and gravel operation to the pond has occurred since 2009 at SW9 and there is also no discharge to the pond at SW10 (CRA, 2014). The decline in water levels is likely due to the declining precipitation trend over the past three years including below normal precipitation recorded in 2015.

The water levels at the surface water stations on July 21, 2015 are plotted on Figure 4.6 which is toward the end of the three months of highest pumping. Review of the water levels on July 21, 2015 indicates that surface water features varied in elevation from approximately 317.4 masl at SW3 to 307.2 masl at SW5 with surface water levels across the Site ranging from 311.4 masl (SW1) to 310.4 masl (SW2).

4.3.3 Surface Water Flow

The monthly stream flow data collected in 2015 is summarized in Appendix F. Stream flow has been measured at these locations since December 2001. SW1 is located along Aberfoyle Creek near the upstream part of the property while SW2 is located along Aberfoyle Creek near the downstream part of the property.

In 2015 stream flow measured (during monthly monitoring) at SW1 ranged from 34.4 L/s (September) to 387.0 L/s (April) and at SW2 stream flow ranged from 42.3 L/s (September) to 488.5 L/s (April). The channel at SW1 was frozen in February and the channel at SW2 was frozen in January and February.

Stage-discharge curves were developed for SW1 and SW2 which show the relationship between surface water elevation (stage) and stream flow (discharge). The stage-discharge relationships at surface water stations SW1 and SW2 were updated based on the 2015 survey information and to account for the 2015 measured water levels and flow rates. Continuous surface water flows at SW1 in 2014 and 2015 are based on the stagedischarge curve developed from the data from 2011 to 2015. Continuous surface water flows at SW2 in 2014 are based on the stage-discharge curve developed from the data from 2011 to 2014. A separate stagedischarge curve was developed to represent continuous flows in 2015 at SW2. This was done because a review of the discrete flow measurement results indicates that they have changed subtly (the measured water levels in 2015 were typically lower than previous years, for comparable measured flows). This change in the data suggested that there was a change in hydraulic control at this station and an additional stage-discharge relationship was required. Stage-discharge curves were developed by estimating the level at which zero flow would occur (i.e. v0) at each station. This was estimated using the available low flow measurements collected over the monitoring period. Historical data was included for comparison and to include measured data over a larger range of stream discharge conditions. Power functions were used to develop a best fit curve for the measured data at each station. Data outliers were evaluated with a lower confidence due to suspected winter conditions or measurement error. The updated stage-discharge curves for SW1 and SW2 are presented on Figures F1 and F2, respectively. Surface water flow prior to 2014 was estimated using the previous stagedischarge curves developed by CRA.

Graphs of stream flow measured at SW1 and SW2, along with pumping rates and precipitation, are presented on Figure F3 in Appendix F with the "a" figure including data for the last 5 years (2011 to 2015) and the "b" figure including data for the current year (2015). The stage-discharge relationship was used to estimate stream flow from the continuous water level elevation data. It should be noted that historically there are a few occasions when flow was estimated at SW1 and SW2 for stream elevations outside of the observed stage-discharge curve relationship (typically flows exceeding approximately 1,200 L/s).

Review of the flow data indicates the following:

- From mid-March to the end of 2015, the trends in surface water flow at SW1 and SW2 are similar. Flows during the early part of the year vary between the two stations.
- There was variability in the flows last year at SW1 from mid-April to mid-May 2014. The cause of the variability is not known.
- Stream flow at SW1 and SW2 was within the range observed in the past.
- In 2015, stream flow generally increased following the spring melt and then declined through the summer before rising slightly in October and remaining fairly constant for the remainder of the year.
- With the exception of flow in May, manually measured flows in 2015 were higher downstream (SW2) compared to upstream (SW1) indicating that there does not appear to be a significant impact to flows in Aberfoyle Creek as a result of pumping at TW3-80. The manually measured flow in May was slightly higher at SW1 compared to SW2, but similar. The change in flow is not related to pumping TW3-80 as sustained higher pumping continues at TW3-80 after May when the flows are higher at SW2.





CRA (2014) notes that pumping tests conducted in 2004, 2007, and 2010 have indicated that surface water flow at SW1 and SW2 was not measurably affected by pumping.

4.3.4 Surface Water Temperature

Surface water temperature was monitored at six stations across the Nestlé property.

The average daily water and air temperature data for 2011 to 2015 are shown on Figure G1a and for 2015 on Figure G1b. Review of the data indicates the following:

- The overall trend in stream temperature levels in 2015 is similar to previous years and relatively stable.
- Average daily ambient air temperature ranged from -21.8°C to 24.0°C in 2015.
- Average daily surface water temperature ranged from 0°C to 28.1°C at the upstream end of the property and from -0.1°C to 26.3°C at the downstream end of the property.
- Surface water temperatures generally decrease, across the site, moving downstream.
- Ambient air temperature significantly influences stream temperature as seen by the strong correlation between the two although the changes in air temperature are more significant than the changes in surface water temperature. The correlation is not evident during the winter months when air temperature typically drops below 0°C and surface water temperature remains relatively constant around 0°C.

The surface water temperature monitoring results were provided to C. Portt and Associates, and the results were incorporated in their report, which is also included in Appendix G.

The C. Portt and Associates report concluded that:

The water temperature suitabilities for the fish species found in the Aberfoyle Branch of Mill Creek in 2015 are consistent with previous years. Water temperatures during the June 1 – August 31 period were generally too warm for coldwater species such as brook trout and brown trout and too cold for warmwater species such as smallmouth bass. The water temperatures during this period were most favourable for species such as common shiner that have intermediate thermal requirements. The data continue to demonstrate the important influence of air temperature on water temperature.

4.4 Biological Monitoring Program

The 2015 Biological Monitoring Report (Beacon Environmental and C. Portt and Associates) makes the following conclusions:

In summary, the results of the biological monitoring at the Aberfoyle property to date indicate that there have not been any significant changes to the terrestrial and aquatic monitoring parameters that could be attributable to changes in environmental factors such as site hydrology or hydrogeology. The data suggest that observed changes in species richness, abundance and distribution are generally within those expected due to natural variation. The subject property continues to support high quality habitat for a diversity of wildlife.

The report also includes recommendations for continued biological monitoring in 2016. Details are included in the report which can be found in Appendix H.



5.0 CONCLUSIONS

The following conclusions are provided based on the results of the 2015 monitoring program:

- TW3-80 and TW2-11 operated in accordance with the limits outlined in the PTTW. The total volume of water taken in 2015 from TW3-80 was 762,363,664 L (201,395,269 US gal) or 58% of the permitted volume. The daily water taking at TW3-80 ranged from 0 L/day to 3,105,437 L/day (820,370 USgpd). No water was taken from TW2-11 in 2015.
- 2) The water levels in TW3-80, which obtains water from the Amabel Aquifer, ranged from approximately 299 to 311 masl and the estimated drawdown at the well ranged from approximately 10 to 14 m in 2015. The slightly lower water levels are attributed to the minor increase in pumping relative to 2014 and the below normal precipitation in 2015.
- 3) The trend of water level variation within the Amabel (production aquifer) is stable and the groundwater taking from TW3-80 has not caused a long-term declining trend in the aquifer water level.
- 4) The Amabel Aquifer is hydraulically connected to the overlying Guelph Aquifer and overburden aquifer; however the Eramosa Aquitard limits the effect of pumping on overlying units. Unacceptable impacts to the Guelph Aquifer and overburden aquifer have not been identified.
- 5) Surface water levels fluctuate in response to precipitation and snow melt.
- 6) Water taking from TW3-80 at the current rate is sustainable.

6.0 **RECOMMENDATIONS**

The following recommendations are provided based on the results of the 2015 monitoring program:

- 1) The mini-piezometer nest MP11, which is used as background monitoring, should be replaced with a new station that is located along the main branch of Aberfoyle Creek and situated within the creek. The MOECC agrees with a potential replacement location near SW3.
- 2) The monitoring program has been on-going for a number of years and no impacts to private wells or the surrounding aquifer have been noted. In addition, the monitoring data from these wells is often influenced by pumping at the private well. Based on this, we suggest that monitoring of the private wells be replaced with dedicated monitoring wells. Nestlé is in the process of obtaining agreements to install monitoring wells on various properties. The following changes to the monitoring program should be discussed with the MOECC:
 - a. Discontinue monitoring at M1 and W2 which are completed in the Amabel Aquifer. Although monitoring at wells MW4A-07 and PW5 (completed in the same aquifer) provide sufficient coverage of this area, in 2015 the MOECC requested that another monitoring well be constructed in the general vicinity of these wells.





- b. Discontinue monitoring at 8 Maple Leaf Lane, Private Well "I" (50 Brock Road), 58 Brock Road and MOE WWR #67-08740. These wells are completed in both the Guelph Aquifer and the Amabel Aquifer. We recommend that a multi-level monitoring well completed in both aquifers be installed in the general vicinity of these wells. Land access will need to be negotiated with local land owners.
- c. Discontinue monitoring at MOE WWR #67-07589, Private Well "B" and 2 Brock Road. These wells are also completed in both aquifers. Monitoring well PCC-D is completed in the Guelph Aquifer and provides sufficient coverage for this area. We recommend that a monitoring well be completed in the Amabel Aquifer at the PCC site.
- 3) Nestlé has indicated that they will no longer require a water taking from TW2-11. In addition, the Fireflow well is no longer used and Nestlé would like to decommission it. A review of the monitoring network and data indicates that TW2-11 provides similar water level response to the Fireflow well and is close enough that it could replace the Fireflow well for monitoring purposes. Upon approval by the MOECC, the Fireflow well should be decommissioned and removed from the PTTW (provided TW2-11 is removed from the PTTW as a source well).
- 4) The remaining groundwater and surface water monitoring program should continue as is.
- 5) The PTTW should be updated with the following changes when the PTTW is renewed:
 - a. MW1A-04 should be removed from continuous monitoring of groundwater levels at bedrock wells as it has been decommissioned and replaced with MW10B-09, which is in the permit.
 - b. Private well "J" should be removed from monthly monitoring of groundwater levels in bedrock and replaced with Private well "I".
 - c. MP17S/D-12 and MP18S/D-12 should be renamed MP17S/D-11 and MP18S/D-11.
 - d. MW-I should be removed from the list of continuous monitoring overburden wells to the list of continuous monitoring bedrock wells.





Report Signature Page

GOLDER ASSOCIATES LTD.

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Kevin MacKenzie, M.Sc., P.Eng. Senior Hydrologist, Associate

John had

John Piersol, M.Sc., P.Geo. Senior Hydrogeologist, Associate

GRP/KM/JAP/II

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FIGURES





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REFERENCE(S) CROSS-SECTION OBTAINED FROM CRA 2013 ANNUAL MONITORING REPORT, MARCH 2014. Golder

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+ Production Well

• Monitoring Well (Overburden)

- Watercourse
- Property Boundary



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PROJECT 2015 ANNUAL REPORT

TITLE 2015 OVERBURDEN MONITORING LOCATIONS

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• Production Well

Well Status as of December 2015

- Decommissioned
 - Watercourse
- Property Boundary



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CLIENT NESTLE WATERS CANADA

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UNUSED OR DECOMMISSIONED WELLS

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APPENDIX A

Permit To Take Water Number 1381-95ATPY



Ministry of the Environment

West-Central Region Technical Support Section 12th Floor 119 King St W Hamilton ON L8P 4Y7 Fax: (905)521-7820 Tel: (905) 521-7640

December 19, 2013

Nestle Canada Inc. 101 Brock Road S. Puslinch, Ontario N1H 6H9

Dear Sir/Madam:

Ministère de l'Environnement

Direction régionale du Centre-Ouest Secteur du Soutien Technique 12e étage 119 rue King W Hamilton ON L8P 4Y7 Télécopieur: (905)521-7820 Tél:(905) 521-7640



RE: Lot 23, Concession 7 Geographic Township of Puslinch City of Guelph Wellington County Permit Number 1381-95ATPY

Please find attached a Permit to Take Water which authorizes the withdrawal of water in accordance with the application for this Permit to Take Water, dated December 3, 2012 and signed by Don DeMarco.

This Permit expires on July 31, 2016. Authorized rates and amounts are indicated on Table A. This Permit cancels and replaces Permit Number 1763-8FXR29, issued on April 29, 2011.

Ontario Regulation 387/04 (Water Taking) requires all water takers to report daily water taking amounts to the Water Taking Reporting System (WTRS) electronic database: <u>http://www.ene.gov.on.ca/envision/water/pttw.htm</u>. Daily water taking must be reported on a calendar year basis. If no water is taken, then a "no taking" report must be entered. Please consult the Regulation and Section 4 of this Permit for monitoring requirements.

If you have questions about reporting requirements, please call the WTRS Help Desk at 416-235-6322 (toll free: 1-877-344-2011) or by email, <u>WTRSHelpdesk@ontario.ca</u>. It is preferred that you submit your data directly and electronically to the WTRS. Where this is impracticable, please use the Water Taking Submission Form (*included as Appendix C of the Technical Bulletin: Permit To Take Water (PTTW)-Monitoring and Reporting of Water Takings)*, which can be downloaded from the above website, and fax your completed forms to 416-235-6549 or mail them to: Water User Reporting Section, 125 Resources Rd. Toronto, ON M9P 3V6.

Please also note Condition 1.4 specifically indicates that <u>this Permit is not transferable</u> to another party. Any queries regarding a change in owner/operator should be made to the Permit to Take Water Evaluator at the above address.

Take notice that in issuing this Permit, terms and conditions pertaining to the taking of water and to the results of the taking have been imposed. The terms and conditions have been designed to allow for the development of water resources, while providing reasonable protection to existing water uses and users.

Yours truly,

Carl Slater

Carl Slater Director, Section 34, Ontario Water Resources Act West Central Region

File Storage Number: AP28 PUNE



AMENDED PERMIT TO TAKE WATER Ground Water NUMBER 1381-95ATPY

Pursuant to Section 34 of the <u>Ontario Water Resources Act</u>, R.S.O. 1990 this Permit To Take Water is hereby issued to:

Nestle Canada Inc. 101 Brock Road S. Puslinch, Ontario N1H 6H9

For the water taking from:	Two bedrock wells (TW3-80 and TW2-11)
Located at:	Lot 23, Concession 7, Geographic Township of Puslinch Guelph, County of Wellington

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

- (a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34, OWRA.
- (b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.
- (c) "Ministry" means Ontario Ministry of the Environment.
- (d) "District Office" means the Guelph District Office.
- (e) "Permit" means this Permit to Take Water No. 1381-95ATPY including its Schedules, if any, issued in accordance with Section 34 of the OWRA.
- (f) "Permit Holder" means Nestle Canada Inc..
- (g) "OWRA" means the Ontario Water Resources Act, R.S.O. 1990, c. O. 40, as amended.

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

TERMS AND CONDITIONS

1. Compliance with Permit

- 1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated December 3, 2012 and signed by Don DeMarco, and all Schedules included in this Permit.
- 1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.
- 1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.
- 1.4 This Permit is not transferable to another person.
- 1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.
- 1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.
- 1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections

The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act*, R.S.O. 1990, the *Pesticides Act*, R.S.O. 1990, or the *Safe Drinking Water Act*, S. O. 2002.

2.2 Other Approvals

The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act*, and the *Environmental Protection Act*, and any regulations made thereunder; or

(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any

further information related to this Permit.

2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

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

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

2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability

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

2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. Water Takings Authorized by This Permit

3.1 Expiry

This Permit expires on **July 31, 2016**. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

<u>Table A</u>

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	Well TW3-80	Well Drilled	Bottled Water	Commercial	2,500	24	3,600,000	365	17 569053 4812797
2	Well TW2-11	Well Drilled	Other - Miscellaneous	Miscellaneous	475	24	684,000	365	17 568638 4812238
						Total Taking:	3,600,000		

- 3.3 For greater certainty, Source Name Well TW2-11 in Table A shall not be used for bottled water and shall be used for miscellaneous purposes such as providing water to the on site pond for fire fighting purposes.
- 3.4 For greater certainty, the total amount of water taken for the combination of sources in Table A shall not exceed 3,600,000 litres per day.

4. Monitoring

- 4.1 Under section 9 of O. Reg. 387/04, and as authorized by subsection 34(6) of the *Ontario Water Resources Act*, the Permit Holder shall, on each day water is taken under the authorization of this Permit, record the date, the volume of water taken on that date and the rate at which it was taken. The daily volume of water taken shall be measured by a flow meter or calculated in accordance with the method described in the application for this Permit, or as otherwise accepted by the Director. A separate record shall be maintained for each source. The Permit Holder shall keep all records required by this condition current and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request. The Permit Holder, unless otherwise required by the Director, shall submit, on or before March 31st in every year, the records required by this condition to the ministry's Water Taking Reporting System.
- 4.2 The Permit Holder shall establish the following groundwater monitoring program for the duration of the Permit:

Bedrock Wells

(i) Continuous monitoring of groundwater levels in the following wells:

- TW3-80 (67-07290)
- MW2A/B/C-07
- MW4A/B-07
- Fireflow (67-14195)
- MW-D (67-11936)
- MW1A-04
- PCC-D (67-11650)
- MW10B/C/D-09
- MW6A/B-08

- MW7A/B-08
- MW8A/B-08
- TW2-11
- MW14A/B/C-11
- MW15A/B-12
- MW16A/B-12
- MW17A/B-12
- MW18A/B-12

(ii) Monthly monitoring of groundwater levels at the following private wells (if the owner permits):

- Private well MOE WWR #67-08740
- Private well at 2 Brock Road
- Private well MOE WWR #67-07589
- Private well MOE WWR #67-08317 also known as 8 Maple Lane Well
- Private well at 58 Brock Road
- Private well "B"
- Private well "M1"
- Private well "Y" MOE WWR #67-09669
- Private well "J"
- Meadows of Aberfoyle well #PW5 (67-1197)
- Private Well "W2" (67-13335)

Overburden Wells

(iii) Continuous monitoring of groundwater levels in the following wells:

- TW1-93 (67-11283)
- TW1-99 (67-12929)
- MW-S/I
- PCC S/I
- MW2D/E-07
- MW4C-07
- MW10A-09
- 4.3 The Permit Holder shall establish the following surface water monitoring program for the duration of the Permit:

Surface Water Levels

(i) Continuous monitoring of water levels at the following locations:

- SW1
- SW2

(ii) Monthly monitoring of water levels at the following locations:

- SW3
- SW4
- SW5
- SW9
- SW10

Stream Flow

(iii) Monthly monitoring of flow, encompassing a range of flow conditions, and the development of a stage-discharge curve at the following surface water locations:

- SW1
- SW2

Multi-level Piezometers

(iv) Continuous monitoring of multi-level piezometers at the following locations:

- MP16S/D-08
- MP6S-08/D -04
- MP12S/D-04
- MP14S/D-07
- MP8S/D-04
- MP11S-08/D-04
- MP17S/D-12
- MP18S/D-12
- MP19S/D-12

Temperature

(v) Continuous monitoring of temperature at the sediment-water interface at the following locations:

- ST6-08
- ST1-05/AT-01
- ST2-05
- ST3-05
- ST4-05
- ST5-05
- 4.4 The Permit Holder shall undertake wetland monitoring and redd surveys as recommended in "2010 Biological Monitoring Program Final Report" by C. Portt and Associates dated January 28, 2011. Results from the wetland and redd surveys shall be submitted to the Director as a part of the annual monitoring report required under Condition 4.8.
- 4.5 The Permit Holder shall determine the total amount of water taken for each calendar month. If the monthly amount exceeds 83,700,000 L, the Permit Holder shall submit multi-level piezometer data in a letter report to the Director within 30 days of the end of the calendar month for the following monitoring locations:
 - MP6S-08/D-04
 - MP12S/D-04
 - MP11S-08/D-04
 - MW2-D/E
- 4.6 Continuous monitoring shall be datalogged at 60 minute intervals and downloaded monthly, however, the daily minimum water levels can be used to evaluate the water level variation with respect to pumping to improve the data handling and presentation. Monthly groundwater monitoring shall be conducted in the same week each calendar month.
- 4.7 The Permit Holder shall identify to the Director in writing, within 15 days of any monthly

monitoring event, any monitoring locations identified in Conditions 4.2 and 4.3 which become inaccessible and/or abandoned along with a recommendation for replacement monitoring locations. Upon approval of the Director the monitoring program shall be appropriately modified.

- 4.8 The Permit Holder shall submit to the Director, an annual monitoring report which present and interprets the monitoring data to be collected under the Terms and Conditions of this Permit. This report shall be prepared, signed and stamped by a licensed professional geoscientist or a licensed professional engineer specializing in hydrogeology who shall take responsibility for its accuracy. Surface water impact assessment shall be conducted by a qualified surface water scientist who shall co-sign the report as responsibility for the accuracy of the surface water portion. The report shall be submitted to the Director by March 31 of each calendar year and include monitoring data for the 12 month period ending December 31 of the previous year.
- 4.9 The Permit Holder shall submit to the Director as part of the annual monitoring report, details of the bottling operations involved with water taking under this Permit to Take Water to indicate compliance with OWRA Section 34.3. These details shall include:
 - Location and name of the facilities to which water is delivered in bulk containers greater than 20 L from this source,
 - If the bulk water is containerized at the receiving location,
 - The size of container(s) into which the water is transferred at the receiving location, and
 - Total volume of the water transported in bulk in each calendar year to each remote facility.

5. Impacts of the Water Taking

5.1 Notification

The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 For Groundwater Takings

If the taking of water is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected, a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of so.

If permanent interference is caused by the water taking, the Permit Holder shall restore the water supplies of those permanently affected.

6. Director May Amend Permit

The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act*, Section 100 (4).

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

- 1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.
- 2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.
- 3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the <u>Ontario Water Resources Act</u>, R.S.O. 1990, you may by written notice served upon me, the Environmental Review Tribunal and the Environmental Commissioner, **Environmental Bill of Rights**, R.S.O. 1993, Chapter 28, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the <u>Ontario Water Resources Act</u>, as amended provides that the Notice requiring a hearing shall state:

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

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

- 3. The name of the appellant;
- 4. The address of the appellant;
- 5. The Permit to Take Water number;
- 6. The date of the Permit to Take Water;
- 7. The name of the Director;
- 8. The municipality within which the works are located;

This notice must be served upon:

The Secretary Environmental Review Tribunal 655 Bay Street, 15th Floor Toronto ON M5G 1E5 Fax: (416) 314-4506 Email:	<u>AND</u>	The Environmental Commissioner 1075 Bay Street 6th Floor, Suite 605 Toronto, Ontario M5S 2W5	<u>AND</u>	The Director, Section 34 Ministry of the Environment 12th Floor 119 King St W Hamilton ON L8P 4Y7 Fax: (905)521-7820
ERTTribunalsecretary@ontario.ca				

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by telephone at (416) 314-4600

by fax at (416) 314-4506

by e-mail at <u>www.ert.gov.on.ca</u>

This instrument is subject to Section 38 of the **Environmental Bill of Rights** that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek to appeal for 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.

This Permit cancels and replaces Permit Number 1763-8FXR29, issued on 2011/04/29.

Dated at Hamilton this 19th day of December, 2013.

Carl Slater

Carl Slater Director, Section 34 Ontario Water Resources Act, R.S.O. 1990

Schedule A

This Schedule "A" forms part of Permit To Take Water 1381-95ATPY, dated December 19, 2013.

Ministry of the Environment and Climate Change West Central Region

119 King Street West 12th Floor Hamilton, Ontario L8P 4Y7 Tel.: 905 521-7640 Fax: 905 521-7820

February 5, 2015

Nestle Canada Inc. 101 Brock Road S. Puslinch, Ontario N1H 6H9 Ministère de l'Environnement et de l'Action en matière de changement climatique Direction régionale du Centre-Ouest



119 rue King Ouest 12e étage Hamilton (Ontario) L8P 4Y7 Tél.: 905 521-7640 Téléc.: 905 521-7820

Attention: Ms. Andreanne Simard

Dear Ms. Simard:

RE: Request for short term pumping rate change for well sanitization Permit to Take Water 1381-95ATPY

NOTICE

Pursuant to s. 100, Ontario Water Resources Act, R.S.O. 1990, c. O.40 as amended, I am issuing notice that, as Director of Section 34 of the Ontario Water Resources Act, I am exercising my discretion to amend Permit to Take Water 1381-95ATPY condition 3.5. All other terms and conditions of Permit to Take Water 1381-95ATPY shall continue in force.

In an email dated November 27, 2014, Ms. Simard, requested the sanitation Notice issued on December 20, 2013 be applicable for all years remaining on the permit.

This Notice supersedes the Notice issued December 20, 2013. Condition 3.5 is hereby revoked and replaced as follows:

3.5 Notwithstanding Table A, the maximum pumping of water extracted from Source TW3-80 may be increased to 2575 litres per minute (680 U.S. gallons per minute) annually, or as needed, for the sole purpose of sanitization of the well. The maximum amount of water taken shall not exceed 3,600,000 litres/day.

This Notice now forms part of the current permit and must be attached to the original Permit to Take Water, if available. If the original is no longer available, this letter must be kept attached to a certified copy of the Permit to Take Water.

Any change in circumstances related to this permit should be reported promptly to a Director.

It is your responsibility to ensure that any person taking water under the authority of this permit is familiar with and complies with the terms and conditions.

In accordance with Section 100 of the <u>Ontario Water Resources Act</u>, R.S.O. 1990, you may by written notice served upon me, the Environmental Review Tribunal and the Environmental Commissioner, **Environmental Bill of Rights**, R.S.O. 1993, Chapter 28, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the <u>Ontario Water Resources Act</u>, as amended provides that the Notice requiring a hearing shall state:

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

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

- 3. The name of the appellant;
- 4. The address of the appellant;
- 5. The Permit to Take Water number;
- 6. The date of the Permit to Take Water;
- 7. The name of the Director;
- 8. The municipality within which the works are located;

This notice must be served upon:

The Secretary Environmental Review Tribunal 2300 Yonge Street, Suite 1700 Toronto, Ontario M4P 1E4	AND	The Director, Section 34 Ministry of the Environment 12th Floor 119 King St W Hamilton ON L8P 4Y7 Fax: (905)521-7820
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Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by telephone at (416) 314-4600

by fax at (416) 314-4506

by e-mail at www.ert.gov.on.ca

Yours truly.

Director, Section 34, Ontario Water Resources Act West Central Region

File Storage Number: AP28 PUNE



APPENDIX B

TW3-80 Borehole Log



Attachment 2

Proje Job N Clier Boren	ict Na ic it: icle T ion:	me: <u>ABERFOYLE FISHERIES</u> 979-653 CUSTOM AGGREGATE Yge: <u>12" Ø Cable Tool</u> Pit No. 1. Aberfoyle		Borehole No. Date Completed Geologist/Engine Elevation 1040.	TW3-80 April 14/80 aer A.V.N. 90, top of casing
-		. Profile	Sample		·
Depth (Elev.)	Stratigraphy	Description & Remarks	Number Type Blows/Foot	Penetration Test Blows/Foot 20 40 60 80	Piezometer or Standpipe Installation
0		(316.7 m amsl)			
(1039)		Brown clayey-silt till containing some sand and small gravel			¥ ∶ 12" Ø steel
40		(303.0 m and)			rock
45	<u> </u>	fine sand matrix w/sand and gravel (302.1 m ama	1)	grouted to
		Eramosa member of the Guelph formation * Black dolomite slightly crystalline solid (292.3 m amsl)			12" Ø Drive shoe seated into rock
(959) - -		Saw Wiarton formation of the Amabel Group light - medium grey dolomite slightly crystalline fractured water bearing zone			12" Ø Open hole in rock
-		(274] m amel)	· · · · · · · · · · · · · · · · · · ·		
<u>139</u> (900)		N.B. Static level, ll.42 ft. below top of casing on April 15/80 ELEV. = 1029.48	:		

* Based on driller's log, Guelph Fm. interpreted to occur from El. 302.1 to 299.9 m ams1. 20 Eramosa from 299.9 to 292.3 m amsl.

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		Average Flow		Average Flow
Date	Volume	Rate Over Time	Volume	Rate Over Time
		Taken		Taken
	(US gpd)	(US gpm)	(L/day)	(L/min)
1-Jan-15	92,333	64	349,518	243
2-Jan-15	422,878	294	1,600,767	1,112
3-Jan-15	495,162	344	1,874,392	1,302
4-Jan-15	458,274	318	1,734,755	1,205
5-Jan-15	450,935	313	1,706,972	1,185
6-Jan-15	525,268	365	1,988,353	1,381
7-Jan-15	495,155	344	1,874,364	1,302
8-Jan-15	490,088	340	1,855,184	1,288
9-Jan-15	488,182	339	1,847,970	1,283
10-Jan-15	484,179	355	1,832,815	1,345
11-Jan-15	459,458	319	1,739,236	1,209
12-Jan-15	409,128	287	1,548,718	1,086
13-Jan-15	341,480	236	1,292,641	894
14-Jan-15	452,286	318	1,712,088	1,202
15-Jan-15	489,672	339	1,853,610	1,285
16-Jan-15	501,753	348	1,899,339	1,318
17-Jan-15	337,746	233	1,278,508	880
18-Jan-15	447,709	313	1,694,761	1,183
19-Jan-15	453,943	314	1,718,358	1,187
20-Jan-15	418,478	293	1,584,111	1,110
21-Jan-15	443,398	309	1,678,445	1,171
22-Jan-15	496,977	347	1,881,263	1,313
23-Jan-15	459,090	318	1,737,845	1,203
24-Jan-15	423,173	296	1,601,882	1,119
25-Jan-15	459,280	321	1,738,563	1,215
26-Jan-15	441,199	304	1,670,119	1,153
27-Jan-15	434,349	303	1,644,190	1,147
28-Jan-15	505,590	353	1,913,867	1,334
29-Jan-15	528,335	365	1,999,965	1,380
30-Jan-15	513,094	356	1,942,270	1,349
31-Jan-15	535,262	372	2,026,187	1,407

		Average Flow		Average Flow
Date	Volume	Rate Over Time	Volume	Rate Over Time
		Taken		Taken
	(US gpd)	(US gpm)	(L/day)	(L/min)
1-Feb-15	488,276	341	1,848,324	1,289
2-Feb-15	469,240	323	1,776,266	1,224
3-Feb-15	517,088	362	1,957,391	1,371
4-Feb-15	533,107	370	2,018,030	1,400
5-Feb-15	521,730	360	1,974,962	1,362
6-Feb-15	603,240	418	2,283,510	1,583
7-Feb-15	607,630	422	2,300,128	1,599
8-Feb-15	597,310	416	2,261,064	1,575
9-Feb-15	532,616	368	2,016,170	1,394
10-Feb-15	585,245	406	2,215,393	1,538
11-Feb-15	592,189	415	2,241,680	1,573
12-Feb-15	593,051	411	2,244,940	1,556
13-Feb-15	545,788	383	2,066,031	1,449
14-Feb-15	548,071	381	2,074,673	1,443
15-Feb-15	539,625	376	2,042,701	1,424
16-Feb-15	421,597	292	1,595,917	1,107
17-Feb-15	553,165	391	2,093,958	1,482
18-Feb-15	604,718	422	2,289,105	1,599
19-Feb-15	641,536	442	2,428,477	1,675
20-Feb-15	468,720	329	1,774,299	1,246
21-Feb-15	522,509	361	1,977,909	1,366
22-Feb-15	562,730	393	2,130,165	1,487
23-Feb-15	628,986	436	2,380,971	1,651
24-Feb-15	491,581	346	1,860,836	1,309
25-Feb-15	402,010	278	1,521,771	1,051
26-Feb-15	575,598	404	2,178,876	1,528
27-Feb-15	558,438	391	2,113,917	1,480
28-Feb-15	609,227	422	2,306,175	1,599

		Average Flow		Average Flow
Date	Volume	Rate Over Time	Volume	Rate Over Time
		Taken		Taken
	(US gpd)	(US gpm)	(L/day)	(L/min)
1-Mar-15	603,603	422	2,284,886	1,598
2-Mar-15	516,067	358	1,953,526	1,354
3-Mar-15	612,661	429	2,319,174	1,626
4-Mar-15	707,660	489	2,678,783	1,850
5-Mar-15	728,397	506	2,757,283	1,917
6-Mar-15	650,078	454	2,460,812	1,717
7-Mar-15	652,519	471	2,470,053	1,781
8-Mar-15	694,756	499	2,629,936	1,889
9-Mar-15	654,085	453	2,475,981	1,715
10-Mar-15	596,910	415	2,259,549	1,572
11-Mar-15	454,405	341	1,720,111	1,292
12-Mar-15	630,324	436	2,386,034	1,649
13-Mar-15	625,064	431	2,366,122	1,632
14-Mar-15	640,942	311	2,426,228	1,176
15-Mar-15	412,045	1	1,559,760	4
16-Mar-15	495,515	344	1,875,726	1,301
17-Mar-15	538,310	361	2,037,724	1,368
18-Mar-15	542,520	381	2,053,661	1,441
19-Mar-15	582,010	407	2,203,146	1,542
20-Mar-15	639,480	450	2,420,694	1,704
21-Mar-15	711,480	495	2,693,244	1,876
22-Mar-15	776,790	544	2,940,469	2,061
23-Mar-15	565,170	396	2,139,400	1,499
24-Mar-15	512,340	362	1,939,417	1,370
25-Mar-15	534,030	376	2,021,523	1,424
26-Mar-15	598,540	423	2,265,719	1,601
27-Mar-15	618,490	430	2,341,238	1,627
28-Mar-15	641,450	450	2,428,151	1,704
29-Mar-15	642,240	454	2,431,142	1,718
30-Mar-15	585,910	409	2,217,910	1,549
31-Mar-15	532,140	376	2,014,368	1,425

		Average Flow		Average Flow
Date	Volume	Rate Over Time	Volume	Rate Over Time
		Taken		Taken
	(US gpd)	(US gpm)	(L/day)	(L/min)
1-Apr-15	676,660	481	2,561,436	1,822
2-Apr-15	717,160	505	2,714,745	1,911
3-Apr-15	789,200	553	2,987,446	2,093
4-Apr-15	635,450	446	2,405,439	1,687
5-Apr-15	652,960	459	2,471,721	1,739
6-Apr-15	689,940	483	2,611,706	1,830
7-Apr-15	583,000	408	2,206,894	1,543
8-Apr-15	641,280	449	2,427,508	1,701
9-Apr-15	661,170	463	2,502,800	1,754
10-Apr-15	713,510	499	2,700,928	1,889
11-Apr-15	569,930	402	2,157,419	1,521
12-Apr-15	634,340	444	2,401,237	1,682
13-Apr-15	756,390	531	2,863,246	2,009
14-Apr-15	637,350	447	2,412,631	1,693
15-Apr-15	592,850	415	2,244,180	1,572
16-Apr-15	638,530	447	2,417,098	1,693
17-Apr-15	588,540	412	2,227,865	1,558
18-Apr-15	582,530	411	2,205,115	1,557
19-Apr-15	529,020	371	2,002,558	1,404
20-Apr-15	633,190	446	2,396,884	1,688
21-Apr-15	539,950	380	2,043,932	1,440
22-Apr-15	565,920	398	2,142,239	1,505
23-Apr-15	636,900	447	2,410,928	1,691
24-Apr-15	545,360	381	2,064,411	1,442
25-Apr-15	733,800	516	2,777,734	1,952
26-Apr-15	778,700	546	2,947,699	2,065
27-Apr-15	665,420	467	2,518,888	1,768
28-Apr-15	594,730	416	2,251,297	1,575
29-Apr-15	482,130	337	1,825,060	1,276
30-Apr-15	593,080	419	2,245,051	1,585

		Average Flow		Average Flow
Date	Volume	Rate Over Time	Volume	Rate Over Time
		Taken		Taken
	(US gpd)	(US gpm)	(L/day)	(L/min)
1-May-15	635,880	445	2,407,067	1,686
2-May-15	680,980	478	2,577,789	1,811
3-May-15	667,100	467	2,525,247	1,769
4-May-15	545,050	382	2,063,238	1,447
5-May-15	621,650	436	2,353,200	1,649
6-May-15	593,960	417	2,248,382	1,577
7-May-15	675,000	473	2,555,152	1,791
8-May-15	714,850	502	2,706,000	1,899
9-May-15	704,340	494	2,666,216	1,869
10-May-15	718,820	504	2,721,028	1,908
11-May-15	595,720	416	2,255,044	1,574
12-May-15	552,320	388	2,090,758	1,468
13-May-15	583,920	413	2,210,377	1,565
14-May-15	626,700	441	2,372,316	1,668
15-May-15	653,230	458	2,472,743	1,733
16-May-15	745,270	522	2,821,153	1,977
17-May-15	733,460	514	2,776,447	1,946
18-May-15	655,630	460	2,481,828	1,740
19-May-15	699,610	490	2,648,311	1,856
20-May-15	621,150	436	2,351,307	1,650
21-May-15	640,870	450	2,425,956	1,702
22-May-15	591,990	412	2,240,925	1,561
23-May-15	631,650	445	2,391,054	1,685
24-May-15	689,870	484	2,611,441	1,831
25-May-15	569,020	399	2,153,974	1,510
26-May-15	656,480	459	2,485,046	1,736
27-May-15	622,640	438	2,356,948	1,658
28-May-15	671,670	471	2,542,546	1,783
29-May-15	628,570	440	2,379,395	1,667
30-May-15	669,570	469	2,534,597	1,777
31-May-15	730,350	512	2,764,674	1,939

		Average Flow		Average Flow	
Date	Volume	Rate Over Time	Volume	Rate Over Time	
		Taken		Taken	
	(US gpd)	(US gpm)	(L/day)	(L/min)	
1-Jun-15	736,240	516	2,786,970	1,953	
2-Jun-15	696,920	487	2,638,128	1,845	
3-Jun-15	746,960	525	2,827,550	1,989	
4-Jun-15	693,070	486	2,623,554	1,841	
5-Jun-15	652,890	458	2,471,456	1,734	
6-Jun-15	715,300	500	2,707,704	1,893	
7-Jun-15	693,750	486	2,626,128	1,840	
8-Jun-15	708,280	496	2,681,130	1,879	
9-Jun-15	678,020	477	2,566,584	1,806	
10-Jun-15	675,410	472	2,556,704	1,787	
11-Jun-15	662,630	465	2,508,326	1,762	
12-Jun-15	579,630	407	2,194,137	1,539	
13-Jun-15	624,740	437	2,364,897	1,655	
14-Jun-15	623,340	439	2,359,597	1,660	
15-Jun-15	613,120	430	2,320,911	1,627	
16-Jun-15	593,930	412	2,248,269	1,560	
17-Jun-15	660,050	464	2,498,560	1,758	
18-Jun-15	677,860	475	2,565,978	1,798	
19-Jun-15	644,030	450	2,437,918	1,705	
20-Jun-15	739,830	519	2,800,560	1,964	
21-Jun-15	732,510	514	2,772,851	1,945	
22-Jun-15	702,510	493	2,659,288	1,865	
23-Jun-15	678,030	475	2,566,622	1,800	
24-Jun-15	729,400	511	2,761,078	1,935	
25-Jun-15	717,800	503	2,717,167	1,904	
26-Jun-15	715,950	502	2,710,164	1,901	
27-Jun-15	820,370	575	3,105,437	2,176	
28-Jun-15	808,540	567	3,060,655	2,145	
29-Jun-15	699,770	490	2,648,916	1,856	
30-Jun-15	660,080	463	2,498,673	1,752	

	Average Flow		Average Flow		
Date	Volume	Rate Over Time	Volume	Rate Over Time	
		Taken		Taken	
	(US gpd)	(US gpm)	(L/day)	(L/min)	
1-Jul-15	652,910	457	2,471,532	1,731	
2-Jul-15	679,530	477	2,572,300	1,806	
3-Jul-15	545,820	385	2,066,152	1,457	
4-Jul-15	698,020	490	2,642,292	1,853	
5-Jul-15	741,630	520	2,807,374	1,968	
6-Jul-15	681,850	476	2,581,082	1,803	
7-Jul-15	675,550	473	2,557,234	1,792	
8-Jul-15	694,140	486	2,627,604	1,838	
9-Jul-15	703,670	493	2,663,679	1,866	
10-Jul-15	692,860	485	2,622,759	1,836	
11-Jul-15	737,330	516	2,791,096	1,955	
12-Jul-15	733,160	514	2,775,311	1,946	
13-Jul-15	683,120	478	2,585,889	1,810	
14-Jul-15	576,580	406	2,182,592	1,538	
15-Jul-15	584,590	410	2,212,913	1,553	
16-Jul-15	642,450	447	2,431,937	1,692	
17-Jul-15	600,890	424	2,274,615	1,606	
18-Jul-15	617,930	432	2,339,118	1,636	
19-Jul-15	599,310	421	2,268,634	1,593	
20-Jul-15	585,600	411	2,216,736	1,554	
21-Jul-15	714,010	501	2,702,821	1,897	
22-Jul-15	734,080	515	2,778,794	1,949	
23-Jul-15	666,690	467	2,523,695	1,770	
24-Jul-15	597,250	419	2,260,836	1,586	
25-Jul-15	667,620	468	2,527,215	1,771	
26-Jul-15	619,850	434	2,346,386	1,645	
27-Jul-15	674,280	473	2,552,426	1,790	
28-Jul-15	635,370	446	2,405,136	1,690	
29-Jul-15	613,830	429	2,323,598	1,625	
30-Jul-15	634,620	447	2,402,297	1,690	
31-Jul-15	627,790	440	2,376,443 1,667		

		Average Flow		Average Flow	
Date	Volume	Rate Over Time	Volume	Rate Over Time	
		Taken		Taken	
	(US gpd)	(US gpm)	(L/day)	(L/min)	
1-Aug-15	666,770	468	2,523,998	1,771	
2-Aug-15	730,570	512	2,765,507	1,939	
3-Aug-15	574,230	403	2,173,696	1,526	
4-Aug-15	511,000	360	1,934,345	1,361	
5-Aug-15	545,620	379	2,065,395	1,433	
6-Aug-15	488,570	345	1,849,438	1,307	
7-Aug-15	555,140	389	2,101,433	1,473	
8-Aug-15	579,760	406	2,194,629	1,538	
9-Aug-15	526,250	370	1,992,072	1,400	
10-Aug-15	544,980	382	2,062,973	1,448	
11-Aug-15	485,730	341	1,838,687	1,292	
12-Aug-15	531,020	370	2,010,128	1,399	
13-Aug-15	583,600	409	2,209,165	1,546	
14-Aug-15	582,270	409	2,204,131	1,549	
15-Aug-15	648,000	454	2,452,946	1,718	
16-Aug-15	617,070	430	2,335,863	1,626	
17-Aug-15	619,980	437	2,346,878	1,655	
18-Aug-15	567,260	398	2,147,312	1,508	
19-Aug-15	557,970	391	2,112,145	1,481	
20-Aug-15	565,840	397	2,141,936	1,503	
21-Aug-15	669,890	469	2,535,808	1,777	
22-Aug-15	716,720	502	2,713,079	1,902	
23-Aug-15	713,880	500	2,702,328	1,894	
24-Aug-15	565,630	397	2,141,141	1,504	
25-Aug-15	602,490	423	2,280,672	1,599	
26-Aug-15	632,060	441	2,392,606	1,669	
27-Aug-15	574,220	405	2,173,658	1,532	
28-Aug-15	583,940	409	2,210,452	1,549	
29-Aug-15	645,980	453	2,445,299	1,716	
30-Aug-15	601,970	422	2,278,703	1,598	
31-Aug-15	439,300	305	1,662,931	1,155	

	Average Flow			Average Flow	
Date	Volume	Rate Over Time	Volume	Rate Over Time	
		Taken		Taken	
	(US gpd)	(US gpm)	(L/day)	(L/min)	
1-Sep-15	444,740	312	1,683,523	1,183	
2-Sep-15	413,230	291	1,564,245	1,102	
3-Sep-15	498,420	349	1,886,724	1,321	
4-Sep-15	548,320	386	2,075,616	1,463	
5-Sep-15	506,990	354	1,919,165	1,339	
6-Sep-15	481,270	339	1,821,804	1,284	
7-Sep-15	503,390	354	1,905,538	1,339	
8-Sep-15	490,460	342	1,856,592	1,296	
9-Sep-15	460,490	325	1,743,143	1,231	
10-Sep-15	490,890	347	1,858,220	1,313	
11-Sep-15	572,070	401	2,165,519	1,518	
12-Sep-15	497,380	349	1,882,787	1,322	
13-Sep-15	496,180	346	1,878,245	1,311	
14-Sep-15	534,590	377	2,023,642	1,427	
15-Sep-15	498,680	351	1,887,708	1,327	
16-Sep-15	379,270	265	1,435,692	1,003	
17-Sep-15	370,360	262	1,401,964	992	
18-Sep-15	410,120	287	1,552,472	1,087	
19-Sep-15	488,060	343	1,847,507	1,297	
20-Sep-15	528,050	370	1,998,886	1,402	
21-Sep-15	467,590	329	1,770,020	1,245	
22-Sep-15	544,380	382	2,060,701	1,446	
23-Sep-15	474,950	334	1,797,880	1,266	
24-Sep-15	560,790	393	2,122,820	1,488	
25-Sep-15	548,310	385	2,075,578	1,458	
26-Sep-15	459,420	323	1,739,093	1,222	
27-Sep-15	566,970	395	2,146,214	1,497	
28-Sep-15	607,830	427	2,300,886	1,618	
29-Sep-15	598,180	423	2,264,357	1,600	
30-Sep-15	608,740	426	2,304,330	1,614	

		Average Flow			
Date	Volume	Rate Over Time	Volume	Rate Over Time	
		Taken		Taken	
	(US gpd)	(US gpm)	(L/day)	(L/min)	
1-Oct-15	526,360	369	1,992,488	1,396	
2-Oct-15	495,420	349	1,875,368	1,321	
3-Oct-15	538,770	376	2,039,465	1,423	
4-Oct-15	529,680	373	2,005,056	1,414	
5-Oct-15	500,010	349	1,892,743	1,322	
6-Oct-15	460,150	325	1,741,856	1,231	
7-Oct-15	516,810	362	1,956,338	1,370	
8-Oct-15	522,230	367	1,976,855	1,388	
9-Oct-15	582,750	408	2,205,948	1,546	
10-Oct-15	523,060	368	1,979,997	1,393	
11-Oct-15	569,920	400	2,157,381	1,516	
12-Oct-15	476,290	335	1,802,953	1,268	
13-Oct-15	402,240	282	1,522,643	1,067	
14-Oct-15	421,920	297	1,597,140	1,124	
15-Oct-15	487,630	343	1,845,879	1,298	
16-Oct-15	482,940	339	1,828,126	1,282	
17-Oct-15	542,810	378	2,054,758	1,432	
18-Oct-15	566,250	400	2,143,488	1,515	
19-Oct-15	488,390	342	1,848,756	1,295	
20-Oct-15	541,790	381	2,050,897	1,444	
21-Oct-15	474,850	331	1,797,502	1,251	
22-Oct-15	463,010	325	1,752,683	1,229	
23-Oct-15	506,180	358	1,916,099	1,354	
24-Oct-15	655,140	459	2,479,974	1,739	
25-Oct-15	611,670	429	2,315,422	1,625	
26-Oct-15	450,150	314	1,704,002	1,187	
27-Oct-15	374,820	262	1,418,847	993	
28-Oct-15	368,280	259	1,394,091	981	
29-Oct-15	446,720	316	1,691,018	1,194	
30-Oct-15	504,060	352	1,908,074	1,333	
31-Oct-15	534,940	378	2,024,967	1,429	

		Average Flow			
Date	Volume Rate Over Time Vo		Volume	Rate Over Time	
		Taken		Taken	
	(US gpd)	(US gpm)	(L/day)	(L/min)	
1-Nov-15	551,390	352	2,087,237	1,333	
2-Nov-15	257,410	195	974,402	737	
3-Nov-15	388,800	295	1,471,767	1,118	
4-Nov-15	463,460	342	1,754,386	1,294	
5-Nov-15	475,250	344	1,799,016	1,300	
6-Nov-15	512,000	355	1,938,130	1,346	
7-Nov-15	534,170	380	2,022,052	1,437	
8-Nov-15	553,320	393	2,094,543	1,489	
9-Nov-15	464,610	308	1,758,739	1,167	
10-Nov-15	354,850	256	1,343,253	971	
11-Nov-15	520,660	382	1,970,912	1,445	
12-Nov-15	523,880	362	1,983,101	1,372	
13-Nov-15	455,710	302	1,725,049	1,142	
14-Nov-15	504,230	357	1,908,717	1,350	
15-Nov-15	557,160	392	2,109,079	1,482	
16-Nov-15	449,410	328	1,701,201	1,243	
17-Nov-15	460,990	329	1,745,036	1,244	
18-Nov-15	516,590	363	1,955,505	1,374	
19-Nov-15	545,570	380	2,065,206	1,440	
20-Nov-15	458,080	310	1,734,021	1,173	
21-Nov-15	500,480	377	1,894,522	1,427	
22-Nov-15	571,360	380	2,162,832	1,439	
23-Nov-15	559,780	440	2,118,997	1,666	
24-Nov-15	560,160	390	2,120,435	1,478	
25-Nov-15	528,830	379	2,001,838	1,436	
26-Nov-15	554,010	377	2,097,155	1,427	
27-Nov-15	541,940	378	2,051,465	1,431	
28-Nov-15	441,220	322	1,670,199	1,219	
29-Nov-15	318,590	203	1,205,994	767	
30-Nov-15	10	2	38	7	

		Average Flow		Average Flow	
Date	Date Volume Rate Over Time Volum		Volume	Rate Over Time	
		Taken		Taken	
	(US gpd)	(US gpm)	(L/day)	(L/min)	
1-Dec-15	0	1	0	4	
2-Dec-15	71,530	51	270,770	194	
3-Dec-15	273,620	198	1,035,764	749	
4-Dec-15	392,360	275	1,485,243	1,042	
5-Dec-15	449,750	314	1,702,488	1,190	
6-Dec-15	516,990	362	1,957,019	1,369	
7-Dec-15	379,180	267	1,435,352	1,010	
8-Dec-15	280,590	195	1,062,148	740	
9-Dec-15	391,220	275	1,480,928	1,041	
10-Dec-15	389,230	274	1,473,395	1,037	
11-Dec-15	385,710	264	1,460,070	998	
12-Dec-15	485,020	341	1,836,000	1,290	
13-Dec-15	530,840	371	2,009,447	1,403	
14-Dec-15	402,830	283	1,524,877	1,071	
15-Dec-15	408,580	287	1,546,643	1,085	
16-Dec-15	416,860	293	1,577,986	1,107	
17-Dec-15	445,850	313	1,687,725	1,185	
18-Dec-15	527,770	368	1,997,826	1,392	
19-Dec-15	506,550	359	1,917,499	1,357	
20-Dec-15	549,600	385	2,080,461	1,456	
21-Dec-15	460,040	324	1,741,440	1,227	
22-Dec-15	447,680	312	1,694,652	1,181	
23-Dec-15	266,780	188	1,009,872	711	
24-Dec-15	22,720	17	86,005	64	
25-Dec-15	17,610	13	66,661	51	
26-Dec-15	18,570	14	70,295	54	
27-Dec-15	232,920	164	881,698	621	
28-Dec-15	330,740	236	1,251,987	894	
29-Dec-15	412,860	289	1,562,844	1,093	
30-Dec-15	269,870	189	1,021,569	717	
31-Dec-15	0	1	0	3	

Notes:

1. All volumes measured with a flow meter and recorded on a datalogger.



APPENDIX D

Groundwater Level Monitoring



TABLE D1 Manual Groundwater Elevations 2015 Annual Report

	Water Level (masl)										
Date	#125 Brock S. (Y Well)	#2 Brock N.	#27 Old Brock	#50 Brock S. (I Well)	#58 Brock S.	#7404 Rd. 34	#7425 Rd. 34 (B Well)	#8 MapleLeaf Lane	#80 Brock S. (W2 Well)	#98 Brock S. (M1 Well)	
1/20/2015	311.489		309.358	309.310	311.843				308.646	310.003	
1/21/2015		315.846				315.760	310.346	311.654			
2/17/2015		315.746	309.173	309.260	311.303	315.581	310.136	311.494	309.086	310.373	
2/18/2015	311.280										
3/17/2015	311.275	315.936				315.871	310.221		308.096	309.653	
3/18/2015			308.258		310.953			311.514			
4/21/2015			309.218	309.250	311.433	316.036	309.791	312.114			
4/22/2015	311.475								307.846	308.803	
4/23/2015											
5/19/2015	311.355		307.688	307.695	310.873	315.461	309.141	311.329	306.466	307.753	
5/20/2015											
6/16/2015	311.475	315.976	309.038	309.050	311.463	315.876	309.621	311.684	307.996	309.043	
6/17/2015											
7/21/2015		315.756	308.068	308.410	311.513	315.371	309.541	311.424	309.836	308.513	
7/22/2015	311.380										
7/23/2015											
8/18/2015	311.415	315.716	308.848	308.720	311.153	315.511	309.721	311.464	307.326	308.743	
9/17/2015	311.305	315.586	309.878	309.790	311.013	315.211	310.411	311.594	308.586	309.753	
9/18/2015											
10/22/2015	311.180	315.514	309.093	309.030	311.443	315.326	309.761	311.324	307.916	309.323	
11/19/2015	311.230	315.806	309.338	309.280	311.563	315.671	309.781	311.454	308.616	309.203	
11/20/2015								_			
12/21/2015	311.195	315.796	309.718	309.750	311.593	315.661	310.021	311.544	306.696	309.673	
	Water Level (masl)										
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Date	Fireflow	MW02A-07	MW02B-07	MW02C-07	MW02D-07	MW02E-07	MW04A-07	MW04B-07	MW04C-07		
1/20/2015	309.881										
1/21/2015		308.979	309.696	310.816	311.447	311.415	309.478	311.714	311.661		
2/17/2015							309.035	311.529	311.507		
2/18/2015	309.330	306.885	307.941	308.181	311.181	311.279					
3/17/2015											
3/18/2015	309.695	307.720	308.691	310.576	311.407	311.421	308.295	311.544	311.666		
4/21/2015							309.190	311.740	311.753		
4/22/2015	309.735	308.291	308.926	310.652	311.647	311.676					
4/23/2015											
5/19/2015	309.243						307.370	311.569	311.561		
5/20/2015		307.545	308.501	310.401	311.207	311.226					
6/16/2015	309.715						308.925	311.679	311.621		
6/17/2015		306.893	308.001	310.338	311.412	311.461					
7/21/2015	309.430						308.240	311.639	311.561		
7/22/2015		305.845	307.126	309.871	311.142	311.236					
7/23/2015											
8/18/2015	309.400	309.130	309.676	310.751	311.332	311.301	308.845	311.604	311.531		
9/17/2015	309.745	307.910	308.771	310.451	311.134	311.154	309.645	311.508	311.391		
9/18/2015											
10/22/2015	309.480	308.325	308.846	310.501	311.155	311.201	308.850	311.379	311.296		
11/19/2015	309.590	309.455	309.691	310.706	311.355	311.346	309.195	311.419	311.371		
11/20/2015											
12/21/2015	309.550	307.750	308.389	310.475	311.283	311.335	309.105	311.379	311.331		

	Water Level (masl)										
Date	MW06A-08	MW06B-08	MW07A-08	MW07B-08	MW08A-08	MW08B-08	MW10A-09	MW10B-09	MW10C-09	MW10D-09	
1/20/2015	315.638	318.435	309.741	310.944	Frozen	317.337	319.551	319.604	317.194	316.795	
1/21/2015											
2/17/2015	315.480	318.302	309.550	310.728	Frozen	317.229	319.479	319.549	316.995	316.555	
2/18/2015											
3/17/2015	315.693	318.519	309.075	310.668	317.714	317.464	319.751	319.569	317.115	316.670	
3/18/2015											
4/21/2015	315.695	318.567	309.360	310.878	317.709	317.497	319.854	319.799	317.265	316.837	
4/22/2015											
4/23/2015											
5/19/2015	315.400	318.202	307.665	310.453	317.214	317.159	319.516	319.624	317.225	316.795	
5/20/2015											
6/16/2015	315.610	318.592	308.890	310.568	317.439	317.394	319.724	319.709	317.325	316.900	
6/17/2015											
7/21/2015	315.510	318.462	308.975	310.548	317.239	317.184	319.549	319.609	317.200	316.775	
7/22/2015											
7/23/2015											
8/18/2015	315.380	318.412	309.338	310.618	317.149	317.147	319.494	319.559	317.030	316.582	
9/17/2015	315.670	318.281	310.175	311.088	317.339	317.038	319.354	319.444	317.170	316.760	
9/18/2015											
10/22/2015	315.485	318.377	309.140	310.398	317.394	317.114	319.399	319.459	317.030	316.570	
11/19/2015	315.575	318.470	310.260	310.123	317.494	317.209	319.599	319.549	317.080	316.600	
11/20/2015											
12/21/2015	315.385	318.402	309.060	310.513	317.449	317.214	319.479	319.534	316.756	316.395	

	Water Level (masl)											
Date	MW13-10	MW14A-11	MW14B-11	MW14C-11	MW15A-12	MW15B-12	MW16A-12	MW16B-12				
1/20/2015					310.599	308.252	307.247	307.480				
1/21/2015	306.540	310.155	313.806	314.512								
2/17/2015		309.999	313.587	314.285	310.468	308.227	306.996	307.400				
2/18/2015	301.260											
3/17/2015		309.999	313.797	314.483	310.631	308.342	307.177	307.485				
3/18/2015	305.560											
4/21/2015		309.834	313.937	314.775	310.656	308.461	307.207	307.555				
4/22/2015												
4/23/2015	303.020											
5/19/2015		308.989	313.467	314.380	310.259	308.267	307.042	307.540				
5/20/2015	301.360											
6/16/2015	306.340	309.669	313.742	314.530	310.691	308.352	307.167	307.620				
6/17/2015												
7/21/2015	301.595	309.304	313.511	314.275	310.436	308.247	307.132	307.580				
7/22/2015												
7/23/2015												
8/18/2015	305.060	309.424	313.470	314.215	310.307	308.270	307.052	307.549				
9/17/2015	304.130	310.019	313.367	313.970	310.326	308.172	306.942	307.405				
9/18/2015												
10/22/2015	308.460	309.539	313.302	313.870	310.229	308.167	306.782	307.275				
11/19/2015	304.060	309.579	313.492	314.015	310.386	308.202	306.857	307.265				
11/20/2015												
12/21/2015		309.809	313.497	314.015	310.231	308.172	306.782	307.150				

	Water Level (masl)										
Date	MW17A-12	MW17B-12	MW18A-12	MW18B-12	MW-D	MW-I	MW-S				
1/20/2015	308.638	318.074	308.377	308.211							
1/21/2015					311.065	311.032	311.087				
2/17/2015	308.483	308.698	308.217	308.143							
2/18/2015					309.947	310.360	310.932				
3/17/2015	308.343	308.758	308.222								
3/18/2015				308.219	310.737	310.707	311.197				
4/21/2015	307.948	308.813									
4/22/2015			307.757	308.289	310.967	310.912	311.457				
4/23/2015											
5/19/2015	307.582	308.713	307.207	308.089							
5/20/2015					310.447	310.392	311.012				
6/16/2015	307.958	308.948	307.762	308.294							
6/17/2015					310.697	310.630	311.272				
7/21/2015	307.941	308.870	307.602	308.164	310.105	310.496	311.002				
7/22/2015											
7/23/2015											
8/18/2015	307.720	308.948	307.452	308.114	310.142	310.532	311.012				
9/17/2015	308.438	308.598	308.175	307.864	310.642	310.627	310.682				
9/18/2015											
10/22/2015	307.973	308.458	307.647	307.744	310.017	310.422	310.742				
11/19/2015	307.988	308.418	307.747	307.767	310.135	310.527	311.039				
11/20/2015											
12/21/2015	308.003	308.348	307.677	307.757	310.220	310.632	310.978				

	Water Level (masl)										
Date	PCC-D	PCC-I	PCC-S	PW5 Meadows of Aberfoyle	TW1-93	TW1-99	TW2-11	TW3-80			
1/20/2015				310.193	309.849	311.538	309.960				
1/21/2015	314.228	313.991	314.140					304.127			
2/17/2015	314.103	313.854	314.064		309.747		309.696				
2/18/2015				309.485		311.303		301.437			
3/17/2015				309.830	309.862	311.423		306.077			
3/18/2015	314.378	314.204	315.014								
4/21/2015	314.533	314.344	314.554								
4/22/2015				309.105	309.967	311.643	309.356	302.137			
4/23/2015											
5/19/2015	314.033	313.854	313.934	308.645	309.699	311.433	308.769				
5/20/2015								301.867			
6/16/2015	314.308	314.134	314.324	309.533	309.927	311.613	309.564	308.412			
6/17/2015											
7/21/2015	314.018	313.852	313.924	309.120	309.742	311.458	309.099				
7/22/2015											
7/23/2015								299.847			
8/18/2015	313.978	313.829	313.994	309.645	309.542	311.468	309.279	308.417			
9/17/2015	313.788	313.624	313.699	309.870	309.342	311.323	309.854				
9/18/2015								307.117			
10/22/2015	313.793	313.664	313.789	309.575	309.282	311.238	309.374	308.027			
11/19/2015	314.143	313.934	314.154	309.330	309.417	311.348	309.433				
11/20/2015								308.007			
12/21/2015	314.123	313.919	314.099	309.730	309.377	311.338	309.699	307.147			






























































































APPENDIX E

Surface Water Level Monitoring



TABLE E1Manual Surface Water Elevations (Mini Piezometers)2015 Annual Report

	Water Level (masl)							
Date	MP06D-04	MP06S-08	MP08D-04	MP08S-04	MP11D-04	MP11S-08		
1/20/2015					Frozen	Frozen		
1/21/2015	311.450	311.450	Frozen	Frozen				
2/17/2015					Frozen	Frozen		
2/18/2015	Frozen	Frozen	Frozen	Frozen				
3/17/2015					Frozen	317.750		
3/18/2015	311.530	311.530	310.470	310.450				
4/21/2015					315.570	317.755		
4/22/2015			310.550	310.535				
4/23/2015	311.645	311.640						
5/19/2015					317.910	317.730		
5/20/2015	311.335	311.340	310.350	310.340				
6/16/2015					317.940	317.750		
6/17/2015	311.490	311.495	310.440	310.420				
7/21/2015			310.350	310.330	317.910	317.735		
7/22/2015	311.340	311.350						
8/18/2015	311.345	311.345	310.330	310.315	317.900	317.735		
9/17/2015	311.265	311.285	310.290	310.220	317.875	317.715		
10/22/2015	311.287	311.330	310.370	310.335	317.900	317.740		
11/19/2015	311.403	311.422	310.400	310.388	317.920	317.760		
12/21/2015	311.374	311.386	310.385	310.360	317.920	317.765		

TABLE E1Manual Surface Water Elevations (Mini Piezometers)2015 Annual Report

	Water Level (masl)							
Date	MP12D-04	MP12S-04	MP14D-07	MP14S-07	MP16D-08	MP16S-08		
1/20/2015								
1/21/2015	Frozen	Frozen	Frozen	Frozen	311.946	312.274		
2/17/2015								
2/18/2015	Frozen	Frozen	Frozen	Frozen	311.950	311.945		
3/17/2015					312.215	312.205		
3/18/2015	311.150	311.170	Frozen	Frozen				
4/21/2015								
4/22/2015	311.565	311.585	311.590	311.553				
4/23/2015					312.365	312.360		
5/19/2015					312.030	312.025		
5/20/2015	311.190	311.220	311.340	311.330				
6/16/2015					312.305	312.300		
6/17/2015	311.386	311.405	311.485	311.455				
7/21/2015			311.335	311.330				
7/22/2015	311.185	311.220			312.040	312.030		
8/18/2015	311.235	311.260	311.315	311.345	312.060	312.060		
9/17/2015	311.100	311.121	311.215	311.220	311.880	311.875		
10/22/2015	311.158	311.188	311.270	311.230	311.950	311.940		
11/19/2015	311.276	311.306	311.391	311.381	312.065	312.063		
12/21/2015	311.277	311.307	311.366	311.367	312.009	312.010		

TABLE E1Manual Surface Water Elevations (Mini Piezometers)2015 Annual Report

	Water Level (masl)							
Date	MP17D-11	MP17S-11	MP18D-11	MP18S-11	MP19D-12	MP19S-12		
1/20/2015								
1/21/2015	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen		
2/17/2015								
2/18/2015	Frozen	Frozen	Frozen	Frozen	Frozen	Frozen		
3/17/2015								
3/18/2015	309.420	309.340	308.350	308.160	Frozen	Frozen		
4/21/2015								
4/22/2015	309.775	309.750	308.535	308.490	310.795	310.708		
4/23/2015								
5/19/2015								
5/20/2015	309.515	309.525	308.275	308.302	310.532	310.488		
6/16/2015								
6/17/2015	309.870	309.395	308.403	308.373	310.625	310.577		
7/21/2015	309.525	309.535	308.275	308.300	310.495	310.470		
7/22/2015								
8/18/2015	309.525	309.525	308.265	308.300	310.485	310.443		
9/17/2015	309.410	309.475	308.160	308.245	310.250	310.230		
10/22/2015	309.510	309.470	308.154	308.253	310.405	310.420		
11/19/2015	309.577	309.603	308.227	308.306	310.513	310.523		
12/21/2015	309.527	309.580	308.175	308.275	310.452	310.462		

TABLE E2Manual Surface Water Elevations (Surface Water Stations)2015 Annual Report

	Water Level (masl)							
Date	SW1	SW2	SW3	SW4	SW5	SW9D-10	SW10B	SW10C
20-Jan-15			317.375		307.303	Frozen	Frozen	Submerged
21-Jan-15	311.440	Frozen		Frozen				
17-Feb-15			317.345	Frozen	Frozen			
18-Feb-15	Frozen	Frozen				Frozen	Frozen	Frozen
17-Mar-15			317.455	312.526	307.403	Frozen	Frozen	Frozen
18-Mar-15	311.545	310.320						
21-Apr-15				312.526	307.543			
22-Apr-15		310.544	317.585			311.436	311.486	Submerged
23-Apr-15	311.650							
19-May-15			317.365	312.416	307.223	312.066	311.456	Submerged
20-May-15	311.320	310.300						
16-Jun-15			317.545	312.471	307.403	311.461	311.496	Submerged
17-Jun-15	311.495	310.437						
21-Jul-15		310.385	317.385	312.396	307.243	311.396	311.531	Submerged
22-Jul-15	311.415							
18-Aug-15	311.415	310.346	317.325	312.426	307.253	311.396	311.486	Submerged
17-Sep-15	311.285	310.320	317.310	312.406	307.253	Dry	Dry	Submerged
22-Oct-15	311.275	310.379	317.375	312.416	307.253	Dry	Dry	311.167
19-Nov-15	311.485	310.442	317.475	312.426	307.303	Dry	Dry	311.204
21-Dec-15	311.407	310.374	317.475	312.426	307.253	Dry	Dry	311.160




































































APPENDIX F

Surface Water Flow Monitoring



TABLE F1Surface Water Flow2015 Annual Report

DATE	SW-1 FLOW (L/sec)	COMMENT	SOURCE	MEASUREMENT
21-Jan-15	109.0		GOLDER	manual
18-Feb-15	NA	Frozen channel	GOLDER	manual
18-Mar-15	282.2		GOLDER	manual
23-Apr-15	387.0		GOLDER	manual
19-May-15	75.5		GOLDER	manual
17-Jun-15	213.4		GOLDER	manual
22-Jul-15	77.5		GOLDER	manual
18-Aug-15	67.2		GOLDER	manual
17-Sep-15	34.4		GOLDER	manual
23-Oct-15	80.8		GOLDER	manual
19-Nov-15	111.5		GOLDER	manual
21-Dec-15	92.6		GOLDER	manual

TABLE F1Surface Water Flow2015 Annual Report

DATE	SW-2 FLOW (L/sec)	COMMENT	SOURCE	MEASUREMENT
21-Jan-15	NA	Frozen channel	GOLDER	manual
18-Feb-15	NA	Frozen channel	GOLDER	manual
18-Mar-15	300.8		GOLDER	manual
22-Apr-15	488.5		GOLDER	manual
19-May-15	67.4		GOLDER	manual
17-Jun-15	259.8		GOLDER	manual
21-Jul-15	107.7		GOLDER	manual
18-Aug-15	89.4		GOLDER	manual
17-Sep-15	42.3		GOLDER	manual
23-Oct-15	92.5		GOLDER	manual
19-Nov-15	157.9		GOLDER	manual
21-Dec-15	127.0		GOLDER	manual











APPENDIX G

Stream Temperature Monitoring







Examination of the Temperature Suitability of Aberfoyle Creek for Resident Fishes: 2006-2015

Prepared for Nestlé Waters Canada



Prepared by Cam Portt and Jim Reid C. Portt and Associates January 2016

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Introduction

Condition 4.4 of the Permit to Take Water (PTTW Number 1763-8FXR29) issued to Nestlé Waters Canada (Nestlé) by the Ontario Ministry of Environment (MOE) on April 29, 2011, required that Nestlé review the appropriateness of the methodology of their water temperature monitoring program in Aberfoyle Creek (the Nestlé program). C. Portt and Associates conducted that review for Nestlé and made a number of recommendations (Portt, 2011). The recommendations of the review were accepted by the MOE and were to be incorporated commencing in the 2012 field season (letter from Carl Slater, MOE, to Don DeMarco, Nestlé, October 26, 2011). One of those recommendations was that historical and future temperature data be analyzed using ThermoStat software that has been developed to evaluate the thermal suitability of Ontario streams for thermal guilds or individual species of fishes in order to provide insight into the ecological implications of the current temperature regime. The analysis of the earlier data (2006-2012) was reported in Portt and Reid (2013). That analysis was conducted using ThermoStat Version 2 (Ontario Ministry of Natural Resources and the Institute for Watershed Science, Trent University, 2010 <u>http://people.trentu.ca/ nicholasjones/tools.htm</u>). The software was updated to Version 3.1 (Version 3.1, Jones and Schmidt, http://people.trentu.ca/nicholasjones/thermostat.htm) prior to the analysis of the 2013 data. The update corrected errors in the calculations by the previous version of the software and eliminated the calculation of the summer temperature suitability index. Therefore the 2006 – 2012 data were reanalyzed using ThermoStat Version 3.1 and subsequent years' data have been analyzed using that version. This report presents the results of the analyses of the 2015 data, together with the data from previous years.

Methods

Water temperature is monitored at the sediment-water interface at six locations in Aberfoyle Creek (Figure 1) using Tidbit© V2 temperature loggers manufactured by Onset Computer Corporation. (<u>http://www.onsetcomp.com/products/data-loggers/utbi-001</u>). The logger has an accuracy of $\pm 0.2^{\circ}$ C between 0°C and 50°C and drift is 0.1°C per year. Monitoring at Stations 1 – 5 began in 2005; monitoring at Station 6 began in 2008.

Temperature is typically logged at 30 minute intervals, but was logged at 60 minute intervals for a period of time at some locations during some years. The ThermoStat software requires that the time interval be consistent during the period covered by each analysis. Therefore, in cases where temperature at a location was logged at half-hour intervals during part of the period and at one-hour intervals during another part, every second recorded temperature was deleted from the half-hour interval portion, so that the values were at one-hour intervals through the entire period. All of the 2015 data were logged at half-hour intervals.

The data were analyzed using ThermoStat Version 3.1 temperature analysis software that calculates the thermal suitability for individual fish species based on laboratory determined optimal and lethal temperatures, compiled by Hasnain et al. (2010), and the water temperature data. ThermoStat calculates the thermal suitability for individual fish species based on laboratory determined optimal and

lethal temperatures, compiled by Hasnain et al. (2010), and the water temperature record. Hasnain *et al.* (2010) provide the following definitions for the temperature criteria:

Optimum growth temperature (OGT): The optimum growth temperature is that which supports the highest growth rate in an experiment where separate groups of fish are exposed to one of a set of constant temperatures under ad libitum feeding conditions. The range of these constant temperatures is chosen so that reduced growth is observed at both extremes (McCauley and Casselman 1980 cited in Wismer and Christie 1987, Jobling 1981).

Final temperature preferendum (FTP): Final temperature preferendum is that towards which fish gravitate when exposed to an 'infinite' temperature range (Giattina and Garton 1982 cited in Wismer and Christie 1987). Two methods are used to determine FTP: the gravitation method and the acclimation method (Jobling 1981). The gravitation method involves exposing fish to a temperature gradient until they gravitate towards a specific temperature. The acclimation method extends the gravitation method by carrying out repeated 'gravitation trials' with fish acclimated to progressively higher temperatures. The preferred temperature exhibited in each trial is then plotted against the acclimation temperature and the FTP is the temperature at which the best fit line for these data crosses the line of equality (Jobling 1981). An informal survey of a subset of the original sources indicated that most estimates were determined via the gravitation method. FTP estimates obtained using both methods were compiled in the database.

Upper incipient lethal temperature (UILT): The upper incipient lethal temperature is that at which 50% of the fish in an experimental trial survive for an extended period (Spotila et al. 1979, Jobling 1981, Wismer and Christie 1987). Testing for UILT involves placing groups of fish in separate baths, each held at a different constant temperature, using a sufficiently wide range of constant temperatures that rapid mortality is observed in some baths whereas slow incomplete mortality occurs in others (Spotila et al. 1979).

Critical thermal maximum (CTMax): The critical thermal maximum is an indicator of 'thermal resistance' and is defined as the temperature at which a fish loses its ability to maintain a 'normal' upright posture in the water (loss of equilibrium; Jobling 1981). It is determined by exposing fish in a tank to steadily increasing water temperatures (typically at a rate of 1 C° min-1) and noting the temperature at which the fish exhibit spasms and loss of equilibrium (Jobling 1981, Wismer and Christie 1987). Remaining at, or above, CTMax results in mortality (Jobling 1981, Wismer and Christie 1987).

Thermal indices that reflect suitability are calculated based on the temperature record for a location and the laboratory derived criteria (Table 1). The proportion of the June through August temperature measurements that are within ±2 °C of the optimal or preferred temperature and the proportion of the June through August temperature measurements that equal or exceed the lethal threshold temperatures are expressed as a percentage of the total number of temperature measurements during this period. Because the temperature measurements occurred at fixed intervals, this percentage of measurements is equivalent to the percentage of the time from June 1st through August 31st that the temperature conditions are met.

Table 1. Indices used to evaluate the thermal suitability for individual fish species.

Optimal Range Indices				
%OGT	Percent of temperature measurements within ±2°C of the optimal growth temperature.			
	Higher values indicate better conditions, to a theoretical maximum of 100%.			
%FTP	Percent of temperature measurements within ±2°C of the final temperature preferendum.			
	Higher values indicate better conditions, to a theoretical maximum of 100%.			
Lethal Threshold Indices				
%>UILT	Percent of temperature measurements that equal or exceed the upper incipient lethal			
	temperature. Lower values indicate better conditions. 0% is optimum.			
%>CTmax	Percent of temperature measurements that equal or exceed the critical thermal maximum.			
	Lower values indicate better conditions. 0% is optimum.			

Not all of the temperature criteria are available from the scientific literature (Hasnain et al, 2010), and therefore some of the thermal suitability indices cannot be calculated for some species. The temperature criteria that were available and used by ThermoStat for the fish species that were captured in Aberfoyle Creek during electrofishing conducted in 2008 are presented in (Table 2), together with the number of individuals of each species that was captured on each of the two sampling dates.

		Number of indi	viduals	Tomporaturo crito	ria availabla	from	
Hasnain et al (2010), and are used by ThermoStat to calculate thermal indices.							
31 and September 24, 2008 and the temperature criteria that are available from the scientific literature, from							
						-	

Table 2. Number of individuals of each species that were captured by electrofishing Aberfoyle Creek on January

		Number of individuals		Temperature criteria available from				
		captured		the scientific literature				
		Samplir	ng date		-			
Common name	Scientific name	01/31/2008	09/24/2008	OGT	FTP	UILT	CTmax	
blacknose dace	Rhinichthys atratulus	25	29	na¹	19.6	28.6	30.2	
bluntnose minnow	Pimephales notatus	3	2	26.2	24.1	31.5	29.9	
brook trout	Salvelinus fontinalis	1	0	14.2	14.8	24.9	29.3	
brown trout	Salmo trutta	4	3	12.6	15.7	25.0	28.3	
common shiner	Luxilus cornutus	96	36	22.0	21.9	30.4	31.2	
common white sucker	Catostomus commersonii	49	76	25.5	23.4	27.8	31.6	
creek chub	Semotilus atromaculatus	154	353	na	24.9	29.1	33.0	
johnny darter	Etheostoma nigrum	59	52	na	na	na	na	
largemouth bass	Micropterus salmoides	0	3	26.6	28.6	31.9	38.4	
pumpkinseed	Lepomis gibbosus	2	10	25.0	27.7	31.7	37.6	
rainbow darter	Etheostoma caeruleum	3	28	na	19.9	na	32.1	
rock bass	Ambloplites rupestris	9	37	28.4	24.9	33.9	36.0	

1. na indicates that the temperature metric was not available.

The water temperature data were analyzed for each year at each monitoring location, excluding cases for which a significant portion of the potential temperature measurements was missing for the June through August period. Temperature logging at Sites 1 through 5 began on July 1, 2005; consequently 2006 is the first year for which thermal suitability indices were calculated. Temperature logging at Site 6 began on May 15, 2008, so there are no thermal suitability indices for that site prior to 2008. There are significant gaps in the summer temperature data for Site 4 in 2010, so the thermal suitability indices were not calculated. Approximately 3.5 days of data were missing for Sites 2 and 3, at the end of August

in 2010, and 9.5 hours of data for June 1 were missing for Site 1 in 2010; it was assumed that these amounts of missing data would not materially alter the calculated thermal suitabilities.

The mean air temperature at the Guelph Turfgrass Institute, which is the closest Environment Canada weather station to the site, was calculated for the period June 1 through August 31 for the years 2007-2009 and 2011-2015. The weather station began operating during the summer of 2006, and there are missing data during June of 2010, so the June – August mean could not be calculated for those years. The relationship between mean June – August air temperature and mean June – August water temperature was explored graphically and using regression analyses.

Results

Graphs of the thermal suitability indices are presented in Figure 2 (%>UILT), Figure 3 (%>CTmax), Figure 4 (%FTP) and Figure 5 (%OTG). The indices values are presented in Appendix A. Lethal temperatures are arguably the most critical thermal factor in determining fish distributions. If lethality occurs, other factors such as growth are immaterial. It is clear from Figure 5 that brook trout and brown trout are the species whose upper incipient lethal temperature is equaled or exceeded most frequently; in the warmest years, at the warmest site (Site 6), the %>UILT can exceed 40. The upper incipient lethal temperature is also exceeded, but infrequently, for blacknose dace, creek chub and white sucker. In 2015, the upper incipient lethal temperature was frequently exceeded for brook trout and brown trout and occasionally exceeded for blacknose dace, creek chub and white sucker, at the warmest (upstream) sites.

Exceedence of CTmax does not occur for most species but occurs infrequently for, in order of decreasing frequency, brown trout, brook trout, bluntnose minnow and blacknose dace (Figure 3). For most species, CTmax is higher than the UILT, and the proportion of the time that it is exceeded is smaller. The exception among the species in Aberfoyle Creek is bluntnose minnow, for which the upper incipient lethal temperature is 0.6 degrees lower (Table 2). This seems implausible, given how the two values are determined, and probably occurs because the values were determined in different studies, under different conditions. In 2014, CTmax was exceeded, infrequently, for brook trout at Site 6 and for brown trout at Sites 6, 5, and 4.

The percentage of the time from June 1st to August 31st, that water temperature is within 2C° of the final temperature preferendum (%FTP) is lowest for brown trout and brook trout (Figure 4) which have the lowest preferred temperatures (Table 2). The next lowest %FTP values are for rock bass and largemouth bass, (

Figure 4), which have the highest preferred temperatures (Table 2). In 2014, the %FTP was lower than in most other years for species with a low temperature preferendum and species with a high temperature preferendum. As in past years, the %FTP was highest in 2015 for species with intermediate temperature requirements.

The percentage of the time, from June 1st to August 31st, that water temperature is within 2C° of the optimal temperature for growth (%OGT) is presented in Figure 5. The lowest %OGT values are for brown

trout and brook trout, which have the lowest optimum temperature for growth among the species that occur in this portion of Aberfoyle Creek (Table 2). The next lowest value is for rock bass, which is the species with the highest optimum temperature for growth (Table 2). The %OGT is also low for the largemouth bass and pumpkinseed. The highest %OGT is for common shiner. The 2015 results were consistent with those from previous years.

The mean June – August water temperature is plotted versus mean June – August air temperature at the Guelph Turfgrass Institute in Figure 6. Mean June – August water temperature decreases in a downstream direction through the Nestlé property (Figure 6) and this is also evident in the plots of the temperatures indices (Figures 2 – 5). For example, the percent of temperature measurements that exceed the ultimate upper incipient lethal temperature (%>UIL) for brook trout decreases with distance downstream (Figure 5). As Figure 6 illustrates, the mean June – August water temperature is highly correlated with the mean June – August air temperature accounted for more than 90% of the variation in mean water temperature. The rate of increase in water temperature with air temperature decreased in a downstream direction, as did the r^2 . The 2015 mean air and water temperatures were very similar to those recorded in 2014 and were higher than would have been predicted from the relationship between mean air temperature from previous years.

Discussion

Based on the average air temperatures for the period June 1 – August 31, 2015 was the second coolest year since water temperature monitoring began in 2008, only 2009 was cooler. Mean air and water temperatures were, however, very similar in 2014 and 2015. A plot of the water temperatures for June 1 – August 31 at Station 6 (Figure 7) shows that during the first part of June, in 2015 there was a brief period with cooler water temperatures that fell within $\pm 2C^{\circ}$ of the final temperature preferendum for brook trout and a second, very brief period in early July.

In the reach of Aberfoyle Creek that flows through the Nestlé property, some species (i.e. largemouth bass, rock bass) are limited by low temperatures and the individuals that were captured probably originated from the mill pond that is just upstream. Brook trout and brown trout, on the other hand, are limited by high temperatures, which exceed their upper incipient lethal temperature frequently during the summer and often exceed their preferred temperature and their optimum temperature for growth (Figure 4; Figure 5). These results support the previously expressed opinion that water temperature is the principal factor limiting trout abundance in the Nestlé reach of Aberfoyle Creek, which was based on an analysis by C. Portt using the thermal suitability model of Wehrly et al (2007), and presented in the Response to Technical Stakeholders' Comments on the TW3-80 Permit Renewal Application (Distributed: March 4, 2011).

The correlations between annual mean June - August air temperature at the Guelph Turf Grass Institute and the annual mean June - August water temperature in the Nestlé branch of Aberfoyle Creek remain remarkably high. The strength of the correlations is strongly influenced by the data from the coolest year (2009), although the relationships remain strong even if the 2009 data are removed. The similarity

in both air and water temperatures in 2015 and 2014 water temperatures were somewhat higher at all of the sites than would have been expected based on the relationship. This may be a consequence of higher temperatures in the first part of June, relative to other years. Other weather-related factors that are correlated with mean June – August temperature, such as precipitation, which influences flow, may also be influencing this relationship.

Conclusions

The water temperature suitabilities for the fish species found in the Aberfoyle Branch of Mill Creek in 2015 are consistent with previous years. Water temperatures during the June 1 - August 31 period were generally too warm for coldwater species such as brook trout and brown trout and too cold for warmwater species such as smallmouth bass. The water temperatures during this period were most favourable for species such as common shiner that have intermediate thermal requirements. The data continue to demonstrate the important influence of air temperature on water temperature.

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Figure 1. Temperature logging locations used in the Nestlé Waters Canada monitoring program in Aberfoyle Creek.


Figure 2. Percent of temperature measurements that exceed the ultimate upper incipient lethal temperature (%>UILT) during the period June 1 to August 31, by species, station and year.



Figure 3. Percent of temperature measurements that exceed the critical thermal maximum temperature during the period June 1 to August 31, by species, station and year.



Figure 4. Percent of temperature measurements within ±2°C of the final temperature preferendum during the period June 1 to August 31, by species, station and year.



Figure 5. Percent of temperature measurements within ±2°C of the optimal temperature for growth during the period June 1 to August 31, by species, station and year.



Figure 6. Plot of the mean June 1 - August 31 water temperature at each site versus mean June – August air temperature at the Guelph Turfgrass Institute, by year. The lines and R² values are for second order polynomial regressions. Temperature at sites 3 and 4 are virtually identical, and hence indistinguishable, in 2008 and 2014.



Figure 7. Water temperature at Station 6 from June 1 – August 31 in 2013, 2014 and 2015, the final temperature preferendum for brook trout (brook trout FTP) and the brook trout FTP plus 2 C° and minus 2 C°.

APPENDIX A

Thermal suitability indices

					%OGT	-						
							Year					
Species	Station	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	Mean
Bluntnose Minnow	6	27.0	18.2	23.2	49.2	37.4	43.1	12.3	26.2			31.9
	1	21.3	13.0	19.3	43.7	35.3	40.6	8.5	19.3	25.0	30.5	27.8
	2	17.3	8.5	16.2	36.8	31.9	32.2	7.2	19.3	22.2	29.1	24.4
	3	13.2	7.9	14.2	28.7	24.9	28.3	5.9	11.7	15.1	23.3	19.0
	4	10.7	7.0	14.3	20.9	21.3		7.0	11.9	12.1	20.3	15.4
	5	9.4	5.9	13.2	19.7	20.1	23.5	6.9	9.5	9.0	17.5	14.9
	Mean	16.5	10.1	16.7	33.2	28.5	33.5	8.0	16.3	16.7	24.1	22.0
Brook Trout	6	0.8	0.0	2.3	3.6	0.2	0.0	1.7	0.2			1.3
	1	1.1	0.0	2.4	3.5	0.2	0.0	2.9	0.7	0.0	0.0	1.2
	2	1.0	0.0	2.6	3.8	0.4	0.0	3.2	0.6	0.0	0.0	1.3
	3	1.2	0.0	2.7	3.9	0.5	0.0	3.8	1.1	0.1	0.0	1.5
	4	1.3	0.0	2.6	3.8	0.5		3.4	1.0	0.2	0.0	1.6
	5	1.4	0.0	2.8	3.9	0.6	0.0	3.6	1.4	0.7	0.1	1.6
	Mean	1.1	0.0	2.6	3.8	0.4	0.0	3.1	0.8	0.2	0.0	1.4
Brown Trout	6	0.5	0.0	0.0	0.4	0.0	0.0	0.3	0.0			0.1
	1	0.6	0.0	0.0	0.3	0.0	0.0	0.5	0.0	0.0	0.0	0.1
	2	0.6	0.0	0.0	0.3	0.0	0.0	0.5	0.0	0.0	0.0	0.1
	3	0.6	0.0	0.0	0.6	0.0	0.0	0.6	0.0	0.0	0.0	0.2
	4	0.6	0.0	0.0	0.3	0.0		0.6	0.0	0.0	0.0	0.1
	5	0.6	0.0	0.0	0.5	0.0	0.0	0.6	0.1	0.0	0.0	0.2
	Mean	0.6	0.0	0.0	0.4	0.0	0.0	0.5	0.0	0.0	0.0	0.1
Common Shiner	6	53.7	68.5	55.0	36.4	47.3	44.8	63.9	60.0			51.2
	1	56.7	73.1	57.7	43.1	51.0	47.0	60.8	59.8	60.1	56.3	54.5
	2	60.9	75.6	59.1	51.8	53.4	54.8	62.8	62.7	67.1	61.5	59.2
	3	62.4	76.3	60.1	56.8	59.7	56.7	51.4	62.9	66.8	60.5	59.4
	4	62.7	76.2	60.1	63.1	62.5		57.9	65.7	68.2	61.4	62.7
	5	63.0	75.3	59.4	63.0	62.6	59.6	54.2	64.4	67.4	60.7	61.4
Langers with Daga	Mean	59.9	74.2	58.6	52.4	56.1	52.6	58.5	62.6	65.9	60.1	58.3
Largemouth Bass	6	20.6	13.4	17.5	44.6	34.2	38.0	9.0	19.6			27.2
	1	16.5	9.1	15.1	38.8	31.0	33.7	6.8	15.1	19.9	26.6	23.4
	2	13.6	6.2	13.4	31.5	26.6	26.5	4.4	14.8	18.7	25.5	20.2
	3	9.5	5.6	11.3	22.3	20.4	22.7	4.3	8.9	12.1	20.2	15.3
	4	7.7	5.3	11.3	15.8	16.9	10.0	5.2	8.9	9.3	17.6	12.1
	5	6.4	4.7	10.2	15.0	16.3	18.0	4.6	7.0	6.4	15.3	11.6
Pumpkinseed	Mean	12.4	7.4	13.1	28.0	24.2	27.8	5.7	12.4	13.3	21.0	18.0
	6	42.5	39.8	39.5	57.5	47.5	53.0	23.4	45.8	40.0	40.0	44.5
	1	38.3	33.2	36.5	57.4	47.6	53.8	18.3	38.3	48.8	46.8	43.4
	2	35.8	23.5	33.0	52.6	45.1	50.1	15.4	38.2	45.3	43.6	40.4
	3	29.3	23.3	28.2	46.3	41.5	47.8	13.7	29.0	34.1	36.5	34.6
	4	20.0	21.4	28.6	41.8	31.0	40.4	14.4	29.5	21.2	32.0	30.2
1	5	24.0	17.4	20.1	39.0	31.0	42.4	14.Z	∠ɔ.0	Z1.Z	ZØ.9	29.1

	Mean	32.9	26.4	31.8	49.1	42.7	49.4	16.6	34.3	35.3	37.7	36.9
Rock Bass	6	5.5	3.1	8.5	20.1	17.1	14.6	1.6	5.4			11.2
	1	3.3	1.9	8.0	13.1	12.7	11.1	1.0	2.5	3.8	12.4	8.1
	2	3.0	1.0	7.8	8.2	10.2	6.9	0.8	2.5	3.3	9.3	6.1
	3	1.4	0.8	6.5	4.9	5.2	4.2	0.2	0.5	1.4	6.5	3.7
	4	1.1	0.5	6.5	1.7	4.2		0.3	0.5	0.6	6.0	2.8
	5	0.8	0.2	5.7	2.3	3.3	2.5	0.3	0.2	0.1	4.7	2.4
	Mean	2.5	1.3	7.2	8.4	8.8	7.9	0.7	1.9	1.8	7.8	5.5
White Sucker	6	36.6	30.4	33.6	55.3	44.6	50.0	18.0	37.3			39.8
	1	32.0	23.7	30.0	53.3	43.0	48.9	15.0	27.5	37.0	42.4	37.1
	2	28.0	15.7	25.8	47.0	39.9	43.6	12.8	28.5	35.1	36.8	33.7
	3	22.4	14.9	20.8	39.5	34.6	40.8	9.5	19.4	21.9	29.0	26.9
	4	18.9	12.8	21.1	32.9	31.2		10.8	21.1	18.9	27.0	23.3
	5	17.2	10.3	18.7	30.3	29.7	34.2	11.1	17.5	14.2	22.3	22.3
	Mean	27.6	18.0	25.0	43.1	37.2	43.5	12.9	25.2	25.4	31.5	30.3

				(%FTP							
							Year					
Species	Station	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	Mean
Blacknose Dace	6	28.0	26.7	26.9	10.2	21.6	21.1	51.1	30.5			26.9
	1	33.3	31.4	30.7	12.9	24.7	22.5	57.2	35.1	24.9	24.8	29.1
	2	36.1	42.3	34.0	17.1	28.4	24.8	53.2	34.1	26.7	26.5	30.6
	3	41.7	42.0	38.9	22.9	34.1	29.2	59.9	40.2	37.8	37.7	37.6
	4	45.0	43.9	38.6	27.4	36.4		58.4	39.6	41.2	42.2	40.5
	5	46.9	48.7	42.1	30.9	38.9	34.1	59.7	43.3	49.8	48.4	43.4
	Mean	38.5	39.2	35.2	20.2	30.7	26.3	56.6	37.1	36.1	35.9	34.9
Bluntnose Minnow	6	54.3	58.7	51.1	57.0	52.0	57.4	33.9	56.3			51.3
	1	50.5	52.9	48.1	60.7	53.2	58.8	28.9	53.8	62.2	58.0	53.0
	2	48.0	43.0	44.9	59.9	51.5	59.5	26.6	52.5	59.1	54.6	51.1
	3	43.3	42.3	40.5	57.6	50.7	57.5	23.6	47.4	50.0	47.6	46.9
	4	40.1	40.9	40.7	56.2	48.9		23.4	46.1	43.4	42.0	43.0
	5	37.6	37.1	38.0	51.5	48.0	55.6	22.6	42.3	38.3	39.0	41.9
	Mean	45.6	45.8	43.9	57.2	50.7	57.8	26.5	49.7	50.6	48.2	47.8
Brook Trout	6	1.5	0.0	2.9	3.9	0.8	0.0	3.5	1.2			2.1
	1	1.8	0.0	3.0	3.9	0.8	0.0	5.2	1.7	0.2	0.0	1.9
	2	1.8	0.0	3.4	4.0	1.0	0.0	5.5	1.6	0.3	0.0	2.0
	3	2.1	0.1	3.7	4.1	1.2	0.0	6.3	1.9	0.5	0.1	2.2
	4	2.6	0.1	3.6	4.3	1.2		5.8	1.8	1.7	0.2	2.7
	5	2.5	0.3	3.8	4.2	1.2	0.0	6.5	2.6	3.8	0.4	2.8
	Mean	2.1	0.1	3.4	4.1	1.0	0.0	5.5	1.8	1.3	0.1	2.3
Brown Trout	6	2.9	0.8	4.2	4.3	2.3	0.7	8.3	3.8			3.9
	1	3.4	0.9	4.4	4.3	2.3	0.6	9.7	4.5	2.6	0.2	3.6
	2	3.5	1.2	4.8	4.8	2.6	1.1	10.1	4.7	2.8	0.4	3.9
	3	3.9	1.4	5.4	5.0	3.1	1.4	11.6	5.6	4.0	1.0	4.6
	4	4.1	1.4	5.4	5.4	3.1		10.5	5.1	5.0	1.6	5.2
	5	4.4	1.8	5.9	5.3	3.3	2.1	11.8	5.9	6.6	2.8	5.5
	Mean	3.7	1.3	5.0	4.9	2.8	1.2	10.3	4.9	4.2	1.2	4.5
Common Shiner	6	53.2	67.2	54.2	34.8	46.0	43.9	62.5	57.2			49.8
	1	56.6	72.5	56.9	41.5	50.3	46.2	60.8	59.8	60.1	56.3	54.0
	2	60.5	75.4	59.1	50.7	52.6	53.0	62.8	60.5	63.9	58.9	57.7
	3	62.0	76.3	60.4	55.9	59.1	55.7	56.5	63.4	66.6	61.4	59.9
	4	63.1	76.4	60.3	61.9	62.0		60.5	65.2	67.8	62.2	62.8
	5	63.1	75.8	59.3	62.1	62.1	58.9	56.3	64.6	65.1	57.9	60.8
	Mean	59.8	73.9	58.4	51.2	55.4	51.5	59.9	61.8	64.7	59.3	57.7
Crook Chub	6	43.9	42.1	40.5	57.4	47.9	53.6	23.3	45.2			44.7
Creek Chub	1	39.4	34.8	37.7	58.0	48.4	54.3	18.1	38.3	48.8	45.0	43.6
	2	37.1	25.3	33.9	53.8	45.8	50.8	19.2	38.0	44.9	43.0	41.2
	3	30.9	24.9	29.4	47.8	42.9	49.1	13.7	29.0	34.1	36.5	35.3
	4	27.8	23.3	30.0	43.5	38.6		16.2	32.1	30.1	34.1	32.1
	5	25.9	18.9	26.9	40.4	38.4	43.9	14.9	26.7	21.2	28.9	30.2
	Mean	34.2	28.2	33.1	50.2	43.7	50.3	17.6	34.9	35.8	37.5	37.7
Largemouth Bass	6	4.8	2.4	8.0	17.5	15.4	12.4	1.1	4.4			9.8
	1	2.9	1.4	7.7	10.8	10.7	9.1	0.5	2.5	3.8	10.0	6.9
	2	2.5	0.3	7.2	6.9	8.7	5.4	0.5	1.8	2.7	8.3	5.2

				(%FTP							
							Year					
Species	Station	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	Mean
	3	1.2	0.3	5.8	3.7	4.2	3.6	0.2	0.5	1.4	6.5	3.2
	4	0.7	0.2	5.7	1.1	3.3		0.2	0.2	0.4	5.4	2.3
	5	0.5	0.0	5.1	1.5	2.6	2.1	0.1	0.2	0.1	4.7	2.1
	Mean	2.1	0.8	6.6	6.9	7.5	6.5	0.4	1.6	1.7	7.0	4.8
Pumpkinseed	6	9.8	5.4	10.0	30.1	22.1	21.0	3.6	9.4			16.0
	1	6.3	3.9	9.7	21.6	18.9	18.2	2.7	5.6	8.1	18.1	12.9
	2	5.2	2.2	8.7	14.9	16.0	14.2	2.3	5.9	8.0	14.0	10.5
	3	2.9	2.1	8.2	9.0	10.2	9.7	0.7	2.2	3.1	9.8	6.6
	4	2.1	2.0	8.2	5.3	7.7		0.9	2.5	2.4	9.1	5.2
	5	1.6	1.6	7.8	5.7	6.3	5.5	0.6	1.0	0.8	6.8	4.3
	Mean	4.7	2.9	8.8	14.4	13.5	13.7	1.8	4.4	4.5	11.6	9.0
Rainbow Darter	6	32.7	32.2	31.0	12.9	25.4	23.7	52.3	31.5			29.5
	1	37.8	38.4	34.7	15.9	28.1	25.6	60.5	37.5	29.1	29.4	32.6
	2	41.7	49.7	38.2	21.0	32.5	28.8	57.5	36.8	31.4	31.9	34.8
	3	47.1	49.9	43.6	27.9	38.4	33.7	62.3	45.2	42.5	42.7	42.0
	4	50.1	51.5	43.3	31.9	41.1		62.2	43.7	46.5	46.8	45.1
	5	52.1	55.6	45.7	35.6	42.9	37.4	63.2	49.0	54.7	52.3	47.6
	Mean	43.6	46.2	39.4	24.2	34.7	29.8	59.7	40.6	40.8	40.6	38.9
Rock Bass	6	43.9	42.1	40.5	57.4	47.9	53.6	23.3	45.2			44.7
	1	39.4	34.8	37.7	58.0	48.4	54.3	18.1	38.3	48.8	45.0	43.6
	2	37.1	25.3	33.9	53.8	45.8	50.8	19.2	38.0	44.9	43.0	41.2
	3	30.9	24.9	29.4	47.8	42.9	49.1	13.7	29.0	34.1	36.5	35.3
	4	27.8	23.3	30.0	43.5	38.6		16.2	32.1	30.1	34.1	32.1
	5	25.9	18.9	26.9	40.4	38.4	43.9	14.9	26.7	21.2	28.9	30.2
	Mean	34.2	28.2	33.1	50.2	43.7	50.3	17.6	34.9	35.8	37.5	37.7
White Sucker	6	59.1	69.0	57.1	52.3	54.7	56.2	43.5	59.9			54.0
	1	57.9	66.1	55.5	57.5	56.1	58.4	38.1	58.2	66.7	60.3	56.4
	2	56.9	58.3	52.8	61.7	55.4	61.1	35.8	57.6	64.1	59.3	56.0
	3	53.9	58.3	49.7	62.7	56.1	61.6	32.2	55.3	58.5	54.7	53.9
	4	51.3	57.2	50.0	62.7	57.0		33.6	54.8	54.0	49.7	51.7
	5	49.3	52.3	47.1	59.1	55.0	61.6	33.4	53.8	49.0	46.1	50.6
	Mean	55.8	60.2	52.0	59.3	55.7	59.8	36.1	56.6	58.5	54.0	53.8

				9	6>UILT							
							Year					
Species	Station	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	Mean
Blacknose Dace	6	1.0	0.0	4.7	2.2	4.3	2.0	0.0	0.0			2.2
	1	0.4	0.0	3.8	0.3	2.3	1.5	0.0	0.0	0.0	2.0	1.2
	2	0.2	0.0	2.8	0.0	1.4	1.0	0.0	0.0	0.0	1.6	0.9
	3	0.0	0.0	1.9	0.0	0.3	0.6	0.0	0.0	0.0	1.1	0.5
	4	0.0	0.0	1.9	0.0	0.0		0.0	0.0	0.0	0.8	0.4
	5	0.0	0.0	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.3
	Mean	0.3	0.0	2.8	0.4	1.4	1.0	0.0	0.0	0.0	1.2	0.9
Bluntnose Minnow	6	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0			0.0
	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mean	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brook Trout	6	17.8	9.9	18.4	42.0	33.6	33.7	7.9	17.7			25.6
	1	13.6	7.1	15.9	34.5	27.7	29.1	4.9	11.6	17.1	25.4	20.8
	2	10.8	5.0	13.9	26.3	24.4	23.7	3.5	11.2	15.5	23.7	17.8
	3	7.3	4.8	11.5	17.8	17.1	19.3	3.1	7.2	9.8	17.8	13.0
	4	5.1	4.5	11.5	12.4	13.1		3.4	7.0	6.8	15.4	9.9
	5	4.1	3.9	10.5	11.2	13.3	13.0	2.9	5.3	4.5	13.3	9.3
		9.8	5.9	13.6	24.0	21.5	23.8	4.3	10.0	10.7	19.1	15.8
Brown Trout	6	16.7	9.1	17.7	40.6	32.0	31.7	7.0	15.6			24.1
	1	12.9	6.5	15.4	32.9	26.6	27.5	4.9	11.6	17.1	25.4	20.2
	2	9.7	4.6	13.1	24.7	23.6	22.5	3.5	10.0	13.9	21.6	16.6
	3	6.4	4.4	11.2	16.5	16.3	18.4	2.2	5.3	7.0	14.8	11.5
	4	4.5	4.3	11.3	11.0	12.4		2.9	6.0	5.6	14.2	9.1
	5	3.7	3.4	10.1	10.3	12.5	12.1	2.8	4.8	4.5	13.3	8.8
	Mean	9.0	5.4	13.1	22.7	20.6	22.4	3.9	8.9	9.6	17.9	14.8
Common Shiner	6	0.0	0.0	1.3	0.0	0.2	0.5	0.0	0.0			0.3
	1	0.0	0.0	0.7	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.1
	2	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ore als Obush	Mean	0.0	0.0	0.4	0.0	0.0	0.1	0.0	0.0	0.0	0.1	0.1
Сгеек Спир	6	0.6	0.0	3.6	0.6	2.9	1.5	0.0	0.0			1.4
	1	0.0	0.0	2.5	0.2	1.2	0.9	0.0	0.0	0.0	1.0	0.7
	2	0.0	0.0	2.0	0.0	0.4	0.4	0.0	0.0	0.0	0.9	0.5
	3	0.0	0.0	1.2	0.0	0.0	0.1	0.0	0.0	0.0	0.7	0.3
	4	0.0	0.0	1.2	0.0	0.0		0.0	0.0	0.0	0.4	0.2
	5	0.0	0.0	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Largomouth Pass	Mean	0.1	0.0	1.9	0.1	0.8	0.6	0.0	0.0	0.0	0.6	0.5
	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0
	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

				9	6>UILT							
							Year					
Species	Station	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	Mean
	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mean	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pumpkinseed	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0
	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mean	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rock Bass	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0
	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mean	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
White Sucker	6	0.0	0.0	5.7	6.5	7.3	4.3	0.0	0.4			4.0
	1	0.0	0.0	5.0	3.4	4.7	2.9	0.0	0.0	0.3	3.8	2.5
	2	0.0	0.0	4.6	1.2	3.5	2.0	0.0	0.0	0.2	3.1	1.8
	3	0.0	0.0	3.8	0.2	1.0	1.3	0.0	0.0	0.0	2.2	1.1
	4	0.0	0.0	3.8	0.0	0.5		0.0	0.0	0.0	1.7	0.9
	5	0.0	0.0	3.0	0.0	0.5	0.6	0.0	0.0	0.0	1.4	0.7
	Mean	0.0	0.0	4.3	1.9	2.9	2.2	0.0	0.1	0.1	2.4	1.8

				Q	%>Ctmax	[
_							Year					
Species	Station	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	Mean
Blacknose Dace	6	0.0	0.0	1.7	0.1	0.3	0.7	0.0	0.0			0.5
	1	0.0	0.0	0.9	0.0	0.0	0.1	0.0	0.0	0.0	0.3	0.2
	2	0.0	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mean	0.0	0.0	0.5	0.0	0.1	0.2	0.0	0.0	0.0	0.1	0.1
Bluntnose Minnow	6	0.0	0.0	2.1	0.2	0.9	0.8	0.0	0.0			0.7
	1	0.0	0.0	1.3	0.0	0.2	0.4	0.0	0.0	0.0	0.5	0.3
	2	0.0	0.0	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2
	3	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mean	0.0	0.0	0.7	0.0	0.2	0.2	0.0	0.0	0.0	0.2	0.2
Brook Trout	6	0.4	0.0	3.3	0.4	2.3	1.3	0.0	0.0			1.2
	1	0.0	0.0	2.2	0.2	0.6	0.9	0.0	0.0	0.0	1.0	0.6
	2	0.0	0.0	1.7	0.0	0.4	0.4	0.0	0.0	0.0	0.8	0.4
	3	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2
	4	0.0	0.0	0.9	0.0	0.0		0.0	0.0	0.0	0.1	0.1
	5	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	Mean	0.1	0.0	1.6	0.1	0.6	0.5	0.0	0.0	0.0	0.4	0.4
Brown I rout	6	1.3	0.0	5.0	3.8	5.2	2.6	0.0	0.0			2.8
	1	0.6	0.0	4.4	1.2	3.1	1.8	0.0	0.0	0.0	3.1	1.7
	2	0.5	0.0	3.7	0.2	2.2	1.4	0.0	0.0	0.0	2.2	1.2
	3	0.0	0.0	2.5	0.0	0.4	0.8	0.0	0.0	0.0	1.1	0.6
	4	0.0	0.0	2.4	0.0	0.3		0.0	0.0	0.0	1.2	0.6
	5	0.0	0.0	2.0	0.0	0.1	0.2	0.0	0.0	0.0	1.0	0.4
Common Chinor	Mean	0.4	0.0	3.3	0.9	1.9	1.4	0.0	0.0	0.0	1.7	1.2
Common Shiner	6	0.0	0.0	0.4	0.0	0.0	0.0	0.0	0.0			0.1
	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Creek Chub	Mean	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CIEER CIUD	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0
	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Largemouth Bass	Mean	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Largemouth Dass	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0

				c	%>Ctmax	(
							Year					
Species	Station	2015	2014	2013	2012	2011	2010	2009	2008	2007	2006	Mean
	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mean	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pumpkinseed	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0
	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mean	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rainbow Darter	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0
	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mean	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rock Bass	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0
	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mean	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
White Sucker	6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			0.0
	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	4	0.0	0.0	0.0	0.0	0.0		0.0	0.0	0.0	0.0	0.0
	5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Mean	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0





Biological Monitoring





GUIDING SOLUTIONS IN THE NATURAL ENVIRONMENT

2015 Biological Monitoring Program Nestlé Waters Canada Aberfoyle Property

Prepared For:

Nestlé Waters Canada

Prepared By:

Beacon Environmental C. Portt & Associates

Date: Project:

February 2016 214122



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1. Introduction

Beacon Environmental Limited (Beacon) and C. Portt and Associates were retained by Nestlé Waters Canada to undertake terrestrial and aquatic monitoring at the company's Aberfoyle property located 101 Brock Road South in Township of Puslinch (**Figure 1**). The biological monitoring program for the property was initiated in 2007 as a condition of a Ministry of Environment and Climate Change (MOECC) Permit To Take Water (PTTW) (#7043-74BL3K) for the onsite wells that service their bottling operations. Biological monitoring remains a condition of the current PTTW (#1381-95ATPY).

PTTW Condition 4.4 states:

"The Permit Holder shall undertake wetland monitoring and redd surveys as recommended in "2010 Biological Monitoring Program Final Report" by C. Portt and Associates dated January 28, 2011. Results from the wetland and redd surveys shall be submitted to the Director as a part of the annual monitoring report..."

*Note: Authorship of the 2010 report should be attributed to Dougan & Associates.

The objectives of the biological monitoring program are to:

- 1. Characterize existing aquatic, wetland and terrestrial resources; and
- 2. Document potential long-term changes to the site's biological resources

Baseline biological conditions on the property were determined between 2007 and 2009 and fulfilled the first objective. To achieve the second objective, there has been ongoing biological monitoring with annual reports submitted to the MOECC as per the PTTW conditions.

Since 2007, the following types of terrestrial and aquatic surveys were completed on the subject property:

- Electrofishing surveys of Aberfoyle Creek
- Fish spawning (redd) surveys of Aberfoyle Creek
- Ecological Land Classification (ELC)
- Vascular plant surveys
- Permanent vegetation monitoring plot surveys
- Amphibian call survey
- Breeding bird surveys
- Odonate (dragonfly/damselfly) surveys
- Owl surveys
- Turtle surveys
- Marsh surveys (assessment of surface hydrology)
- Invasive species mapping Common Reed

A summary of the various surveys is presented in Table 1.



		Aquat	ic		Veg	etatior	١				Wildlif	e		
Year	Electrofishing	Habitat characterization	Spawning (<i>i.e.</i> Redd) surveys	Ecological Land Classification (ELC) mapping	ELC updates	Permanent plot sampling	Marsh surveys	Invasive species mapping	Nocturnal amphibian call monitoring	Breeding bird monitoring	Breeding bird surveys	Owl surveys	Basking Turtle surveys	Odonate surveys
2007			Х	Х		-								
2008	Х		Х	Х	Х	Х			Х	Х	Х			
2009		Х	Х	Х	Х		Х	Х	Х	Х	Х			
2010			Х			Х	Х	Х	Х	Х	Х	Х	X	Х
2011			Х				Х	Х	Х	Х	Х	Х	X	Х
2012			Х										X	Х
2013			Х			Х	Х	X						
2014			Х			Х								
2015									Х		Х		X	

Table 1. Summary of Biological Monitoring Program (2007-2015)

The 2014 Biological Monitoring Program Report (Beacon 2015) recommended that the following monitoring activities be undertaken in 2015:

- 1. Salmonid spawning surveys in Aberfoyle Creek
- 2. Core wildlife monitoring (amphibian, reptiles and birds)

These recommendations were implemented in 2015. C. Portt and Associates completed salmonid spawning surveys and Beacon completed wildlife monitoring, including amphibian (frog), reptile (turtle), and breeding bird surveys. This report presents the methodology and findings of the 2015 biological monitoring program and compares the 2015 data with previous year's data to assess potential long-term changes to species assemblages or diversity.

2. Methods

2.1 Field Data Collection

2.1.1 Aquatic Survey

C. Portt and Associates surveyed Aberfoyle Creek for evidence of Brown Trout (*Salmo trutta*) or Brook Trout (*Salvelinus fontinalis*) spawning, from its confluence with Mill Creek upstream to the limit of the Nestlé property (**Figure 2**), on October 26 and November 16, 2015. On these dates, the entire reach of the creek was walked and searched for areas of disturbed substrate that could be indicative of salmonid spawning. The locations of any observed spawning sites was noted.













2.1.1 Amphibian Surveys

Amphibian call surveys were undertaken to document the diversity and abundance of frog and toad populations associated with the subject property. Because, there is variation in the breeding periods for different frog and toad species; surveys were completed at three different periods between April and June to ensure coverage of the full range of early to late breeding species.

Call surveys were performed on April 13, May 15, and June 23, 2015 using the standard survey protocols of the Marsh Monitoring Program (MMP) (Bird Studies Canada 2009). On each occasion, the subject property was visited at least ½ hour after sunset during suitable weather conditions to listen for calling frogs and toads using three (3) permanent monitoring stations that were established in 2008. The locations of amphibian monitoring stations are illustrated in **Figure 2**. Amphibians observed or heard calling in other locations on the property were also recorded as incidental observations.

Weather conditions (i.e., air temperature, precipitation, wind speed, and cloud cover) at the time of survey were recorded (see **Table 2**). Surveys were conducted using the point count method whereby the surveyor stands at a set point or station for a specific period of time and records all species that can be heard calling within the sample area. A minimum of three minutes was spent listening at each station. The approximate locations of calling amphibians were noted on a standard MMP data sheet and chorus activity for each species was assigned a call code as follows:

- 0 no calls;
- 1 individuals of one species can be counted, calls not simultaneous;
- 2 calls of one species simultaneous, numbers can be reliably estimated; and,
- 3 full chorus, calls continuous and overlapping, individuals indistinguishable.

	Survey 1	Survey 2	Survey 3
Date:	April 13, 2015	May 15, 2015	June 23, 2015
Start time:	21:35	21:10	21:35
Temp (°C):	8°C	15°C	20°C
Wind (km/h):	0 km/h	0 km/h	0-10 km/h
Cloud cover (%):	50 %	50 %	100 %
Precipitation	None	None	None

Table 2. Amphibian Survey Details

2.1.2 Breeding Bird Surveys

Breeding bird surveys were undertaken in 2015 by Beacon to document the diversity and abundance of avian populations associated with the subject property. Previous surveys were completed in 2008, 2009, 2010 and 2011 by Dougan & Associates. There are five (5) permanent point count stations on the subject property that were originally established in 2008 and selected to provide coverage for the majority of the property. Each point count station is positioned so the observer can detect calling birds



up to a distance of 125 m. The locations of the point count stations are illustrated in **Figure 2**. A handheld GPS was used to locate the plots.

A modified point count methodology was utilized to complete breeding bird surveys, based on protocols established for the Ontario Breeding Bird Atlas for point counts (Cadman *et al.* 2007), Forest Bird Monitoring Program (CWS, 2009) and a standard method recommended for monitoring songbird populations in the Great Lakes Region (Howe *et al.* 1997). A detailed description of the modified approached utilized to complete these surveys is included below:

- Although acceptable dates to complete breeding bird surveys under the Ontario Breeding Bird Atlas are between May 24 and July 10 for southern Ontario (Cadman *et al.* 2007), it iss recommended that both surveys be completed in June to maximize survey success by reducing the probability of recording late spring migrants and avoids detection of declining song output. It is recommended that the first survey be scheduled between June 1st and June 17th and the second be scheduled between June 13th and June 30th.
- Surveys should be conducted a minimum of one week apart (CWS 2009).
- Point count stations will be at least 250 m apart (Howe et al. 1997 & CWS 2009).
- Since the Nestlé Waters Canada property in Aberfoyle is relatively small, a randomized site selection approach will not be required. The majority of natural features are covered by the 5-point count station survey areas.
- Survey duration for each point count will be 10 minutes, consistent with the Forest Bird Monitoring Program (CWS 2006) and Howe *et al.* (1997) and will not be restricted to forested habitats.
- The location of each individual adult bird will be recorded on a field sheet as per the layout and symbols used by the Forest Bird Mapping Protocol (CWS 2006) or Howe *et al.* (1997). Bird flying overhead (i.e. not directly associating with the survey area) or otherwise not showing any breeding evidence will be distinguished from the other breeding birds.
- Observations recorded on the field maps will be transferred into a summary table. All birds observed or heard within suitable habitat were assumed to be breeding.
- Breeding evidence is to be documented according to the Ontario Breeding Bird Atlas protocols (Cadman *et al.* 2007).

Birds that were observed between the point count surveys were noted separately on a field map to help ensure that no bird species present on the property were missed as the point count circles do not completely cover the entire property.

	Survey 1	Survey 2
Date:	June 4, 2015	June 25, 2015
Start time:	5:50	6:00
End Time	8:15	8:00
Temp (°C):	10°C	17°C
Wind (km/h):	0 km/h	0 – 5 km/h
Cloud cover (%):	0%	50%
Precipitation	None	None

Table 3. Breeding Bird Survey



2.1.3 Basking Turtle Survey

The subject property is known to support populations of Midland Painted Turtle (*Chrysemys picta marginata*) and Snapping Turtle (*Chelydra serpentina*). Snapping Turtle was assigned "Special Concern" status in Canada in 2008 and Ontario in 2009. Snapping Turtle was observed in the large pond near the western property boundary in 2008. As a result of this observation, basking turtle surveys were initiated in 2010 to determine the level of use of this habitat by Snapping Turtle; however no Snapping Turtles were observed in 2010.

Three basking turtle surveys were recommended to be completed in 2015 with a focus on the large pond near the western property boundary. Basking surveys were completed in the spring and fall of 2015. The surveys consisted of slowly travelling along the outer edge of the pond using binoculars to scan its entire perimeter and any other potential basking sites. Surveys were completed between 8:00 am and 5:00 pm during sunny periods when the air temperature was greater than 10°C. Where possible, surveys were completed when air temperature is higher than water temperature and after inclement weather. Brief surveys of the other ponds on the subject property were also completed at the time of this survey. Details of these surveys, including weather conditions are included in **Table 4**.

	Survey 1	Survey 2	Survey 3
Date:	April 17, 2015	April 30, 2015	25-Sep-15
Start time:	13:00	13:30	14:30
End time:	14:20	15:00	15:45
Temp (°C):	20 °C	19°C	22 °C
Wind (km/h):	6-19 km/h	3-11 km/h	3-11 km/h
Cloud cover (%):	10%	50%	0%
Precipitation	None	None	None

Table 4. Basking Turtle Survey Details

3. Results

3.1 Aquatic Survey

No evidence of salmonid spawning was observed in 2015. This is consistent with the 2007 – 2014 results for this reach of Aberfoyle Creek.

3.2 Breeding Amphibians

A total of six frog species were recorded on the subject property during the amphibian monitoring. Species detected included Wood Frog (*Rana sylvatica*), Spring Peeper (*Pseudacris crucifer*), Gray



Tree Frog (*Hyla versicolor*), and Green Frog (*Rana clamitans*). Also two species of frog were incidentally documented while conducting the basking turtle surveys: American Bullfrog (*Lithobates catesbeianus*) and the Northern Leopard Frog (*Lithobates [Rana] pipiens*), both of which were observed along the edge of the large pond at the west end of the property. American Bullfrog is considered significant in Wellington County (D&A, 2008). Neither of these species were documented during the nocturnal amphibian call surveys.

The primary breeding areas on the property are: 1) the large pond at west end of the property and 2) the group of three small ponds/shallow aquatic features ("fire ponds") located just west of the parking lot. The general locations of calling frogs are illustrated in **Figure 3**.

The findings of the amphibian breeding surveys are summarized in **Table 5**. The 2015 amphibian breeding surveys are generally comparable to those of previous years (2008-2010). Spring Peeper, Gray Tree Frog, and Green Frog have all been observed consistently each monitoring year. Wood Frog, previously heard only in 2008, was detected again in 2015. Northern Leopard Frog was also observed on the property in 2010 but not documented during the nocturnal amphibian surveys. American Bullfrog has not been recorded on the property prior to this year.

Location (Figure 2)	Round 1 (April 13, 2015)	Round 2 (May 15, 2015)	Round 3 (June 23, 2015)				
1	0	0	0				
2	SPPE - 2(8) WOFR - 1(1)	SPPE - 2(7)	GRFR - 1(3) GRTR - 2(6)				
3	SPPE - 1(1) SPPE - 3 (in distance)	SPPE - 2(5) GRTR - 2(4)	GRTR - 2(6) GRFR - 1(5)				

Table 5. Breeding Amphibian Survey Results

SPPE = Spring Peeper, GRTR = Gray Tree Frog, WOFR = Wood Frog, GRFR = Green Frog

Code 0 – No calling

Code 1 - Individuals can be counted; calls not simultaneous. Estimated number of individuals indicated in brackets

Code 2 - Calls distinguishable; some simultaneous calling. Estimated number of individuals indicated in brackets

Code 3 - Full chorus; calls continuous and overlapping.

3.3 Breeding Birds

A total of 39 species of birds (**Appendix A**) were documented from and directly adjacent to the subject property in 2015. Thirty-four (34) of the species detected exhibited evidence of breeding and are considered to be breeding on the subject property.

Species that were observed flying over or foraging over the property, but not considered to be breeding on the property included: Killdeer (*Charadrius vociferous*), Ring-billed Gull (*Larus delawarensis*), Caspian Tern (*Sterna caspia*), Tree Swallow (*Tachycineta bicolor*) and Barn Swallow (*Hirundo rustica*). These species were either observed flying overhead or were using the property to forage (e.g. swallow species).

Of the 34 species that exhibited breeding evidence, there is one species that has conservation status. Eastern Wood-Pewee (*Contopus virens*) is considered a 'Species at Risk' in Canada (COSEWIC

	Date Species 13-Apr-15 15-May-15 23-Jun-15 WOFR 1(1) 0 0 SPPE 2(5) 2(7) 0 GRTR 0 2(6) 0 GRFG 0 0 1(3)	Date Species 13-Apr-15 WOFR 1(1) SPPE 2(3)	A REAL ROAD
Date Species 13-Apr-15 SPPE 3(N/A)	Date Species 23-Jun-15 GRTR 2(6)		
Date Species 13-Apr-15 15-May-15 23 SPPE 1(1) 2(5) 24 GRTR 0 2(4) 24 GRFR 0 0 0	3 3-Jun-15 0 2(6) 1(5)		





2015) and Ontario (MNRF 2015). This species is designated Special Concern. No other species are designated as Special Concern, Threatened or Endangered. All had a conservation rank of S5 (Secure) or S4 (Apparently Secure) (NHIC 2015).

Four (4) of the 34 species showing breeding evidence are considered to be "priority landbird species" in Bird Conservation Region (BCR) 13, the Lower Great Lakes – St. Lawrence Plain (OPIF 2008). Species include:

- 1. Eastern Wood-Pewee (Contopus virens)
- 2. Eastern Kingbird (Tyrannus tyrannus)
- 3. Willow Flycatcher (Empidonax traillii)
- 4. Rose-breasted Grosbeak (Pheucticus Iudovicianus)

Two Eastern Wood-Pewee were documented in the forest at breeding bird survey point 5 near the north west corner of the property. One Eastern Kingbird was documented along the edge of the pond south of breeding bird survey point 1 near the south east corner of the property. One Willow Flycatcher was documented along the edge of the pond south east of the main building access. One Rose-breasted Grosbeak was documented along the edge of the forest north of breeding bird survey point 4.

Seven of the 34 breeding bird species are considered significant in Wellington County (D&A 2008). Species included:

- 1. Hairy Woodpecker (*Picoides villosus*)
- 2. Northern Flicker (*Colaptes auratus*)
- 3. Willow Flycatcher (Empidonax traillii)
- 4. Red-breasted Nuthatch (Sitta canadensis)
- 5. Black-and-white Warbler (*Mniotilta varia*)
- 6. American Redstart (Setophaga ruticilla)
- 7. Rose-breasted Grosbeak (Pheucticus Iudovicianus)

Two Hairy Woodpeckers were documented in the forest at breeding bird survey station # 2 on the eastern half of the property. A single Northern Flicker and a single Red-breasted Nuthatch were documented from breeding bird survey station # 5 near the north west corner of the property. A single Black-and-white Warbler was documented in the forest at breeding bird survey station # 2 on the eastern half of the property. Three American Redstarts were also documented on the eastern half of the property. One at breeding bird survey station # 1 and two at breeding bird survey station # 2.

Four of the 34 breeding bird species observed in 2015 are considered area-sensitive. These included:

- 1. Hairy Woodpecker (Picoides villosus)
- 2. Red-breasted Nuthatch (*Sitta canadensis*)
- 3. Black-and-white Warbler (*Mniotilta varia*)
- 4. American Redstart (Setophaga ruticilla)

Area-sensitive species require larger areas of suitable habitat in order to sustain their populations (OMNR 2000) and are therefore considered more sensitive to habitat loss and fragmentation. All four of these species are associated with the forested habitats on the site.



The results of this breeding bird survey are similar to the results of previous breeding bird surveys that were completed in previous years at the site. Differences in the results of these surveys can be attributed to minor variations in survey techniques, daily and annual species variations and the absence of an overall site survey, which was not considered necessary at this time.

3.4 Basking Turtle Survey

Three turtle surveys were conducted in 2015 under appropriate weather conditions, two in the early spring and one in the late fall. The majority of the survey focused on the large pond located near the western property boundary. Brief surveys of the other ponds on the property were also completed. The total number of turtles observed varied from 10 to 37 (**Table 6**).

Table 6. Basking Turtle Survey Results

	Survey 1 (April 17, 2015)	Survey 2 (April 30, 2015)	Survey 3 (Sept 25, 2015)
Midland Painted Turtle	36	34	10
Snapping Turtle	1	1	0

The majority of the turtles that were observed were Midland Painted Turtle (*Chrysemys picta*), which is not considered significant at the local (D&A 2009b), regional (Plourde et al. 1989), provincial (NHIC 2015) or national level (COSEWIC 2015).

One Snapping Turtle was observed during both spring surveys. This individual was observed swimming around the pond at or near the water surface, which is typically how snapping turtles sun themselves as they typically only leave the water to migrate between suitable habitats or to lay their eggs.

Both of these species have been observed in the large pond in previous years. The difference between the numbers of Midland Painted Turtles observed within the pond could be attributed to population fluctuations, survey techniques and the time of year at which the survey was completed. Turtle surveys are often most successful when air temperatures are higher than water temperatures because turtles are ectothermic and regulate their body temperature largely by exchanging heat with the surrounding environment; therefore, when air temperatures are higher than water temperatures turtles are more likely to leave the water to warm themselves which makes them easier to spot. Also surveys in the early spring are often more successful as the pond is not vegetated and provides less cover to impede detection. 2015 was also the first time that Snapping Turtle has been observed in this pond since the 2008 monitoring program. Many adult Snapping Turtles are known to migrate up to 3.9 km a year between ponds and nesting habitats. Therefore, the absence of this species from this pond between 2008 and 2015 could be attributed to turtles migrating between other suitable habitats in the area or variation in survey timing/effort.





4. Conclusions

This report describes the methods and summarizes the findings of aquatic and terrestrial monitoring completed during the 2015 season at Nestlé Waters Canada's property in Aberfoyle. All of the recommendations from the 2014 Monitoring Report (Beacon 2015) have been implemented during the 2015 monitoring season. Monitoring completed in 2015 season included spawning surveys in Aberfoyle Creek, nocturnal amphibian surveys, breeding bird surveys and basking turtle surveys.

Consistent with the recommended aquatic monitoring program, spawning surveys (i.e. redd surveys) were completed along Aberfoyle Creek in 2015. No evidence of salmonid spawning was observed in 2015, which is consistent with the 2007 – 2014 results for this reach of Aberfoyle Creek.

Three nocturnal amphibian surveys were completed 2015. Four frog species were recorded on the subject property during the amphibian monitoring, including Wood Frog, Spring Peeper, Gray Tree Frog, and Green Frog. Two additional species, Northern Leopard Frog and American Bullfrog were observed during basking turtle surveys. American Bullfrog is considered significant in Wellington County (D&A, 2008). None of the other species recorded are locally or regionally significant. Western Chorus Frog, which was recorded in 2008, was not heard in 2015. The 2015 nocturnal amphibian survey results were generally comparable to those in obtained in previous years.

Two breeding bird surveys were completed in 2015. Thirty-nine species of birds were recorded, thirtyfour of which were considered to be breeding on the property. These numbers were slightly lower than the number of birds that were recorded during the 2009 (forty 45 species of birds) and 2010 (48 species of birds) breeding bird surveys. This difference is not considered to be significant as it can likely be attributed to minor variations in survey techniques, daily and annual species variations and the absence of an additional overall site survey which completed during the 2009 and 2010 surveys but was not considered necessary during the 2015 surveys.

Three basking turtle surveys of the large pond near the western property boundary were completed in 2015. Two species were recorded during these surveys, Painted Turtle and Snapping Turtle. Thirtyseven Midland Painted Turtles were observed in the pond during the first spring survey. One Snapping Turtle was observed in the pond during both of the spring surveys. The number of Midland Painted Turtles observed in the pond was significantly higher than the number observed during the 2010 survey and likely indicates that the number of Midland Painted Turtles within the pond has increased. This increase in numbers could also partially be attributed to a variation in survey techniques and the time of year at which the survey was completed. The Snapping Turtle record within this pond was the first record since it was recorded during the 2008 monitoring program.

In summary, the results of the biological monitoring at the Aberfoyle property to date indicate that there have not been any significant changes to the terrestrial and aquatic monitoring parameters that could be attributable to changes in environmental factors such as site hydrology or hydrogeology. The data suggest that observed changes in species richness, abundance, and distribution are generally within those expected due to natural variation. The subject property continues to support high quality habitat for a diversity of wildlife.



5. Recommendations

Based on the review of the biological monitoring data, we recommend that the following biological monitoring activities be completed in 2016:

- 1. Salmonid spawning surveys in Aberfoyle Creek (C. Portt & Associates);
- 2. Core wildlife monitoring (amphibian, reptiles and birds) (2010 monitoring report recommended a regular monitoring update program with surveys completed 2 out of every 5 years);
- 3. Vegetation plot sampling; and
- 4. Monitoring Common Reed colonies.

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Appendix A

2015 Breeding Bird Monitoring Results





Appendix A

2015 Breeding Bird Monitoring Results

		Statua					Breeding Bird Monitoring Results											
				Status					June 4	l, 2015					June 2	5, 201	5	
Common Name	Scientific Name	National Species at Risk COSEWICª	Species at Risk in Ontario Listing ^b	Provincial breeding season SRANK⁰	Regional Status ^d	Area- sensitive (OMNR) [⊧]	PCS #1	PCS #2	PCS #3	PCS #4	PCS #5	Incidentals	PCS #1	PCS #2	PCS #3	PS #4	PCS#5	Incidentals
Canada Goose	Branta canadensis			S5								19						
Red-tailed Hawk	Buteo jamaicensis			S5													1	
Killdeer	Charadrius vociferus			S5			F											
Spotted Sandpiper	Actitis macularia			S5						1								
Ring-billed Gull	Larus delawarensis			S5			F										F	
Caspian Tern	Sterna caspia			S3	Y												F	
Downy Woodpecker	Picoides pubescens			S5							1						1	
Hairy Woodpecker	Picoides villosus			S5	Y	Α								2				
Northern Flicker	Colaptes auratus			S4	Y						1							
Eastern Wood-Pewee	Contopus virens	SC	SC	S4							2						1	
Willow Flycatcher	Empidonax traillii			S5	Y							1						
Great Crested Flycatcher	Myiarchus crinitus			S4						1	1				1		1	
Eastern Kingbird	Tyrannus tyrannus			S4	Y		1										1	1
Tree Swallow	Tachycineta bicolor			S4					F								F	
Barn Swallow	Hirundo rustica	THR	THR	S4								F		F				F
Blue Jay	Cyanocitta cristata			S5				1	1			1				1	1	
American Crow	Corvus brachyrhynchos			S5						1					1			
Black-capped Chickadee	Poecile atricapillus			S5				1	1		1			1				
Red-breasted Nuthatch	Sitta canadensis			S5	Y	Α											1	
American Robin	Turdus migratorius			S5			1		1	2	1	3	1	1			2	2
Gray Catbird	Dumetella carolinensis			S4					1			1			2	1	1	1
Cedar Waxwing	Bombycilla cedrorum			S5			1	2	F	1	F	1	2	1	1	1		



		Statua					Breeding Bird Monitoring Results											
Common Name		Status				June 4, 2015						June 25, 2015						
	Scientific Name	National Species at Risk COSEWICª	Species at Risk in Ontario Listing⁵	Provincial breeding season SRANK⁰	Regional Status ^d	Area- sensitive (OMNR) [⊧]	PCS #1	PCS #2	PCS #3	PCS #4	PCS #5	Incidentals	PCS #1	PCS #2	PCS #3	PS #4	PCS排5	Incidentals
European Starling	Sturnus vulgaris			SE									1			1	1	1
Warbling Vireo	Vireo gilvus			S5			1					2	1	1	1	ı'	1	1
Red-eyed Vireo	Vireo olivaceus			S5						1	3	1				1	1	<u> </u>
Yellow Warbler	Setophaga petechia			S5			1					2	1			i ,		1
Black-and-white Warbler	Mniotilta varia			S5	Y	А		1										
American Redstart	Setophaga ruticilla			S5	Y	A	1	3				2		1		í'		
Northern Waterthrush	Parkesia noveboracensis			S5						2	1	1					1	
Common Yellowthroat	Geothlyphis trichas			S5			1	1	1			2	1	2		'	1	2
Northern Cardinal	Cardinalis cardinalis			S5			1	1		1		2						1
Rose-breasted Grosbeak	Pheucticus ludovicianus			S4	Y											1		
Indigo Bunting	Passerina cyanea			S4													1	
Chipping Sparrow	Spizella passerina			S5									1					1
Song Sparrow	Melospiza melodia			S5			2	1	2		1	8	2	1	1	1	2	3
Swamp Sparrow	Melospiza georgiana			S5						1					[ا	<u> </u>	
Red-winged Blackbird	Agelaius phoeniceus			S4			5	1	1	1	3	11	8	1	2	1	4	2
Brown-headed Cowbird	Molothrus ater			S4			1									1		
American Goldfinch	Spinus tristis			S5			F	2	1		1	1		1	1	1	1	2

a - COSEWIC = Committee on the Status of Endangered Wildlife in Canada END = Endangered, THR = Threatened, SC = Special Concern

b - Species at Risk in Ontario List (as applies to ESA) as designated by COSSARO (Committee on the Status of Species at Risk in Ontario) END = Endangered, THR = Threatened, SC = Special Concern

c- SRANK (from Natural Heritage Information Centre) for breeding status if: S1 (Critically Imperiled), S2 (Imperiled), S3 (Vulnerable), S4 (Apparently Secure), S5 (Secure), SNA (Not applicable...'because the species is not a suitable target for conservation activities'; includes non-native species)

- d Dougan & Associates. 2008. Guelph Natural Heritage Strategy. Phase 2: Terrestrial Inventory & Natural Heritage System Updates. Volume 2 Appendices.
- e Ontario Ministry of Natural Resources (OMNR). 2000. Significant Wildlife Habitat Technical Guide (Appendix G). 151 p plus appendices.



Appendix B

2015 Breeding Bird Survey Field Sheets





Breeding Bird Station Mapping Card



CLASSIF	Y HABITAT	(within 10	00 m):					
Merred	Lown, C	oltural	Meoday,	Pond,	Marsh	Decid your	FOIPIT	
Late at	F traffir	noise						




Contescus Swanch Morsh





CLASSIFY HABITAT (within 100 m): Mixed/Coniferens Forest/Sump, Forest Edge, Pond









CLASSIFY HABITAT (within 100 m): Pond, Constereus/Mized Forest/Swarp







CLASSIFY HABITAT (within 100 m):

See Round #1 Notes





CLASSIFY HABITAT (within 100 m): See Round #1 Notes









CLASSIFY HABITAT (within 100 m): See Round #1 Notes





CLASSIFY HABITAT (within 100 m): See Rand # 1 Notes

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18 March 2016

Ms. Belinda Koblik, Director, Section 34, OWRA Ministry of the Environment, West Central Region Technical Support Section, Water Resources 12th Floor 119 King Street West Hamilton, ON L8P 4Y7

Re: Meadows of Aberfoyle - 2015 Annual Monitoring Report Permit to Take Water No. 5626-7WLQ3W

Dear Ms. Koblik,

On behalf of Wellington Vacant Land Condominium Corporation No. 147, enclosed is the Annual Monitoring Report in fulfilment of Conditions 4.1 to 4.5 of the above-referenced Permit to Take Water. This report presents the monitoring data required to comply with these conditions, as they apply to a communal water supply system for the Meadows of Aberfoyle residential development. This community is located in the southwest half of Lot 23, Concessions 7 and 8, Township of Puslinch, Wellington County.

I trust that the information provided herein meets the Permit requirements. Should you have any questions or comments, please contact me.

Respectfully submitted, Banks Groundwater Engineering Limited

William D. Banks, P.Eng. Principal Hydrogeologist

Encl.

Copies: Wellington Vacant Land Condominium Corporation No. 147 Township of Puslinch

BGE.86.151

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Figure 1 Project Site & Monitoring Location Map

Appendixes

Appendix A:	Permit to Take Water No. 5626-7WLQ3W and MOECC Approval for
	Modified Monitoring Program

- Appendix B: 2015 Daily Pumping Records for PW6 and PW7
- Appendix C: Water Taking Reporting System Confirmation for 2015
- Appendix D: Monitoring Program Graphs
- Appendix E: Monitoring Program Data

1 Introduction

The following annual monitoring report has been prepared to comply with Conditions 4.1 to 4.5 of Permit to Take Water (PTTW) Number 5626-7WLQ3W. This report presents the monitoring data required to comply with these conditions, as they apply to a communal water supply system for the Meadows of Aberfoyle residential development. This community is located in the southwest half of Lot 23, Concessions 7 and 8, Township of Puslinch, Wellington County. It comprises 55 building lots and has been considered fully occupied since May 2011. The location of the community, the two water supply wells serving the residents, and the groundwater and surface water monitoring stations are illustrated in the appended Figure 1.

Banks Groundwater Engineering Limited was retained in September 2012, by Wellington Vacant Land Condominium Corporation No. 147, to assume groundwater and surface water level monitoring and reporting responsibilities. This report is the seventh annual report submitted to meet the PTTW Monitoring Conditions. The PTTW, which expires on October 31, 2017, is included for reference in Appendix A. In January 2015 the Ministry of the Environment and Climate Change (MOECC) agreed to a reduction in the frequency of manual measurement and recording of groundwater levels at all monitoring stations from monthly to quarterly (i.e. January, April, July, and October). A subsequent confirmation of the same reduction for surface water levels was received in March 2015. A copy of the Memorandum from the MOECC confirming these reductions is included with the PTTW in Appendix A. Changes in the manual monitoring are described in this report.

2 PTTW - Monitoring Conditions

Reference is made under each of the following sections to the respective PTTW Conditions and is followed by the information required to comply with each Condition.

2.1 Condition 4.1 - Record of All Water Takings

In addition to the requirements imposed by Section 9 of O.Reg. 387/04, and as authorized by Subsection 34(6) of the Ontario Water Resources Act, the Permit Holder shall do the following: maintain a record of all water takings that includes the date, times, rates and total measured amounts of water pumped per day for each day that water is taken under the authorization of this Permit; keep all required records current and available at or near the site of the taking; and produce those records for the inspection of a Provincial Officer immediately upon his or her request. A separate record shall be maintained for each source. The total amounts of water pumped from each well shall be measured using a calibrated flow device that shall be installed on each well prior to the commencement of the water taking.

During 2015 (and all previous years), wells PW6 and PW7 were the only wells pumped. Wells PW2 and PW5 are not equipped with pumps and serve only as bedrock observation wells. Water takings from PW6 and PW7 are measured using totalizing flow meters and recorded electronically as per Condition 4.1. The daily volume pumped data have been provided to Banks Groundwater Engineering for the purposes of reporting. The daily pumping records are presented in Table B1, Appendix B. These daily water takings have been reported to the Ministry of Environment and Climate Change (MOECC) using the on-line Water Taking Reporting System. A record of this reporting is included in Appendix C. The daily pumping data are presented in Graphs 1 and 2 in Appendix D. The total combined daily volume pumped is presented concurrently with the total daily precipitation in Graph 3, Appendix D.

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1

The precipitation data was obtained from Environment Canada recorded at the Region of Waterloo International Airport Meteorological Station (WMO ID 71368). This station was selected due to its' proximity to the Aberfoyle site and availability of total daily precipitation and maximum daily air temperature data. The daily volume pumped and precipitation data are included in selected subsequent graphs to assist in the interpretation of groundwater and surface water level responses and trends.

A summary of the annual pumping data is presented below in Table 1. The maximum allowable taking from each well for any day is 785,000 Litres. As shown in Table 1, the maximum amount pumped in one day during 2015 from PW6 was 144,900 Litres and from PW7 was 202,400 Litres, which is much less than the maximum permitted daily taking.

Year	Maximum Da	ay (Litres)	Minimum Day* (Litres)			
	PW6	PW7	PW6	PW7		
2008	61,866	49,400	294	154		
2009	61,100	50,900	2,500	3,100		
2010	20,900	118,400	100	6,500		
2011	82,700	273,300	100	5,100		
2012	136,000	185,100	8,400	7,000		
2013	85,200	113,000	10,100	6,800		
2014	109,600	114,000	400	600		
2015	144,900	202,400	100	100		

Table 1: Summary of Annual Pumping Data

* Minimum non-zero taking

It has been previously reported that the water pumping and distribution system is controlled in a manner that wells PW6 and PW7 are not pumped simultaneously. The wells are pumped on an alternating basis. This arrangement complies with Condition 3.3 of the PTTW.

2.2 Condition 4.2 - Groundwater Monitoring Program

The Permit Holder shall conduct the following groundwater monitoring program as soon as 50 % occupancy is achieved:

1) Monitor the water levels as follows:

a) Monthly measurements at the following wells:

i) On-site overburden wells MW8, MW9, MW10 and MW11

ii) On-site bedrock wells PW6, PW2 and PW5

iii) Domestic off-site wells Leachman and Pond (with permission of the owners)

b) At a frequency of once per hour at the following wells:
 i) On-site bedrock well PW7
 ii) Off-site domestic wells Heuther and Howlett (with permission of the owners)

2) Establish a 3-month baseline database as a minimum, prior to the water taking.

2.2.1 Quarterly Groundwater Monitoring (Manually-Recorded)

In January 2015, the MOECC agreed to a reduction in the frequency of manual measurement and recording of groundwater levels at all monitoring stations. Manual measurements were reduced from monthly to quarterly. Therefore, during 2015, measurements of groundwater levels were taken and recorded in all of the listed wells in January, April, July, and October. The only exception was the Leachman domestic off-site well. The owner of this domestic well no longer wishes to be included in the monitoring program. The 2015 manually-recorded groundwater levels (i.e. for monitoring wells and

domestic wells not equipped with data loggers) are summarized in Table 2. The groundwater level data for these eight wells, from 2007 through 2015, is presented in Graphs 4 to 7 in Appendix D. A complete set of groundwater levels is presented in Table E1, Appendix E.

All overburden monitored wells (i.e. MW8-MW11) exhibited similar groundwater level trends during 2015. Higher water levels were observed in April and July. The lowest levels were observed in January and October. Groundwater levels in the bedrock monitored wells (i.e. PW2, PW5 and Pond) and production well PW6 were highest in January and April, then declined to the lowest in July, and rose through the fall, which is interpreted to be in response to rainfall events in September and October.

 Table 2: 2015 Quarterly Groundwater Levels for Monitoring and Domestic Wells

 for Condition 4.2

Date	MW8	MW9	MW10	MW11	PW6	PW2	PW5	Pond
21-Jan	5.34	3.05	1.71	1.85	13.35	6.55	11.47	2.37
22-Apr	4.19	2.66	1.23	1.70	14.18	6.44	11.73	1.99
8-Jul	4.22	2.73	1.31	1.71	15.20	6.62	12.58	2.31
7-Oct	5.49	3.10	1.72	1.93	14.31	6.83	11.78	2.62

Note: All readings are metres below top of well casing

A comparison of 2015 manually-recorded groundwater level data to historical data is presented in Table 3, including maximum (highest), minimum (lowest), range, and average values.

	2007	-2014 Gro	undwater l	evels	2015 Groundwater Levels			
Well	High	Low	Range	Average	High	Low	Range	Average
MW8	3.31	6.00	2.69	4.51	4.19	5.49	1.30	4.81
MW9	2.47	3.41	0.94	2.83	2.66	3.10	0.44	2.89
MW10	1.08	2.24	1.16	1.61	1.23	1.72	0.49	1.49
MW11	1.25	2.20	0.95	1.81	1.70	1.93	0.23	1.80
PW6	11.71	17.34	5.63	13.99	13.35	15.20	1.85	14.26
PW2	5.88	7.97	2.09	6.57	6.44	6.83	0.39	6.61
PW5	9.68	14.86	5.18	11.60	11.47	12.58	1.11	11.89
Pond	1.72	2.82	1.10	2.24	1.99	2.62	0.63	2.32

 Table 3: Summary of Manually-Recorded Groundwater Levels - Historical vs. 2015

Note: All readings metres below top of well casing

Groundwater levels during 2015 fluctuated within the range of levels observed from 2007 through 2014. The greatest ranges in 2015 were observed in MW8, PW6, and PW5, which has been similar in previous years. There was only one new high groundwater level observed during 2015 (i.e. MW10) and no new low groundwater levels. Groundwater levels in bedrock wells PW6, PW2, and PW5 were relatively steady during 2015, compared with the previously-reported gradual increasing trend over the 2007 to 2014 period, as illustrated in Graphs 5 and 6 in Appendix D.

2.2.2 Hourly Groundwater Monitoring

During 2015, hourly groundwater levels were recorded with data loggers installed in the bedrock production well PW7 and the two off-site domestic wells Heuther and Howlett. Groundwater levels for these three wells recorded over the 2007 to 2015 period are presented in Graphs 8, 9, and 10 respectively in Appendix D. These graphs illustrate temporarily reduced groundwater levels in response to pumping of the respective wells (i.e. drawdown), and also confirm recovery of the levels following each pumping period.

Seasonal trends are exhibited by the highest water levels (i.e. static levels), which are similar to the manual measurements in the other monitored wells. The static groundwater levels in bedrock wells PW7 and Howlett did not continue to exhibit a gradual increasing trend that had been previously observed over the 2007 through 2014 period. The static groundwater levels in the Heuther well are remaining within the same narrow range, without trending upward. Groundwater levels in these wells during 2015 continued to be within the ranges observed during the previous eight years. A comparison of 2015 hourly groundwater level data to historical data (i.e. 2007 to 2014) is presented in Table 4, including maximum (highest), minimum (lowest), range, and average values.

	2007	-2014 Gro	undwater	Levels	2015 Groundwater Levels				
Well	High	Low	Range	Average	High	Low	Range	Average	
PW7	11.33	18.50	7.17	14.22	12.27	17.95	5.69	15.26	
Heuther	9.67	29.23	19.56	11.91	10.95	28.79	17.84	12.77	
Howlett	6.12	20.67	14.55	9.09	6.39	20.18	13.79	9.67	

Table	4:	Summary	of Hourly	Groundwater	Levels -	Historical	VS.	2015

Note: All readings metres below top of well casing

2.2.3 Baseline Database

The condition of a three-month baseline database was reported in previous annual monitoring reports. Groundwater level monitoring began on-site in April 2007 and occupancy began at the site in August 2007. As noted previously, this residential community comprises 55 building lots and has been considered fully occupied since May 2011.

2.3 Condition 4.3 - Surface Water Monitoring Program

The Permit Holder shall conduct the following surface water monitoring program as soon as 50% occupancy is achieved:

1) The Permit Holder shall monitor surface water levels at MP1, MP3, and MP4 on a continuous basis from April 1 to November 30 and manually at a frequency of monthly for December to March <u>for two years.</u>

2) The Permit Holder shall monitor piezometer water levels and hydraulic gradients at MP1, MP3, and MP4 on a continuous basis from April 1 to November 30 and manually at a frequency of monthly for December to March <u>for two years</u>. For the ease of analysis, discussions and interpretations in the annual monitoring report the minimum daily levels and the average hydraulic gradient may be used.

3) The Permit Holder shall measure surface water flows at MP3 and MP4 on a monthly basis.

2.3.1 Surface Water and Groundwater Monitoring at MP1, MP3, and MP4

Condition 4.3 states that surface water and groundwater monitoring should continue for a period of two years after 50% occupancy. The two-year mark was prior to May 2013. However, as agreed to with the MOECC, surface water and groundwater levels were recorded with data loggers at the locations of minipiezometers MP1, MP3, and MP4, during the period April 1 to November 30, 2015. Water levels were recorded on an hourly basis by each of the six data loggers. In March 2015 the MOECC agreed to a reduction in manual monitoring from monthly to a quarterly basis.

Frozen conditions were encountered in all mini-piezometers in January, February, and March. The quarterly surface water and groundwater levels recorded manually at the three mini-piezometer locations from April to October, as well as December are presented in Table 5. All monitoring data from 2007 through 2015, for mini-piezometers MP1, MP3, and MP4, is presented in Graphs 11, 12, and 13 respectively in Appendix D.

Banks Groundwater Engineering Limited

0.80

0.87

1.07

8-Jul

7-Oct

9-Dec

at MP1, M	P3, and MP4						
	M	P1	M	P3	MP4		
Date	SW	GW	SW	GW	SW	GW	
21-Jan	frozen	frozen	frozen	frozen	frozen	frozen	
22-Apr	0.77	0.79	0.18	0.17	0.54	0.25	

 Table 5: 2015 Manually -Recorded Surface Water and Groundwater Levels

 at MP1, MP3, and MP4

0.80

0.87

1.11

Note: All readings are metres below top of piezometer. The measuring points are the same for each pair of piezometers.

0.33

0.50

0.43

The surface water and groundwater levels for each of these piezometer stations are plotted for 2015 only along with the total daily precipitation recorded during 2015 in Graphs 14, 15, and 16. The surface water and groundwater levels for each of these piezometer stations are also plotted with the total daily pumping from PW6 and PW7 recorded during 2015 in Graphs 17, 18, and 19, in Appendix D.

0.38

0.59

0.47

0.63

0.76

0.72

0.33

0.40

0.35

The surface water and groundwater fluctuations observed at each mini-piezometer station reflect precipitation events and seasonal changes during 2015. At MP1 the levels increased sharply in early April as Mill Pond levels rose and declined from late-April to late May. Subsequent fluctuations are interpreted to be in response to precipitation events, as illustrated in Graph 14. Levels declined in mid-November to levels comparable to early April as Mill Pond levels reduced. There is no evidence that groundwater withdrawals from PW6 and PW7 had any effect on surface water and groundwater levels observed at MP1, as illustrated in Graph 17.

At MP3 (in Mill Creek) and MP4 (in Aberfoyle Creek) levels declined from high spring levels in mid-April to the end of May due to a lack of precipitation through this period. Rainfall events in June and early July caused notable rises in surface water and groundwater levels, which then declined through July during a period of no rainfall. Surface water and groundwater levels were lowest during September and recovered during October and November in response to numerous rainfall events. These observations are illustrated in Graphs 15 and 16. There is no evidence that groundwater withdrawals from PW6 and PW7 had any effect on surface water and groundwater levels observed at MP3 and MP4, as illustrated in Graphs 18 and 19.

A comparison of 2015 hourly surface water level, groundwater level, and hydraulic gradient data to historical data (i.e. 2007 to 2014) is presented in Table 6, including maximum (highest), minimum (lowest), range, and average values. The vertical hydraulic gradient between surface water and groundwater levels was calculated using a standard hydrogeologic method.

The data indicates that surface water and groundwater levels at MP1 and MP3 during 2015 were comparable to the previous seven years, as were the hydraulic gradients. At MP4 the groundwater and surface water levels during 2015 fluctuated within similar ranges to previous years, but the upward vertical hydraulic gradients varied within a narrower range.

The vertical hydraulic gradients at MP1, MP3, and MP4 are illustrated on an hourly basis for the period April 2007 to November 2015 in Graph 20, in Appendix D. The seasonal changes are shown in this graph, with the highest vertical hydraulic gradients of 2015 occurring through the spring. The vertical hydraulic gradients at MP4 were in a range that was higher than the previous three years. The hydraulic gradients at MP3 were downwards during much of 2015. At MP1 hydraulic gradients were close to zero over most of 2015.

The 2015 vertical hydraulic gradients at MP1, MP3, and MP4 are plotted in Graph 21, with the total daily precipitation recorded during 2015. The responses to precipitation events are illustrated by this graph.

Meadows of Aberfoyle - 2015 Annual Monitoring Report

Graph 22 illustrates the 2015 vertical hydraulic gradients at MP1, MP3, and MP4 and the total daily pumping from PW6 and PW7 recorded during 2015. Based on all of these graphs, there is no evidence from these data that pumping of PW6 and PW7 during 2015 had any effect on surface water and groundwater levels at each of the piezometer stations. It is interpreted that the most significant influence on water levels and vertical hydraulic gradients continues to be precipitation events and periods of little to no precipitation.

Table 6: Sum	nary of Hoເ	Irly Surface W	ater & Grour	idwater Leve	els, & Hydraulio	c Gradients
- Historical v	. 2015					
				-		

		2007-201 Hydraulic	4 Levels a Gradient	s s	2015 Levels & Hydraulic Gradients			
Well	High	Low	Range	Average	High	Low	Range	Average
MP1-SW	0.60	1.14	0.54	0.89	0.73	1.15	0.42	0.89
MP1-GW	0.59	1.40	0.81	0.91	0.72	1.11	0.39	0.89
MP1-HG	0.04	-0.05	0.09	-0.01	0.08	-0.06	0.14	0.00
MP3-SW	-0.20	0.75	0.95	0.47	-0.03	0.60	0.63	0.45
MP3-GW	-0.20	0.92	1.12	0.46	-0.09	0.76	0.85	0.50
MP3-HG	0.16	-0.21	0.37	0.00	0.09	-0.11	0.20	-0.03
MP4-SW	0.19	1.08	0.89	0.67	0.34	0.81	0.47	0.71
MP4-GW	-0.03	0.94	0.97	0.28	0.11	0.41	0.30	0.35
MP4-HG	0.38	-0.01	0.39	0.24	0.31	0.12	0.18	0.23

Note: All water level readings metres below top of piezometer casing; a positive vertical hydraulic gradient indicates movement of groundwater is upwards; a negative vertical hydraulic gradient indicates movement of surface water is downwards

2.3.2 Surface Water Flows at MP3 and MP4

Surface water flows were determined from measurements at culverts adjacent to MP3 and MP4. Mill Creek flows through a culvert passing under Wellington County Road 46 (i.e. Brock Road) up-gradient of MP3. Aberfoyle Creek flows through a culvert passing under Gilmour Road down-gradient of MP4. As of March 2015, the MOECC has agreed to a reduction in the monitoring of flows at each location from monthly to quarterly. The 2015 quarterly flow values (plus readings in December) for each location are summarized in Table 7.

Table 7: 2015 Surface Water Flows (m³/sec)at MP3 and MP4 for Condition 4.3

Date	MP3	MP4
21-Jan	0.20	0.09
22-Apr	0.70	0.18
8-Jul	0.38	0.15
7-Oct	0.16	0.06
9-Dec	0.23	0.10

Graphs 23 and 24 in Appendix D illustrate the surface water flows based on measurements at culverts near MP3 and MP4 respectively, for the period 2008 to 2015. A comparison of 2015 monthly surface water flows to historical data is presented in Table 8, including maximum (high), minimum (low), range, and average values. All surface water monitoring data is summarized in Table E2, Appendix E.

Culvert	2008-	-2014 Sur	face Wate	er Flow	2015 Surface Water Flow			
current	High	Low	Range	Average	High	Low	Range	Average
MP3	1.02	0.08	0.94	0.37	0.70	0.16	0.54	0.33
MP4	1.29	0.01	1.28	0.15	0.18	0.06	0.12	0.12

 Table 8: Summary of Surface Water Flows - Historical vs. 2015 (m³/sec)

The average flows observed at MP3 and MP4 during 2015 compared closely to the historical averages. However, the range in flows was narrower in 2015 at both locations when compared to the previous seven years of flow records. This has been observed in previous years and is considered to be due to higher flows observed during 2008, the first year of flow monitoring. There is no evidence from these data that pumping of PW6 and PW7 during 2015 had any effect on surface water flow at these monitoring stations.

2.4 Condition 4.4 - Water Conservation

In order to conserve and sustain the resource and address impacts on natural function during drought conditions, the Permit Holder shall comply with the measures required under each level of the City of Guelph's Outside Water Use By-Law, or any superseding water conservation by-law.

As previously reported, the condominium corporation representing Aberfoyle Meadows has established a water committee that advises residents to adhere to the City of Guelph's Outside Water Use By-Law, or any superseding water conservation by-law.

2.5 Condition 4.5 - Annual Report

Data collected under Conditions 4.2 and 4.3 shall be analyzed, interpreted and summarized in an annual report by a qualified consultant and submitted to the Director by March 31 of each year and shall include the monitoring for the 12-month period ending December 31 of the previous year. The report shall include the record of water taking and documentation of all well interference complaints, if any, and any other water supply activities. The report should provide recommendations on the need for changes to monitoring locations and frequency, pumping patterns and/or need for mitigation. However, the Permit Holder may only request approval for a reduction in the frequency of the monitoring requirements after having collected data for two years after the development has been fully occupied. Any such request shall be supported by the collected data and its interpretation. A copy of the report shall also be submitted to the Township of Puslinch.

2.5.1 Annual Report

The information and analyses presented in the previous sections, this section and the Appendixes fulfil the annual reporting requirements. The following is a summary of observations and analyses that support the conclusion that the Conditions of Permit to Take Water No. 5626-7WLQ3W have been met for 2015.

This residential community comprises 55 building lots and has been considered fully occupied since May 2011. The Permit Holder was therefore required to collect all data required by the Permit until at least May 2013, before approval for a reduction in frequency of the monitoring requirements could be requested. In 2015 the MOECC approved a reduction in the frequency of manual monitoring from monthly to quarterly (e.g. January, April, July, and October). This applies to all monitored locations.

In 2015, all pumping volumes and pumping rates were in compliance with the Permit. The maximum allowable taking from each well for any day is 785,000 Litres. The maximum amount pumped in one day during 2015 from PW6 was 144,900 Litres and from PW7 was 202,400 Litres, which is much less than the maximum permitted daily taking. These wells are pumped on an alternating basis, except during periods of maintenance when one well is taken off-line. Water levels measured in these pumped wells

indicated recovery to static levels following pumping periods, confirming the water takings are sustainable.

As in previous years, PW2 and PW5 were not pumped and remained as bedrock observation wells. Groundwater levels in these two wells and production well PW6 were highest in January and April, then declined to the lowest in July, and rose through the fall, which is interpreted to be in response to rainfall events in September and October. All overburden monitored wells (i.e. MW8-MW11) exhibited similar groundwater level trends during 2015. Higher water levels were observed in April and July. The lowest levels were observed in January and October.

Groundwater levels in the three monitored domestic wells (i.e. Pond, Heuther, and Howlett) showed no indication of interference related to pumping of PW6 and PW7. There were no well interference complaints received by the Permit Holder.

Surface water and groundwater level fluctuations measured at MP1, MP3, and MP4 located in Mill Pond, Mill Creek and Aberfoyle Creek respectively, continued to be the result of precipitation events and seasonal fluctuations. No fluctuations can be attributed to the pumping of PW6 and PW7. Similarly, flow measured in Mill and Aberfoyle Creeks varied throughout 2015. However, there is no evidence from the data that pumping of PW6 and PW7 has any effect on surface water flow at these monitoring stations.

2.5.2 Reduction in Manual Monitoring Frequency

On the basis of the observations and analyses presented in this report and the preceding six reports, it is concluded there is no evidence that pumping of PW6 and PW7 has any effects on off-site groundwater levels, surface water levels, and surface water flow at any of the respective monitoring stations.

With reference to Condition 4.5 of the PTTW, and as noted previously, the MOECC has confirmed that manual groundwater and surface water level monitoring and surface water flow monitoring can be reduced from monthly to quarterly (e.g. January, April, July, and October). It should be noted for those stations that are also monitored with data loggers, water levels will continue to be recorded hourly in the same manner as previous years. It is therefore recommended that the annual monitoring program for 2016 continue on this basis.

The current PTTW expires on October 31, 2017. At least 90 days prior to the expiry date, it will be necessary to apply for either an amended or a new Permit. It is recommended that the 2016 monitoring report be submitted in support of this application submitted to the MOECC. Based on the results and analyses of the surface water and groundwater monitoring conducted from 2007 through 2015, there does not appear to be any merit in continuing this monitoring program as a condition of an amended or a new Permit.

Respectfully submitted, Banks Groundwater Engineering Limited

William D. Banks, P.Eng. Principal Hydrogeologist





Appendix A

Permit to Take Water No. 5626-7WLQ3W MOECC Approval for Modified Monitoring Program

Banks Groundwater Engineering Limited

Ministry of the Environment and Climate Change West Central Region

119 King Street West 12th Floor Hamilton, Ontario L8P 4Y7 Tel.: 905 521-7640 Fax: 905 521-7820 Ministère de l'Environnement et de l'Action en matière de changement climatique Direction régionale du Centre-Ouest



119 rue King ouest 12e étage Hamilton (Ontario) L8P 4Y7 Tél. : 905 521-7640 Téléc, : 905 521-7820

March 10, 2015

MEMORANDUM

- TO: Belinda Koblik Direction, Sec 34, OWRA
- FROM: Rosa Stewart Hydrogeologist Technical Support Section, West Central Region

Sarah Day Surface Water Specialist Technical Support Section, West Central Region

RE: Meadows of Aberfoyle Permit to Take Water 5626-7WLQ3W Annual Monitoring Reports 2008-2013

We have reviewed the following documents for groundwater and surface water issues with regard to the taking of water, Puslinch, County of Wellington:

- Permit to Take Water 8228-97gXLE2 2008 Annual Monitoring Report, Waterloo Geoscience Consultants Ltd. (March 2009)
- 2009 Annual PTTW Monitoring Report (PTTTW No. 5626-7WLQ3W), MTE (March 2010)
- 2010 Annual PTTW Monitoring Report (PTTW No. 5626-7WLQ3W), MTE (March 2010)
- 2011 Annual PTTW Monitoring Report (PTTW No. 5626-7WLQ3W), MTE (March 2012)
- 2012 Annual Monitoring Report Meadows of Aberfoyle Permit to Take Water No. 5626-7WLQ3W, Banks Groundwater Engineering Limited (March 2013)
- 2013 Annual Monitoring Report Meadows of Aberfoyle Permit to Take Water No. 5626-7WLQ3W, Banks Groundwater Engineering Limited (January 2014)

We have referred to information in the PTTW file AP 28 PU AB and PTTW 5626-7WLQ3W.

Background

Meadows of Aberfoyle is a residential community with a PTTW for a communal water supply and landscape watering. The water is obtained through four bedrock wells: PW6 is the main production well, PW7 is the backup well and PW5 and PW2 are for landscaping. To date PW7 is operated consistently and pumped alternatingly with PW6. PW5 and PW2 are not equipped with pumps and have yet to be taken from. The residential community was considered full occupancy as of May 2011.

Under the Permit, the Permit Holder is required to conduct a groundwater and surface water program. Currently, the Permit Holder has asked the Director, Sec 34 OWRA to reduce the frequency of the manual monitoring from monthly to quarterly. The hourly frequency of the datalogger monitoring is to remain unchanged.

Comments and Recommendations

Groundwater

- 1. The groundwater level monitoring results are shown in hydrographs including data from 2007 to 2013. The data do not show any trends other than water level fluctuations due to seasonal variations.
- 2. The total water taking from the water supply wells is about 20% of the maximum permitted rate. One might presume that this daily amount of water should not increase as the condominium units have full occupancy; however, the monitoring plan should be kept in place should the daily water takings increase above the typical volume shown so far. If the permitted maximum daily rates were to be reduced to reflect typical takings, the groundwater monitoring could be scaled down.
- 3. Based on the above, the proposed change of frequency of manual measurements from monthly to quarterly is acceptable for groundwater monitors.

Surface Water

- 1. A figure should be included in all future monitoring reports identifying the surface water monitoring locations and any relevant surface water features.
- 2. Table 5 should be clarified as to the statistic presented average, maximum, minimum, etc.
- 3. A figure should be included in all future monitoring reports plotting surface water flow data.
- 4. The raw surface water monitoring data should be provided in Appendix E.
- 5. All future monitoring reports should have surface water levels, shallow groundwater levels and hydraulic gradients plotted with precipitation and pumping data for the year

being reported so that any impacts from environmental or anthropogenic effects can be identified.

- 6. The information provided in Appendix B does not satisfy Condition 4.1 as it does not include the times and rates (LPM) of the water pumped. Further to this, as the times were not provided, it cannot be verified that water was not taken at the same time on days when both PW6 and PW7 were pumped.
- 7. The trends in water level and vertical hydraulic gradients at MP1, MP3 and MP4 are related to environmental and seasonal factors rather than from pumping. There are also apparent anthropogenic influences on water levels at MP1 and MP3 that are a result of the operation of the outlet of the pond. For example, the dramatic increase in water levels at MP1 between May and June and the strong drop in water levels at MP3 is likely a result of water being held back in the pond while the dramatic decrease in water levels at MP1 between November and December and the strong sharp increase in water levels at MP3 not coinciding with a precipitation event at are likely a release of water from the pond for the winter season.
- 8. Surface water flow data at MP3 and MP4 do not appear to be experiencing a decline in flows as a result of pumping
- 9. The proponent is requesting a decrease in the flow and manual water level measurements from a monthly to a quarterly frequency. This change is acceptable however should surface water level or vertical hydraulic gradient data indicate impacts from pumping then flow monitoring shall be returned to a monthly measurement frequency.

Should you have any questions or comments or require additional information, please feel free to contact Rosa at (905) 521-7592 or <u>Rosa.Stewart@ontario.ca</u> and Sarah at (905) 521-7304 or Sarah.Day@ontario.ca.

Regards,

Rosa Stewart, P. Geo

Sarah Day, M.Sc.

Cc Belinda Koblik, Supervisor, Water Resources Unit Jamie Connelly, Groundwater Group Leader Paul Odom, Surface Water Group Leader

The purpose of the preceding review is to provide advice to the Ministry of the Environment regarding groundwater and surface water conditions based on a review of the information provided in the above referenced documents. The conclusions, opinions and recommendations of the reviewers are based on information provided by others, except where otherwise specifically noted. The Ministry cannot guarantee that the information that is provided by others is accurate or complete. A lack of specific comment by the reviewers is not to be construed as endorsing the content or views expressed in the reviewed material.



AMENDED PERMIT TO TAKE WATER Ground Water NUMBER 5626-7WLQ3W

Pursuant to Section 34 of the <u>Ontario Water Resources Act</u>, R.S.O. 1990 this Permit To Take Water is hereby issued to:

Wellington Vacant Land Condominium Corporation Number 147 66 Aberfoyle Mill Cres Guelph, Ontario N1H 6H9

For the waterPW7, PW6, PW5, PW2taking from:Located at:Lot 23, Concession 8Puslinch, County of Wellington

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

- (a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34, OWRA.
- (b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.
- (c) "Ministry" means Ontario Ministry of the Environment.
- (d) "District Office" means the Guelph District Office.
- (e) "Permit" means this Permit to Take Water No. 5626-7WLQ3W including its Schedules, if any, issued in accordance with Section 34 of the OWRA.
- (f) "Permit Holder" means Wellington Vacant Land Condominium Corporation Number 147.
- (g) "OWRA" means the Ontario Water Resources Act, R.S.O. 1990, c. O. 40, as amended.

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

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TERMS AND CONDITIONS

1. Compliance with Permit

- 1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated March 20, 2007 and signed by Lucky Bobeta and as amended by Glenn Lerchman on May 12, 2009, and all Schedules included in this Permit.
- 1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.
- 1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.
- 1.4 This Permit is not transferable to another person.
- 1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.
- 1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.
- 1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections

The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act*, R.S.O. 1990, the *Pesticides Act*, R.S.O. 1990, or the *Safe Drinking Water Act*, S. O. 2002.

2.2 Other Approvals

The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act*, and the *Environmental Protection Act*, and any regulations made thereunder; or

(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including

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the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

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

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

2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability

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

2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. Water Takings Authorized by This Permit

3.1 Expiry

This Permit expires on October 31, 2017. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

<u>Table A</u>

の言語の言語	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	PW7	Well	Communal	Water Supply	545	24	785,000	365	17 569389 4813250
2	PW6	Well Drilled	Communal	Water Supply	545	24	785,000	365	17 569384 4813245
3	PW5	Well Drilled	Other - Recreational	Recreational	138	8	67,000	85	17 569536 4813137
4	PW2	Well Drilled	Other - Recreational	Recreational	227	10	137,000	85	17 569616 4813435
						Total Taking:	2,095,200		

- 3.3 Despite the Table A authorized rates and amounts, backup well PW7 shall not be pumped simultaneously with the main production well PW6.
- 3.4 Despite the Table A authorized rates and amounts, irrigation wells PW5 and PW2 shall not be pumped simultaneously.
- 3.5 The Permit Holder shall ensure that the taking complies with the requirements of the <u>Safe</u> <u>Drinking Water Act S.O. 2002</u> and all pertinent regulations thereunder.

4. Monitoring

- 4.1 In addition to the requirements imposed by Section 9 of O. Reg. 387/04, and as authorized by Subsection 34(6) of the Ontario Water Resources Act, the Permit Holder shall do the following: maintain a record of all water takings that includes the date, times, rates and total measured amounts of water pumped per day for each day that water is taken under the authorization of this Permit; keep all required records current and available at or near the site of the taking; and produce those records for the inspection of a Provincial Officer immediately upon his or her request. A separate record shall be maintained for each source. The total amounts of water pumped from each well shall be measured using a calibrated flow device that shall be installed on each well prior to the commencement of the water taking.
- 4.2 The Permit Holder shall conduct the following groundwater monitoring program as soon as 50% occupancy is achieved:
 - (1) Monitor the water levels as follows:
 - (a) Monthly measurements at the following wells:
 - i) on-site overburden wells MW8, MW9, MW10 and MW11

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- ii) on-site bedrock wells PW6, PW2 and PW5
- iii) domestic off-site wells Leachman and Pond (with permission of the owners)
- (b) At a frequency of once per hour at the following wells:
 - i) on-site bedrock well PW7
 - ii) off-site domestic wells Huether and Howlett (with permission of the owners)
- (2) Establish a 3-month baseline database as a minimum, prior to the water taking.
- 4.3 The Permit Holder shall conduct the following surface water monitoring program as soon as 50% occupancy is achieved:
 - (1) The Permit Holder shall monitor surface water levels at MP1, MP3, and MP4 on a continuous basis from April 1 to November 30 and manually at a frequency of monthly for December to March for two years.
 - (2) The Permit Holder shall monitor piezometer water levels and hydraulic gradients at MP1, MP3 and MP4 on a continuous from April 1 to November 30 and manually at a frequency of monthly for December to March for two years. For the ease of analysis, discussions and interpretations in the annual monitoring report the minimum daily levels and the average daily hydraulic gradient may be used.
 - (3) The Permit Holder shall measure surface water flows at MP3 and MP4 on a monthly basis.
- 4.4 In order to conserve and sustain the resource and address impacts on natural function during drought conditions, the Permit Holder shall comply with the measures required under each level of the City of Guelph's Outside Water Use By-Law, or any superceding water conservation by-law.
- 4.5 Data collected under Conditions 4.2 and 4.3 shall be analyzed, interpreted and summarized in an annual report by a qualified consultant and submitted to the Director by March 31 of each year and shall include the monitoring for the 12-month period ending December 31 of the previous year. The report shall include the record of water taking and documentation of all well interference complaints, if any, and any other water supply activities. The report should provide recommendations on the need for changes to monitoring locations and frequency, pumping patterns and/or the need for mitigation. However, the Permit Holder may only request approval for a reduction in the frequency of the monitoring requirements after having collected data for two years after the development has been fully occupied. Any such request shall be supported by the collected data and its interpretation. A copy of the report shall also be submitted to the Township of Puslinch.

5. Impacts of the Water Taking

5.1 Notification

The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 For Groundwater Takings

If the taking of water is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected, a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of doing so.

If permanent interference is caused by the water taking, the Permit Holder shall restore the water supplies of those permanently affected.

6. Director May Amend Permit

The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act*, Section 100 (4).

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

- 1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.
- 2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.
- 3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the <u>Ontario Water Resources Act</u>, R.S.O. 1990, you may by written notice served upon me, the Environmental Review Tribunal and the Environmental Commissioner, **Environmental Bill of Rights**, R.S.O. 1993, Chapter 28, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the <u>Ontario Water Resources Act</u>, as amended provides that the Notice requiring a hearing shall state:

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

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

- 3. The name of the appellant;
- 4. The address of the appellant;
- 5. The Permit to Take Water number;
- 6. The date of the Permit to Take Water;
- 7. The name of the Director;
- 8. The municipality within which the works are located;

This notice must be served upon:

The Secretary Environmental Review Tribunal 655 Bay Street, 15th Floor Toronto ON MSG 1E5	AND	The Environmental Commissioner 1075 Bay Street 6th Floor, Suite 605 Toronto, Ontario M5S 2W5	<u>AND</u>	The Director, Section 34 Ministry of the Environment 12th Floor 119 King St W Hamilton ON L8P 4Y7
				Fax: (905)521-7820

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by telephone at (416) 314-4600

by fax at (416) 314-4506

by e-mail at www.ert.gov.on.ca

This instrument is subject to Section 38 of the Environmental Bill of Rights that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek to appeal for 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.

This Permit cancels and replaces Permit Number 8228-76XLE2, issued on 2007/10/05.

Dated at Hamilton this 8th day of October, 2009.

11:2

Belinda Koblik Director, Section 34 Ontario Water Resources Act, R.S.O. 1990

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Appendix B

2015 Daily Pumping Records for PW6 and PW7

Banks Groundwater Engineering Limited

	Daily Pumping Volumes (L/day)			
Date	PW6	PW7		
01-Jan-15	9,900	20,900		
02-Jan-15	9,100	19,400		
03-Jan-15	9,200	19,000		
04-Jan-15	9,400	19,200		
05-Jan-15	9,400	20,000		
06-Jan-15	8,600	18,900		
07-Jan-15	8,900	18,200		
08-Jan-15	9,300	19,600		
09-Jan-15	8,700	17,900		
10-Jan-15	9,600	19,200		
11-Jan-15	10,700	21,000		
12-Jan-15	8,800	18,200		
13-Jan-15	9,000	18,400		
14-Jan-15	8,300	17,300		
15-Jan-15	9,100	18,600		
 16-Jan-15	8,200	17,200		
17-Jan-15	10,200	22,300		
18-Jan-15	12,000	25,700		
19-Jan-15	14,700	31,600		
20-Jan-15	10,800	33,300		
21-Jan-15	3,000	23,100		
22-Jan-15	3,300	23,400		
23-Jan-15	0	27,500		
24-Jan-15	0	29,700		
25-Jan-15	0	30,800		
26-Jan-15	0	27,400		
27-Jan-15	0	27,100		
28-Jan-15	0	24,800		
29-Jan-15	0	27,800		
30-Jan-15	1,000	26,800		
31-Jan-15	0	28,500		

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	Daily Pumping Volumes (L/day)			
Date	PW6	PW7		
01-Feb-15	1,500	30,500		
02-Feb-15	0	29,000		
03-Feb-15	0	27,100		
04-Feb-15	0	30,700		
05-Feb-15	0	27,700		
06-Feb-15	0	27,800		
07-Feb-15	0	33,500		
08-Feb-15	0	32,800		
09-Feb-15	0	24,900		
10-Feb-15	0	27,800		
11-Feb-15	0	25,900		
12-Feb-15	600	25,000		
13-Feb-15	100	27,300		
14-Feb-15	0	27,300		
15-Feb-15	0	26,200		
16-Feb-15	0	30,900		
17-Feb-15	400	27,400		
18-Feb-15	0	25,500		
19-Feb-15	900	28,000		
20-Feb-15	0	26,600		
21-Feb-15	0	29,000		
22-Feb-15	0	34,300		
23-Feb-15	0	29,500		
24-Feb-15	0	30,700		
25-Feb-15	0	28,000		
26-Feb-15	0	28,700		
27-Feb-15	600	27,100		
28-Feb-15	0	29,700		
	Daily Pumping Volumes (L/day)			
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Date	PW6	PW7		
01-Mar-15	0	29,000		
02-Mar-15	0	26,900		
03-Mar-15	100	29,200		
04-Mar-15	0	29,200		
05-Mar-15	0	26,300		
06-Mar-15	0	29,300		
07-Mar-15	0	28,800		
08-Mar-15	0	29,600		
09-Mar-15	15,700	14,900		
10-Mar-15	24,100	300		
11-Mar-15	27,200	600		
12-Mar-15	26,700	0		
13-Mar-15	28,100	0		
14-Mar-15	25,900	0		
15-Mar-15	32,400	0		
16-Mar-15	34,300	0		
17-Mar-15	25,400	0		
18-Mar-15	26,900	0		
19-Mar-15	34,700	0		
20-Mar-15	30,400	0		
21-Mar-15	27,800	0		
22-Mar-15	33,500	0		
23-Mar-15	43,500	0		
24-Mar-15	58,000	0		
25-Mar-15	57,800	0		
26-Mar-15	58,500	0		
27-Mar-15	59,900	0		
28-Mar-15	59,000	0		
29-Mar-15	64,500	0		
30-Mar-15	63,100	0		
31-Mar-15	62,300	0		

	Daily Pumping Volumes (L/day)		
Date	PW6	PW7	
01-Apr-15	62,500	500	
02-Apr-15	62,500	0	
03-Apr-15	72,200	0	
04-Apr-15	63,800	0	
05-Apr-15	63,300	0	
06-Apr-15	63,500	600	
07-Apr-15	63,400	0	
08-Apr-15	62,800	0	
09-Apr-15	59,700	0	
10-Apr-15	61,900	0	
11-Apr-15	61,900	0	
12-Apr-15	38,500	0	
13-Apr-15	36,300	0	
14-Apr-15	35,800	0	
15-Apr-15	31,800	0	
16-Apr-15	33,500	0	
17-Apr-15	32,700	0	
18-Apr-15	35,800	0	
19-Apr-15	37,600	0	
20-Apr-15	37,300	0	
21-Apr-15	32,900	0	
22-Apr-15	31,200	0	
23-Apr-15	33,800	600	
24-Apr-15	41,400	0	
25-Apr-15	42,700	0	
26-Apr-15	42,200	0	
27-Apr-15	37,600	0	
28-Apr-15	33,100	C	
29-Apr-15	36,200	C	
30-Apr-15	39,700	C	

	Daily Pumping Volumes (L/day)		
Date	PW6	PW7	
01-May-15	42,900	0	
02-May-15	49,100	0	
03-May-15	73,500	0	
04-May-15	46,700	0	
05-May-15	42,900	0	
06-May-15	40,200	0	
07-May-15	75,900	100	
08-May-15	67,900	0	
09-May-15	97,200	0	
10-May-15	47,200	0	
11-May-15	60,500	0	
12-May-15	41,800	0	
13-May-15	56,100	0	
14-May-15	58,900	0	
15-May-15	64,600	0	
16-May-15	73,700	0	
17-May-15	91,700	0	
18-May-15	102,800	0	
19-May-15	81,000	0	
20-May-15	95,700	0	
21-May-15	125,100	2,900	
22-May-15	141,300	0	
 23-May-15	116,300	0	
24-May-15	143,100	0	
25-May-15	105,800	0	
26-May-15	144,700	0	
27-Mav-15	144,900	0	
28-Mav-15	134,500	0	
29-May-15	141,100	0	
30-May-15	99,900	0	
31-May-15	76.300	0	

	Daily Pumping Volumes (L/day)		
Date	PW6	PW7	
01-Jun-15	37,800	0	
02-Jun-15	54,700	0	
03-Jun-15	104,700	1,600	
04-Jun-15	71,900	0	
05-Jun-15	104,300	0	
06-Jun-15	88,300	0	
07-Jun-15	102,600	0	
08-Jun-15	48,200	0	
09-Jun-15	29,000	0	
10-Jun-15	87,200	0	
11-Jun-15	45,400	0	
12-Jun-15	86,400	0	
13-Jun-15	44,000	0	
14-Jun-15	83,900	0	
15-Jun-15	43,100	0	
16-Jun-15	38,500	0	
 17-Jun-15	84,800	0	
 18-Jun-15	31,600	13,900	
19-Jun-15	39,100	73,500	
20-Jun-15	24,100	37,300	
21-Jun-15	43,200	72,200	
22-Jun-15	29,100	45,300	
23-Jun-15	15,800	24,900	
24-Jun-15	36,600	65,600	
25-Jun-15	25,500	43,000	
26-Jun-15	140,500	202,400	
27-Jun-15	20,400	31,100	
28-Jun-15	24,600	39,800	
29-Jun-15	11,800	18,300	
	12,500	20,600	

	Daily Pumping Volumes (L/day)		
Date	PW6	PW7	
01-Jul-15	25,700	44,800	
02-Jul-15	18,600	30,700	
03-Jul-15	40,500	76,300	
04-Jul-15	27,100	43,700	
05-Jul-15	45,500	78,300	
06-Jul-15	33,600	56,000	
07-Jul-15	24,200	37,600	
08-Jul-15	28,700	45,400	
09-Jul-15	21,100	30,800	
10-Jul-15	35,200	84,600	
11-Jul-15	38,300	54,700	
12-Jul-15	35,400	73,900	
13-Jul-15	47,700	65,000	
 14-Jul-15	27,900	37,300	
15-Jul-15	33,300	43,200	
 16-Jul-15	35,500	40,700	
17-Jul-15	36,100	59,600	
 18-Jul-15	24,300	23,800	
19-Jul-15	31,800	41,700	
20-Jul-15	13,700	37,600	
21-Jul-15	1,300	61,800	
22-Jul-15	0	89,600	
23-Jul-15	0	72,700	
24-Jul-15	0	123,000	
25-Jul-15	0	96,100	
26-Jul-15	0	129,200	
27-Jul-15	0	137,600	
28-Jul-15	0	143,000	
29-Jul-15	0	186,200	
30-10-15	0	121,800	
24 1,145	 0	136.100	

	Daily Pumping Volumes (L/day)		
Date	PW6	PW7	
01-Aug-15	0	111,700	
02-Aug-15	0	119,600	
03-Aug-15	0	47,600	
04-Aug-15	200	78,600	
05-Aug-15	0	96,900	
06-Aug-15	0	92,200	
07-Aug-15	0	131,800	
08-Aug-15	0	115,500	
09-Aug-15	0	146,400	
10-Aug-15	0	82,200	
11-Aug-15	0	37,800	
12-Aug-15	0	103,000	
13-Aug-15	0	72,000	
14-Aug-15	0	88,600	
15-Aug-15	0	45,100	
16-Aug-15	0	96,600	
17-Aug-15	0	104,000	
18-Aug-15	0	67,800	
19-Aug-15	0	124,100	
20-Aug-15	0	48,400	
21-Aug-15	0	96,400	
22-Aug-15	0	86,200	
23-Aug-15	0	105,800	
24-Aug-15	0	64,900	
25-Aug-15	0	65,200	
26-Aug-15	0	108,700	
27-Aug-15	0	71,000	
28-Aug-15	0	108,400	
29-Aug-15	0	78,400	
30-Aug-15	0	111,200	
31-Aug-15	0	100,800	

	Daily Pumping Volumes (L/day)		
Date	PW6	PW7	
01-Sep-15	0	96,700	
02-Sep-15	0	119,000	
03-Sep-15	0	85,300	
04-Sep-15	0	105,100	
05-Sep-15	0	92,400	
06-Sep-15	0	114,100	
07-Sep-15	0	107,600	
08-Sep-15	0	77,800	
09-Sep-15	0	96,100	
10-Sep-15	0	70,400	
11-Sep-15	9,300	93,600	
12-Sep-15	19,000	33,800	
13-Sep-15	23,200	45,200	
14-Sep-15	24,500	47,800	
15-Sep-15	27,100	38,200	
16-Sep-15	30,400	64,000	
17-Sep-15	28,200	52,800	
18-Sep-15	34,900	72,300	
19-Sep-15	18,700	31,900	
20-Sep-15	26,100	42,200	
21-Sep-15	27,200	45,100	
22-Sep-15	25,000	42,900	
23-Sep-15	35,400	73,000	
24-Sep-15	22,800	40,300	
25-Sep-15	33,300	67,600	
26-Sep-15	26,200	44,400	
27-Sep-15	34,000	57,100	
28-Sep-15	26,900	45,400	
29-Sep-15	18,900	30,200	
30-Sep-15	28,300	48,500	

	Daily Pumping Volumes (L/day)		
Date	PW6	PW7	
01-Oct-15	17,700	28,300	
02-Oct-15	30,400	57,200	
03-Oct-15	16,500	27,200	
04-Oct-15	27,800	47,000	
05-Oct-15	22,700	32,500	
06-Oct-15	19,800	27,900	
07-Oct-15	28,500	49,400	
08-Oct-15	16,000	22,500	
09-Oct-15	12,400	19,200	
10-Oct-15	14,700	23,500	
11-Oct-15	16,200	23,400	
12-Oct-15	17,300	25,000	
13-Oct-15	11,400	18,100	
14-Oct-15	12,800	20,600	
15-Oct-15	12,800	19,200	
16-Oct-15	15,000	19,500	
17-Oct-15	18,800	22,600	
18-Oct-15	21,200	23,900	
19-Oct-15	18,500	19,300	
20-Oct-15	18,500	18,700	
21-Oct-15	14,900	17,300	
22-Oct-15	17,400	19,800	
23-Oct-15	16,200	17,000	
24-Oct-15	17,700	17,800	
25-Oct-15	18,900	18,300	
26-Oct-15	16,500	20,600	
27-Oct-15	13,800	21,900	
28-Oct-15	11,200	18,400	
29-Oct-15	11,600	18,300	
30-Oct-15	11,700	17,900	
31-Oct-15	13,700	19,200	

Page 10 of 12

-	Daily Pumping Volumes (L/day)		
Date	PW6	PW7	
01-Nov-15	14,000	19,700	
02-Nov-15	12,700	16,300	
03-Nov-15	10,800	16,700	
04-Nov-15	11,800	18,300	
05-Nov-15	11,200	18,600	
06-Nov-15	11,000	17,700	
07-Nov-15	13,300	20,500	
08-Nov-15	14,500	17,800	
09-Nov-15	13,400	16,200	
10 -Nov- 15	13,100	18,700	
11-Nov-15	12,700	14,300	
12-Nov-15	9,800	13,900	
13-Nov-15	10,400	16,400	
14-Nov-15	11,100	17,900	
15-Nov-15	13,400	14,100	
16-Nov-15	11,900	14,700	
17-Nov-15	12,700	12,800	
18-Nov-15	13,700	13,100	
19-Nov-15	13,200	12,700	
20-Nov-15	14,000	14,200	
21-Nov-15	15,100	14,400	
22-Nov-15	16,500	15,800	
23-Nov-15	14,100	15,300	
24-Nov-15	27,400	0	
25-Nov-15	28,500	1,000	
26-Nov-15	16,800	9,800	
27-Nov-15	14,600	13,500	
28-Nov-15	14,700	13,700	
29-Nov-15	16,000	15,100	
30-Nov-15	14,500	13,400	

	Daily Pumping Volumes (L/day)		
Date	PW6	PW7	
01-Dec-15	13,800	13,000	
02-Dec-15	12,400	11,900	
03-Dec-15	14,300	9,300	
04-Dec-15	14,800	13,700	
05-Dec-15	15,500	14,700	
06-Dec-15	15,700	14,800	
)7-Dec-15	14,000	13,100	
08-Dec-15	14,000	13,500	
09-Dec-15	15,300	14,400	
10-Dec-15	13,800	12,900	
11-Dec-15	14,600	13,600	
12-Dec-15	14,300	13,400	
13-Dec-15	15,300	14,400	
14-Dec-15	12,900	12,300	
15-Dec-15	14,700	13,700	
16-Dec-15	11,800	13,900	
17-Dec-15	14,500	14,200	
18-Dec-15	13,900	12,600	
19-Dec-15	17,100	16,100	
20-Dec-15	19,100	17,900	
21-Dec-15	18,000	16,800	
22-Dec-15	15,500	14,500	
23-Dec-15	15,100	14,200	
24-Dec-15	18,700	17,000	
25-Dec-15	17,500	16,600	
26-Dec-15	16,900	15,900	
27-Dec-15	15,500	14,500	
28-Dec-15	15,500	9,800	
29-Dec-15	13,900	13,000	
30-Dec-15	13,900	13,000	
31-Dec-15	15.500	15,300	

Appendix C

Water Taking Reporting System Confirmation for 2015

Banks Groundwater Engineering Limited



Location: WTRS / WT DATA / View Submitted WT Records

WTRS-WT-002

nter th	e water tak	ing data for ea	ch of the source(s)	in the reporting year.			
ermi	t Inform	ation:					
sue Da	ate:	2009/1	0/08	Expiry Da	te:	2017/10/31	
Permi 147	it Holder	Informatio	n: WELLINGT(DN VACANT LAND	CONDOM	INIUM CORPO	RATION NUMBE
lame:		WELLINGTON	VACANT LAND CON	NDOMINIUM Address:	66	Aberfoyle Mill Cres	6
City:		Guelph		Province:	ON	ITARIO	
Postal	code			Country:	CA	NADA	
ostar	COUE.				Select r	eporting year: 20	015 V G
Vate	r Taking Source Name	Informatio Source / Type	n by Source Taking Specific Purpose	Zone / Easting / Northing	Select r Date Last Saved	eporting year: 20 2014 (Liters) Water Taken	015 ▼ Ga 2015 (Liters) Water Taken
View Data	r Taking Source Name PW7	Informatio Source / Type Well/Drilled	n by Source Taking Specific Purpose Communal	Zone / Easting / Northing 17/569389/4813250	Select r Date Last Saved 2016/03/09	eporting year: 20 2014 (Liters) Water Taken 10,211,600	015 ▼ Ga 2015 (Liters) Water Taken 11,162,600
View Data View Data	r Taking Source Name PW7 PW6	Informatio Source / Type Well/Drilled Well/Drilled	n by Source Taking Specific Purpose Communal Communal	Zone / Easting / Northing 17/569389/4813250 17/569384/4813245	Select r Date Last Saved 2016/03/09 2016/03/09	eporting year: 20 2014 (Liters) Water Taken 10,211,600 7,268,100	015 ▼ G 2015 (Liters) Water Taken 11,162,600 9,378,000
View Data View Data View Data	r Taking Source Name PW7 PW6 PW5	Informatio Source / Type Well/Drilled Well/Drilled Well/Drilled	n by Source Taking Specific Purpose Communal Communal Other - Recreational	Zone / Easting / Northing 17/569389/4813250 17/569384/4813245 17/569536/4813137	Select r Date Last Saved 2016/03/09 2016/03/09	eporting year: 20 2014 (Liters) Water Taken 10,211,600 7,268,100	015 ▼ G 2015 (Liters) Water Taken 11,162,600 9,378,000
View Data View Data View Data View Data	r Taking Source Name PW7 PW6 PW5 PW2	Informatio Source / Type Well/Drilled Well/Drilled Well/Drilled Well/Drilled	n by Source Taking Specific Purpose Communal Communal Other - Recreational Other - Recreational	Zone / Easting / Northing 17/569389/4813250 17/569384/4813245 17/569536/4813137 17/569616/4813435	Select r Date Last Saved 2016/03/09 2016/03/09	eporting year: 20 2014 (Liters) Water Taken 10,211,600 7,268,100	015 ▼ G 2015 (Liters) Water Taken 11,162,600 9,378,000

WILLIAM D. BANKS | 2016/03/16 version: v4.3.0.0 (build#: 7) Last modified: 2015/10/29



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Location: WTRS / WT DATA / Input WT Record

Water Taking Data submitted successfully.

Confirmation:

Thank you for submitting your water taking data online.

Permit Number: 5626-7WLQ3W Permit Holder: WELLINGTON VACANT LAND CONDOMINIUM CORPORATION NUMBER 147. Received on:Mar 16, 2016 4:43 PM

This confirmation indicates that your data has been received by the Ministry, but should not be construed as acceptance of this data if it differs from that specified on the Permit Number, assigned to the Permit Holder stated above.

Return to Main Page

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Appendix D

Monitoring Program Graphs

Banks Groundwater Engineering Limited

























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0.8
























Appendix E

Monitoring Program Data

Banks Groundwater Engineering Limited

Table E1: Historic Groundwater Levels

Depth (sbg) 6.10 4.27 4.23 A.27 60.98 (s).17 60.96 (s).40 (s).40 (s).40 17-Agr-07 4.26 2.57 1.32 1.22 6.93 1.1.33 1.385 1.442 1.1.94 5.1.3 1.07 9.47 11-May-07 4.60 3.13 1.165 7.1.2 1.22 1.4.35 1.50.8 1.1.55 5.57 2.42 1.1.45 17-Jul-07 5.68 3.25 2.08 2.00 7.51 1.2.76 1.51.9 5.58 2.64 1.0.74 26-Sep-07 5.91 3.41 2.20 2.05 7.51 1.2.78 1.51.8 1.56.6 1.2.28 1.66 1.3.2 1.1.25 3.0.8 2.08 1.63 1.1.2.9 1.1.3 1.3.66 1.2.28 1.64 1.1.2.8 3.6.4 2.77 1.2.6 3.0.2 2.05 1.0.3 1.1.65 1.2.2.8 5.6.4 2.2.7 1.2.1 1.6.5 1.1.2.1 1.6.5 3.0.2.7	Well TD	MW8	MW9	MW10	MW11	PW2	PW5	PW6	PW7	Huether	Leachman	Pond	Howlett
Verse TPVC TPVC <t< th=""><th>Denth (mbal)</th><th>6 10</th><th>4 27</th><th>4 23</th><th>4 27</th><th>60.96</th><th>55.17</th><th>60.96</th><th>60.96</th><th>n/a</th><th>19.20</th><th>n/a</th><th>n/a</th></t<>	Denth (mbal)	6 10	4 27	4 23	4 27	60.96	55.17	60.96	60.96	n/a	19.20	n/a	n/a
10. 10. <th>Measuring Point</th> <th>T/PVC</th> <th>T/PVC</th> <th>T/PV/C</th> <th>T/PVC</th> <th>TOC</th> <th>TOC</th> <th>TOC</th> <th>TOC</th> <th>TOC</th> <th>TOC</th> <th>TOC</th> <th>TOC</th>	Measuring Point	T/PVC	T/PVC	T/PV/C	T/PVC	TOC	TOC	TOC	TOC	TOC	TOC	TOC	TOC
11.99-07 458 2.68 1.63 1.65 7.72 12.72 11.63 1.502 11.94 1.513 2.05 10.76 127.Jub/07 568 3.23 2.08 2.05 7.51 12.76 15.50 11.59 5.50 1.58 2.42 10.76 24-0er/07 591 3.41 2.24 2.00 7.51 12.76 15.18 15.81 11.71 5.87 2.42 10.87 29-0er/07 591 3.41 2.24 2.02 7.57 14.86 17.31 15.82 12.32 6.42 2.77 11.11 12.92 12.83 14.40 12.42 12.33 12.92 12.33 12.92 12.33 12.92 12.33 12.92 12.33 12.44 12.44 12.44 12.44 12.44 12.44 12.44 12.44 12.44 12.44 12.44 12.44 12.44 12.44 12.44 12.44 12.44 12.44 12.44 <th12.44< th=""> <th12.44< th=""> <th12.44< <="" th=""><th>17-Apr-07</th><th>4.26</th><th>2 57</th><th>1 32</th><th>1 25</th><th>6.93</th><th>11 33</th><th>13.85</th><th>14.42</th><th>11.76</th><th>5.13</th><th>1.97</th><th>9.47</th></th12.44<></th12.44<></th12.44<>	17-Apr-07	4.26	2 57	1 32	1 25	6.93	11 33	13.85	14.42	11.76	5.13	1.97	9.47
122 133 1.91 1.85 7.49 1.35 1.583 16.08 11.65 5.07 2.42 1.143 26-Sep 0.7 5.68 3.34 2.20 2.20 7.57 12.78 15.18 15.81 11.51 5.87 2.82 10.97 26-Sep 0.7 5.91 3.34 2.20 2.08 1.78 7.79 14.86 15.37 11.89 6.13 2.82 10.91 30-Nov.70 6.00 2.93 2.02 1.78 7.79 14.86 17.34 17.84 17.40 12.42 14.44 12.17 6.23 1.90 9.69 05-9a-06 3.34 2.47 1.35 1.12 1.176 1.176 1.176 1.171 1.176 1.139 1.442 1.444 1.12 5.10 1.76 1.139 1.133 1.137 5.10 1.76 1.138 5.33 1.137 5.10 1.76 1.68 1.74 1.86 1.86 1.86 1.86 1.8	11-May-07	4 35	2.57	1.52	1.65	7 12	12 27	14 53	15.02	11 94	5 15	2.05	10.76
17.1	22-Jun-07	4.60	2.00	1 91	1.85	7 49	13 35	15.83	16.08	11.65	5.07	2.42	11.45
21-140-07 5.69 3.44 2.20 2.00 7.57 12.78 15.18 11.71 5.87 2.82 10.87 29-5xp-07 5.91 3.40 2.08 1.78 7.97 1.282 15.15 15.66 12.22 6.25 2.71 11.25 30-thor.07 5.33 2.97 2.05 1.84 7.97 11.81 13.93 14.40 12.04 2.73 1.90 9.69 05-bree.08 3.91 2.68 1.73 1.72 1.71 1.71 1.72 1.90 9.69 9.69 05-hree.08 3.34 2.64 1.49 1.29 1.44 1.429 1.444 1.144 1.144 1.144 1.144 1.144 1.145 5.00 2.00 1.56 1.145 1.145 5.20 2.115 1.164 1.142 1.145 5.20 2.13 1.031 1.241 1.145 5.20 2.13 1.031 1.241 1.145 1.145 1.145 1.145	17-Jul-07	5.08	3 25	2.08	2.05	7.51	12.61	15.00	15.50	11.59	5.58	2.64	10.74
16 25 1 18 24 224 228 15 11 11 2 2 11 </th <th>21-400-07</th> <th>5.60</th> <th>3 34</th> <th>2.00</th> <th>2.00</th> <th>7.51</th> <th>12.01</th> <th>15.18</th> <th>15.81</th> <th>11 71</th> <th>5.87</th> <th>2.82</th> <th>10.87</th>	21-400-07	5.60	3 34	2.00	2.00	7.51	12.01	15.18	15.81	11 71	5.87	2.82	10.87
19-0er.07 59.0 3.20 2.08 1.39 7.44 1.292 15.13 15.66 12.32 6.23 2.71 11.292 18-Due.07 5.33 2.97 2.05 1.84 7.90 18.61 13.93 14.40 12.23 6.25 2.73 9.50 05-Due.06 4.68 2.46 1.49 1.42 1.42.9 1.44.94 12.17 5.01 1.76 9.50 05-Due.06 3.96 2.68 1.73 1.76 1.10 1.76 1.84 1.84 1.84 1.18 5.27 2.16 9.77 05-Due.06 3.33 2.54 1.28 1.64 6.61 1.49 1.42 1.42 1.43 1.14 1.55 2.07 2.18 9.40 11-Mue.06 4.28 2.89 1.69 1.68 6.70 1.63 1.48 1.49 1.42 1.58 5.33 2.18 1.02 12-Due.06 3.28 2.78 1.66 6.70	26-Sen-07	5.05	3 41	2.20	2.08	7.61	12.70	14 86	15 37	11.89	6.13	2.82	10.51
30 100 2.93 2.02 1.15 7.97 14.86 17.34 17.80 12.81 12.93 6.40 2.78 12.92 100 5.13 2.97 2.05 184 7.50 11.81 13.93 14.84 12.17 6.23 1.90 9.69 05 6.10 2.06 1.42 14.25 14.28 14.29 14.84 12.17 6.23 2.10 1.66 9.77 03 1.25 1.28 1.64 6.61 12.26 15.64 15.68 11.87 5.05 2.10 11.34 2.14 1.28 1.64 6.61 1.29 14.67 1.18 5.03 2.18 10.23 05 2.27 1.64 1.77 1.66 0.57 11.63 1.53 11.33 11.33 11.33 11.23 12.81 13.39 11.33 12.33 13.33 13.33 2.13 9.01 06 9.69 0.67 1.23 <	29-0ct-07	5.91	3 20	2.08	1 93	7 44	12 92	15 13	15.66	12.32	6.25	2.71	11.25
18. Doe O7 5.33 2.97 2.05 1.84 7.50 11.81 1.938 1.4.00 12.01 2.75 9.50 09. Jan-06 4.63 2.44 1.35 1.29 7.14 11.64 14.29 14.48 12.17 6.21 1.90 6.45 9.70 03.41 2.246 1.48 1.27 7.16 11.76 1.308 14.83 11.77 5.10 1.76 11.36 10Apr-08 3.34 2.75 1.53 1.86 7.11 12.56 15.04 15.68 11.47 5.10 1.76 9.40 24-Jur-08 4.22 2.78 1.64 1.77 6.56 11.69 12.30 1.43 1.429 1.15 5.20 2.18 1.02 3.33 2.13 1.33 3.30 1.43 1.439 1.42 1.43 1.439 1.42 1.32 2.23 2.13 1.31 1.33 1.33 1.33 1.33 1.33 1.33 1.33 1.33 <th>30-Nov-07</th> <th>6.00</th> <th>2 93</th> <th>2.00</th> <th>1 78</th> <th>7.97</th> <th>14.86</th> <th>17.34</th> <th>17.82</th> <th>12.83</th> <th>6.40</th> <th>2.78</th> <th>12.92</th>	30-Nov-07	6.00	2 93	2.00	1 78	7.97	14.86	17.34	17.82	12.83	6.40	2.78	12.92
10 10 12 12 12 12 14 12 14 14 14 14 16 17 11 11 11 11 11 11 11 11 11 11 11 11 11 11<	18-Dec-07	5 33	2.55	2.02	1.84	7 50	11.81	13.93	14.40	12.04		2.75	9.50
orseh-os 3.9 2.68 1.49 1.27 7.14 11.66 14.25 14.73 14.88 5.97 2.16 9.77 O3 Mar-OB 3.36 2.83 1.73 1.76 1.164 1.20 1.53 1.59 1.134 21-May-OB 3.31 2.75 1.59 1.66 1.88 6.88 11.49 14.29 11.15 5.05 2.07 11.66 24-Jun-OB 4.28 2.78 1.69 1.88 6.88 11.49 14.72 11.15 5.20 2.20 8.40 OB-sep-OB 4.29 2.90 1.59 1.60 7.03 12.27 14.67 13.26 10.97 5.20 2.20 8.40 OB-sep-OB 4.29 2.90 1.59 1.60 7.03 12.37 13.43 1.480 1.92 5.20 2.09 8.40 O3 1.77 1.86 6.97 1.23 1.31 1.81 1.80 1.81 1.91 1.41	08-120-08	4 68	2.57	1 35	1.01	7.30	12.01	14.29	14.84	12.17	6.23	1.90	9.69
G3 Mar 08 3 56 2 23 1.73 1.76 7.10 11.76 13.38 14.80 1.84 2.27 9.69 10 Apr-08 3.31 2.24 1.28 1.64 6.51 12.20 15.36 15.83 11.77 5.00 1.76 11.34 21-June 8 4.28 2.89 1.69 1.89 6.88 11.49 14.72 14.20 14.20 1.53 2.13 1.04 1.77 1.66 1.54 1.77 1.76 1.23 1.349 11.97 5.20 2.10 8.40 09-sep-68 4.29 2.87 1.86 1.86 6.97 1.23 1.31 1.39 1.13 2.32 2.13 1.031 11-Nov-66 4.72 2.87 1.86 1.86 6.97 1.23 1.331 1.135 2.32 2.13 1.031 11-Nov-66 4.72 2.87 1.86 6.98 1.022 1.316 1.363 1.344 2.32 2.31 1.031<	05-Feb-08	3 91	2.68	1 49	1 27	7.14	11.96	14.25	14.73	11.88	5.97	2.16	9.77
10 Apr.08 3.31 2.54 1.28 1.64 6.91 12.00 15.36 15.83 11.77 5.10 1.76 11.34 21-May.08 3.84 2.75 1.59 1.66 7.11 12.56 15.64 11.87 5.05 2.20 1.13 24-Jun.08 4.25 2.73 1.64 1.77 7.05 12.27 14.67 15.16 1.58 5.33 2.18 9.40 09-Sep-08 4.29 2.90 1.59 1.60 7.03 12.37 15.43 1.89 1.92 5.20 2.20 8.40 16-Oct.08 4.34 2.84 1.77 1.86 6.97 11.23 1.33 1.33 2.17 1.83 1.34 2.11 9.41 25-Feb-09 3.61 2.71 1.66 6.88 1.02 1.33 1.34 1.84 1.83 8.41 25-Feb-09 3.61 2.66 1.37 1.70 6.68 1.14 1.848 1.14	03-Mar-08	3.96	2.83	1.73	1.76	7.10	11.76	13.98	14.80	11.84		2.27	9.69
11.Hwy.08 3.84 2.75 1.59 1.86 7.11 12.265 15.04 15.86 11.87 5.05 2.07 11.66 24-Jun-08 4.28 2.89 1.69 1.89 5.88 11.49 14.72 14.57 5.05 2.07 1.18 5.33 2.18 9.40 09-Sep-06 4.29 2.35 2.73 1.64 1.77 6.69 10.59 12.80 13.24 11.92 5.32 2.09 8.40 09-Sep-06 4.29 2.87 1.66 1.85 7.09 11.33 13.81 11.92 5.20 2.09 8.40 11-Nov-08 4.72 2.87 1.66 6.95 12.00 14.31 14.80 11.97 5.86 27-Jan-09 3.61 2.71 1.63 1.83 6.98 10.92 13.16 13.63 13.84 1.107 1.84 1.85 1.135 1.145 1.83 8.81 27-Jan-09 3.61 2.74 <th< th=""><th>10-Apr-08</th><th>3.31</th><th>2.54</th><th>1.28</th><th>1.64</th><th>6.91</th><th>12.90</th><th>15.36</th><th>15.83</th><th>11.77</th><th>5.10</th><th>1.76</th><th>11.34</th></th<>	10-Apr-08	3.31	2.54	1.28	1.64	6.91	12.90	15.36	15.83	11.77	5.10	1.76	11.34
np-ng 4.28 2.89 1.69 1.89 6.88 11.49 14.72 14.73 11.15 5.20 2.18 9.40 21-Jul-08 3.25 2.78 1.57 1.73 7.05 12.27 14.67 15.16 11.58 5.33 2.18 10.23 09-Sep-08 4.29 2.90 1.53 1.60 7.03 12.37 15.43 1.48 11.93 5.22 2.13 10.31 16-0cr.08 4.42 2.84 1.74 1.86 6.99 1.00 1.33 1.381 1.193 2.22 2.13 10.30 16-0cr.08 3.82 2.51 1.49 1.56 6.95 1.00 1.431 1.480 11.97 1.87 8.33 16-0cr.09 3.61 2.71 1.66 6.98 1.0.9 1.3.35 1.1.45 1.83 8.46 12-Mar-09 3.45 2.46 1.717 6.26 1.071 1.3.44 1.442 14.48 15.1	21-May-08	3.84	2.75	1.59	1.86	7.11	12.56	15.04	15.68	11.87	5.05	2.07	11.66
21-ju-log 4.25 2.78 1.57 1.73 7.05 12.27 14.67 15.16 11.58 5.33 2.18 10.23 08-Auge08 3.95 2.73 1.64 1.77 6.69 10.59 12.80 13.26 10.97 5.20 2.09 8.40 09-Sep-06 4.29 2.90 1.74 1.88 6.97 11.23 13.31 14.93 2.13 9.00 11-Nor-06 4.74 2.87 1.86 6.97 10.29 13.41 14.80 11.97 2.83 2.17 8.83 127-Jan-09 2.38 2.51 1.49 1.56 6.95 10.09 13.33 13.41 11.97 1.83 8.861 127-Jan-09 3.61 2.71 1.63 1.83 6.82 10.99 13.17 1.84 1.83 8.41 1.83 1.83 1.64 1.84 1.85 1.13 1.83 9.01 1.83 1.84 1.145 1.13 1.83 1.	24-Jun-08	4.28	2.89	1.69	1.89	6.88	11.49	14.72	14.29	11.15	5.20	2.18	9.40
08-mg-6 3.95 2.73 1.64 1.77 6.69 10.29 12.80 11.26 10.97 5.20 2.09 8.40 09-Sep-08 4.29 2.00 1.59 1.60 7.03 12.37 15.43 13.81 11.93 2.13 10.31 16-0c-08 3.88 2.81 1.42 1.33 13.31 13.31 13.31 13.31 13.31 13.31 13.31 13.31 13.31 13.31 13.31 13.31 13.31 13.31 13.34 13.34 13.34 13.34 13.34 13.34 13.34 2.11 9.41 27-3m-09 2.93 1.77 1.86 6.98 10.90 13.17 13.64 11.87 1.83 8.81 12-Mar-09 3.45 2.64 1.47 1.77 6.18 10.04 12.88 13.35 11.45 1.83 8.81 12-Mar-09 3.81 2.50 1.40 1.71 6.68 11.07 14.42 14.88	21-Jul-08	4.25	2.78	1.57	1.73	7.05	12.27	14.67	15.16	11.58	5.33	2.18	10.23
09-56p-66 4.29 2.90 1.59 1.60 7.03 1.23 15.43 14.89 11.92 5.32 2.13 10.01 16-0c+06 4.34 2.84 1.74 1.88 6.97 11.23 13.51 13.99 11.93 2.13 9.00 11-Nov-08 4.72 2.87 1.86 1.88 7.09 11.93 2.17 1.86 6.98 12.00 14.31 14.40 1.17 1.86 6.98 10.92 13.16 13.64 11.87 1.87 9.61 27-Jan-09 3.61 2.71 1.63 1.83 6.82 10.99 13.17 1.36 1.88 1.145 1.83 8.81 37-Mar-09 3.50 2.56 1.37 1.70 6.62 11.07 1.342 1.388 11.45 1.80 1.62 1.023 16-Jun-09 3.93 2.69 1.63 1.89 6.68 1.254 1.49 1.43 1.447 1.204 2.29 9.	08-Aug-08	3.95	2.73	1.64	1.77	6.69	10.59	12.80	13.26	10.97	5.20	2.09	8.40
16 Oct-08 4.34 2.84 1.74 1.88 6.97 11.23 13.51 13.99 11.93 2.13 9.00 11 Nov-08 4.72 2.87 1.86 1.85 7.09 11.09 13.33 13.81 11.93 2.17 8.93 16-Dec-08 3.88 2.51 1.49 1.56 6.98 10.92 13.16 13.64 13.84 2.11 9.14 27-Jan-09 3.45 2.64 1.47 1.77 6.18 10.90 13.17 13.64 11.87 1.95 6.86 12-Mar-09 3.45 2.64 1.47 1.77 6.18 10.69 11.42 1.88 15.1 1.90 10.023 13-Ju-09 3.93 2.69 1.63 1.89 6.68 12.54 14.46 1.88 15.51 1.90 10.023 12-Ju-09 4.32 2.99 1.55 1.73 6.65 11.38 13.67 14.41 12.14 2.29 10.45 <t< th=""><th>09-Sep-08</th><th>4.29</th><th>2.90</th><th>1.59</th><th>1.60</th><th>7.03</th><th>12.37</th><th>15,43</th><th>14.89</th><th>11.92</th><th>5.32</th><th>2.13</th><th>10.31</th></t<>	09-Sep-08	4.29	2.90	1.59	1.60	7.03	12.37	15,43	14.89	11.92	5.32	2.13	10.31
11-Nov-08 4.72 2.87 1.86 1.85 7.09 11.09 13.33 13.81 11.93 2.17 8.93 16-Dec-08 3.88 2.51 1.49 1.66 6.95 12.00 14.31 14.80 11.97 1.87 9.61 27-Jan-09 2.93 1.77 1.63 6.95 12.00 14.31 14.80 11.97 1.87 9.61 27-Jan-09 3.61 2.71 1.63 1.83 6.82 10.90 13.17 1.86 1.83 8.81 23-Apr-09 3.50 2.56 1.37 1.70 6.26 11.07 1.342 1.88 1.1.70 1.82 9.22 29-May-09 3.81 2.50 1.40 1.77 6.38 1.20 1.414 1.414 2.11 1.88 8.81 16-Jun-09 3.83 2.66 1.53 1.53 1.38 3.67 14.14 2.11 1.88 9.02 23-Aur-09 3.92 2.6	16-Oct-08	4.34	2.84	1.74	1.88	6.97	11.23	13.51	13.99	11.93		2.13	9.00
16-Dec-08 3.88 2.51 1.49 1.56 6.95 12.00 14.31 14.80 11.97 1.87 9.51 27-Jan-09 2.93 1.77 1.86 6.98 10.92 13.16 13.63 13.84 2.11 9.14 25-6e-09 3.61 2.71 1.63 1.83 6.82 10.90 13.17 13.64 11.67 1.83 8.81 123-Apr-09 3.55 2.56 1.37 1.70 6.26 11.07 13.42 13.88 1.45 1.83 8.81 23-Apr-09 3.81 2.50 1.40 1.71 6.38 12.01 14.42 1.88 15.51 1.90 10.23 16-Jun-09 3.95 2.62 1.55 1.73 6.65 1.138 1.47 1.475 12.04 2.29 9.27 13-Aug-09 3.95 2.62 1.55 1.73 6.65 1.87 1.477 12.42 2.29 7.62 13-bee-09	11-Nov-08	4.72	2.87	1.86	1.85	7.09	11.09	13.33	13.81	11.93		2.17	8.93
27-Jan-09 3.57 2.93 1.77 1.86 6.98 10.92 13.16 13.83 13.84 2.11 9.14 25-Feb-09 3.61 2.71 1.63 1.83 6.82 10.90 13.17 13.64 11.87 1.95 6.68 25-May-09 3.50 2.56 1.37 1.70 6.18 10.64 12.88 13.36 11.45 1.83 8.81 29-May-09 3.81 2.50 1.40 1.71 6.38 12.01 14.42 14.88 15.51 1.90 10.23 16-Jun-09 3.98 2.669 1.65 1.73 6.66 11.38 1.4.75 12.04 2.29 9.27 13-Aug-09 3.95 2.62 1.55 1.73 6.66 11.38 14.47 12.06 2.30 9.02 27-Oct-09 4.30 2.71 1.67 1.84 6.83 11.97 14.41 12.01 2.24 8.68 15-bec-09 4.19	16-Dec-08	3.88	2.51	1.49	1.56	6.95	12.00	14.31	14.80	11.97		1.87	9.61
25-reb-09 3.61 2.71 1.63 1.83 6.82 10.90 13.17 13.64 11.87 1.95 8.68 17-Mar-09 3.45 2.64 1.47 1.77 6.18 10.64 12.88 11.30 11.45 1.83 8.61 12-Mar-09 3.81 2.50 1.40 1.71 6.38 12.01 14.42 13.88 11.70 16.2 9.222 29-May-09 3.81 2.50 1.63 1.89 6.68 12.54 14.48 15.51 1.90 10.33 16-jun-09 3.98 2.62 1.55 1.73 6.65 11.87 14.03 14.44 12.11 1.88 9.02 29-sep-09 4.41 2.02 1.85 6.85 11.87 14.33 14.47 12.64 2.23 9.02 27-oct-09 4.30 2.71 1.67 1.84 6.26 10.07 12.13 12.61 12.24 2.29 7.62 16-bec-09	27-Jan-09		2.93	1.77	1.86	6.98	10.92	13.16	13.63	13.84		2.11	9.14
17-Mar-09 3.45 2.64 1.47 1.77 6.18 10.64 12.88 13.36 11.45 1.83 8.81 23-Mar-09 3.50 2.56 1.37 1.70 6.26 11.07 13.42 13.88 11.70 1.82 9.22 16-Jun-09 3.88 2.69 1.63 1.89 6.66 12.54 14.48 15.51 1.09 10.23 12-Jul-09 4.23 2.99 1.85 1.95 6.89 11.93 14.31 14.75 12.44 2.29 9.27 13-Aug-09 3.95 2.62 1.55 1.73 6.65 11.83 13.67 14.14 12.06 2.30 9.02 27-0ct-09 4.30 2.91 1.67 1.84 6.83 11.97 14.32 14.47 12.06 2.30 9.02 27-0ct-09 4.54 2.92 1.88 1.91 6.66 10.07 12.31 12.61 12.24 2.29 7.62 16-Dec-09 4.19 2.69 1.71 1.81 6.26 11.06 13.25	25-Feb-09	3.61	2.71	1.63	1.83	6.82	10.90	13.17	13.64	11.87		1.95	8.68
23-Apr-09 3.50 2.56 1.37 1.70 6.26 11.07 13.42 13.88 11.70 1.82 9.22 29-May-09 3.81 2.50 1.40 1.71 6.38 12.01 14.42 13.88 15.51 1.90 10.233 16-Jun-09 3.82 2.69 1.63 1.89 6.68 1.33 14.47 11.04 2.09 2.92 13-Aug-09 3.95 2.62 1.55 1.73 6.65 11.33 13.67 14.44 12.11 1.88 9.02 29-Sep-09 4.41 2.90 1.70 1.85 6.85 11.87 14.03 14.47 12.06 2.30 9.02 27-Oct-09 4.30 2.71 1.67 1.84 6.63 11.97 13.32 14.47 12.08 2.42 2.92 7.62 16-Dec-09 4.19 2.69 1.71 1.81 6.26 11.06 13.82 14.29 13.84 2.16 2.24 <t< th=""><th>17-Mar-09</th><th>3.45</th><th>2.64</th><th>1.47</th><th>1.77</th><th>6.18</th><th>10.64</th><th>12,88</th><th>13.36</th><th>11.45</th><th></th><th>1.83</th><th>8.81</th></t<>	17-Mar-09	3.45	2.64	1.47	1.77	6.18	10.64	12,88	13.36	11.45		1.83	8.81
29-hay-09 3.81 2.50 1.40 1.71 6.38 12.01 14.42 14.88 15.51 1.90 10.23 16-Jun-09 3.98 2.69 1.63 1.89 6.68 11.39 14.31 11.475 12.04 2.29 3.97 13-hug-09 3.95 2.62 1.55 1.73 6.65 11.38 13.47 12.04 2.29 2.37 13-hug-09 3.95 2.62 1.55 1.73 6.65 11.38 13.47 12.06 2.30 9.02 27-0ct-09 4.30 2.71 1.67 1.84 6.65 11.07 13.32 14.47 12.81 2.23 1.015 18-Nov-09 4.54 2.92 1.88 1.91 6.66 10.17 13.12 12.61 12.62 2.24 8.68 17-reb-10 4.72 3.11 2.06 1.93 6.42 11.13 13.57 14.44 13.88 2.44 8.83 01-Apr-10	23-Арг-09	3.50	2.56	1.37	1.70	6.26	11.07	13.42	13.88	11.70		1,82	9.22
16-Jun-09 3.98 2.69 1.63 1.89 6.68 12.54 1.946 15.41 11.04 2.09 10.45 21-Jul-09 4.23 2.99 1.85 1.95 6.89 11.93 14.31 14.75 12.04 2.29 9.27 13-Aug-09 3.95 2.62 1.55 1.73 6.65 11.38 13.67 14.14 12.11 1.88 9.02 27-Oct-09 4.30 2.71 1.67 1.84 6.66 10.17 12.13 12.61 12.24 2.23 9.02 15-bec-09 4.54 2.92 1.88 1.91 6.66 10.07 12.13 12.61 12.24 2.23 7.62 15-bec-09 4.19 2.69 1.71 1.81 6.20 10.82 13.64 14.24 1.82 2.44 8.83 05-Jan-10 4.93 2.207 1.86 6.42 11.13 13.57 14.41 12.40 2.66 9.57 <th< th=""><th>29-May-09</th><th>3.81</th><th>2.50</th><th>1.40</th><th>1.71</th><th>6.38</th><th>12.01</th><th>14.42</th><th>14.88</th><th>15.51</th><th></th><th>1.90</th><th>10.23</th></th<>	29-May-09	3.81	2.50	1.40	1.71	6.38	12.01	14.42	14.88	15.51		1.90	10.23
21-jul-09 4.23 2.99 1.85 1.95 6.89 11.93 14.31 14.75 12.04 2.29 9.27 13-Aug-09 3.95 2.62 1.55 1.73 6.65 11.38 13.67 14.14 12.11 1.88 9.02 29-Sep-09 4.30 2.71 1.67 1.84 6.85 11.87 14.03 14.47 12.06 2.30 9.02 27-Oct-09 4.54 2.92 1.88 1.91 6.66 10.17 12.13 12.61 12.24 2.29 7.62 16-Dec-09 4.19 2.05 1.71 1.81 6.26 10.62 13.06 13.54 12.18 2.44 8.83 05-Jan-10 4.03 2.85 1.82 1.91 6.20 10.82 13.06 13.57 12.18 2.44 8.83 01-Apr-10 3.68 2.68 1.82 6.42 11.13 13.57 14.04 13.89 2.44 8.93 0	16-Jun-09	3.98	2.69	1.63	1.89	6.68	12.54	14.96	15.41	11.04		2.09	10.45
13-Aug-09 3.95 2.62 1.55 1.73 6.65 11.38 13.67 14.14 12.11 1.88 9.02 29-Sep-09 4.41 2.90 1.70 1.85 6.85 11.87 14.03 14.47 12.06 2.30 9.02 27-Oct-09 4.30 2.71 1.67 1.84 6.83 11.97 14.32 14.77 12.81 2.23 10.15 18-Nov-09 4.54 2.92 1.88 1.91 6.66 10.17 12.13 12.61 12.24 2.39 7.62 16-Dec-09 4.19 2.68 1.71 1.81 6.20 10.82 13.80 12.18 2.24 8.68 05-Jan-10 4.03 2.85 1.86 6.49 11.06 13.20 13.67 12.18 2.70 2.44 8.36 01-Agr-10 3.68 2.68 1.58 1.86 6.42 11.33 13.57 14.04 12.49 2.05 9.72 01-Jun-10 4.21 3.05 1.87 1.96 6.32 11.28 13.51	21-Jul-09	4.23	2.99	1.85	1.95	6.89	11.93	14.31	14.75	12.04		2.29	9.27
29-Sep-09 4.41 2.90 1.70 1.85 6.85 11.87 14.03 14.47 12.06 2.20 9.02 27-Oct-09 4.30 2.71 1.67 1.84 6.83 11.97 14.32 14.77 12.81 2.23 10.15 18-Nov-09 4.54 2.92 1.88 1.91 6.66 10.17 12.13 12.16 12.24 2.29 7.62 16-Dec-09 4.19 2.69 1.71 1.81 6.26 11.06 13.82 14.29 13.81 2.18 9.36 05-Jan-10 4.03 2.85 1.86 6.42 11.13 13.57 14.04 13.88 2.44 8.83 01-Apr-10 3.68 2.68 1.58 1.86 6.10 11.55 13.93 14.41 12.40 2.06 9.57 03-Mar-10 4.21 3.05 1.87 1.96 6.32 11.35 14.01 12.91 2.25 9.72 01-Jun-10 4.21	13-Aug-09	3.95	2.62	1.55	1.73	6.65	11.38	13.67	14.14	12.11		1.88	9.02
27-Oct-09 4.30 2.71 1.67 1.84 6.83 11.97 14.32 14.77 12.81 2.23 10.15 18-Nov-09 4.54 2.92 1.88 1.91 6.66 10.17 12.13 12.61 12.24 2.29 7.62 16-Dec-09 4.03 2.85 1.82 1.91 6.20 10.82 13.06 13.54 12.18 2.24 8.68 17-Feb-10 4.03 2.85 1.82 1.91 6.20 10.82 13.06 13.54 12.10 2.44 8.68 17-Feb-10 4.72 3.11 2.06 1.83 6.49 11.13 13.57 14.04 13.88 2.44 8.83 01-Apr-10 3.68 2.68 1.58 1.86 6.10 11.52 13.93 14.41 12.40 2.06 9.57 03-May-10 3.93 2.85 1.66 1.87 6.32 11.28 13.60 13.97 11.76 2.39 9.60 28-jul-10 269 1.58 1.82 6.63 11.31 13.54	29-Sep-09	4.41	2.90	1.70	1.85	6.85	11.87	14.03	14.47	12.06		2.30	9.02
18-Nov-09 4.54 2.92 1.88 1.91 6.66 10.17 12.13 12.61 12.24 2.29 7.62 16-Dec-09 4.19 2.69 1.71 1.81 6.26 11.06 13.82 14.29 13.81 2.18 9.36 05-Jan-10 4.03 2.85 1.82 1.91 6.20 10.82 13.81 12.18 2.24 8.68 17-Feb-10 4.72 3.11 2.06 1.93 6.49 11.06 13.20 13.67 12.70 2.41 9.07 03-Mar-10 4.94 3.12 2.07 1.86 6.42 11.13 13.57 14.04 13.98 2.44 8.83 01-Apr-10 3.68 2.68 1.58 1.86 6.32 11.35 13.54 14.01 12.91 2.25 9.72 01-Jun-10 4.21 3.05 1.87 1.96 6.32 11.28 13.60 13.97 11.76 2.39 9.60 28-Jul-10 2.85 1.68 1.91 6.63 11.31 13.54 14.01	27-Oct-09	4.30	2.71	1.67	1.84	6.83	11.97	14.32	14.77	12.81		2.23	10.15
16-Dec-09 4.19 2.69 1.71 1.81 6.26 11.06 13.82 14.29 13.81 2.18 9.36 05-Jan-10 4.03 2.85 1.82 1.91 6.20 10.82 13.06 13.54 12.18 2.24 8.68 05-Jan-10 4.94 3.12 2.07 1.86 6.42 11.13 13.20 13.67 12.70 2.41 9.07 03-Mar-10 4.94 3.12 2.07 1.86 6.42 11.13 13.27 14.04 13.98 2.44 8.83 01-Apr-10 3.68 2.68 1.58 1.86 6.10 11.52 13.93 14.41 12.40 2.06 9.57 01-Aug-10 4.21 3.05 1.87 1.96 6.32 11.18 13.60 13.97 11.76 2.39 9.60 28-Jup-10 2.10 2.85 1.68 1.91 6.28 12.20 15.00 15.79 11.97 2.45 9.82	18-Nov-09	4.54	2.92	1.88	1.91	6.66	10.17	12.13	12.61	12.24		2.29	7.62
05-Jan-10 4.03 2.85 1.82 1.91 6.20 10.82 13.06 13.54 12.18 2.24 8.68 17-Feb-10 4.72 3.11 2.06 1.93 6.49 11.05 13.20 13.67 12.70 2.41 9.07 03-Mar-10 4.94 3.12 2.07 1.86 6.42 11.13 13.57 14.04 13.98 2.44 8.83 01-Apr-10 3.68 2.68 1.58 1.86 6.10 11.52 13.93 14.41 12.40 2.06 9.57 03-May-10 3.93 2.85 1.66 1.87 6.34 11.35 13.54 14.01 12.91 2.25 9.72 01-Jun-10 4.01 2.04 9.35 10.66 1.87 1.82 6.63 13.80 16.57 11.97 2.45 9.82 15-Sep-10 5.40 2.94 1.79 1.94 6.38 10.34 12.52 12.99 12.08 2.35 <t< th=""><th>16-Dec-09</th><th>4.19</th><th>2.69</th><th>1.71</th><th>1.81</th><th>6.26</th><th>11.06</th><th>13.82</th><th>14.29</th><th>13.81</th><th></th><th>2.18</th><th>9.36</th></t<>	16-Dec-09	4.19	2.69	1.71	1.81	6.26	11.06	13.82	14.29	13.81		2.18	9.36
17-Feb-10 4.72 3.11 2.06 1.93 6.49 11.06 13.20 13.67 12.70 2.41 9.07 03-Mar-10 4.94 3.12 2.07 1.86 6.42 11.13 13.57 14.04 13.98 2.44 8.83 01-Apr-10 3.68 2.68 1.58 1.86 6.10 11.52 13.93 14.41 12.40 2.06 9.57 01-Jun-10 4.21 3.05 1.87 1.96 6.32 11.28 13.60 13.97 11.76 2.39 9.60 28-Jul-10 2.69 1.58 1.82 6.63 11.31 13.54 14.01 11.98 2.04 9.35 10-Aug-10 4.00	05-Jan-10	4.03	2.85	1.82	1.91	6.20	10.82	13.06	13.54	12.18		2.24	8.68
03-Mar-10 4.94 3.12 2.07 1.86 6.42 11.13 13.57 14.04 13.98 2.44 8.83 01-Apr-10 3.68 2.68 1.58 1.86 6.10 11.52 13.93 14.41 12.40 2.06 9.57 03-May-10 3.93 2.85 1.66 1.87 6.34 11.35 13.54 14.01 12.91 2.25 9.72 01-Jun-10 4.21 3.05 1.87 1.96 6.32 11.28 13.60 13.97 11.76 2.39 9.60 28-Jul-10 2.69 1.58 1.82 6.63 11.31 13.57 14.01 11.98 2.04 9.35 10-Aug-10 4.00 2.85 1.68 1.91 6.28 12.20 15.00 15.79 11.97 2.45 9.82 15-Sep-10 5.40 2.94 1.79 1.94 6.91 13.80 16.57 17.37 12.18 2.71 12.26	17-Feb-10	4.72	3,11	2.06	1.93	6.49	11.06	13.20	13.67	12.70		2.41	9.07
01-Apr-10 3.68 2.68 1.58 1.86 6.10 11.52 13.93 14.41 12.40 2.06 9.57 03-May-10 3.93 2.85 1.66 1.87 6.34 11.35 13.54 14.01 12.91 2.25 9.72 01-Jun-10 4.21 3.05 1.87 1.96 6.32 11.28 13.60 13.97 11.76 2.39 9.60 28-Jul-10 2.69 1.58 1.82 6.63 11.31 13.54 14.01 11.98 2.04 9.35 10-Aug-10 4.00 2.69 1.58 1.68 1.91 6.28 12.20 15.00 15.79 11.97 2.45 9.82 15-Sep-10 5.40 2.94 1.79 1.94 6.91 13.80 16.57 17.37 12.18 2.71 12.26 04-Oct-10 5.23 2.75 1.67 1.88 6.38 10.34 12.52 12.09 12.08 2.35 8.21	03-Mar-10	4.94	3.12	2.07	1.86	6.42	11.13	13.57	14.04	13.98		2.44	8.83
03-May-10 3.93 2.85 1.66 1.87 6.34 11.35 13.54 14.01 12.91 2.25 9.72 01-Jun-10 4.21 3.05 1.87 1.96 6.32 11.28 13.60 13.97 11.76 2.39 9.60 28-Jul-10 2.69 1.58 1.82 6.63 11.31 13.54 14.01 11.98 2.04 9.35 10-Aug-10 4.00	01-Apr-10	3.68	2.68	1.58	1.86	6.10	11.52	13.93	14.41	12.40		2.06	9.57
01-Jun-10 4.21 3.05 1.87 1.96 6.32 11.28 13.60 13.97 11.76 2.39 9.60 28-Jul-10 2.69 1.58 1.82 6.63 11.31 13.54 14.01 11.98 2.04 9.35 10-Aug-10 4.00	03-May-10	3.93	2.85	1.66	1.87	6.34	11.35	13.54	14.01	12.91		2.25	9.72
28-Jul-10 2,69 1,58 1,82 6,63 11.31 13.54 14.01 11.98 2.04 9.35 10-Aug-10 4,00	01-Jun-10	4.21	3.05	1.87	1.96	6.32	11.28	13.60	13.97	11.76		2.39	9.60
10-Aug-10 4.00 25-Aug-10 5.10 2.85 1.68 1.91 6.28 12.20 15.00 15.79 11.97 2.45 9.82 15-Sep-10 5.40 2.94 1.79 1.94 6.91 13.80 16.57 17.37 12.18 2.71 12.26 04-Oct-10 5.23 2.75 1.67 1.88 6.86 13.86 16.51 16.96 13.19 2.50 12.33 04-Oct-10 4.85 2.74 1.70 1.89 6.38 10.34 12.52 12.99 12.08 2.35 8.21 09-Dec-10 4.65 2.76 1.76 1.87 6.34 10.28 12.52 13.01 12.32 2.27 8.86 14-Jan-11 4.95 2.92 1.91 1.88 5.88 9.79 12.25 12.70 11.95 2.05 7.78 09-Feb-11 5.58 3.22 2.10 1.90 6.76 11.74 13.61 14.04 13.58 2.52 9.73 07-Mar-11 4.90 2.72 1.72	28-Jul-10		2.69	1.58	1.82	6.63	11.31	13.54	14.01	11.98		2.04	9.35
25-Aug-10 5.10 2.85 1.68 1.91 6.28 12.20 15.00 15.79 11.97 2.45 9.82 15-Sep-10 5.40 2.94 1.79 1.94 6.91 13.80 16.57 17.37 12.18 2.71 12.26 04-Oct-10 5.23 2.75 1.67 1.88 6.86 13.86 16.51 16.96 13.19 2.50 12.33 01-Nov-10 4.85 2.74 1.70 1.89 6.38 10.34 12.52 12.99 12.08 2.35 8.21 09-Dec-10 4.65 2.76 1.76 1.87 6.34 10.28 12.52 13.01 12.32 2.27 8.86 14-Jan-11 4.95 2.92 1.91 1.88 5.88 9.79 12.25 12.70 11.95 2.05 7.78 09-Feb-11 5.58 3.22 2.10 1.90 6.76 11.74 13.61 14.04 13.58 2.52 9.73 07-Mar-11 4.90 2.72 1.72 1.68 6.34 10.40	10-Aug-10	4.00											
15-Sep-10 5.40 2.94 1.79 1.94 6.91 13.80 16.57 17.37 12.18 2.71 12.26 04-Oct-10 5.23 2.75 1.67 1.88 6.86 13.86 16.51 16.96 13.19 2.50 12.33 01-Nov-10 4.85 2.74 1.70 1.89 6.38 10.34 12.52 12.99 12.08 2.35 8.21 09-Dec-10 4.65 2.76 1.76 1.87 6.34 10.28 12.52 13.01 12.32 2.27 8.86 14-Jan-11 4.95 2.92 1.91 1.88 5.88 9.79 12.25 12.70 11.95 2.05 7.78 09-Feb-11 5.58 3.22 2.10 1.90 6.76 11.74 13.61 14.04 13.58 2.52 9.73 07-Mar-11 4.90 2.72 1.72 1.68 6.34 10.40 13.11 13.59 12.27 2.14 8.24 29-Apr-11 3.62 2.575 1.29 1.68 5.94 10.05	25-Aug-10	5.10	2.85	1.68	1.91	6.28	12.20	15.00	15.79	11.97		2.45	9.82
04-Oct-10 5.23 2.75 1.67 1.88 6.86 13.86 16.51 16.96 13.19 2.50 12.33 01-Nov-10 4.85 2.74 1.70 1.89 6.38 10.34 12.52 12.99 12.08 2.35 8.21 09-Dec-10 4.65 2.76 1.76 1.87 6.34 10.28 12.52 13.01 12.32 2.27 8.86 14-Jan-11 4.95 2.92 1.91 1.88 5.88 9.79 12.25 12.70 11.95 2.05 7.78 09-Feb-11 5.58 3.22 2.10 1.90 6.76 11.74 13.61 14.04 13.58 2.52 9.73 07-Mar-11 4.90 2.72 1.72 1.68 6.34 10.40 13.11 13.59 12.27 2.14 8.24 29-Apr-11 3.62 2.575 1.29 1.68 5.94 10.05 12.49 12.68 12.27 2.14 8.24	15-Sep-10	5.40	2.94	1.79	1.94	6.91	13.80	16.57	17.37	12.18		2./1	12.26
01-Nov-10 4.85 2.74 1.70 1.89 6.38 10.34 12.52 12.99 12.08 2.35 8.21 09-Dec-10 4.65 2.76 1.76 1.87 6.34 10.28 12.52 13.01 12.32 2.27 8.86 14-Jan-11 4.95 2.92 1.91 1.88 5.88 9.79 12.25 12.70 11.95 2.05 7.78 09-Feb-11 5.58 3.22 2.10 1.90 6.76 11.74 13.61 14.04 13.58 2.52 9.73 07-Mar-11 4.90 2.72 1.72 1.68 6.34 10.40 13.11 13.59 12.27 2.14 8.24 29-Apr-11 3.62 2.575 1.29 1.68 5.94 10.05 12.49 12.68 12.23 1.90 7.985 25-May-11 3.72 2.60 1.29 1.78 6.025 11.09 13.18 13.70 12.70 1.94 9.44 <th>04-Oct-10</th> <th>5.23</th> <th>2.75</th> <th>1.67</th> <th>1.88</th> <th>6.86</th> <th>13.86</th> <th>16.51</th> <th>16.96</th> <th>13.19</th> <th></th> <th>2.50</th> <th>12.33</th>	04-Oct-10	5.23	2.75	1.67	1.88	6.86	13.86	16.51	16.96	13.19		2.50	12.33
09-Dec-10 4.65 2.76 1.76 1.87 6.34 10.28 12.52 13.01 12.32 2.27 8.86 14-Jan-11 4.95 2.92 1.91 1.88 5.88 9.79 12.25 12.70 11.95 2.05 7.78 09-Feb-11 5.58 3.22 2.10 1.90 6.76 11.74 13.61 14.04 13.58 2.52 9.73 07-Mar-11 4.90 2.72 1.72 1.68 6.34 10.40 13.11 13.59 12.27 2.14 8.24 29-Apr-11 3.62 2.575 1.29 1.68 5.94 10.05 12.49 12.68 12.23 1.90 7.985 25-May-11 3.72 2.60 1.29 1.78 6.025 11.09 13.18 13.70 12.70 1.94 9.44 24-Jun-11 4.32 2.68 1.36 1.81 6.040 10.31 12.80 13.20 11.76 1.72 8.02 <th>01-Nov-10</th> <th>4.85</th> <th>2.74</th> <th>1.70</th> <th>1.89</th> <th>6.38</th> <th>10.34</th> <th>12.52</th> <th>12.99</th> <th>12.08</th> <th></th> <th>2.35</th> <th>8.21</th>	01-Nov-10	4.85	2.74	1.70	1.89	6.38	10.34	12.52	12.99	12.08		2.35	8.21
14-Jan-114.952.921.911.885.889.7912.2512.7011.952.057.7809-Feb-115.583.222.101.906.7611.7413.6114.0413.582.529.7307-Mar-114.902.721.721.686.3410.4013.1113.5912.272.148.2429-Apr-113.622.5751.291.685.9410.0512.4912.6812.231.907.98525-May-113.722.601.291.786.02511.0913.1813.7012.701.949.4424-Jun-114.322.681.361.816.04010.3112.8013.2011.761.728.0220-Jul-114.793.061.751.986.39013.4316.2617.0512.212.3710.9726-Aug-115.252.881.601.846.2711.6714.3314.8214.832.479.7114-Sep-115.432.941.761.976.3911.1613.8414.2212.602.539.1821-Oct-114.672.761.651.806.1310.3712.6213.0312.342.048.6625-Nov-114.672.761.651.806.3311.1613.5914.1213.001.048.47	09-Dec-10	4.65	2.76	1.76	1.87	6.34	10.28	12.52	13.01	12.32		2.27	8.86
09-Feb-11 5.58 3.22 2.10 1.90 6.76 11.74 13.61 14.04 13.58 2.52 9.73 07-Mar-11 4.90 2.72 1.72 1.68 6.34 10.40 13.11 13.59 12.27 2.14 8.24 29-Apr-11 3.62 2.575 1.29 1.68 5.94 10.05 12.49 12.68 12.23 1.90 7.985 25-May-11 3.72 2.60 1.29 1.78 6.025 11.09 13.18 13.70 12.70 1.94 9.44 24-Jun-11 4.32 2.68 1.36 1.81 6.040 10.31 12.80 13.20 11.76 1.72 8.02 20-Jul-11 4.79 3.06 1.75 1.98 6.390 13.43 16.26 17.05 12.21 2.37 10.97 26-Aug-11 5.25 2.88 1.60 1.84 6.27 11.67 14.33 14.82 14.83 2.47 9.71 14-Sep-11 5.43 2.94 1.76 1.97 6.39 11.16 <th>14-Jan-11</th> <th>4.95</th> <th>2.92</th> <th>1.91</th> <th>1.88</th> <th>5.88</th> <th>9.79</th> <th>12.25</th> <th>12.70</th> <th>11.95</th> <th></th> <th>2.05</th> <th>7.78</th>	14-Jan-11	4.95	2.92	1.91	1.88	5.88	9.79	12.25	12.70	11.95		2.05	7.78
07-Mar-11 4.90 2.72 1.72 1.68 6.34 10.40 13.11 13.59 12.27 2.14 8.24 29-Apr-11 3.62 2.575 1.29 1.68 5.94 10.05 12.49 12.68 12.23 1.90 7.985 25-May-11 3.72 2.60 1.29 1.78 6.025 11.09 13.18 13.70 12.70 1.94 9.44 24-Jun-11 4.32 2.68 1.36 1.81 6.040 10.31 12.80 13.20 11.76 1.72 8.02 20-Jul-11 4.79 3.06 1.75 1.98 6.390 13.43 16.26 17.05 12.21 2.37 10.97 26-Aug-11 5.25 2.88 1.60 1.84 6.27 11.67 14.33 14.82 14.83 2.47 9.71 14-Sep-11 5.43 2.94 1.76 1.97 6.39 11.16 13.84 14.22 12.60 2.53 9.18 21-Oct-11 4.56 2.48 1.37 1.53 6.13 10.37 <th>09-Feb-11</th> <th>5.58</th> <th>3,22</th> <th>2.10</th> <th>1.90</th> <th>6.76</th> <th>11.74</th> <th>13.01</th> <th>12.04</th> <th>13.58</th> <th></th> <th>2.52</th> <th>9.75</th>	09-Feb-11	5.58	3,22	2.10	1.90	6.76	11.74	13.01	12.04	13.58		2.52	9.75
Z9-Apr-11 3.62 2.575 1.29 1.68 5.94 10.05 12.49 12.66 12.23 1.90 7.965 25-May-11 3.72 2.60 1.29 1.78 6.025 11.09 13.18 13.70 12.70 1.94 9.44 24-Jun-11 4.32 2.68 1.36 1.81 6.040 10.31 12.80 13.20 11.76 1.72 8.02 20-Jul-11 4.79 3.06 1.75 1.98 6.390 13.43 16.26 17.05 12.21 2.37 10.97 26-Aug-11 5.25 2.88 1.60 1.84 6.27 11.67 14.33 14.82 14.83 2.47 9.71 14-Sep-11 5.43 2.94 1.76 1.97 6.39 11.16 13.84 14.22 12.60 2.53 9.18 21-Oct-11 4.56 2.48 1.37 1.53 6.13 10.37 12.62 13.03 12.34 2.04 8.66 25-Nov-11 4.67 2.76 1.65 1.80 6.33	U/-Mar-11	4.90	2.72	1.72	1.68	0.34	10.40	12 40	12.59	12.27		2,14	7 005
25-may-11 3.72 2.60 1.29 1.78 6.025 11.09 13.16 13.70 12.70 1.94 9.44 24-Jun-11 4.32 2.68 1.36 1.81 6.040 10.31 12.80 13.20 11.76 1.72 8.02 20-Jul-11 4.79 3.06 1.75 1.98 6.390 13.43 16.26 17.05 12.21 2.37 10.97 26-Aug-11 5.25 2.88 1.60 1.84 6.27 11.67 14.33 14.82 14.83 2.47 9.71 14-Sep-11 5.43 2.94 1.76 1.97 6.39 11.16 13.84 14.22 12.60 2.53 9.18 21-Oct-11 4.56 2.48 1.37 1.53 6.13 10.37 12.62 13.03 12.34 2.04 8.66 25-Nov-11 4.67 2.76 1.65 1.80 6.33 11.16 13.59 14.12 13.00 1.04 8.47	29-Apr-11	3.62	2,5/5	1.29	1.00	5.94	11.00	12.49	12.00	12.23		1.50	0 44
24-Jun-11 4.32 2.06 1.30 1.61 6.040 10.31 12.00 13.20 11.70 1.72 6.02 20-Jul-11 4.79 3.06 1.75 1.98 6.390 13.43 16.26 17.05 12.21 2.37 10.97 26-Aug-11 5.25 2.88 1.60 1.84 6.27 11.67 14.33 14.82 14.83 2.47 9.71 14-Sep-11 5.43 2.94 1.76 1.97 6.39 11.16 13.84 14.22 12.60 2.53 9.18 21-Oct-11 4.56 2.48 1.37 1.53 6.13 10.37 12.62 13.03 12.34 2.04 8.66 25-Nov-11 4.67 2.76 1.65 1.80 6.33 11.16 13.59 14.12 13.00 1.04 8.47	25-May-11	3,72	2.00	1.29	1.78	6.025	10.21	12 00	12.70	11 76		1 70	דד.פ גע א
26-Aug-11 5.25 2.88 1.60 1.84 6.27 11.67 14.33 14.82 14.83 2.47 9.71 14-Sep-11 5.43 2.94 1.76 1.97 6.39 11.16 13.84 14.22 12.60 2.53 9.18 21-Oct-11 4.56 2.48 1.37 1.53 6.13 10.37 12.62 13.03 12.34 2.04 8.66 25-Nov-11 4.67 2.76 1.65 1.80 6.33 11.16 13.59 14.12 13.02 2.33 8.84	24-JUN-11	4.52	2.00	1.30	1.01	6 200	12 42	16.00	17.05	12 21		2.72	10.02
14-Sep-11 5.25 2.66 1.60 1.67 0.27 11.67 14.53 14.62 14.63 2.47 9.71 14-Sep-11 5.43 2.94 1.76 1.97 6.39 11.16 13.84 14.22 12.60 2.53 9.18 21-Oct-11 4.56 2.48 1.37 1.53 6.13 10.37 12.62 13.03 12.34 2.04 8.66 25-Nov-11 4.67 2.76 1.65 1.80 6.33 11.16 13.59 14.12 13.02 2.33 8.84	20-JUI-11	4./9	3.00	1./5	1.90	6 27	11 67	14 22	1/.00	14.82		2.37	Q 71
14-Sep-11 5.45 2.54 1.76 1.57 6.35 11.16 13.64 14.22 12.00 2.33 5.16 21-Oct-11 4.56 2.48 1.37 1.53 6.13 10.37 12.62 13.03 12.34 2.04 8.66 25-Nov-11 4.67 2.76 1.65 1.80 6.33 11.16 13.59 14.12 13.02 2.33 8.84 15 1.20 1.20 1.20 1.04 9.47	20-AUG-11	5.25	2.00	1.00	1.04	6 20	11.07	12 9/	14 72	12 60		2.7/	9.71 9.18
21-Oct-11 4.50 2.46 1.57 1.55 0.15 10.57 12.62 15.05 12.54 2.04 8.00 25-Nov-11 4.67 2.76 1.65 1.80 6.33 11.16 13.59 14.12 13.02 2.33 8.84 10.57 1.29 1.59 1.41 13.00 1.04 9.47	14-Sep-11	5.43	2.94	1.70	1 57	6 12	10.27	12.04	12 02	12.00		2.55	8 66
ZO-NUV-11 4.0/ Z./D 1.00 1.00 0.00 11.10 10.00 14.12 10.02 2.00 0.04	21-0CT-11	4.50	2.40	1.3/	1.00	6.13	11 16	12.02	1/10	12.07		2.07	0.00 8 94
	25-NOV-11	4.0/	2.70	1.00	1.00	6.04	10.20	13.39	17.00	12 00		1 04	8 47

Table ET: HISTORIC GLORINGWAREL LEVE	Table	E1:	Historic	Groundwater	Levels
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Well ID	MW8	MW9	MW10	MW11	PW2	PW5	PW6	PW7	Huether	Leachman	Pond	Howlett
Depth (mbgl)	6.10	4.27	4.23	4.27	60.96	55.17	60.96	60.96	n/a	19.20	n/a	n/a
Measuring Point	T/PVC	T/PVC	T/PVC	T/PVC	TOC	TOC	TOC	TOC	тос	TOC	TOC	тос
11-Jan-12	4.05	2.71	1.44	1.84	6.27	11.29	13.66	14.10	13.12		2.18	9.41
09-Feb-12	4.23	2,74	1.49	1.84	6.18	11.01	13,41	13.43	12.67		2.16	8.31
21-Mar-12	4.27	2.78	1.50	1.87	6.21	10.90	13.30	13.71	12.75		2.16	8.71
02-Apr-12	4.63	2.84	1.57	1.88	6.24	11.40	12.82	13.25	12.55		2,23	8.42
02-May-12	4.91	2.89	1.68	1.88	6.36	11.44	13.65	14.20	12.83		2.29	9.38
07-Jun-12	5.01	2.82	1.69	1.82	6.50	12.09	14.42	14.89	12.93		2.43	10.66
05-Jul-12	4.96	3.18	1.95	2.06	6.87	13.57	16.11	16.54	12.68		2.66	10.84
02-Aug-12		3.28	2.04	2.07	7.14	14.27	16.83	17.35	13.26		2.04	11.73
11-Sep-12	5.09	3.11	1.88	1.90	7.05	13.62	16.20	16.78	12.03		2.80	11.74
12-Oct-12	5.02	2.99	1.78	1.96	6.70	11.57	14,11	14.58	13.55		2.66	9.60
15-Nov-12	4.29	2.77	1.50	1.85	6.41	11.33	13.43	13.60	12.95		2.40	9.40
14-Dec-12	4.57	2.77	1.56	1.83	6.46	11.31	13.16	13.61	13.08		2.35	9.43
10-Jan-13	6.30	11.21	13.69	14.20	4.91	2.95	1.63	1.89	13.92		2.43	9.43
18-Feb-13	6.02	9.68	11.71	12.17	4.52	2.84	1.47	1.81	12.12		2.27	7.18
15-Mar-13	5.93	11.12	13.38	13.84	3.59	2.67	1.18	1.60	13.36		1.91	8.74
17-Apr-13	5.88	10.66	13.32	13.78	3.53	2.61	1.12	1.74	12.52		1.81	8.59
15-May-13	6.08	11.21	14.02	14.53	4.34	2.78	1.33	1.89	13.11		2.16	9.52
11-Jun-13	6.02	10.89	12.84	13.33	4.38	2.65	1.22	1.44	11.95		2.04	9.13
11-Jul-13	6.09	11.32	13.30	13.84	4.32	2.75	1.32	1.83	12.60		2.51	9.68
09-Aug-13	6.45	12.68	15.26	15.70	4,56	2.82	1.42	1.90	12.87		2.76	11.10
09-Sep-13	6.40	11.04	13.90	14.33	4,97	2.90	1.52	1.81	12.60		2.38	9.03
08-Oct-13	6.20	10.96	12.85	13.36	4.42	2.61	1.30	1.53	12.84		2.07	8.89
14-Nov-13	6.20	11.27	13.32	13.77	4.18	2.72	1.32	1.84	14.96		2.12	9.68
12-Dec-13	6.37	11.37	14.19	14.60	4.88	2.95	1.61	1.90	13.57		2.28	9.42
15-Jan-14	4.46	2.77	1.36	1.62	6.24	11.07	13.47	13.89	13.22		2.02	9.12
20-Feb-14	5.38	3.10	1.71	1.90	6.36	10.90	13.73	14.15	13.18		2.37	8.91
18-Mar-14	5.11	2.93	1.56	1.79	6.42	11.15	13.84	14.35	n/a		2.23	9.45
30-Apr-14	3.85	2.54	1.08	1.41	6.05	11.25	13.90	14.35	13.06		1.80	9.36
26-May-14	4.04	2.77	1,24	1.84	6.05	10.77	13.04	13.51	12.24		2.02	10.75
25-Jun-14	4.74	2.95	1.46	1.94	6.41	12.09	14.14	14.56	13.01		2.32	10.37
18-Jul-14	4.80	3.07	1.60	1.98	6.48	12.38	14.95	15.36	12.64		2.46	10.78
18-Aug-14	4.61	2.93	1.46	1.90	6.51	12.38	15.13	15.55	12.82		2.44	10.77
10-Sep-14	4.47	2.75	1.40	1.82	6.38	11.80	14.25	14.66	13.37		2.31	9.86
23-Oct-14	4.71	2.77	1.38	1.84	6.28	11.00	13.44	13.80	12.85		2.22	9.06
24-Nov-14	4.80	2.70	1.37	1.70	6.50	11.30	13.70	14.15	13.07		1.97	9.32
18-Dec-14	5.07	2.90	1.55	1.84	6.52	11.95	14.54	14,92	13.71		2.27	9.96
21-Jan-15	5.34	3.05	1.71	1.85	6.55	11.47	13.35	13.75	13.35		2.37	9.56
22-Apr-15	4.19	2.66	1.23	1.70	6.44	11.73	14.18	14.67	13.03		1.99	9.62
08-Jul-15	4.22	2.73	1.31	1.71	6.62	12.58	15.20	15.75	14.10		2.31	10.93
07-Oct-15	5.49	3.10	1.72	1.93	6.83	11.78	14.31	14.83	14.03		2.62	9.83

w

1	Location	MP3	MP4
	Flow	m3/sec	m3/sec
	Measuring Point	Culvert	Culvert
	08-Jan-08	0.27	0.45
	05-Feb-08	0.27	0.21
	03-Mar-08	0.36	0.36
	10-Apr-08	0.54	1.29
	21-May-08	0.37	0.38
	24-Jun-08	0.26	0.25
	21-Jul-08	0.41	0.26
	08-Aug-08	0.22	0.22
	09-Sep-08	0.40	0.32
	16-Oct-08	0.19	0.11
	11-Nov-08	0.18	0.12
L	16-Dec-08	0.47	0.49
	27-Jan-09	0.14	0.20
	25-Feb-09	0.51	0.12
	17-Mar-09	0.70	0.30
	23-Apr-09	0.85	0.07
	29-May-09	1.00	0.31
	16-Jun-09	0.27	0.06
	21-Jul-09	0.19	0.05
	13-Aug-09	0.88	0.24
	29-Sep-09	0.30	0.10
	27-Oct-09	0.28	0.13
	18-Nov-09	0.22	0.10
-	16-Dec-09	0.40	0.16
	05-Jan-10	0.25	0.07
	17-Feb-10	0.19	0.04
	03-Mar-10	0.20	0.06
	01-Apr-10	0.40	0.11
	03-May-10	0.27	0.14
	01-Jun-10	0.12	0.05
	28-Jul-10	0.18	0.06
	25-Aug-10	0.13	0.04
	15-Sep-10	0.08	0.04
	04-Oct-10	0.11	0.05
	01-Nov-10	0.20	0.06
-	09-Dec-10	0.17	0.06
	09-Feb-11	0.18	0.05
	07-Mar-11	1.02	0.29
	29-Apr-11	0.87	0.32
	20-May-11	0.34	0.17
	24-Jun-11	0.32	0.15
	20-JUI-11	0.12	0.03
	20-Aug-11	0.20	0.04
	14-Sep-11	0.10	0.02
	21-UCT-11	0.99	0.34
_	25-NOV-11	0.26	0.10

Location	MP3	MP4
Flow	m3/sec	m3/sec
Measuring Point	Culvert	Culvert
11-Jan-12	0.35	0.05
09-Feb-12	0.36	0.10
21-Mar-12	0.34	0.07
02-Apr-12	0.20	0.05
02-May-12	1.00	0.16
07-Jun-12	0.71	0.12
05-Jul-12	0.08	0.01
02-Aug-12	0.08	0.02
11-Sep-12	0.40	0.02
12-Oct-12	0.20	0.05
15-Nov-12	0.30	0.10
14-Dec-12	0.30	0.09
10-Jan-13	0.23	0.08
18-Feb-13	0.29	0.10
15-Mar-13	0.58	0.17
17-Apr-13	0.64	0.17
15-May-13	0.23	0.11
11-Jun-13	0.50	0.20
11-Jul-13	0.29	0.09
09-Aug-13	0.15	0.07
09-Sep-13	0.17	0.08
08-Oct-13	0.69	0.19
14-Nov-13	0.38	0.11
05-Dec-13	0.35	0.13
15-Jan-14	n/a	n/a
20-Feb-14	n/a	n/a
18-Mar-14	n/a	n/a
31-Mar-14	0.53	0.16
30-Apr-14	0.84	0.29
26-May-14	0.31	0.12
25-Jun-14	0.20	0.09
18-Jul-14	0.14	0.06
18-Aug-14	0.22	0.07
10-Sep-14	0.20	0.09
23-Oct-14	0.58	0.12
26-Nov-14	0.70	0.28
18-Dec-14	0.55	0.14
21-Jan-15	0.20	0.09
22-Apr-15	0.70	0.18
08-Jul-15	0.38	0.15
07-Oct-15	0.16	0.06
09-Dec-15	0.23	0.10

Table E2: Historic Surface Water Flow



Groundwater Studies

Geochemistry

Phase I / II

Regional Flow Studies

Contaminant Investigations

OMB Hearings

Water Quality Sampling

Monitoring

Groundwater Protection Studies

Groundwater Modelling

Groundwater Mapping

Our File: 9507

April 12, 2016

Township of Puslinch 7404 Wellington Road 34 Guelph, ON N1H 6H9

Attention: Karen Landry CAO

Dear Mrs. Landry:

Re: PTTW – Meadows of Aberfoyle (MOE Ref. # 5626-7WLQ3W)

We have reviewed the 2015 Monitoring Report for the Permit to Take Water for the Meadows of Aberfoyle.

The rate of water taking at Meadows of Aberfoyle is well within the permissible limits listed on the Permit to Take Water. At most, wells PW6 and PW7 took approximately 26% of their maximum daily allowable.

Groundwater Monitors

There are eight years of data that show that groundwater levels in the overburden are not trending downward.

Manual measurements obtained from PW6, one of the two active wells, and inactive pumping wells PW2 and PW5 confirm that there is not an overall downward trend in bedrock water levels over time.

Domestic Wells

Pond – No downward trend in water levels





Huether – The average water level (non-pumping) appears to be approximately one meter lower since measurements began in 2008. There is a trend towards lower water levels in the data as presented.

Howlett - no downward trend in water levels.

Surface Water / Groundwater Interaction

As noted previously, the data obtained from MP4 located in Aberfoyle Creek suggests a downward shift in groundwater levels since 2012. Lower groundwater levels in MP4 persisted in 2015 similar to those in 2012. Since 2012, there is not a year over year decline.

The 2015 data obtained from mini-piezometer MP3 located on the west side of Brock Road shows predominantly downward water movement from the creek to the underlying sediments. In 2008 and 2009 there was predominantly upward movement and between 2009 and 2014 both upward and downward movement occurred. The hydraulic gradients in MP3 are influenced by precipitation and we cannot verify if the apparent downward trend in hydraulic gradient at MP3 is a result of anthropogenic influences. The groundwater level at MP3 is not historically low, therefore a relatively higher surface water level creates the observed downward hydraulic gradient.

In summary, water taking at the Meadows of Aberfoyle is within the permitted rates and that long term impacts of the water taking are not occurring. There is no obvious reason for the declining water level at the Huether residence and the lowest water level recorded occurred in 2013. This indicates that the functioning of the well is not affected by this small change in available drawdown.

If you have any questions or comments regarding this submission please do not hesitate to contact Stan Denhoed at 519-826-0099.

Respectfully submitted,

Stal) enlose

Stan Denhoed, M.Sc., P.Eng Harden Environmental

R.J. Burnside & Associates Limited 292 Speedvale Avenue West Unit 20 Guelph ON N1H 1C4 CANADA telephone (519) 823-4995 fax (519) 836-5477 web www.rjburnside.com



RECEIVED

APR 1 5 2016

Transmittal

Township of Puslinch

Date:	April 14, 201	6	Project No.:	PGA120890.0001				
Re:	2015 PTTW	2015 PTTW Monitoring Report for Victoria Park Valley Golf Club						
То:	Attention: Ms. Katie Nasswetter							
	Company:	City of Guelph	Address:	1 Carden Street Guelph ON N1H 3A1				
From:	Name:	Devin Soeting						
	Sent Via:	Courier						
Enclose	ed items							
1	2015 F	PTTW Monitoring Report						
Please	Please find the above mentioned items enclosed.							

DS:mp

cc: Ms. Karen Landry, Township of Puslinch Mr. David DeCorso, DeCorso Enterprises Limited

160412_2015 PTTW Monitoring Report-trans_120890.0001.docx 4/14/2016 12:19 PM



2015 PTTW Monitoring Report

Victoria Park Valley Golf Club 7660 Maltby Road East Guelph, Ontario



APR 1 5 2016

Township of Puslinch

R.J. Burnside & Associates Limited 292 Speedvale Avenue West Unit 20 Guelph ON N1H 1C4 CANADA

April 2016 PGA120890.0001



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1	No	No	City of Guelph
1	No	No	DeCorso Enterprises Limited

Record of Revisions

Revision	Date	Description	
0	April 2016	Initial Submission	

R.J. Burnside & Associates Limited

Report Prepared By:

Devin Soeting, B.A., Can-CISEC Environmental Technologist DS:mp

Report Reviewed By:

ind Mont

Dave Marks, P.Geo. Senior Hydrogeologist DM:mp

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Victoria Park Valley Golf Club

2015 PTTW Monitoring Report April 2016

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Appendices

Appendix A 2015 Permit to Take Water
Appendix B VPV-01 Installation Report
Appendix C Excerpts from Groundwater Protection Study
Appendix D Water Taking Summary
Appendix E Hydrographs
Appendix F Laboratory Certificates of Analysis

Disclaimer

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1.0 Introduction

R.J. Burnside & Associates Limited (Burnside) was retained by Victoria Park Valley Golf Club (Victoria Valley) to conduct a long term Permit to Take Water (PTTW) groundwater monitoring program. Victoria Valley is a 27-hole executive style golf course that is located at the northeast corner of Victoria Road South and Maltby Road East in the Township of Puslinch (referred to herein as the Site). Construction of the course started in 2010; the course was opened in the spring of 2012. The location of the site is indicated on Figure 1.

The PTTW allows water taking from well TW1-05 at a maximum rate of 456 L/min. Well TW1-05 was constructed in 2005 as a 150 mm diameter bedrock well that extends to approximately 101.2 m below ground surface (bgs). A steel casing extends to approximately 58.0 m bgs and is designed to limit water taking to the lower bedrock aquifer (Gasport Formation). Groundwater from TW1-05 is pumped to a nearby irrigation pond then distributed to the golf course when required. The irrigation pond was constructed in 2010 and is lined to prevent interaction with the local shallow groundwater regime. The PTTW also includes water taking from the irrigation pond at a maximum rate of 2,271 L/min.

As a condition of site plan approval, Victoria Valley was required to develop and implement a groundwater monitoring program. In addition, as part of the PTTW approval process, a comprehensive monitoring and reporting program was developed in consultation with the Ministry of the Environment and Climate Change (MOECC), the City of Guelph and the Township of Puslinch. The program included the assessment of the shallow groundwater conditions (overburden) and examination of potential environmental effects from fertilizer applications.

Three overburden monitoring wells (MW1, MW2 and MW3) and one deep-bedrock borehole were installed by Aardvark Drilling in August 2010. The University of Guelph (University) is undertaking research of the bedrock aquifer in the area and Victoria Valley has agreed to allow the University instrument the bedrock borehole (known as VPV-01). The installation and instrumentation of the multi-level bedrock monitoring well was completed in March 2012. The VPV-01 installation report is included in Appendix B. The locations of wells monitored as part of the PTTW program are shown on Figure 2.

The water taking at this Site was previously permitted under PTTW 1722-8T9LW9 which expired on February 28, 2015. Burnside prepared and submitted a Category 3 PTTW application to allow Victoria Valley to continue to take the same amount of water from the same well and pond as it had under the previous PTTW. As part of the submission, Victoria Valley had requested that the off-site water level monitoring conditions be removed from the PTTW. We note that the data showed there is no response to pumping since monitoring began in 2010.

The new PTTW 5743-9UQQXX was issued in February of 2015 by the MOECC and contains less monitoring requirements than PTTW 1722-8T9LW9. The scope of work necessary to fulfill the requirements of the new PTTW 5743-9UQQXX is described in Section 1.1, below. A copy of the new PTTW can be found in Appendix B.

This report documents the results of the original pumping test, previous water taking data, historic monitoring trends, and recommendations for future water quality monitoring requirements, in light of the historic results and new PTTW monitoring requirements. Note that Victoria Valley is requesting that the off-site water quality monitoring conditions required by the City of Guelph and Township of Puslinch be removed as a condition.

1.1 Scope of Work

The 2015 PTTW monitoring program included the following:

- Recording of water volumes taken from TW1-05 and Pond #1;
- Measurement of water levels automatically at 15 minute intervals at locations MW1 and MW2 for the duration of the 2015 irrigation season;
- Measurement of water levels within Port 23 and Port 9 of Well VPV-01;
- Collection of bi-annual groundwater samples (in April and October) at MW1 and MW2 for laboratory analysis of general water quality parameters; and,
- Collection of annual groundwater samples (in October) at DWW1, DWW2, and TW1-05 for laboratory analysis of general water quality parameters.

2.0 Background

A summary of the regional geology and the results of the 2006 pumping test are included below. The background section is based upon the May 2006 Burnside report *"Hydrogeological Assessment, DeCorso Enterprises Limited"*.

2.1 Geologic Setting

The Site is located in the physiographic region known as the Horseshoe Moraines, which is represented locally by the Paris Moraine. The Paris Moraine was deposited during the Port Bruce Stadial of the Ontario ice lobe and extends in a northeast-southeast direction, across the southeast portion of the Guelph area. The moraine comprises sandy Wentworth Till and some kame deposits. The Wentworth Till is the youngest till in the Guelph map area and covers most of the Paris Moraine. It was deposited by a retreat of the Ontario ice lobe into the Lake Ontario basin during the Port Bruce Stadial (15,000 to 14,000 years before present) (OMNR 1983).

The bedrock geology of the study site includes the Middle and Lower Silurian group of formations, which is found over a major portion of Wellington County. In the Guelph area this includes the Guelph Formation, which is underlain by the Eramosa, Goat Island, Gasport and Irondequoit/Rockway/Merritton formations (formerly known

collectively as the unsubdivided Amabel Formation); all formations consist of dolostone. Based on samples recovered during the drilling of TW1-05 and the bedrock monitoring well, the Eramosa Formation underlies the Guelph Formation. The full bedrock sequence at the Site is summarised in the results of a geophysical program conducted by the University – included in Appendix B.

Based upon review of the Ontario Department of Mines Map P. 2224 there appears to be a slight bedrock valley in the vicinity of the Site. The bedrock surface is present at an elevation of approximately 310 m above sea level (asl) and slopes up from the Site to the north, east and south. In general, the Paleozoic bedrock layers slope to the southwest at a rate of 2 to 3 m/km.

2.2 Regional Hydrogeology

Groundwater is an abundant and reliable resource in southern Wellington County where overburden aquifers are not as commonly exploited as the bedrock aquifers. Groundwater recharge is enhanced in areas of coarse-textured soils with either limited slope or hummocky topography. It has been estimated that 25% of the precipitation in Puslinch Township infiltrates as groundwater recharge (Golder, 2005).

Based upon a review of Figure 3.12 "*Groundwater Elevations in the Overburden*" from the County of Wellington's "*Groundwater Protection Study*" the groundwater in the overburden is present at an elevation of approximately 331 m to 340 m asl. Groundwater flow in the overburden is generally towards the Eramosa River to the north, however, there may be local variations due to topography and groundwater discharge features.

Based upon a review of Figure 3.13 "*Groundwater Elevations in the Bedrock*" from the County of Wellington's "*Groundwater Protection Study*" the groundwater in the bedrock is present at an elevation of approximately 310 m to 320 m asl. Groundwater flow in the bedrock is generally towards the Eramosa River to the north. Copies of the maps are provided in Appendix C.

The specific capacity of wells constructed in bedrock range between 0.1 and 2,908 L/min/m having a geometric mean of 7.8 L/min/m. The transmissivity, calculated from the specific capacity, ranges between 0.1 and 7,548 m^2 /day. The relatively high geometric means indicates that the Guelph-Amabel-Lockport hydrogeologic has good water yield capabilities (Singer et al., 1994). Based on the results of the pumping test at TW1-05, the transmissivity of the deep bedrock aquifer in the area of TW1-05 was estimated to be 20 m²/day. This is lower than average for the bedrock in this area because permeable sections of the shallow bedrock were cased-off during the well construction process.

2.3 Well Construction

In October 2005 well TW1-05 was drilled and constructed using air rotary drilling technology. The well is located approximately 80 m east of Victoria Road South on the western portion of the Site (see Figure 2). A representative of Burnside was present during the drilling program to collect samples and document the geology. The well is constructed as a 150 mm open borehole bedrock well that extends to approximately 102.1 m bgs. The overburden and upper bedrock was sealed from the lower portion using a 150 mm steel casing that extends from surface to approximately 58 m bgs. An as constructed diagram of TW1-05 is provided as Figure 3.

It is important to note that TW1-05 was constructed specifically to draw water from the deeper Gasport Formation, which is generally not used for a water source by nearby domestic wells. There was a highly productive water producing interval encountered in TW1-05 at a depth of approximately 38 m bgs that was eliminated as a source of water for TW1-05 for this reason. Since the source zone for TW1-05 is designed to be below the locally confining Eramosa Formation, pumping at TW1-05 does not influence water levels at the shallow domestic wells. This is supported by the results of the 72 hour pumping test at TW1-05, during which pumping at TW1-05 did not influence water levels at overburden and shallow bedrock wells monitored in the area.

2.4 Pumping Test Summary

Following completion of the construction of TW1-05 a pumping test program was conducted over a period of five days from March 7 to March 12, 2006. TW1-05 was equipped with a 15 horsepower submersible pump rated to flows up to 15 L/s and a calibrated in-line flow meter. A variable-rate step test and continuous rate long-term test were conducted under conditions set in MOE PTTW number 5404-6LKMFU.

Constant-rate testing of TW1-05 consisted of a 72-hour pumping test at a rate of 7.6 L/s. Automatic water level recorders were installed in the pumping well (TW1-05), nine local private wells and four surface water monitoring locations. Manual readings were also collected through the testing period.

Based on the constant-rate pumping test, the 2006 hydrogeological assessment report concluded:

- TW1-05 is capable of providing 7.6 L/s on a long-term basis with little effect on local water supply wells. This is supported by the fact that:
 - No discernible response was noted during the monitoring of local domestic wells including one bedrock domestic well located less than 100 m from the pumping well; and
 - No discernible response was noted during the monitoring of two wells completed into the Gasport Formation.

- The monitoring data from the local surface water features indicates that there is no measurable response due to pumping activities. During the test the response at the surface water features was influenced by precipitation and runoff.
- Given the lack of response in local water supply wells, it appears that the Guelph Formation was sealed properly during the well construction program.
- Water quality at TW1-05 is suitable for both irrigation and consumption purposes. Concentrations of tested parameters meet the Ontario Drinking Water Standards.
- The seasonal irrigation demand, estimated to be 86,996 m³/year, is less than the estimated infiltration volume on the property of 106,000 m³/year. It was noted that a portion of the 86,996 m³ extracted from the deeper aquifer will recharge the shallow groundwater resources having a positive benefit on local cold water fisheries.

3.0 Groundwater Monitoring Program

The 2015 monitoring program differed from years past, in that water levels were monitored at only the on-site monitoring wells (MW1, MW2, and Port 23 and Port 9 in well VPV-01, respectively). Water level monitoring from the domestic well locations (DWW1, DWW2, and DWW3), MW3, and the SWMP surface water piezometer station, are no longer required under the new PTTW. However, since the water quality monitoring program was prescribed in conjunction with the City of Guelph and Township of Puslinch, the water quality monitoring program remained unchanged in 2015. No response to pumping has been observed in any of the monitoring stations since the monitoring began with the exception of Port 9 in VPV-01. Historic and current monitoring locations are shown on Figure 2.

As noted previously, the University of Guelph has designed and installed a multi-level monitoring system in VPV-01. As a result, the deep bedrock at the Site was monitored at 15 minute intervals by the University through the months of August to October in 2013 and 2014. However, in 2015 only three water levels were recorded in each of the two monitored ports, respectively. Conversations are ongoing with the University of Guelph to reinstate the continuous interval monitoring for 2016.

Table 1 summarizes the approximate static water level, total depth and distance from TW1-05 of each PTTW monitoring location.

Well Id	Location	Static Water Level (m bmp)	Total Depth (m bgs)	Distance from TW1-05 (m)
TW1-05	Site	18.5	102.1	+
MW1	Site	28	30.9	760 NE
MW2	Site	7.5	8.9	200 SE
VPV-01 (Port 23)	Site	17	32.44 - 36.09	620 NE
VPV-01 (Port 9)	Site	18.5	68.71 - 72.36	620 NE

Table 1: Summary Monitoring Locations

Notes:

"bmp" indicates below measuring point.

"bgs" indicates below ground surface.

Letters following distance from TW1-05 value indicate direction from TW1-05.

Groundwater quality samples were collected in 2015 at MW1, MW2, DWW1, DWW2, and DWW3 to satisfy the City of Guelph and Township of Puslinch site plan monitoring conditions. The spring sampling round was conducted on May 8, 2015, while, with the exception of DWW2, the fall sampling round was conducted on November 18, 2015. The DWW2 fall 2015 sample was obtained on November 26, 2015.

The samples were submitted for laboratory analysis of general chemistry parameters. Since the monitoring equipment installed in VPV-01 does not allow the collection of groundwater samples, an additional sample was collected at TW1-05 during the November 18, 2015 sampling event to allow an assessment of the deep bedrock water quality. The sample collected at TW1-05 was submitted for analysis of general chemistry parameters. As has occurred during past monitoring events, a groundwater sample could not be obtained at MW3 due to lack of available water. All samples were collected according to industry accepted practises and were submitted to AGAT Laboratories in Mississauga under the chain of custody process.

4.0 Monitoring Results

4.1 **Pumping Volumes**

The irrigation water demand for the 2015 season was considered average. The following describes the volumes of water used to irrigate the golf course.

Pumping volume records were compiled on a daily basis. Under PTTW 5713-9UQQXX the water taking from TW1-05 is limited to a maximum daily taking of 657,000 L and a maximum rate of 456 L/min. Pumping records submitted to Burnside indicate that during 2015, TW1-05 was pumped periodically during the months of May, June, July, and August, and September. The average daily pumping volume for the 2015 irrigation season was 204,531 L; this value was calculated by dividing the total volume pumped by the total number of days in the 2015 irrigation season (179 days). Table 2 provides a summary of the 2015 irrigation season pumping data from TW1-05.

Month	Monthly Total (L)	Maximum Daily (L)	Maximum Rate (L/min)
April	0	0	0
May	11,22,190	545,760	379
June	3,160,860	545,760	379
July	9,619,020	545,760	379
August	4,388,520	545,760	379
September	8,220,510	545,760	379
October	0	0	0

Table 2: Summary	of 2015 Wate	r Taking from	TW1-05
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Review of the pumping data indicates that the daily permitted maximum volume was not exceeded during the 2015 irrigation season. The maximum allowable pumping rate was also not exceeded at any time during the irrigation season. As noted previously, the average daily water taking during the 2015 irrigation season was 204,531 L, which is approximately one third of the maximum allowable daily water taking under the 2015 PTTW.

Under the PTTW the water taking from Pond #1 is limited to a maximum daily taking of 1,635,120 L and a maximum rate of 2,271 L/min. Pumping records submitted to Burnside indicate that during 2015, Pond #1 was pumped periodically throughout the months of May, June, July, August, and September, and was pumped once in October. The average daily pumping volume for Pond #1 through the 2015 irrigation season was 188,648 L; this value was also calculated by dividing the total volume pumped by the total number of days in the 2015 irrigation season (179 days). Table 3 provides a summary of the 2015 irrigation season pumping data from Pond #1.

Month	Monthly Total (L)	Maximum Daily (L)	Maximum Rate (L/min)
April	0	0	0
May	11,579,255	1,516,098	2,271
June	1,490,142	416,662	2,271
July	10,140,424	980,871	2,271
August	3,124,554	878,969	2,271
September	6,548,677	1,166,585	2,271
October	885,091	885,091	2,271

Table 3: \$	Summary of	of 2015	Water	Taking	from	Pond #1
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Review of the pumping data from Pond #1 indicates that the daily permitted maximum volume was not exceeded during the 2015 irrigation season. The maximum pumping rate from Pond #1 was also not exceeded at any time during the irrigation season; the average pumping rate for days where pumping occurred was 2,271 L/min. As noted

previously, the average daily water taking during the irrigation season was 188,648 L, which is approximately 12% of the maximum allowable daily water taking (1,635,120 L).

Table 4 provides historic water taking totals from both TW1-05 and irrigation Pond #1.

Month	TW1-05 (L)	Pond #1 (L)
2010	41,295,840	-
2011	36,884,280	-
2012	64,594,242	
2013	30,059,941	23,264,596
2014	31,540,380	29,902,788
2015	36,611,100	33,768,143

 Table 4: Summary of Annual Water Taking Totals

The complete water taking data set is included in Appendix D.

4.2 Groundwater Elevation

Groundwater elevations are monitored to examine impacts from the operation of the irrigation well. Water levels are recorded continuously at MW1 and MW2 at an interval of 15 minutes throughout the monitoring period. Automatic Water Level Recorders (AWLR) were installed at these locations in late March 2011. As previously mentioned, water levels are also recorded by the University of Guelph at two distinct ports (Port 23 and Port 9) in the VPV-01 well. However, these stations were only monitored for water levels three times throughout the year in 2015.

Several monitoring locations were removed from the monitoring program as part of the 2015 PTTW renewal process. Monitoring locations DWW1, DWW2, DWW3(R), and SWMP2 were removed from the monitoring program as no impacts to water levels were observed as a result of pumping from TW1-05 or Pond #1. Burnside notes that water level data was lost between March 14 and May 8 of 2015 in MW1 and MW2 due to AWLR (pressure transducer) error. The following sections summarize the observed fluctuations in water levels.

4.2.1 MW1

Monitoring well MW1 is constructed in the deep overburden and is located approximately 760 m northeast of TW1-05. Water level fluctuations during the irrigation season at this location are characterized by a typical recovery of water levels during the spring freshet period (March to early May) of approximately 0.5 m. The total recovery of water levels from the recorded seasonal low in March 2015 was approximately 0.15 m. Following a yearly high in mid-May, water levels declined by approximately 0.4 m at a relatively constant rate from mid-summer through the late fall period.

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As observed in previous years, the comparison of pumping at TW1-05 with the water level trend at MW1 suggests that pumping at TW1-05 does not significantly influence water levels at MW1. The longer term water level decline observed in 2012 appears more closely related to a delayed response to variations in seasonal precipitation. The decline in 2012 is not observed in 2013 or 2014, as precipitation amounts were higher and TW1-05 pumping volumes were much lower. However, water levels recorded in 2015 were noted to be at their lowest levels since 2012, and did not increase significantly during the spring freshet. This anomaly appears to be due to a lack of local precipitation through the winter months preceding the spring freshet. MW1 will continue to be monitored to identify any potential trends related to pumping at the TW1-05 well and Pond #1.

4.2.2 MW2

Monitoring well MW2 is constructed in the shallow overburden and is located approximately 200 m southeast of TW1-05. Water level fluctuations during the irrigation season are characterized by a typical recovery of water levels during the spring freshet period (March to late April) of approximately 0.95 m. The total recovery of water levels from the recorded seasonal low in March 2015 was approximately 0.3 m. However as previously noted, water level data for the majority of the spring freshet period was lost due to AWLR (pressure transducer) error. Following a brief stabilization in mid-July, water levels declined by approximately 0.45 m at a relatively constant rate through the summer to late fall.

Similar to MW1, the water level trend at MW2 suggests that pumping at TW1-05 does not significantly influence water levels at MW2. Similar to 2012, the longer term water level decline in 2015 appears more closely related to a slightly delayed response to seasonal precipitation variations and below average annual precipitation. Water levels in 2015 showed no indication of any long term water level declines and were observed to be the highest observed at this location since monitoring began.

4.2.3 VPV-01

Well VPV-01 contains a Westbay multi-port installation designed by the University of Guelph Centre for Applied Groundwater Research team. VPV-01 is located approximately 620 m northeast of TW1-05. Brief monitoring intervals occurred in March, September, and November 2015 using specialized equipment installed at the well to monitor water level responses to pumping at TW1-05. The AWLR were installed at ports in the Gasport and Guelph Formations. Port 23 recorded water level responses in the Guelph Formation (between approximately 32.44 mbgs and 36.09 mbgs), while Port 9 recorded water level responses in the Gasport Formation (between approximately 68.71 mbgs and 72.36 mbgs).

The historic data from Port 9 indicates that water levels fluctuate approximately 0.5 m in the Gasport Formation. Port 9 provides excellent indicators of the water level response in the deep bedrock. The three water levels recorded in 2015 were within the previously recorded historic levels. A semi-logarithmic plot of water levels in this interval from the start of the 2014 pumping season is included in Appendix F.

A Cooper-Jacob analysis using the data from August 15, 2013 was completed to determine the connectivity between TW1-05 and VPV-01. The data from 300 to 1,000 minutes after TW1-05 was started indicates a Transmissivity of 212 m²/day and a Storativity of 0.0002. These aquifer coefficients compare to the coefficients calculated for TW1-05. This monitor should be used as an indicator for the response to TW1-05 in the future.

Water levels measured in 2014 from Port 23 (Guelph Formation) show a general decrease in water levels of approximately 0.3 m throughout the 2014 monitoring period. This trend is attributed to seasonal fluctuations and does not appear to be the result of pumping at TW1-05. Similar to Port 9, water levels in Port 23 were only monitored on three occasions over 2015 (March, September, and November). The water levels recorded during these three events were within historic ranges.

4.2.4 Summary

The water level monitoring data collected during the 2015 period indicates that there is no measurable response to pumping from TW1-05 in wells constructed in the overburden or Guelph Formation. Water from TW1-05 is supplied primarily by lateral flow in the deep bedrock aquifer and there is no significant recharge from local overlying granular sediments. As a result, pumping at TW1-05 has no measurable impact on the Mill Creek Watershed. Hydrographs are included in Appendix F.

4.3 Groundwater Quality

During 2015, groundwater samples were collected at MW1, MW2, DWW1, DWW2, DWW3(R) and TW1-05. The samples were submitted for analysis of general water quality parameters. Table 5 provides a summary of the locations and requested analysis.

Location	May 2015	November 2015
MW1	General Chemistry	General Chemistry
MW2	General Chemistry	General Chemistry
DWW1	Not Sampled	General Chemistry
DWW2	Not Sampled	General Chemistry
DWW3(R)	Not Sampled	General Chemistry
TW1-05	Not Sampled	General Chemistry

Deremeter	Aug	Apr	Oct	Apr	Nov	Apr	Nov	Apr	Oct	May	Nov
Falameter	10	11	11	12	12	13	13	14	14	15	15
Nitrate (as N)	<0.0	0.27	0.91	1.82	2.01	2.68	3.35	2.45	2.23	2.10	2.29
Sulphate	13.4	35.4	34.8	26.8	15.8	40.0	39.9	56.2	27.1	29.9	25.5
Chloride	44.7	17.0	13.3	12.6	13.1	12.9	13.3	7.81	10.1	11.5	11.7
2,4-D	<0.5	-	<0.5	-	<0.5	142	-		<0.5	-	-
Dicamba	<0.5	2 9 1	<0.5	-	<0.5	-		-	<0.5		-

Table 7:	Summary of	of Key	Parameters	at MW2
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Notes:

1. Concentrations of nitrate, sulphate and chloride are expressed as mg/L.

2. Concentrations of 2,4-D and dicamba are expressed as µg/L.

The concentration of total hardness was above the ODWS Operational Guideline range of 80 to 100 mg/L at MW2; however the levels detected are typical for untreated water in the region.

The concentrations of 2,4-D and dicamba have consistently been below the corresponding laboratory method detection limits and are considered "not detected". Dicamba and 2,4-D were not analyzed at MW2 in 2015 as it is a biennial requirement.

The concentrations of nitrate had increased from non-detect in August 2010 to more than 2.0 mg/L in November 2012 and have remained relatively stable since. The concentrations are still well below the ODWS Maximum Acceptable Concentration (MAC) of 10 mg/L.

The concentrations of chlorides have decreased and stabilized from a high of 44.7 mg/L in August 2010 to relatively stable concentrations of approximately 11 mg/L since.

4.3.3 DWW1

The analytical results for samples collected during the 2010 to 2015 monitoring period indicate that the concentrations of most parameters are below the ODWS with low concentrations of nitrate, sulphate and chloride detected. Table 8 provides a summary of the analytical data.

Parameter	Aug 10	Oct 11	Nov 12	Nov 13	Oct 14	Nov 15
Nitrate (as N)	0.19	0.08	0.15	0.21	0.22	0.23
Sulphate	28.9	34.5	29.9	29.4	31.5	27.9
Chloride	3.74	2.34	3.07	2.74	3.11	2.54

Table 8:	Summar	of Key	Parameters	at DWW1
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Notes:

R.J. Burnside & Associates Limited

1. Concentrations of nitrate, sulphate and chloride are expressed as mg/L.

The concentration of total hardness was above the ODWS Operational Guideline range of 80 to 100 mg/L at DWW1; however the levels detected are typical in for water from the limestone bedrock aquifer.

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aquifers where nitrate concentrations are typically above the laboratory method detection limit.

4.3.6 Groundwater Quality Summary

The water quality monitoring program indicates that the concentrations of key water quality parameters (nitrates, sulphate, chloride, 2,4-D and dicamba) are well below the ODWS. Concentrations of all of these parameters have remained relatively stable in each of the respective wells that are monitored as part of the water quality program. Trends will continue to be evaluated further during subsequent sampling events. The concentrations of tested parameters were below the Canadian Water Quality Guidelines for Irrigation supplies.

Burnside recommends that:

- The condition to collect water samples from off-site locations be reviewed at the end of the 2016 monitoring season. No significant changes in the concentrations of tested parameters have been observed at these locations since monitoring began in 2010.
- The condition to analyze 2,4-D and dicamba be reviewed at the end of the 2016 monitoring season as concentrations have been consistently below laboratory method detections limits.

The 2015 laboratory Certificates of Analysis are included in Appendix F.

5.0 Water Conservation

Various conservation measures have been used by Victoria Valley to manage the water demand of the operation, including:

- Irrigate only those areas that require it, specifically tees, greens, and some fairways. The longer grasses in the out-of-play areas are more tolerant of dry periods and do not require irrigation.
- Irrigate at night when the losses due to evapotranspiration are at a minimum and the water can be retained in the soil structure before the plants absorb the water.
- Optimization of water use. Not all areas will require the same amount of water. The fairways, tees and greens will use different grass types and will be cut to different heights. Sprinkler heads will be set individually to provide the optimum amount of water to each area depending on the grass type and length.
- Localized hand watering of "hot-spot" areas will take place, which will avoid over-water in many areas.

- Regular aeration of turf grass to prevent the formation of thatch. Thatch is a thick mat of grass roots that grows so densely that the passage of water to the bottom of the root system is reduced. Thatch means that an increased amount of water must be applied to an area to be able to water it effectively.
- Adjust irrigation practices to the local weather conditions such as solar radiation or precipitation. For instance if it starts raining while irrigating, the irrigation system will be shut down to conserve water.
- Lowering fertility rates and use of plant growth regulators to slow down plant growth, which reduces water demand. The use of soil surfactants on greens and tees ensures more efficient water distribution and improves the moisture content of soils.
- Regular monitoring of all water takings will increase awareness and assist in monitoring the success of water conservation efforts.

The overall water conservation strategy at the golf course is to water for plant sustainability and health and the golf club is proactive in reviewing procedures and looking for ways to improve on irrigation efficiency.

6.0 Trigger Levels and Contingency Planning

The PTTW outlines specific requirements in the case of adverse effects on local groundwater resources due to pumping at TW1-05; these include:

- Notification, investigation and reporting of interference complaints;
- Reducing or ceasing pumping activities and remediation of affected water supplies if required; and
- Ceasing to pump during a Level III low water condition as defined by the Grand River Conservation Authority.

No well interference complaints were received by Victoria Valley during the 2015 pumping season. Review of the monthly flow condition reports as provided by the Ministry of Natural Resources and Forests indicates that at no time during the May to October 2015 period did a Level III Low Water Condition occur within the Grand River Conservation Authority watershed. Since monitoring began, a Level III Low Water Condition has not been issued within the Mill Creek subwatershed.

7.0 Conclusions

• The maximum daily water taking volume, maximum daily hours of water taking and maximum taking rate prescribed in the PTTW were not exceeded during the 2015 irrigation season and are sufficient to supply the water needs of the Site.

- The water level trends observed at MW1 and MW2 indicate that pumping at TW1-05 does not influence water levels in the shallow and deep overburden in the area of the Site.
- The water level trends previously observed at VPN-01 Port 9 indicate a measureable response in the Gasport Formation opposite the primary water source for TW1-05.
- Concentration trends indicate that indicator water quality parameters (nitrate, sulphate, and chloride) have remained relatively stable at MW1 and MW2 since 2012.
- Pumping from TW1-05 has no measurable impact on the local shallow overburden flow system and is unlikely to cause any measureable impact on the Mill Creek watershed.

7.1 Recommendations

The continuous monitoring of Ports 9 and 23 in the VPV-01 well, through the use of AWLR should be re-established in 2016 to comply with the monitoring requirements of PTTW 5743-9UQQXX.

Since the 2016 irrigation season marks the fifth year of water quality monitoring after the final completion of the golf course, the water quality monitoring program should be re-evaluated to determine if the program is to be continued, modified, or terminated. Potential changes to the scope of the water quality program will be discussed in the 2016 monitoring report.

We trust that this report satisfies the reporting requirements requested by the Township of Puslinch and City of Guelph.







Figures





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Appendix A

2015 Permit to Take Water



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

> PERMIT TO TAKE WATER Ground Water NUMBER 5743-9UQQXX

Pursuant to Section 34.1 of the <u>Ontario Water Resources Act</u>, R.S.O. 1990 this Permit To Take Water is hereby issued to:

DeCorso Enterpris	ses Limited
1096 Victoria Roa	d S., R.R. 2
Guelph, Ontario	N1H 6H8

For the water

taking from: Bedrock Well TW1-05 and Pond #1

Located at: Lot 15, Concession 9, Geographic Township of Puslinch Puslinch, County of Wellington

For the purposes of this Permit, and the terms and conditions specified below, the following definitions apply:

DEFINITIONS

- (a) "Director" means any person appointed in writing as a Director pursuant to section 5 of the OWRA for the purposes of section 34.1, OWRA.
- (b) "Provincial Officer" means any person designated in writing by the Minister as a Provincial Officer pursuant to section 5 of the OWRA.
- (c) "Ministry" means Ontario Ministry of the Environment and Climate Change.
- (d) "District Office" means the Guelph District Office.
- (e) "Permit" means this Permit to Take Water No. 5743-9UQQXX including its Schedules, if any, issued in accordance with Section 34.1 of the OWRA.
- (f) "Permit Holder" means DeCorso Enterprises Limited.
- (g) "OWRA" means the Ontario Water Resources Act, R.S.O. 1990, c. O. 40, as amended.

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

TERMS AND CONDITIONS

1. Compliance with Permit

- 1.1 Except where modified by this Permit, the water taking shall be in accordance with the application for this Permit To Take Water, dated December 23, 2014 and signed by David DeCorso, and all Schedules included in this Permit.
- 1.2 The Permit Holder shall ensure that any person authorized by the Permit Holder to take water under this Permit is provided with a copy of this Permit and shall take all reasonable measures to ensure that any such person complies with the conditions of this Permit.
- 1.3 Any person authorized by the Permit Holder to take water under this Permit shall comply with the conditions of this Permit.
- 1.4 This Permit is not transferable to another person.
- 1.5 This Permit provides the Permit Holder with permission to take water in accordance with the conditions of this Permit, up to the date of the expiry of this Permit. This Permit does not constitute a legal right, vested or otherwise, to a water allocation, and the issuance of this Permit does not guarantee that, upon its expiry, it will be renewed.
- 1.6 The Permit Holder shall keep this Permit available at all times at or near the site of the taking, and shall produce this Permit immediately for inspection by a Provincial Officer upon his or her request.
- 1.7 The Permit Holder shall report any changes of address to the Director within thirty days of any such change. The Permit Holder shall report any change of ownership of the property for which this Permit is issued within thirty days of any such change. A change in ownership in the property shall cause this Permit to be cancelled.

2. General Conditions and Interpretation

2.1 Inspections

The Permit Holder must forthwith, upon presentation of credentials, permit a Provincial Officer to carry out any and all inspections authorized by the OWRA, the *Environmental Protection Act*, R.S.O. 1990, the *Pesticides Act*, R.S.O. 1990, or the *Safe Drinking Water Act*, S. O. 2002.

2.2 Other Approvals

The issuance of, and compliance with this Permit, does not:

(a) relieve the Permit Holder or any other person from any obligation to comply with any other applicable legal requirements, including the provisions of the *Ontario Water Resources Act*, and
the Environmental Protection Act, and any regulations made thereunder; or

(b) limit in any way any authority of the Ministry, a Director, or a Provincial Officer, including the authority to require certain steps be taken or to require the Permit Holder to furnish any further information related to this Permit.

2.3 Information

The receipt of any information by the Ministry, the failure of the Ministry to take any action or require any person to take any action in relation to the information, or the failure of a Provincial Officer to prosecute any person in relation to the information, shall not be construed as:

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

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

2.4 Rights of Action

The issuance of, and compliance with this Permit shall not be construed as precluding or limiting any legal claims or rights of action that any person, including the Crown in right of Ontario or any agency thereof, has or may have against the Permit Holder, its officers, employees, agents, and contractors.

2.5 Severability

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

2.6 Conflicts

Where there is a conflict between a provision of any submitted document referred to in this Permit, including its Schedules, and the conditions of this Permit, the conditions in this Permit shall take precedence.

3. Water Takings Authorized by This Permit

3.1 Expiry

This Permit expires on February 28, 2025. No water shall be taken under authority of this Permit after the expiry date.

3.2 Amounts of Taking Permitted

The Permit Holder shall only take water from the source, during the periods and at the rates and amounts of taking specified in Table A. Water takings are authorized only for the purposes specified in Table A.

Table A

	Source Name / Description:	Source: Type:	Taking Specific Purpose:	Taking Major Category:	Max. Taken per Minute (litres):	Max. Num. of Hrs Taken per Day:	Max. Taken per Day (litres):	Max. Num. of Days Taken per Year:	Zone/ Easting/ Northing:
1	TW1-05	Well Drilled	Golf Course Irrigation	Commercial	456	24	657,000	214	17 568312 4816988
2	Irrigation Pond #1	Pond Dugout	Golf Course Irrigation	Commercial	2,271	24	1,635,120	214	17 568348 4817000
3	Storage Pond #2	Pond Dugout	Golf Course Irrigation	Commercial	1,136	24	1,635,120	214	17 568486 4817243
4	Storage Pond #3	Pond Dugout	Golf Course Irrigation	Commercial	1,136	24	1,635,120	214	17 568498 4817304
						Total Taking:	657,000		

- 3.3 Notwithstanding Table A, only the Irrigation Pond (Pond #1) shall be used as a water source for golf course irrigation and for transfer to the Storage Ponds (#2 & #3). Well TW1-05 shall be used for the sole purpose of filling the Irrigation Pond. The two Storage Ponds on the site (Ponds #2 and #3) shall only be used for the storage of water transferred from Pond #1 for potential later transfer back to the Irrigation Pond.
- 3.4 Water taking under the authorization of this Permit shall only occur between April 1 and October 31 of each year from date of issue to expiry.

4. Monitoring

4.1 Under section 9 of O. Reg. 387/04, and as authorized by subsection 34(6) of the *Ontario Water Resources Act*, the Permit Holder shall, on each day water is taken under the authorization of this Permit, record the date, the volume of water taken on that date and the rate at which it was taken. The daily volume of water taken shall be measured by a flow meter or as otherwise accepted by the Director. A separate record shall be maintained for the well and the irrigation pond. The Permit Holder shall keep all records required by this condition current and available at or near the site of the taking and shall produce the records immediately for inspection by a Provincial Officer upon his or her request. The Permit Holder, unless otherwise required by the Director, shall submit, on or before March 31st in every year, the records required by this condition to the ministry's Water Taking Reporting System.

- 4.2 The Permit Holder shall monitor static water levels at a minimum of 15 minute intervals at the monitoring well locations listed below. Water levels shall be recorded using a dedicated automated water level recorder in each well. Monitoring will commence April 1 and finish November 30 during each calendar year.
 - MOE WWR# 7150964 (MW1 and MW2)
- 4.3 The Permit Holder shall monitor static water levels at a minimum of 15 minute intervals at Bedrock Multi-level Well VPV-01 (MOE WWR# 7150964) within Port 23 (Guelph Formation) and Port 9 (Gasport Formation) using a dedicated automated water level recorder. Monitoring shall be conducted for a minimum period of 2 months during the peak water taking season between June 1 and August 31 of each calendar year.
- 4.4 As part of the renewal application, the Permit Holder shall submit an evaluation report which presents and interprets the monitoring data collected under Conditions 4.1 through 4.3. The report shall be prepared by a licensed Professional Geoscientist or licensed Professional Engineer specializing in hydrogeology and shall include an assessment of impact of the taking on groundwater and surface water resources. The report shall present yearly hydrographs for all monitoring wells and pumping well and include local precipitation data. The report shall include recommendations for changes to the groundwater monitoring program as necessary. Copies of this report shall also be provided to the City of Guelph and the Township of Puslinch.

5. Impacts of the Water Taking

5.1 Notification

The Permit Holder shall immediately notify the local District Office of any complaint arising from the taking of water authorized under this Permit and shall report any action which has been taken or is proposed with regard to such complaint. The Permit Holder shall immediately notify the local District Office if the taking of water is observed to have any significant impact on the surrounding waters. After hours, calls shall be directed to the Ministry's Spills Action Centre at 1-800-268-6060.

5.2 For Groundwater Takings

If the taking of water is observed to cause any negative impact to other water supplies obtained from any adequate sources that were in use prior to initial issuance of a Permit for this water taking, the Permit Holder shall take such action necessary to make available to those affected, a supply of water equivalent in quantity and quality to their normal takings, or shall compensate such persons for their reasonable costs of so doing, or shall reduce the rate and amount of taking to prevent or alleviate the observed negative impact. Pending permanent restoration of the affected supplies, the Permit Holder shall provide, to those affected, temporary water supplies adequate to meet their normal requirements, or shall compensate such persons for their reasonable costs of doing so. If permanent interference is caused by the water taking, the Permit Holder shall restore the water supplies of those permanently affected.

6. Director May Amend Permit

The Director may amend this Permit by letter requiring the Permit Holder to suspend or reduce the taking to an amount or threshold specified by the Director in the letter. The suspension or reduction in taking shall be effective immediately and may be revoked at any time upon notification by the Director. This condition does not affect your right to appeal the suspension or reduction in taking to the Environmental Review Tribunal under the *Ontario Water Resources Act*, Section 100 (4).

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

- 1. Condition 1 is included to ensure that the conditions in this Permit are complied with and can be enforced.
- 2. Condition 2 is included to clarify the legal interpretation of aspects of this Permit.
- 3. Conditions 3 through 6 are included to protect the quality of the natural environment so as to safeguard the ecosystem and human health and foster efficient use and conservation of waters. These conditions allow for the beneficial use of waters while ensuring the fair sharing, conservation and sustainable use of the waters of Ontario. The conditions also specify the water takings that are authorized by this Permit and the scope of this Permit.

In accordance with Section 100 of the <u>Ontario Water Resources Act</u>, R.S.O. 1990, you may by written notice served upon me, the Environmental Review Tribunal and the Environmental Commissioner, **Environmental Bill of Rights**, R.S.O. 1993, Chapter 28, within 15 days after receipt of this Notice, require a hearing by the Tribunal. The Environmental Commissioner will place notice of your appeal on the Environmental Registry. Section 101 of the <u>Ontario Water Resources Act</u>, as amended provides that the Notice requiring a hearing shall state:

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

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

- 3. The name of the appellant;
- 4. The address of the appellant;
- 5. The Permit to Take Water number;
- 6. The date of the Permit to Take Water;
- 7. The name of the Director;
- 8. The municipality within which the works are located;

This notice must be served upon:

The Secretary The Environmental Commissioner The Director, Section 34.1, Environmental Review Tribunal <u>AND</u> 1075 Bay Street <u>AND</u> Ministry of the Environment and 655 Bay Street, 15th Floor 6th Floor, Suite 605 Climate Change Toronto ON Toronto, Ontario M5S 2W5 12th Floor M5G 1E5 119 King St W Fax: (416) 314-4506 Hamilton ON L8P 4Y7 Email: Fax: (905) 521-7820 ERTTribunalsecretary@ontario.ca

Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal:

by telephone at (416) 314-4600

by fax at (416) 314-4506

by e-mail at www.ert.gov.on.ca

This instrument is subject to Section 38 of the **Environmental Bill of Rights** that allows residents of Ontario to seek leave to appeal the decision on this instrument. Residents of Ontario may seek to appeal for 15 days from the date this decision is placed on the Environmental Registry. By accessing the Environmental Registry, you can determine when the leave to appeal period ends.

This Permit cancels and replaces Permit Number 6553-8XUL9C, issued on 2012/09/05.

Dated at Hamilton this 31st day of March, 2015.

Belinda Koblik Director, Section 34.1

Ontario Water Resources Act , R.S.O. 1990

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Schedule A

This Schedule "A" forms part of Permit To Take Water 5743-9UQQXX, dated March 31, 2015.



Appendix B

VPV-01 Installation Report

Schlumberger Water Services

Schlumberger Canada Limited 3480 Gilmore Way, Suite 110 Burnaby, BC V5G 4Y1 Canada Tel. +1.604.430.4272 Fax. +1.604.430.3538



COMPLETION REPORT

Westbay System Monitoring Well:

VPV-01

Guelph, Ontario

Prepared for:

University of Guelph

G360 - Centre for Applied Groundwater Research School of Engineering Alexander Hall, Rm 230 Guelph, ON N1G 2W1

> Prepared by: Schlumberger Water Services WB888 April 4, 2012

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APPENDIX

APPENDIX: VPV-01

1. Introduction

This report and the attached Appendix document the technical services carried out by Schlumberger Water Services (SWS) under University of Guelph Purchase Order number 201201708 dated February 2, 2012. A Westbay System monitoring well was installed in borehole VPV-01 in Guelph, Ontario.

SWS technical services representative Mr. Mark Lessard was on site for the installation of the Westbay System well from March 27 to 29, 2012. This report documents the installation tasks and related QA checks. Assistance and supervision during the installation was provided by Daniel Elliot of the University of Guelph and field staff of Aardvark Drilling.

2. Previous Activities

During August 3 and 6, 2010 a nominal 6-in diameter OD surface casing was installed to 1mbgs. An HQ diameter borehole with at a nominal 3.78 in diameter was then drilled to 101 m (331 ft). A nominal 4.78-in diameter OD surface casing was set to 31.5 mbgs. Water was used as the drilling fluid. ATV, Conductivity, Gamma, Temperature profiling, FLUTe K-profiling and full wave sonic testing were performed in the open borehole before the installation of the Westbay system. A steel guide tube was placed in the borehole before the lowering of the Westbay casing to protect against caving of the borehole. The bottom of the guide tube was positioned such that the bottom Westbay System packer was in the open hole.

Monitoring	Installation	Borehole	MP38 Casing	No. Monitoring	Surface Casing (diameter/depth)
Well No.	Date	Depth	Length (ft)	Zones	
VPV-01	Mar 27 - 29	321.5 (ft) 98.0 (m)	319.0 (ft) 97.2 (m)	23	6 in / 1 m (3.3 ft) 4.78 in / 31.5 m (103.3 ft)

Table 1, Summary of Westbay Well Installation

(Note: all depths are with respect to ground surface. Monitoring well reference elevations were not available at the time of writing).

The well was installed according to the procedure described below.

3. Installation

3.1 Preparation of Monitoring Well Design

A preliminary well design for the borehole, which specifies the location of components in the well, was provided to SWS in a document from Mr. Adam Gilmore of the University of Guelph. A well design was created based on the chosen zone locations. The well design was used to prepare a Casing Installation Log, which specifies the location of components in the well. Mr. Daniel Elliot of the University of Guelph reviewed and approved the log in the field. The Casing Installation Log as approved was used as an installation guide in the field. A copy of the log is located in the Appendix.

A measurement port coupling was included in all zones to provide the capability to measure fluid pressures, collect fluid samples and to permit operation of the squeeze relief venting capabilities of the Westbay Model No. 6055 packer inflation tool. A pumping port coupling was also included in two zones to provide purging and hydraulic conductivity testing capabilities. All pumping ports are Westbay Model 0224 mechanical ports. Mr. Daniel Elliot requested that optional polypropylene filters were to be installed over all measurement port couplings.

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3.2 Layout of Westbay Casing Components

Prior to the installation, the Westbay System casing components were set out at the borehole according to the sequence indicated on the Casing Installation Log. Each casing length was numbered beginning with the lowermost as an aid to confirming the proper sequence of components. The appropriate Westbay System couplings were attached to the casing sections. Magnetic location collars were attached 2 ft below the top of the measurement port in six zones. Each casing component was visually inspected. Serial numbers for each packer, pumping port and measurement port coupling were recorded on the Casing Installation Log. The component layout was confirmed with the log before the components were lowered into the borehole.

After the guide tube was lowered into the borehole, the depth was tagged to make sure no sluff had settled on the bottom of the borehole. It was found that the borehole was about 10-feet shallower than drilled. Daniel Elliot made the decision to remove the bottom three components from the Westbay system casing to accommodate the shallower borehole depth.

3.3 Lowering of Westbay Components

The open-hole water level in VPV-01 was 17.0 m below ground level, so the Westbay casing components were lowered into the borehole using a development rig and later with hand lowering as the Westbay Casing became boyant. Clean water supplied by Aardvark Drilling was added to the Westbay casing when necessary for testing of joint seals during lowering and to counter buoyancy. Each casing joint was tested with a minimum internal hydraulic pressure of 150 psi for one minute to confirm hydraulic seals. Records of each successful joint test and the placement of each casing component are noted on the Casing Installation Log by check marks.

3.4 Hydraulic Integrity Testing

After the Westbay casing string was lowered into the borehole, the water level inside the Westbay casing was monitored at a depth different from the open borehole water level for a minimum period of thirty minutes to confirm hydraulic integrity of the casing. The data from the hydraulic integrity test are shown on Page 3 of the Casing Installation Log in the Appendix and in Table 2 below.

Well number	Borehole water level (Ground Surface)	Westbay water level (top of casing)
VPV-01	17.0 m (55.8 ft)	60.863 m (199.7 ft)

Table 2, Borehole and Westbay Casing Water Levels

3.5 Positioning of Westbay Components

After the components were lowered into the well and the hydraulic integrity of the Westbay casing had been confirmed, the Westbay casing string was positioned as illustrated on the Casing Installation Log. The datum for VPV-01 is with respect to ground surface. The Westbay casing string was supported in this position while packer inflation was carried out. The positioning of the Westbay casing components is based on the "nominal" lengths of Westbay casing components. The positioning calculations do not include allowances for borehole temperature or deviation effects.

The attached figure titled "MOSDAX Transducer Position" provides information to correlate the position of MOSDAX Transducer sensors to the reference position at the top of the Measurement Port. The attached figure titled "Dimensions of Packer Seals and Monitoring Zones" outlines the calculations used to determine the packer depths and zone length. A Summary Casing Log, which

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shows the final "as-built" locations of the components in the well, is included in the Appendix. The depths of key items in the well are shown on Table 3.

3.6 Pre-inflation Profile

A pre-inflation pressure profile was carried out at the well prior to inflating the packers to confirm the proper operation and position of measurement ports and magnetic collars. The data confirmed that the ports operated properly and were positioned correctly in the well. A plot of the Pre-Inflation Piezometric levels in all zones is shown on Figure 1 in the Appendix.

3.7 Inflation of Westbay System Packers

The Westbay packers were inflated sequentially beginning at the bottom of the well using clean water provided by Aardvark Drilling. The Westbay Model No. 6055 vented inflation tool was used for packer inflation. After the exposed bottom packer was inflated, the guide tube was removed from the borehole as directed by Daniel Elliot. During the guide tube removal the weight of the Westbay casing was supported by the inflated packer. All the packers appear to have inflated normally. The data for inflation of each packer are provided on the Westbay Packer Inflation Records included in the Appendix.

4. Fluid Pressure Measurements

After packer inflation was completed, fluid pressures were measured at each measurement port. At that time, the in-situ formation pressures may not have recovered from the pre-installation activities. Longer term monitoring may be required to establish representative fluid pressures.

Plot of the Piezometric levels in all zones in the well is shown on Figures 2 in the Appendix. The data were examined to confirm proper operation of the measurement ports and as a check on the presence of annulus seals between monitoring zones. The calculation sheets for the pressure profile of the Westbay System monitoring well is also enclosed in the Appendix.

Zone No.	Monitoring Interval* (ft)	MP Casing No. (from MP Log)	Packer No.	Packer Serial No.	Nominal Packer Position (ft) ***	Measurement Port Depth** (ft)	Magnetic Collar Depth (ft)	Pumping Port Depth** (ft)
1	308.1-321.5	1			ан стана 1997 — 1997 — 1997 — 1997 — 1997 — 1997 — 1997 — 1997 — 1997 — 1997 — 1997 — 1997 — 1997 — 1997 — 1997 — 1997 —	308.8		
Packer		2	1	18007	303.8			
2	292.1-305.1	3-4				292.8	294.8	
Packer		5	2	18006	287.8			
3	287.1-289.1				-	287.8		
Packer	\overline{a}	6	3	18005	282.8	e.		
4	279.1-284.1	7			***	279.8		
Packer		8	4	17984	274.8			
5	270.1-276.1	9				270.8		
Packer	÷	10	5	17998	265.8			
6	260.1-267.1	11		÷.		260.8		
Packer		12	6	17997	255.8			
7	255.1-257.1					255.8		
Packer		13	7	17996	250.8			
8	240.1-252.1	14-15				240.8	242.8	245.8
Packer		16	8	17995	235.8	-		
9	225.1-237.1	17-18		10 mm		225.8		
Packer		19	9	18004	220.8			
10	217.1-222.1	20	***			217.8		
Packer		21	10	18003	212.8	- 44	1-++	
11	203.1-214.1	22-23	***			203.8	e e	
Packer		24	11	18002	198.8			+++
12	194.1-200.1	25			442	194.8	196.8	÷
Packer		26	12	18001	189.8			

Table 3, Depths of Key Items for Westbay Monitoring Well VPV-01.

* Depths are with respect ground surface.

** Component positions are referenced to the top of the subject Westbay System coupling.

*** Packer positions are referenced to the top Westbay System coupling on the packer.

Monitoring zone dimensions are determined as described on the attached "Dimensions of Packer Seals and Monitoring Zones".

The position of a MOSDAX Transducer in a Measurement Port is illustrated in the attached "MOSDAX Transducer Position". This information may be used in calculating piezometric levels.

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Zone No.	Monitoring Interval* (ft)	MP Casing No. (from MP Log)	Packer No.	Packer Serial No.	Nominal Packer Position (ft) ***	Measurement Port Depth** (ft)	Magnetic Collar Depth (ft)	Pumping Port Depth** (ft)	
13	185.1-191.1	27				185.8		***	
Packer		28	13	18000	180.8				
14	180.1-182.1					180.8			
Packer	***	29	14	17989	175.8	.÷++			
15	171.1-177.1	30				171.8	173.8		
Packer		31	15	17988	166.8	(in 1			
16	161.1-168.1	32				161.8		***	
Packer		33	16	17900	156.8				
17	151.1-158.1	34				151.8		(***)	
Packer		35	17	17992	146.8				
18	141.1-148.1	36				141.8	143.8	146.8	
Packer		37	18	17991	136.8				
19	136.1-138.1					136.8	+++/		
Packer		38	19	17994	131.8		÷.	÷.	
20	131.1-133.1					131.8			
Packer		39	20	17993	126.8				
21	126.1-128.1			***		126.8	-		
Packer		40	21	17986	121.8				
22	121.1-123.1			+++		121.8			
Packer	1. 1.	41	22	17985	116.8				
23	106.1-118.1	42				106.8	108.8		
Packer		43	23	17987	101.8				
Casing	0-103.1	44-55					9.8		

Table 3, Depths of Key Items for Westbay Monitoring Well VPV-01 (cont).

* Depths are with respect ground surface.

** Component positions are referenced to the top of the subject Westbay System coupling.

*** Packer positions are referenced to the top Westbay System coupling on the packer.

Monitoring zone dimensions are determined as described on the attached "Dimensions of Packer Seals and Monitoring Zones".

The position of a MOSDAX Transducer in a Measurement Port is illustrated in the attached "MOSDAX Transducer Position". This information may be used in calculating piezometric levels.

MOSDAX Transducer Position

In an MP System Measurement Port Coupling



System	Measurement Port Type	A	В
Plastic MP38	0222, 0205	4.5" (114.3 mm)	6.5" (165.1 mm)

Technical Note



Dimensions of Packer Seals and Monitoring Zones Westbay System – Plastic MP38



Discussion Points:

- The top of a coupling (Regular Coupling, Measurement Port or Pumping Port) is the reference point for describing nominal depths and nominal lengths. Actual positions of packer seals and zone lengths are determined with respect to the appropriate reference positions.
- <u>Packer Position Example</u>: A packer with a nominal depth of 50 ft (15.2m), will have a nominal packer seal position of 51.3 to 54.3 ft. (15.59 to 16.49m)
- <u>Zone Length Example</u>: A zone whose upper packer is at 50 ft (15.2m) and bottom packer is at 70 ft (21.3m) will have a nominal zone length of 15 ft (4.6m) and an actual zone length (between packer seals) of 15.0+1.3+0.7 = 17.0ft. (4.6 + 0.39 + 0.2 = 5.19m)
- Information on the position of Measurement Port Valve and MOSDAX Transducer sensor, used for detailed calculation of piezometric level measurements, are described separately.

APPENDIX

1- j

Monitoring Well VPV-01

Summary Casing Log	-3 pages
Pre-Inflation Piezometric Pressure/Levels	
Field Data and Calculation Sheet (Mar 28, 2012)	-2 pages
Figure 1, Pre-Inflation Piezometric Pressure Profile	-1 page
Post- Inflation Piezometric Pressure/Levels	
Field Data and Calculation Sheets (Mar 29, 2012)	-2 pages
Figure 2, Post-Inflation Piezometric Pressure Profile	-1 page
Casing Installation Log (field copy)	-5 pages
Westbay System Packer Inflation Records	-23 pages

Summary Casing Log

Company: University of Guelph Well: VPV-01 Site: Victoria Park Valley Golfcourse Project: University of Guelph Job No: WB888 Author: ML

Well Information

Reference Datum: Ground Surface Elevation of Datum: 0.00 ft. MP Casing Top: 0.00 ft. MP Casing Length: 318.95 ft.

Borehole Inclination: Vertical Borehole Diameter: 4.00 in.

Borehole Depth: 321.50 ft.

Well Description: MP38 Other References:

File Information

File Name: VV_IMP.WWD Report Date: Tue Apr 03 09:05:35 2012 File Date: Apr 02 14:55:29 2012

Sketch of Wellhead Completion



VPV-01 Completion Sketch

Summary Casing Log University of Guelph

Job No: WB888 Well: VPV-01

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				Legend		
		(Qty) (Librar	MP Components y - WD Library 7/27/00)	Geo	logy	Backfill/Casing
(-	(2)	0203 - MP38 End Cap			
I	<u>ji</u>	(1)	020102 - MP38 Casing 3 (2)	F/0.6M)		
ţ	1	(10)	020105 - MP38 Casing 2 (5)	F/1.5M)		
		(13)	020110 - MP38 Casing 1 (10)F/3M)		
		(23)	0238 - MP38 Packer 74mm (5F/1.5M)			
Ĵ,	1	(5)	020104 - MP38 Casing 5 (4F	F/1.2M)		
I.	1	(2)	020103 - MP38 Casing 6 (3F	F/0.9M)		
2		(1)	020101 - MP38 Casing 4 (1F	F/0.3M)		
1 <u>1</u>	_	(30)	0202 - MP38 Regular Coupli	ng		
-•	-	(23)	0205 - MP38 Measurment P	ort		
-C)-	(2)	0224 - MP38 Pumping Port			
-		(7)	0216 - Magnetic Location Co	llar		

(c) Westbay Instruments Inc. 2000

Summary Casing Log University of Guelph

Job No: WB888 Well: VPV-01



(c) Westbay Instruments Inc. 2000

Mon Apr 02 09:39:57 2012

	3										
R	SC	ter si	berg ERVIC	ES					N 99	estbay	y Piezometric Pressures/Levels AT Fov Field Data and Calculation Sheet
		Well No.: Datum: Elev. G.S.:	Victoria 65	Valley			robe Type: Serial No.:	San EMS	25 32		Date: March 38/12 Client: Vof C Job No:: WR 889
Height . Elev.	of Westbay top of West Referenc	above G.S.: tbay Casing: te Elevation:	DO: 2	Ξ.		Pr Westbay C Sampler Val	obe Range: asing Type: ve Position:	aso aso Class	-05. 38		Location: Virbera yallar Golf Club Weather: Cool - clear Operator: M.Lessard
ole: "Port p	Bon osition* in angle calculated us	ehole angle: _ ed boreholes refe sing borehole ang	V PCF: c	siong drillhole. on data to calci	True depth (D) ulate zone ple:	p) needs to ba cometric level (C	2 z).	P. m	13.90	Start: psi	Amblent Reading (P and) (pressure, temperature, time)PressurePressure13.90-05.Finish:1/2.873-96.Temp1/4.60.961/0.220Time9.32.041/0.220
	Port Position	Port Position	True Port		Fluic	d Pressure Rear	lings		Pressure Head Outside Port	Piez. Level Outside Port	Manactic Collar
Port No.	From Log (m)	From Cable	Depth "Dp" (m)	Inside Casing (P1)	Outside Casing (P2)	Time H:M:S	Probe Temp. (°C)	Inside Casing (P1)	(m) H = (P2-Patm)/w	(m) Dz = Dp - H	Septh by Counter.
1	99.3	n [a	1,	,	-	1	1	1	1	١	Port Removed
رو	94.1	309	1	97.53	12353	9:39	10.20	92,52	77.1	17.0	
~	89.2	893	3	90.60	116.63	14:41	9.31	60.60	72.2	17.0	ags ft
4	87.7	228		88.44	85311	9:42	8.93	88.64	70.7	17.0	
5	85.3	380	1	84.97	111.02	9:44	8.65	8498	63.3	17.0	
9	825	126	1	81.08	107.14	95.6	8.45	81.08	656	16.9	
A	79.S	361	1	76.73	62.62	9:48	8:36	76.74	625	12.0	
8	78.0	256	1	74.57	(00.67	9:50	821	7458	61.0	17.0	
0	73.4	146	١	68.07	94.18	15:10	8.16	68-02	56.9	17.0	243-64
01	68.8	226	1	61.56	87.70	4:53	8.12	61.57	51.9	16.9	
11	66.4	318	ı	52.08	84.24	prig p	20-8	5-8-09	89.5	16.9	
6	62.1	30 %	1	52.00	78.19	9:55	8.04	52.00	45.2	16.9	
13	59.4	195	1	98.10	74.29	4.5.7	802	97.10	42.5	16.9	197-F+
14	56.6	981		44.18	70,40	9.59	8-02	44. 18	397	16.9	
5	55.1	181	1	12.01	68.33	10101	8.03	1027	38.2	16.9	

~cb

Dp = true depth of measurement port

H = pressure head of water in zone

Patm = atmospheric pressure

Dz = piezometric level in zone

w = 0.4335 psi/ft (1.422psi/m) of H_2O

Notes:

d't	Pressures/Levels	Date: March 23/12 Client: Uof F b No.: Us 888 ation: Vicharize Uallay Colf Cub ather: cold - clear irator: M. Lers ed	am) (pressure, temperature, time) <u>055</u> Finish: <u>17.88 - 051</u> <u>7.966 95</u> <u>16:22 em</u>		COMPRETING														true depth of measurement port
	ay Piezometric נאד דייאי ^{Field}	OP Ne O	Ambient Reading (P rt: Pressure 3.90 - Temp 14.60 f Time 4:32 e.	Magnetse Collar	depth he count oc	174-FL			14-FF					tt-601	10.94				head of water in zone Dp =
	estba É-JNB	6562	Sta psi	Piez. Level Outside Por	(m) Dz = Dp - H	16.9	16.9	16.9	16.9	16.9	16.9	16.8	16.8	16.9					H = pressure
	PR V	oler 3532 38	3.90	Pressure Head Outside Port	(m) H = (P2-Patm)/w	35.5	32.4	29.4	26.3	dr's b	23.3	31.7	20.2	15.7					
		Sam Eng	e ti		Inside Casing (P1)	38.10	33.76	1296	26:3	22,90	20.72	18.54	16.34	13.99					heric pressure
		robe Type: Serial No.: be Range: ising Type: e Position:	z).	sbuj	Probe Temp. (°C)	8.03	8 DIG	8.02	8.04	8.01	8.01	86%	86%	7.94					Patm = atmosp
		Prc Prc Westbay Ca ampler Valv) needs to be ometric level (D	Pressure Read	Time H:M:S	20:0/	10.04	10:05	80:01	10:12	10.14	10:16	10:16	10:19					
		. 0	l'rue depth (Dp) liate zone plezc	Fluid	Outside Casing (P2)	64.34	60.02	5569	51.35	49.19	47.04	98.86	9269	36.19					ric level in zone
	er Es	Valler	iong drillhole.		Inside Casing (P1)	38.10	33.76	29.40	25.05	83:00	20.72	18.53	16.34	13.96		8			Dz = piezomet
	berg Ervic	Victoria 65 8 1151 Vort-	ar to position al	True Port	Depth "Dp" (m)	1	1	1	1	1	1	,	١	ł					of H ₂ O
	nlum rer s	Well No.: Datum: Elev. G.S.: bove G.S.: ay Casing: Elevation:	boraholes rafe g borahole ang	Port Position	From Cable	-ct1	162	152	142	137	132	1221	122	201					ft (1.422psi/m)
	Sci	Westbay a p of Westb Reference	ition" in angles calculated usin	Port Position	From Log (m)	Say	49.3	46.3	43.2	41.7	5.07	38.6	37.1	326					w = 0.4335 psi/
		Height of Elev. tr	Vote: "Port pos		Port No.	10	17	18	19	90	રો	સ	33	34					Votes:

Piezometric Profile Monitoring Well: Victoria Valley Golf Club



Equivalent Depth to Water (ft)

Client: University of Guelph Site: Victoria Valley Golf Club Datum: Ground Surface

Plot By: MI-Date: Apr. 12 Checked By: D Date: Apr. 3/12 Westbay Project: WB888

Piezometric Profile Monitoring Well: Victoria Valley Golf Club



Equivalent Depth to Water (ft)

Client: University of Guelph Site: Victoria Valley Golf Club Datum: Ground Surface

Plot By: ML Date: 4002 || Checked By: DL Date: 4103 Westbay Project: WB888 12

Casing Installation Log

Company: University of Guelph Well: Victoria Valley Golf Club Site: Victoria Valley Golf Club Project: University of Greeph Job No: WB888 Author: ML

98:m ml

Well information

Reference Datum: **Gro, Ad Svifa (e** Elevation of Datum: 0.00 m. MP Casing Top: 0.00 m. MP Casing Length: 100.87 m.

94-m m/

Well Description: MP38 Other References: Borehole Depth: 107.00 m. Borehole Inclination: Vertical Borehole Diameter: 0.00 mm

File Information

File Name: VICTORIA.WWD Report Date: Tue Mar 20 16:18:06 2012 File Date: Mar 20 16:11:23 2012

Comments

Zero reference is ground surface - IE Filter socks over all measurement ports - 19

Log Information

Borehole condition confirmed. MP well design & preparation. MP well design checked. MP well and borehole approved to install.

Date: March 27/12 Date: March 27/12 (method) By: M By: Date: 27-Mar-12 Date: ____ By: 11

Job No: WB888 Well: Victoria Valley Golf Club



Job No: WB888 Well: Victoria Valley Golf Club

	Scale Meters	Westbay Casing	QA Tested OK	MP Casing Description	Serial Numbe r s
	0 _	158 57	<u></u> Чим	070105-MP38 (06,27) (5P -020102-MP38 Casing 3 (2F/0.6M)	Finished lowering at 16:30
	-	56	Y	020110 - MP38 Casing 1 (10F/3M)	on March 27,2010
		55	<u> </u>	020110 - MP38 Casing 1 (10F/3M)	Hydraulic Integrity Test 60.864-m at 8:45 am
		54		020110 - MP38 Casing 1 (10F/3M)	60.863-m at 8:55 am
Adel 2 gal	10_	53	F	020110 - MP38 Casing 1 (10F/3M)	60.863 m at 9:20 am
0 4z (\$	-	52		020110 - MP38 Casing 1 (10F/3M)	Mul Zeront
	÷	51		020110 - MP38 Casing 1 (10F/3M)	
Adul 2gal 🕨	20_	50	FAR F	020110 - MP38 Casing 1 (10F/3M)	
	Ĵ.	49	F F	020110 - MP38 Casing 1 (10F/3M)	
At 4:00 pm		48	P I I I	020110 - MP38 Casing 1 (10F/3M)	
Aad 2gallon .f	30_	47	T M	020110 - MP38 Casing 1 (10F/3M)	
arby.	- 1	46	দেশশ দ দদদ	0238 - MP38 Packer 74mm (5F/1.5M 0205 - MP38 Measurment Port) 17987-155 7264
	+	45		020110 - MP38 Casing 1 (10F/3M)	
	(c) Westbay Ins	truments Inc.	2000	Tue Mar 20 16:19:05 2012	Page: 3

Job No: WB888 Well: Victoria Valley Golf Club

Scale Meters	Westbay Casing	QA Tested OK	MP Casing Description	Serial Numbers
35.				
		IFININ		in an Irr
	44		0238 - MP38 Packer 74mm (5F/1.5M)	17985-105
	FY ZOK	UNN	0205 - MP38 Measurment Port	12090-150
	43	N	0238 - MP38 Packer 74mm (5F/1.5M)	17906-100
	FS	444	0205 - MP38 Measurment Port	7256
	42	W.	0238 - MP38 Packer 74mm (5F/1.5M)	17993-135
	13	444	0205 - MP38 Measument Pon	7260
	41	4	0205 - MP36 Packer / 4mm (5r/1.5M)	14999-190
	40	MNN	0238 - MP38 Packer 74mm (5F/1 5M)	1701-140
8.00		V /10	0205 - MP38 Measurment Port	7257
	39	LVV	020105 - MP38 Casing 2 (5F/1.5M)	0901
45_		N INTE	0224 - MP38 Pumping Port	8399
	38	Nº F	0238 - MP38 Packer 74mm (5F/1.5M)	17992-195
	E O	MMM	0205 - MP38 Measurment Port	7262
	37	M	020105 - MP38 Casing 2 (5F/1.5M)	
		WM M	0000 MD00 Decker Zamer (CC(4 CM)	12000-145
	30	V	0205 MP36 Packer /4mm (5P/1.5W)	7770 115
	13 35	MMM	0205 - MF38 Measurment Port	7259
	55	M	020100 - Mi 50 023ilig 2 (5171.5M)	
	34	EFF F	0238 - MP38 Packer 74mm (5F/1.5M)	17938-140
	ES CA	UNIN	0205 - MP38 Measurment Port	7261
	33	V.	020104 - MP38 Casing 5 (4F/1.2M)	
	32	MUN	0238 - MP38 Packer 74mm (5F/1.5M)	179 99-150
55_	FS OC	MAN	0205 - MP38 Measurment Port	7263
	31	VIVI	0238 - MP38 Packer 74mm (5F/1.5M)	19000-150
	FS	UVIV	0205 - MP38 Measument Port	2154
	30	M	020104 - MP38 Casing 5 (4F/1.2M)	F20 -1
	29	M- M	0238 - MP38 Packer 74mm (5F/1.5M)	18001-140
	FS CA	HHM	0205 - MP38 Measurment Port	7242
	28	-	020104 - MP38 Casing 5 (4F/1.2M)	
	27	VVV	0238 - MP38 Packer 74mm (5F/1.5M)	18002-145
	IL O	NI CHARTA	0205 - MP38 Measurment Port	7211/
-	26	W	020105 - MP38 Casing 2 (5F/1.5M)	7070
	05	HHV		
65_	25	V	020104 - MP38 Casing 5 (4F/1.2M)	
	24	VVW	0238 - MP38 Packer 74mm (5F/1.5M)	18002.140
		VVV	0205 - MP38 Measurment Port	2749
	23	LUV	020103 - IVIF30 Casing 6 (3F/0.91VI)	1010
	22	V	0238 - MP38 Packer 74mm (5F/1.5M)	18004.150
-	FS	MMM	0205 - MP38 Measurment Port	2011
	21	V	020105 - MP38 Casing 2 (5F/1.5M)	4251
(c) Westl	bay Instruments Inc.	2000	Tue Mar 20 16:19:05 2012	Page

FS-filter sock installed.

£.

Page: 4

Job No: WB888 Well: Victoria Valley Golf Club

	Scale Meters	Westbay Casing	QA Tested OK	MP Casing Description	Serial Numbers	
	70_	20	MAN	020105 MD29 Cooling 2 (55/1 5M)		
		20	MANN	020105 - MP36 Casing 2 (57/1.3M)	17995-145	
		19	V	0238 - MP38 Packer 74mm (5F/1.5M)	7252	
		FS 18	NAM	020105 - MP38 Casing 2 (5F/1.5M)		
	•	0	VVV	0224 - MP38 Pumping Port	8395	
		17	M	020105 - MP38 Casing 2 (5F/1.5M)		
		16	VVV	0238 - MP38 Packer 74mm (5F/1.5M)	17996-193	
		15 A	MV M	0205 - MP38 Measurment Port	7255	- ,
		15	M	0238 - MP38 Packer 74mm (5F/1.5M) 0205 - MP38 Measurment Port	17997-130	
	80_	₹ 5 14	VIVIN	020105 - MP38 Casing 2 (5F/1.5M)	7250	
			WIN		17998-145	
		13	V	0238 - MP38 Packer 74mm (5F/1.5M) 0205 - MP38 Measurment Port	7253	
	0	F5 12	V	020104 - MP38 Casing 5 (4F/1.2M)		
		11	VVW	0238 - MP38 Packer 74mm (5F/1.5M)	17989-145	
		15	- VV	0205 - MP38 Measurment Port 020103 - MP38 Casing 6 (3F/0 9M)	7243	
	0.40		VVV		18005-140	
		9	E.	0238 - MP38 Packer 74mm (5F/1.5M) 0205 - MP38 Measument Port	7249	
	-	PS 8	VVV	0238 - MP38 Packer 74mm (5F/1.5M)	18006-140	
	90	4	VVV	0205 - MP38 Measurment Port	9245	
	00_	7	117	020110 - MP38 Casing 1 (10F/3M)		
			V			
		6	Ex5	020101 - MP38 Casing 4 (1F/0.3M)	12002-145	
		5	M	0238 - MP38 Packer 74mm (5F/1.5M)	77.4.1	
		K	111	0205 - MP38 Measurment Port	7244	
	Q.	4		020110 - MP38 Casing 1 (10F/3M)		
	EndC	40 -> ->	শেষ	020102 MB28 Coping 2 (25/0 6M)		Component#1-3
	li-€		P	020102 - MP36 Casility 3 (2F/0.0M)		removed from
			W	0238 - MP38 Packer 74mm (5F/1.5M) 0205 - MP38 Measument Port	+++444-140	Well. Bottom
	100	1	1.66	020105 - MP38 Casing 2 (5F/1.5M)	-7241-	Cap installed
			711	0203 - MP38 End Cap	1	on hotton of
		Start	lowering	at 14:00 on March 27, 201	2.	Sit usition of
0	TW 3 18,22	-m @ 1=10>	n (TSC)	2	0	component # 4
um2:4	15 3/4 from -	⊤ ا لىقىما	,		4	
Ó	(c) West	bav instruments inc	2000	Tue Mar 20 16:19:05 2012		Page: 5
•	Tout had	1 1. 15.	AF •	Inflation tool @ 420 m	m M. I	10 2.02
	UOMT FEST	1001-490-	P*1.	Tuchen Lal D (1)	on March	ad, doil
	FS-filter	sock installed		+nriarion rooi y 440-ps;	on March	29,2012.

Schlumberger WATER SERVICES

Sheet (of 33 Westbay Packer Inflation Record

Project: Uof Guelbh	Project No.: WA 888	
Location: Victoria Valley Golf Club	Completed by: M.Lessard	Date Inflated: March 28/12
Packer No. 1, comp 2 SN: 18007	Depth (Nt / m): 92.6	Inflation Tool No.: 3197
Packer Valve Pressure, Pv: /45 psi Final L	ine Pressure, P _L : <u>740</u> psi	Tool Pressure, P _T : <u>470</u> psi
Borehole Water Level: $/7$ (%/m) = 25	_psi (P _w)	Packer Model No.: 0238
Borehole Diameter: 4 (in / mm) Calculate	ed Packer Element Pressure, P _E =	$= P_L + P_W - P_V - P_T = / 50 \text{ psi}$

Volume, litres	1.0	2.0	2.5	3.0	3.25	3.5	3.75	3.9	4.0	/
Pressure, psi	660	680	690	690	690	690	700	720	740	/
Volume, litres	3.65			1.1						
Pressure, psi	ø									





Sheet 4 of 33 Westbay Packer Inflation Record

Project:	30 (Guelo	h		Project No.:	WB 988	Well No.:	VPViol	_
Location: Vr	ctor:a	Valley	Golf clu	b	Completed by	. MLessard	Date Inflated	1: March 28/1	12
Packer No. 4,	comp	8	SN: /79	84	Depth (ft / m): 83.8	Inflation Too	No.: 3197	_
Packer Valve F	Pressure	Pv: 14	5psi	Final Lir	ne Pressure, P	1: 700 psi	Tool Pressu	re, P _T : <u>470</u> p	si
Borehole Wate	r Level:	17	(Kt/m)=	25	psi (P _w)		Packer Mod	el No.: 0738	_
Borehole Diam	eter:	4	_(in / 1%-000) C	alculated	d Packer Elem	ent Pressure, P _E	= P _L + P _W - P _\	,-P _T = <u>(10</u> p	si

Volume, litres	1.0	2.0	2.5	3.0	3.25	3.5	3.75	3.85	/	3.6
Pressure, psi	670	680	680	680	680	680	690	700	/	ø
Volume, litres										
Pressure, psi			1							





Sheet S of 23 Westbay Packer Inflation Record

Project: U of	Guelph	Project No.: W8 888	Well No.: VPV-01
Location: Victoria	Valley Golf Club	Completed by: <u>m. Lessard</u>	Date Inflated: March 28/12
Packer No. 5. comp	10 SN: 17998	Depth (\tt / m): <u> 81.0</u>	Inflation Tool No.: 3197
Packer Valve Pressure,	Pv: 145 psi Final Lir	ne Pressure, P _L : <u>710</u> psi	Tool Pressure, P _T : <u>470</u> psi
Borehole Water Level:	17 (1 k/m) = 25	psi (P _w)	Packer Model No.: 0238
Borehole Diameter:	u (in / ກາຫຼ) Calculated	d Packer Element Pressure, P _E -	$= P_L + P_W - P_V - P_T = 120 \text{ psi}$

Volume, litres	1.0	2.0	2.5	3.0	3.25	3.5	3,75	3.85	3.9	/
Pressure, psi	660	670	680	680	680	680	690	700	710	/
Volume, litres	3.6									
Pressure, psi	Ø									



Sheet 6 of 23 Westbay Packer Inflation Record

Project: U of Guelph	Project No.: WB 898	Well No.: VPV-01
Location: Victor: a Valley Golf Club	Completed by: M.Lessard	Date Inflated: March 28/12
Packer No. 6, comp 12' SN: 17997	Depth (it / m): 78.0	Inflation Tool No.: 2197
Packer Valve Pressure, Pv: 150 psi Final Lin	ne Pressure, P _L : 710 psi	Tool Pressure, PT: 470 psi
Borehole Water Level: $/7 (\Re/m) = 25$	psi (P _w)	Packer Model No.: 0138
Borehole Diameter: (in / mm) Calculate	d Packer Element Pressure, P _E	$= P_L + P_W - P_V - P_T = //5$ psi

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Volume, litres	1.0	20	25	3.0	3.25	3.5	3.75	3.9	/	3.6
Pressure, psi	650	680	690	690	690	690	690	710	/	ø
Volume, litres										
Pressure, psi										





Sheet 7 of 23 Westbay Packer Inflation Record

Project: U of Guelph	Project No.: w8888	Well No.: VPV-01
Location: Victoria Valley Golf club	Completed by: M.Lessard	Date Inflated: March 28/12
Packer No. 7, comp 13 SN: /7996	_Depth (ft./ m): 76.4	Inflation Tool No.: 3,97
Packer Valve Pressure, Pv: 145 psi Final L	ine Pressure, P _L : <u>700</u> psi	Tool Pressure, P _T : <u>920</u> psi
Borehole Water Level: 17 (it / m) = 25	_psi (P _w)	Packer Model No.: 0238
Borehole Diameter: (in / m/m) Calculate	ed Packer Element Pressure, P _E	$= P_L + P_W - P_V - P_T = //0$ psi

Volume, litres	1.0	2.0	2.5	3.0	3.5	3.75	3.9	/	3.65	
Pressure, psi	640	670	670	670	670	690	700	1	ø	
Volume, litres										
Pressure, psi										





Sheet (1 of 23 Westbay Packer Inflation Record

Project: U of Grelph	Project No.: WB888	Well No.: VPV-01		
Location: Victor: a Valley Golf Club	Completed by: T.K.m	Date Inflated: March 29/12		
Packer No. 18, comp 37 SN: 17991	Depth (tt / m): 41.7	Inflation Tool No.: 3197		
Packer Valve Pressure, Pv: 140 psi Final Li	ine Pressure, P _L : <u>690</u> psi	Tool Pressure, P _T : 440 psi		
Borehole Water Level: <u>17</u> (#/m) = 25	_psi (P _w)	Packer Model No.: 0738		
Borehole Diameter: 4 (in / m/m) Calculate	ed Packer Element Pressure, P _E	$= P_L + P_W - P_V - P_T = \frac{125}{5}$ psi		

Volume, litres	1.0	2.0	3.0	3.25	3.5	3.75	11	3.55	
Pressure, psi	610	620	640	640	640	680	11	Ø	
Volume, litres									
Pressure, psi									




Sheet <u>او of ک</u> Westbay Packer Inflation Record

Project:	U of Grelph	Project No.:	WB 888		1-01
Location:	Victoria Valley Golf Club	Completed by:	T.K:m	Date Inflated:	March 29/12
Packer No.	19, comp 38 SN: 17994	_Depth (tt/m):	40.2	Inflation Tool No.	: 3197
Packer Val	ve Pressure, Pv: 140 psi Final Li	ne Pressure, P _L :	670 psi	Tool Pressure, P	т: <u>440</u> psi
Borehole V	Vater Level: (A_/m) =	_psi (P _w)		Packer Model No	D.: 0238
Borehole D	Diameter: <u>(</u> in / mm) Calculate	d Packer Eleme	nt Pressure, P _E :	= P _L + P _W - P _V - P _T	= <u>/15</u> psi

Volume, litres	1.0	2.0	3.0	3.25	3.5	3.7	3.75	11	3.5	
Pressure, psi	600	620	620	640	640	650	670	(1	ø	
Volume, litres										
Pressure, psi								_		





sheet که of کر Sheet که of کر Sheet Westbay Packer Inflation Record

Project: () of Guelph	Project No.: WB989	Well No.: VPV-ol
Location: Victoria Valley Golf Club	Completed by: T.K.m	Date Inflated: Mar 29/12
Packer No. 20, Comp 39 SN: 17993	Depth (It / m): 38.6	Inflation Tool No.: 3197
Packer Valve Pressure, Pv: 155 psi Final Lir	ne Pressure, P _L : 680 psi	Tool Pressure, PT: 440 psi
Borehole Water Level: $(t / m) = 25$	psi (P _w)	Packer Model No.: 023%
Borehole Diameter: 4 (in / mm) Calculated	d Packer Element Pressure, P _E :	$= P_L + P_W - P_V - P_T = \underline{llo} psi$

Volume, litres	1.0	2.0	3.0	3.25	3.5	3.7	3.75	11	3.5	
Pressure, psi	640	660	660	660	660	670	680	11	ø	
Volume, litres										
Pressure, psi										



Comments: Packer # 2-0

TIME- 12=32

Westbay Packer Inflation Record

Project:	Vot G	velph	Project No.:	WB 888	Well No.: 🗸	PV-01
Location:	Victoria Valle	y Golf Clash	Completed by:	TKm/M.L.	Date Inflated:	Mar 29/12
Packer No.	21, comp 40	SN: 17986	_Depth (It / m)	37.1	Inflation Tool	No.: 3197
Packer Val	ve Pressure, Pv:	150 psi Final L	ine Pressure, P _L	670 psi	Tool Pressure	PT: 440 psi
Borehole W	Vater Level:	$1\eta (t/m) = 25$	psi (P _w)		Packer Model	No.: 0138
Borehole D	iameter: 4	(in / mm) Calculate	ed Packer Eleme	nt Pressure, P _E :	= P _L + P _W - P _V -	P _T = <u>05</u> psi

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Volume, litres	1.0	2.0	3.0	3.25	3.5	3.75	3.8	/	3.6	
Pressure, psi	620	640	640	640	640	650	670	(ø	
Volume, litres										
Pressure, psi										



Sheet 22 of 23 Westbay Packer Inflation Record

Project: U of Guelph	Project No.: WB 8 8 9	Well No.: VPV-01
Location: Victoria Valley Golf Club	Completed by: T.K.m	Date Inflated: May 29/12
Packer No. 22, Comp 41 SN: 179.85	Depth (t / m): 35.6	Inflation Tool No.: 3(97
Packer Valve Pressure, Pv: 155 psi Final Lin	ne Pressure, P _L : 700 psi	Tool Pressure, P _T : 440 psi
Borehole Water Level: 17 ($\frac{1}{1}$ ($\frac{1}{1}$ m) = 25	psi (P _w)	Packer Model No.: 0738
Borehole Diameter: (in / m/m) Calculate	d Packer Element Pressure, P _E :	$= P_L + P_W - P_V - P_T = 30$ psi

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Volume, litres	1.0	2.0	3.0	3.25	35	3.75	3.8	11	36	
Pressure, psi	620	640	660	660	660	670	702	11	Ø	
Volume, litres										
Pressure, psi										



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Sheet 23 of 23 Westbay Packer Inflation Record

Project: Usf Guelph	Project No.: WG888	Well No.: VPV-01
Location: Victoria Valley Golf Club	Completed by: T.K:m	Date Inflated: 142 29/12
Packer No. 23, comp 43' SN: 17987	Depth (ft/m): 31-0	Inflation Tool No.: 3(47
Packer Valve Pressure, Pv: 155 psi Final Li	ne Pressure, P _L : <u>700</u> psi	Tool Pressure, P _T : <u>440</u> psi
Borehole Water Level: $/\eta$ ($\frac{1}{2}$ /m) = 25	_psi (P _W)	Packer Model No.: 0738
Borehole Diameter: 4 (in / mm) Calculate	d Packer Element Pressure, P _E	$= P_L + P_W - P_V - P_T = 130$ psi

Volume, litres	10	2.0	3.0	3.25	3.5	3.75	4.0	11	3.75	
Pressure, psi	620	640	650	660	660	660	700	11	ø	
Volume, litres	11					1				
Pressure, psi										



Comments: Packer # 23

TIME - 1 = 42 pm

	August 3 & 6 2010	A. Gilmore, J. Munn, T. Coleman	Approx. (not surveyed): 569025 E, 4817280 N (17 T)		CONTACTS 392 - sharp	396 - gradational	Caliber &	ve from Centralized TravelTin	cm 3.5		Simply Frank	Shine & Ten	Claury & Tauk	Samp & Tran & Pump	Stanut & Take	Simple for	Simula A Tana	Samp 2 Film	Samp & Share	Samp & Tan	Samn & Tan & Dum	Jairip & Iran & Fump
ole Log	Date drilled:	Logged by:	Coordinates:	end	bot Head		ATV	Amplitude-NM r - a	⁸⁰ 0° 90° 180°270°0° 3.2 -10 1800				n de la Bernard La Carles Programs Programs									
Coreho	/ Golfcourse		nd surface	Leg	Cal	Rockway/Merritton	Gamma		0	Mmilling	N MMMM	mult	WWWW	un Murria	Walawand	Whanym		Mulur	Munth	Miduliu	M. M. Multin	Muliforni
	Victoria Park Valley	VPV-01	:e: meters below grour		Goat Island	Gasport	Stratigraphy															
UNIVERSITY %GUELPH	Site ID:	Corehole ID:	Depth referenc		STRATIGRAPHY	Guelph Eramosa	Depth	MBGS	1m:250m	28.0	32.0	36.0	40.0	44.0	48.0	52.0	56.0	60.0	64.0	68.0	72.0	76.0





Appendix C

Excerpts from Groundwater Protection Study



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of miles #21 12 W 03-1113-016 GRCA



Appendix D

Water Taking Summary

Date of Taking	Hrs. of Taking	Rate of Taking (L/Min)	Amt. of Taking (L)
6-May-15	8.5	379	193,290
7-May-15	24	379	545,760
8-May-15	24	379	545,760
9-May-15	24	379	545,760
10-May-15	24	379	545,760
11-May-15	16	379	363,840
12-May-15	8.5	379	193,290
13-May-15	24	379	545,760
14-May-15	24	379	318,360
15-May-15	0	0	0
16-May-15	0	0	0
17-May-15	0	0	0
18-May-15	14.5	379	329,730
19-May-15	24	379	545,760
20-May-15	24	379	545,760
21- May-15	24	379	545,760
22-May-15	24	379	545,760
23-May-15	24	379	545,760
24-May-15	24	379	545,760
25-May-15	24	379	545,760
26-May-15	24	379	545,760
27-May-15	24	379	545,760
28-May-15	24	379	545,760
29-May-15	24	379	545 ,7 60
30-May-15	24	379	545,760
31-May-15	24	379	545,760
1-Jun-15	24	379	545,760
2-Jun-15	24	379	545,760
3-Jun-15	24	379	545,760
4-Jun-15	24	379	545,760
5-Jun-15	14.5	379	329,730
6-Jun-15	0	0	0
7-Jun-15	0	0	0
8-Jun-15	0	0	0
9-Jun-15	0	0	0
10-Jun-15	0	0	0
11-Jun-15	0	0	0
12-Jun-15	0	0	0
13-Jun-15	0	0	0
14-Jun-15	0	0	0
15-Jun-15	0	0	0
16-Jun-15	0	0	0
17-Jun-15	0	0	0
18-Jun-15	0	0	0
19-Jun-15	0	0	0
20-Jun-15	0	0	0

21-Jun-15	0	0	0
22-Jun-15	16.5	379	375,210
23-Jun-15	12	379	272,880
24-Jun-15	0	0	0
25-Jun-15	0	0	0
26-Jun-15	0	0	0
27-Jun-15	0	0	0
28-Jun-15	0	0	0
29-Jun-15	0	0	0
30-Jun-15	0	0	0
1-Jul-15	0	0	0
2-Jul-15	0	0	0
3-Jul-15	0	0	0
4-Jul-15	17	379	386,580
5-Jul-15	24	379	545,760
6-Jul-15	24	379	545,760
7-Jul-15	24	379	545,760
8-Jul-15	7	379	159,180
9-Jul-15	0	0	0
10-Jul-15	0	0	0
11-Jul-15	0	0	0
12-Jul-15	14	379	318,360
13-Jul-15	24	379	545,760
14-Jul-15	11	379	250,140
15-Jul-15	0	0	0
16-Jul-15	0	0	0
17-Jul-15	0	0	0
18-Jul-15	0	0	0
19-Jul-15	0	0	0
20-Jul-15	14	379	318,360
21-Jul-15	24	379	545,760
22-Jul-15	24	379	545,760
23-Jul-15	24	379	545,760
24-Jul-15	24	379	545,760
25-Jul-15	24	379	545,760
26-Jul-15	24	379	545,760
27-Jul-15	24	379	545,760
28-Jul-15	24	379	545,760
29-Jul-15	24	379	545,760
30-Jul-15	24	379	545,760
31-Jul-15	24	379	545,760
1-Aug-15	24	379	545,760
2-Aug-15	24	379	545,760
3-Aug-15	24	379	545,760
4-Aug-15	24	379	545,760
5-Aug-15	24	379	545,760
6-Aug-15	15	379	341,100

7-Aug-15	0	0	0
8-Aug-15	15.5	379	352,170
9-Aug-15	24	379	545,760
10-Aug-15	10	379	227,400
11-Aug-15	0	0	0
12-Aug-15	0	0	0
13-Aug-15	0	0	0
14-Aug-15	0	0	0
15-Aug-15	0	0	0
16-Aug-15	0	0	0
17-Aug-15	0	0	0
18-Aug-15	0	0	0
19-Aug-15	0	0	0
20-Aug-15	0	0	0
21-Aug-15	0	0	0
22-Aug-15	0	0	0
23-Aug-15	0	0	0
24-Aug-15	0	0	0
25-Aug-15	0	0	0
26-Aug-15	0	0	0
27-Aug-15	0	0	0
28-Aug-15	0	0	0
29-Aug-15	0	0	0
30-Aug-15	0	0	0
31-Aug-15	8.5	379	193,290
1-Sep-15	24	379	545,760
2-Sep-15	24	379	545,760
3-Sep-15	24	379	545,760
4-Sep-15	24	379	545,760
5-Sep-15	9	379	204,660
6-Sep-15	0	0	0
7-Sep-15	15	379	341,100
8-Sep-15	24	379	545,760
9-Sep-15	14	379	318,360
10-Sep-15	0	0	0
11-Sep-15	9	379	204,660
12-Sep-15	7.5	379	170,550
13-Sep-15	0	0	0
14-Sep-15	0	0	0
15-Sep-15	0	0	0
16-Sep-15	13	379	295,620
17-Sep-15	24	379	545,760
18-Sep-15	24	379	545,760
19-Sep-15	9	379	204,660
20-Sep-15	0	0	0
21-Sep-15	0	0	0
22-Sep-15	0	0	0

23-Sep-15	6.5	379	147,810
24-Sep-15	24	379	545,760
25-Sep-15	24	379	545,760
26-Sep-15	24	379	545,760
27-Sep-15	24	379	545,760
28-Sep-15	14.5	379	329,730
29-Sep-15	0	0	0
30-Sep-15	0	0	0
1-Oct-15	0	0	0
2-Oct-15	0	0	0
3-Oct-15	0	0	0
4-Oct-15	0	0	0
5-Oct-15	0	0	0
6-Oct-15	0	0	0
7-Oct-15	0	0	0
8-Oct-15	0	0	0
9-Oct-15	0	0	0
10-Oct-15	0	0	0
11-Oct-15	0	0	0
12-Oct-15	0	0	0
13-Oct-15	0	0	0
14-Oct-15	0	0	0
15-Oct-15	0	0	0
16-Oct-15	0	0	0
17-Oct-15	0	0	0
18-Oct-15	0	0	0
19-Oct-15	0	0	0
20-Oct-15	0	0	0
21-Oct-15	0	0	0
22-Oct-15	0	0	0
23-Oct-15	0	0	0
24-Oct-15	0	0	0
25-Oct-15	0	0	0
26-Oct-15	0	0	0
27-Oct-15	0	0	0
28-Oct-15	0	0	0
29-Oct-15	0	0	0
30-Oct-15	0	0	0
31-Oct-15	0	0	0
	TOTAL		36,611,100

Date	Rate of Taking (L/Min)	Amount of Taking (L)
1-May	2,271	448,433
2-May	2,271	315,199
3-May	2,2 71	3,297
4-May	2,271	3,297
5-May	2,271	703,314
6-May	2,271	329,236
7-May	0	0
8-May	0	0
9-May	0	0
10-May	0	0
11-May	0	0
12-May	2,271	113,700
13-May	2,271	0
14-May	2,271	3,297
15-May	2,271	2,968
16-May	2,271	2,968
17-May	2,271	829,131
18-May	2,271	527,568
19-May	2,271	109,467
20-May	2,271	1,356,532
21-May	2,271	813,880
22-May	2,271	682,462
23-May	2,271	458,196
24-May	2,271	1,216,428
25-May	2,271	1,516,098
26-May	2,271	370,131
27-May	2,271	879,579
28-May	2,271	352,612
29-May	2,271	437,881
30-May	2,271	103,581
1-Jun	0	0
2-Jun	2,271	3,297
3-Jun	2,271	3,297
4-Jun	2,271	416,662
5-Jun	2,271	273,460
6-Jun	2,271	312,531
7-Jun	2,271	67,947
8-Jun	0	0
9-Jun	0	0
10-Jun	0	0
11-Jun	2,271	4,119
12-Jun	2,271	0
13-Jun	0	0
14-Jun	0	0
15-Jun	2,271	65,681
16-Jun	2,271	0

Date	Rate of Taking (L/Min)	Amount of Taking (L)
17-Jun	0	0
18-Jun	2,271	68,978
19-Jun	2,271	82,168
20-Jun	2,271	5,685
21-Jun	2,271	5,685
22-Jun	2,271	15 ,1 60
23-Jun	0	0
24-Jun	2,271	65,681
25-Jun	2,271	65,681
26-Jun	0	0
27-Jun	0	0
28-Jun	0	0
29-Jun	0	0
30-Jun	0	0
1-Jul	2,271	34,110
2-Jul	2,271	34,110
3-Jul	0	0
4-Jul	2,271	741,172
5-Jul	2,271	310,977
6-Jul	0	0
7-Jul	2,271	156,008
8-Jul	0	0
9-Jul	0	0
10-Jul	2,271	122,803
11-Jul	2,271	683,590
12-Jul	2,271	190,406
13-Jul	2,271	192,483
14-Jul	2,271	61,762
15-Jul	0	0
16-Jul	2,271	207,139
17-Jul	0	0
18-Jul	0	0
19-Jul	0	0
20-Jul	2,271	298,629
21-Jul	2,271	609,565
22-Jul	2,271	298,265
23-Jul	2,271	778,538
24-Jul	2,271	694,309
25-Jul	2,271	352,872
26-Jul	2,271	918,921
27-Jul	2,271	507,957
28-Jul	2,271	109,516
29-Jul	2,271	980,871
30-Jul	2,271	330,522
31-Jul	2,271	805,587
1-Aug	2,271	754,422

Date	Rate of Taking (L/Min)	Amount of Taking (L)
2-Aug	2,271	588,470
3-Aug	2,271	0
4-Aug	2,271	59,025
5-Aug	2,271	50,203
6-Aug	2,271	65,961
7-Aug	0	0
8-Aug	2,271	834,510
9-Aug	2,271	110,349
10-Aug	2,271	0
11-Aug	0	0
12-Aug	2,271	29,066
13-Aug	2,271	52,734
14-Aug	2,271	65,961
15-Aug	0	0
16-Aug	0	0
17-Aug	0	0
18-Aug	0	0
19-Aug	2,271	0
20-Aug	0	0
21-Aug	0	0
22-Aug	0	0
23-Aug	0	0
24-Aug	2,271	3790
25-Aug	2,271	61,762
26-Aug	2,271	196,072
27-Aug	0	0
28-Aug	0	0
29-Aug	0	0
30-Aug	2,271	105,696
31-Aug	2,271	878,969
1-Sep	2,271	21,986
2-Sep	2,271	715,753
3-Sep	2,271	109,868
4-Sep	0	0
5-Sep	2,271	244,345
6-Sep	2,271	351,162
7-Sep	2,271	122,135
8-Sep	2,271	755,112
9-Sep	2,271	0
10-Sep	2,271	3,297
11-Sep	0	0
12-Sep	0	0
13-Sep	0	0
14-Sep	0	0
15-Sep	2,271	459,329
16-Sep	2,271	474,212

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Date	Rate of Taking (L/Min)	Amount of Taking (L)
17-Sep	2,271	724,515
18-Sep	2,271	0
19-Sep	0	0
20-Sep	0	0
21-Sep	0	0
22-Sep	0	0
23-Sep	0	0
23-Sep	2,271	1,166,585
24-Sep	2,271	111,941
25-Sep	0	0
26-Sep	2,271	497,415
27-Sep	0	0
28-Sep	2,271	813,008
29-Sep	0	0
30-Sep	0	0
1-Oct	0	0
2-Oct	0	0
3-Oct	0	0
4-Oct	0	0
5-Oct	0	0
6-Oct	0	0
7-Oct	0	0
8-Oct	0	0
9-Oct	0	0
10-Oct	0	0
11-Oct	0	0
12-Oct	0	0
13-Oct	0	0
14-Oct	0	0
15-Oct	0	0
16-Oct	0	0
17-Oct	0	0
18-Oct	0	0
19-Oct	0	0
20-Oct	0	0
21-Oct	0	0
22-Oct	0	0
23-Oct	0	0
24-Oct	0	0
25-Oct	0	0
26-Oct	0	0
27-Oct	0	0
28-Oct	0	0
29-Oct	0	0
30-Oct	2,271	885,091
	TOTAL	33768143



Appendix E

Hydrographs



Victoria Park Valley Golf Club 2015 PTTW Monitoring Program PGA120890

R. J. Burnside & Associates Limited File: W:\120890 MOE Letter Updated Victoria Golf 2015 Hydrographs.xlsx Prepared By: DS Date: January 2016



Victoria Park Valley Golf Club PTTW Monitoring Program MW1 Hydrograph



Victoria Park Valley Golf Club 2015 PTTW Monitoring Program PGA120890

Manual Water Level ——Precipitation

- AWLR

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R. J. Burnside & Associates Limited File. W:\120890 MOE Letter Updated Victoria Golf 2015 Hydrographs.xlsx Prepared By: DS Date: January, 2016



R. J. Burnside & Associates Limited File: W:\120890 MOE Letter Updated Victoria Golf 2015 Hydrographs,xlsx Prepared By: DS Date: January, 2016

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Victoria Park Valley Golf Club 2015 PTTW Monitoring Program PGA120890



Victoria Park Valley Golf Club 2015 PTTW Monitoring Program PGA120890

R. J. Burmside & Associates Limited File: W:\120890 MOE Letter Updated Victoria Golf 2015 Hydrographs.xlsx Prepared By: DS Date: January, 2016



Victoria Park Valley Golf Club 2015 PTTW Monitoring Program PGA120890

R. J. Burnside & Associates Limited File: W:/120890 MOE Letter Updated Victoria Golf 2015 Hydrographs.xisx Prepared By: DS Date: January, 2016



Victoria Park Valley Golf Club

Victoria Park Valley Golf Club 2015 PTTW Monitoring Program PGA120890

R. J. Burnside & Associates Limited File. W:120890 MOE Letter Updated Victoria Golf 2015 Hydrographs.xlsx Prepared By: DS Date: January, 2016



R. J. Burnside & Associates Limited File: W:\120890 MOE Letter Updated Victoria Golf 2015 Hydrographs,xlsx Prepared By: DS Date: January, 2016

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Victoria Park Valley Golf Club 2015 PTTW Monitoring Program PGA120890

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Victoria Park Valley Golf Club

Victoria Park Valley Golf Club 2014 PTTW Monitoring Program PGA120890

R. J. Burnside & Associates Limited File: W:\120890 MOE Letter Updated Victoria Golf 2015 Hydrographs;xlsx Prepared By: DS Date: January, 2015



R. J. Burnside & Associates Limited File: W:\120890 MOE Letter Updated Victoria Golf 2015 Hydrographs.xfsx Prepared By: DS Date: January, 2015

Victoria Park Valley Golf Club 2014 PTTW Monitoring Program PGA120890



Victoria Park Valley Golf Club

Victoria Park Valley Golf Club 2014 PTTW Monitoring Program PGA120890

R. J. Burmside & Associates Limited File: W:\120890 MOE Letter Updated Victoria Golf 2015 Hydrographs.xlsx Prepared By: DS Date: January, 2015 Victoria Park Valley Golf Club PTTW Monitoring Program Port 9 - U of G Well



R. J. Burnside & Associates Limited File: W:\120890 MOE Letter Updated Victoria Golf 2015 Hydrographs.xlsx Prepared By: DS Date: February 6, 2013

Victoria Park Valley Golf Club 2014 PTTW Monitoring Program PGA120890



R. J. Burnside & Associates Limited File. W:\120890 MOE Letter Updated Victoria Golf 2015 Hydrographs.xlsx Prepared By: DS Date: January, 2015

Victoria Park Valley Golf Club 2014 PTTW Monitoring Program PGA120890



Appendix F

Laboratory Certificates of Analysis



5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122 http://www.agatlabs.com

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Devin Soeting

PROJECT: PGA120890

AGAT WORK ORDER: 15T971619

WATER ANALYSIS REVIEWED BY: Mike Muneswar, BSc (Chem), Senior Inorganic Analyst

DATE REPORTED: May 20, 2015

PAGES (INCLUDING COVER): 8

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES		

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

Member of: Association of Professional Engineers, Geologists and Geophysicists of Alberta (APEGGA) Western Enviro-Agricultural Laboratory Association (WEALA) Environmental Services Association of Alberta (ESAA)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Page 1 of 8

CUENTINGE AL BADONALDONIS AND				U	Certifica	te of Analysis	5835 COOPEHS AVENUE MISSISSAUGA, ONTARIO
CLENT NAME: F. J. BURNEDER A ASCOCATES LTD ACTION TO: Devin Statute Carling Activisations and activity of the control of the c	り配	R	Laboratorie	S. A D		ORDER: 15T971619 Δ120800	CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122
SAMPLED Str. SAMPLED Str. SAMPLED Str. Mater OLality Assessment (excl. Hg) - Groundwater Samples Dr. E RECEVER: 2015.06.08 Mater OLality Assessment (excl. Hg) - Groundwater Samples Dr. E RECEVER: 2015.06.08 Mater OLality Assessment (excl. Hg) - Groundwater Samples Dr. E RECEVER: 2015.06.08 Mater OLality Assessment (excl. Hg) - Groundwater Samples Dr. E RECEVER: 2015.06.08 Mater OLality Assessment (excl. Hg) - Groundwater Samples Dr. E RECEVER: 2015.06.08 Mater Distribution Mater OLality Assessment (excl. Hg) - Groundwater Samples Dr. Endometric Mater OLality Assessment (excl. Hg) - Groundwater Samples Mater OLality Assessment (excl. Hg) - Groundwater Samples Dr. Endometric Mater OLality Assessment (excl. Hg) - Groundwater Samples Mater OLality Assessment (excl. Hg) - Groundwater Samples Dr. Endometric Mater OLality Assessment (excl. Hg) - Groundwater Samples Mater OLality Assessment (excl. Hg) - Groundwater Samples Dr. Endometric Mater OLality Assessment (excl. Hg) - Groundwater Samples Mater OLality Assessment (excl. Hg) - Groundwater Samples Dr. Endometric Mater OLCOS Mater OLCOS Mater OLCOS Dr. Endometric Mater OLCOS Mater OLCOS Mater OLCOS Dr. Endometric	CLIENT NAME: R.J. BURNSI	DE & ASSO	CIATES LTD			ATTENTION TO: Devin S	http://www.agatlabs.com Soeting
Mater Clustify Assessment (exc). Hg) - Groundwater Samples DATE RECIVER; 2015-05-00 DATE RECEIVER; 2015-05-00 DATE RECEIVER; 2015-05-06 SMELE CROUND (EXC) Mater Clustify Assessment (exc). Hg) - Groundwater Samples DATE RECEIVER; 2015-05-06 SMELE CROUND (EXC) Mater Clustify Assessment (exc). Hg) DATE RECEIVER; 2015-05-00 DATE RECEIVER; 2015-05-06 SMELE CROUND (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Pennole Unit C/S SMM SMM Mater Clustify (EXC) Pennole Unit C/S SMM SMM Mater Clustify (EXC) Pennole Unit C/S SMM SMM SMM Definition (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Mater Clustify (EXC) Mater Clustify (EXC) </td <td>SAMPLING SITE:</td> <td></td> <td></td> <td></td> <td></td> <td>SAMPLED BY:</td> <td></td>	SAMPLING SITE:					SAMPLED BY:	
ONTE RECIPICID. 2015-005-201 DATE RECONTED: 2015-005-201 DATE RECONTED: 2015-005-201 Over the control of the			Water Quali	ty Assess	sment (excl.	Hg) - Groundwater Samples	
Andre Energiants Andre Energiants<	DATE RECEIVED: 2015-05-08						ATE REPORTED: 2015-05-20
Tarmeter District Price: Water Water Water Water Farmeter Unit 0.15 RUL 662015 RUL 662015 Entransfer Unit 0.15 RUL 662015 RUL 662015 Entransfer Unit 0.15 RUL 662015 RUL 662015 Entransfer PUll Units X 840 X 863 662 Entransfer PULL X X 7 7 7 Entransfer PULL X X X 7 7 Entransfer PULL X X X 7 7 Entransfer PULL X X X			SAMPLE DESCRIPTION:	MW1		MW2	
Farmeter DATE SAMPLED: S68/0015 E68/0015 S68/0015 Farmeter Utt 2 S68/015 S68/015 S68/015 Entention Opt Utt 3 3 3 3 3 Entention Opt Utt 3 3 3 3 3 3 3 Entention Opt Utt 3			SAMPLE TYPE:	Water		Water	
Parameter Dirit of cisa Poll cisa Poll cisa Poll Enderation Unit cisa Poll cisa Poll cisa Poll Standon M Sistin N a.80 cisa cis			DATE SAMPLED:	5/8/2015		5/8/2015	
Control Sign 2 48 2 48 5 Pf 100 2 48 8 64 64 Pf 100 2 48 64 64 Langeline pH 211 64 64 64 Langeline pH 231 5 36 36 Langeline pH 23 24 2 36 36 Langeline pH 23 24 2 36 36 Langeline pH 2 24 2 36 36 Langeline pH 2 24 2 36 36 Langeline pH 2 24 2 36 37 Langeline pH 2 2 2 36 37 Langeline pH 2 2 2 37 36 Langeline pH 2 2 2 36 37 Langeline pH 2 2 3 36 37	Parameter	Unit	G/S RDL	6524751	RDL	6524810	
pH Title NA 810 bits MA 810 bits MA 810 bits Lunginger (notex) Lunginger (notex) 128 128 128 128 128 Lunginger (notex) mpL 23 23 23 23 23 Lunginger (notex) mpL 5 23 23 23 23 Langinger (notex) mpL 5 24 20 23 23 Langinger (notex) mpL 5 24 20 23 24 Restrinker (acco) mpL 10 5 17 24 24 Restrinker (acco) mpL 0.10 210 115 211 210 Restrinker (acco) mpL 0.10 210 210 210 210 Restrinker (acco) mpL 0.10 210 210 210 210 Restrinker (acco) mpL 0.10 210 210 210 210 Restrinker (acco) <td< td=""><td>Electrical Conductivity</td><td>uS/cm</td><td>2</td><td>462</td><td>N</td><td>649</td><td></td></td<>	Electrical Conductivity	uS/cm	2	462	N	649	
Statistical (Million) 231 531 Train Andrease (ac Cool) mpt 13 13 Train Andrease (ac Cool) mpt 5 23 55 Mathin (ac Cool) mpt 5 23 26 Mathin (ac Cool) mpt 5 23 26 Mathin (ac Cool) mpt 5 24 25 7 Mathin (ac Cool) mpt 5 26 27 26 26 Mathin (ac Cool) mpt 5 26 27 5 26 Mathin (ac Cool) mpt 010 200 215 200 215 Mathin (ac Cool) mpt 010 201 201 215 203 215 Mathin SN mpt 010 215 200 223 201 223 201 223 201 223 201 223 201 223 201 223 201 202 223 201 223 202 223	Hd	pH Units	NA	8.49	NA	8.50	
Lution 138 138 138 138 138 Langelen from colds mpl 5 24 20 372 Langelen from colds mpl 5 24 20 372 Land Description 66 20 274 20 372 Land Description mpl 5 2 27 2 Reinhores (ac CACO) mpl 5 3 2 2 Reinhores (ac CACO) mpl 0.01 301 0.01 311 Reinhores (ac CACO) mpl 0.01 301 0.01 311 Reinhores (ac CACO) mpl 0.01 310 0.01 311 Reinhores (ac CACO) mpl 0.01 310 0.01 311 Reinhores (ac CACO) mpl 0.01 310 321 321 Reinhores (ac CACO) mpl 0.01 310 321 321 Reinhores (ac CACO) mpl 0.01 321 321 321<	Saturation pH			7.11		6.81	
Trail Differences and	Langelier Index	•		1.38	1	1.69	
All Interfactors MpL 5 271 5 372 All Inter Use accoss mpL 5 2 2 2 2 All Inter Use accoss mpL 5 2 2 2 2 All Inter Use accoss mpL 5 2 5 2 2 All Interval (ac accos) mpL 0 0 0 0 0 0 All Interval (ac accos) mpL 0 0 0 0 0 0 0 All Interval (ac accos) mpL 0 0 0 0 0 0 0 All Interval (ac accos) mpL 0.10<	Total Hardness (as CaCO3)	mg/L	0.5	243	0.5	365	
Beathorise (accos) mgL 5 217 5 28 Cathorise (ac accos) mgL 5 7 5 7 Cathorise (ac accos) mgL 5 7 5 7 Cathorise (ac accos) mgL 6 5 7 5 7 Cathorise (ac accos) mgL 0.10 -4.10 -4.10 -4.10 Floode mgL 0.10 -6.10 0.10 -2.11 -4.10 Floode mgL 0.10 -6.10 0.10 -4.10 -4.10 Nemes N mgL 0.10 -1.13 0.00 -4.10 -4.10 Nemes N mgL 0.10 -1.13 0.00 -4.10 -4.10 Nemes N mgL 0.10 -1.13 0.00 -4.10 -4.10 Cathor mgL 0.10 -1.12 0.00 -4.10 -4.10 Cathor mgL 0.10 -1.12 0.00 -4.10 -4.10 <td>1 otal Dissolved Solids</td> <td>mg/L</td> <td>20</td> <td>294</td> <td>20</td> <td>3/2</td> <td></td>	1 otal Dissolved Solids	mg/L	20	294	20	3/2	
And control mgh 5 70 5 75 Hordrock (at GaCOS) mgh 5 -6 5 -6 Hordrock (at GaCOS) mgh 5 -6 5 -6 Hordrock (at GaCOS) mgh 0 0 0 0 0 Chordrock mgh 0.0 -5 -6 5 -6 Chordroc mgh 0.0 -6 0 0 -10 Chordroc mgh 0.0 -11 0 0 -10 Strends mgh 0.0 -11 0 0 -11 Chordroc 0.0 0.0 0.0 0 0 0 Chordroc 0.0 0.0 0.0 0 0 0 Chordroc 0.0 0.0		mg/L	о u	112	n u	307	
Honologies Honolog	Dicarbonate (as cacod)	mg/L mg/l	ה ע	102	ο u	203 17	
Hundle mgl 0.0 -6.0 0.0 -6.0 Rudrete mgl 0.10 -6.10 0.10 -6.10 0.10 -6.10	Hvdroxide (as CaCC3)	mg/L	ט רכ	<u>2</u> 10	מו כ	<u>-</u> ₩	
Chrolie mpl mpl mpl mpl mpl mpl 0.00 0.77 0.10 0.77 0.27 0.10 0.10 0.77 0.10 0.70 0.10 0.71 0.10 0.71 0.10 0.71 0.10 0.71 0.10 <th0< th=""> 0.10</th0<>	Flinrida	l/Dm	0.10	<0.10	0.10	<0.10	
Wrate as N mgl 0.10 0.57 0.10 2.10 Nitrie as N mgl 0.00 0.10 0.10 0.10 Nitrie as N mgl 0.10 0.10 0.10 0.10 Nitrie as N mgl 0.00 0.10 0.10 0.10 Subhat mgl 0.20 2.18 0.20 2.93 Ortho Prosphotes rP mgl 0.20 0.20 0.20 0.20 Otho Prosphotes rP mgl 0.00 0.00 0.00 0.00 Otho Prosphotes rP mgl 0.00 0.00 0.00 0.00 Otho Prosphotes rP mgl 0.00 0.00 0.00 0.00 Ammonia as N mgl 0.00 0.00 0.00 0.00 0.00 Total Prosphotes mgl 0.00 0.00 0.00 0.00 0.00 Total Prosphotes mgl 0.05 0.05 0.05 0.05 0.05 Color 0.05	Chloride	mg/L	0.20	3.92	0.20	11.5	
Nithe as N mgL 0.10 -0.10 <	Nitrate as N	ma/L	0.10	0.57	0.10	2.10	
Bromide may may Chrono Chrono Prescheral ars N mg/ mg/ mg/ mg/ mg/ mg/ mg/ mg/ mg/ mg/	Nitrite as N	mg/L	0.10	<0.10	0.10	<0.10	
Sulprate mg/L 0.20 218 0.20 289 Ontro Prosphate as P mg/L 0.10 1.15 0.00 -0.20 Refination as Indiversition mg/L 0.10 1.15 0.00 -0.20 Ammonia es Indiversition mg/L 0.01 1.15 0.06 -0.20 Ammonia es Indiversition mg/L 0.02 -0.05 0.05 -0.06 Ammonia es Indiversition mg/L 0.05 -0.05 0.06 -0.06 Ammonia es Indiversition mg/L 0.05 -0.05 -0.06 -0.06 Total Prosphorus mg/L 0.05 -0.05 -0.06 -0.06 Color Total Prosphorus mg/L 0.05 -4.0	Bromide	mg/L	0.10	<0.10	0.10	<0.10	
Othor Phrasphate as P mg/L 0.20 -6.20 -6.020 Readive Siles mg/L 0.05 7.15 0.05 7.15 Ammonias mg/L 0.05 1.38 0.05 6.020 Ammonias mg/L 0.05 1.38 0.05 0.08 Ammonias mg/L 0.05 1.38 0.05 0.03 Total Phrosphorus mg/L 0.05 1.37 0.05 1.37 Total Phrosphorus mg/L 0.05 2.29 0.05 7.67 Magnesium mg/L 0.05 2.72 0.05 7.67 Solum mg/L 0.05 2.73 0.05 7.67 Potassium mg/L 0.05 0.05 7.67 <tr< td=""><td>Sulphate</td><td>mg/L</td><td>0.20</td><td>21.8</td><td>0.20</td><td>29.9</td><td></td></tr<>	Sulphate	mg/L	0.20	21.8	0.20	29.9	
Reactive Silica mg/L 0.10 11.5 0.05 7.15 Ammonias N mg/L 0.02 -0.02 0.02 -0.02 Ammonias N mg/L 0.02 -0.02 0.03 -0.02 Ammonias N mg/L 0.05 1.38 0.06 -0.03 Total Organic Carbon mg/L 0.5 2.9 0.5 -4.0 Total Organic Carbon TCU 5 -5 -5 -5 Unbidity NTU 0.5 9650 0.5 970 Colour TCU 5 -5 -5 -5 Vinbidity NTU 0.5 970 -5 -5 Sodium mg/L 0.05 7.13 -5 -5 Nummum mg/L 0.06 0.03 -0.03 -1.34 Potassium mg/L 0.06 0.03 -0.03 -0.03 Attimony mg/L 0.003 -0.03 -0.03 -0.03	Ortho Phosphate as P	mg/L	0.20	<0.20	0.20	<0.20	
Armonia as N mgl. 0.02 <0.02 <0.02 <0.02 Total Phosphorus mgl. 0.05 1.38 0.05 0.08 Total Organic Carbon mgl. 0.05 1.38 0.05 0.09 Total Organic Carbon TCU 0.5 5 5 5 5 Color TCU 0.5 9770 0.5 9770 Color mgl. 0.05 27.2 0.05 76.7 Magnesium mgl. 0.05 27.2 0.05 4.19 Magnesium mgl. 0.05 1.37 0.05 76.7 Magnesium mgl. 0.05 27.2 0.05 4.19 Polssium mgl. 0.06 0.03 4.13 Autimony mgl. 0.003 -0.003 -0.003 Artimony mgl. 0.003 -0.003 -0.003 Artimony mgl. 0.003 -0.003 -0.003 Artimony mgl.	Reactive Silica	mg/L	0.10	11.5	0.05	7.15	
Total Phosphorus mg/L 0.05 1.38 0.05 0.09 Total Phosphorus Total Organic Carbon Tot 0.5 2.3 0.05 0.09 Total Organic Carbon Totul 0.5 2.3 0.5 4.0 Turboliv NTU 0.5 52.6 0.05 76.7 Turboliv mg/L 0.05 52.6 0.05 76.7 Magnesium mg/L 0.05 1.97 0.05 4.19 Nagnesium mg/L 0.05 1.97 0.05 4.19 Sodium mg/L 0.063 1.34 1.34 Autimony mg/L 0.003 -0.003 -0.003 Artimony mg/L 0.003 -0.003 -0.003 Artimony mg/L 0.003 -0.003 -0.003 Artimony mg/L 0.003 -0.003 -0.003	Ammonia as N	mg/L	0.02	<0.02	0.02	<0.02	
	Total Phosphorus	mg/L	0.05	1.38	0.05	0.09	
Colour TCU 5 55 5 5 Turbidity NTU 0.5 9770 9770 Turbidity mg/L 0.05 76.7 76.7 Magnesium mg/L 0.05 7.4.2 9700 Magnesium mg/L 0.05 1.37 0.05 4.19 Norminum mg/L 0.05 0.36 0.03 4.13 Auminum mg/L 0.03 0.003 -0.03 -0.03 Autinony mg/L 0.003 -0.003 -0.003 -0.003 Artenic mg/L 0.003 -0.003 -0.003 -0.003	Total Organic Carbon	mg/L	0.5	2.9	0.5	4.0	
Turbidity NTU 0.5 9550 0.5 9770 Calcium mg/L 0.05 52.6 0.05 76.7 Magnesium mg/L 0.05 27.2 0.05 4.2 Magnesium mg/L 0.05 1.97 0.05 4.19 Sodium mg/L 0.05 1.97 0.05 4.19 Potassium mg/L 0.03 0.03 0.03 0.013 Autinomy mg/L 0.003 0.003 0.003 0.003 Arsenic mg/L 0.003 0.003 0.003 0.003	Colour	TCU	5	ŝ	£	Ś	
Calcium mg/L 0.05 52.6 0.05 76.7 Magnesium mg/L 0.05 1.97 0.05 42.2 Nagnesium mg/L 0.05 1.97 0.05 42.2 Portasium mg/L 0.05 1.97 0.05 4.19 Portasium mg/L 0.03 0.03 0.03 0.03 Autimium mg/L 0.03 -0.03 0.03 -0.03 Artimium mg/L 0.03 -0.03 0.03 -0.03 Artimium mg/L 0.03 -0.03 0.03 -0.03 Artimium mg/L 0.03 -0.03 0.03 -0.03	Turbidity	NTU	0.5	9650	0.5	9770	
Magnesium mg/L 0.05 27.2 0.05 4.2 Nagnesium mg/L 0.05 1.97 0.05 4.19 Sodium mg/L 0.05 1.97 0.05 4.19 Potassium mg/L 0.06 0.05 1.34 Auminum mg/L 0.003 <0.003 <0.013 Antimony mg/L 0.003 <0.003 <0.003 <0.003 Arsenic mg/L 0.003 <0.003 <0.003 <0.003 <0.003 Arsenic mg/L 0.003 <0.003 <0.003 <0.003 <0.003 Arsenic mg/L 0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003 <0.003	Calcium	mg/L	0.05	52.6	0.05	76.7	
Sodum mg/L 0.05 1.37 0.05 4.19 Potasium mg/L 0.05 0.05 1.37 0.05 4.19 Potasium mg/L 0.06 0.05 1.37 0.03 4.19 Auminum mg/L 0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <0.03 <th< td=""><td>Magnesium</td><td>mg/L</td><td>0.05</td><td>27.2</td><td>0.05</td><td>42.2</td><td></td></th<>	Magnesium	mg/L	0.05	27.2	0.05	42.2	
Potasum mg/L 0.05 0.86 0.05 1.34 Aluminum mg/L 0.004 <0.004	Sodium	mg/L	0.05	1.97	0.05	4.19	
Auminum mg/L 0.004 <0.013 Antimuny mg/L 0.003 <0.003	Potassium	mg/L	0.05	0.86	0.05	1.34	
Antimony mg/L 0.003 <0.003 <0.003 Arsenic mg/L 0.003 <0.003	Aluminum	mg/L	0.004	<0.004	0.004	0.013	
Arsenic mg/L 0.003 <0.003 <0.003 <0.003 Arsenic Arseni	Antimony	mg/L	0.003	<0.003	0.003	<0.003	
Certified By:	Arsenic	mg/L	0.003	<0.003	0.003	<0.003	
Certified By:							Mail an
						Certified Bv.	

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CLIENT NAME: R.J. BURNSID	E & ASSC	CIATES LT	D			ATTENTIO	N TO: Devin Soeting	-
SAMPLING SITE:						SAMPLED	BY:	
	1	Wa	ter Qualit	y Assessi	ment (excl.	Hg) - Groundwater Sam	iples	
DATE RECEIVED: 2015-05-08							DATE REPORTED: 20	015-05-20
		SAMPLE DES	CRIPTION:	MW1		MW2		
		SAN	PLE TYPE:	Water		Water		
Parameter	Unit	DATE G/S	SAMPLED: RDL	5/8/2015 6524751	RDL	5/8/2015 6524810		
Barium	mg/L		0.002	0.038	0.002	0.040		
Beryllium	mg/L		0.001	<0.001	0.001	<0.001		
Boron	mg/L		0.010	<0.010	0.010	0.028		
Cadmium	mg/L		0.001	<0.001	0.001	<0.001		
Chromium	mg/L		0.003	<0.003	0.003	0.005		
Cobalt	mg/L		0.001	<0.001	0.001	0.001		
Copper	mg/L		0.003	<0.003	0.003	<0.003		
Iron	mg/L		0.010	<0.010	0.010	<0.010		
Lead	mg/L		0.002	<0.002	0.002	0.003		
Manganese	mg/L		0.002	0.037	0.002	0.010		
Molybdenum	mg/L		0.002	<0.002	0.002	0.002		
Nickel	mg/L		0.003	<0.003	0.003	<0.003		
Selenium	mg/L		0.004	<0.004	0.004	<0.004		
Silver	mg/L		0.002	<0.002	0.002	<0.002		
Strontium	mg/L		0.005	0.061	0.005	0.202		
Thalium	mg/L		0.006	<0.006	0.006	<0.006		(
Tin	mg/L		0.002	<0.002	0.002	<0.002		
Titanium	mg/L		0.002	<0.002	0.002	<0.002		
Tungsten	mg/L		0.010	<0.010	0.010	<0.010		
Uranium	mg/L		0.002	<0.002	0.002	<0.002		
Vanadium	mg/L		0.002	<0.002	0.002	<0.002		
Zinc	mg/L		0.005	0.025	0.005	0.092		
Zirconium	mg/L		0.004	<0.004	0.004	<0.004		
% Difference/ Ion Balance			0.1	0.2	0.1	1.9		
Commonto: BDI - Benorted De	startion Limit	G/S-Guid	eline / Standard					
6524751-6524810 Samples required to re-	dilution prior t	to analysis for A	vnions & Reactiv	ve Silica in orde	r to keep the analy	es within the calibration range of the i	instruments and/or to minimize any matri	x interferences; the RDLs

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Page 3 of 8

Results relate only to the items tested and to all the items tested

GGAT CERTIFICATE OF ANALYSIS (V1)

Certified By:
AGAT Laboratories

Certificate of Analysis AGAT WORK ORDER: 15T044376 PROJECT: PGA120890

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

ATTENTION TO: Devin Soeting SAMPLED BY: Devin Soeting

				:							
			Ň	ater Quality	Assessm	ient (mg/L) e	excl. Hg				
DATE RECEIVED: 2015-11-19									ATE REPORTE	D: 2015-11-26	
		SAMPLE DESC	RIPTION:	MW1		MW2		DWW1	DWW2	TW1	
		SAMP	LE TYPE:	Water		Water		Water	Water	Water	
		DATE S	AMPLED:	11/18/2015		11/18/2015		11/18/2015	11/18/20-5	11/18/2015	
Parameter	Unit	G/S	RDL	7210637	RDL	7210656	RDL	7210662	7210669	7210697	
Electrical Conductivity	uS/cm		2	515	Q	754	CJ	551	577	569	
HC	pH Units		NA	8.12	AN	8.09	NA	8.15	8.24	8.14	
Saturation pH				6.99		6.69		6.93	7.00	7.07	
Langelier Index				1.13		1.40		1.22	1.24	1.07	
Total Hardness (as CaCO3)	mg/L		0.5	277	0.5	398	0.5	286	262	243	
Total Dissolved Solids	mg/L		20	286	20	424	20	292	290	276	
Alkalinity (as CaCO3)	mg/L		£	251	5	374	5	275	255	236	
Bicarbonate (as CaCO3)	mg/L		5	251	5	374	ى ك	275	255	236	
Carbonate (as CaCO3)	mg/L		S	ŝ	5	55	5	ŝ	ъ	ŝ	
Hydroxide (as CaCO3)	mg/L		S	ΰ	5	<5	5	£	ŝ	ъ	
Fluoride	mg/L		0.10	<0.10	0.25	<0.25	0.10	<0.10	<0.10	1.10	
Chloride	mg/L		0.20	3.25	0.50	11.7	0.20	2.54	26.1	24.4	
Nitrate as N	mg/L		0.10	0.53	0.25	2.29	0,10	0.23	0.14	<0.10	
Nitrite as N	mg/L		0.10	<0.10	0.25	<0.25	0.10	<0.10	<0.10	<0.10	
Bromide	mg/L		0.10	<0.10	0.25	<0.25	0.10	<0.10	<0.10	0.18	
Sulphate	mg/L		0.20	22.0	0.50	25.5	0.20	27.9	14.2	25.8	
Ortho Phosphate as P	mg/L		0.20	0.32	0.50	<0.50	0.20	0.56	0.40	0.33	
Reactive Silica	mg/L		0.05	10.9	0.05	7.74	0.05	13.0	7.72	9.79	
Ammonia as N	mg/L		0.02	<0.02	0.02	<0.02	0.02	<0.02	<0.02	0.09	
Total Phosphorus	mg/L		0.05	0,08	0.05	0.15	0.05	<0.05	<0.05	<0.05	
Total Organic Carbon	mg/L		3.5	92.2	0.5	10.2	0.5	0.6	0.8	0.6	
Colour	TCU		5	ŝ	5	ŝ	ŋ	ŝ	5	ŝ	
Turbidity	NTU		4	34600	20	47800	0.5	<0.5	<0.5	4.7	
Calcium	mg/L		0.05	65.1	0.05	93.4	0.05	72.9	65.7	61.3	
Magnesium	mg/L		0.05	27.8	0.05	39.9	0.05	25.3	23.9	21.9	
Sodium	mg/L		0.05	1.98	0.05	3.44	0.05	2.52	15.0	17.0	
Potassium	mg/L		0.05	1.21	0.05	1.56	0.05	1.15	1.24	2.46	
Aluminum	mg/L		0.004	<0.004	0.004	<0.004	0.004	<0.004	0.011	<0.004	
Antimony	mg/L		0.003	<0.003	0.003	<0.003	0.003	<0.003	<0.003	<0.003	
America	Name of Street o						0000			0000	

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Certified By:

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GGAT CERTIFICATE OF ANALYSIS (V1)

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CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

Certificate of Analysis AGAT WORK ORDER: 15T044376 PROJECT: PGA120890

ATTENTION TO: DEVID SOBTING	SAMPLED BY:Devin Soeting

SAMPLING SITE:						SAMPLE	D BY:Devin So	eting		
		M	ater Quality	Assessm	ent (mg/L) e	xcl. Hg				
DATE RECEIVED: 2015-11-	-19							ATE REPORTE	D: 2015-11-26	
		SAMPLE DESCRIPTION:	MW1		MW2		DWW1	DWW2	TW1	
		SAMPLE TYPE:	Water		Water		Water	Water	Water	
		DATE SAMPLED:	11/18/2015		11/18/2015		11/18/2015	11/18/2015	11/18/2015	
Parameter	Unit	G/S RDL	7210637	RDL	7210656	RDL	7210662	7210669	7210697	
Barium	mg/L	0.002	0.043	0.002	0.015	0.002	0.059	0.033	0.078	
Beryllium	mg/L	0.001	<0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001	
Boron	mg/L	0.010	<0.010	0.010	0.012	0.010	<0.010	<0.010	0.047	
Cadmium	mg/L	0.001	<0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001	
Chromium	mg/L	0.003	<0.003	0.003	<0.003	0.003	<0.003	<0.003	<0.003	
Cobalt	mg/L	0.001	<0.001	0.001	<0.001	0.001	<0.001	<0.001	<0.001	
Copper	mg/L	0.003	<0.003	0.003	<0.003	0.003	0.022	0.004	<0.003	
Iron	mg/L	0.010	<0.010	0.010	<0.010	0.010	<0.010	<0.010	0.236	
Lead	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002	<0.002	
Mandanese	mg/L	0.002	<0.002	0.002	0.004	0.002	<0.002	<0.002	0.012	
Molvbdenum	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002	<0.002	
Nickel	mg/L	0.003	<0.003	0.003	<0.003	0.003	<0.003	<0.003	<0.003	
Selenium	mg/L	0.004	<0.004	0.004	<0.004	0.004	<0.004	<0.004	<0.004	
Silver	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002	<0.002	
Strontium	mg/L	0.005	0.071	0.005	0.075	0.005	0.080	0.060	2.48	
Thallium	mg/L	0.006	<0.006	0.006	<0.006	0.006	<0.006	<0.006	<0.006	
Tin	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002	<0.002	
Trtanium	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002	<0.002	
Tungsten	mg/L	0.010	<0.010	0.010	<0.010	0.010	<0.010	<0.010	<0.010	
Uranium	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002	<0.002	
Vanadium	mg/L	0.002	<0.002	0.002	<0.002	0.002	<0.002	<0.002	<0.002	
Zinc	mg/L	0.005	0.054	0.005	0.039	0.005	0.041	0.009	0.022	
Zirconium	mg/L	0.004	<0.004	0.004	<0.004	0.004	<0.004	<0.004	<0.004	
% Difference/ Ion Balance	%	NA	0.385	NA	2.25	NA	2.59	1.77	2.87	Í
Comments' RDI - Reno	Had Detection Limit-	G / S - Guideline / Standa	9							



Certified By:



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Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: PGA120890

SAMPLING SITE:

AGAT WORK ORDER: 15T044376

ATTENTION TO: Devin Soeting SAMPLED BY:Devin Soeting

Water Analysis

RPT Date: Nov 26, 2015				UPLICATE	-		REFERE		TERIAL	METHOD	BLAN	K SPIKE	MA	TRIX SP	IKE
DADAMETER		Sample				Method	Measurod	Acce	ptable		Acce	eptable		Acce	eptable
PARAMETER	Batch	Id	Dup #1	Dup #2	RPD	Dialik	Value	Lower	Upper	Recovery	Lower	Upper	Recover	Lower	Upper
Water Quality Assessment (mg/L) excl. Hg	1	l				1				-			-	1
Electrical Conductivity	7210637	7210637	515	512	0.6%	< 2	105%	80%	120%	NA			NA		
pН	7210637	7210637	8.12	8.07	0.6%	NA	100%	90%	110%	NA			NA		
Total Dissolved Solids	7208497		726	732	0.8%	< 20	94%	80%	120%	NA			NA		
Alkalinity (as CaCO3)	7210637	7210637	251	253	0.8%	< 5	94%	80%	120%	NA			NA		
Bicarbonate (as CaCO3)	7210637	7210637	251	253	0.8%	< 5	NA			NA			NA		
Carbonate (as CaCO3)	7210637	7210637	<5	<5	NA	< 5	NA			NA			NA		
Hydroxide (as CaCO3)	7210637	7210637	<5	<5	NA	< 5	NA			NA			NA		
Fluoride	7210656	7210656	<0.25	<0.25	NA	< 0.05	93%	90%	110%	94%	90%	110%	94%	80%	120%
Chloride	7210656	7210656	11.7	11.2	4.4%	< 0.10	90%	90%	110%	101%	90%	110%	105%	80%	120%
Nitrate as N	7210656	7210656	2.29	2.12	7.7%	< 0.05	98%	90%	110%	104%	90%	110%	106%	80%	120%
Nitrite as N	7210656	7210656	<0.25	<0.25	NA	< 0.05	NA	90%	110%	98%	90%	110%	102%	80%	120%
Bromide	7210656	7210656	<0.25	< 0.25	NA	< 0.05	98%	90%	110%	98%	90%	110%	102%	80%	120%
Sulphate	7210656	7210656	25.5	24.5	4.0%	< 0.10	98%	90%	110%	102%	90%	110%	104%	80%	120%
Ortho Phosphate as P	7210656	7210656	<0.50	0.62	NA	< 0.10	108%	90%	110%	100%	90%	110%	108%	80%	120%
Reactive Silica	7207578		12.8	12.7	0.8%	< 0.05	98%	90%	110%	101%	90%	110%	91%	80%	120%
Ammonia as N	7209660		<0.02	<0.02	NA	< 0.02	100%	90%	110%	98%	90%	110%	94%	80%	120%
Total Phosphorus	7210174		142	144	1.4%	< 0.05	101%	80%	120%	103%	90%	110%	98%	70%	130%
Total Organic Carbon	7210637	7210637	92.2	92.4	0.2%	< 0.5	101%	90%	110%	105%	90%	110%	98%	80%	120%
Colour	7210637	7210637	<5	<5	NA	< 5	102%	90%	110%	NA			NA		
Turbidity	7207927		<0.5	<0.5	NA	< 0.5	105%	90%	110%	NA			NA		
Calcium	7210637	7210637	65.1	65.1	0.0%	< 0.05	105%	90%	110%	103%	90%	110%	98%	70%	130%
Magnesium	7210637	7210637	27.8	27.8	0.0%	< 0.05	94%	90%	110%	92%	90%	110%	90%	70%	130%
Sodium	7210637	7210637	1.98	1.97	0.5%	< 0.05	102%	90%	110%	101%	90%	110%	101%	70%	130%
Potassium	7210637	7210637	1.21	1.20	0.8%	< 0.05	105%	90%	110%	104%	90%	110%	101%	70%	130%
Aluminum	7210637	7210637	< 0.004	<0.004	NA	< 0.004	109%	90%	110%	105%	90%	110%	114%	70%	130%
Antimony	7210637	7210637	< 0.003	<0.003	NA	< 0.003	103%	90%	110%	98%	90%	110%	112%	70%	130%
Arsenic	7210637	7210637	< 0.003	<0.003	NA	< 0.003	106%	90%	110%	102%	90%	110%	103%	70%	130%
Barium	7210637 7	7210637	0.043	0.045	4 5%	< 0.002	103%	90%	110%	105%	90%	110%	112%	70%	130%
Beryllium	7210637 7	7210637	< 0.001	<0.001	NA	< 0.001	105%	90%	110%	101%	90%	110%	108%	70%	130%
Boron	7210637 7	7210637	< 0.010	<0.010	NA	< 0.010	102%	90%	110%	98%	90%	110%	94%	70%	130%
Cadmium	7210637 7	7210637	< 0.001	<0.001	NA	< 0.001	102%	90%	110%	102%	90%	110%	126%	70%	130%
Chromium	7210637 7	7210637	< 0.003	< 0.003	NA	< 0.003	103%	90%	110%	103%	90%	110%	125%	70%	130%
Cobalt	7210637 7	7210637	< 0.001	<0.001	NA	< 0.001	107%	90%	110%	107%	90%	110%	1 16%	70%	130%
Copper	7210637 7	7210637	< 0.003	< 0.003	NA	< 0.003	102%	90%	110%	108%	90%	110%	111%	70%	130%
Iron	7210637 7	7210637	< 0.010	<0.010	NA	< 0.010	110%	90%	110%	98%	90%	110%	89%	70%	130%
Lead	7210637 7	7210637	< 0.002	<0.002	NA	< 0.002	103%	90%	110%	104%	90%	110%	108%	70%	130%
Manganese	7210637 7	7210637	< 0.002	<0.002	NA	< 0.002	101%	90%	110%	104%	90%	110%	117%	70%	130%
Molybdenum	7210637 7	7210637	< 0.002	<0.002	NA	< 0.002	105%	90%	110%	103%	90%	110%	121%	70%	130%
Nickel	7210637 7	7210637	< 0.003	<0.003	NA	< 0.003	108%	90%	110%	108%	90%	110%	113%	70%	130%

AGAT QUALITY ASSURANCE REPORT (V1)

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Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: PGA120890

SAMPLING SITE:

AGAT WORK ORDER: 15T044376 ATTENTION TO: Devin Soeting

SAMPLED BY:Devin Soeting

Water Analysis (Continued)

					-					-					
RPT Date: Nov 26, 2015				UPLICAT	E	1	REFEREN	ICE MA	TERIAL	METHOD	BLANK	(SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	RPD	Method Blank	Measured	Acce Lin	ptable nits	Recovery	Acce Lir	ptable nits	Recovery	Acce Lin	ptable nits
		ld					value	Lower	Upper		Lower	Upper		Lower	Upper
Selenium	7210637	7210637	< 0.004	<0.004	NA	< 0.004	98%	90%	110%	97%	90%	110%	104%	70%	130%
Silver	7210637	7210637	< 0.002	<0.002	NA	< 0.002	102%	90%	110%	105%	90%	110%	113%	70%	130%
Strontium	7210637	7210637	0.071	0.073	2.8%	< 0.005	101%	90%	110%	99%	90%	110%	127%	70%	130%
Thallium	7210637	7210637	< 0.006	<0.006	NA	< 0.006	103%	90%	110%	107%	90%	110%	114%	70%	130%
Tin	7210637	7210637	< 0.002	<0.002	NA	< 0.002	110%	90%	110%	103%	90%	110%	113%	70%	130%
Titanium	7210637	7210637	< 0.002	<0.002	NA	< 0.002	107%	90%	110%	104%	90%	110%	116%	70%	130%
Tungsten	7210637	7210637	< 0.010	<0.010	NA	< 0.010	101%	90%	110%	98%	90%	110%	110%	70%	130%
Uranium	7210637	7210637	< 0.002	<0.002	NA	< 0.002	101%	90%	110%	101%	90%	110%	109%	70%	130%
Vanadium	7210637	7210637	< 0.002	<0.002	NA	< 0.002	101%	90%	110%	104%	90%	110%	119%	70%	130%
Zinc	7210637	7210637	0.054	0.056	3.6%	< 0.005	105%	90%	110%	108%	90%	110%	109%	70%	130%
Zirconium	7210637	7210637	< 0.004	<0.004	NA	< 0.004	101%	90%	110%	100%	90%	110%	112%	70%	130%

Comments: NA signifies Not Applicable

Duplicate Qualifier: As the measured result approaches the RL (Reporting Limit), the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:



Page 5 of 8

AGAT QUALITY ASSURANCE REPORT (V1)

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Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: PGA120890

SAMPLING SITE:

41

AGAT WORK ORDER: 15T044376 ATTENTION TO: Devin Socting

SAWFLING SHE.		SAMPLED BY:De	vin Soeting
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Water Analysis			
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE
pH	INOR-93-6000	SM 4500-H+ B	PC TITRATE
Saturation pH		SM 2320 B	CALCULATION
Langelier Index		SM 2330B	CALCULATION
Total Hardness (as CaCO3)	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE
Alkalinity (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Bicarbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Carbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Hydroxide (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrate as N	INOB-93-6004	SM 4110 B	ION CHROMATOGRAPH
Nitrite as N	INOR-93-6004	SM 4110 B	
Bromide	INOR-93-6004	SM 4110 B	
Sulphate	INOR-93-6004	SM 4110 B	
Ortho Phosphate as P	INOR-93-6004	SM 4110 B	
Beactive Silica	INOR-93-6047	AO2 EPA-122A & SM 4500 SiO2 D	
	1101-30-0047	QuikChom 10-107-06-1-18 SM 4500	AGZ DISCHETE ANALISEN
Ammonia as N	INOR-93-6059	NH3-F	LACHAT FIA
Total Phosphorus	INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA
Total Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310	SHIMADZU CARBON ANALYZER
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES
Aluminum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Iron	MET-93-6103	EPA SW-846 60204 & 200.8	
Lead	MET-00-0100	EPA SW-846 6020A & 200.8	
Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	
Malybdopum	MET 92 6103	EDA SW 946 6020A & 200.0	
Nickol	MET 93-6103	EPA SW-040 0020A & 200.0	
Selenium	MET-02-6109	EDA SW 946 60004 & 200.0	
Ciluor	MET 02 6100	EPA 300-040 0020A & 200.8	
Oliver	NET 00 0100	EPA 5VV-040 0020A & 200.8	
	WET-93-6103	EPA SW-846 6020A & 200.8	
r nailium T	ME1-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
lin	ME1-93-6103	EPA SW-846 6020A & 200.8	ICP-MS



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOC	IATES LTD	AGAT WORK ORE	DER: 15T044376
PROJECT: PGA120890		ATTENTION TO: D	Devin Soeting
SAMPLING SITE:		SAMPLED BY:Dev	vin Soeting
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Tungsten	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zirconium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
% Difference/ Ion Balance		SM 1030 E	CALCULATION

AGAT METHOD SUMMARY (V1)

Laboratory Use Only Work Order #: 15T 0443746 Cooler Quantity:	Custody Seal Intact:	Turnaround Time (TAT) Required: Regular TAT	Rush TAT (Rush Surcharges Apply) 2 Business 1 Business Image: Days Image: Days Image: Days	OR Date Required (Rush Surcharges May Apply): Please provide prior notification for rush TAT	* IAI IS exclusive of weekends and statutory holidays		sə)	Pesticia	henols shlorine stals/In se se LA	старова Ссва Сова Совалос Совалос Совалос Совалос Совалос Совалос Совалос Совалос Совалос Совалос Сова Сова Сова Сова Сова Сова Сова Сова	•		>	2.		71419 Toole 1 Of Page 1 of 1 1 from No: 7017789
5635 Coopers Avenue Mississauga, Ontano L42 172 Ph: 905 712.5100 Fax: 905,712.5122 webearth agatlabs.com	ments: Ov Regulatory Requirement	Sewer Use Regulation 558	Diplocate One Other Other	ra Report Guideline on ton? Certificate of Analysis	3	(Check Applicable)	EK THM Do TRM CAR CAR CAR CAR S	s 1 to 4 b 1 to 4 c 1	can Leotions Leotions Leotions Leotions Leotions Leotions Leotions	Metals : Metals S Metal S Mydride Cfret C □ total □ t						eard Sign 2015
atories	Regulatory Requires	Table Indicate One	Book Strank Check One) Regi Coarse	Is this submission fo Record of Site Condit		Sample Matrix Legend	B Biota GW Ground Water 0 Oil	- P Paint Soil	SD Sediment SW Surface Water	Comments/ Special instructions	providing Cont					Samples Roceand Thy Pirret Nam
abora		st bug	1.02.1			price for analysis	ie: Yes No [of Sample ainers Matrix	64	-				 NoU-15 Time
		the u	c de			client will be billed full	Bill To Sam			Time # ampled Conta	1:00 5	0:30	52:	0:00	0	Pate A-1 Date
E	90	SED UAL	1-2-5 Fa	07.85	らってい	PO on number is not provided,				Date Sampled Si	1-NON-81		-	-	•	
Chain of Custody Re	Report Information: Company: BUAVSI	Address: 292 SP	Phone: 514 - 823 - Reports to be sent to: 1. Email: 2. Email:	Project Information: Project: DGA-12.6	Sampled By:	AGAT Quote #: Please note: If quotat	Invoice Information: Company:	Contact: Address:	Email:	Sample Identification	Inm	2115	DUUNI	DWUZ	P71	Samber Balveurand By Print Name and Sept. Set M. S. S. C. C. T. M. K. Samous fundried By Amil Kame and Sept.

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CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD 292 Speedvale Avenue West, Unit 7 Guelph, ON N1H1C4 (519) 823-4995

ATTENTION TO: Dave Arsenault

PROJECT: PGA120890

AGAT WORK ORDER: 15T047338

WATER ANALYSIS REVIEWED BY: Parvathi Malemath, Data Reviewer

DATE REPORTED: Dec 08, 2015

PAGES (INCLUDING COVER): 8

VERSION*: 1

Should you require any information regarding this analysis please contact your client services representative at (905) 712-5100

*NOTES		

All samples will be disposed of within 30 days following analysis. Please contact the lab if you require additional sample storage time.

AGAT Laboratories (V1)

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Page 1 of 8

Results relate only to the items tested and to all the items tested

All reportable information as specified by ISO 17025:2005 is available from AGAT Laboratories upon request

DE C		Laboratorie	Cert SS AGAT	tificate of Analysis	5835 COOPERS AVENUE MISSISSAUGA, ONTARIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122
CLIENT NAME: R.J. BURNSIC	DE & ASSOC	SIATES LTD		ATTENTION TO: Dave Arsenault	http://www.agatlabs.com
SAMPLING SITE:				SAMPLED BY:	
			Water Quality	y Assessment excl. Hg	
DATE RECEIVED: 2015-11-27				DATE REPORTED:	2015-12-08
	0)	AMPLE DESCRIPTION:	DWW2		
		SAMPLE IYPE: DATE SAMPLED:	water 11/26/2015		
Parameter	Unit	G/S RDL	7236467		
Electrical Conductivity	uS/cm	5	660		
pH Saturation nH	pH Units	NA	8.29 6 04		
Langelier Index			1.35		
Total Hardness (as CaCO3)	mg/L	0.5	306		
Total Dissolved Solids	mg/L	20	320		
Alkalinity (as CaCO3)	mg/L	Q	269		
Bicarbonate (as CaCO3)	mg/L	Ð	269		
Carbonate (as CaCO3)	mg/L	വ	γ Ω		
Hydroxide (as CaCO3)	mg/L "	C 2	5. 2		
Fluoride	mg/L	0.10	<0.10		
Chloride	mg/L	0.20	43.1		
Nitrate as N	mg/L	0.10	1.71		
	mg/L mg/l	0.10			
Sulphate	ma/l	0.00	<0.10 18.4		
Ortho Phosphate as P	ma/L	0.20	<0.20		
Reactive Silica	mg/L	0.05	10.4		
Ammonia as N	mg/L	0.02	<0.02		
Total Phosphorus	mg/L	0.05	<0.05		
Total Organic Carbon	mg/L	0.5	0.7		
Colour	TCU	<u></u> م	ۍ ۲		
r urbiany Calcium		0.0 ROD	0.U>		
Magnesium	ma/L	0.05	27.0		
Sodium	mg/L	0.05	22.3		
Potassium	mg/L	0.05	1.15		
Aluminum	mg/L	0.004	<0.004		
Antimony	mg/L	0.003	<0.003		
Arsenic	mg/L	0.003	<0.003		
				Characterized Based Control (Control (Contro) (Control (Contro) (Control (C	307
				Certified By:	£
	LYSIS (V1)				Page 2 of 8
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101			35 COOPERS AVENUE
	「「」 Laboratorie	CELLIICALE UL AILALYSIS C AGAT WORK ORDER: 15T047338 TE TE FA	SSISSAUGA ONTAHIO CANADA L4Z 1Y2 TEL (905)712-5100 FAX (905)712-5122
CLIENT NAME: R.J. BURN:	SIDE & ASSOCIATES LTD	ATTENTION TO: Dave Arsenault	http://www.agatlabs.com
SAMPLING SITE:		SAMPLED BY:	
		Water Quality Assessment excl. Hg	
DATE RECEIVED: 2015-11-27		DATE REPORTED: 2015-12-08	-08
	SAMPLE DESCRIPTION:	DWW2	
	SAMPLE TYPE:	Water	
	DATE SAMPLED:	: 11/26/2015	
Parameter	Unit G/S RDL	7236467	
Barium	mg/L 0.002	0.053	
Beryllium	mg/L 0.001	<0.001	
Boron	mg/L 0.010	0.011	0
Cadmium	mg/L 0.001	<0.001	
Chromium	mg/L 0.003	<0.003	
Cobalt	mg/L 0.001	<0.001	
Copper	mg/L 0.003	0.008	
Iron	mg/L 0.010	<0.010	
Lead	mg/L 0.002	<0.002	
Manganese	mg/L 0.002	<0.002	
Molybdenum	mg/L 0.002	<0.002	
Nickel	mg/L 0.003	<0.003	
Selenium	mg/L 0.004	<0.004	
Silver	mg/L 0.002	<0.002	
Strontium	mg/L 0.005	0.144	
Thallium	mg/L 0.006	<0.006	
Tin	mg/L 0.002	<0.002	
Titanium	mg/L 0.002	<0.002	
Tungsten	mg/L 0.010	<0.010	
Uranium	mg/L 0.002	<0.002	
Vanadium	mg/L 0.002	<0.002	
Zinc	mg/L 0.005	0.077	
Zirconium	mg/L 0.004	<0.004	
% Difference/ Ion Balance	% NA	0.0438	
Comments: RDL - Reported	I Detection Limit; G / S - Guideline / Standa	dard	
7236467 The RDL's wer	e increased for Anions to reflect a dilution of th	the sample in order to keep the analytes within a valid calibration range of the instruments.	
		The second s	
		Cartifiad Rv.	

Results relate only to the items tested and to all the items tested

AGAT CERTIFICATE OF ANALYSIS (V1)

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Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: PGA120890

SAMPLING SITE:

AGAT WORK ORDER: 15T047338

ATTENTION TO: Dave Arsenault

SAMPLED BY:

Water Analysis RPT Date: Dec 08, 2015 DUPLICATE REFERENCE MATERIAL METHOD BLANK SPIKE MATRIX SPIKE Method Acceptable Acceptable Acceptable Sample Blank Measure Limits Limits PARAMETER Limits Batch Dup #1 Dup #2 RPD Recover Recover Id Value Lower Upper Lower Upper Lower Upper Water Quality Assessment excl. Hg Electrical Conductivity 7236467 7236467 660 661 0.2% < 2 102% 80% 120% NA NA pН 7236467 7236467 8.29 8.23 0.7% NA 100% 90% 110% NA NA Total Dissolved Solids 7233459 42 40 NA < 20 98% 80% 120% NA NA Alkalinity (as CaCO3) 7236467 7236467 269 269 0.0% < 5 94% 80% 120% NA NA Bicarbonate (as CaCO3) 7236467 7236467 269 269 0.0% < 5 NA NA NA Carbonate (as CaCO3) 7236467 7236467 <5 <5 NA < 5 NA NA ΝA Hydroxide (as CaCO3) 7236467 7236467 <5 <5 NA < 5 NA NA NA Fluoride 7231071 < 0.25 <0.25 NA < 0.05 104% 90% 110% 106% 90% 110% 102% 80% 120% 0.1% Chloride 7231071 91.4 91.5 < 0.10100% 90% 110% 101% 90% 110% 98% 80% 120% Nitrate as N 7231071 <0.25 <0.25 < 0.05 92% 90% 80% NA 110% 96% 90% 110% 96% 120% Nitrite as N <0.25 7231071 <0.25 NA < 0.05 NA 90% 110% 102% 90% 110% 88% 80% 120% Bromide 7231071 <0.25 < 0.25 NA < 0.05108% 90% 110% 106% 90% 110% 100% 80% 120% Sulphate 1.30 7231071 1.28 1.6% < 0.10 91% 90% 110% 99% 90% 110% 98% 80% 120% Ortho Phosphate as P 7231071 < 0.50 <0.50 NA < 0.10 101% 90% 110% 104% 110% 102% 80% 120% 90% Reactive Silica 7235441 2.00 2.01 0.5% < 0.05 98% 90% 110% 110% 90% 110% 97% 80% 120% Ammonia as N 7230891 705 699 0.9% < 0.02 98% 90% 110% 103% 90% 110% 99% 80% 120% Total Phosphorus 7237954 0.36 0.0% 0.36 < 0.05 103% 80% 120% 96% 90% 110% 100% 70% 130% Total Organic Carbon 7236467 7236467 0.7 0.7 NA < 0.5 99% 90% 110% 104% 90% 110% 99% 80% 120% Colour 7236249 <5 <5 NA < 5 99% 90% 110% NA NA Turbidity 7231594 0.7 0.7 NA 101% 90% < 0.5 110% NA NA Calcium 7235564 56.9 57.3 0.7% 98% < 0.05 90% 110% 99% 90% 110% 103% 70% 130% Magnesium 7235564 16.0 16.1 0.6% < 0.05 92% 70% 90% 110% 94% 90% 97% 130% 110% Sodium 7235564 105 104 106% 90% 1.0% < 0.05 110% 106% 90% 110% 100% 70% 130% Potassium 7235564 3.31 0.3% 3.30 < 0.05 99% 90% 110% 98% 90% 110% 99% 70% 130% Aluminum 7236467 7236467 < 0.004 < 0.004 NA < 0.004 107% 90% 110% 107% 90% 110% 107% 70% 130% Antimony 7236467 7236467 < 0.003 < 0.003 NA < 0.003 102% 90% 110% 99% 90% 110% 109% 70% 130% Arsenic 7236467 7236467 < 0.003 < 0.003 NA < 0.003 101% 90% 110% 95% 90% 110% 119% 70% 130% Barium 7236467 7236467 0.053 0.053 0.0% < 0.002 102% 90% 110% 104% 90% 110% 105% 70% 130% Beryllium 7236467 7236467 < 0.001 < 0.001 NA < 0.00195% 90% 110% 101% 90% 110% 111% 70% 130% Boron 7236467 7236467 0.011 0.011 NA < 0.010 102% 90% 110% 105% 90% 110% 122% 70% 130% Cadmium 7236467 7236467 < 0.001 <0.001 NA < 0.001 103% 90% 110% 103% 90% 70% 130% 110% 115% Chromium 7236467 7236467 < 0.003 < 0.003 NA < 0.003 102% 90% 110% 100% 90% 110% 111% 70% 130% Cobalt 7236467 7236467 < 0.001 <0.001 NA < 0.001 97% 90% 110% 93% 90% 110% 103% 70% 130% Copper 7236467 7236467 0.008 0.008 NA < 0.003 105% 90% 110% 100% 90% 130% 110% 106% 70% Iron 7236467 7236467 < 0.010 <0.010 NA < 0.010110% 90% 110% 101% 90% 110% 95% 70% 130% Lead <0.002 7236467 7236467 < 0.002 NA < 0.002101% 90% 110% 100% 90% 110% 100% 70% 130% Manganese < 0.002 7236467 7236467 < 0.002 NA < 0.002 106% 90% 110% 106% 90% 110% 120% 70% 130% Molvbdenum 7236467 7236467 < 0.002 < 0.002 NA < 0.002 98% 90% 92% 70% 110% 90% 110% 109% 130% Nickel 7236467 7236467 < 0.003 < 0.003 NA < 0.003 100% 90% 110% 95% 90% 110% 103% 70% 130%

AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.

Page 4 of 8



Quality Assurance

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: PGA120890

SAMPLING SITE:

AGAT WORK ORDER: 15T047338 ATTENTION TO: Dave Arsenault SAMPLED BY:

Water Analysis (Continued)

													-		
RPT Date: Dec 08, 2015			0	UPLICATI	E		REFEREN	NCE MA	TERIAL	METHOD	BLAN	SPIKE	MAT	RIX SPI	KE
PARAMETER	Batch	Sample	Dup #1	Dup #2	BPD	Method Blank	Measured	Acce Lir	ptable nits	Recoverv	Acce Lir	eptable mits	Recovery	Acce Lir	ptable nits
	Batom	Id	Dup #1	Bup #E			Value	Lower	Upper		Lower	Upper		Lower	Upper
Selenium	7236467	7236467	<0.004	<0.004	NA	< 0.004	100%	90%	110%	96%	90%	110%	128%	70%	130%
Silver	7236467	7236467	<0.002	<0.002	NA	< 0.002	106%	90%	110%	105%	90%	110%	78%	70%	130%
Strontium	7236467	7236467	0.144	0.145	0.7%	< 0.005	103%	90%	110%	101%	90%	110%	106%	70%	130%
Thallium	7236467	7236467	<0.006	<0.006	NA	< 0.006	104%	90%	110%	102%	90%	110%	104%	70%	130%
Tin	7236467	7236467	<0.002	<0.002	NA	< 0.002	100%	90%	110%	97%	90%	110%	106%	70%	130%
Titanium	7236467	7236467	<0.002	<0.002	NA	< 0.002	97%	90%	110%	91%	90%	110%	106%	70%	130%
Tungsten	7236467	7236467	<0.010	<0.010	NA	< 0.010	99%	90%	110%	94%	90%	110%	105%	70%	130%
Uranium	7236467	7236467	< 0.002	<0.002	NA	< 0.002	101%	90%	110%	100%	90%	110%	105%	70%	130%
Vanadium	7236467	7236467	<0.002	<0.002	NA	< 0.002	93%	90%	110%	91%	90%	110%	106%	70%	130%
Zinc	7236467	7236467	0.077	0.073	5.3%	< 0.005	105%	90%	110%	105%	90%	110%	119%	70%	130%
Zirconium	7236467	7236467	<0.004	<0.004	NA	< 0.004	94%	90%	110%	92%	90%	110%	106%	70%	130%

Comments: NA signifies Not Applicable.

Duplicate Qualifier: As the measured result approaches the RL (Reporting Limit), the uncertainty associated with the value increases dramatically, thus duplicate acceptance limits apply only where the average of the two duplicates is greater than five times the RL.

Certified By:



Page 5 of 8

AGAT QUALITY ASSURANCE REPORT (V1)

AGAT Laboratories is accredited to ISO/IEC 17025 by the Canadian Association for Laboratory Accreditation Inc. (CALA) and/or Standards Council of Canada (SCC) for specific tests listed on the scope of accreditation. AGAT Laboratories (Mississauga) is also accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) for specific drinking water tests. Accreditations are location and parameter specific. A complete listing of parameters for each location is available from www.cala.ca and/or www.scc.ca. The tests in this report may not necessarily be included in the scope of accreditation.



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASSOCIATES LTD

PROJECT: PGA120890

SAMPLING SITE:

AGAT WORK ORDER: 15T047338 ATTENTION TO: Dave Arsenault

SAMPLING SITE:	SAMPLED BY:									
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE							
Water Analysis										
Electrical Conductivity	INOR-93-6000	SM 2510 B	PC TITRATE							
pН	INOR-93-6000	SM 4500-H+ B	PC TITRATE							
Saturation pH		SM 2320 B	CALCULATION							
Langelier Index		SM 2330B	CALCULATION							
Total Hardness (as CaCO3)	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Total Dissolved Solids	INOR-93-6028	SM 2540 C	BALANCE							
Alkalinity (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE							
Bicarbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE							
Carbonate (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE							
Hydroxide (as CaCO3)	INOR-93-6000	SM 2320 B	PC TITRATE							
Fluoride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Chloride	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Nitrate as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Nitrite as N	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Bromide	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Sulphate	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Ortho Phosphate as P	INOR-93-6004	SM 4110 B	ION CHROMATOGRAPH							
Reactive Silica	INOR-93-6047	AQ2 EPA-122A & SM 4500 SiO2 D	AQ2 DISCRETE ANALYSER							
Ammonia as N	INOR-93-6059	QuikChem 10-107-06-1-J & SM 4500 NH3-F	LACHAT FIA							
Total Phosphorus	INOR-93-6057	QuikChem 10-115-01-3-A & SM 4500-P I	LACHAT FIA							
Total Organic Carbon	INOR-93-6049	EPA 415.1 & SM 5310	SHIMADZU CARBON ANALYZER							
Colour	INOR-93-6046	SM 2120 B	SPECTROPHOTOMETER							
Turbidity	INOR-93-6044	SM 2130 B	NEPHELOMETER							
Calcium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Magnesium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Sodium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Potassium	MET-93-6105	EPA SW-846 6010C & 200.7	ICP/OES							
Aluminum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Antimony	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Arsenic	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Barium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Beryllium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Boron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Cadmium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Chromium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Cobalt	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Copper	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Iron	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Lead	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Manganese	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Molybdenum	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Nickel	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Selenium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Silver	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Strontium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Thallium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							
Tin	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS							



Method Summary

CLIENT NAME: R.J. BURNSIDE & ASS	OCIATES LTD	AGAT WORK OR	DER: 15T047338
PROJECT: PGA120890		ATTENTION TO:	Dave Arsenault
SAMPLING SITE:		SAMPLED BY:	
PARAMETER	AGAT S.O.P	LITERATURE REFERENCE	ANALYTICAL TECHNIQUE
Titanium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Tungsten	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Uranium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Vanadium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zinc	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
Zirconium	MET-93-6103	EPA SW-846 6020A & 200.8	ICP-MS
% Difference/ Ion Balance		SM 1030 E	CALCULATION

Laboratory Use Only work Order #: 51047358 Cooler Quantity: 300	Arrival Temperatures:	Oustody Seal Intact: Tyes Ino Oustody Seal Intact	Turnaround Time (TAT) Required: Regular TAT	Rush TAT (Rush Surcharges Apply) 3 Rusinees - 2 Businees - 1 Businees	Days Days	OR Date Required (Rush Surcharges May Apply): Please provide prior notification for rush TAT *TAT is exclusive of weekends and statutory holidays		ophenols Metals/inorganics ר טפפ עלילי	СВ3 ССВ3 Соме ССР ССР ССР СОЧОИ ССР СОЧОИ ССР СОЧОИ ССР ССР СОЧОИ ССР ССР ССР ССР ССР ССР ССР ССР ССР СС		The page 1 of 1
5835 Coopers Avanue Missiscauga. Ontario L4Z 1/2 Ph: 905.712 6100 Fax: 905.712.5122 webearth agatlabs.com	In of Custody Form (potable water intended for human consumption)	squirements: On Regulatory Requirement	- Sewer Use Regulation 558	Region Dijectives (PWQO)	Indicate One Other Indicate One	Condition? Certificate of Analysis	Xi	E and Inorganics Scan de Forming Metals : Custom Metals : Cu	5 الطحية الجاها الجاها الحاص الحاص الحاص الحاص الحاص الحاص الحاص الحاص الحاص الحاص الحاص الحاص الحاص الحام المام المام الما الما		Ex (Print Name and Sept.
Laboratories	g Water sample, please use Drinking Water Chalr		Check Control Table Indicate One Indicate On	Action of the set		Is this submis Record of Site (Sample Matri	ame: Yes : J No C Oil Protected Water Analysis Biology Cound Water C Oil C Oil P Paint S S Oil S S Soil S S S S S S S S S S S S S S S S S S S	# of Sample Comments/ ntainers Matrix Special Instruction	5 GW No MERCURY	FNOU 15 Taim SSATURATION
LUDU	Custody Record If this is a Drinking	NEW CLANSING	1912 Sper Nutue Hur. W	519-523-4495 Fax	methodry harrow work	Tation: PGAILOG & 0	PO:	Please note: If autostrow number is not utmatter blent will be blind for the station: Bill To Sa	entification Date Time Con	22-wor-15 10: 30	It Manna and 5 ga.
	Chain of C	Report Inform Company:	Address:	Phone: Reports to be sent to:	1. Email: 2. Email:	Project Inforr Project: Site Location:	AGAT Quote #:	AuAri Quote #: Invoice Infori Company: Contact: Address: Email:	Sample Ide	DWWZ	Ral (a transfer restant) a) (b)



Harden Environmental Services Ltd. 4622 Nassagaweya-Puslinch Townline Road R.R. 1, Moffat, Ontario, L0P 1J0 Phone: (519) 826-0099 Fax: (519) 826-9099

Groundwater Studies

Geochemistry

Phase I / II

Regional Flow Studies

Contaminant Investigations

OMB Hearings

Water Quality Sampling

Monitoring

Groundwater Protection Studies

Groundwater Modeling

Groundwater Mapping

Permits to Take Water

Environmental Compliance Approvals Our File: 0511

April 19, 2016

Township of Puslinch 7404 Wellington Road 34 Guelph, ON, N1H 6H9

Attention: Ms. Karen Landry CAO

Dear Ms. Landry;

Re: 2015 Monitoring Report: Victoria Park Valley Golf Club

We have reviewed the 2015 Monitoring Report: Victoria Park Valley Golf Club report prepared by R.J. Burnside and Associates Ltd. The report summarizes the observations of water level monitoring and water quality monitoring at the golf course until the end of 2015.

Based on our review we concur with R.J. Burnside and Associates that the water taking is occurring within the allowable limits set by Permit to Take Water 5743-9UQQXX.

We agree that there is no discernable impact to water levels in the overburden aquifer caused by the water taking.

We agree that monitoring shows that there is no discernable impact to water levels in the Guelph Formation from the water taking.

The water taking has less than a 0.5 metre impact to water levels in the Gasport Aquifer within the site boundary, therefore the water level change outside of the site boundary will be considerably less and unlikely to cause an impact to neighbouring private wells.

Water quality in the overburden wells shows that since 2011 there has been an increase in nitrate from less than 0.5 mg/L to greater than 2 mg/L and has remained at that level for the past three years. No impact to the on-site domestic water well quality has occurred.

Pesticides have not been measured in the shallow groundwater during any of the sampling events.

Township of Puslinch April 19, 2016 Page 2

We are satisfied with the 2015 Monitoring Report and conclude that neither groundwater quantity nor quality is being affected to an appreciable degree.

Sincerely,

Harden Environmental Services Ltd.

Stan Denhoed, M.Sc., P.Eng. Senior Hydrogeologist



CAPITAL PAVING INC.

Quality Construction by Quality People P.O Box 815 Guelph, Ontario N1H 6L8

March 24, 2016

Ontario Ministry of Natural Resources and Forestry Guelph District 1 Stone Rd. West Guelph ON N1H 4Y2

Attention: Ms. Kristy Sutherland

RE:

2015 Groundwater Monitoring Report

Capital Paving Inc., Wellington Pit, Licence No. 20085 Part Lots 7 and 8, Concession 3, Township of Puslinch

Dear Ms. Sutherland,

Please find enclosed with this letter, as per Site Plan requirements, a copy of the 2015 Groundwater Monitoring Summary for Capital Paving's Wellington Pit, prepared by Groundwater Science Corp.

A copy has also been submitted to the Townhip of Puslinch.

Should you have any questions, please do not hesitate to contact me at (519) 822-4511 or <u>glourenco@capitalpaving.on.ca</u>

Sincerely,

Toplan

George Lourenco, P.Eng Resources Manager

C.C. Karen Landry, Township of Puslinch

(enclosures)

APR 0 1 2016

Township of Puslinch

CLERK'S D	EPARTMENT
TO S.D	
Сору	
Please Handle	
For Your Information	
Council Agenda	Mailzoll
File	2016





328 Daleview Place, Waterloo, ON N2L 5M5 Phone: (519) 746-6916 groundwaterscience.ca

March 24, 2016

George Lourenco Resource Manager, Capital Paving Inc. P.O. Box 815 Guelph, ON N1H 6L8

Dear Mr. Lourenco:

RE: 2015 Groundwater Monitoring Summary, Wellington Pit, Licence No. 20085 Part Lots 7 and 8, Concession 3, Township of Puslinch

This letter is a summary of the results of the 2015 groundwater monitoring program completed for the above reference property. The site location is shown on **Figure 1** (attached).

1.0 Monitoring Program Requirements

The Licence conditions as listed on the Site Plan are summarized as follows:

- Quarterly (seasonal) groundwater level measurements at locations BH204, BH205, BH213, BH214, BH219, A3, A4, A5, A8, A10, and TP319 for the life of the pit;
- Annual reporting of the monitoring data. The report shall include a review of the monitoring program and recommendations regarding future monitoring frequency. It will also include a determination of the "normal" seasonal groundwater tale variations that will trigger mitigation measures;
- Should groundwater levels at any time be measured above or below the "normal" seasonal groundwater table variations, all below groundwater table extraction will cease immediately and the operator will inform the Ministry of Natural Resources (MNR), Ministry of the Environment (MOE) and the Township of Puslinch.

2.0 Monitoring Completed

Water level monitoring at the site during the period 1997 to 2010 was completed by Stantec Consulting Ltd. Annual reporting was prepared by Stantec during years of site operation up until 2010 summarizing operational activities and monitoring results. Please refer to those previous reports for specific information. Based on recommendations made by Stantec in the March 30, 2010 report, monitoring was discontinued at that time. The historical data (April 1997 to January 2010) available for the site is incorporated into this (2015) report.

Groundwater Science Corp. was retained in November 2012 to reinstate the monitoring program. As part of that work the monitors were located, or re-installed and ongoing measurements obtained. Annual monitoring reports were provided for 2012, 2013 and 2014.

Providing Professional Services

Page 2

Monitor		Elevations	(mAMSL)	
Monitor	Ground	Top of Well	Top of Screen	Bottom of Well
BH204	318.71	319.63	305.51	304.01
BH205	315.52	316.57	301.12	299.62
BH213	324.79	325.56	304.69	303.19
BH214	324.30	325.17	316.00	314.50
BH219	330.21	331.21	315.21	313.71
TP319	319.0*	319.9*	317.9*	316.4*
A3	315.6*	316.4*	314.5*	314.2*
A4	316.7*	317.6*	315.6*	315.3*
A5	313.9*	314.8*	312.9*	312.6*
A8	317.0*	317.9*	316.6*	316.3*
A10	315.4*	316.3*	313.7*	313.4*
nAMSL = metres	s above mean sea le	evel		
nonitor elevation	s as per Stantec Co	nsulting Ltd. report N	larch 30, 2010	
A3 and A5 elevation	ions revised as per	installation notes Janu	ary 29, 2013	
^k elevations estin	nated from Site Play	n topographic mappir	σ	

The monitoring locations are shown on **Figure 1**. Monitor installation details are shown in **Table 1**.

Table 1: Monitor Installation Details

Summaries of the water level data available for the site are attached to this letter report, in both tabular and hydrograph formats.

3.0 Discussion of Monitoring Results

For comparison to the hydrographs, a plot of the monthly precipitation and current 30-year monthly precipitation normal (1981-2010) reported by Environment Canada for the Kitchener/Waterloo (former Waterloo-Wellington) Airport Station (and overall area) for the years 1994 to 2015 is attached to this report. In 2015 the total reported precipitation estimate of 636.6 mm is approximately 279.9 mm below the current 30-yr mean value of 916.48 mm. As indicated by the graph, conditions were relatively "dry" compared to average conditions throughout most of the year, with the exception of June, August and October. In addition, the pattern of monthly precipitation resulted in lower than average groundwater recharge volume over the year.

The data gathered to date indicates that groundwater elevations during extraction periods at the site have been maintained within in similar range under varying climate conditions since prior to extraction (1997). As shown on the hydrographs, water levels in 2015 also remain within the historical range of water levels observed. There are no evident long-term trends that indicate significant or measurable groundwater level impacts (e.g. declines). Therefore both historical and current water level elevations are interpreted to be within the range of "natural" seasonal conditions for the site and immediate area. This is consistent with monitoring results at other nearby sites over the same period.

Theoretically the reduction in runoff associated with the extraction to date has likely led to additional recharge as compared to the original site condition. This effect would tend to slightly increase local seasonal water table fluctuation and average annual groundwater levels. As illustrated by the hydrographs however, it is likely that the on-going seasonal and annual variation in recharge has a larger influence on local water table elevations, and masks any potential small-scale effect related to the extraction.

Page 3

The maximum and minimum elevations measured in the period 1997 to 2015 are shown on the data tables and likely represents the "natural" range in fluctuation at the site. No mitigation measures response is recommended as a result of the monitoring data.

4.0 **Recommendations**

The monitoring program as listed on the Site Plan should continue in 2016.

If you have any questions or require further assistance please do not hesitate to contact us.

Sincerely,

Jour No

Dave Nahrgang, P.Geo. Project Hydrogeologist.

And Pety

Andrew Pentney, P.Geo Senior Hydrogeologist



Attached:Figure 1 Monitoring LocationsWater Level Monitoring Data Summary TableHydrograph – Monitoring Well Water Level DataHydrograph – Drive-Point Piezometer Water Level DataPrecipitation Analysis



	_							_							_			_	_							_										_	port
	A10 SW	n/a	n/a	n/a	n/a	n/a	n/a	315.50	315.45	n/a	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	dry	toring Re							
	A10 GW	n/a	n/a	n/a	n/a	n/a	n/a	314.80	315.43	315.19	315.04	315.00	314.89	314.70	315.18	dry	γD	314.79	314.13	dry	dry	dry	dry	314.65	314.24	315.12	n/a	313.71	314.48	315.16	n/a	314.12	313.87	315.03	314.90	314.33	iual Monit
	A8 SW	n/a	n/a	n/a	n/a	n/a	n/a	317.09	317.07	317.00	n/a	n/a	n/a	n/a	317.07	dry	dry	dry	dry	dry	dry	dry	317.02	dry	dry	λıp	dry	dry	dry	dry	317.06	٩ŋ	drγ	fr	drγ	dry	Ann
	A8 GW	n/a	n/a	n/a	n/a	n/a	n/a	317.27	317.28	317.18	317.08	317.05	316.98	fr	317.26	316.60	316.45	317.11	316.76	316.16	316.13	316.82	317.24	317.11	316.86	317.02	317.22	n/a	317.08	316.96	317.27	316.94	316.74	317.00	317.03	316.94	
	A5 SW	n/a	n/a	n/a	n/a	n/a	n/a	313.78	313.76	313.84	313.88	313.96	313.97	n/a	n/a	dry	dry	313.94	dry	dry	dry	313.87	313.91	dгу	fr	n/a	313.85	dry	313.83	313.94	313.79	dгу	dry	fr	dry	313.74	
- -	A5 GW	n/a	n/a	n/a	n/a	n/a	n/a	n/a	313.72	313.81	313.94	313.98	313.97	ħ	313.76	313.32	313.72	314.15	313.72	dry	313.84	313.90	313.96	313.68	fr	314.13	313.86	313.27	313.88	313.86	313.80	313.31	313.51	f	313.62	313.77	٩
n (mAMSI	A4 GW	n/a	n/a	n/a	n/a	n/a	n/a	315.55	315.51	315.43	315.39	315.46	315.47	315.62	315.54	dry	dry	315.59	315.39	dry	dry	315.44	316.71	315.43	drγ	315.63	315.61	dry	315.46	315.64	315.66	dry	dry	315.53	315.54	315.48	mary Tabl
el Elevatio	A3 SW	n/a	n/a	n/a	n/a	n/a	n/a	315.62	315.59	n/a	n/a	315.59	315.61	n/a	315.60	dгу	۲p	fr	dηγ	dry	dry	dry	315.79	dry	dry	n/a	315.69	dry	315.61	fr	315.71	dry	dry	fr	dry	315.60	Data Sum
/ater Leve	A3 GW	n/a	n/a	n/a	n/a	n/a	n/a	n/a	314.75	315.53	315.58	315.58	315.00	n/a	315.60	314.99	315.08	315.66	315.51	dry	316.15	315.53	315.82	315.54	315.34	dry	315.70	315.05	315.56	315.73	315.72	315.21	315.09	315.57	315.63	315.55	onitoring
5	TP319	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	316.85	316.53	316.44	316.45	316.80	316.93	316.58	316.50	316.89	316.85	316.45	316.83	316.89	316.86	316.45	316.48	316.91	316.69	316.74	r Level M
	BH219	316.55	316.34	316.29	316.35	316.46	316.13	n/a	316.11	315.87	315.46	315.52	315.42	315.48	316.07	315.35	315.06	315.10	315.27	314.94	314.81	314.96	315.64	315.74	315.37	315.43	315.95	315.19	315.23	315.69	316.12	315.49	315.28	315.26	315.74	315.67	Wate
	BH214	315.85	315.53	315.49	315.51	315.54	315.16	n/a	315.11	314.82	314.55	dry	dry	314.85	315.15	314.45	314.43	314.90	314.70	dry	314.56	dгу	315.30	314.97	dry	315.47	315.29	314.59	314.56	315.66	315.99	315.31	314.46	314.71	315.61	314.60	
	BH213	315.79	315.50	315.37	315.44	315.46	314.98	n/a	314.87	314.27	313.83	313.69	313.53	313.59	313.52	313.26	312.89	313.12	313.22	312.68	312.59	312.92	313.85	313.75	313.27	313.60	314.20	315.25	313.18	313.91	314.68	313.70	313.02	313.33	313.80	313.93	
	BH205	307.47	307.46	307.42	307.45	307.48	307.15	n/a	307.09	306.84	306.59	306.56	306.46	306.50	306.68	305.88	305.64	305.90	305.65	305.10	305.28	305.43	305.99	305.94	305.80	305.99	306.25	305.67	305.81	306.12	306.45	305.96	305.73	305.77	306.03	305.85	
	BH204	307.68	307.64	307.58	307.68	307.73	307.27	n/a	307.21	306.83	306.47	306.37	306.18	306.11	306.62	305.66	305.25	305.37	305.33	305.02	304.94	305.05	305.48	305.64	305.43	n/a	305.93	306.12	305.47	305.63	306.23	305.87	305.56	305.30	305.75	305.63	ġ
	Date	15-Apr-97	26-May-97	11-Jun-97	25-Jun-97	9-Jul-97	22-Jul-97	23-Jul-97	30-Jul-97	15-Sep-97	15-Oct-97	17-Nov-97	17-Dec-97	21-Jan-98	10-Jun-98	23-Oct-98	24-Dec-98	6-Apr-99	18-Jun-99	22-Sep-99	19-Nov-99	5-Apr-00	16-Jun-00	19-Sep-00	7-Dec-00	19-Mar-01	14-Jun-01	1-0ct-01	15-Dec-01	1-Apr-02	4-Jul-02	30-Sep-02	10-Dec-02	8-Apr-03	15-Jul-03	20-Oct-03	tal Paving In

Groundwater Science Corp.

Water Level Monitoring Data Summary Table page 1 of 3

Capital Paving Inc. Wellington Pit

316.06 315.79 A10 GW A10 SW 315.40 315.48 315.69 315.48 315.40 315.57 n/a λp Zp γ γī dry γ dry dry γ drγ dry n/a drγ n/a dry dηγ γīρ Σp Ŧ £ f ÷ ÷ 315.79 315.28 315.59 316.06 315.43 315.10 315.37 315.13 315.75 315.48 315.14 314.38 315.02 315.58 315.43 314.77 315.48 314.38 314.84 315.69 315.21 314.80 315.41 314.83 315.65 315.11 n/a n/a n/a λp γ £ £ ÷ A8 SW 317.29 317.08 317.30 317.47 317.67 317.07 317.37 317.12 n/a γ Zp γ ٩r n/a λıρ ۷ dry dry n/a Zp n/a γ dry dry dry dry dry f ÷ ÷ ÷ ÷ ÷ A8 GW 317.25 317.25 316.90 316.98 317.09 317.20 317.35 317.18 316.79 317.11 317.67 317.64 317.81 317.57 317.04 317.05 316.92 317.17 317.24 316.97 317.06 317.31 317.77 316.98 n/a n/a n/a n/a ÷ ÷ £ ÷ f f A5 SW 313.69 313.66 313.78 313.69 313.76 313.87 313.70 314.50 313.61 313.64 313.63 313.67 313.61 n/a n/a n/a Zp Zp √up drγ n/a γh Zp 1- 1-1-÷ ÷ ÷ ÷ £ f Ŧ 누구 A5 GW 313.80 313.75 313.32 313.92 313.68 313.60 313.82 313.68 313.88 313.56 313.61 313.65 313.59 313.63 313.76 313.68 313.79 313.75 313.17 313.83 n/a ٩r n/a n/a n/a ÷ f ₽ Ŧ 4 ÷ ÷ f Water Level Elevation (mAMSL 315.65 A4 GW 315.60 316.75 315.76 315.56 315.68 315.58 315.50 315.78 315.58 315.45 315.75 315.61 316.96 316.69 315.52 315.66 315.67 315.69 315.53 315.58 315.48 315.58 315.64 315.64 315.67 315.60 dry n/a n/a drγ n/a ÷ £ A3 SW 315.98 315.78 315.62 315.64 315.62 315.69 315.48 315.64 316.40 315.66 315.70 315.60 315.54 315.79 315.69 n/a λp ٩r٧ dry n/a n/a γh £ f 1 ÷ ÷ ÷ ÷ ÷ ÷ f 4 Ŧ 315.78 A3 GW 315.93 315.50 315.66 315.63 315.58 315.61 315.49 315.73 314.49 314.98 315.66 315.59 315.49 315.68 315.98 315.32 315.61 315.14 315.58 n/a n/a Zp n/a ÷ ÷ ÷ Ŧ £ ÷ ÷ Ŧ 4 316.93 316.76 316.45 316.75 316.66 316.85 316.92 316.45 316.80 316.73 317.23 TP319 317.00 316.81 317.13 316.97 316.60 316.88 317.15 316.44 316.40 316.97 316.83 316.93 317.04 316.92 316.84 316.75 316.90 316.54 316.80 316.86 316.76 316.81 n/a 315.49 316.01 316.10 316.18 315.76 316.01 316.16 316.06 315.69 315.84 315.66 315.98 316.48 317.79 315.89 316.06 315.90 315.43 316.04 315.98 315.98 316.34 315.58 315.90 315.92 315.98 316.22 **BH219** 316.19 315.91 316.17 315.91 315.81 316.22 n/a **BH214** 314.72 315.76 316.26 315.22 316.43 315.20 315.59 316.74 316.15 315.85 316.03 315.93 315.88 315.40 315.00 315.40 315.73 316.82 316.18 314.47 314.47 316.00 314.99 316.47 316.01 315.81 316.03 316.63 315.03 315.67 316.77 n/a γŋ dη 315.19 314.74 313.70 314.18 314.30 315.40 314.33 316.11 314.25 313.96 314.48 314.05 314.83 315.20 315.14 314.24 313.38 313.29 315.04 315.96 314.81 314.28 313.55 315.37 315.07 **BH213** 314.71 314.58 314.21 315.51 314.67 314.83 315.47 n/a n/a 307.45 306.49 306.66 306.30 306.25 306.56 306.96 306.89 307.48 306.65 305.96 307.49 306.22 306.61 306.22 307.84 306.64 306.93 307.00 306.68 306.02 307.32 306.97 306.07 306.61 306.68 306.64 **BH205** 306.20 306.61 306.67 306.10 306.97 306.63 n/a 305.95 307.06 306.58 306.76 306.46 306.38 306.50 307.11 306.13 305.69 306.28 306.08 306.50 306.29 306.53 306.43 306.93 306.09 305.89 306.89 307.52 307.25 306.82 306.39 305.75 **BH204** 306.02 306.87 306.82 306.52 305.77 306.24 306.77 306.21 n/a 21-Dec-03 24-Mar-04 15-Dec-05 31-Mar-06 20-Dec-06 15-Mar-07 27-Mar-08 25-Mar-09 17-Dec-13 13-Dec-04 15-Jun-05 17-Oct-05 13-Oct-06 29-Oct-07 14-Dec-07 26-Jun-08 26-Nov-12 29-Jan-13 13-Jan-14 10-Apr-14 23-Oct-14 6-Apr-06 3-Aug-04 23-Jul-07 7-Dec-08 22-Jul-09 8-Oct-04 5-Apr-05 7-Jul-06 6-Oct-08 7-Oct-09 8-Jan-10 4-0ct-13 3-Jul-14 Date

Annual Monitoring Report Groundwater Science Corp.

Water Level Monitoring Data Summary Table page 2 of 3

Capital Paving Inc. Wellington Pit

	-	_	_					port.
A10 SW	ALC UTY	- -	dry	dry			316.06	toring Re
A10.GW	June of the second	= ,	315.09	dry	ζ		316.06	inal Moni
A8 SW	VID	t d	dry	٩ry	ζp	ė	317.67	
AR GW	fr fr	= +=	317.46	dry	g	Science Co	317.81	CTOTC
A5 SW	313.53	fr	313.45	dry	Δp	ر ndwater S	314.50 313 AF	CH-CTC
-) A5 GW	313.47	fr	313.51	313.24	213.18 213	fr = frozei d by Grou	314.15	6 JT.CTC
n (mAMSI A4 GW	315.63	fr	315.66	315.45	ζ. Σ	measure	316.96	mary Tabl
Elevatio	315.80	fr	315.78	dry	≿ ₽	available nt data as	316.40 315.40	Data Sumi
/ater Leve A3 GW	315.82	fr	315.79	315.52	64.CL 8	n/a = not subseque	316.15	onitoring [
М Тр319	316.80	316.98	316.97	316.46	3 Ib. 23		317.23	r Level Mo
RH219	315.91	315.98	316.13	315.79	VC.CIE		AMSL) 317.79 314.81	Wate
RH214		dry dry	315.44	314.72	≿ B	face wate	/ations (m 316.82	01111
RH213	313.99	314.30	314.25	313.71	54.515 215.43	, SW = sur	imum Elev 316.11 317 59	00:310
RH205	306.49	306.40	306.46	306.09	905.20	undwater,	307.84	01.000
RH204	306.28	306.43	306.51	306.05	205.82 28	GW = grol	Maximun 307.73	
Date	29-Dec-14	27-Mar-15	19-Jun-15	24-Sep-15	23-Dec-15	Note:	997 to 2015 max min	tal Paving Inc



Groundwater Science Corp.

Monitoring Well Water Level Data

Wellington Pit

Annual Monitoring Report Jan-97 Jan-98 Jan-09 Jan-00 Jan-01 Jan-02 Jan-03 Jan-04 Jan-05 Jan-06 Jan-07 Jan-08 Jan-09 Jan-10 Jan-12 Jan-13 Jan-14 Jan-15 Jan-16 manual and an advanta •+ A A10 SW 2 p 0 ▲ A10 GW \diamond + O A8 SW 50 1.00 and the second \diamond ♦ A5 SW € + A4 GW D A3 SW A3 GW ┏ 313 318 316 317 315 314 Water Level Elevation (mANAL)

Groundwater Science Corp.

Drive-Point Piezometer Water Level Data

Capital Paving Inc. Wellington Pit



Monitoring Program

Groundwater Science Corp.



Harden Environmental Services Ltd. 4622 Nassagaweya-Puslinch Townline Road R.R. 1, Moffat, Ontario, L0P 1J0 Phone: (519) 826-0099 Fax: (519) 826-9099

Groundwater Studies

Geochemistry

Phase I / II

Regional Flow Studies

Contaminant Investigations

OMB Hearings

Water Quality Sampling

Monitoring

Groundwater Protection Studies

Groundwater Modeling

Groundwater Mapping

Permits to Take Water

Environmental Compliance Approvals Our File: 9711

April 11, 2016

Township of Puslinch 7404 Wellington Road 34 Guelph, ON, N1H 6H9

Attention: Ms. Karen Landry CAO

Dear Ms. Landry;

Re: Capital Paving Inc., Wellington Pit, License 20085 Puslinch File: E10 CAP – Wellington License: 20085

We have reviewed the 2015 Monitoring Report for the Capital Paving Inc. Wellington Pit, License 20085 prepared by Groundwater Science Corp. on March 24, 2016.

There are nineteen years of data available for the majority of groundwater and surface water monitors at this site. We agree with Groundwater Science Corp. that there is no indication of long term trends of declining groundwater or surface water levels. Water levels are observed to vary seasonally but remain within a relatively narrow range over the historical record period. There is no indication that water levels are outside of their normal range.

There has been limited below-water-table extraction to-date, therefore any change in water levels are expected to be subtle. Based on this review we conclude that groundwater and surface water conditions adjacent to the pit are not being affected by pit activities.

Sincerely,

Harden Environmental Services Ltd.

Stan Denhoed, M.Sc., P.Eng. Senior Hydrogeologist



Dufferin Aggregates 2300 Steeles Ave W, 4th Floor Concord, ON L4K 5X6 Canada

RECEIVED

APR 1 4 2016

Township of Puslinch

Seana Richardson Aggregates Technical Specialist Ministry of Natural Resources Guelph District 1 Stone Road West Guelph, Ontario N1G 4Y2

CLE	CAENT
Tr Slan. [)
Phease Hannie	
For Your Information	0.11
Council Agenda	May 2016
File	

Attention: Ms. Richardson

April 14, 2016

Re: Monthly Monitoring Report Mill Creek Pit, License #5738 Township of Puslinch, Wellington County

Please find enclosed the required monitoring data for the month of March 2016. As indicated, a head difference exceedance occurred at the gradient pair DP6 to DP3 on April 1st. The creek level was very high at the time of monitoring due to a heavy rainfall event the previous day. As indicated, monitoring station DP3 in the creek is well above the threshold. The head difference was back above the threshold at the next monitoring event in early April. There was no extraction activity in March.

If you have any questions, please do not hesitate to call.

Sincerely.

Ron Van Ooteghem Site Manager

C.c. Karen Landry (Township of Puslinch) Sonja Strynatka (GRCA) Kevin Mitchell (Dufferin Aggregates) University of Guelph

				Month Mill Creek Ma	ly Reporting Aggregates rch 2016	Pit			
Date	DP21 (mASL)	Threshold Value (mASL)	Exceedance	Date	BH13 (mASL)	DP21 (mASL)	Head Difference (m)	Threshold Value (m)	Exceedance
4-Mar-16		305.66	NO	4-Mar-16	306.38			0.11	NO
10-Mar-16		305.66	NO	10-Mar-16	306.42			0.11	NO
17-Mar-16	305.85	305.66	NO	17-Mar-16	306.43	305.85	0.58	0.11	NO
1-Apr-16	306.23	305.60	NO	1-Apr-16	306.61	306.23	0.38	0.11	NO
Date	DP17 (mASL)	Threshold Value (mASL)	Exceedance	Date	BH92-12 (mASL)	DP17 (mASL)	Head Difference (m)	Threshold Value (m)	Exceedance
4-Mar-16		305.17	NO	4-Mar-16	305.51			0.07	NO
10-Mar-16	10.000	305.17	NO	10-Mar-16	305.52			0.07	NO
17-Mar-16	305.37	305.17	NO	17-Mar-16	305.66	305.37	0.29	0.07	NO
1-Apr-16	305.55	305.17	NO	1-Apr-16	305.78	305.55	0.23	0.14	NO
Date	DP3 (mASL)	Threshold Value (mASL)	Exceedance	Date	DP6 (mASL)	DP3 (mASL)	Head Difference (m)	Threshold Value (m)	Exceedance
4-Mar-16	1.	304.54	NO	4-Mar-16	305.72			0.57	NO
10-Mar-16		304.54	NO	10-Mar-16	305.75	1		0.57	NO
17-Mar-16	304.97	304.54	NO	17-Mar-16	305.81	304.97	0.84	0.57	NO
1-Apr-16	305.29	304.54	NO	1-Apr-16	306.00	305.29	0.71	0.73	YES
Date	DP2 (mASL)	Threshold Value (mASL)	Exceedance	Date	BH92-27 (mASL)	DP2 (mASL)	Head Difference (m)	Threshold Value (m)	Exceedance
4-Mar-16		303.65	NO	4-Mar-16	1.		0	0.43	NO
10-Mar-16		303.65	NO	10-Mar-16				0.43	NO
17-Mar-16	304.34	303.65	NO	17-Mar-16		304.34	1. I	0.43	NO
1-Apr-16	304.43	303.69	NO	1-Apr-16	305.18	304.43	0.75	0.34	NO
Date	DP1 (mASL)	Threshold Value (mASL)	Exceedance	Date	BH92-29 (mASL)	DP1 (mASL)	Head Difference (m)	Threshold Value (m)	Exceedance
4-Mar-16		303.88	NO	4-Mar-16	1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-1-			0.29	NO
10-Mar-16		303.88	NO	10-Mar-16			1	0.29	NO
17-Mar-16	1.2513	303.88	NO	17-Mar-16	305.23	1 S. 1.		0.29	NO
1-Apr-16	304.60	303.97	NO	1-Apr-16	305.38	304.60	0.78	0.17	NO
Date	DP5C (mASL)	Threshold Value (mASL)	Exceedance	Date	OW5-84 (mASL)	DP5C (mASL)	Head Difference (m)	Threshold Value (m)	Exceedance
4-Mar-16		302.88	NO	4-Mar-16				0.30	NO
10-Mar-16		302.88	NO	10-Mar-16	303.52			0.30	NO
17-Mar-16	303.18	302.88	NO	17-Mar-16	303.54	303.18	0.36	0.30	NO
1-Apr-16	303.46	302.86	NO	1-Apr-16	303.86	303.46	0.40	0.30	NO

Notes:

A blank cell indicates the wells were frozen during that monitoring event

The event scheduled for March 24 was cancelled due to an ice storm, rescheduled March 31. Due to heavy rains, this was postponed to April 1. Threshold values changed in April, therefore the results of the monitoring event at DP3 & DP6 show an exceedance of the head difference threshold. It should be noted that this exceedance of the threshold was due to a rain event, which has occurred historically at this location in previous heavy rain events. Due to the exceedance, follow-up events at DP3 & DP6 took place on Apr 4 and Apr 7. There were no results on Apr 4 due to frozen conditions. There were no exceedances on Apr 7. These results will be provided in April's report.

Monthly Re Mill Creek A March 2016	porting vggregates Pit											
									Max. Allowa	the as per PTT	W- Main Po	pu
Total Monthly F	tecinitation (mm)	130.4	Interest of the second		4			(Imperial Gallons)				(Litres)
Total Monthly N	Iormal Precipitation (mm):	E.6	Waterloo-Wellingto	n Airport (March Acti	iai)			2,500			per minute	11,365
	-/um/	3		i Alipur (Ju-year No	(Imal)			1,800,000			per day	8,183,000
Date	Below Water Table Extraction (wet tonnes) Phase 2	Below Water Table Extraction (wet tonnes) Phase 3	Water Pumped from Main Pond (gats)	Water Pumped from Active Silt Pond (gals)	Main Pond Level (mASL)	Exceedance Y/N (BELOW 305.5 mASL)	Phase 2 Pond Level (mASL)	Exceedance Y/N (BELOW 305.0 mASL)	Phase 3 Pond Level (mASL)	Exceedance Y/N (BELOW 303.85 mASL)	Phase 4 Pond Level (mASL)	Exceedance Y/N (BELOW 304.5 mASL)
1-Mar-16	0	0	0	1.290.644	306.51	ON					001 100	
2-Mar-16	0	0	0	1,282,318	306.52	ON	1			I	502-302	ON.
3-Mar-16	0	0	0	1,290,644	306.52	ON	1	1	14	1	305.75	ON ON
dr-Mar-16	0	0	0	1,298,971	306.54	ON	1	1	1	1	305 74	
o-Mar-16	0	0	0	1,323,951	1	1	1	1	1		1.000	
6-Mar-16	0	0	0	1,298,971	1	,	1					r
7-Mar-16	0	0	0	1,290,644	306.59	ON	1	1			1 206 70	1
8-Mar-16	0	0	0	1.282.318	306.61	ON	-				0/.000	DR I
9-Mar-16	0	0	0	1.273,991	306.62	CN	1				305.70	ON
10-Mar-16	0	0	0	1.273.991	306.63	ON				1	0/.002	Q
11-Mar-16	0	0	0	574.545	306.63	ON		r	1	1	305.69	ON
12-Mar-16	0	0	0	c	,			1	1		305.69	NO
13-Mar-16	0	0	0	00			1	i	1		1	1
14-Mar-16	0	0	0	1 JRE REA	306.60	MO	1	1	1		ī	t
15-Mar-16	0	0		1 257 227	00.000		í	1	1	1	305.76	ON
16-Mar-16	0			100,102,1	00.000	DN O	t	3	1	4	305.76	ON
17-Mar-16				1.2/3,391	300.62	ON	1	4	1	1	305.75	ON
18-Mar-16				400,002,1	306.63	ON	1	1	1	1	305.75	ON
19-Mar-16				186.0121	306.64	Q	1	1	+		305.74	NO
20-Mar-16				1.213,340	1	1	1	1	1.		1	1
21-Mar-16				010'707'1	1 000	1	t	1	1	1	ł	ı
22-Mar-16				110,242,1	300.00	ON	1	1	1	1	305.70	ON
23-Mar-16			0	1,240,084	306.66	ON	;	1	1		305.70	ON
24 Mar 16				1,189,050	306.65	ON	1	Ţ	1	1	305.70	CN
DE Mor 16			0	0	306.65	ON		1	1	1	305 71	CN
OI-IPINI-CZ		0	0	732,753	306.70	ON	1	1	1	4	305 76	ON ON
QI-JEM-07	0	0	0	1,265,664		1	1	1	,		0.000	DR.
2/-Mar-16	0	0	0	1,082,476	1	1	1	1	1	1	305 7E	
28-Mar-16	0	0	0	855	306.74	ON	1	1	1		200.70	-
29-Mar-16	0	0	0	1,315,625	306.76	NON	306.10	CN	305 52	ON	200.10	
30-Mar-16	0	0	0	1,249,011	306.76	NON	306.10	Q	305 53		11.000	ON C
31-Mar-16	0	0	0	1,298,971	306.77	ON	306 11		205.64		11.000	NO
Total	0	0		33,008,044				24	10.000	N	11.000	NC
Avg./ day	0.0	0.00		1,064,776	4	ŀ	ī	1	1			

Note: No exceedences to report



Stantec Consulting Ltd. 100-300 Hagey Boulevard, Waterloo ON N2L 0A4

March 28, 2016 File: 1611 07544/31

Attention: Ms. Karen Landry, CAO/Clerk Township of Puslinch 7404 Wellington Road 34 Guelph ON N1H 6H9

Dear Ms. Landry,

Reference: Mini Lakes Mobile Home Community 2015 Operation and Maintenance Report

RECEIVED

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CLERK'S OF	of Puslinch
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Please Handle	
For Your Information	_
Council Agenda	may 16.
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INTRODUCTION

The Mini Lakes Mobile Home Community is a private community located in the Hamlet of Aberfoyle, Township of Puslinch, in the County of Wellington.

The site was originally zoned for seasonal use; however, it was re-zoned in March 2000 to allow for a maximum of 400 year round mobile home and modular units. In conjunction with re-zoning requirements, a new sewage treatment and disposal system was required.

Amended Certificate of Approval (C of A) Number 6792-6U8JKA (October 2006) for the sewage treatment and disposal system has now been superseded by Amended C of A Number 2113-7M8RBP (February 18, 2009). The current C of A was amended by the Ministry of the Environment and Climate Change (MOECC) to include and consolidate the existing onsite sewage collection system and to modify the monitoring program as requested by Mini Lakes Residents Association (MLRA). Monitoring for 2015 has been completed as per the requirements under the current C of A as enclosed with this letter. The following Monitoring Report was prepared in accordance with these requirements.

In November 2012, an application for amendment to C of A Number 2113-7M8RBP was submitted to the Ministry of the Environment and Climate Change (MOECC). The application proposed upgrades to the wastewater treatment plant's primary clarifier, revisions to reflect the average daily flow of 158 cubic metres per day (m³/d), remove surface water sampling stations SW2 and SW7 from the monitoring program, revise the nitrate limit to 8.0 milligrams per litre (mg/L), and change the definition of non-compliance from "during any 12 consecutive calendar months" to "during any calendar year".

SEWAGE TREATMENT SYSTEM

Sewage from the community is treated by a dual-train, communal aerobic sewage treatment unit. This unit is a Rotating Biological Contactor (RBC) with denitrification and phosphorus reduction capabilities. A primary settlement tank precedes the RBC unit and sewage effluent is



March 28, 2016 Ms. Karen Landry, CAO/Clerk Page 2 of 11

Reference: Mini Lakes Mobile Home Community 2015 Operation and Maintenance Report

discharged from final clarifiers (following treatment in the RBC) to a Shallow Buried Trench (SBT) disposal system. The RBC system commenced operation in January 2001. Due to the nature of the development, the number of homes occupied fluctuates throughout the year. The corresponding flows generally peak in the summer and decline in the winter.

The communal sewage collection and treatment system was operated and maintained by American Water Canada Corporation (AWC) under contract for the entire year covered by this report.

MONITORING REQUIREMENTS

In accordance with the C of A, monthly monitoring of the sewage treatment unit effluent is required. The sewage effluent from the RBC is to be monitored monthly for CBOD5, Total Suspended Solids (TSS), Total Phosphorus (TP), Total Ammonia Nitrogen (TAN = $NH_4^+ + NH_3$), Nitrate Nitrogen (NO_3^-), Nitrite Nitrogen (NO_2^-), Total Kjeldahl Nitrogen (TKN), E.coli, Dissolved Oxygen (DO), and pH.

MONITORING RESULTS

In accordance with the C of A requirements, Table 1 provides the 2015 monitoring data for the wastewater treatment plant. The annual average concentration for each parameter is listed at the bottom of the table.

			Effluent Sampling Parameters								
	CBOD5	TSS	TP	NH ₃	NO ₃	NO ₂	TKN	TN (calc)	DO	E. coli	рН
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	/100mL	
Limit	20	20	1.00	na	5.00	na	na	na	na	na	na
Date											
13-Jan-15	8	2	0.09	2.90	8.09	0.56	4.1	12.75	8.15	15,000	7.39
18-Feb-15	5	3	0.06	2.20	11.40	0.64	2.8	14.84	8.06	20,000	7.33
17-Mar-15	11	4	0.09	2.20	7.29	0.58	3.4	11.27	8.14	40,000	7.54
23-Apr-15	4	6	0.10	0.93	10.90	0.56	2.2	13.66	8.68	19,000	7.24
11-May-15			-		5.48	0.36					
19-May-15	3	2	0.03	0.49	3.02	0.07	1.7	4.79	9.63	2,300	7.53
10-Jun-15	8	3	0.05	0.56	4.39	0.27	1.4	6.06	8.30	6,200	7.58
23-Jun-15					3.61	0.42					

Table 1:	Wastewater	Treatment Plant	Effluent	Sampling	Results
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March 28, 2016 Ms. Karen Landry, CAO/Clerk Page 3 of 11

Reference: Mini Lakes Mobile Home Community 2015 Operation and Maintenance Report

		Effluent Sampling Parameters									
	CBOD ₅	TSS	TP	NH ₃	NO ₃	NO ₂	TKN	TN (calc)	DO	E. coli	рН
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	/100mL	
Limit	20	20	1.00	na	5.00	na	na	na	na	na	na
Date	· · · · ·										
8-Jul-15					2.97	0.23					
16-Jul-15	3	4	0.04	0.51	2.78	0.27	2.30	5.35	9.42	12,000	7.68
21-Jul-15					1.66	0.26					
10-Aug-15	5	3	0.05	0.63	2.05	0.47	0.84	3.36	8.68	11,000	8.32
20-Aug-15					2.53	0.33					
11-Sep-15	3	4	0.08	2.00	1.83	0.20	2.90	4.93	8.8	15,000	7.61
13-Oct-15	10	7	0.13	4.10	1.98	0.61	5.60	8.19	7.55	56,000	7.29
10-Nov-15	5	2	0.10	4.10	1.83	0.64	10.00	12.47	7.97	32,000	7.82
17-Dec-15	8	7	0.13	3.90	5.84	0.44	5.20	11.48	6.76	15,000	7.22
2015 Average	6.1	3.9	0.08	2.04	4.57	0.41	3.54	9.10	8.35	20,000	7.55
12-mo Count	12	12	12	12	17	17	12	12	12	12	12
notes:	- Shaded area exceeds compliance limit										
	1. Compliance Limits stipulated in Certificate of Approval for the Sewage System.										
	2. na - N	lo comp	liance lir	nits stipu	lated by	Certifico	ate of Ap	proval.	C 1		

A summary of the 2015 effluent results for parameters with effluent requirements are as follows.

Table 2:	Wastewater	Treatment	Plant 2015	Effluent	Results	Summary
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Parameter	Compliance Limit	Annual Average
CBOD5	20	6.1
TSS	20	3.9
TP	1	0.1
Nitrate Nitrogen	5	4.6



March 28, 2016 Ms. Karen Landry, CAO/Clerk Page 4 of 11

Reference: Mini Lakes Mobile Home Community 2015 Operation and Maintenance Report

Plant effluent has generally been sampled and analyzed monthly in 2015. Annual average effluent concentrations for CBOD₅, TSS, and TP, and nitrate were less than their respective effluent limit concentrations for the 2015 reporting period.

The average CBOD5 concentration for 2015 was 6.1 mg/L, which is below the effluent limit of 20 mg/L. CBOD5 concentrations were below the effluent limit on all samples taken in 2015. Overall, the plant is deemed to have performed well with respect to CBOD5 in 2015.

The average TSS concentration for 2015 is 3.9 mg/L, which is below the effluent limit of 20 mg/L. TSS concentrations were below the effluent limit on all samples taken in 2015. Although TSS does not have an associated Ontario Drinking Water Standards (ODWS) or Provincial Water Quality Objectives (PWQO), it does have the potential to affect the long term performance of the leaching beds, and should continue to be monitored closely given past issues with TSS. Overall, the plant is deemed to have performed well with respect to TSS in 2015.

The average TP concentration for 2015 is 0.1 mg/L, which is well below the effluent limit of 1.0 mg/L. TP values were below the effluent limit on all samples taken in 2015. The historical average for TP has continued to drop below the compliance limit, and is now 0.61 mg/L. Overall, the plant is deemed to have performed well with respect to TP in 2015.

The average nitrate concentration for 2015 is 4.6 mg/L, which is below the compliance limit of 5.0 mg/L. Nitrate values were below the compliance limit in 11 of the 17 samples taken in 2015. The wastewater treatment plant was in compliance on a 12-month rolling average basis for nitrate for the second, third, and fourth quarters of the year. The historical average for nitrate continues to remain below the effluent limit, and is currently 4.6 mg/L. Overall, the plant is deemed to have performed acceptably with respect to nitrate in 2015.

Since it has been shown that consistent denitrification is difficult to achieve, particularly in the winter, operations staff need to continue close monitoring and maintenance of the denitrification process. General measures required to maintain denitrification and phosphorus removal include, but are not limited to:

- Emptying and cleaning of the denitrification chambers, including addition of new media in areas previous left empty.
- Recording of sludge depths on a weekly or more frequent basis and prompt sludge removal as necessary in all clarifiers and the effluent pump chamber.
- Regular denitrification media maintenance cleanings and removal of floatable material from the denitrification chambers.
- Use of the RBC feed-forward values to the maximum extent possible to improve soluble carbon availability and lower dissolved oxygen in the denitrification zone.
- Daily inspections and cleaning of all clarifier weirs.


March 28, 2016 Ms. Karen Landry, CAO/Clerk Page 5 of 11

Reference: Mini Lakes Mobile Home Community 2015 Operation and Maintenance Report

The following upgrades to the wastewater treatment plant were proposed in the application for amendment to C of A Number 2113-7M8RBP, submitted in November 2012 and currently still under review with the MOECC:

- A partition wall separating the chamber into two compartments, an inlet and sludge storage compartment having a working volume of 73 m³ and a primary effluent compartment having a working volume of 23 m³.
- An inlet baffle plate.
- An outlet weir box and baffle plate.
- Extension of all sludge recirculation piping to inlet chamber.
- Denitrification inlet modifications to allow crossover between trains for redundancy and option to run on one RBC train and two tertiary trains.
- One new effluent pump and piping for effluent recirculation to primary clarifier inlet.
- New chemical building as previously approved.

The proposed amendment to the C of A also includes re-rating the wastewater treatment plant, based on the current Draft Plan of Subdivision, to 158 m³/d and revising the nitrate limit to 8.0 mg/L based on lower long term projected nitrate loadings than original design.

The status of additional improvement works under previous consideration is generally as follows:

• Replacement of intermediate and final clarifier sludge pumps and scum removal systems due to mechanical issues is currently on hold due to higher priority items detailed above. This would be intended to provide better control of sludge return rates and removal of floating sludge.

It must be noted that these plans are ongoing and subject to approval and financial resources, though Mini Lakes already has approval and funding in place for the chemical building upgrades, and all five wastewater pumping station panels have been replaced as of November 2012. MLRA is committed to resolving this situation, and additional monitoring of initial repairs to the denitrification media system will continue in the near term.

Results for DO in 2015 are above expected values at an average of 8.35 mg/L. An assessment of historic nitrate data appears to show more of a correlation between seasonal temperature variation and nitrate reduction than DO concentration; however, nitrate performance generally appears to improve with lower DO levels.



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Reference: Mini Lakes Mobile Home Community 2015 Operation and Maintenance Report

The remaining parameters shown on Table 1 have been sampled in accordance with the C of A effluent monitoring requirements; however, they do not have corresponding effluent limits. With the exception of consistently elevated coliform results, which are normal in plants without disinfection, the non-regulated parameter concentrations are reasonable and demonstrate an efficiently operating sewage treatment plant.

SEWAGE FLOW MONITORING

In addition to the effluent quality, the sewage effluent flows were also monitored. The monthly flow data is summarized in Table 3.

The as-recorded daily flows to effluent disposal ranged from 19,460 L/d to 167,980 L/d. On a monthly basis, average daily flows ranged from 84,975 L/d to 113,269 L/d. The overall average daily flow was 99,920 L/d, with a negligible decrease of 0.18% from last year. The maximum recorded monthly flow was 3,511,350 L and occurred in May 2015. Historically, there has been a seasonal variation in overall sewage flows and average sewage flow per home; however, overall flows and flows per unit were relatively consistent in 2015. There does appear to be marginally higher per unit flows in wet period conditions (spring and winter), however the impact of infiltration and inflow appears to be minimal, and total flow has remained within the design parameters.

The average sewage flow rate per unit is 422 L/unit/day. This is slightly higher than the average per unit flow over the previous four years of 411 L/unit/day, where the design average is 500 L/unit/day and the design maximum allowance is 800 L/unit/day. This may be due to higher infiltration/inflow in 2015. The overall plant maximum daily flow of 320 m³/d has never been exceeded. The average daily flow was only 46.3% of the daily design average flow rate of 216 m³/d. Based on these trends, and the fact that the development as a whole is approximately 65% built out (80% based on Draft Plan of Subdivision application), it is our opinion that infiltration and inflow is not an issue at this time.

Month	Recorded Average Daily Flow (L/d)	Maximum Daily Flow (L/d)	Number of Units Occupied (estimated)	Average Flow per Home (L/d)	Total Monthly Flow (L)	Minimum Daily Flow (L/d)
January	103,164	137,690	220	469	3,198,090	39,000
February	94,481	130,380	220	429	2,645,460	72,330
March	96,890	144,700	225	431	3,003,600	58,850
April	111,833	140,080	230	486	3,555,000	59,240
May	113,269	167,980	240	472	3,511,350	71,880
June	106,442	138,380	250	426	3,193,270	48,070

Table 3: Sewage Flow Summary



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Reference: Mini Lakes Mobile Home Community 2015 Operation and Maintenance Report

Month	Recorded Average Daily Flow (L/d)	Maximum Daily Flow (L/d)	Number of Units Occupied (estimated)	Average Flow per Home (L/d)	Total Monthly Flow (L)	Minimum Daily Flow (L/d)
July	104,341	157,420	265	394	3,234,560	57,460
August	98,656	122,010	260	379	3,058,330	29,590
September	98,163	120,280	255	385	2,944,890	66,930
October	95,071	126,600	235	405	2,947,200	65,070
November	84,975	118,340	230	369	2,549,250	19,460
December	91,760	133,940	220	417	2,844,570	28,750
Average =	99,920	136,483	238	422	3,040,464	51,386
High range =	113,269	167,980	265	486	3,511,350	72,330
Low range =	84,975	118,340	220	369	2,549,250	19,460

SYSTEM MAINTENANCE

The operation and maintenance of the sewage treatment unit has been performed by AWC as of November 2004. The AWC 2015 Annual Report has been submitted under separate cover. Regular maintenance of the treatment unit is noted in the table below.

Plant Area/Equipment	Activity
Lift Stations	Obstructions removed and floats cleaned as necessary.
	Sludge removed from all lift stations as required.
	Floats adjusted as required.
	Stations flushed as required.
Primary Settling Tank	Sludge depths recorded on an ongoing basis.
	Sludge removed by Weber Septic as necessary.
Biological Contactors	Greased and oiled bearings/gearboxes as per manufacturer's instructions.
	Limit switched adjusted as required.
	Washed down units as necessary
	Gearboxes lubricated.
	Go switch on RBC#2 replaced.

Table 4: System Maintenance Summary



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Reference: Mini Lakes Mobile Home Community 2015 Operation and Maintenance Report

Plant Area/Equipment	Activity
Intermediate Clarifiers	 Sludge depths recorded on an ongoing basis. Weirs checked frequently for blockages. Check valves cleaned on a regular basis.
Denitrification Tanks	 Weirs checked for blockages. Floatable material and sludge removed on an ongoing basis. Some sludge from denite beds removed by Weber Septic.
Sludge Management	 Weekly sludge measurements. Sludge return pump run times adjusted as required. Check valves cleaned on return pumps.
Final Clarifiers	Weirs checked for blockages.Check valves, pumps cleaned as required.Pump blockages cleared as required.
Effluent Pump Chambers	 Chambers pumped out as necessary to maintain low sludge depths. Cleaned intakes and 'y' strainers on all pumps. Pumps pulled and cleaned as required. Annual cleanout (with tank entry) of effluent chambers.
Chemical Systems: - Alum - Carbon Source	Chemical tanks, lines cleaned and replaced as required.Pumps inspected.
Subsurface Disposal System	 Some laterals inspected, several repaired by Drexler. Some lateral caps replaced.
Other	 Annual alarm system verification conducted. Flow meters, pH meter calibrated. New batteries installed in dialer. Floor grating in WWTP repaired and reinforced. Temporary laneway installed to the back of the WWTP for chemical deliveries.



March 28, 2016 Ms. Karen Landry, CAO/Clerk Page 9 of 11

Reference: Mini Lakes Mobile Home Community 2015 Operation and Maintenance Report

ENVIRONMENTAL/OPERATING PROBLEMS AND MITIGATIVE MEASURES

A monthly summary of environmental/operating problems and mitigative measures by AWC is presented as follows (no issues were noted on months not listed):

January – April

Monthly effluent nitrate levels exceeding 5mg/L (regulatory limit).

April – June

Regulatory nitrate limits being exceeded.

May 2015

A significant number of effluent bed lateral caps found missing or broken. Replacements ordered and some replaced.

August 2015

Alum pump was not functioning properly causing an alarm call in. Pump issue was resolved.

September 2015

Go switches were causing a number of alarms for no apparent reason. One switch was replaced.

There were two power outage, one in March (two hours) and a planned power outage by Hydro One on September 8/9 to change new underground lines. There were no negative impacts to the system.

The wastewater treatment plant is currently not in compliance with the specific C of A requirements for chemical storage. In order to achieve conformance with the C of A, a 9,000 L carbon tank and a 2,300 L alum tank, complete with spill containment facilities are recommended. There is no sludge removal system for the denitrification zone. Sludge removal in this zone is necessary to maintain the efficiency of nitrogen removal from the system to stay within the C of A limits. Stantec has submitted documentation to the Approvals branch of the MOECC to increase the compliance limit for effluent nitrates.

AWC has a number of recommendations to improve the overall system (efficiency, health and safety). They are as follows:

- Improved chemical delivery system for reduced materials handling; and,
- Improve sludge management and increase recirculation rates.



March 28, 2016 Ms. Karen Landry, CAO/Clerk Page 10 of 11

Reference: Mini Lakes Mobile Home Community 2015 Operation and Maintenance Report

The above recommendations are under consideration by Stantec on behalf of AWC and MLRA. Implementation of some or all of these measures will be dependent on approvals, priority level, and funding availability.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the monitoring program discussed above, the following points are concluded:

- The sewage treatment unit sampling results indicate compliance with the C of A effluent limits on an annual average basis for all parameters.
- The surface water sampling results have indicated no adverse impacts to surface water quality.
- The groundwater sampling results indicate groundwater quality has not been adversely impacted by the subsurface sewage disposal system, and that the nitrate concentrations leaving the property comply with the RUP objective:
 - It is unclear why DOC at up-gradient monitors MW1 and MW9 continue to show elevated concentrations, and likely indicate naturally high DOC levels associated with the adjacent wetlands or offsite impacts.
 - Elevated TP in 2014 at the recently reconstructed MW10 has declined significantly to expected concentrations.

It is therefore recommended that:

- The sewage treatment unit, surface water, and groundwater monitoring program continue in accordance with the C of A without modification until such time as the Amended ECA (under review) is issued.
- The mitigation plans presented in this report be implemented to improve operation, process reliability, and decrease effluent nitrate concentrations (pending approval of the application for amendment to C of A Number 2113-7M8RBP, submitted in November 2012):
 - A partition wall separating the chamber into two compartments, an inlet and sludge storage compartment having a working volume of 73 m³ and a primary effluent compartment having a working volume of 23 m³.



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Reference: Mini Lakes Mobile Home Community 2015 Operation and Maintenance Report

- An inlet baffle plate.
- An outlet weir box and baffle plate.
- 6 Extension of all sludge recirculation piping to inlet chamber.
- Denitrification inlet modifications to allow crossover between trains for redundancy and option to run on one RBC train and two tertiary trains.
- One new effluent pump and piping for effluent recirculation to primary clarifier inlet.
- Revise the effluent nitrate criteria from 5 mg/L to 8 mg/L based on the revised maximum approved development build-out from 400 units to 329 units.
- Revise the compliance criteria to annual average (average of 12 monthly averages) in the year being monitored, as opposed to previous 12 months (i.e., omit the 12-month rolling average compliance provision).
- Provide new chemical building and upgrade chemical dosing systems as per the existing C of A.

Should you have any questions please contact our office.

Regards,

Stantec Consulting Ltd.

Chad Schwartzentruber, P.Eng. Senior Project Manager Phone: 519-585-7352 Fax: 519-579-6733 chad.schwartzentruber@stantec.com

Attachment

c. President, Mini Lakes Residents Association (enclosure) Ms. Lynn Zettle, Regional Business Banking Centre (enclosure)

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ENCLOSURE 1

Certificate of Approval – Sewage

Ministry of the Environment Ministère de l'Environnement



AMENDED CERTIFICATE OF APPROVAL MUNICIPAL AND PRIVATE SEWAGE WORKS NUMBER 2113-7M8RBP Issue Date: February 18, 2009

Mini Lakes Residents Association 7541 Wellington County Road 34 Puslinch, Ontario N1H 6H9

Site Location:

Mini Lakes Trailer Park 7541 County Road 34 Township of Puslinch, County of Wellington

You have applied in accordance with Section 53 of the Ontario Water Resources Act for approval of:

Existing sewage works comprising of a sanitary collection system, pumping stations and forcemains, a sewage treatment and subsurface disposal system rated at approx. 216 m^3/d serving the Mini Lakes Trailer Park comprising of a maximum of 400 mobile units for year round use in the Township of Puslinch as follows:

Sanitary Collection System

All existing and proposed sewage collection system gravity mains, forcemains, and services as generally indicated on Drawing 1 - Site Servicing Plan dated February 25, 2008 as submitted by Stantec Consulting Ltd.

Pumping Stations and Forcemain

1. Sewage Pumping Station PS-1 (UTM NAD83: Zone 17, 569553 mE, 4814393 mN)

One (1) 1,200 mm diameter fibreglass package duplex sewage pumping station (located at the intersection of Ash Avenue, Cross Street and Pine Street servicing approximately 77 units), equipped with two (2) submersible pumps, each pump rated at 1.8 L/s at 28.98 m TDH and having a working volume of 0.405 m³, and a forcemain, approx. 29 m long, extending from the pump station before discharging into the common 75 mm forcemain from PS-2 and PS-3, where the common forcemain continues approximately 621 m to discharge directly to the Wastewater Treatment Plant (WWTP) described below.

- a concrete common primary settlement tank with cover, approx. 8.1m wide x 8.5m long x 1.73m liquid depth discharging (via an outlet pipe to each treatment train) to the rotating biological contactors, complete with gear motor and drive mechanism;
- two (2) rotating biological contactors with 2.35m diameter rotor, each equipped with low profile fixed baffles and establish four (4) zones per rotor, and providing approx. 4,179 m² of bio-support media area;
- two (2) hopper bottom 3m x 3.6m intermediate clarifiers per treatment train, complete with inlet and outlet weir, sludge and scum transfer equipment and pumping systems;
- two (2) denitrification tanks, approx. 5.06m x 3.6m, each consisting with 4,704m² of submerged rigid media, complete with an adjustable flow distribution box;
- one (1) 900 L capacity chemical tank and chemical metering pump capable of feeding a carbon source to the denitrification tanks, complete with spill containment facilities;
- chemical feed system comprising of one (1) 2,300 L capacity polyethylene chemical storage tank and metering pump (with standby pump) capable of feeding approx. 1.5 L/hr of alum into the last stage of the rotating biological contactor rotor, complete with spill containment facilities;
- two (2) hopper bottom 3m x 3.6m final clarifiers per treatment train, complete with inlet and outlet weirs and sludge transfer equipment and pumping systems;
- a 50,000 L capacity effluent pump chamber equipped with five (5) submersible pumps (with one additional standby pump), each rated at 2.7 L/s at 11m TDH (max.), to discharge treated effluent via a splitter valve and five (5) 75mm diameter forcemains, one forcemain to each absorption cell of the subsurface disposal system.

Subsurface Disposal System

A subsurface disposal system comprising of five (5) shallow buried trench absorption cells, each cell comprising of six (6) zones with eight (8) laterals (each lateral located within a trench 18m long and 0.6m wide, with a hollow inverted semi-circular chamber housing a 25mm PVC pressurized pipe with 3.2mm holes spaced at 1m c/c) per zone, for a total of approx. 864m of piping per cell (total of approx. 4,320m of piping), and distribution valve assembly and manifold together with a relocation area (alternate subsurface disposal area) and the use of the existing leaching bed areas as contingencies for a period of three (3) years of operation of the sewage works,

all in accordance with the final plans and specifications prepared by P. J. Hannah Equipment Sales Corp. and Stantec Consulting Ltd., Consulting Engineers. You are hereby notified that this approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. **PERFORMANCE**

1.1 The Owner shall ensure that the flow of sewage into the sewage system does not exceed the average daily flow of 216 m³/d.

2. MONITORING AND RECORDING

2.1 The Owner shall ensure that the following monitoring program is carried out during operation of the works:

(a) Average daily flow of effluent being disposed of through the subsurface disposal system, including the daily pump volumes and pump rates, shall be measured or estimated, and recorded.

(b) **EFFLUENT MONITORING**

Samples of treated effluent (ahead of subsurface disposal system) shall be collected at the effluent pump chamber and analyzed for at least the following parameters at the indicated <u>minimum</u> frequencies:

Table 1	- Treated Effluent Sam	pling
Parameter	Type of Sample	Minimum Frequency
CBOD5	grab	monthly
Total Suspended Solids	grab	monthly
Total Phosphorus	grab	monthly
Total Ammonia Nitrogen	grab	monthly
Nitrate Nitrogen	grab	monthly
Nitrite Nitrogen	grab	monthly
Total Kjeldahl Nitrogen	grab	monthly
E. coli	grab	monthly
Dissolved Oxygen	grab	monthly
pН	grab	monthly

Table	3 - Surface Water Samp	oling
Parameter	Type of Sample	Minimum Frequency
Total Phosphorus	grab	quarterly
Total Ammonia Nitrogen	grab	quarterly
Nitrate Nitrogen	grab	quarterly
Nitrite Nitrogen	grab	quarterly
Total Kjeldahl Nitrogen	grab	quarterly
E. coli	grab	quarterly

(e) The temperature and pH of the surface water samples as required by Clause (d) shall be determined in the field at the time of sampling for Total Ammonia Nitrogen. The concentration of un-ionized ammonia shall be calculated using the total ammonia concentration, pH and temperature using the methodology stipulated in "Ontario's Provincial Water Quality Objectives" dated July 1994, as amended, for ammonia (un-ionized).

(f) The sampling and analyses required by clause (b) above shall be performed in accordance with the Ministry's Publication, "Protocol for the Sampling and Analysis of Industrial - Municipal Wastewater", Ministry of Environment and Energy July 1993; or as described in "Standard Methods for Examination of Water and Wastewater", 19th Edition, 1995, as amended from time to time by more recently published editions.

- 2.2 The Owner shall retain for a minimum of three years from the date of their creation, all records and information related to or resulting from the monitoring activities required by this certificate.
- 2.3 Following completion of two (2) full years of operation of the sewage system, if the quality of effluent discharged to the subsurface disposal system satisfies the objectives stipulated in Condition 3.1 as evidenced by the results of the monitoring program required by this condition, the monitoring requirements may be reduced by the District Manager is he/she is of the opinion that such a reduction is appropriate in the circumstances.

3. OPERATION AND MAINTENANCE

3.1 The Owner shall design, construct and operate the sewage treatment plant such that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the sewage treatment plant, ahead of the subsurface disposal system.



ENCLOSURE 2

Operations and Maintenance Agreement OPERATIONS AND MAINTENANCE AGREEMENT

THIS AGREEMENT made in quadruplicate, the 20H yay of October 1999

SETWEEN:

MINI LAKES CAMPERS ASSOCIATION

hereinafter called the "Owner" of the FIRST PART

- and -

11

THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

hereinafter called the "Township" of the SECOND PART

XXX

WHEREAS the Owner proposes the operation of a Mobile Home Park on lands identified as Part of Lots 21 and 22, Concession 8 in the Township of Puslinch, County of Wellington, which lands are identified in the Township's Site Plan Control By-Law No. 15/94.

AND WHEREAS the Owner is the registered owner of the lands described in Schedule "A" attached hereto.

AND WHEREAS the parties have agreed that the operation of the Mobile Home Park shall be served by a Sewage Treatment System to service 400 home sites as outlined in the Engineering Report prepared by Stantec Consulting Ltd., "Mini Lakes Sewage Treatment Design Brief" dated April 1999, or as amended to satisfy the requirements of the MOE to obtain a Certificate of Approval, and that both parties agree to enter into an Operations and Maintenance Agreement to ensure the general requirements for operation and maintenance of the sewage system will be achieved.

NOW THEREFORE in consideration of other good and valuable consideration and the sum of One Dollar paid by each party to the other, the receipt and sufficiency of which is hereby acknowledged, the parties agree as follows:

1. TOWNSHIP'S RESPONSIBILITIES

The Township agrees to the operation of a 400 site Mobile Home Park on the premises, serviced by a sewage treatment system as proposed by Stantec Consulting Ltd. in their Design Brief of April 1999 and amended July 1999.

2. OWNER'S RESPONSIBILITIES

The Owner agrees that prior to constructing the sewage treatment system, that he will be responsible for all costs of the construction, operation and maintenance of the sewage system, the sanitary sewer collection system, and the leaching bed which receives the treated effluent.

The Owner further agrees that

14.14

- (a) The mobile home park shall not contain more than 400 dwelling sites.
- (b) The Owner will enter into an Operations and Maintenance Contract with a qualified Sewage System Operator, certified as a Class 1 Operator under the Ontario Water Resources Act. The system operator must be approved by the Township but such approval shall not be unreasonably withheld. The operation and maintenance of the sewage system shall at all times be under such a contract.
- (c) The Owner shall have undertaken by a qualified engineer the monitoring program as set by the Ministry of the Environment and attached to this Agreement as Schedule "B", or as modified from time to time by the Ministry of the Environment or the Township.
- (d) The Owner agrees to take such measures as are necessary to ensure the sewage treatment system meets the effluent criteria set out in the Certificate of Approval issued by the Ministry of the Environment for the sewage treatment system and attached to this Agreement as Schedule "C" or as amended from time to time by the Ministry of the Environment.

Measures taken to comply with the Cartificate of Approval may include but not limited to:

- reducing the total number of home sites,
- modifying and improving the existing system based on sound engineering principles approved by the Ministry of the Environment and Township, and
- transport of the sewage to a suitable treatment facility

In the event the Township determines that it or another public authority shall operate the works or any part of the works without the Township having acquired ownership of that part of the works, the Owner shall pay quarterly such fee as the Township determines to reimburse the Township for the costs of operating and maintaining the works.

3. TRUST FUND DEPOSIT MODIFICATIONS

The Owner and the Township acknowledge that the trust fund deposit schedule attached as Schedule 'D' is only an estimate of the amounts required to ensure the long term maintenance and operation of the sewage treatment system. Either party may, from time to time, ask for a review of the sewage treatment system, collection system and leaching bed to determine if the trust fund is insufficient or unnecessarily large. The review will be carried out by a qualified Engineer agreed to by both parties and the deposit schedule will be adjusted according to the recommendations of the Engineer. The cost of the investigation will be paid for out of the trust fund. If the Township and the Owner cannot agree on the selection of an Engineer to carry out the review, then the Township's Engineer shall select one.

If the fund accumulates to a value of \$450,000,00, then contributions to the fund will be suspended until a report prepared by a qualified engineer identifies the condition of the sewage treatment system, collection system and leaching bed, and proposes a revised fund contribution schedule.

9. REGISTRATION AND RELEASE

The Owner hereby agrees that this Agreement and the Schedules hereto or any part or parts thereof, may be registered upon the title of the land, at the Owner's expense.

10. OWNER INDEMNIFIES TOWNSHIP

The Owner indemnifies and shall keep indemnified and save harmless the Township from all loss, damage, cost and expense of every nature and kind whatsoever arising from or in consequence of the maintenance or operation of the works or any matter under this Agreement, whether such loss, damage, cost or expense is incurred by reason of negligence or without negligence on the part of the Owner and whether such loss, damage, cost or expense is sustained by the Township, the Owner or their several and respective employees, workmen, servants, agents or councillors or any other person or corporation.

11. RIGHT TO ENTER AGREEMENT

The Owner shall not call into question directly or indirectly in any proceedings whatsoever in law or in equity or before any administrative tribunal the right of the Township to enter into this agreement and to enforce each and every term of this Agreement and this Agreement may be pleaded as an estoppel against the Owner in any such proceedings. Notwithstanding the foregoing, if at any time during the currency of this Agreement, it is found by any Court of competent jurisdiction, any administrative tribunal or Ministry of Government that this Agreement, or any part thereof is void insofar as the Township is empowered to enter into this Agreement, then no obligation, liability or duty of any nature or kind whatsoever, whether in law or in equity, shall be imposed upon the Township to carry out any part of this Agreement found to be void.

12. ASSIGNMENT

11

The Owner shall not assign this Agreement without the consent of the Township, and such consent shall not be unreasonably withheld.

13. SEVERANCE OF ULTRA VIRES TERMS

If any term of this Agreement shall be found to be Ultra Vires of the Township, or otherwise unlawful, such term shall conclusively be deemed severable and the remainder of this Agreement mutatis mutancis shall be and remain in full force and effect.

This Agreement is binding upon and shall enure to the benefit of the Owner and the Township, their respective heirs, executors, administrators, successors and assigns.



April 22, 2016 Our File: 199024

Township of Puslinch RR3, 7404 Wellington Road 34 Guelph, ON N1H 6H9

Attention: Ms. Karen Landry CAO/Clerk

> Re: Mini Lakes Mobile Home Community 2015 Annual Operation & Maintenance Report

Dear Ms. Landry,

We have reviewed the '2015 Operation and Maintenance Report' for the above facility, as submitted by Stantec Consulting Limited, dated March 28, 2016. We are pleased to provide our comments for your consideration.

The Mini Lakes Mobile Home Community is permitted a maximum of 400 year round units based on the original design or 292 year round units based on the current draft plan of subdivision application. The number of homes occupied varies throughout the year as well as the corresponding sewage flows to the wastewater treatment plant. Currently, the wastewater treatment plant is rated for an average daily flow of 216 m3/d with the effluent compliance limits stipulated in the Table below.

In November 2012, an application for amendment to C of A Number 2113-7M8RBP was submitted to the Ministry of the Environment and Climate Change (MOECC) to undertake proposed plant improvements, re-rate the plant for an average daily flow of 158 m3/d, revise the nitrate limit upwards to 8.0 mg/L and change the definition of noncompliance to "during any calendar year" from "during any 12 consecutive calendar months".

EFFLUENT QUALITY:

Monthly monitoring of the sewage treatment effluent is required. The following Table summarizes the average effluent quality for the year 2015 presented as year to date (YTD) average (column 2), previous YTD average (2014) (column 3) and Ministry of the Environment (MOE) Certificate of Approval (C of A) Compliance Limit (column 4). Only parameters with compliance limits stipulated by the C of A are presented below.

1	2	3	4
Parameters (mg/L)	YTD Avg., (Jan. 1, 2015 to Dec.31, 2015) ^a	Previous YTD Avg., (Jan. 1, 2014 to Dec.31, 2014) ^a	C of A Compliance Limit
CBOD ₅ ^D	6.1	18.4	20.0
TSS [℃]	3.9	9.9 ^r	20.0
TP ^α	0.08	0.4	1.0
NO ₃ ^e	4.6	4.7	5.0

to date (YTD) average, as reported by Stantec Consulting Ltd

b. CBOD₅ = 5 day Carbonaceous Biological Oxygen Demand

TSS = Total Suspended Solids C. d

TP = Total Phosphorous

 $NO_3 = Nitrate$ e.

Note: Discrepancy compared to Table 2 in Stantec report due to May 26, 2014 and June 20, 2014 TSS results reported as <10 mg/L. Results were interpreted by G&M as 10 mg/L for purposes of calculating averages. Results were interpreted by Stantec as 0 mg/L for purposes of calculating averages.



The YTD average concentrations for $CBOD_5$, TSS, TP and NO_3 are all within C of A compliance limits for the year 2015. Exceedences of NO_3 were observed in January, February, March, April, May, and December. Plant effluent was sampled monthly during 2015, with the exception of nitrate and nitrite which were sampled more frequently as the result of ongoing denitrification issues.

 $CBOD_5$ concentrations were below the effluent limit for all 12 samples taken during 2015. The average $CBOD_5$ concentration of 6.1 mg/L was well below the effluent concentration of 20 mg/L. Plant effluent $CBOD_5$ has shown a decrease from 2014 to 2015. Overall the plant is considered to have performed well in terms $CBOD_5$ during 2015.

TSS concentrations were below the effluent limit for all 12 samples taken during 2015. The average TSS concentration of 3.9 mg/L was below the effluent limit of 20 mg/L, however,. TSS has the potential to affect the long term performance of leaching beds and should therefore be monitored closely given past issues with TSS. Overall the plant is considered to have performed well with respect to TSS during 2015.

TP concentrations were below the effluent limit for all 12 samples taken during 2015. The average TP concentration of 0.08 was well below the effluent limit of 1.0 mg/L. Overall the plant is considered to have performed well in terms TP removal during 2015.

The average nitrate concentration was below the compliance limit at 4.6 mg/L, although it is very close to the compliance limit of 5.0 mg/L. Nitrate values exceeded the effluent limit on six of the 17 sampling visits during 2015. High nitrate concentrations starting of October 27, 2014 through spring of 2015 meant that the plant was out of compliance on a 12-month rolling average basis for the first and second quarter of 2015. The reduction in denitrification during the winter and spring is attributed to colder temperatures which are known to impact the denitrification process. Operations staff members continue to closely monitor nitrate levels, and are undertaking additional operational and maintenance procedures required to maintain denitrification.

PROPOSED UPGRADES:

A long term strategy for improving plant performance, particularly with respect to effluent NO₃ concentrations, has been developed and an application for an amendment to the Environmental Compliance Approval (ECA) for the plant was submitted in December 2012. The Stantec report indicates that upgrades to the plant are expected to occur in Spring 2016 at the earliest due to delays in the ECA. Stantec provided an update on the status of the approval in a letter dated October 26, 2015. The email indicated that Stantec has received comments regarding the application in July/August 2015 and are incorporating them into the proposed design. The MOE had indicated that approvals are pending barring approvals and comments. GMBP has not received any notification if the ECA has been finalized but it was expected to be issued in November 2015. GMBP has not been notified of the receipt of this ECA.

The application for amendment also includes a proposal to re-rate the plant based on the current the Draft Plan of Subdivision to 158 m³/d and revise the nitrate limit upwards to 8.0 mg/L, based on lower long term projected nitrate loadings than originally designed.

It is noted that the system is not presently in conformance with the specific requirements of the C of A with respect to chemical storage. In order to achieve conformance with the C of A, a 900 L carbon tank and a 2,300 L alum tank, complete with spill containment facilities are recommended. The community currently has approval and funding in place for chemical building upgrades. Upgrades were intended to be completed as part of the 2014 upgrades project but are still awaiting approval by the MOECC. It is expected that the upgrades will occur during 2016 (pending ECA approval).

Other upgrade plans are ongoing and subject to approval and financial resources. Improvements to the control of sludge return rates and the removal of floating sludge remains a priority, however the replacement of intermediate and



final clarifier pumps and scum removal systems are currently on hold due to the higher priority nature of the sludge management improvements planned for construction in 2016 (pending ECA approval).

SEWAGE FLOWS:

From Table 3 of the 2015 Operation and Maintenance Report, the monthly average daily flow ranged from 85.0 m³/d to 113.8 m³/d during 2015. The monthly average daily flow for 2015 was 99.92 m³/d which represents approximately 46% of the current rated capacity (216 m³/d) and 63% of the proposed rated capacity (158 m³/d). The monthly average daily flow of 99.92 m³/d is a decrease of 0.2% from 2014.

The estimated number of homes occupied during 2015 ranged between 220 and 265 units, which represents approximately 81.5% occupancy based on the 292 units proposed under the Draft Plan of Subdivision Application. The estimated average daily flow per home ranged between 369 L/d and 486 L/d with an overall average of 422 L/d. This is a slight increase from the average per unit flow over the past three years of 416 L/unit/day, and is below the design average of 500 L/unit/day.

The overall plant maximum daily flow rate of 320 m³/d has not been exceeded, even during periods of high occupancy and wet periods. Based on the above trends infiltration and inflow is not considered to be an issue at this time.

SYSTEM MAINTENANCE:

Table 4, in the annual report summarizes the system maintenance during the year. For the most part the maintenance is general housekeeping items normally found in the operation of a wastewater treatment plant and sewage collection system.

Key maintenance items conducted during 2015 included the replacement of the Go switch on RBC #2, chemical tanks relined and replaced, laterals repaired (by Drexler Construction), floor grating repaired and reinforced, and a temporary laneway installed to the back of the WWTP.

ENVIRONMENTAL/OPERATING PROBLEMS AND MITIGATION MEASURES:

Operational problems during 2015 mostly involved small issues with pumps and alarms, which were resolved and have not since recurred. Operational issues included:

- Monthly effluent nitrate levels exceeding 5 mg/L (January April 2015)
- Regulatory nitrate limits exceeded (April June 2015)
- A significant number of effluent bed lateral caps found missing or broken. Replacement ordered and some replaced (May 2015)
- Alum pump was not functioning properly causing an alarm call in. Pump issue was resolved (August 2015)
- Go switches were causing a number of alarms for no apparent reason. One switch was replaced (September 2015)

CHEMICAL STORAGE CONTAINMENT REQUIREMENTS:

As reported by Stantec, the wastewater treatment plant is currently out of compliance with the C of A requirements for chemical storage. In order to achieve conformance with the C of A, a 900 L carbon tank and 2300 L alum tank, complete with spill management facilities, are recommended. Stantec report that they are working with the Mini Lakes Residents Association to implement this project during the 2016 upgrades project (Pending ECA approval).



OTHER SYSTEM IMPROVEMENT:

American Water Canada Corporation (AWC), the system operator, has identified a number of recommendations to improve the overall system. These include:

- Improved chemical delivery system for reduced materials handling,
- Improved sludge management and increased recirculation rates (scheduled for 2015, pending C of A amendment application and approval),

These recommendations are under consideration by the owner, operators and Stantec. Implementation will depend on evaluation, priority levels and funding availability.

RECOMMENDATIONS:

Based on the information provided in the '2015 Annual Operation and Maintenance report', the Mini Lakes wastewater treatment plant effluent met the MOE (C of A) compliance limits for TP, CBOD₅, NO₃ and TSS on an annual average basis during 2015. The wastewater treatment plant was generally in compliance on a 12-month rolling average basis for all parameters, with the exception of the nitrate exceedences for the first half of 2015. The situation is known to MOECC and operational changes and upgrades to resolve the nitrate issues are ongoing.

We recommend that;

- 1. The operators continue to closely monitor effluent parameters in 2016 and take corrective action if the effluent is approaching the C of A limits.
- 2. The operators continue to implement the general measures outlined in the Stantec annual report to maintain the denitrification process.
- 3. The operators continue to report average daily flow, maximum daily flow and estimated number of occupied homes for each month in the quarterly reports. The estimate of occupied homes should include all occupied homes contributing sewage flows to the wastewater treatment plant.
- 4. The owner and operators take appropriate action to bring the wastewater treatment plant into compliance with respect to C of A requirements for chemical storage (scheduled for implementation during 2015 plant upgrades, pending ECA approvals).
- 5. The owner continues to provide updates to the Township in the quarterly monitoring reports with respect to the status of the MOE approval and timing for implementation of the sludge management upgrades and plant re-rating proposed to address nitrate compliance issues (scheduled for implementation during 2016, pending receipt of approval).
- 6. It is recommended that the owner/Owner's Consulting Engineer submit an update to the Township outlining the nature of the delays in the ECA amendment process and the status and timing of implementation of the proposed work (eg. status of preparation of contract documents and drawings, anticipated schedule for tendering/construction, status of funding, etc.).



We trust this is sufficient for your requirements. If you have any questions please do not hesitate to contact us.

Yours truly,

GM BLUEPLAN ENGINEERING Per:

Steve Conway, C.E.T., rcsi, PMP

SC/mh

cc: Amanda Pepping, P.Eng., GM BluePlan Engineering



Stantec Consulting Ltd. 100-300 Hagey Boulevard Waterloo ON N2L 0A4

March 24, 2016 File: 1611 07544/31

Attention: Karen Landry, CAO/Clerk Township of Puslinch R.R. #4 County Road 34 Aberfoyle Guelph, ON N1H 6H9

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Please Handle	Township of Puslinch
For Your Information	
Council Agenda	Mary Della
File	istery sold

Dear Ms. Landry,

Reference: Mini Lakes Mobile Home Community Quarterly Monitoring Program – 4th Quarter 2015

Please find enclosed the wastewater treatment plant effluent results for Mini Lakes Mobile Home Community, provided in Table 1 (attached). These results are provided in accordance with the Operation and Maintenance Agreement between the Mini Lakes Residents Association and The Township of Puslinch, and the Certificate of Approval (CofA) for the sewage system. This letter represents the fourth quarter reporting for 2015.

As shown on Table 1, plant effluent has been sampled and analyzed on three (3) occasions for this quarter.

The average CBOD₅ concentration for the quarter is 7.7 mg/L, which is below the compliance limit of 20 mg/L. CBOD₅ values were below the compliance limit on all three (3) of the sampling occasions this quarter. The 12-month rolling average for CBOD₅ is 6.1 mg/L. Overall the plant is deemed to be performing well with respect to CBOD₅.

The average TSS concentration for the quarter is 5.3 mg/L, which is below the compliance limit of 20 mg/L. TSS values were below the compliance limit on all three (3) sampling occasions this quarter. The 12-month rolling average for TSS is 3.9 mg/L. Overall, the plant is deemed to be performing well with respect to TSS.

The average total phosphorus (TP) concentration for the quarter is 0.1 mg/L which is below the compliance limit of 1.0 mg/L. TP values were below the compliance limit on all three (3) sampling occasions this quarter. The 12-month rolling average for TP is 0.1 mg/L. Overall, the plant is deemed to be performing well with respect to TP.

The average nitrate concentration for the quarter is 3.2 mg/L, which is below the compliance limit of 5.0 mg/L. Nitrate values were below the compliance limit on two (2) of the three (3) sampling occasions this quarter (the December 17 sampling exceeded the compliance limit). The 12-month rolling average for nitrate is 4.6 mg/L, which is below the compliance limit of 5.0 mg/L.



March 24, 2016 Karen Landry, CAO/Clerk Page 2 of 4

Reference: Mini Lakes Mobile Home Community Quarterly Monitoring Program – 4th Quarter 2015

Since it has been shown that consistent denitrification is difficult to achieve, operations staff need to continue close monitoring and maintenance of the denitrification process. General measures required to maintain denitrification and phosphorus removal include, but are not limited to:

- Recording of sludge depths on a weekly or more frequent basis, and prompt sludge removal (as necessary) in all clarifiers and the effluent pump chamber.
- Regular denitrification media maintenance cleanings and removal of floatable material from the denitrification chambers.
- Use of the RBC feed-forward values to the maximum extent possible to improve soluble carbon availability and lower dissolved oxygen in the denitrification zone.
- Daily inspections and regular cleaning of all clarifier weirs.
- Balancing of chemical dosing flows; conceptual plans have been prepared and reviewed by AWC for new chemical dosing facilities in accordance with the existing CofA.

The recommended long term plan is to provide better sludge management by partitioning the existing primary clarifier into two (2) chambers, one (1) for primary clarification and sludge storage, and the second for primary effluent polishing. This will resolve issues with sludge carryover and washout, and allow much greater flexibility in recirculating sludge and effluent in order to optimize nitrogen removal. Current issues with sludge carryover are related to the buildup of sludge in the primary clarifier and washout during high flow events. Additionally, operations staff indicated that the return sludge is deposited at the discharge end, contributing to excessive buildup prior to the rotating biological contactor trains, and thus there is a higher potential for carryover. There is also no weir/baffle assembly in this clarifier to prevent sludge from entering the clarifier overflow. The proposed upgrades are as follows:

- Primary clarifier upgrades including:
 - A partition wall separating the chamber into two compartments, an inlet and sludge storage compartment having a working volume of 73 m³ and a primary effluent compartment having a working volume of 23 m³.
 - An inlet baffle plate.
 - An outlet weir box and baffle plate.
 - Extension of all sludge recirculation piping to inlet chamber.
- Denitrification inlet modifications to allow crossover between trains for redundancy and option to run on one (1) RBC train and two (2) tertiary trains.



March 24, 2016 Karen Landry, CAO/Clerk Page 3 of 4

Reference: Mini Lakes Mobile Home Community Quarterly Monitoring Program - 4th Quarter 2015

- One (1) new effluent pump and piping for effluent recirculation to primary clarifier inlet.
- New chemical building as previously approved.

Implementation of these upgrades will be difficult and complex due to the need to bypass the clarifier during installation using an offline tank; however, these upgrades would improve the operational efficiency of the plant, resistance to upsets (e.g., denitrification media plugging), and provide savings related to reduced sludge haulage. These upgrades will require an amendment to the current approval. Stantec has applied on behalf of Mini Lakes for an amended Environmental Compliance Approval (ECA) as of December 6, 2012 and we expect approval and construction to begin no earlier than Spring of 2016 due to delays in the ECA. With the approval amendment, we also propose to re-rate the wastewater treatment plant based on the current Draft Plan of Subdivision and subsequently revise the nitrate limit upwards to 8.0 mg/L based on lower long term projected nitrate loadings than originally designed.

It must be noted that these plans are ongoing and subject to approval and financial resources, though Mini Lakes already has approval and funding in place for the chemical building upgrades. MLRA is committed to resolving this situation, and additional monitoring of initial repairs to the denitrification media system will continue in the near term.

Results for dissolved oxygen (DO) this quarter are above optimal values at an average of 7.4 mg/L, where the objective is to be below 2 mg/L to ensure reliable denitrification. The effluent DO concentrations are lower than in the previous quarter which showed DO effluent concentrations averaging 9.0 mg/L. An assessment of historic nitrate data appears to show more of a correlation between seasonal temperature variation and nitrate reduction than DO concentration; however, low DO levels are generally necessary for efficient denitrification.

The remaining parameters shown on Table 1 have been sampled in accordance with the CofA; however, they do not have compliance limits. The results for these additional parameters are deemed to be acceptable and are reasonable for this type of wastewater treatment plant. Results for effluent *E.coli* this quarter show an average of 34,000 CFU/100 mL. Results for pH this quarter are consistent with expected values at an average of 7.4.

With respect to wastewater flows this quarter, the average flow per unit estimate is approximately 397 L/unit/day. The design average is 540 L/unit/day and the maximum daily design flow is 800 L/unit/day. Estimated per unit flows have not exceeded the daily design basis this quarter. The average day flow was only 41.9% of the design average day flow of 216 m³/d this quarter, and the maximum day flow never exceeded the wastewater treatment plant maximum day design flow of 320 m³/d. Based on these trends and the fact that the development as a whole is approximately 65% built out based on original design (and 90% based on current Draft Plan of Subdivision application for 292 total units), it is our opinion that infiltration and inflow are not an issue at this time. The average daily flows for each month, and the corresponding estimated number of occupied homes, is given below.



March 24, 2016 Karen Landry, CAO/Clerk Page 4 of 4

Reference: Mini Lakes Mobile Home Community Quarterly Monitoring Program – 4th Quarter 2015

Month (2015)	Average Daily Flow (L/d)	Maximum Daily Flow (L/d)	Estimated Number of Occupied Homes	Estimated Flow per Unit (L/d)
October	95,071	126,600	235	405
November	84,975	118,340	230	369
December	91,760	133,940	220	417

Table 2: Sewage Flow Volumes

In addition to the monitoring requirements for the wastewater treatment plant, surface water and groundwater have been monitored for the development. Please find attached the letter report from CH2M Hill Canada Limited outlining the subsurface and groundwater monitoring results.

We trust this meets with your requirements. Should you have any questions, please contact the undersigned.

Regards,

STANTEC CONSULTING LTD.

XTZ

Chad Schwartzentruber, P.Eng. Senior Project Manager Phone: (519) 585-7273 Fax: (519) 579-6733 Chad.Schwartzentruber@stantec.com

Attachment

c. Ms. Dianne Paron, Mini Lakes Residents Associated (letter only)
 Ms. Lynn Zettle, Region Business Banking Centre (letter only)
 Ms. Mary Kennedy, CH2M Hill Canada Limited (letter only)
 Ms. Amanda Pepping, Gamsby and Mannerow Limited (attachment)
 Ms. Lynnette Armour, Ministry of the Environment - Guelph District Office (attachment)

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Table 1

MINI LAKES MOBILE HOME COMMUNITY WWTP - Effluent Sampling Results

					E	ffluent	Samplin	g Paramete	rs		
A STREET OF COMPANY	C-BOD ₅	TSS	TP	NH ₃	NO ₃	NO ₂	TKN	TN(calc)	DO	E coli	рН
	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	/100mL	
compliance limit	20	20	1.00	na	5.00	na	na	na	'na	na	па
Sampling Date					1.1.1.1.1						and the second
13-Jan-15	8	2	0.09	2.90	8.09	0.56	4.10	12.75	8.15	15,000	7.39
18-Feb-15	5	3	0.06	2.20	11.40	0.64	2.80	14.84	8.06	20.000	7.33
17-Mar-15	11	4	0.09	2.20	7.29	0.58	3.40	11.27	8.14	40,000	7.54
23-Apr-15	4	6	0.10	0.93	10.90	0.56	2.20	13.66	8.68	19,000	7.24
11-May-15	1		1.000		5.48	0.36		1		1.00	
19-May-15	3	2	0.03	0.49	3.02	0.07	1.70	4.79	9.63	2,300	7.53
10-Jun-15	8	3	0.05	0.56	4.39	0.27	1.40	6.06	8.30	6,200	7.58
23-Jun-15			11.11.11	1	3.61	0.42	1	A		1	
8-Jul-15			1 1 1 1	1	2.97	0.23					
16-Jul-15	3	4	0.04	0.51	2.78	0.27	2.30	5.35	9.42	12,000	7.68
21-Jul-15		1			1.66	0.26		1			
10-Aug-15	5	3	0.05	0.63	2.05	0.47	0.84	3.36	8.68	11,000	8.32
20-Aug-15			1.00		2.53	0.33					
11-Sep-15	3	4	0.08	2.00	1.83	0.20	2.90	4.93	8.80	15.000	7.61
13-Oct-15	10	7	0.13	4.10	1.98	0.61	5.60	8.19	7.55	56.000	7.29
10-Nov-15	5	2	0.10	4.10	1.83	0.64	10.00	12.5	7.97	32,000	7.82
17-Dec-15	8	7	0.13	3.90	5.84	0.44	5.20	11.5	6.76	15,000	7.22
Q4 Sample count	3	3	3	3	3	3	3	3	3	3	3
Q4 Average	7.7	5.3	0,12	4.03	3.22	0.56	6.93	10.71	7.43	34.000	7.44
YTD Average	6.1	3.9	0.08	2.04	4.57	0.41	3.54	9.10	8.35	20.000	7.55
12-mo Rolling Avg.	6.1	3.9	0.08	2.04	4.57	0.41	3.54	9.10	8.35	20,000	7.55
12-mo Count	12	12	12	12	17	17	12	12	12	12	12

notes:

- Shaded area exceeds compliance limit.

Shaded area exceeds compliance limit.
Compliance Limits stipulated in Certificate of Approval for the Sewage System.
na - No compliance limits stipulated by Certificate of Approval.
YTD - Year to date



CH2M HILL Canada Limited 72 Victoria Street Suite 300 Kitchener, ON N2G 4Y9 O +519 579 3500 F +519 579 8986 www.ch2m.com

Wellington Common Elements Condominium Corporation No. 214 c/o M.F. Property Management Limited 28 Bett Court Guelph, Ontario, N1C 0A5

January 29, 2016

Subject: Groundwater and Surface Water Monitoring Report Fourth Quarter – October to December 2015

Attention: Ivan Horvat President

Background

In accordance with Certificate of Approval – Sewage - No. 2113-7M8RBP (CofA), quarterly groundwater sampling and monitoring and quarterly surface water sampling are required to be completed by the Wellington Common Elements Condominium Corporation No. 214 (WCECC#214), formerly the Mini Lakes Resident Association.

The sewage treatment plant and associated disposal trenches were commissioned in April, 2001. This report is a summary of groundwater and surface water quality data obtained during the fourth quarter of 2015. All groundwater sampling and water level monitoring was performed on December 15, 2015. All surface water sampling and monitoring was performed on December 8, 2015.

Sampling and monitoring were performed by American Water Canada (AWC) of Hamilton, Ontario. AWC performs the quarterly sampling and monitoring program, with quarterly report preparation by CH2M HILL Canada Limited (CH2M). AWC is the operator of both the sewage treatment works and the water works systems.

There are nine groundwater sampling and monitoring locations (MW1, MW2, MW4, MW5, MW6, MW7, MW8, MW9, and MW10) requiring quarterly sampling and water level monitoring (shown in Figure 1-1). Using an audible water level tape, static water level measurements were collected at each location prior to purging and sampling. Each monitoring well was purged and sampled using a peristaltic pump. Each well was purged until water ran "clear", free of visible sediment, and then samples were collected directly into laboratory supplied containers. The quarterly sampling requirements are summarized in Table 1. CH2M visited the site during the first quarter 2015 groundwater sampling event on March 26, 2015 and provided recommendations to WCECC#214 to improve the groundwater sampling methodology (CH2M 2015) in accordance with standard industry procedures and best practices. It was recommended that AWC develop and follow a Standard Operating Procedure (SOP) to guide all future groundwater sampling events in accordance with industry best standards and practices. It is CH2M's understanding based on subsequent communications with AWC that like second and third quarter sampling events in 2015, the fourth quarter sampling was also completed following recommendations provided in March 2015.

Wellington Common Elements Condominium Corporation No. 214 Page 2 January 29, 2016

Surface water is sampled at seven monitoring locations (SW1 through SW7) requiring quarterly sampling and field measurement (shown in Figure 1-1). Surface water samples are collected by dipping a laboratory-prepared jar into the flow of water at the monitoring location. The quarterly sampling requirements for surface water are summarized in Table 1.

Samples were packed on ice in coolers and shipped to Maxxam Analytics, Inc. (Maxxam) Laboratory in Waterloo for analysis. Maxxam is accredited by the Standards Council of Canada, in cooperation with the Canadian Association for Laboratory Accreditation, for specific environmental tests listed in the scope of accreditation approved by the Standards Council of Canada.

Overburden Groundwater Elevations

Water level elevations were measured in each monitoring well prior to purging and sampling during the fourth quarter monitoring event in 2015. The actual overburden groundwater elevations and "top of casing" elevations in each monitoring well are calculated from topographic survey measurements previously taken at each monitoring well. The fourth quarter water level measurements were collected on December 8, 2015, and are provided in Table 2 with groundwater elevations.

A comparison of the groundwater elevations (metres below ground surface [mbgs]) between the fourth quarter of 2015 and the fourth quarter of 2014 indicates a decrease of water elevation at 8 of 9 sampling locations. The decrease in elevation between September 2014 and September 2015 ranged between 0.01 metres (m) (MW8) to 0.39 m (MW4).

Groundwater elevation data for 2010 to 2015 is presented in Attachment A. In general water elevations show a stable trend since 2010 with seasonal fluctuations likely related to precipitation. Groundwater elevations measured during both of the first and second quarter monitoring events in 2015 were higher than those measured in 2014. Higher groundwater elevations during the first two quarters of 2015 are likely a result of increased precipitation during this period and particularly during the month of June. The decrease in groundwater elevation observed during the third and fourth quarters 2015 is likely due decreased amounts of precipitation during this period. A review of climate data at the closest Environment Canada weather station to site (approximately 12 km from site, located in Guelph Ontario) indicates that approximately 197 mm of precipitation was received in September through December 2015 compared with approximately 234 mm received over the same time period in 2014.

Seasonal trends in groundwater elevation show that groundwater tends to be high in the spring and low in the summer, increasing again in the fall. When comparing groundwater elevations measured in the fourth quarter against those measured in the first, second and third quarters of 2015, the water elevation has slightly increased at all monitoring well locations when comparted to groundwater elevations from third quarter of 2015 but remain lower than first and second quarter. Water elevations likely reached a minimum for 2015 in third quarter due to wetter weather conditions in late spring and the relatively dry weather conditions observed in the third quarter of 2015.

In general as presented in the previous annual sampling reports, the groundwater flow direction in the overburden is in a west-southwest direction.

Groundwater Sampling – Analytical Results

Three key parameters were identified by the Ontario Ministry of the Environment and Climate Change (MOECC) during the pre-construction discussion as the main constituents of concern (COCs); nitrate, total phosphorus (Tp) and *Escherichia coli* (*E.coli*). In groundwater the analytical results are compared to the following standards:

Wellington Common Elements Condominium Corporation No. 214 Page 3 January 29, 2016

- Nitrate concentrations are compared to the Reasonable Use Policy (RUP) objective for the site (2.74 milligrams per litre [mg/L]) which was developed based on water quality conditions at the upstream property boundary prior to the implementation of the wastewater treatment system in April 2001. The Nitrate concentration at the property boundary was considered the most critical nutrient of interest as identified by the MOECC during completion of the CofA for WCECC#214.
- There is no RUP or Ontario Drinking Water Quality Standard (ODWQS) for Tp; therefore, concentrations of Tp in groundwater is reviewed for general trends.
- E.coli is compared to the ODWQS of 0 coliforms per 100 millilitre (CFU/100 mL). It should be noted that total coliforms were specified in the original Certificate of Approval No. 3-0356-99-006. However, a MOECC Technical Memorandum dated April 5, 2007 from the Technical Support Section of the West Central Region to the Environmental Officer of the Guelph District Office recommended that *E. coli* be reported instead of total coliforms. *E.coli* concentrations have been reported instead of total coliforms. *E.coli* concentrations have been reported instead of total coliforms.

Laboratory certificates of analysis for groundwater are presented in Attachment B and the concentration of nitrate, Tp and *E. coli* in groundwater from the second quarter of 2015 is summarized in Table 3.

Nitrate Concentrations

The RUP for nitrate in the overburden aquifer at the downstream property boundary is 2.74 mg/L and is represented by groundwater monitoring well MW8. The concentration of nitrate at MW8 in the fourth quarter of 2015 was non-detectable (Table 3). The RUP is derived from data collected at the upstream property boundary. The upstream property boundary is represented by MW1. The nitrate concentrations at MW1 was also reported as 0.14 mg/L in the fourth quarter of 2015 (Table 3). Nitrate concentrations at these locations have been stable over the last 5 years as presented in Attachment C.

As a best management practice to understand nitrate concentrations across the site, all onsite monitoring locations were compared to the RUP. During the fourth quarter of 2015 the nitrate concentration exceeded the RUP MW4 (5.44 mg/L) which is consistent with the results recorded in the first, second and third quarters of 2015. In third quarter of 2015, the nitrate concentration at MW2 was also found to exceed the RUP, however in the fourth quarter of 2015 the concentration is less than the RUP; 1.99 mg/L. Nitrate concentrations at these locations, located closest to and downgradient of the infiltration cells, have often exceeded the RUP since sampling and monitoring began in 2001 with concentrations over the last 5 years ranging from non-detect to 8 mg/L at MW2 and 3.7 to 10.9 mg/L at MW4. Nitrate concentrations vary seasonally, tend to be higher in spring/early summer than fall, but show a stable trend (that is neither increasing nor decreasing) at both MW2 and MW4.

Nitrate was also detected above laboratory detection limit at MW5, MW6 and MW10. MW5 and MW6 monitoring wells are located south-southwest of the infiltration beds and MW10 is located upgradient and adjacent to the infiltration beds. Concentrations of nitrate these wells were reported below the RUP in the fourth quarter of 2015 and have below the RUP and showing a stable trend over the last 6 years (Attachment C).

Nitrate at all other monitoring locations was reported as non-detectable in the fourth quarter of 2015.

Total Phosphorus Concentrations

The observed concentration for Tp at the upstream property boundary, MW1, during the fourth quarter of 2015 was 0.049 mg/L (Table 3). At the downstream property boundary, MW8, the observed Tp concentration was 0.029 mg/L (Table 3). Concentrations of Tp in groundwater at MW1 and MW8 have been stable for the last 5 years as presented in Attachment C.

Wellington Common Elements Condominium Corporation No. 214 Page 4 January 29, 2016

Tp was also detected at MW9 (upstream location) at concentration of 0.0.02 mg/L in fourth quarter of 2015 as presented in Table 3. Tp concentrations at MW9 have been stable over the last 6 years (that is there is neither an increasing nor decreasing trend) and are similar to concentrations of Tp observed at MW1 which is also an upstream location, shown in Attachment C.

Tp concentration was observed to have been elevated at MW10 since the well was replaced in 2011 ranging from 0.45 to 19 mg/L. The concentrations of Tp at MW10 have shown a decline since 2013 but remain high in comparison to other monitoring wells on site. A change in sampling technique occurred in first quarter of 2015 in order to better align with standard industry practices. In first quarter 2015, Tp concentration at MW10 was reduced and in second, third, and fourth quarter of 2015 was reported as non-detect. This reduction in Tp concentrations between the sampling events following a change in sampling technique suggests that previous sampling results may have been biased high as a result of previous sampling techniques which led to increased suspended particulate in the groundwater samples. Further monitoring data will be assessed in order to confirm this however.

Escherichia coli Concentrations

The ODWQS for *E. coli* in groundwater is 0 CFU/100mL. The *E. coli* count observed at the downgradient location, MW8, was 0 CFU/100mL during the fourth quarter of 2015 (Table 3). At the upgradient location, MW1, the *E. coli* count was 28 CFU/100mL. Since *E.coli* has been sampled during the monitoring program, it has been occasionally detected at MW1. CH2M will continue to assess the *E. coli* count at MW1 over future sampling events in order to confirm if the elevated count previously observed in June and December 2015 is representative of current conditions or is anomalous/isolated. It is likely that occasional detections of *E.coli* observed at MW1 is a result of wildlife sources in the general area. MW9, also an upgradient location, also had a detection of *E. coli* in the fourth quarter of 2015, 10 CFU/100mL. MW9 is located upstream of the sewage treatment system and is located in a wooded area, it is likely that historically elevated *E.coli* could be from wildlife sources in the area. 6 year data for *E.coli* at MW1 and MW9 is presented in Attachment C.

The *E.coli* count at all other monitoring locations was also reported as 0 CFU/100mL which is consistent with data from the last 5 years.

Surface Water Sampling – Analytical Results

Nitrate, Tp and *Escherichia coli (E.coli)* are the main COCs in surface water and were identified by the MOECC. In surface water, the analytical results are compared to the following standards:

- Nitrate concentrations are compared to the Canadian Environmental Quality Guidelines (CEQG) at the property boundary as there is no Provincial Water Quality Objective (PWQO) for nitrate. The CEQG for nitrates is 3.0 mg/L.
- Tp is compared to the PWQO of 0.02 mg/L although the surface water quality within Mill Creek (northwest of the site boundary) does not meet PWQO for Tp. The PWQOs were established to ensure the protection of water quality for aquatic life and recreation and further degradation of water quality with respect to Tp concentration is not permitted. During sampling of surface water in 1996 and in conjunction with a hydrogeological study for the site, a baseline concentration of 0.10 mg/L in surface water was observed at the downstream property boundary (CH2M Gore & Storrie Limited, 1996).
- Like groundwater, *E.coli* has been reported instead of total coliforms since July, 2007. *E.coli* is compared to the PWQO of 100 CFU/100 mL.

During the fourth quarter in 2015, surface water sampling was conducted on December 8, 2015, as required in the CofA. These sampling results are included as an attachment to the report (Attachment D). Table 4 is a summary of the concentrations detected in the surface water from all monitoring locations for the key parameters of nitrates, Tp and *E. coli*.

Wellington Common Elements Condominium Corporation No. 214 Page 5 January 29, 2016

Nitrate Concentrations

The nitrate concentration observed at the upstream property boundary, represented by SW1, in the fourth quarter of 2015 was non-detect. At the downstream property boundary, represented by SW6, the nitrate concentration was also non-detect. The maximum nitrate concentration in the fourth quarter of 2015 of 0.51 mg/L was observed at SW5. Occasional detections of the CEQG for nitrate has been observed at SW5 and SW7 (both upstream on Mill Creek prior to the confluence (Figure 1-1)) in the last 6 years with a maximum concentration of 0.70 mg/L at SW5 and of 0.60 mg/L at SW7. These are likely due to background influences on Mill Creek rather than a direct result of site activities. In general nitrate concentrations have a stable trend (neither increasing nor decreasing) at SW5 and SW7 (Attachment E).

Nitrate was also detected at SW2 and SW3 in the fourth quarter of 2015 at just above the detection limit; 0.11 mg/L at both locations. These analytical results are consistent with historical results. Nitrate concentrations at all of the surface water sample locations have been reported below the CEQG for the last 6 years (Attachment E).

Total Phosphorus Concentrations

Tp at the upstream property boundary, represented by SW1, was reported as non-detect in the fourth quarter of 2015. At the downstream property boundary (SW6), the Tp concentration was also reported as less than laboratory detection limit. Tp was detected at SW2 in exceedance of the PWQO (0.022 mg/L). Tp was non-detect at all other locations. While occasional exceedances of the PWQO have been observed at most of the surface water monitoring locations over the last 6 years (Attachment E), Tp concentrations have stayed below the baseline concentration of 0.1 mg/L in surface water at all locations.

Escherichia coli Concentrations

The *E. coli* count at the upstream property boundary, SW1, was 53 CFU/100 mL in the fourth quarter of 2015. At the downstream property boundary, SW6, the *E. coli* count was 1 CFU/100 mL. *E.coli* was also detected at all of the other surface water sampling locations in the fourth quarter of 2015 with the exception of SW4 as presented in Table 4. Despite detections of *E.coli* at 6 of 7 surface water monitoring locations, all data was less than the PWQO of 100 CFU/100mL.

Detections of *E.coli* in surface water are likely a result of inputs from natural sources such as wild life. SW5 and SW7 are located offsite in wooded areas and SW1, SW2, SW3, and SW4 are located on the onsite ponds which tend to be populated by geese. *E.coli* concentrations from 2010 to 2015 are presented in Attachment E. Concentrations have fluctuated throughout each year and tend to be higher in in the spring/early summer of each year.

Physical Measurements

Physical measurements, pH and temperature, were collected on December 8, 2015, at each surface water sampling location. These results are presented in Table 5 with calculated un-ionized ammonia concentrations as required by the CofA. Un-ionized ammonia is compared to the PWQO of 20 µg/L. Ammonia was detected at 3 of 7 surface water monitoring locations in the fourth quarter of 2015. Un-ionized ammonia did not exceed the PWQO at any locations.

In general, concentrations of un-ionized ammonia are similar to those seen throughout the last 6 years. When compared to the data from the same quarter (quarter 4 of 2010 through 2014), concentrations of un-ionized ammonia is consistent with data from the fourth quarter of 2013. Previously, concentrations of un-ionized ammonia seemed to be elevated in the fourth quarter2012. Un-ionized ammonia was unable to be calculated in the fourth quarter of 2014 as pH and temperature were not collected. In the last 6 years despite detections of ammonia, there have been no exceedances of the PWQO.

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Wellington Common Elements Condominium Corporation No. 214 Page 6 January 29, 2016

Elevated ammonia could be a result of natural sources, however based on the current data set it is difficult to determine. Assessment of ammonia in groundwater during future monitoring events would enable comparison to surface water results for reference purposes.

Recommendations

After review of the analytical data collected during the fourth quarter 2015 groundwater and surface water monitoring program at the WCECC#214 site, CH2M would like to present the following recommendation:

 It is recommended that field parameters of pH and temperature be collected at each groundwater monitoring location during future sampling events. This data will allow CH2M to assess the concentrations of un-ionized ammonia in groundwater to enable comparison to the surface water results for reference purposes.

Limitations

This report has been reviewed by a Professional Geoscientist from CH2M HILL Canada Limited. All sampling, monitoring and lab analyses were performed and reported by others. This report summarizes the results of this work only and cannot substantiate whether or not approved MOECC procedures and standard protocol were followed during the collection of the samples. This letter has been prepared in accordance with generally accepted environmental engineering practices for the exclusive use of the Wellington Common Elements Condominium Corporation No. 214 (formerly Mini Lakes. Third parties cannot rely upon the findings and conclusions presented without express written consent of CH2M and WCECC#214 through an extension of reliance using a reliance letter signed by both parties. CH2M accepts no responsibility for damages, if any, incurred by any third party as a result of decisions made or actions based on this letter.

References

CH2M Gore & Storrie Limited. 1996. *Hydrogeological Assessment of Mini Lakes Country Club and Trailer Resort.*

CH2M HILL Canada Limited (CH2M). 2015. *Mini Lakes Groundwater Sampling – Recommendations*. April 14.

Ministry of the Environment and Climate Change (MOECC). 2009. Amended Certificate of Approval, Municipal and Private Sewage Works, Number 2113-7M8RBP. February 18.

We trust this report meets with your approval, however should you have any questions please do not hesitate to contact the undersigned.

Sincerely, CH2M HILL Canada Limited

mken &

Mary Kennedy, MSc. Project Manager

cc:

Judy Beauchamp – Stantec Consultants Diane Paron– MF Property Management Ltd. CH2M HILL Canada Limited

Kunt Kmm

Kurt Hansen, M.E.S., P.Geo Senior Technical Reviewer

Tables

Table 1. Wellington Common Elements Condominium Corporation No. 214

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Sampling Requirements Groundwater and Surface Water

			ī
Parameter	Type of Sample	Minimum Frequency	1
Groundwater			
Carbonaceious Biochemical Oxygen Demand (CBOD ₅)	Grab	Quarterly	
Total Suspended Solids (TSS)	Grab	Quarterly	
Total Phosphorus (Tp)	Grab	Quarterly	
Total Ammonia Nitrogen	Grab	Quarterly	
Nitrate Nitrogen	Grab	Quarterly	
Nitrite Nitrogen	Grab	Quarterly	
Total Kieldahl Nitrogen (TKN)	Grab	Quarterly	
Dissolved Organic Carbon (DOC)	Grab	Quarterly	
Escherichia coli (E.coli)	Grab	Quarterly	1
Surface Water			
Total Phosphorus (Tp)	Grab	Quarterly	
Total Ammonia Nitrogen	Grab	Quarterly	
Nitrate Nitrogen	Grab	Quarterly	
Nitrite Nitrogen	Grab	Quarterly	
Total Kieldahl Nitrogen (TKN)	Grab	Quarterly	
Escherichia coli (E.coli)	Grab	Quarterly	
Temperature	Field	Quarterly	
. Ha	Field	Quarterly	1
			-

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Notes: Sampling program as per Condition 2 Subsections c and d of Certificate of Approval No. 2113-7M8RBP

Table 2. Wellington Common Elements Condominium Corporation No. 217 Groundwater Monitoring Well Program Comparison between Ground Water Elevations - Q4 - 2014 vs. Q4 - 2015

				Decer	mber-14	Decel	mber-15	Variance
		Top of						between Dec 2014 and Dec
Location	Ground	Casing	Stick-Up	Water Level	Water Elevation	Water Level	Water Elevation	2015
	(masl)	(masl)	Height (m)	(mbtoc)	(masl)	(mbtoc)	(masl)	(m)
MW1	322.46	323.01	0.55	1.41	321.60	1.31	321.70	0.10
MW2	323.26	324.20	0.94	2.40	321.80	2.62	321.58	-0.22
MW4	322.22	323.24	1.02	2.00	321.24	2.39	320.85	-0.39
MW5	322.12	323.04	0.92	1.95	321.09	2.21	320.83	-0.26
MW6	320.93	321.93	1.00	1.97	319.96	2.15	319.78	-0.18
MW7	320.25	321.18	0.93	1.88	319.30	1.93	319.25	-0.05
MW8	319.76	320.56	0.80	1.70	318.86	1.71	318.85	-0.01
6MM	322.02	322.84	0.82	0.94	321.90	0.96	321.88	-0.02
MW10	324.06	325.16	1.10	2.75	322.41	3.02	322.14	-0.27
Notes								

(-) - Indicates Decrease in GW Level between same Quarter - 2014 and 2015 **Bold** indicates Increase in GW Level

masl - meters above sea level m- meters

mbtoc - meters below top of casing

Table 3. Wellington Common Elements Condominium Corporation No. 214 Nutrient Concentrations observed

Q4 - December 2015

Ground Water Monitoring Wells

	Nitrates	RUP	T. Phosphorus	MAC - ODWQS	Escherichia coli	MAC - ODWQS
Well No.	mg/L	mg/L	mg/L	mg/L	CFU/100 mL	CFU/100 mL
* MW1	0.14	2.74	0.049	N/A	28	0
MW2	1.99	2.74	ND	N/A	0	0
MW4	5.44	2.74	ND	N/A	0	0
MW5	0.46	2.74	QN	N/A	0	0
MW6	0.55	2.74	ND	N/A	0	0
MW7	ND	2.74	ND	N/A	0	0
** MW8	QN	2.74	0.029	N/A	O,	0
6MM	ND	2.74	0.022	N/A	10	0
MW10	0.11	2.74	QN	N/A	0	0

Notes:

- upstream property boundary * MW1

- downstream property boundary ** MW8

exceeds RUP or ODWQS

- Reported below laboratory detection limit

ND N/A RUP

Not Applicable
 Reasonable Use Policy Guideline

'- Ontario Drinking Water Quality Standard - Maximum Allowable Concentration ODWQS MAC

- milligrams per litre

CFU/100mL - coliforms per 100 millilitres mg/L

Groundwater samples collected on December 15, 2015

Table 4. Wellington Common Elements Condominium Corporation No. 214 Nutrient Concentrations Observed

Nutrient Concentrations Upsei Q4 - December 2015

Surface Water Monitoring

	Nitrates	CEGQ	T. Phosphorus	PWQO	Escherichia coli	PWQO
Well No.	mg/L	mg/L	mg/L	mg/L	CFU/100mL	CFU/100mL
* SW1	QN	3.0	QN	0.02	23	100
SW2	0.11	3.0	0.022	0.02	80	100
SW3	0.11	3.0	QN	0.02	2	100
SW4	QN .	3.0	ND	0.02	0	100
SW5	0.51	3.0	ND	0.02	13	100
** SW6	QN	3.0	ND	0.02	1	100
SW7	0.22	3.0	DN	0.02	7	100
Notes:						
* CM/1 .	- unstream property	v houndary				

* SW1 - upstream property boundary
** SW6 - downstream property boundary

PWQO - Provincial Water Quality Objectives - PWQO - 1994 - (Lakes and ponds)

CEQG - Canadian Environmental Quality Guideline - 2012

ND - Reported below the laboratory detection limit

mg/L - milligrams per litre

CFU/100mL - coliforms per 100 millilitres

- Exceeds PWQO or CEGQ

Surface water samples collected December 8, 2015

.
• Table 5. Wellington Common Elements Condominum Corporation No. 214 Physical Measurements and Un-ionized Ammonia in Surface Water

Surface Water Monitoring Q4 - December 2015

	PH	Temperature	Ammonia	Un-ionized Ammonia
Well No.		(°C)	(hg/L)	(Hg/L)
* SW1	8.41	4.8	<50	,
SW2	8.28	3.7	120	2.48
SW3	8.56	4.1	110	4.38
SW4	8.5	5.2	59	2.24
SW5	8.61	4.5	<50	1
** SW6	8.58	3.6	<50	1
SW7	8.35	3.4	<50	1
Votes:				
LW2	 upstream property boundary 			
= SW6	- downstream property boundary			

	- upstream pr	6 - downstream
tes:	SW1	SW6

- downstrear - Exceeds PM	n property boundary	/QO of 20 µg/L
	- downstreal	- Exceeds PV

- Provincial Water Quality Objectives - PWQO - 1994 - (Lakes and ponds) - Reported below the laboratory detection limit PWQO

degrees celsius

- microgram per litre

- unable to be calucalted as concentration less than laboratory detection limit ţ

.

Surface water samples collected September 23, 2015

Figure

October 19, 2015



Attachment A Groundwater Elevation 2010–2015



Attachment B Groundwater Analytical Results



Your Project #: MINI LAKES Site Location: GUELPH, ON

Attention:John Wilson

American Water Services Canada Corp 701 Main Street W Suite 100 Hamilton, ON L8S 1A2

Your C.O.C. #: NA, 120F1, 120F2, 120F4, 120F5, 120F6, 120F7, 120F8, 120F9, 120FA

Report Date: 2015/12/22 Report #: R3823638 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5P8063

Received: 2015/12/15, 14:43

Sample Matrix: Water # Samples Received: 9

		Date	Date		
Analyses	Quantity	Extracted	Analyzed	Laboratory Method	Reference
Carbonaceous BOD	9	N/A	2015/12/21	CAM SOP-00427	SM 22 5210B m
Dissolved Organic Carbon (DOC) (1)	9	N/A	2015/12/16	CAM SOP-00446	SM 22 5310 B m
E.coli, (CFU/100mL)	9	N/A	2015/12/15	CAM SOP-00552	MOE LSB E3371
Total Ammonia-N	9	N/A	2015/12/18	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (2)	9	N/A	2015/12/17	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Total Kjeldahl Nitrogen in Water	9	2015/12/17	2015/12/17	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	9	2015/12/21	. 2015/12/21	CAM SOP-00407	SM 4500 P B H m
Total Suspended Solids	9	N/A	2015/12/17	CAM SOP-00428	SM 22 2540D m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Dissolved Organic Carbon (DOC) present in the sample should be considered as non-purgeable DOC.

(2) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager. Hina Ahmed, Project Manager Email: HAhmed@maxxam.ca Phone# (905)817-5734

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Total Cover Pages : 1 Page 1 of 8

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, L5N 2L8 Tel: (905) 817-5700 Toll-Free: 800-563-6266 Fax: (905) 817-5777 www.maxxam.ca



American Water Services Canada Corp Client Project #: MINI LAKES Site Location: GUELPH, ON Sampler Initials: JW

RESULTS OF ANALYSES OF WATER

Maxxam ID		BNK891	BNK892		BNK893		BNK894	BNK895	BNK896		
Sampling Date		2015/12/15 12:20	2015/12/15 09:40		2015/12/15 10:05		2015/12/15 12:00	2015/12/15 11:40	2015/12/15 11:20		
COC Number	0.000	120F1	120F2		120F4		120F5	120F6	120F7		
	UNITS	MW1	MW2	RDL	MW4	RDL	MW5	MW6	MW7	RDL	QC Batch
Inorganics										-	
Total Ammonia-N	mg/L	1.9	ND	0.050	ND	0.050	ND	ND	ND	0.050	4318131
Total Carbonaceous BOD	mg/L	ND	ND	2	ND	2	ND	ND	ND	2	4315718
Total Kjeldahl Nitrogen (TKN)	mg/L	2.2	0.31	0.10	ND (1)	0.50	0.11	0.14	0.15	0.10	4318138
Dissolved Organic Carbon	mg/L	11	1.0	0.20	0.92	0.20	0.87	0.79	1.8	0.20	4315658
Total Phosphorus	mg/L	0.049	ND	0.020	ND	0.020	ND	ND	ND	0.020	4321666
Total Suspended Solids	mg/L	56	ND	10	ND	10	ND	ND	ND	10	4316234
Nitrite (N)	mg/L	0.012	ND	0.010	ND	0.010	ND	ND	ND	0.010	4315844
Nitrate (N)	mg/L	0.14	1.99	0.10	5.44	0.10	0.46	0.55	ND	0.10	4315844
Nitrate + Nitrite (N)	mg/L	0.15	1.99	0.10	5.44	0.10	0.46	0.55	ND	0.10	4315844

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

ND = Not detected

(1) TKN: Due to high concentrations of the target analytes, sample required dilution. Detection limits were adjusted accordingly.

Maxxam ID	1	BNK897	BNK898	BNK899		
Sampling Date		2015/12/15 10:55	2015/12/15 12:40	2015/12/15 10:30		
COC Number		120F8	120F9	120FA		
	UNITS	MW8	MW9	MW10	RDL	QC Batch
Inorganics						
Total Ammonia-N	mg/L	1.7	1.1	ND	0.050	4318131
Total Carbonaceous BOD	mg/L	ND	ND	ND	2	4315718
Total Kjeldahl Nitrogen (TKN)	mg/L	2.0	1.5	0.10	0.10	4318138
Dissolved Organic Carbon	mg/L	6.2	6.1	0.73	0.20	4315658
Total Phosphorus	mg/L	0.029	0.022	ND	0.020	4321666
Total Suspended Solids	mg/L	ND	15	ND	10	4316234
Nitrite (N)	mg/L	ND	ND	ND	0.010	4315844
Nitrate (N)	mg/L	ND	ND	0.11	0.10	4315844
Nitrate + Nitrite (N)	mg/L	ND	ND	0.11	0.10	4315844
RDL = Reportable Detection Li QC Batch = Quality Control Ba	mit tch					
ND = Not detected						



American Water Services Canada Corp Client Project #: MINI LAKES Site Location: GUELPH, ON Sampler Initials: JW

MICROBIOLOGY (WATER)

Maxxam ID		BNK891	BNK892	BNK893	BNK894	BNK895	BNK896	BNK897	
Come New Parts		2015/12/15	2015/12/15	2015/12/15	2015/12/15	2015/12/15	2015/12/15	2015/12/15	
Sampling Date		12:20	09:40	10:05	12:00	11:40	11:20	10:55	
COC Number		120F1	120F2	120F4	120F5	120F6	120F7	120F8	
	UNITS	MW1	MW2	MW4	MW5	MW6	MW7	MW8	QC Batch
Microbiological									
Escherichia coli	CFU/100mL	28	0	0	0	0	0	0	4315216
QC Batch = Quality Cor	ntrol Batch								

Maxxam ID		BNK898	BNK899	
Compling Date		2015/12/15	2015/12/15	
Sampling Date		12:40	10:30	
COC Number		120F9	120FA	1
	UNITS	MW9	MW10	QC Batch
Microbiological				
Escherichia coli	CFU/100mL	10	0	4315216
QC Batch = Quality Cor	ntrol Batch			

Maxxam Analytics International Corporation o/a Maxxam Analytics 6740 Campobello Road, Mississauga, Ontario, LSN 2L8 Tel: (905) 817-5700 Toll-Freel 800-563 6266 Fax: (905) 817-5777 www.maxxam.ca



American Water Services Canada Corp Client Project #: MINI LAKES Site Location: GUELPH, ON Sampler Initials: JW

GENERAL COMMENTS

emperature is the	average of up to three cooler i	emperatures taken at receipt	
Package 1	6.0°C		
its relate only to th	e items tested.		

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American Water Services Canada Corp Client Project #: MINI LAKES Site Location: GUELPH, ON Sampler Initials: JW

QUALITY ASSURANCE REPORT

QA/QC				Date				
Batch	Init	QC Type	Parameter	 Analyzed	Value	Recovery	UNITS	QC Limits
4315658	AHA	Matrix Spike	Dissolved Organic Carbon	2015/12/16		98	%	80 - 120
4315658	AHA	Spiked Blank	Dissolved Organic Carbon	2015/12/16		98	%	80 - 120
4315658	AHA	Method Blank	Dissolved Organic Carbon	2015/12/16	ND,		mg/L	
					RDL=0.20			
4315658	AHA	RPD	Dissolved Organic Carbon	2015/12/16	0.90		%	20
4315718	BKE	QC Standard	Total Carbonaceous BOD	2015/12/21		95	%	85 - 115
4315718	BKE	Method Blank	Total Carbonaceous BOD	2015/12/21	ND,RDL=2		mg/L	
4315718	BKE	RPD	Total Carbonaceous BOD	 2015/12/21	4.2		%	25
4315844	C_N	Matrix Spike	Nitrite (N)	2015/12/17		100	%	80 - 120
			Nitrate (N)	2015/12/17		99	%	80 - 120
4315844	C_N	Spiked Blank	Nitrite (N)	2015/12/17		102	%	80 - 120
			Nitrate (N)	2015/12/17		103	%	80 - 120
4315844	C_N	Method Blank	Nitrite (N)	2015/12/17	ND,		mg/L	
					RDL=0.010			
			Nitrate (N)	2015/12/17	ND,		mg/L	
					RDL=0.10		-	
4315844	C_N	RPD	Nitrite (N)	2015/12/17	NC		%	25
	-		Nitrate (N)	2015/12/17	NC		%	25
4316234	ALP	QC Standard	Total Suspended Solids	2015/12/17		96	%	85 - 115
4316234	ALP	Method Blank	Total Suspended Solids	2015/12/17	ND,		mg/L	
					RDL=10			
4316234	ALP	RPD [BNK892-01]	Total Suspended Solids	2015/12/17	NC		%	25
4318131	ADB	Matrix Spike [BNK898-03]	Total Ammonia-N	2015/12/18		98	%	80 - 120
4318131	ADB	Spiked Blank	Total Ammonia-N	2015/12/18		99	%	85 - 115
4318131	ADB	Method Blank	Total Ammonia-N	2015/12/18	ND,		mg/L	
U					RDL=0.050			
4318131	ADB	RPD [BNK898-03]	Total Ammonia-N	2015/12/18	0.40		%	20
4318138	LHA	Matrix Spike [BNK898-03]	Total Kjeldahl Nitrogen (TKN)	2015/12/17		NC	%	80 - 120
4318138	LHA	QC Standard	Total Kjeldahl Nitrogen (TKN)	2015/12/17		97	%	80 - 120
4318138	LHA	Spiked Blank	Total Kjeldahl Nitrogen (TKN)	2015/12/17		100	%	80 - 120
4318138	LHA	Method Blank	Total Kjeldahl Nitrogen (TKN)	2015/12/17	ND,		mg/L	
					RDL=0.10		•	
4318138	LHA	RPD [BNK898-03]	Total Kjeldahl Nitrogen (TKN)	2015/12/17	7.8		%	20
4321666	SNR	Matrix Spike [BNK898-03]	Total Phosphorus	2015/12/21		102	%	80 - 120
4321666	SNR	QC Standard	Total Phosphorus	2015/12/21		100	%	80 - 120
4321666	SNR	Spiked Blank	Total Phosphorus	2015/12/21		100	%	80 - 120
4321666	SNR	Method Blank	Total Phosphorus	2015/12/21	ND,		mg/L	
					RDL=0.020			

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American Water Services Canada Corp Client Project #: MINI LAKES Site Location: GUELPH, ON Sampler Initials: JW

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC				Date				
Batch	Init	QC Type	Parameter	Analyzed	Value	Recovery	UNITS	QC Limits
4321666	SNR	RPD [BNK898-03]	Total Phosphorus	2015/12/21	NC		%	20

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

Page 6 of 8



American Water Services Canada Corp Client Project #: MINI LAKES Site Location: GUELPH, ON Sampler Initials: JW

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

(Listin Camere

Cristina Carriere, Scientific Services

Ranju Chaudhari

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Attachment C Groundwater Concentration Trends of Selected Parameters 2010–2015







Attachment D Surface Water Analytical Results



Your Project #: MINI LAKES Site Location: GUELPH, ON

Attention:John Wilson

American Water Services Canada Corp 701 Main Street W Suite 100 Hamilton, ON L8S 1A2

Your C.O.C. #: na, 120FB, 120FD, 120FE, 120FF, 12102, 12100, 12101

Report Date: 2015/12/15 Report #: R3807763 Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B5P2304 Received: 2015/12/08, 14:33

Sample Matrix: Water # Samples Received: 7

		Date	Date		
Analyses	Quantity	Extracted	Analyzed	Laboratory Method	Reference
E.coli, (CFU/100mL)	7	N/A	2015/12/08	CAM SOP-00552	MOE LSB E3371
Total Ammonia-N	7	N/A	2015/12/14	CAM SOP-00441	EPA GS I-2522-90 m
Nitrate (NO3) and Nitrite (NO2) in Water (1)	7	N/A	2015/12/10	CAM SOP-00440	SM 22 4500-NO3I/NO2B
Total Kjeldahl Nitrogen in Water	7	2015/12/11	2015/12/14	CAM SOP-00938	OMOE E3516 m
Total Phosphorus (Colourimetric)	7	2015/12/14	2015/12/15	CAM SOP-00407	SM 4500 P B H m
Total Suspended Solids	7	N/A	2015/12/11	CAM SOP-00428	SM 22 2540D m

Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) Values for calculated parameters may not appear to add up due to rounding of raw data and significant figures.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager. Hina Ahmed, Project Manager Email: HAhmed@maxxam.ca Phone# (905)817-5734

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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American Water Services Canada Corp Client Project #: MINI LAKES Site Location: GUELPH, ON Sampler Initials: JW

RESULTS OF ANALYSES OF WATER

Maxxam ID		BMI751	BMI752	BMI753	BM1754		
Sampling Date		2015/12/08 11:15	2015/12/08 13:25	2015/12/08 12:05	2015/12/08 12:20		
COC Number		120FB	120FD	120FE	120FF		
	UNITS	SW #1 UPGRADIENT TRIB	SW #2 MAIN POND #1	SW #3 MAIN POND #2	SW #4 MAIN POND OUTLET	RDL	QC Batch
Inorganics							
Total Ammonia-N	mg/L	ND	0.12	0.11	0.059	0.050	4310169
Total Kjeldahl Nitrogen (TKN)	mg/L	0.28	0.40	0.41	0.33	0.10	4309681
Total Phosphorus	mg/L	ND	0.022	ND	ND	0.020	4311646
Total Suspended Solids	mg/L	ND	ND	ND	ND	10	4305636
Nitrite (N)	mg/L	ND	ND	ND	ND	0.010	4305403
Nitrate (N)	mg/L	ND	0.11	0.11	ND	0.10	4305403
Nitrate + Nitrite (N)	mg/L	ND	0.11	0.11	ND	0.10	4305403

RDL = Reportable Detection Limit

QC Batch = Quality Control Batch

ND = Not detected

15/12/08 13:05 12102 COUNTY RD 34	2015/12/08 12:45 12100 SW #6 PROPERTY OUTLET	2015/12/08 11:45 12101 SW #7 MILL CR/RD. 38	RDI	
12102 COUNTY RD 34	12100 SW #6 PROPERTY OUTLET	12101 SW #7 MILL CR/RD. 38	ROI	
COUNTY RD 34	SW #6 PROPERTY OUTLET	SW #7 MILL CR/RD. 38	RDI	
			NOL	QC Batch
ND	ND	ND	0.050	4310169
0.22	0.29	0.28	0.10	4309681
ND	ND	ND	0.020	4311646
ND	ND	ND	10	4305636
ND	ND	ND	0.010	4305403
0.51	ND	0.22	0.10	4305403
0.51	ND	0.22	0.10	4305403
	ND 0.22 ND ND 0.51 0.51	ND ND 0.22 0.29 ND ND ND ND ND ND 0.51 ND	ND ND 0.22 0.29 0.28 ND ND ND ND ND ND ND ND ND ND ND 0.22 0.51 ND 0.22	ND ND 0.050 0.22 0.29 0.28 0.10 ND ND 0.020 ND ND 10 ND ND 0.010 0.51 ND 0.22 0.51 ND 0.22

ND = Not detected



American Water Services Canada Corp Client Project #: MINI LAKES Site Location: GUELPH, ON Sampler Initials: JW

MICROBIOLOGY (WATER)

Maxxam ID		BM1751	BM1752	BMI753	BMI754	
Sampling Date		2015/12/08 11:15	2015/12/08 13:25	2015/12/08 12:05	2015/12/08 12:20	
COC Number		120FB	120FD	120FE	120FF	
	UNITS	SW #1 UPGRADIENT TRIB	SW #2 MAIN POND #1	SW #3 MAIN POND #2	SW #4 MAIN POND OUTLET	QC Batch
Microbiological						
Escherichia coli	CFU/100mL	53	8	2	0	4304817
QC Batch = Quality Co	ntrol Batch					

Maxxam ID		BMI755	BMI756	BMI757	
Sampling Date		2015/12/08 13:05	2015/12/08 12:45	2015/12/08 11:45	
COC Number		12102	12100	12101	
	UNITS	SW #5 COUNTY RD 34	SW #6 PROPERTY OUTLET	SW #7 MILL CR/RD. 38	QC Batch
Microbiological					
Escherichia coli	CFU/100mL	13	1	7	4304817
QC Batch = Quality Co	ntrol Batch				



American Water Services Canada Corp Client Project #: MINI LAKES Site Location: GUELPH, ON Sampler Initials: JW

GENERAL COMMENTS

Each te	mperature is the	average of up to	e cooler temperatures taken at receipt		
]	Package 1	3.3°C	9°		
Results	relate only to th	e items tested.			

Page 4 of 7

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American Water Services Canada Corp Client Project #: MINI LAKES Site Location: GUELPH, ON Samoler Initials: JW

QUALITY ASSURANCE REPORT

				Date				
Batch	Init	OC Type	Parameter	Analyzed	Value	Recoverv	UNITS	QC Limits
4305403	CN	Matrix Spike [BMI755-01]	Nitrite (N)	2015/12/10		107	%	80 - 120
	-		Nitrate (N)	2015/12/10		102	- %	80 - 120
4305403	CN	Spiked Blank	Nitrite (N)	2015/12/10		105	%	80 - 120
	-		Nitrate (N)	2015/12/10		102	%	80 - 120
4305403	CN	Method Blank	Nitrite (N)	2015/12/10	ND,		mg/L	
	-				RDL=0.010			
			Nitrate (N)	2015/12/10	ND,		mg/L	
					RDL=0.10			
4305403	CΝ	RPD [BMI755-01]	Nitrite (N)	2015/12/10	NC		%	25
	-		Nitrate (N)	2015/12/10	0.059		%	25
4305636	GKR	QC Standard	Total Suspended Solids	2015/12/11		97	%	85 - 115
4305636	GKR	Method Blank	Total Suspended Solids	2015/12/11	ND,		mg/L	
					RDL=10			
4305636	GKR	RPD	Total Suspended Solids	2015/12/11	NC	1.0	%	25
4309681	RTY	Matrix Spike	Total Kjeldahl Nitrogen (TKN)	2015/12/14		NC	%	80 - 120
4309681	RTY	QC Standard	Total Kjeldahl Nitrogen (TKN)	2015/12/14		100	%	80 - 120
4309681	RTY	Spiked Blank	Total Kjeldahl Nitrogen (TKN)	2015/12/14		101	%	80 - 120
4309681	RTY	Method Blank	Total Kjeldahl Nitrogen (TKN)	2015/12/14	ND,		mg/L	
					RDL=0.10			
4309681	RTY	RPD	Total Kjeldahl Nitrogen (TKN)	2015/12/14	NC		%	20
4310169	COP	Matrix Spike	Total Ammonia-N	2015/12/14		96	%	80 - 120
4310169	COP	Spiked Blank	Total Ammonia-N	2015/12/14		102	%	85 - 115
4310169	COP	Method Blank	Total Ammonia-N	2015/12/14	ND,		mg/L	
					RDL=0.050			
4310169	COP	RPD	Total Ammonia-N	2015/12/14	NC		%	20
4311646	SNR	Matrix Spike [BMI755-03]	Total Phosphorus	2015/12/15		103	%	80 - 120
4311646	SNR	QC Standard	Total Phosphorus	2015/12/15		103	%	80 - 120
4311646	SNR	Spiked Blank	Total Phosphorus	2015/12/15		102	%	80 - 120
4311646	SNR	Method Blank	Total Phosphorus	2015/12/15	ND,		mg/L	
					RDL=0.020			
4311646	SNR	RPD [BM1755-03]	Total Phosphorus	2015/12/15	NC		%	20

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).



American Water Services Canada Corp Client Project #: MINI LAKES Site Location: GUELPH, ON Sampler Initials: JW

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Eno

Ewa Pranjic, M.Sc., C.Chem, Scientific Specialist

Maxima C. Humanez.

Maxima Hermanez, Senior Analyst

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Attachment E Surface Water Concentration Trends of Selected Parameters 2010–2015











April 19, 2016 Our File: 199024

Township of Puslinch RR3, 7404 Wellington Road 34 Guelph, ON N1H 6H9

Attention: Ms. Karen Landry CAO/Clerk

> Re: Mini Lakes Wastewater Treatment Plant Effluent Monitoring Report, 4th Quarter (2015)

Dear Ms. Landry:

We have reviewed the "Mini Lakes Mobile Home Community Quarterly Monitoring Program – 4th Quarter 2015" report, as submitted by Stantec Consulting Limited on March 24, 2016. We are pleased to provide our comments for your consideration.

The following table summarizes the average effluent quality for the fouth quarter (Q4) of 2015 (column 2), the year to date (YTD) average (column 3), the 12-month rolling average (column 4), the previous YTD average (2014) (column 5) and the MOECC Certificate of Approval (C of A) compliance limits (column 6).

1	2	3	4	5	6
Parameters	Q4 Avg.,	YTD Avg.,	Twelve-Month	Previous YTD	Compliance
(mg/L)	(Oct. 1 to	(January 1 to	Rolling Avg.,	Avg.	Limit
	December 31,	December 31,	(January 1 to Dec.	(Jan. 1 to Dec.	
	2015)	2015)	31, 2015) ^a	31, 2014)	
CBOD ₅ ^b	7.7	6.1	6.1	18.4	20.0
TSS ^c	5.3	3.9	3.9	9.9 ^f	20.0
TP ^d	0.1	0.1	0.1	0.4	1.0
NO ₃ ^e	3.2	4.6	4.6	4.7	5.0

a. Condition 3.1 of the MOE C of A, average is defined as "any twelve (12) consecutive calendar months"

b. CBOD₅ = 5 day Carbonaceous Biological Oxygen Demand

c. TSS = Total Suspended Solids

d. TP = Total Phosphorous

e. NO₃ = Nitrate

f. Note: Discrepancy compared to Table 1 in Stantec report due results reported as <10 mg/L being interpreted by GMBP as 10 mg/L for the purposes of calculating averages, whereas results were interpreted by Stantec as 0 mg/L for purposes of calculating averages.



The MOECC C of A requires that plant effluent be sampled and analyzed on a monthly basis for each of the parameters defined above. As a minimum, plant effluent was sampled monthly for all parameters during this quarter.

Effluent CBOD₅

The average $CBOD_5$ effluent concentration for this quarter was 7.7 mg/L. This is within the C of A compliance limit of 20.0 mg/L for this parameter. $CBOD_5$ concentrations were below the compliance limit on all three sampling occasions this quarter. The twelve month rolling average for this parameter remains below the compliance limit at 6.1 mg/L, demonstrating that the plant is generally performing well with respect to $CBOD_5$.

Effluent TSS

The average TSS effluent concentration for this quarter was 5.3 mg/L. This is below the C of A compliance limit of 20.0 mg/L for this parameter. Effluent TSS concentrations were below the compliance limit on all three sampling occasions this quarter. The twelve month rolling average for this parameter remains below the compliance limit at 3.9 mg/L, demonstrating that the plant is generally performing well with respect to TSS.

Effluent TP

The average TP effluent concentration for this quarter was 0.1 mg/L. This is well below the C of A compliance limit of 1.0 mg/L for this parameter. Effluent TP concentrations were below the compliance limit on all three sampling occasions this quarter. The twelve month rolling average for this parameter is in compliance at 0.1 mg/L, demonstrating that the plant is generally performing well with respect to TP.

Effluent NO₃

The average effluent NO_3 concentration for this quarter was 3.2mg/L which is below the C of A compliance limit of 5.0 mg/L for this parameter. Effluent NO_3 concentrations exceeded the compliance limit on one of the three sampling occasions this quarter (December 17, 2015). The twelve month rolling average for this parameter is in compliance at 4.6 mg/L.

A long term strategy for improving plant performance, particularly with respect to effluent NO₃ concentrations, has been developed and an application for an amendment to the Environmental Compliance Approval (ECA) for the plant was submitted in December 2012. The Stantec report indicates that upgrades to the plant are expected to occur in Spring 2016 at the earliest due to delays in the ECA. Stantec provided an update on the status of the approval in a letter dated October 26, 2015. The email indicated that Stantec has received comments regarding the application in July/August 2015 and are incorporating them into the proposed design. The MOE had indicated that approvals are pending barring approvals and comments. GMBP has not received any notification if the ECA has been finalized but it was expected to be issued in November 2015.



Average Sewage Flows

The average daily sewage flow rate to the plant ranged between 84.98 m^3/d and 95.07 m^3/d during this quarter. This is below the plant's current design capacity of 216 m^3/d , and proposed re-rated plant capacity of 158 m^3/d . The estimated number of occupied homes ranged between 220 and 235 this quarter, which represents approximately 80% of units in the current Draft Plan of Subdivision application of 292 units.

The estimated average daily flow per home ranged between 369 L/d and 417 L/d, below the design average daily flow per home of 540 L/d.

We trust this is sufficient for your requirements. If you have any questions please call.

Yours truly,

GM BLUEPLAN ENGINEERING Per:

Steve Conway, C.E.T., rcsi, PMP

AP/mh

6.7(a).

Bridge Dedications for Fallen Police Officers

😵 Ontario

Bridge Dedications for Fallen Police Officers



Officer's Name Memorial Bridge

POLICY NUMBER: 2007-01-rev

Effective Date: June 18, 2007

Approved by: Gord Troughton, Manager 29. Juno · 2007 Manager's Signature Date

Traffic Office Highway Standards Branch Ministry of Transportation 301 St. Paul Street, 2nd Floor St. Catharines, ON L2R 7R4

General Inquiries: (905) 704-2960 Fax: (905) 704-2888



Purpose and Background

As a gesture of respect, bridge dedications are intended to posthumously recognize police officers that have courageously and unselfishly given their lives in the line of duty to preserve our free and peaceful society.

In accordance with the <u>Highway Memorials for Fallen Police Officers Act, 2002</u>, this policy allows for the naming of bridges and other structures on provincial highways in memory of police officers that have died in the line of duty.

Guidelines

Bridge dedication signs are to be installed at provincial highway bridges/structures in all directions of travel (provincial highway and crossroad). Dedication signs will be in addition to any existing signs identifying the geographical feature being crossed (i.e. – name of a river) or the intersecting street at an interchange. The dedication signs are not intended to replace the existing system of bridge identification.

This policy applies to dedications for fallen police officers, regardless of when the officer was killed.

This policy does not replace other methods the Ministry may have to name/identify bridges.

Bridges/structures are to be selected in the following preferred order:

- 1st Mainline bridges/structures over rivers or other obstructions
- 2nd Overpasses/underpasses that are not interchanges
- 3rd Interchange bridges

Definitions

 <u>Highway Memorials for Fallen Police Officers Act, 2002</u> – an Act allowing the Legislative Assembly to name bridges and other structures on Ontario's highways in memory of police officers who have died in the line of duty.



- 2. <u>Memorial Dedications for Provincial Highways and/or Sections of Provincial Highways</u> <u>Policy</u> – a policy allowing a dedication of a highway (or section thereof) to posthumously acknowledge individuals and groups who have contributed to the health, welfare and prosperity of Ontarians, and to honour the sacrifice of those who have lost their lives servicing the people of Ontario or the nation.
- 3. The term "*Immediate Family Member*" refers to a spouse, child, stepchild, brother, stepbrother, sister, stepsister, mother, stepmother, father, stepfather.

Process and Qualification Criteria

Bridges

The dedication of bridges is reserved for police officers that have died in the line of duty in accordance with the *Highway Memorials for Fallen Police Officers Act, 2002*.

Highways

Requests to have a highway, or section thereof, dedicated must be in accordance with the Ministry of Transportation's <u>Memorial Dedications for Provincial Highways and/or Sections of</u> <u>Provincial Highways Policy</u>, and, therefore, do not qualify for signs under this policy.

The preferred method of dedicating bridges after fallen police officers is through the Legislative process as per the <u>Highway Memorials for Fallen Police Officers Act, 2002</u>. However, this policy allows the Minister to approve dedications in situations where there are tight timelines or the House is not sitting.

The police service the officer served in (OPP, municipal or other) will coordinate and provide the following information to the Ministry of Transportation:

- A letter, addressed to the Minister of Transportation, requesting/supporting the dedication including the preferred location (township or specific site) of the bridge to be dedicated;
- Written consent from immediate family members of the deceased officer for whom the bridge is being dedicated. If any immediate family member objects (in writing) to the placement of a sign, the sign will not be installed.
- Written confirmation from immediate family members of the deceased officer of the proper name to appear on the sign (no nicknames allowed, such as John "Red" Smith);
- Although MTO encourages the use of the officer's name only on the signs, the use of an abbreviated rank (Sgt., Cst., etc.) will be allowed on the sign with the written consent of family members.
- Written support of the bridge dedication from the MPP(s) of the riding(s) that the bridge is located in.
- Written consent from the Municipality/First Nation in which the signs are being installed;
- An electronic version of the police force logo to be included on the sign in Encapsulated Postscript (eps) or Adobe Illustrator (ai) file format. In situations where the logo is too complex for the Provincial Sign Shop to reproduce, the police force shall provide a colour logo (preferably on engineering grade reflective sheeting) in a ready-to-apply format with a maximum dimension of 500mm square.

Ministry Head Office and Regional staff will review the submission. Ministry Head Office will prepare the final sign design and confirm the final design with the local police agency or the Ministry of Community Safety and Correctional Services. Ministry regional staff will coordinate the sign installation and act as the primary contact for the proponent. The sign design and associated documentation will be forwarded to the Assistant Deputy Minister of Provincial Highway Standards, the Deputy Minister's Office and then to the Minister's Office for final approval.

Head Office Traffic will be responsible for maintaining a central registry of dedications that will include approved, denied and outstanding requests.

Final approval of a bridge dedication shall rest with the Minister of Transportation or his/her designee and must be obtained prior to proceeding with the implementation of a bridge dedication.

Under this policy, only one dedication per fallen police officer is permitted. A bridge/structure cannot have multiple dedications. For the purpose of this policy, "twin" structures can be dedicated to a single individual.

Ceremonies recognizing the dedication of the bridge are not allowed within the highway rightof-way. The police service will be responsible for the organization of any off-site ceremonies. MTO will provide a colour mock-up of the sign for presentation purposes. This mock-up may be offered to the family as a keepsake.



Implementation

Sign Design and Installation

Signs shall conform to the following design:

Place Police Association Crest Here	Officer's Name Memorial Bridge	Bridge Dedication Sign Sign Size: 600mm x 2400 mm Retroreflective Sheeting: Type I
Place Police Association Creat Hore	Pont commémoratif Officer's Name Memorial Bridge	Bridge Dedication Sign (Bilingual) Sign Size: 600mm x 2400mm Retroreflective Sheeting: Type I

Signs must conform to the standard ministry design as shown above. Signs shall include the name of the police officer being identified in the dedication and may, upon written request, display their abbreviated rank (Sgt., Cst., etc.). Signs may include a crest/logo, but shall not include commercial messages or slogans, or other messages commercial in nature.

The bilingual version of the sign must be used in areas designated under the French Language Services Act.

A bridge dedication under this policy shall have signs installed at the bridge in all directions of travel (provincial highway and crossroad), in addition to any other signs identifying the geographic feature being crossed (i.e. river, intersecting street, etc.).

Fees

The Ministry of Transportation is responsible for all costs associated with the manufacturing, installation and maintenance of the signs.

6.8(a)

RECEIVED

BY-LAW 5001-05 SCHEDULE 4

APR 1 9 2016

Application for Noise Exemption To Noise Control By-law 5001-05

Township of Puslinch

Applicant Name Last First Sponga arrie Applicant Address Street Postal Code #35 **K**7 4518 Wellington NIH 633 Applicant's Phone Number 519-731-1826 Group or Organization **Event Title** held at above residence Wedding Date of Event Sat Suly 16116 Time of Event GPM Dam Description of Event - include the source of sound or vibration in respect of which the exemption is being sought: 30 ~ 2C liarto 00 O am Did Speakers

State the particular provision or provisions of the By-law from which the exemption is being sought Noise Exemption 45001-05

tpr:1 18/16

Signature sme 0 Title

Submit to: Clerk's Office Township of Puslinch 7404 Wellington Road 34 R.R. #3 Guelph, ON N1H 6H9 (519) 763-1226 From: Aldo Salis Sent: March 17, 2016 12:05 PM To: Dennis Lever1 Subject: Share the Road

Dennis,

Here is the link to the Town of Blue Mountains video on road bike safety within the rural context. Very well done. If the County were to produce a video, we should consider adding gravel trucks, horse & buggy vehicles, and cycling through 'turning circles'... to name a few.

http://www.thebluemountains.ca/share-the-road.cfm

As mentioned, Jamie Stuckless is the Executive Director of Share the Road. She had a very informative session at the recent OGRA/ROMA conference. She was there with people from Waterloo and Blue Mountains – two of the many municipalities in the province that are Bicycle Friendly Communities as awarded by Share the Road. Here is a link to that program too.

http://www.sharetheroad.ca/bicycle-friendly-communities-p138264

Aldo



experience

Fincoe County



Cycling Safety and Etiquette

Trail Etiquette

Trails are a wonderful way to spend an enjoyable day, relaxing and taking in the scenery. There are spectacular views and natural areas as you travel Simcoe County's trails. Trail etiquette is important so that everyone will have a safe and enjoyable outdoor experience and trails will be preserved for future generations.

Code of Conduct:

- 1. Show courtesy to all trail users.
- 2. Stay on the trail preserve the natural vegetation and private property.
- **3. Stay to the right** obey all posted signs and warnings.
- 4. If you stop, **Do not block the trail.**
- 5. "Wheels yield to heels" pedestrians always have the right of way.
- 6. Cyclists Ride defensively and in contro
- 7. Pass on the left when overtaking others and sound a warning by bell or voice.
- 8. Do not litter. Take out what you bring in.

Welcome to South Georgian Bay!

South Georgian Bay, located only 90 minutes north of Toronto, is considered one of Ontario's most diverse regions. The southern shores of Georgian Bay give rise to the highest point of the Niagara Escarpment, a UNESCO biosphere reserve and a haven for four-season outdoor adventure.

Experience Historic Downtown Collingwood and the quaint communities of the Blue Mountains, Meaford, Creemore and others which lie on the edge of worldclass resorts, forested trails and picturesque farmland and Thornbury lie on the edge of world-class resorts, forested trails and picturesque farmland

Take a ride around town or in the scenic countryside. Visit a vineyard, orchard or tour one of many local breweries. Taste the local bounty. Ride along the longest freshwater beach in the world, located in Wasaga Beach. Discover the beauty as you ride the winding roads and enjoy the vistas from the extensive rail trail network.

Home to one of the most extensive multi-use trail networks and some of the most scenic road cycling climbs in the province, South Georgian Bay offers a challenge for riders of all abilities and styles. Whether touring with friends or enjoying the fresh air with your family, we have a route for you.

For more regional tourism information visit: www.visitsouthgeorgianbay.ca. If you would like more information on the cycling routes and trail networks, visit: www.cyclesimcoe.ca.

Share the Road

Bicycles are considered vehicles under the Ontario Highway Traffic Act, and have the same rights and responsibilities on public roadways as motorists. When cyclists fail to obey the rules of the road, the support of motorists is lost. Do your part by being a good ambassador for bicycling.

- **1.** Wear a helmet a properly fitting helmet is the best protection against injury (required by law for cyclists under 18 years old).
- 2. Obey all traffic laws as any other legal vehicle under the HTA.
- 3. Ride on the Right while you may use any part of the road when there is no approaching traffic you are required by law to be on the right side of the road when a vehicle passes.
- 4. Be Predictable it is recommended that you ride within 1 meter of the edge of the road when possible and that you ride in a smooth, straight and predictable manner.
- 5. Be Visible wear brightly coloured clothing at all times and use lights and reflectors in low light conditions. Give the drivers as much of an opportunity to see you as possible.
- 6. Tight and to the Right Group cyclists ride in tight and controlled formations and as close to the right side of the road as possible. This allows drivers approaching from behind to see if the road ahead is clear for a proper lane changing pass. If the group is obstructing traffic then the group should go single file until the obstruction has cleared.

To Motorists: Please Pass with Care

Cyclists are vulnerable road users. While it is understood that slower vehicles have an obligation to move to the right to accommodate faster vehicles, it must also be understood that the law requires that the passing vehicles move to the left to perform safe and legal passes. A minimum of 1 metre must exist between the passing vehicle and the cyclist. A vehicle cannot legally pass a cyclists while the road ahead is not clear.



The following map has ben printed by Cycle Simcoe. While every effort has been made to ensure the accuracy of this ip, inaccuracies or changes may occur. Cycle S Barrie/Simcoe Cycling Club and the County of Simcoe are not responsible for any variations from the printed information.

This cycling map has been developed to assist in planning bicycle trips throughout Simcoe County. Users of this cycling map are responsible for their own safety and use these routes and trails at their own risk. Users should consider not only route and trail conditions but also their level of experience, comfort level riding in traffic, traffic conditions and traffic volume, weather, time of day, and any obstacles, such as construction or potholes, whe cycling on any route or trail within Simcoe County. This map is not intended as a guide for children. Cyclists should exercise the same level of caution whether riding on a route designated by this map or any non-designated route.

Cycle Simcoe, the Barrie/Simcoe Cycling Club, the County of Simcoe and others involved in the design and publication of this map and the cycling routes are not responsible for any loss or damage users may suffer as a result of using this cycling map or the cycling routes. Cycle Simcoe, Barrie/Simcoe Cycling Club and their partners do not warrant the safety of any route, highway road, street, trail or designated cycling route shown on this cycling

Waiver: Having read the foregoing material and as a condition of using this cycling map, the users of this cycling map waive, release, and discharge, for themselves and their heirs, executors administrators, successors and assigns, any rights or claims which the users have or may hereafter have against the directors officers, employees, owners, volunteers and staff of Cycle Simco Barrie/Simcoe Cycling Club, the County of Simcoe and other sponsoring businesses and organizations, for any and all damages which may be sustained by the users directly or indirectly in connection with their use of this cycling map or the cycling routes.







cycle apparel and more



146 Mill Street, Creemore, ON 705 466 6950



Ride Creemore!! We'll make vour heart beat"



The Heather Pathway **Difficulty:** Easy

Frail Descriptions

Length: 17 km Start: Sunset Point Park

The Heather Pathway is a series of Town trails linked together that creates a loop around the Town of Collingwood. Millennium Park and Hen & Chickens boardwalk provide scenic views of Georgian Bay. Along the Heather Pathway you will find interpretive signs that describe the rich history of both the trail and the Town of Collingwood. For a break, stop at Sunset Point park; both food and washrooms available in season.

The Georgian Trail **Difficulty:** Easy

Length: 34 km (each way) **Start:** 3 Birch Street, Collingwood or Craigleith Depot - 113 Lakeshore Rd

From Collingwood to Meaford, the trail runs near Hwy. 26 West with numerous access points along the way. If you are looking for the most scenic waterfront trail in the area, the Georgian Trail has it. Running along the south shore of beautiful Georgian Bay, the Georgian Trail has ample opportunity to stop, rest and swim during the summer months.

The Georgian Trail is a fantastic way to commute around South Georgian Bay and is safe, accessible and fun for the whole

Clearview-Collingwood Train Trail

Difficulty: Easy

Length: 14 km (each way) Start: Station Museum, Collingwood Spanning from Collingwood to Staynor, the Clearview Train Trail is a crushed gravel, linear trail connecting to the Collingwood Train Trail. It follows an abandoned rail line which used to be part of the Ontario Simcoe and Huron Railway system connecting Collingwood to Toronto and was built between 1851 and 1855. Prior to its abandonment in 1960, passengers enjoyed views of the tranquil landscape along the way. Now used as a multi-use trail, hikers and bikers can enjoy this flat railbed, stopping in either Stayner or Collingwood for lunch or a break.

Carley Patterson Memorial Trail

Difficulty: Easy Length: 11 km (each way) Start: Wasaga Beach RecPlex 1724 Mosley Street

The Carley Patterson Memorial Trail meanders along Trillium Creek though a mosaic of swamp and upland forests. Snowmelt in the spring creates woodland pools that suppor breeding habitat for migrating waterfowl. Several woodpecker species - including the rare Red-headed Woodpecker and Redbellied Woodpecker - forage and nest along the creek corridor. White-tailed Deer and Wild Turkeys can be seen along the trail. Trillium Creek provides habitat for a handful of small fish species as well as amphibians even though flows can be very low or even intermittent during spring and early fall. Please Note: A hybrid bike is recommended for this trail as it is a combination of quiet roads and stone dusted trail

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Road Descriptions

The Seven Beaches Tour

Difficulty: Moderate Length: 60 km **Start:** Wasaga Beach RecPlex 1724 Mosley Street

Starting in Wasaga Beach and carrying on to Historic Balm Beach, this relatively flat route travels up the shore of Georgian Bay, passing beach after beach, including the world's longest fresh water beach in Wasaga Beach. Bring your bathing suit along, because this route lives up to it's name, "Seven Beaches Tour". Take a swim in the clear blue waters of Georgian Bay at any point along the way or at the halfway point in Balm Beach. Grab a quick bite to eat and fill up your water bottles before you return via the same way back to Wasaga Beach where you can have a refreshing après ride swim!. Please note: This route sees high volumes of traffic in the peak summer season. If you want to avoid the crowds and have the beaches to yourself do this ride early in the morning.

Iron Bridge Route

Difficulty: Moderate Length: 35 km Start: Wasaga Beach RecPlex - 1724 Mosley Street

For a more scenic and rural ride, try the Iron Bridge Route. Known for being relatively flat except the small valley where Iron Bridge is located, this route crosses the Nottawasaga River in three separate places along your 35km journey. At the halfway point you will travel through a cedar forest valley and cross a picturesque single lane Iron Bridge - a great place to stop, take a picture and have a quick break before continuing on. After you cross the bridge you climb out of the valley back into farmland then back towards the bay, then ride along the shore line through Wasaga Beach areas 1 and 2 and back to your starting point. Make sure you check out all the beach excitement and beautiful views of Southern Georgian Bay at its finest while riding though Beaches 1 and 2.

Please Note: Shoreline roads near Wasaga Beach will be a busy during peak season. Tip, if you want to avoid the crowds and have the beach to yourself do this ride early in the morning

Community Bike Loop

Difficulty: Easy Length: 14 km

Start: 30 Lewis Street, Wasaga Beach

This bicycle loop follows 12 kilometres of roads in the Town of Wasaga Beach, using paved shoulders and designated bicycle lanes. Circling the 800 hectare 'Dunes' area of the Wasaga Beach Provincial Park, the Community Bike Loop contains a large system of parabolic dunes, forested with mature oak and pine which create a mosaic of wetland and upland forest habitats. The height of the dunes can be seen from Klondike Park Road, particularly at its intersection with Powerline Road at the south end of the bicycle loop.

Creemore loop (counter clockwise)

Difficulty: Moderate/Advanced Length: 60 km

Start: Fisher Fields Park, Collingwood Heading counter clockwise out of the Town of Collingwood, the first portion which passes the Collingwood Regional Airport is relatively flat and perfect for your warm up. After crossing County Road 91 you enter more challenging rolling terrain. But the challenge is worth it, as you have multiple opportunities to view the beautiful Mad River along the way. If you are looking for an opportunity to stop and soak up the culture, be sure to take a break in Creemore, approximately half way through your ride. This town, known for it's mouth watering restaurants and coffee shops, has art galleries, shopping and more!

On your way back in to Collingwood, be sure your legs are ready for the Fairgrounds Road climb, which is a difficult but short climb to a fantastic view of Georgian bay.

Lake Eugenia Loop (clockwise)

Difficulty: Advanced Length: 90 km

For experienced road riders looking to test their fitness, the Lake Eugenia Loop is the right choice. The Lake Eugenia Loop guides you along beautiful landscape and up epic climbs, such as the Pretty River Valley. Stop off at the Rob Roy Museum or the Feversham Gorge for a break or carry on to the Village of Eugenia to refuel with a quick coffee. If you are a fan of butter tarts, be sure to visit the Kimberley General Store - known for welcoming cyclists with open arms, the Kimberly General Store has a gazebo, coffee and a butter tart that will charge you up for the last leg of the ride. One of the most picturesque sections of the ride is the return back in to Collingwood, as it is characterized by a series of climbs that takes you to the top of the escarpment, overlooking Georgian Bay, followed by a quick blast downhill into the Town of Collingwood.

Thornbury Sticky Bun Loop

Difficulty: Moderate Length: 15 km

Start: Town Hall in Thornbury - 32 Mill

Start at the Thornbury Bakery, ride up through Thornbury, cross over the Beaver River into Clarksburg, full of galleries and The Honey House. Turn right and go over the single lane bridge and a short climb up to Frogs Hollow (Side Rd 33). Spectacular views at the highest point and a fantastic ride down Frogs Hollow. Goldsmiths Market, carefully cross Hwy 26 and connect with the Georgian Trail back to Thornbury Bakery for a coffee and people watching on the patio. While you're there check out the Thornbury Pier, ice cream at Maiolo's (by the harbour), the Fish Ladder at the Bridge and The Cheese Gallery across from the Bakery

Wasaga Collingwood **Connections**

Difficulty: Easy

Length: 15 km Start: Wasaga RecPlex - 1724 Mosley

Both Collingwood and Wasaga Beach are exciting towns to be in during the summer months - from waterfront events to concerts and festivals, you are guaranteed fun every time you visit. For those looking to travel between each Town via bicycle, two routes are recommended;

For a longer, more challenging on-road route, take the Wasaga Collingwood link to the Escarpment based routes. If you and your family are looking for a flatter, less challenging ride take the route which follows quiet streets until it reaches the Heather Pathway.

Please Note: Riders looking to only cycle one direction can take the Wasaga Collingwood bus link, as it can transport bikes.

Apple Pie Trail PEDAL & PADDLE Adventure

Difficulty: Easy/Moderate Length: 40 km **Start:** Blue Mountain Village

oad your bike on the Blue Mountair. Gondola and cycle 40km through the scenic Beaver Valley orchards, trails and country roads. The first 3km is a bit challenging but will all be forgotten when you're riding down the escarpment. Includes a picnic lunch at Blackbird Pie Co., just steps from the launching point for your gentle 1 hour paddle down the winding Beaver River. Return to the Village via the Georgian Trail along the shoreline of Georgian Bay. For more information on dates and prices visit ApplePieTrail.ca.

Please Note: A hybrid bike is recommended for this trail as it is a combination of quiet roads and stone

Start: Fisher Fields Park, Collingwood

North Simcoe Rail Trail Difficulty: Easy

Length: 47 km (each way) Start: Pinegrove Road near Hwy 90 or Phelpston roadside parking

The North Simcoe Rail Trail follows the route of the North Simcoe Railway, which was built in 1878 and primarily served lumber business on Georgian Bay. The trail now offers stunning views over the Minesing Swamp and the Mayer's Marsh, both excellent birding spots or check historic Fort Willow, and its Nine Mile Portage Hertiage Festival every September. The trail connects to the Tiny Trail in the north, and with the Ganaraska Hiking Trail in the south.

R

Badjeros Loop (clockwise)

Difficulty: Advanced Length: 85 km

Start: Fisher Fields Park, Collingwood Known for it's challenging climbs and scenic landscape, the Badjeros Loop was designed for the advanced rider looking to test their abilities. The start is flat until you cross County Road 91, after which you have a series of rolling climbs to the top with a great view over Georgian Bay and then a steep drop into Creemore, a very pretty town with great cafes, restaurants and galleries. Riders then pass through the quaint town of Dunedin before taking the long and challenging climb up to Maple Valley and Highway 124. Enjoy the view of Mennonite country, riding through Mennonite farms and churches, before you head down Pretty River Valley Road and back in to Collingwood.

Please Note: There is a slight jog to cross Highway 124 - be careful since the cars do travel at higher speeds on that road. Also, Pretty River Valley Road is one of the most fun descents in the area with lots of twists and turns down this undulating road.



Elmvale 'Bakery' Extension

Difficulty: Moderate Length: 37 km Start: Wasaga Beach RecPlex - 1724 Mosley Street

If you have a sweet tooth Elmvale is the place – home to the 2nd largest Maple syrup festival in Ontario and a fabulous bakery downtown. This route extends the Iron Bridge route through moderately flat terrain and small valleys, which will take you to downtown Elmvale to grab something sweet mid ride. Just outside of town fill up your water bottles from a fresh water spring. Please use caution on the stretch of road leaving the spring, as this can be a busy .5km section of HWY until you turn off on Flos Rd 11 W . This route also connects to the "Ontario Lake County" cycling routes if you would like to explore other areas of Simcoe County. With a full belly and full bottle of spring water its just rolling hills, farm fields and views of the Niagara Escarpment back to Wasaga Beach for your Après ride Swim!!

PEDAL PADDLE THE BLUE MOUNTAINS

Collingwood







INGWOOD



luemountainvillage.ca/

Local Bicycle Repair Shops

Collingwood, ON

Kamikaze Bikes - (705) 446-1234 Little Ed's Ski & Bike Shop - (705) 444-5488 Squire John's - (705) 445-1130 Skiis and Biikes - (877) 405-7547

Local Bicycle Rentals and Services

Blue Mountain Resort - (877) 445-0231 Kamikaze Bikes - (705) 446-1234 Squire John's - (705) 445-1130 Ride Guides - (705) 241-9938 Ride On Bikes - (519) 538-5030

Local Clubs

GET YOUR RIDE ON

wona

Ellectra portación

ain

Collingwood Cycling Club www.collingwoodcyclingclub.ca

Upcoming Events

Simcoe County is home to many great events and festivals which take place throughout the year. Whether you are looking to soak up the local culture or test your abilities in a cycling challenge, Simcoe County has something for you and your family.

For a complete listing of cycling events, please visit cyclesimcoe.ca/events. For other events, visit www.visitsouthgeorgianbay.ca.

ach is just the begi

Beach

Come leave your footprints in the sand!

www.wasagabeach.com

SHANTI

COLLINGWOOD

"From Farm to Cup

esh . Locally Roasted . Direct Trade . Single Origin . Estate

Collingwood Ashanti Café offers you the finest coffee from Ashanti Coffee Plantation in Zimbabwe, Africa. We also serve delicious sandwiches, wraps, soups and sweer















Automated Speed Limit Guidelines FORM A - Automated Speed Limit Guidelines Spreadsheet

Version: 10-Apr-09

Nam	e of Corridor:	Watson Road						
Segment Evaluated: 40km Zone		to RRX						
Geographic Region: Ontario								
Roa	d Agency:	Township of Puslinc	h					
Roa	d Classification:	Collector	ler		h of Corridor:		4,200	m
Urba	an / Rural:	Rural		Design Speed: (Required for Freeway, Expressway, Highway) Current Posted Speed:		Required for Freeway,	80	km/h
Divid						y) beed:	80	lum/h
				(For infor Prevaili	mation only) ng Speed:)	00	KIII/II
Majo # Thr	or / Minor:	Major		(85th Per	centile - for	information only)	80	km/h
Per D	Direction:	1 lane		(Maximur	n Posted Sp	beed)	80	km/h
			RISK	Score				
A1	GEOMETR	Y (Horizontal)	Lower	2				
A2	GEOMET	RY (Vertical)	Medium	4				
A3	A3 AVERAGE LANE WIDTH		Medium	2			Total Risk Score:	
в	B ROADSIDE HAZARDS		Medium	6			31	
C1 PEDESTRIAN EXPOSURE		Higher	3				-4	
C2 CYCLIST EXPOSURE		Higher	3					
D PAVEMENT SURFACE		Lower	3			Recommended Posted Speed Limit (km/h):		
	NUMBER OF INTERSECTIONS WITH PUBLIC ROADS		Number of Occurrences			As	determined by road character	istics
	STOF	controlled intersection	2				70]
- 4		Signalized intersection	0				10	
E1	Rou	ndabout or traffic circle	0	2			As determined by policy	-
		Crosswalk	0	-			80	
	Active, at-grade railroad crossing Sidestreet STOP-controlled or lane		0	-				
			0			The recommen	nded posted speed limit may be	
NUMBER OF INTERSECTIONS		NTERSECTIONS CCESS DRIVEWAYS	Number of Occurrences	_		roadway and t	ist the prevailing speeds of the he road's safety performance.	
E2	E2 Left turn movements		45	5	Con	nments:		
Right-in / Right-out on		Right-in / Right-out only						
E3	E3 NUMBER OF INTERCHANGES Number of Occurrences Number of interchanges along corridor 0		Number of Occurrences	0				
			0					
F	ON-STREE		Lower	1				



Automated Speed Limit Guidelines FORM A - Automated Speed Limit Guidelines Spreadsheet

Version: 10-Apr-09

Nam	e of Corridor:	Watson Road							
Segment Evaluated: Maltby Rd		to Hume Rd							
Geographic Region: Ontario									
Roa	d Agency:	Township of Puslinc	h						
Roa	d Classification:	Collector		Length of Corridor:		or:	2,100	m	
Urba	an / Rural:	Rural	Design Spe		Spee	Speed: (Required for Freeway,		80	km/h
Divid	ded / Undivided:	Undivided	Expressway, H Current Post		[,] ay, Highway) Posted Speed:) eed:	80	km/h
Maic	or / Minor:	Maior		(For information Prevailing Sp		mation only) ng Speed:		80	km/h
# Thr	ough Lanes			(85th Percentile - for information only) Policy:		nformation only)	80	lung /b	
Per D	Direction:	Tiane		(Maximur	n Poste	ed Spe	eed)	80	кm/n
			RISK	Score					
A1	GEOMETR	Y (Horizontal)	Lower	2					
A2	A2 GEOMETRY (Vertical)		Medium	4					
A3	A3 AVERAGE LANE WIDTH		Medium	2				Total Risk Score:	
в	B ROADSIDE HAZARDS		Medium	6				29	
C1	C1 PEDESTRIAN EXPOSURE		Higher	3					-
C2	C2 CYCLIST EXPOSURE		Higher	3					
D	D PAVEMENT SURFACE		Lower	3				Recommended Posted Speed Limit (km/h):	
	NUMBER OF INTERSECTIONS WITH PUBLIC ROADS		Number of Occurrences				As	determined by road character	istics
	STOP controlled intersection		0					70	
- 4	Signalized intersection		0	0				10	
E1	E1 Roundabout or traffic circle		0	0				As determined by policy	-
	Crosswalk		0					80	
	Active, at-grade railroad crossing		0						J
	Sidestreet STOP-controlled or lane		0				The recommer	nded posted speed limit may be	
	NUMBER OF INTERSECTIONS WITH PRIVATE ACCESS DRIVEWAYS		Number of Occurrences	_			checked again roadway and tl	ist the prevailing speeds of the he road's safety performance.	
E2	E2 Left turn movements permitted		20	5	(Com	ments:		
Right-in / Right-out only									
E3	NUMBER OF INTERCHANGES		Number of Occurrences	0					
	Number of inter	changes along corridor	0						
F	ON-STREE		Lower	1					

Friday, April. 1, 2016 Dear Puslinch Optimists Saco mu SUDU o fo therink 19 Feally SKat \langle P ate SO ne US cate unity a Cat O GI P Kating is nV X 1 7 days IANKS ncerly ackenzie

Friday, April, 1, 201 TO' Puslinda optimists/Township n for 1ett M UNV herad M . aves beim SIMO P Sincere Georgia 0

Ô Ô Ö O Ő Ö Ô FMB2+12014191. 0157 2016 to Ruslikch optimists/township hants I an so happy that you let us do this, I am so exerted that you put all the pffort the to this just for us. 1Kp cleaning the ice and checking the re before we go on the 1ce. AND because of You now I thow to Skate. So that's a 619 thanks to You! from Jogh O

Friday, April, 1.201 fimists/ town Ship To: Puslinch F ing S C ating rin 0 of exercise. 1+ even earned how -un, miss at Vate 05 nele. Ja 260 00 ou

Friday april 1,2016 To: Pustinch Optimist's + ownship tor let ting ususe 0 muc Veally like SKatiby Because e get hank ibu P. Tha a SKattha 0 VP teacher. I ana So Skating Because of you guys, SME You gu) 15 are

Frida YAP 2015 h Í n Marcus

Friday April 1,2016 To: pustinch optimists/ Township FOR m 64 S0000 givina Gar free. Ju I Ican Te. 00 VD O Agin For Leting US Kating ring K ! @ los s agin save ne 51 aleen

APrilil to: Puslipch optimists to Wnship Thank you so much for left is voas vour ice rink. Now F'S I could learn how to state. fan to skate because it 9 IVES figre stating Von exisise. Ido and it's tan to skater. YOU gys are the best !!! From Jessica

Friday, April 1, 2016 TOPuslinch optimists Town ship Thank you for the free ice this year. time and effect into VOUC any people lped Jom ndvou to Skote And 12m 1:pt aetingo and uch Funtorme indvou. hank for so much ice this ye davin rack San

FridaysApril122 1545 00 1 so we Se.A r'e e W 5 K State A150 how er kh an People MR 1 to P From's Chlore nists/township Toppistin Q Q \mathcal{O}

-C

FIL Pasilinch optimist / town sh 10. 6 1: ē. t widood 0

Eriday April n l P P an P 6 From Reber

Friday, April 1,20 ptimists/Township To Puslinc P De

Friday APril 1, 2016 To: Puslinch optimists/town ship Dear puslingh optimists. Thank you so much for leting us every year for leting us use your rink. I'm thanking you guy's for a bunch of reasons. When you let us use the rink it let's us get to miss two periodes. And we get exercise You guy are amazeino. From oliver

Eriday, April 1, 2016 To Pushlinch Optimists/township Thanks for letting us skate on your rink it was really fun to gave me lots of exercise it is awe some hocker and be on to + was a goal oppor ICP. to have fundal

Friday, April 1, 2010; to: puslinch optmists township nkyou for leting us skate on the ink, this year, I't help's usalot We do not no how to skate. Some people donot play hocey and don't get oskate so much everyyear. Italle us more time to spend time Wi ur friend's and skatewithth 00 rom. Samuel

Ministry of Municipal Affairs and Housing Municipal Services Division 777 Bay Street - 16th Floor Toronto ON M5G 2E5 Telephone: 416 585-6429 Fax: 416 585-6445	Ministère des Affaires municipales et du Logement Division des services aux municipalités 777, rue Bay, 16 [®] étage Toronto ON M5G 2E5 Téléphone : 416 585-6429 Télécopieur : 416 585-6445	Ontario
April 22, 2016		I.G.# /
MEMORANDUM TO:	Municipal Chief Administrative Officers, Clerks Service Managers	s and
SUBJECT:	Proclamation of the <i>Infrastructure for Jobs & P</i> 2015	Prosperity Act,

I am writing to you on behalf of the Ministry of Economic Development, Employment and Infrastructure to advise you that the *Infrastructure for Jobs and Prosperity Act, 2015* will be proclaimed on May 1, 2016. The purpose of the Act is to establish mechanisms to encourage principled, evidence-based and strategic long-term infrastructure planning that supports job creation and training opportunities, economic growth, protection of the environment and design excellence.

Upon proclamation, the Government and Broader Public Sector entities covered by the Act will be required to consider statutory infrastructure planning principles when making infrastructure-related decisions.

Attached as Appendix A are the principles that planning and investment decisions should take into account. These include:

- 1. A long-term view as well as demographic and economic trends
- 2. Applicable budgets and fiscal plans
- 3. Clearly identified priorities
- 4. Continuation of the provision of core public services
- 5. Promotion of economic competitiveness, productivity, job creation and training
- 6. Ensuring health and safety of infrastructure workers
- 7. Opportunities to foster innovation
- 8. Evidence-based and transparent decisions
- 9. Existing plans and strategies such as policy statements and transportation plans
- 10. Promotion of accessibility for persons with disabilities
- 11. Designs that minimize environmental impact and are resilient to climate change
- 12. Use of acceptable recycled aggregates
- 13. Promotion of community benefits

As a matter of best practice, many entities are likely already considering these principles. Proclamation of the Act will formalize these requirements, making their application more consistent across entities in a manner appropriate to each entity's context.

The legislation does not immediately introduce any new formal reporting requirements. However, each entity is responsible to meet the legislated requirements and should be prepared to demonstrate compliance, if required.

Note: this memo should not be relied upon as a substitute for specialized legal or professional advice in connection with activities and decisions pertaining to infrastructure planning and investment. Independent legal or professional advice should be obtained when determining the interpretation and application of the Infrastructure for Jobs and Prosperity Act, 2015. Responsibility for decisions remains with the recipients of this letter.

If you have any questions or require further information, please contact your Municipal Services Office at 519-873-4020 or toll-free at 1-800-265-4736.

Your continued support is greatly appreciated.

Sincerely,

typut He

Elizabeth Harding Assistant Deputy Minister Municipal Services Division

Attachment

Appendix A

Infrastructure Planning Principles as provided for in the Infrastructure for Jobs and Prosperity Act, 2015

Principles

The Government, and every broader public sector entity, shall consider the following principles when making decisions respecting infrastructure:

1. Infrastructure planning and investment should take a long-term view, and decision-makers should take into account the needs of Ontarians by being mindful of, among other things, demographic and economic trends in Ontario.

2. Infrastructure planning and investment should take into account any applicable budgets or fiscal plans, such as fiscal plans released under the *Fiscal Transparency and Accountability Act, 2004* and budgets adopted under Part VII of the *Municipal Act, 2001* or Part VII of the *City of Toronto Act, 2006*.

3. Infrastructure priorities should be clearly identified in order to better inform investment decisions respecting infrastructure.

4. Infrastructure planning and investment should ensure the continued provision of core public services, such as health care and education.

5. Infrastructure planning and investment should promote economic competitiveness, productivity, job creation and training opportunities.

6. Infrastructure planning and investment should ensure that the health and safety of workers involved in the construction and maintenance of infrastructure assets is protected.

7. Infrastructure planning and investment should foster innovation by creating opportunities to make use of innovative technologies, services and practices, particularly where doing so would utilize technology, techniques and practices developed in Ontario.

8. Infrastructure planning and investment should be evidence based and transparent, and, subject to any restrictions or prohibitions under an Act or otherwise by law on the collection, use or disclosure of information,

i. investment decisions respecting infrastructure should be made on the basis of information that is either publicly available or is made available to the public, and

ii. information with implications for infrastructure planning should be

shared between the Government and broader public sector entities, and should factor into investment decisions respecting infrastructure.

9. Where provincial or municipal plans or strategies have been established in Ontario, under an Act or otherwise, but do not bind or apply to the Government or the broader public sector entity, as the case may be, the Government or broader public sector entity should nevertheless be mindful of those plans and strategies and make investment decisions respecting infrastructure that support them, to the extent that they are relevant. Examples of plans and strategies to which this paragraph may apply include,

i. policy statements issued under section 3 of the *Planning Act*, and provincial plans as defined by that Act,

ii. municipal water sustainability plans submitted under the *Water Opportunities Act, 2010*,

iii. the Lake Simcoe Protection Plan established under the *Lake Simcoe Protection Act, 2008*, and

iv. transportation plans adopted under the Metrolinx Act, 2006.

10. Infrastructure planning and investment should promote accessibility for persons with disabilities.

11. Infrastructure planning and investment should minimize the impact of infrastructure on the environment and respect and help maintain ecological and biological diversity, and infrastructure should be designed to be resilient to the effects of climate change.

12. Infrastructure planning and investment should endeavour to make use of acceptable recycled aggregates.

13. Infrastructure planning and investment should promote community benefits, being the supplementary social and economic benefits arising from an infrastructure project that are intended to improve the well-being of a community affected by the project, such as local job creation and training opportunities (including for apprentices, within the meaning of section 9), improvement of public space within the community, and any specific benefits identified by the community.

14. Any other principles that may be prescribed for the Government or the broader public sector entity, as the case may be.

Ø	COUNCIL RESOLUTION	(#11)
		Res: 2016-07.11
/	Wednesday April 13 th , 2016	
1A-1	2.6	
Moved by:	ALL.	
Seconded by:	Hent	
WHEREAS Invenergy was awarded	a contract for the Strong Breeze Wind Project	despite the fact that the Counci

WHEREAS Invenergy was awarded a contract for the Strong Breeze Wind Project despite the fact that the Council of the Municipality of Dutton Dunwich surveyed the community as to whether its citizens were in favour or opposed to having an IWT project, and 84% of respondents stated they were not in favour;

AND WHEREAS Invenergy was awarded a contract for the Strong Breeze Wind Project despite the lack of municipal support;

AND WHEREAS Invenergy was awarded a contract for the Strong Breeze Wind Project with support from six Ontario First Nations communities, none of which are local First Nation Bands, and some of which are 1,000 km away from Dutton Dunwich.

THEREFORE BE IT RESOLVED THAT the Council of the Municipality of Dutton Dunwich requests:

- 1. That the "Municipal Support Resolution" becomes a mandatory requirement in the IESO process;
- 2. That any points for Aboriginal participation in a given power project be limited to the First Nation who has a comprehensive claim on the land where the project will be built;
- 3. That any announcement of the successful bidders includes an explanation of the points awarded to each bid.
- 4. AND THAT this resolution be forwarded to the Chair of the Board & President of IESO, the Minister of Energy, Elgin-Middlesex-London MPP Jeff Yurek, AMO and all municipalities within the Province. And Invited Head Y.

×	Recorded Vote	Yeas	Nays
ĥ	I.Fleck	<u> </u>	
	D. McKillop	J 	-
1	M. Hentz	1	_
	B. Purcell	1	
	C. McWilliam - Ma	yor 1	

Carried:

Mayor

G #

Defeated:

Mayor

The Corporation of NORTH ST RESOI	the Township of ORMONT UTION	Date: April 12, 2016 Resolution No. <u>609</u>	Port 1
MOVED BY: Deputy Mayor Bill McGimpsey Councillor Jim Wert Councillor François Landry Councillor Randy Douglas	190.# 4 	SECONDED BY: Deputy Mayor Bill McGimpsey Councillor Jim Wert Councillor François Landry Councillor Randy Douglas	

WHEREAS the OEB file EB-2015-0179 (dated July 23, 2015) application and pre-filed evidence from Union Gas Limited is seeking approval of its proposed Community Expansion Program with intent to support the expansion of infrastructure necessary to provide natural gas to communities that would otherwise not receive natural gas service (Rural areas);

WHEREAS the Ontario Energy Board issued a Notice for Public Hearing **EB-2016-004** (dated January 2016) regarding OEB's intent to review the following issues in May 2016:

- 1. Should the OEB implement new ratemaking mechanisms including changes to current economic tests to encourage utilities to expand natural gas distribution service to new communities? If so, what should these new mechanisms be?
- 2. Should the OEB consider imposing conditions or making other changes to Municipal Franchise Agreements and Certificates of Public Convenience and Necessity to reduce barriers to natural gas expansion?
- 3. Does the OEB have the authority to require the ratepayers of one utility to subsidize the costs of another utility to expand into new communities? If so, under what circumstances (if any) would this be appropriate?

WHEREAS the Eastern Ontario Warden's Caucus's letter of comment (dated April 6, 2016) regarding the Ontario Energy Board's Generic Proceeding EB-2016-004 with intent for the Warden Caucus to support the initial application from Union Gas (EB-2015-0179) and also similar entities that wish to expand natural gas service to rural and remote communities;

WHEREAS the Township of North Stormont has signed a 20 year Franchise Agreement with Enbridge and has attempt many communications with them to have natural gas service in the WESt part of our Township without any responses or actions being taken by Enbridge;

Recorded Vote:	AGAINST
CARRIED: Jemmis Rfs Mayor	DEFEATED:
Declaration of Conflict of interest:	
 Disclosed His/Her/Their interest Vacated His/Her/Their Seat Deferred 	CAO/Cler



The Corporation of the Township of NORTH STORMONT RESOLUTION

Date: April 12, 2016

Part 2

Resolution No. 609

WOVED BY: Deputy Mayor Bill McGimpsey

Councillor Jim Wert Councillor François Landry Councillor Randy Douglas

SECONDED BY:

Deputy Mayor Bill McGimpsey	۵
Councillor Jim Wert	
Councillor François Landry	0
Councillor Randy Douglas	V

WHEREAS the West part of the Township of North Stormont is being served by Union Gas and that the separation is even made on the West side of a road (serviced by Union Gas) versus the East side of the same road (unserved by Enbridge);

WHEREAS the Township of North Stormont made representation with Union Gas to endeavor possible development of the natural gas services on the East side of the Township;

THEREFORE BE IT RESOLVED by the Council of Township of North Stormont that the OEB examine the proposal to expand natural gas services and make it available to all of Eastern Ontario rural areas such as the United Counties of Stormont, Dundas & Glengarry and the United Counties of Prescott-Russell as it is vital to our Economic Development and to Business expansion and retention as well as the increase of employability in our sector.

AND BE IT ALSO RESOLED THAT this resolution supports the letter of comment sent to the Ontario Energy Board by the Eastern Ontario Warden's Caucus.

AND BE IT FURTHER RESOLVED THAT this resolution be circulated to all municipal and regional councils in Ontario requesting that they endorse and support this resolution and communicate their support to the Premier, the OEB and the Ministers of Economic Development, Employment and Infrastructure, Energy, and Agriculture and Rural Affairs.

Passed by the Council of the Township of North Stormont on April 12, 2016

FOR Recorded Vote:	AGAINST
CARRIED: Demon Afe Mayor Declaration of Conflict of interest:	DEFEATED:
 Disclosed His/Her/Their interest Vacated His/Her/Their Seat Deferred 	CAO/Clerk



c/o County of Renfrew, 9 International Drive, Pembroke, ON K8A 6W5

Pembroke, April 6, 2016

Kirsten Walli, Board Secretary Ontario Energy Board 2300 Yonge St. PO Box 2319 Toronto, Ontario M4P 1E4

Re: Ontario Energy Board Generic Proceeding EB-2016-004

Dear Ms. Walli,

Regarding the Ontario Energy Board's Generic Proceeding EB-2016-004, the Eastern Ontario Wardens' Caucus would like to provide the following submission as a letter of comment.

As an organization representing the interests of municipal taxpayers in rural Eastern Ontario, the EOWC supports the initial application from Union Gas (EB-2015-0179) to expand natural gas service to rural and remote communities. Beyond that, however, the EOWC also supports any similar efforts from other entities, such as Enbridge Gas, that wish to provide natural gas services to rural and remote communities that do not currently have access to such services.

The expansion of the infrastructure required to provide natural gas to rural communities that would otherwise not receive this service would allow for significant economic benefits for every sector: residential, commercial and industrial. Natural gas is the most reliable, efficient, and economical form of energy, but due to the dispersed nature of our population – coupled with our geography and geology – many areas remain underserviced or are simply not serviced at all.

As the economic development of our region is a priority issue, the expansion of the natural gas network is of great importance to everyone who lives and does business in rural Eastern Ontario. If certain conditions were put into place, such as those being considered by the Ontario Energy Board, it may become financially feasible to extend natural gas to the EOWC region.

The EOWC is an incorporated non-profit organization comprised of the elected Wardens of the 13 County Councils in rural Eastern Ontario, stretching from Northumberland in the west to the Quebec border in the east, with a combined population of 750,000. In closing, on behalf of the EOWC, I strongly encourage the Board to consider and approve any measures raised in the Generic Proceeding EB-2016-004 that may allow for the provision of natural gas in our region.

Best regards,

Stell

Peter Emon Chair, 2016, Eastern Ontario Wardens' Caucus

ONTARIO ENERGY BOARD NOTICE

The Ontario Energy Board is holding a hearing to consider what mechanisms may be used to recover the costs of expanding natural gas service to Ontario communities that are currently not served.

Learn more. Have your say.

The Ontario Energy Board is commencing a hearing on its own motion to consider what mechanisms may be used to recover the costs of expanding natural gas service to Ontario communities that do not currently have access to natural gas.

In July 2015, Union Gas Limited filed an application (EB-2015-0179) to expand natural gas service to certain rural and remote communities. That application included a proposal to have existing Union Gas Limited customers pay a portion of the costs to connect new customers. The Ontario Energy Board has determined that the requests made by Union Gas Limited in that application raise issues that may be common to any entity that wishes to provide natural gas service to communities that do not currently have access to natural gas service. The Ontario Energy Board will therefore address these issues through a generic proceeding.

The Ontario Energy Board will put the hearing of Union Gas Limited's application (EB-2015-0179) on hold until the generic hearing is complete.

In the generic proceeding, the Ontario Energy Board will consider possible alternative ratemaking frameworks to provide natural gas service to Ontario communities that do not currently have access to natural gas. The OEB plans to seek input from intervenors on exactly what the issues should be. However, broadly speaking the OEB intends to review the following issues:

- Should the OEB implement new ratemaking mechanisms including changes to current economic tests to encourage utilities to expand natural gas distribution service to new communities? If so, what should these new mechanisms be?
- 2. Should the OEB consider imposing conditions or making other changes to Municipal Franchise Agreements and Certificates of Public Convenience and Necessity to reduce barriers to natural gas expansion?
- 3. Does the OEB have the authority to require the ratepayers of one utility to subsidize the costs of another utility to expand into new communities? If so, under what circumstances (if any) would this be appropriate?

To see the detailed draft issues list, please select the file number EB-2016-0004 on the OEB website: www.ontarioenergyboard.ca/notice

THE ONTARIO ENERGY BOARD IS HOLDING A PUBLIC HEARING

The Ontario Energy Board (OEB) will hold a public hearing to consider the kind of cost recovery mechanisms that may be appropriate for rural and remote community expansion projects in Ontario. We will hear arguments from parties involved in the process and will decide what, if any, new mechanisms are appropriate.

The OEB will adopt into the record of this proceeding, all evidence filed in EB-2015-0179 that is relevant to the issues to be determined for the generic hearing. The OEB will provide an opportunity for the filing of further evidence in subsequent procedural orders.

The OEB will deem the intervenors in the EB-2015-0179 case to be intervenors in this generic hearing and grants to any such intervenors the same cost eligibility status as was granted in EB-2015-0179.

The OEB is an independent and impartial public agency. We make decisions that serve the public interest. Our goal is to promote a financially viable and efficient energy sector that provides you with reliable energy services at a reasonable cost.

BE INFORMED AND HAVE YOUR SAY

You have the right to information regarding this application and to be involved in the process.

- You can review this Notice and related documents on the OEB's website now.
- You can sign up to observe the proceeding by receiving OEB documents related to the hearing.
- . You can file a letter with your comments which will be considered during the hearing.
- You can become an active participant (called an intervenor). Apply by February 22, 2016 or the hearing will go ahead without you and you will not receive any further notice of the proceeding.
- · At the end of the process, you can review the OEB's decision and its reasons on our website.

LEARN MORE

Our file number for this case is EB-2016-0004. To learn more about this hearing, find instructions on how to file letters or become an intervenor, or to access any document related to this case (including the draft issues list), please select the file number EB-2016-0004 from the list on the OEB website at www.ontarloenergyboard.ca/notice. You can also phone our Consumer Belations Centre at 1-877-632-2727 with any questions.

ORAL HEARING

The OEB intends to proceed with an oral hearing for this case.

PRIVACY

If you write a letter of comment, your name and the content of your letter will be put on the public record and the OEB website. However, your personal telephone number, home address and email address will be removed. If you are a business, all your information will remain public. If you apply to become an intervenor, all information will be public.

This hearing will be held under sections 19 and 36 of the Ontario Energy Board Act, 1998.



Ontano Energy: Commission de Lenergie Bolica de l'Ontang



IG #

April 13, 2016

All Municipalities Via Email

Attention: All Municipalities within Ontario

Dear Clerks:

Re: Independent Electrical System Operator Review of Request for Proposal Process for the Award of Renewable Energy Contracts

Please be advised the Council of the Corporation of the Township of North Frontenac passed the following Resolution at the March 18, 2016 Council Meeting: Moved by Councillor Good, Seconded by Councillor Inglis #155-16 WHEREAS the Independent Electrical System Operator has requested input on the RFP process used to award renewable energy contracts;

AND WHEREAS the government indicated that new contracts would be directed to willing host communities with the Minister of Energy indicating on March 7 that it would be 'almost impossible' for a contract to be granted under the current process without municipal agreement;

AND WHEREAS three of the five contracts announced on March 10 2016 did not have municipal support for the project;

AND WHEREAS the current process does not meet the government's standards for openness and transparency because municipal Councils are asked to support power projects based on little or no detail and further, the recipient municipalities are unable to determine the basis on which individual contracts were awarded;

AND WHEREAS the province has not demonstrated that renewable energy projects are of sufficient strategic importance in meeting Ontario's electricity generation requirements and/or carbon emission reduction targets to warrant the province taking action to override municipal decisions;
THEREFORE BE IT RESOLVED THAT the Council of the Township of North Frontenac requests:

- 1. That the Municipal Support Resolution become a mandatory requirement in the IESO process;
- 2. That the rules be amended to require that the resolution related to this support must be considered in an open Council meeting held after the community engagement meeting organized by the proponent;
- 3. That full details of the project, including siting of project elements and site consideration reports, are required to be made available at the community engagement meeting and to the Council before the resolution is considered:
- 4. That the terms of any municipal agreement related to the project also need be discussed In open Council and that such agreements cannot contain terms that limit the municipality's ability to exercise Municipal Act powers relative to the project;
- 5. That the process includes the requirement for the municipality to provide comments on the project directly to the IESO;
- 6. That any points for Aboriginal participation in a given power project be limited to the First Nation who has a comprehensive claim on the land where the project will be built;
- 7. That any announcement of the successful bidders includes an explanation of the points awarded to each bid.

AND THAT this Resolution be provided to the President of IESO; Minister of Energy; All Municipalities within the Province; Randy Hillier, MPP; and AMO.

AND THAT the Mayor is authorized to do a press release. Carried

Please provide the Resolution to your Council for consideration of the request for support.

If you have any questions or concerns, please do not hesitate to contact me.

Yours truly,

Tara mieske

Tara Mieske Clerk/Planning Manager TM/bh



14 Mill Avenue PO Box 250 ZURICH ON N0M 2T0 519-236-4351 or 519-565-5212 Fax: 519-236-4329 www.municipalityofbluewater.ca

February 19, 2016

Kathleen Wynne, Premier of Ontario VIA – Email

Dear Premier Wynne,

Please be advised that the Council of the Municipality of Bluewater passed the following motion at their Council meeting on February 16, 2016:

Moved by Councillor Zimmerman, seconded by Councillor Hill that:

Whereas Ontario's growing and aging population is putting an increasing strain on our publicly-funded health care system;

And Whereas since February 2015, the Ontario government has made an almost 7% unilateral cut to physician services expenditures which cover all the care doctors provide to patients – including cuts to programs which are specifically designed to act as incentives for physicians to practice in rural areas:

And Whereas the decisions Ontario makes today will impact patients' access to quality care in the years to come and these cuts will threaten access to the quality, patient-focused care Ontarians need and expect:

And Whereas Ontario in experiencing a growing rural population as retirees move to the countryside;

And Whereas many rural municipalities in Ontario have formed physician recruitment and retention committees and strategies to deal with the reality of physician retirements and shortages;

And Whereas rural areas in Ontario are already at a distinct disadvantage in recruiting family physicians due to a number of factors;

Now Therefore Be It Resolved that the Council of the Municipality of Bluewater hereby requests that the Minister of Health and Long Term Care reinstate incentives for physicians to practice in rural areas of Ontario, and that the minister return to the table with Ontario's doctors and work together through mediation-arbitration to reach a fair deal that protects the quality, patient-focused care Ontario families deserve;

And Be It Further Resolved that copies of this resolution be sent to the Premier of Ontario, the federal and provincial Ministers of Health, the Ontario College of Physicians and Surgeons, and all municipalities in Ontario. Carried.

If you require any further information, please do not hesitate to contact me.

Kind Regards,

(farlew churlos)

Charlene Overholt Manager of Corporate Services/Clerk



TOWNSHIP OF WARWICK

"A Community in Action" 6332 Nauvoo Road, R.R. #8, Watford, ON N0M 2S0

 Township Office:
 (519)
 849-3926
 / 1-877-849-3926
 Works Department:
 (519)
 849-3923

 Watford Arena:
 (519)
 876-2808
 Fax:
 (519)
 849-6136

 Website:
 www.warwicktownship.ca
 E-mail:
 info@warwicktownship.ca

April 14, 2016

Dear Kathleen Wynne, Premier of Ontario VIA E-MAIL

RE: Physician Recruitment

Please be advised that at the regular Council meeting of April 11, 2016, Warwick Township Council approved the following resolution:

WHEREAS Warwick Township Council supports and endorses the Municipality of Bluewater's resolution dated February 16, 2016;

NOW THEREFORE BE IT RESOLVED THAT the Council of the Township of Warwick hereby requests that the Minister of Health and Long Term care reinstate incentives for physicians to practice in rural areas of Ontario, and that the minister return to the table with Ontario's doctors and work together through mediation-arbitration to reach a fair deal that protects the quality, patient-focused care Ontario families deserve;

AND THAT copies of this resolution be sent to the Premier of Ontario, the federal and provincial Ministers of Health, the Ontario College of Physicians and Surgeons and all municipalities in Ontario.

- Carried.

A copy of the resolution approved by the Municipality of Bluewater is enclosed for your reference.

Kindest Regards,

A Abelul.

Amanda Gubbels Clerk/Deputy Administrator Township of Warwick

Donna Tremblay

From:	Minister of Labour (MOL) <ministeroflabour@ontario.ca></ministeroflabour@ontario.ca>	
Sent:	April-19-16 11:49 AM	
То:	Minister of Labour (MOL)	
Subject:	Letter from the Minister of Labour / Lettre du ministre du Travail	

Message from the Minister of Labour

I.G.# 7

I am proud to write today to inform your municipality that Bill 163, the *Supporting Ontario's First Responders Act, 2016,* has passed third reading and received Royal Assent on April 6, 2016. Municipalities across Ontario play a vital role in the delivery of emergency services. Consequently, it is important that municipalities are aware of this critical legislation to support Ontario's first responders.

Over the last decade there has been an increased awareness of the effects of post-traumatic stress disorder (PTSD). We know PTSD can be serious and debilitating, and that first responders are at least twice as likely as the general population to suffer from PTSD.

The Premier asked me to bring forward a plan that addressed prevention of and resiliency to PTSD, and she also asked that we create legislation that makes PTSD a workplace presumption for first responders. First responders put their lives at risk each and every day to keep all of us safe, and it's important we provide our first responders the same unconditional support they provide to us when we need them.

That's why I committed Ontario to becoming a leader in dealing with first-responder PTSD, and we know the solution lies with a comprehensive approach that includes both preventative and legislative measures. The *Supporting Ontario's First Responders Act, 2016* is a key component of that comprehensive strategy. It will provide a presumption that PTSD diagnosed in first responders is work-related, allowing for faster access to WSIB benefits, resources and the timely treatment needed to heal and return to work safely.

The specific groups covered under the PTSD presumption include:

- Police, including First Nations constables, and chiefs of police
- Firefighters (including part-time and volunteer firefighters), including those who are employed or who volunteer to provide fire protection services on a reserve, fire investigators, and fire chiefs
- Paramedics and emergency medical attendants, and ambulance service managers
- Workers involved in dispatching emergency services, including workers who play a role in the chain of communications which lead up to the dispatch for ambulance services, firefighters and police
- Correctional officers/youth services workers (including managers) and workers who provide direct health care services in adult institutional corrections and secure youth justice facilities
- Members of emergency response teams dispatched by a communications officer.

The Supporting Ontario's First Responders Act, 2016 also amends the Ministry of Labour Act to allow the Minister of Labour to collect information about an employer's plans to prevent PTSD and authorizes the Minister to publish those plans. Collecting this information is intended to encourage the development of prevention plans and assess progress in the prevention of PTSD in these workplaces. It will also serve to highlight gaps and inform future prevention initiatives.

I will formally direct certain employers to provide me with information on their workplace post-traumatic stress disorder prevention plans by April 23, 2017. This direction will be published in the *Ontario Gazette*, Volume 149, Issue 17, which will be available at <u>www.ontario.ca/search/ontario-gazette</u>. Additional information can also be found on the Ministry of Labour website at <u>www.labour.gov.on.ca/english/hs/ptsd.php</u>.

As your municipality is an employer or is responsible for employers of workers covered under the PTSD presumption, I am advising you of this direction and look forward to receiving information in a timely manner. You are able to determine an approach that reflects your local context, taking into consideration the ways that first responder services are delivered and supported locally. I would request that you forward this correspondence to any administrations that fall within your purview, so they are aware of the direction to submit information and are engaged in the process as appropriate.

Information about prevention plans should be submitted in electronic Word format to ptsdprevention@ontario.ca. When submission by this method is not possible, information can be mailed to the Ontario Ministry of Labour, Att: PTSD Prevention Plan, 400 University Avenue, 14th Floor, Toronto, ON, M7A 1T7. Resources to assist in the development of a prevention plan are available online as part of a free online toolkit (see the link below). Should you have any questions, please contact ministry staff at 416-325-4575.

These legislative amendments build on our previously announced PTSD prevention strategy, which includes:

- The creation of a radio and digital campaign aimed at increasing awareness about PTSD among first responders, their families and communities and eliminating the stigma that too often prevents those in need from seeking help
- An annual leadership summit to be hosted by the Minister of Labour to highlight best practices, recognize leaders, and monitor progress in preventing and addressing PTSD
- A free online toolkit at <u>www.firstrespondersfirst.ca</u> with resources on PTSD tailored to meet the needs of employers and each of the first responder sectors
- Grants for research that supports the prevention of PTSD.

We started on the prevention initiatives in March 2016 with the launch of the public radio and digital awareness campaign, as well as the free online toolkit.

Through the alignment of research, prevention and treatment efforts, Ontario will create a solid and coordinated set of resources to provide the support needed by the brave men and women who put their lives on the line in our time of greatest need. This is the beginning of a new way forward in preventing PTSD and providing support for our first responder community in Ontario. With your help, our government has put in place a strategy that will help protect our dedicated first responders who put themselves in harm's way to ensure our safety.

These changes will positively impact many lives across the province, and will provide our 73,000 first responders and their families some peace of mind.

Please accept my thanks for your support.

Sincerely,

[Original signed by]

Kevin Flynn Minister of Labour



Laurie Scott, MPP Haliburton-Kawartha Lakes-Brock

RECEIVED APR 1 1 2016 Township of Puslinch

Mayor Dennis Lever Township of Puslinch 7404 Wellington Rd 34 RR 3 Guelph, ON N1H 6H9

Queen's Park Office: Rm. 434, Main Legislative Bldg. Queen's Park Toronto, Ontario M7A 1A8

Tel. (416) 325-2771 Fax (416) 325-2904 E-mail: laurie.scott@pc.ola.org **Constituency Office:** 14 Lindsay St., North Lindsay, Ontario K9V 1T4

Tel. (705) 324-6654 1-800-424-2490 Fax (705) 324-6938 E-mail: laurie.scottco@pc.ola.org



Dear Mayor Lever,

I write to you today to ask you to support my efforts as MPP and PC Critic for Women's Issues, to call on the provincial government to take immediate steps to combat human trafficking in Ontario and to raise public awareness of this horrid crime.

Human trafficking is a heinous crime that has been referred to as nothing short of modern day slavery. It is one of the fastest growing crimes, and starts and stays in Canada - over 90 percent of victims are Canadian-born. Worse, Ontario is a major hub for human trafficking in Canada, as the proximity to cities along the Highway 401 corridor provides an accessible thoroughfare for traffickers, and the ability to keep victims isolated. Victims are lured over the internet, meaning that this crime is in our neighbourhoods, our communities and our towns.

Victims – predominantly girls averaging the age of 14, and shockingly as young as 11 – are lured into a nightmare that they can almost never escape on their own. Traffickers recruit, transport, harbour and control the girl next door for sexual exploitation or forced labour.

On February 18, 2016, the Legislative Assembly of Ontario unanimously supported Bill 158 on Second Reading, which aims to take immediate steps against human trafficking in Ontario.

The bill provides as follows:

- Declare February 22nd as Human Trafficking Awareness Day in Ontario;
- Allow for an application to be brought by a parent of a trafficking victim under the age of 18, a trafficking victim aged 18 or over or an authorized agent such as Covenant House to obtain a protection order from a judge to prohibit the trafficker from contacting or approaching the victim. Such an order would remain in place for a minimum of three years;

- Create a tort or civil action of human trafficking, allowing victims to sue their traffickers for damages and an accounting of profits; and
- Amend the definition of "sex offender" under *Christopher's Law (Sex Offender Registry)*, 2000 to include criminal offences for trafficking of victims under the age of 18 years.

In May of last year, I also received unanimous support for a motion asking the Government of Ontario to immediately create a provincial task force to combat human trafficking in Ontario.

The task force would have a similar structure and funding model to the Guns and Gangs Task Force. A multi-jurisdictional task force made up of specially-trained police officers, Crown prosecutors, judges, and frontline workers would coordinate information sharing, and collaboratively work to apprehend criminals and rescue victims. Training and education would also have to be specialized not only for law enforcement and the justice system, but for victims' services, health care workers, schools and businesses.

The task force was endorsed by the Select Committee on Sexual Violence and Harassment, which I had the honour of co-chairing.

The two recommendations are as follows:

57. The Ontario government provide resources for the development of a coordinated approach to help victims of human trafficking, allowing providers of support services and the criminal justice system to share information and work collaboratively.

58. The Ontario government develop a multi-ministerial, province-wide strategy on human trafficking.

Ontario is far behind other provinces when it comes to combatting human trafficking and taking significant action. For instance, in Manitoba, they have enacted legislation as far back as 2012, which has seen multiple victims rescued and traffickers put behind bars for breaching protection orders.

I ask that you and your council members consider putting forward a resolution to support the following attached draft resolution.

I look forward to your support.

Sincerely,

aurie

Laurie Scott, MPP Haliburton-Kawartha Lakes-Brock

Municipal Resolution on Anti-Human Trafficking Task Force and Bill 158, *Saving the Girl Next Door Act, 2016*

WHEREAS human trafficking is a heinous crime that has been referred to as modern day slavery; and

WHEREAS traffickers recruit, transport, harbour and control the girl next door for sexual exploitation or forced labour; and

WHEREAS it is one of the fastest growing crimes that starts and stays in Canada, targeting victims – 90 percent of which are Canadian-born and predominantly female, averaging the age of 14; and

WHEREAS Ontario is a major hub of human trafficking in Canada, and victims are lured, manipulated and coerced, often over the internet from every part of Ontario; and

WHEREAS human trafficking is in our neighbourhoods and our communities;

THEREFORE BE IT resolved that the Council of (name of municipality) support Bill 158, *Saving the Girl Next Door Act, 2016*, support MPP Laurie Scott's motion for a multi-jurisdictional and coordinated task force of law enforcement agencies, Crown prosecutors, judges, victims' services and frontline agencies; and

That a copy of this resolution be forwarded to all Members of Provincial Parliament and municipalities.

Donna Tremblay

From: Sent: To: Subject: Karen Landry April-26-16 8:46 AM Donna Tremblay FW: Resolution re Bill 158

For IG please

From: Kari Stevenson [mailto:KStevenson@trentlakes.ca] Sent: April-25-16 3:52 PM To: Kari Stevenson Subject: Resolution re Bill 158

Please be advised that Council adopted the following resolution at their Regular Meeting of April 19th, 2016.

Laurie Scott, MPP Re: Bill 158 - Human Trafficking

Resolution No. R2016-239

Moved by: Deputy Mayor Windover Seconded by: Councillor Persson

That Council receive the correspondence from Laurie Scott, MPP for Haliburton-Kawartha Lakes-Brock, regarding Bill 158 which aims to take immediate steps against human trafficking in Ontario; and further

That Council supports the following resolution:

Whereas human trafficking is a heinous crime that has been referred to as modern day slavery; and

Whereas traffickers recruit, transport, harbour and control the girl next door for sexual exploitation or forced labour; and

Whereas it is one of the fastest growing crimes that starts and stays in Canada, targeting victims - 90 percent of which are Canadian-born and predominantly female, averaging the age of 14; and

Whereas Ontario is a major hub of human trafficking in Canada, and victims are lured, manipulated and coerced, often over the internet from every part of Ontario; and

Whereas human trafficking is in our neigbourhoods and our communities;

Therefore be it resolved that the Council of the Municipality of Trent Lakes support Bill 158, Saving the Girl Next Door Act, 2016, support MPP Laurie Scott's motion for a multi-jurisdictional and coordinated task force of law enforcement agencies, Crown prosecutors, judges, victims' services and frontline agencies; and

That a copy of this resolution be forwarded to all Members of Provincial Parliament and municipalities.

Carried.

Kari Stevenson

1.0	G.#	9	

Acting Clerk/Planning Technician

kstevenson@trentlakes.ca

Tel: 705-738-3800 x 240 Fax: 705-738-3801 Toll Free: 800-374-4009

* Individuals who submit letters and other information to Council should be aware that any personal information contained within their communications may become part of the public record and may be made available to the public through the Council Agenda process.

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	PRESCOTT THE FORT TOWN	
I.G.# 0	Regular Council April 25, 2016	
	332016	Itym 12.5
Moved by:	MileOutole	(2 pages)
Seconded by:	Response	
WHEREAS human tr	rafficking is a heinous crime that has bee	en referred to as mode

WHEREAS human trafficking is a heinous crime that has been referred to as modern day slavery; and

WHEREAS traffickers recruit, transport, harbor, and control the girl next door for sexual exploitation or forced labour; and

WHEREAS it is one of the fastest growing crimes that starts and stays in Canada, targeting victims — 90 percent of which are Canadian-born and predominantly female, averaging the age of 14; and

WHEREAS Ontario is a major hub of human trafficking in Canada, and victims are lured, manipulated and coerced, often over the internet from every part of Ontario; and

WHEREAS human trafficking is in our neighbourhoods and our communities;

THEREFORE BE IT resolved that the Council of the Town of Prescott support Bill 158, Saving the Girl Next Door Act, 2016, support MPP Laurie Scott's motion for a multijurisdictional and coordinated task force of law enforcement agencies, Crown prosecutors, judges, victims' services and frontline agencies; and



That a copy of this resolution be forwarded to all Members of Provincial Parliament and municipalities.

		REQUESTED BY:		
		RECORDED VOTE	TE YES NO	
		Councillor Leanne Burton		
		Councillor Teresa Jansman		-
		Councillor Fraser Laschinger		
CARRIED:	V	Councillor Lee McConnell		
TABLED:		Councillor Mike Ostrander		
DEFEATED: Mayor Brett Todd				
RECORDED VOTE: Councillor Ray Young				

BRETT TODD, MAYOR	KIMBERLEY CASSELMAN, CLERK
issol	K.C.



APR 1 2 2015

Laurie Scott, MPP Haliburton-Kawartha Lakes-Brock Queen's Park Office: Rm. 434, Main Legislative Bldg. Queen's Park Toronto, Ontario M7A 1A8

Tel. (416) 325-2771 Fax (416) 325-2904 E-mail: laurie.scott@pc.ola.org Constituency Office: 14 Lindsay St., North Lindsay, Ontario K9V 1T4

Tel. (705) 324-6654 1-800-424-2490 Fax (705) 324-6938 E-mail: laurie.scottco@pc.ola.org

April 7, 2016

Mayor Brett Todd Town of Prescott 360 Dibble St. W, Box 160 Prescott, ON K0E 1T0

Dear Mayor Todd,

I write to you today to ask you to support my efforts as MPP and PC Critic for Women's Issues, to call on the provincial government to take immediate steps to combat human trafficking in Ontario and to raise public awareness of this horrid crime.

Human trafficking is a heinous crime that has been referred to as nothing short of modern day slavery. It is one of the fastest growing crimes, and starts and stays in Canada – over 90 percent of victims are Canadian-born. Worse, Ontario is a major hub for human trafficking in Canada, as the proximity to cities along the Highway 401 corridor provides an accessible thoroughfare for traffickers, and the ability to keep victims isolated. Victims are lured over the internet, meaning that this crime is in our neighbourhoods, our communities and our towns.

Victims – predominantly girls averaging the age of 14, and shockingly as young as 11 – are lured into a nightmare that they can almost never escape on their own. Traffickers recruit, transport, harbour and control the girl next door for sexual exploitation or forced labour.

On February 18, 2016, the Legislative Assembly of Ontario unanimously supported Bill 158 on Second Reading, which aims to take immediate steps against human trafficking in Ontario.

The bill provides as follows:

- Declare February 22nd as Human Trafficking Awareness Day in Ontario;
- Allow for an application to be brought by a parent of a trafficking victim under the age of 18, a trafficking victim aged 18 or over or an authorized agent such as Covenant House to obtain a protection order from a judge to prohibit the trafficker from contacting or approaching the victim. Such an order would remain in place for a minimum of three years;

- Create a tort or civil action of human trafficking, allowing victims to sue their traffickers for damages and an accounting of profits; and
- Amend the definition of "sex offender" under *Christopher's Law (Sex Offender Registry)*, 2000 to include criminal offences for trafficking of victims under the age of 18 years.

In May of last year, I also received unanimous support for a motion asking the Government of Ontario to immediately create a provincial task force to combat human trafficking in Ontario.

The task force would have a similar structure and funding model to the Guns and Gangs Task Force. A multi-jurisdictional task force made up of specially-trained police officers, Crown prosecutors, judges, and frontline workers would coordinate information sharing, and collaboratively work to apprehend criminals and rescue victims. Training and education would also have to be specialized not only for law enforcement and the justice system, but for victims' services, health care workers, schools and businesses.

The task force was endorsed by the Select Committee on Sexual Violence and Harassment, which I had the honour of co-chairing.

The two recommendations are as follows:

57. The Ontario government provide resources for the development of a coordinated approach to help victims of human trafficking, allowing providers of support services and the criminal justice system to share information and work collaboratively.

58. The Ontario government develop a multi-ministerial, province-wide strategy on human trafficking.

Ontario is far behind other provinces when it comes to combatting human trafficking and taking significant action. For instance, in Manitoba, they have enacted legislation as far back as 2012, which has seen multiple victims rescued and traffickers put behind bars for breaching protection orders.

I ask that you and your council members consider putting forward a resolution to support the following attached draft resolution.

I look forward to your support.

Sincerely,

Aurie

Laurie Scott, MPP Haliburton-Kawartha Lakes-Brock

Municipal Resolution on Anti-Human Trafficking Task Force and Bill 158, *Saving the Girl Next Door Act, 2016*

WHEREAS human trafficking is a heinous crime that has been referred to as modern day slavery; and

WHEREAS traffickers recruit, transport, harbour and control the girl next door for sexual exploitation or forced labour; and

WHEREAS it is one of the fastest growing crimes that starts and stays in Canada, targeting victims – 90 percent of which are Canadian-born and predominantly female, averaging the age of 14; and

WHEREAS Ontario is a major hub of human trafficking in Canada, and victims are lured, manipulated and coerced, often over the internet from every part of Ontario; and

WHEREAS human trafficking is in our neighbourhoods and our communities;

THEREFORE BE IT resolved that the Council of (name of municipality) support Bill 158, *Saving the Girl Next Door Act, 2016*, support MPP Laurie Scott's motion for a multijurisdictional and coordinated task force of law enforcement agencies, Crown prosecutors, judges, victims' services and frontline agencies; and

That a copy of this resolution be forwarded to all Members of Provincial Parliament and municipalities.



185667 Grey County Road 9 RR 1 Dundalk, Ontario NOC 1B0 Phone: 519-923-2110 ext. 230 Email: rmartell@southgate.ca www.southgate.ca Township of Southgate Clerk's Department

MEMORANDUM

DATE: April 25, 2016

FROM: Raylene Martell, Clerk

RE: Human Trafficking Resolution



Please be advised that the following motion was passed at the April 20, 2016 Council Meeting as a result of correspondence received from MPP Laurie Scott.

Moved by Mayor Fosbrooke, seconded by Councillor Gordon;

Whereas human trafficking is a heinous crime that has been referred to as modern day slavery; and

Whereas traffickers recruit, transport, harbour and control the girl next door for sexual exploitation or forced labour; and

Whereas it is one of the fastest growing crimes that starts and stays in Canada, targeting victims - 90 percent of which are Canadian-born and predominantly female, averaging the age of 14; and

Whereas Ontario is a major hub of human trafficking in Canada, and victims are lured, manipulated and coerced, often over the internet from every part of Ontario; and

Whereas human trafficking is in our neighbourhoods and our communities; **Therefore be it resolved that** the Council of the Township of Southgate support Bill 158, Saving the Girl Next Door Act, 2016, support MPP Laurie Scott's motion for a multijurisdictional and coordinated task force of law enforcement agencies, Crown prosecutors, judges, victims' services and frontline agencies; and

That a copy of this resolution be forwarded to all Members of Provincial Parliament and municipalities. **Carried.** No. 332-16

Thank-you,

Kaylenie Martel

Raylene Martell, Clerk

Attachment: Correspondence received from Laurie Scott, MPP

RECEIVED APR 1 1 2016



Laurie Scott, MPP Haliburton-Kawartha Lakes-Brock Queen's Park Office: Rm. 434. Main Legislative Bldg. Queen's Park Torento, Ontario M7A 1A8

Tel. (415) 325-2771 Fax (416) 325-2904 E-mail: laurie.scott@pc.ola.org Constituency Office: 14 Lindsay St., North Lindsay, Ontario K9V 1T4

Tel. (705) 324-6654 1-800-424-2490 Fax (705) 324-6938 E-mail: laurie scottco@pc.ola.org

April 7, 2016

Mayor Anna-Marie Fosbrooke Township of Southgate 185667 Grey Rd 9 RR 1 Dundalk, ON N0C 1B0

Dear Mayor Fosbrooke,

I write to you today to ask you to support my efforts as MPP and PC Critic for Women's Issues, to call on the provincial government to take immediate steps to combat human trafficking in Ontario and to raise public awareness of this horrid crime.

Human trafficking is a heinous crime that has been referred to as nothing short of modern day slavery. It is one of the fastest growing crimes, and starts and stays in Canada – over 90 percent of victims are Canadian-born. Worse, Ontario is a major hub for human trafficking in Canada, as the proximity to cities along the Highway 401 corridor provides an accessible thoroughfare for traffickers, and the ability to keep victims isolated. Victims are lured over the internet, meaning that this crime is in our neighbourhoods, our communities and our towns.

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1|

- Create a tort or civil action of human trafficking, allowing victims to sue their traffickers for damages and an accounting of profits; and
- Amend the definition of "sex offender" under *Christopher's Law (Sex Offender Registry)*, 2000 to include criminal offences for trafficking of victims under the age of 18 years.

In May of last year, I also received unanimous support for a motion asking the Government of Ontario to immediately create a provincial task force to combat human trafficking in Ontario.

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57. The Ontario government provide resources for the development of a coordinated approach to help victims of human trafficking, allowing providers of support services and the criminal justice system to share information and work collaboratively.

58. The Ontario government develop a multi-ministerial, province-wide strategy on human trafficking.

Ontario is far behind other provinces when it comes to combatting human trafficking and taking significant action. For instance, in Manitoba, they have enacted legislation as far back as 2012, which has seen multiple victims rescued and traffickers put behind bars for breaching protection orders.

I ask that you and your council members consider putting forward a resolution to support the following attached draft resolution.

I look forward to your support.

Sincerely,

Laurie Scott, MPP Haliburton-Kawartha Lakes-Brock

Municipal Resolution on Anti-Human Trafficking Task Force and Bill 158, *Saving the Girl Next Door Act, 2016*

WHEREAS human trafficking is a heinous crime that has been referred to as modern day slavery; and

WHEREAS traffickers recruit, transport, harbour and control the girl next door for sexual exploitation or forced labour; and

WHEREAS it is one of the fastest growing crimes that starts and stays in Canada, targeting victims – 90 percent of which are Canadian-born and predominantly female, averaging the age of 14; and

WHEREAS Ontario is a major hub of human trafficking in Canada, and victims are lured, manipulated and coerced, often over the internet from every part of Ontario; and

WHEREAS human trafficking is in our neighbourhoods and our communities;

THEREFORE BE IT resolved that the Council of (name of municipality) support Bill 158, *Saving the Girl Next Door Act, 2016*, support MPP Laurie Scott's motion for a multijurisdictional and coordinated task force of law enforcement agencies, Crown prosecutors, judges, victims' services and frontline agencies; and

That a copy of this resolution be forwarded to all Members of Provincial Parliament and municipalities.

GRCA Current



GRCA General Membership

The second se	
Chair	Helen Jowett
Vice-Chair	Chris White
Townships of Amara Garafraxa, Melancth gate and Town of Gr	anth, East ion and South- rand Valley Guy Gardhouse
Townships of Maple and Wellington Nor	ton th Pat Salter
Township of Centre	Wellington Kelly Linton
Town of Erin, Towns Guelph/Eramosa an	hips of d Puslinch Chris White
City of Guelph Bob Be	ll, Mike Salisbury
Region of Waterloo Les Armstrong, Sue Foxto Geoff Loren Joe Now Sandy Shanta	Elizabeth Clarke, on, Helen Jowett, tz, Jane Mitchell, vak, Wayne Roth, z, Warren Stauch
Municipality of Nor and Township of Pe	th Perth rth East George Wicke
Halton Region	Cindy Lunau
City of Hamilton G	eorge Stojanovic
Oxford County	Bruce Banbury
County of Brant Brian Colema	n, Shirley Simons
City of Brantford Dave Neumann	n, Vic Prendergast
Haldimand and Nor Bernie Corb	rfolk Counties ett, Fred Morison





Grassland for bobolinks in the central Grand

A developer is contributing \$65,000 to improve grassland habitat at the Morton property beside Pinehurst Lake.

The Morton property was purchased by the GRCA in 2009 with a plan to transform the farmland into many habitat communities, including grasslands.

The developer has approval from the Ontario Ministry of Natural Resources and Forestry to develop 8.5 hectares (21 acres) of land that contains habitat for bobolinks. This songbird is listed as threatened in the Ontario Endangered Species Act, and loss of breeding habitat is considered a significant factor in the population decline. Provincial regulations may permit a company to undertake a project only if an equivalent amount of habitat can be created within the same region.

The GRCA submitted a compensation proposal to host a grassland enhancement project at a higher ratio than the habitat that was being lost. An agreement is being signed by the developer and the GRCA to improve 13.3 hectares (33 acres) of habitat that will support bobolink and other grassland species.

The developer is paying the full cost of the project for five years. This will include control of invasive species, prescribed burns and seeding native grasses. Annual vegetation and bird surveys will be undertaken so that staff can document and ensure the ongoing success of the grassland habitat. Work is expected to get underway this summer.

March was warm and wet

Precipitation in March was above normal throughout the watershed

Although March started out fairly dry, significant rain, snow and freezing rain fell during the second half of the month. By the end of March, the watershed had recorded more than one and a half times the normal precipitation, with some sites receiving over twice the normal precipitation.

The highest precipitation was recorded at the Environment Canada station at the Brantford Airport, with close to two and a half times the normal March precipitation.

The average temperature in March was well above the long-term average. At Shand Dam the average temperature was 0.5 degrees, which is about 3.1 degrees above the long-term average. March is the sixth month in a row with above average temperature.

A total of eight flood messages were issued in March, with some minor flooding reported. The reservoirs were used to mitigate downstream flows and reduce flooding. They will continue to be operated carefully over the remainder of the filling season.

The level of Lake Erie is well above the longterm average and continued to rise in March.

Queen's Park Day

The GRCA joined a day for MPPs at Queen's Park in March that was held by Conservation Ontario.

Senior staff from all 36 conservation authorities were invited to attend to showcase the wide array

GRCA 50 years ago April 6, 1966

An Act of the Ontario Legislature was proclaimed law on April 6, 1966, resulting in the amalgamation of the Grand River Conservation Commission (formed in 1934) and the Grand Valley Conservation Authority (formed in 1948). The law brought the two organizations together to form the GRCA that we know today.

At that time, Guelph Lake, Brant Park, Shade's Mills and the Elora Quarry parks were not yet formed, while Laurel Creek was planned for 1967.

Elm trees were being removed during the winters due to Dutch elm disease.

of conservation authority program benefits and to advocate for the MPPs' support for continued provincial funding.

There were displays about topics important to conservation authorities, such as the Great Lakes, source protection, climate change, flooding, information management, green infrastructure, and conservation areas.

Key people were in attendance, including the Minister of Natural Resources and Forestry, the Minister of the Environment and Climate Change, and MPP Eleanor McMahon, who is leading the review of the Conservation Authorities Act.

The Grand River Conservation Authority has held two similar Queen's Park days in the past, and this is the first one hosted by Conservation Ontario.

Volunteer program

The volunteer program has really taken flight at the Grand River Conservation Authority thanks to four years of funding provided by the Ontario Trillium Foundation.

The GRCA now has a full-time volunteer coordinator, who is working with community partners and volunteers, as well as developing safe practices.

During National Volunteer Week — April 10 to 16 — GRCA staff are preparing for the busy tree planting season, which involves events in communities across the watershed. The first planting event gets underway April 17 at the New Forest in the City in Brantford and the last will be May 14 at Silvercreek Park in Guelph. For a listing of all these events, visit <u>www.grandriver.ca/events.</u>

Tree planting events

The public is being invited to dig in for the environment at tree planting events across the watershed.

These take starting April 17 and continue to May 14 in a variety of communities, often with partner organizations.

The events provide an opportunity for residents from across the watershed to plant trees to benefit the natural environment and the watershed. The majority of plantings take place on GRCA or municipal property.

To date, the GRCA has planted 30 million trees. In 2015, GRCA staff partnered with community organizations including



Bobolinks are threatened in Ontario. This summer the GRCA will begin work to improve breeding habitat for this songbird on the Morton property, in the Spottiwood Lakes complex near Pinehurst Lake. A similar project is underway at Conestogo Lake.

companies to plant 20,000 trees at 28 events.

The full list with details about the 2016 community planting events is available online at <u>www.grandriver.ca/events</u>.

Parks open April 30

Grand River Parks open April 30 and are gearing up for a busy summer season.

The Grand River Parks membership program is very popular. It is now easier to buy year-round passes online and at any park gate when a staff member is on duty. Passes are valid for one year and provide entry into all parks, as well as a coupon booklet with perks for activities that are free or at a reduced rate.

When it opens, Brant Park will have an automatic access gate. An automatic gate also allows year-round access to Shade's Mills Park.

Nominations due May 1

The annual call for nominations for watershed award recipients is underway with a nomination deadline of May 1.

Anyone can nominate someone who they think is deserving of an award — an individual, family, group or business — by

completing a simple one-page form. There are two types of awards — Honour Roll Awards for a sustained record and Watershed Awards for outstanding examples of environmental work. The winners will be honoured at a special event in October.

The nomination form and more information on the awards can be found at <u>www.grandriver.ca/awards</u>.

This issue of *GRCA Current* was published in April 2016.

It is a summary of the March 2016 business conducted by the Grand River Conservation Authority board and committees as well as other noteworthy happenings and topics of interest.

The Grand River Conservation Authority welcomes distribution, photocopying and forwarding of GRCA Current.

Next board meeting: April 22 at 9:30 a.m., GRCA Administration Centre.

Subscribe to GRCA Current: www.grandriver.ca/subscribe

View meeting reports: www.grandriver.ca/directors

View coming events: www.grandriver.ca/events

Grand Actions newsletter: www.grandriver.ca/GrandActions

PO Box 729, 400 Clyde Road, Cambridge, Ontario N1R 5W6 (519) 621-2761

Follow the GRCA: 🗗



GUELPH FOOD BANK

Established by Spiritwind Christian Centre in 1988 PARTMENT

Green Legacy Program

April 25, 2016

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Council Agenda	
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Dear Volunteers and Residents of Puslinch Township

We would like to thank you for your donations of 341 lbs of food and \$50.00 funds from your Green Legacy Tree Day in Puslinch. It is support like yours that allows us to not only continue to provide Food Assistance programs but to expand our services to meet the changing needs in our community.

With support, we have been able to continue running and adding various support programs to serve community members requiring assistance such as: CVITP Income Tax Preparation clinics, Cooking Demonstrations – offering healthy and budget friendly meal ideas, Urban Teaching Garden – educates on how to grow food in an urban setting, Agency Food Distribution to 23 locations throughout Guelph including; Local crisis shelters, Transitional homes, Youth shelters, Neighbourhood groups, Small emergency pantries, Clothing Exchange, Buy Local Share Local – Fresh Food Donation program, GFB Christmas Adopt-A-Family program.

As the year progresses, support is vital in order to help the 65-85 families daily we serve who struggle to meet their basic needs.

"Every successful individual knows that his or her achievement depends on a community of persons working together." - Paul Ryan

Thank you for being a part of what we do. You make a positive difference in the lives of many!

Tracy Marchesich

Community Liaison Facilitator

RECEIVED

Township of Puslinch

100 Crimer St. Guelph, Ont. NHH 246 | (519) 767 - 1380 | www.guelphfoodbank.ca



REPORT FIN-2016-009

TO:	Mayor and Members of Council
FROM:	Paul Creamer, Director of Finance/Treasurer
MEETING DATE:	May 4, 2016
SUBJECT:	Ontario Regulation 284/09 2016 Budget File No. F05 BUD

RECOMMENDATIONS

That Report FIN-2016-009 regarding Ontario Regulation 284/09 2016 Budget be received; and

That Council adopts this report which meets the requirements of Ontario Regulation 284/09 and outlines the conversion of the cash based operating and capital budgets to a Public Sector Accounting Board (PSAB) compliant budget format.

DISCUSSION

<u>Purpose</u>

Ontario Regulation 284/09 requires municipalities that have excluded expenses in their budgets to prepare a report about those excluded expenses and adopt the report by resolution.

Background

In 2009, accounting standards and financial reporting requirements changed significantly, with the most notable change being that of the requirement to report on tangible capital assets (TCA). However, these new accounting standards do not require budgets to be prepared on the same basis.

The Township of Puslinch, like many municipalities, continues to prepare budgets on the traditional cash basis. These budgets do not include the PSAB requirements of accrual accounting and accounting for non-financial assets such as TCA.

Ontario Regulation 284/09

Allowable excluded expenses as per Ontario Regulation 284/09 can be all or a portion of the following:

- a) Amortization expenses
- b) Post-employment benefit expenses
- c) Solid waste landfill closure and post-closure expenses

The Township excludes amortization expenses as they are a non-cash expense. Postemployment benefit expenses are not applicable to the Township, therefore no adjustment is required. The Township does not have any landfill expenses and as such, they are not applicable.

The regulation requires the report to contain at a minimum:

- a) An estimate of the change in the accumulated surplus (revenues less expenditures) of the municipality to the end of the year resulting from the exclusion of expenses
- b) An analysis of the estimated impact of the exclusion of expenses on future TCA funding requirements

In addition to these excluded expenses, the cash based budgets prepared by the Township include certain types of transactions that need to be excluded for PSAB reporting purposes. These are not covered in Ontario Regulation 284/09. However, for transparency purposes and consistency, the accumulated surplus contained in this report, will be included as budget figures in the 2015 audited financial statements, if approved by Council. As such, the following items that are included in the cash based budget will be excluded from the PSAB based budget:

- a) Carroll Pond debenture principal repayment expenditures
- b) Transfers to working reserves
- c) Contributions from working reserves
- d) Fixed Asset/TCA expenditures

Comments

Table 1 below outlines the changes made to convert the balanced 2015 budget prepared under the cash basis of accounting to a decrease to the Township's accumulated surplus in the amount of \$538,045.

2016 Proposed Budget – Cash Based	
Proposed Operating Budget Tax Levy	\$2,680,654
Proposed Operating Budget Revenues	\$1,824,490
Proposed Operating Contributions from Working Reserves	\$318,333
Proposed Operating Budget Expenditures	-\$4,823,476
Surplus/(Deficit)	\$0
Proposed Capital Budget Funded	\$1,721,412
Proposed Capital Budget Expenditures	<u>-\$1,721,412</u>
Surplus/(Deficit)	\$0
Add Expenditures Excluded from Cash Based Budget	
Amortization Expense	<u>-\$1,692,315</u>
Exclusion Impact on Accumulated Surplus/ (Deficit)	-\$1,692,315
Remove Non PSAB Items from Cash Based Budget	
Carroll Pond debenture principal repayment expenditures	\$110,000
Transfers to Reserves (Capital Budget)	\$17,787
Transfers to Reserves (Operating Budget)	\$0
Contribution from Reserves (Capital Budget)	-\$518,253
Contribution from Reserves (Operating Budget)	-\$318,333
Funds from Debenture Issuances	\$0
Fixed Asset/TCA Expenditures	<u>\$1,721,412</u>
Total Non PSAB Items Removed from Cash Based Budget	\$1,012,613
Total Impact on Accumulated Surplus/(Deficit)	-\$679,701

Amortization of \$1,692,315 was calculated as an average of the amortization expense recorded in the 2015 and 2014 audited financial statements. Amortization expense has a major impact on the 2016 accumulated surplus amount. The amortization expense reduces the surplus amount and also reduces the net book value of the TCA reported on the audited statement of financial position.

Fixed asset purchases of \$1,721,412 are lower than amortization. This means that the Township's assets are declining at a faster rate than they are being replaced.

TCA amortization is an indicator of the amount that should be contributed towards the replacement of existing infrastructure. Although replacement cost will likely be higher than TCA amortization which is based on historical cost, revenues to offset TCA amortization would be a significant contribution to ensuring that a municipality has sufficient funds to repair and replace existing infrastructure.

The Township's projected accumulated surplus at the end of 2016 is as follows:

December 31, 2015 Audited Accumulated Surplus	\$22,754,151
Projected Impact of 2016 Budget	-\$679,701
2016 Estimated Ending Accumulated Surplus	\$22,074,450

FINANCIAL IMPLICATIONS

There are no direct financial implications associated with this report. The intent is to describe the conversion of the cash based operating and capital budgets to a PSAB budget format, which complies with the PSAB requirements.

APPLICABLE LEGISLATION AND REQUIREMENTS

Ontario Regulation 284/09 of the Municipal Act, 2001

ATTACHMENTS

None



REPORT FIN-2016-010

TO:Mayor and Members of CouncilFROM:Paul Creamer, Director of Finance/TreasurerMEETING DATE:May 4, 2016SUBJECT:Township General Surplus 2015
File No. F05 BUD

RECOMMENDATIONS

That Report FIN-2016-010 regarding Township General Surplus 2015 be received; and

That the General Surplus balance as of December 31, 2015 of \$239,670 be allocated in accordance with the policy adopted by Council through Council Resolution Number 2013-284.

DISCUSSION

<u>Purpose</u>

The purpose of this report is to provide Council with a general status report on the 2015 Township General Surplus as at December 31, 2015. The total Township General Surplus was \$239,670 as per the 2015 audited financial statements. The \$239,670 reflects the reduction in the surplus by \$137,667 as per Report FIN-2016-007 Assessment Appeals Update, which Council approved that \$137,667 of the tax-writeoffs to be funded through the 2015 Surplus.

Background

The policy adopted by Council through Council Resolution Number 2013-284 states "that Council adopt a policy to allocate any budget surplus to the Township's working reserves for the purpose of meeting future liabilities in accordance with Report FIN-2013-006."

Report FIN-2013-006 outlines the following allocation percentages based on the proportion of capital expenditures by department:

DEPARTMENT	% SURPLUS
	ALLOCATION
ADMINISTRATION	12%
PUBLIC WORKS	55%
PARKS	5%
OPTIMIST RECREATION CENTRE	5%
PUSLINCH COMMUNITY CENTRE	5%
FIRE AND RESCUE SERVICES	18%

FINANCIAL IMPLICATIONS

It is recommended that the Township General Surplus of \$239,670 be allocated as follows:

	% Allocation	\$ Value
Corporate		
Corporate Office Repairs and Restoration	3%	\$7,190
Corporate Accessibility	3%	\$7,190
Corporate Information Technology Software	3%	\$7,190
Corporate Information Technology Hardware	3%	\$7,190
Public Works		
Public Works Replacement and Restoration of Aging	280/	¢67 109
Infrastructure	20%	\$07,100
Public Works Equipment Replacement	27%	\$64,711
Parks		
Parks Infrastructure Enhancement	2.50%	\$5,992
Parks Equipment Replacement	2.50%	\$5,992
Optimist Recreation Centre		
Optimist Recreation Centre Equipment Replacement	2.50%	\$5,992
Optimist Recreation Centre Facility Improvement	2.50%	\$5,992
Puslinch Community Centre		
Puslinch Community Centre Equipment Replacement	2.50%	\$5,992
Puslinch Community Centre Facility Improvement	2.50%	\$5,992
Fire and Rescue Services		
Fire Vehicle Replacement	9%	\$21,570
Fire Equipment Replacement	9%	\$21,570
Total	100%	\$239,670

APPLICABLE LEGISLATION AND REQUIREMENTS

Municipal Act, 2001

ATTACHMENTS

None



REPORT FIN-2016-012

TO:Mayor and Members of CouncilFROM:Paul Creamer, Director of Finance/TreasurerMEETING DATE:May 4, 2016SUBJECT:2015 Development Charges
File No. F20 MMA

RECOMMENDATIONS

That Report FIN-2016-012 regarding the 2015 Development Charges be received; and

That Council accepts the Treasurer's declaration that the Township is in compliance with section 59.1(1) of the Development Charges Act, 1997; and

That Report FIN-2016-012 and related attachments be posted on the Township's website.

DISCUSSION

<u>Purpose</u>

The purpose of this report is to provide Council with information on the Township of Puslinch's Development Charge Reserve Funds and related transactions as of December 31, 2015.

Background

On December 3, 2015, following considerable consultation on Bill 73, the province passed the Smart Growth for Our Communities Act, 2015. This Act reforms both the Development Charges Act, 1997 (DCA) and the Planning Act. The changes to the DCA were proclaimed effective January 1, 2016 and are now in effect. In addition, on December 17, 2015, the province released a new regulation (O.Reg. 418/15) to amend O.Reg. 89/98 in order to reflect the changes to the Act. This regulation was also effective January 1, 2016.

Prior to the new legislation each municipality who imposed development charges were required to complete an annual financial statement regarding the development charge reserve funds. Pursuant to Section 43(2) of the Development Charges Act (DCA) the Treasurer's statement is to outline the following:

- by DCs were funded
- Opening and closing balances for each reserve
- Amounts collected for each service
- The associated interest earnings
- All assets funded by DCs and how the portions not funded by DCs were funded.

New to the reporting requirements are the following:

 The Bill 73 amendments to the DCA include a new provision (Section 59.1) that specifically prohibits municipalities from imposing additional payments on developers or requiring construction of a service unless specifically authorized under the DCA or another Act. This provision does not affect a municipality's right to include conditions for installation or payment for local services but is intended to close the door on other "voluntary" payments that may have been sought by municipalities outside the legislative framework. The importance that the province places on this new section is reinforced by (a) requiring that the Treasurer's report must now include a statement confirming that the municipality is in compliance with Section 59.1(1) and (b) granting extensive investigative powers to the Minister of Municipal Affairs and Housing to investigate whether a municipality is in compliance.

The Township of Puslinch does not require any "voluntary" payments from developers and the Treasurer's statement below will confirm that we are in compliance with Section 59.1(1).

• In the past, a municipality was required to file the Treasurer's report with the Minister within 60 days of the presentation of the report to Council. That requirement has been removed under Bill 73 and replaced by a requirement that Council shall ensure that the statement is available to the public.

In order to comply with these new reporting requirements:

- a) The Treasurer confirms that, for 2015 development charges reporting, the Township of Puslinch is in compliance with Section 59.1(1) of the *Development Charges Act, 1997*; and,
- b) The recommendations to Report FIN-2016-012 include Council's acceptance of the Treasurer's statement and Council's direction to post this report and related attachments on the Township's website.

FINANCIAL IMPLICATIONS

A statement of Development Charge reserve fund balances and transactions in 2015, by service area, is listed in Schedule A. Details of 2015 projects funded from Development Charges are listed in Schedule B. Schedule C summarizes Development Charge Credits for 2015.

APPLICABLE LEGISLATION AND REQUIREMENTS

Development Charges Act, 1997 Ontario Regulation 82/98

As set out in this report, the financial statement and information being provided herein is pursuant to the requirements of the Development Charges Act and regulations thereunder.

ATTACHMENTS

Schedule A – Statement of Development Charges Reserve Funds as at December 31, 2015

Schedule B – 2015 Development Charges Project Funding

Schedule C – Development Charge Credits for the 12 months ended December 31, 2015

Township of Puslinch Statement of Development Charges Reserve Funds As at December 31, 2015

	Fire Protection		Parks and	Administration -	
	Services	Roads and Related	Recreation	Studies	Total
Opening Balance- January 1, 2015 *	164,283	47,888	32,635	59,826	304,632
Revenues					
Development Charges Act	47,008	93,174	9,944	8,110	158,237
Interest Income	1,863	1,068	392	736	4,059
Total Revenues	48,871	94,242	10,336	8,846	162,296
Expenses					
Transfers to Capital	1,642	190,804	-	38,111	230,557
Transfers to Operating	-	-	-	-	-
Total Expenses	1,642	190,804	-	38,111	230,557
Closing Balance - December 31, 2015 **	211,512	- 48,674	42,971	30,561	236,371
2015 Adjustment Being Completed in 2016		2,372			
Adjusted Closing Balance - December 31, 2015	211,512	- 46,302	42,971	30,561	236,371

* This is the opening balance of the Development Charges per the 2014 Audited Financial Statements.

** This is the closing balance of the Development Charges per the 2015 Audited Financial Statements.

Township of Puslinch 2015 Development Charges Project Funding For the 12 Months Ended December 31, 2015

								T . 10045
Due to st Name	DC Fundad	Capital Cfwd	• • • • •		In Lieu of	Working	Other	Total 2015
	DC Funded	Reserve	Levy	Gas Tax	Parkland	Reserve	(grants)	Expenditures
Fire Protection Services		4.	4.0	4.0	4.0	4.0	4.0	
Radio Communication Interface	<u>\$1,642</u>	<u>\$2,462</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$4,103</u>
Subtotal	\$1,642	\$2,462	\$0	<i>\$0</i>	<i>\$0</i>	\$0	<i>\$0</i>	\$4,103
Roads and Related Services								
Gore Road Culvert - 2017	\$12,750	\$2,363	\$26,119	\$0	\$0	\$0	\$42,878	\$84,110
Gore Road Culvert - 2018	\$13,281	\$5,772	\$53,091	\$0	\$0	\$0	\$0	\$72,144
Gore Road Repaving	\$37,218	\$0	\$0	\$253,706	\$0	\$0	\$0	\$290,924
Leslie Road Culvert	\$14,033	\$0	\$58,931	\$0	\$0	\$1,571	\$0	\$74,535
Morriston Meadows Resurfacing	\$30,953	\$0	\$132,727	\$0	\$0	\$0	\$0	\$163,680
Morriston Streetscaping	\$654	\$4,191	\$0	\$0	\$0	\$0	\$0	\$4,845
Truck- Director	\$34,935	\$0	\$0	\$0	\$0	\$0	\$0	\$34,935
Brush Chipper ¹	\$34,935	\$0	\$0	\$0	\$0	\$8,141	\$0	\$43,076
Calfass Rd	\$3,811	\$0	\$0	\$0	\$0	\$20,617	\$0	\$24,428
Victoria Rd	\$3,075	\$0	\$0	\$0	\$0	\$16,635	\$0	\$19,709
Watson Rd-Maltby to #34	<u>\$5,159</u>	<u>\$0</u>	<u>\$27,913</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$0</u>	<u>\$33,072</u>
Subtotal	\$190,804	\$4,191	\$219,571	\$0	\$0	\$46,964	\$0	\$461,529
Administration - Studies								
Fire Master Plan	\$14,148	\$13,347	\$0	\$0	\$0	\$0	\$0	\$27,495
Recreation and Parks Master Plan	\$10,765	\$1,051	\$7,942	\$0	\$0	\$0	\$0	\$19,758
PCC Master Plan	\$4,606	\$0	\$0	\$0	\$0	\$3,924	\$0	\$8,530
Community Based Strategic Plan	<u>\$8,592</u>	<u>\$0</u>	<u>\$1,001</u>	<u>\$0</u>	<u>\$0</u>	<u>\$9,500</u>	<u>\$0</u>	<u>\$19,093</u>
Subtotal	\$38,111	\$14,398	\$8,943	\$0	\$0	\$13,424	\$0	\$74,875
Total	\$230,556	\$29,186	\$307,723	\$253,706	\$0	\$60,387	\$42,878	\$924,436

Note 1: The Brush Chipper should have been funded by DC's in the amount of \$32,563 but was recorded as \$34,935. The difference of \$2,372 corrected in 2016.

Township of Puslinch Development Charge Credits For the 12 Months Ended December 31, 2015

Credit	January 1, 2015	DC Credits Earned by	DC Credits Provided	December 31, 2015
Holder	Balance	Developer During	by Township During	DC Credit Balance

N/A - the Township has not issued any Development Charge Credits during the period or in previous periods.


REPORT FIN-2016-013

TO:	Mayor and Members of Council
FROM:	Paul Creamer, Director of Finance/Treasurer
MEETING DATE:	May 4, 2016
SUBJECT:	2015 Annual Building Permit Report File No. C11 BUI

RECOMMENDATIONS

That Report FIN-2016-013 regarding the 2015 Annual Building Permit Report be received.

DISCUSSION

<u>Purpose</u>

The purpose of this report is to inform Council of the Building Permit Fees collected for 2015, and the costs associated with the administration and enforcement of the Building Code Act.

Background

In accordance with Section 7(4) of the Building Code Act, every 12 months, each principal authority shall prepare a report that contains such information as may be prescribed about any fees authorized and costs of the principal authority to administer and enforce the Building Code Act in its area of jurisdiction.

Therefore, the municipality is required to prepare an Annual Report, in order to enhance transparency and ensure that the Building Permit Fees do not exceed the anticipated reasonable delivery service expense.

As a requirement of Article 1.9.1.1., Division C of the 2012 Ontario Building Code, the Annual Report must include the following:

a) Total fees collected in the 12-month period from January 1, 2015 to December 31, 2015,

- b) The direct and indirect costs of delivering services related to the administration and enforcement of the Act within the Township,
- c) A breakdown of the costs described in (b) above into at least the following categories:
 - I. Direct costs of administration and enforcement of the Act, including the review of applications for permits and inspection of buildings, and
 - II. Indirect costs of administration and enforcement of the Act, including support and overhead costs, and
- d) If a reserve fund has been established for any purpose relating to the administration or enforcement of the Act, the amount of the fund at the end of the 12-month period referred to in Clause (a).

<u>Revenue</u>

In 2015, the Building Department issued 265 permits. For the full year 2015, the Building Department anticipated revenues of \$279,400. The actual operating revenue earned was \$359,097 or \$79,697 more than the budget.

Expenses

The total budgeted (direct and indirect) operating expenses for the Building Department for the year 2015 were \$363,646. The total actual expenses for the Building Department for the year 2014 were \$338,663. The actuals were below the budget by \$24,983.

A financial summary for the year ended December 31, 2015 is attached as Schedule A to this report.

FINANCIAL IMPLICATIONS

The Building Code Act requires that the total amount of Building Permit fees meets the total costs for the municipality to administer and enforce the Building Code Act and Regulations. Building permit fees were established to fully recover the Township's cost of providing building permit services, including an allocation of administrative overhead/indirect costs. Any surplus revenue from building permit fees is transferred to a reserve fund, to be drawn upon in years of declining building activity.

The only impact to the Township's property tax revenues related to building permit activity is the recovery from the Building Department for indirect costs such as human resources, finance/accounting, information technology, and facility space.

The Building department ended 2015 with an operating surplus of \$20,434 (2015 revenues of \$359,097 and expenditures of \$338,663). The 2015 operating surplus was primarily due to higher than expected revenues.

The Building Department 2015 revenues exceeded the expenses and the surplus of \$20,434 was transferred to the Building Reserve Fund. The balance of the Reserve Fund as at December 31, 2015 is \$499,099 The Reserve Fund activity in 2015 and the balance of the Building Reserve Fund as of December 31, 2015 is shown in Schedule B to this report.

APPLICABLE LEGISLATION AND REQUIREMENTS

Section 7(4) of the Building Code Act Article 1.9.1.1., Division C of the 2012 Ontario Building Code

The Building Code Act also requires that the principal authority gives notice of the preparation of an annual building permit fees report to every person and organization that has requested that the principal authority provide the person or organization with such notice and has provided an address for the notice. As of the date of this report, the Township of Puslinch has not received any requests for this report.

ATTACHMENTS

Schedule A – Financial Summary for the Year Ended December 31, 2015

Schedule B – Building Reserve Fund Balance as of December 31, 2015

Township of Puslinch FIN-2016-013 - Schedule A Financial Summary For the Year Ended December 31, 2015

REVENUE	\$359,097
EXPENSES	
283029 Direct	\$ 272,654
Indirect	\$ 66,009
Total Expenses	\$ 338,663
Net Revenues	\$ 20,434

Township of Puslinch FIN-2016-013 - Schedule B Building Reserve Fund Balance as of December 31, 2015

January 1, 2014 opening balance	\$ 494,289
2015 Building Department Surplus	20,429
Legal Settlement	10,305
Purchase of Truck for CBO	(24,603)
Painting and Lighting Office Entrance	(193)
Schematic Deisgn of Municipal Office	(1,128)
December 31, 2014 closing balance	\$ 499,099

From: Cory Young - GM BluePlan [mailto:Cory.Young@gmblueplan.ca]
Sent: April-28-16 7:42 AM
To: Don Creed; Karen Landry
Cc: Steve Conway - GM BluePlan
Subject: 109012 - ORC Noise Study

Please find attached GM BluePlan's response to the March 1, 2016, Township Councillors' questions pertaining to the noise level assessment completed by dBA Environmental Inc.

Also attached is a letter providing our comments on the dBA reports and the findings of the shorter assessment completed by us in March 2014.

In summary, the dBA reports (daytime and partial nighttime readings) recorded "background" noise levels that were ABOVE the applied guideline limit of 50 decibels during both the daytime and nighttime hours. The guideline document (*Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning. Publication NPC-300. August 2013.*) recommends that noise levels in a small community setting with noise emitting from traffic and human activities be no higher than 50 decibels during the daytime hours and 45 decibels during the nighttime hours.

The dBA daytime report when cross referenced with the Township supplied ORC compressor logs suggests that a slight increase of 0.3 to 0.6 decibel increase is recorded when the ice rink compressors are running. Although there are times when the noise readings are higher and the compressor was not running. However, at no time during the assessment does the noise level decrease to a point below the 50 decibel limit and the report does not identify those source(s) of noise that could be contributing to the overall background noise levels.

In order to fully identify and delineate the source(s) of noise reaching the residents of Maple Leaf Lane a comprehensive noise study would have to be undertaken assessing all the mechanical components at the ORC and possibly completing a longer-term noise level assessment. All at considerable cost and time to the Township.

Both dBA reports suggest that a noise barrier described as a solid wood fence be constructed to reduce perceived noise levels being emitted from the compressors. While the data would suggest that the compressors are not contributing in a significant manner to the overall noise levels, a wooden fence constructed alongside the compressors would show that the Township is being proactive in addressing any potential noise issue originating from the compressors and eliminating those items as a source for complaint by the local resident.

Based on the various noise data to date, background noise levels in the vicinity of Maple Lane are above the MOECC's Class 2 Area levels with or without the ORC compressors.

The cost to construct the proposed wooden sound fence in the area of the compressors would likely be less than the expense of completing a more comprehensive noise assessment monitoring and reporting.

If you have any questions or require additional information do not hesitate to contact us.

Cory Young, B.Sc.-Env.Sc., C.Tech Senior Technical Specialist

GM BluePlan Engineering Limited 650 Woodlawn Road West, Block C, Unit 2 | Guelph ON N1K 1B8 t: 519.824.8150 | c: 226.755.1055 <u>cory.young@gmblueplan.ca</u> | <u>www.gmblueplan.ca</u>



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April 27, 2016 Our File: 109012

Township of Puslinch 7404 Wellington Road 34 Guelph, ON N1H 6H9

Attention: Mr. Don Creed - Director of Public Works and Parks Ms. Karen Landry – CAO/Clerk

> Re: Sound Levels Assessment 10 Maple Leaf Lane Puslinch, ON

Dear Mr. Creed and Ms. Landry:

This letter report is to present and discuss the findings of the recent noise level assessment completed by dBA Environmental Inc. (dBA) in the fall of 2015. dBA was retained by the Township to investigate the transmission of sound from the ice rink compressors located at the Puslinch Optimist Recreation Centre (ORC) to the neighbouring properties fronting along Maple Leaf Lane in Puslinch, Ontario. Also attached to this letter is GM BluePlan's response to the questions and concerns tabled by the Township Council on March 1, 2016.

BACKGROUND

GM BluePlan's March 2014 noise level assessment was a "snapshot" of the background and active compressor noise levels with only 25 minutes of each being recorded. The noise levels were recorded from the front porch of the residence at 8 Maple Leaf Lane between 8:00 am and 9:00 am. The findings of that assessment revealed that the adjusted background levels during the daytime hours were 49.3 decibels and the non-adjusted background levels was 54.4 decibels. With the compressor "active" and operating the readings were 49.6 dB and 59 dB, adjusted and non-adjusted measurements, respectively.

During the 2014 recordings, GM BluePlan staff were on-hand to observe any incidents which may have affected the overall noise level readings.

Based on the findings of the GM BluePlan assessment, the Township requested a larger study be completed to determine noise levels over the duration of several days and evenings. As such, dBA Environmental Inc. (dBA) was retained to complete a noise level assessment.

The purpose of the noise level assessment was to determine whether the ORC ice rink compressor was contributing to a level of sound that is above the general "urban hum" that could be expected from a low density urban setting.



For the purpose of this assessment by dBA (and the previous assessment completed by GM BluePlan) the residential area along Maple Leaf Lane was considered to be a "Class 2 area" where the background sound levels are predominately road traffic and the activities of people between the hours of 0700 to 1900. The Ministry of the Environment (MOE) document "Environmental Noise Guideline – Stationary and Transportation Sources – Approval and Planning" Publication NPC-300 was used as a reference in completing the assessment. The referenced document outlines the sound level limits for the different class areas as noted below in MOE Table B-2.

Time of Day	Class 1 Area	Class 2 Area	Class 3 Area	Class 4 Area
07:00 - 19:00	50	50	45	60
19:00 - 23:00	50	50	40	60
23:00 - 07:00	45	45	40	55

Table B-2
Exclusion Limit Values of One-Hour Equivalent Sound Level (Lea, dBA)
Plane of Window of Noise Sensitive Spaces

FINDINGS

dBA completed a noise level assessment from December 4, 2015 to December 8, 2015. The recording device was placed on the front of the property located at 10 Maple Leaf Lane (immediately west of 8 Maple Leaf Lane) and continuously recorded noise levels from the direction of the ORC. During the noise level recording a "peak" event during any given hour is recorded as the maximum noise for that period. The scope of work completed by dBA did not require them to differentiate between the various sources of noise being recorded, but there was no cross-referencing to the supplied ORC compressor run-time logs to ascertain a potential connection between elevated noise levels and the operation of the compressors.

GM BluePlan completed the cross referencing (enclosed) and assessed the data. Based on the daytime data presented the background noise levels (with no active compressors) are above the 50 decibel daytime limit for a Class 2 area. During compressor operation there is a general 0.3 to 0.6 decibel increase in noise levels which is consistent with the March 2014 observations previously reported by GM BluePlan.

The initial report from dBA did not include nighttime noise level recordings. On April 19, 2016 dBA supplied two partial sets of data for the evenings of December 5th and 6th. The reported data was during the period of 0100hrs to 0500hrs for each day. The lowest reading during each evening was 52.8 decibels with peak readings of 53.1 decibels on December 5th and 53.4 decibels on December 6th representing a peak increase of 0.6 decibels each evening.

Further comment cannot be made on the affect that the active compressor may have had during this reported period without information on the timing and duration of the compressor nighttime activities. However, it is clear that the noise levels during the reported nighttime period are above the Class 2 area limit of 45 decibels.



DISCUSSION

Based on the information presented in the dBA reports, there does not appear to be a correlation between the operation of the ice rink compressors and the recorded noise levels that are consistently above the Class 2 area limits (50dB daytime and 45dB nighttime). Selective sections of noise data readings may suggest that the compressors slightly increase the overall noise level by 0.3 to 0.6 dB; but there are also sections of noise data which appear the have higher noise levels when the compressors were not running.

Based on an absence of data identifying point source noise emissions contributing to the background noise levels, the dBA report could be considered inconclusive in determining whether or not the ice rink compressors are contributing factors to the elevated noise levels along Maple Leaf Lane during the monitoring period.

Should you have any questions or would like clarification regarding the information within this report, please contact the undersigned.

Yours truly,

GM BLUEPLAN ENGINEERING LIMITED Per:

Cryling

Cory Young, B.Sc.-Env.Sc., C.Tech.

CY/sc

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April 27, 2016 Our File: 109012

Township of Puslinch 7404 Wellington Road 34 Guelph, ON N1H 6H9 Attention: Karen Landry, CAO/Clerk

Re: 2015 Noise Study Council Questions

Dear Ms. Landry,

Please find below responses to the questions and concerns raised from Puslinch Council dated

March 1, 2016.

1. Q: Where is the technical description with the layout of the sound source, sound measuring device and other items, like buildings, along with distances?

A: the requested information was not included in the report.

2. Q: What was the background noise measurement over the period?

A: Background (with the compressor not operating) noise levels were consistently above 50dB.

3. Q: What other contributing noises could be heard and or measured? Traffic? Garage doors?

A: This was not a part of dBA's scope of work for the 2015 noise study. The study was to record noise levels only, not to isolate individual sources of noise.

4. Q: The report says noise measurement included nighttime, but there are no results. Where are the results? Include all data not just summary.

A: This has been continually requested from dBA. A partial two evening dataset was provided on April 19, 2016.

5. Q: What are the large swings at the beginning and end of the measured periods?

A: March 2014 assessment the elevated readings at the beginning and the end are possibly attributed to the movement of persons to and from the measuring device. The 2015 assessment was unmanned and as such, the elevated recordings over the course of the monitoring period were not specifically identified.

6. Q: What was temperature on days measured. How much did it change? i.e. was compressor running all the time, was it raining?



A: The ORC logs indicate a reported maximum daytime high of +5 degress during the noise study. The University of Guelph Turfgrass Institute weather station reported a maximum daytime high of 6.0 degrees Celsius and a nighttime low of -2.0 degrees Celsius. Precipitation information is not available at the University of Guelph Turfgrass Institute weather station.

See ORC logs for recorded temperatures and compressor run times.

7. Q: What was the wind direction and speed during the measurement period?

A: Not presented in the data.

8. Q: What are the technical qualifications of the person doing measurement? Of the report writer, if different.

A: dBA Environmental has been in business since 1986.

9. Q: How is the company independent of sound barriers and their installation?

A: We are not aware of any connection and/or relationship between dBA and sound attenuation companies.

10. Q: My basic concern is that the second study done by GM measured sound levels from the ORC that would exceed the night time limit.

Therefore the purpose of the third study was to determine if this in fact was the case.

A: Initial GM BluePlan assessments were "snapshots" of the noise levels with a combined recorded time of 50 minutes (25 min. background and 25 min. compressor operating). Following replacement of the original compressors, the second GM BluePlan study found that the noise added to the background levels by the compressors was less than one decibel. No nighttime readings were recorded by GM BluePlan to be able to provide comment. The December 2015 assessment was longer in duration (approximately 100 hours of recorded time) to obtain a clearer picture of background and "active" compressor run times during all times of the day and night.

Q: However, the third, most recent study did not directly answer this question but merely speculated that the night time levels would exceed the night time limits.

A: Two partial nighttime readings were provided (Dec. 5 and 6).Readings consistently above 50dB were recorded. No cross referencing available with ORC compressor run time. Based on a review of the provided logs the compressors would run for an average of 7.8 hours from the last recoding to the next morning. Average daytime recordings are above the daytime limit (50dB) and the nighttime limit (45dB) is 5dB lower than the daytime.

11. Q: The report quoted the standard for determining the background level but did not report what this was determined to be.

A: Class 2 area is a mixed area with road traffic, human activities set in a smaller community (i.e. not a large urban centre). Reference document: Ministry of the Environment –



Environmental Noise Guideline, Stationary and Transportation Sources – Approval and Planning. Publication NPC-300.

- 12. Q: The report jumped immediately to a sound barrier solution without an examination of the source.
 - A: dBa has not provided a response to why sound barrier solution was proposed.
- 13. Q: What was the daytime and night time background levels?

A: See data review comparisons.

14. Q: What were the overnight noise levels and sources?

A: No noise sources were identified in the assessment. It was not a part of the scope for the contractor. General noise nighttime noise levels in the presented data range from 52.8 to 53.4dB.

15. Q: What are the reasons for this noise? i.e. is it inherent in this use or does the design of the external structure holding the heat exchangers contributing / creating a problem and is a sound barrier the best and most cost effective solution

A: This was not a part of dBA's scope of work for the 2015 noise study. The study was to record noise levels only, not to isolate individual sources of noise.

16. Q: In addition to the above, staff reviewed the log book for the compressor and compared it to the sound study results and note no discernible difference in the results when the compressor is on or off. We would appreciate a detailed review and reporting of these findings. Attached is a copy of excerpts of the log book and the applicable sections of the sound study.

A: Data review (2015 compressor run times) by GM BluePlan to the 2015 noise study indicates that generally the background levels are slightly above the 50dB daytime threshold.

Should you have any questions or would like clarification regarding the information within this correspondence, please contact our office.

Yours truly,

GM BLUEPLAN ENGINEERING LIMITED Per:

Contrag

Cory Young, B.Sc.-Env.Sc., C.Tech.

CY/sc



MINUTES

MEMBERS PRESENT

Councillor Stokley, Chair Daina Makinson, Vice-Chair Kevin Johnson June Williams

MEMBERS ABSENT

Margaret Hauwert

TOWNSHIP STAFF

Marissa Herner, Communications Associate/C.S.R Donna Tremblay, Deputy Clerk Don Creed, Director of Public Works and Parks

1. CALL TO ORDER

The meeting was called to order at 7:00 p.m.

2. DISCLOSURE OF PECUNIARY INTEREST

None.

3. APPROVAL OF MINUTES

a) February 16, 2016 - Regular Meeting

Moved by Kevin Johnson and then Seconded by Daina Makinson REC-2016-013

That the Minutes of the Recreation Committee meeting dated February 16, 2016 be adopted.

CARRIED

4. DELEGATIONS/PRESENTATIONS

None.

5. 2016 RECREATION COMMITTEE - WORK PLAN

1. 2016 Recreation Committee Work Plan – Discussion of Work Plan Items

The Committee reviewed the draft work plans that were submitted by members and discussed the following items:

- Publishing information articles on various available activities/facilities within the Township
- Promotion and advertising of Township activities/facilities through the design of a promotional brochure and generating awareness through various media outlets.
- Partner with organizations such as the Guelph Wellington Senior Association and YMCA/YWCA to develop opportunities for additional recreational opportunities such as line dancing and Christmas and March Break camps.
- Trail development behind the Puslinch Community Centre
- Assist with the launch of a pickleball program at the Optimist Recreation Centre



Puslinch Recreation Committee Tuesday, March 15, 2016 7:00 p.m. Council Chambers, Aberfoyle

The Committee's next steps are to set a list of priorities and assign responsibilities once all of the Committee member's work plan items have been received at the April Recreation Committee meeting.

6. REGULAR BUSINESS

1. Trophy Book – Presentation of the Trophy Book

Ms. Daina Makinson presented the completed trophy book to the Committee. The Committee thanked Ms. Daina Makinson and Ms. Holly Land (Photographer) for all of their efforts in the production of the trophy book.

The Committee discussed the most suitable location for the trophy book to be kept. The Committee recommended that the trophy book should reside at the Puslinch Library for public viewing.

Ms. Makinson advised that she would make inquiries with the Branch Supervisor and report back to the Committee at the following meeting.

Ms. Makinson will also present the trophy book to Council and display the Committee's hard work on this project.

2. Puslinch Community Centre – Parks Master Plan – Phase 1 – Committee Recommendation regarding Options

The Committee discussed the Parks Master Plan concepts.

Moved by June Williams and then Seconded by Daina Makinson REC-2016-14

That the Recreation Committee received the Parks Master Plan Phase 1. The Committee would like to express their support for:

Concept 1: Maintain the existing ball diamond, while remaining open to embracing other concept ideas in future discussions.

The Committee would like to forward their support for only one full size soccer pitch with respect to future concept discussions.

CARRIED

7. FINANCIAL REPORTS

1. Revenue and Expenses

None.

2. Revenue Summaries

None.

8. CLOSED MEETING

None.



Puslinch Recreation Committee Tuesday, March 15, 2016 7:00 p.m. Council Chambers, Aberfoyle

9. ADJOURNMENT

Moved by June Williams and then Seconded by Kevin Johnson REC-2016-15

The Recreation Committee Meeting hereby adjourns at 8:25 p.m.

CARRIED

10.NEXT MEETING

Tuesday, April 19, 2016 at 7:00 p.m. in the Council Chambers.

THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

BY-LAW NUMBER 029/2016

A BY-LAW TO AMEND BY-LAW NUMBER 19/85, AS AMENDED, BEING THE ZONING BY-LAW OF THE TOWNSHIP OF PUSLINCH

WHEREAS, the Council of the Corporation of the Township of Puslinch deem it appropriate and in the public interest to amend By-Law Number 19/85, pursuant to Section 34 of the Planning Act, R.S.O. 1990 as amended;

NOW THEREFORE THE COUNCIL OF THE CORPORATION OF THE TOWNSHIP OF PUSLINCH ENACTS AS FOLLOWS:

- 1. That Schedule 'A' of Zoning By-law 19/85 is hereby amended by rezoning Part of Lot 8, Concession 2, from Agricultural (A) Zone to the **AGRICULTURAL SITE-SPECIFIC (A-63 ZONE** and **(A-64) ZONE**, as shown on Schedule "A" of this By-law.
- 2. That subsection 5(4) SPECIAL PROVISIONS is amended by adding the following new exceptions:

"(kkk) A-63 (COLES – Label It!) Part Lot 8, Concession 2

Notwithstanding the uses permitted under Section 5(2) and any provisions of this By-law to the contrary, for the land zoned **A-63** on Schedule 'A' hereto, the following special provisions shall apply:

(i) Uses Permitted Restricted To

- (a) A service trade restricted to a printer's shop, a plumber's shop, a painter's shop, a carpenter's shop, an electrician's shop, a welding shop, a machine shop, or a monument engraving shop, which may include accessory administrative offices;
- (b) An agricultural use.

(ii) Zone Requirements

The applicable zone provisions of this By-law shall apply to the subject land together with the following special provisions:

	(a)	LOT AREA (MINIMUM)	0.4 ha
	(b)	FRONT YARD DEPTH (MINIMUM)	60 m
	(c)	SIDE YARD (MINIMUM) EACH SIDE	Equal to one-half the
			building height, but
			not less than 3.0 m
	(d)	GROSS FLOOR AREA (MAXIMUM)	465 m ²
	(e)	BUILDING HEIGHT (MAXIMUM)	8.0 m
	(f)	LANDSCAPED OPEN SPACE (MINIMUM)	25%
	(g)	PLANTING STRIP – SIDE YARD	3.0 m
		(MINIMUM)	
	(h)	OUTDOOR STORAGE	Outdoor storage shall

All other applicable regulations of the Zoning By-law shall be maintained.

"(III) A-64 (Home Occupation) Part Lot 8, Concession 2

Notwithstanding any provisions of this By-law to the contrary or previous minor variance approval, for the land zoned **A-64** on Schedule 'A', at no time shall any home occupation employ more than one person who does not reside in the dwelling to which such home occupation is accessory. The land zoned **A-64** is subject to all applicable regulations of Zoning By-law 19/85, as amended."

3. This By-law shall become effective from the date of passage by Council and come into force in accordance with the requirements of the Planning Act, R.S.O. 1990, as amended.

READ A FIRST, SECOND AND THIRD TIME AND FINALLY PASSED THIS 4th DAY OF May, 2016.

Dennis Lever, Mayor

Karen Landry, C.A.O./Clerk

THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

BY-LAW NO. 029/2016

SCHEDULE "A"



This is Schedule "A" to By-law No<u>.029/2016</u> Passed this 4th day of May, 2016.

MAYOR

CLERK

THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

EXPLANATION OF BY-LAW NO. 029/2016

By-law Number <u>029/2016</u> amends the Township of Puslinch Zoning By-law 19/85 by rezoning Part of Lot 8, Concession 2 from Agricultural (A) to Agricultural Site-Specific (A-63) and (A-64). The purpose of the zone change is to allow for a small scale commercial label-making business on a portion of the property. The business has operated as a home occupation out of an accessory structure west of the dwelling on the property. In 2006, the applicant obtained minor variance approval (A4/06) to increase the allowable number of employees for a home occupation who do not reside in the dwelling from one to three. Upon relocation of the business, the applicant would like to maintain the accessory building for personal use.

There are two parts to this rezoning request:

- 1. to allow a small scale commercial use (service trade, as defined); and
- 2. to ensure that any future home occupations would comply with existing By-law requirements that no more than one employee who does not reside in the dwelling to which the home occupation is accessory notwithstanding minor variance approval for an increase to three.

Regulations related to the label-making business ensure appropriate sight lines and buffering of the adjacent Ellis Chapel (front yard setback, landscaping, planting strip, side yards and no outdoor storage). The scale of the business is controlled through a 1.0 acre zoning area, a maximum building size and height.

