



THE CORPORATION OF THE TOWNSHIP OF PUSLINCH
July 17, 2019 COUNCIL MEETING

A G E N D A

DATE: Wednesday, July 17, 2019

REGULAR MEETING: 7:00 P.M.

≠ Denotes resolution prepared

1. Call the Meeting to Order
2. Disclosure of Pecuniary Interest & the General Nature Thereof.
3. **CLOSED ITEMS** ≠
None
4. Adoption and Receipt of Minutes of the Previous Meeting.≠
 - (a) Closed Council Meeting - June 5, 2019
 - (b) Council Meeting – June 12, 2019
 - (c) Closed Council Meeting - June 12, 2019
 - (d) Public Meeting for Zoning Amendment File D14/ELL – June 19, 2019
 - (e) Public Meeting for Proposed Development Charges By-law – June 19, 2019
 - (f) Council Meeting- June 19, 2019
 - (g) Closed Council Meeting- June 19, 2019
 - (h) Public Meeting for Feasibility Study for Municipal Water and Wastewater Services – June 24, 2019
5. Business Arising Out of the Minutes.

6. **PUBLIC MEETINGS**

1. **Proposed Concept Plan for the Accessible Walking Trail at Fox Run Park**

*note this Public Information Meeting will be held on Monday, July 22, 2019 at 6:30 p.m. at the Puslinch Community Centre – 23 Brock Road South.

7. **COMMUNICATIONS**

1. Mini Lakes Annual Wastewater and Water Reports
 - a. 2018 Annual Operations and Maintenance Report for the Wastewater Treatment System submitted by Ontario Clean Water Agency.
 - b. Mini Lakes Water System Annual Monitoring Report prepared by Amanda Pepping, GM BluePlan.



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- c. Peer review of 2018 Annual Operations and Maintenance report for the Wastewater Treatment System by Amanda Pepping, GM BluePlan.
2. Correspondence from GWS Ecological & Forestry Services Inc., with respect to Vegetation Management in Fox Run Park, July 4, 2019.
3. Correspondence from Lafarge Canada Inc., with respect to operations at the Lafarge Wellington site and ERO posting, June 27, 2019.
4. Mill Creek Pit License #5738 Monthly Monitoring Report from Seana Richardson, Aggregates Technical Specialist – Ministry of Natural Resources and Forestry, June 12, 2019.
1. **Intergovernmental Affairs**≠
 - (a) Various correspondence for review.
8. **DELEGATIONS / PRESENTATIONS** ≠
 - 7:05 p.m.** – John McNie, on behalf of neighborhood group, with respect to a potential zone change at the property municipally know as 6947 Concession 2 and abutting lot to the east from agricultural to extractive.
 - 7:15 p.m.** – Glenn James with respect to the proposed Puslinch High Speed Internet Committee.
 - 7:25 p.m.** – Jeff Mckay with respect to report PD-2019-007 TC-01-19 Telecommunication Application File TC-01-2019 (A12/ROG)
9. **REPORTS** ≠
 1. **Administration Department**

None



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2. **Planning and Building**

- (a) Wellington County Report– A Place to Grow: Growth Plan for the Greater Golden Horseshoe 2019
- (b) Wellington County Report Zoning By-law Amendment Application D14/ELL – Donald Elliot Temporary Garden Suite Extension
- (c) PD-2019-007 TC-01-19 Report to Industry Canada RE proposed Rogers Telecommunications Tower at 4638 Sideroad 20 North.

3. **Roads & Parks Department**

None

4. **Finance Department**

- (a) FIN-2019-026 2019 Corporate Energy Conservation and Demand Management Plan
- (b) FIN-2019-025 2019 Development Charges Background Study and By-law
- (c) Applications for Cancellation, Reduction or Refund of Taxes chapter 25, section 357 or 358 of the Municipal Act, 2001

5. **Puslinch Fire and Rescue Department**

None

6. **Mayor's Updates**

- (a) Ministry of Transportation Letter
- (b) Meeting with MPP Ted Arnott with respect to Places to Grow and the Highway 6 Bypass

10. **NOTICES OF MOTION**

- (a) Councilor Sepulis with respect to Internet Service

11. **COMMITTEE MINUTES**

- (a) April 23, 2019 Recreation Committee
- (b) June 11, 2019 Planning and Development
- (c) June 11, 2019 Committee of Adjustment



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12. **MUNICIPAL ANNOUNCEMENTS**

13. **UNFINISHED BUSINESS**

14. **BY-LAWS ≠**

- (a) Being a by-law to delegate authority to the Chief Administrative Officer (CAO) to approve the temporary use of the Puslinch Community Centre and Township Municipal Office parking lot lands.
- (b) A by-law to establish development charges for the Corporation of the Township of Puslinch.
- (c) Being a By-law to appoint Nina Lecic as Municipal Clerk.
- (d) Being a by-law to amend by-law number 19/85, as amended, being the zoning by-law for the Township of Puslinch (4188 Victoria Road South)
- (e) Being a by-law to amend by-law number 023/18, as amended, being the zoning by-law for the Township of Puslinch (4188 Victoria Road South)

15. **CONFIRMING BY-LAW ≠**

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

16. **ADJOURNMENT ≠**



MINUTES

DATE: Wednesday, June 12, 2019

CLOSED MEETING: 12:30 P.M.

OPEN MEETING: 12:30 P.M.

The June 12, 2019 Regular Council Meeting was held on the above date and called to order at 12:30 p.m. in the Council Chambers, Aberfoyle.

1. **ATTENDANCE:**

Mayor James Seeley
Councillor Matthew Bulmer
Councillor Jessica Goyda
Councillor Ken Roth
Councillor John Sepulis

STAFF IN ATTENDANCE:

1. Karen Landry, CAO/Clerk

OTHERS IN ATTENDANCE

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

None

3. **CLOSED MEETING**

Council was in closed session from 12:30 p.m. to 3:50 p.m.

Resolution No. 2019-232: Moved by Councillor Goyda and
Seconded by Councillor Sepulis

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

- (a) Confidential verbal report CAO/Clerk Karen Landry regarding personal matters about an identifiable individual, including municipal or local board employees and labor relations or employee negotiations – recruitment of Interim CAO.

CARRIED

Resolution No. 2019-233: Moved by Councillor Sepulis and
Seconded by Councillor Goyda

THAT Council moves into open session.

CARRIED

Council resumed into open session at 3:49 p.m.

Resolution No. 2019-234: Moved by Councillor Goyda and
Seconded by Councillor Sepulis

That Council receives the:

- (a) Confidential verbal report CAO/Clerk Karen Landry regarding personal matters about an identifiable individual, including municipal or local board employees and labor relations or employee negotiations – recruitment of Interim CAO;

And that staff proceed as directed.

CARRIED



7. CONFIRMING BY-LAW

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

Resolution No. 2019-235: Moved by Councillor Roth and
Seconded by Councillor Bulmer

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

By-Law 036-2019 being a by-law to confirm the proceedings of Council for the Corporation of the Township of Puslinch at its meeting held on the 12th day of June 2019.

CARRIED

8. ADJOURNMENT:

Resolution No. 2019-236: Moved by Councillor Bulmer and
Seconded by Councillor Roth

That Council hereby adjourns at 3:50 p.m.

CARRIED

James Seeley, Mayor

Karen Landry, CAO/Clerk



DATE: Wednesday June 19, 2019

TIME: 6:00 p.m.

PLACE: Township Municipal Office, 7404 Wellington Road 34, Puslinch

FILE NUMBER: Zoning Amendment File D14/ELL
4188 Victoria Road South

MEMBERS: Mayor James Seeley - Chair
Councillor Matthew Bulmer
Councillor Ken Roth
Councillor Jessica Goyda
Councillor John Sepulis

The Chair called the meeting to order at 6:00 p.m and welcomed those attending the Public Meeting.

No pecuniary interest was declared by any member of Council.

The Chair advised the purpose of the Public Meeting is to inform and provide the public with the opportunity to ask questions, or to express views with respect to the proposed Zoning By-law Amendment commenced by the applicant at 4188 Victoria Road South.

The Chair advised that the members of Council are here to observe and listen to public comments; however, they will not provide a position on the matter.

The Chair informed attendees when Council makes a decision, should you disagree with that decision, the Planning Act provides you with an opportunity to appeal this application to the Local Planning Appeal Tribunal for a hearing. Please note that if a person or public body does not make oral submissions at a public meeting or written submissions to the Township of Puslinch before the decision is made, the person or public body is not entitled to appeal the decision of the Township of Puslinch to the Local Planning Appeal Tribunal. In addition, if a person or public body does not make an oral submission at a public meeting, or make written comments to the Township of Puslinch before the decision is made, the person or public body may not be added as a party to the hearing of an appeal before the Local Planning Appeal Tribunal unless, in the opinion of the Tribunal, there are reasonable grounds to do so.

The Chair noted that the Planning Act requires that at least one Public Meeting be held for each development proposal.

The Chair instructed the format of the Public Meeting is as follows:

- The applicant will present the purpose and details of the application and any further relevant information.
- Following this the public can obtain clarification, ask questions and express their views on the proposal.
- The applicant and staff will attempt to answer questions or respond to concerns this evening. If this is not possible, the applicant and/or staff will follow up and obtain this information. Responses will be provided when this matter is brought forward and evaluated by Council at a later date.

Presentations:

Ivan Elliot, the applicant, provided an overview of the application including the purpose of the zoning by-law amendment being the renewal of an existing garden suite originally approved in February 2009.

There were no further questions or comments and Mayor Seeley declared the Public Meeting closed.



Council took no action on the proposal. Staff will be reporting at a later date with a recommendation for Council's consideration.

If the public wishes to receive further notification of this proposal, please sign in or leave your name with staff, or contact Township staff during regular business hours. Only those persons who leave their names will be provided further notification. If you wish to speak to the proposal when it is brought before Council in the future, you must register as a delegation with the Township Clerk prior to the meeting.

Adjournment:

The meeting adjourned at 6:09 p.m.



DATE: Wednesday June 19, 2019

TIME: 6:10 p.m.

PLACE: Township Municipal Office, 7404 Wellington Road 34, Puslinch

FILE: Public Meeting for Proposed Development Charges By-law

MEMBERS: Mayor James Seeley - Chair
Councillor Matthew Bulmer
Councillor Ken Roth
Councillor Jessica Goyda
Councillor John Sepulis

The Chair called the meeting to order at 6:10 p.m.

Presentations:

Andrew Grunda, Principal from Watson and Associates Limited provided an overview of the following information:

- Purpose of the Public Meeting
- Purpose of development charges (DC)
- The growth forecast over the 10-year period (2019-2029) and 20-year period (2019-2039)
- The services included in the Township's Municipal-Wide DC Study
- The Township's anticipated capital needs over the ten-year period total \$15.1 million
- The total DC recoverable capital costs over the ten-year period total \$2.8 million
- Calculated schedule of DC's
- DC comparison of current DC's to proposed DC's for residential and non-residential development
- DC comparisons of other municipalities (excluding water and wastewater services) for residential and non-residential development
- DC By-law policies including:
 - Charge applicability and timing
 - Statutory DC exemptions
 - Non-statutory DC exemptions
 - Redevelopment credits
- Next steps including:
 - Council to receive input from the public on the proposed DC by-law
 - Council to consider further amendments to the DC Background Study and DC By-law prior to by-law passage, as required; and
 - Council DC By-law approval (July 17, 2019)
- Proposed changes to the Development Charges Act as a result of Bill 108

The Chair, requested if there was anyone in attendance that wished to express their views on the proposed DC by-law.

Questions/Comments:

There were no questions or comments.

Adjournment:

The meeting adjourned at 6:29 p.m.



MINUTES

DATE: Wednesday, June 19, 2019

CLOSED MEETING: 5:00 P.M.

REGULAR MEETING: 7:00 P.M.

The June 19, 2019 Regular Council Meeting was held on the above date and called to order at 5:02 p.m. in the Council Chambers, Aberfoyle.

1. ATTENDANCE:

Mayor James Seeley
Councillor Matthew Bulmer
Councillor Jessica Goyda
Councillor Ken Roth
Councillor John Sepulis

STAFF IN ATTENDANCE:

1. Karen Landry, CAO/Clerk
2. Mary Hasan, Director of Finance/Treasurer
3. Nina Lecic, Deputy Clerk

OTHERS IN ATTENDANCE

1. Ivan Elliot	2. Bob Elliot	3. Bev Wozniak
4. Jeff McKay, Rogers	5. B. Jeffrey, Rogers	6. Javier and Anna Vera
7. Roger Will	8. Ellen and Mary M'Gowan	9. Donna Christie
10. Dan Nevndorf	11. Jennifer Nevndorf	12. James Christie
13. Elaine Welier	14. Barb Forestell	15. Lloyd Weber
16. Tm Forestell	17. Scott Lawson	18. Lisbet and Fred Brunnmeier
19. Greg Bowles	20. Laurie Ball	21. Tim Forestell
22. Jordan Collum	23. Bill Reeve	

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

None

3. CLOSED MEETING

Council was in closed session from 5:03 p.m. to 5:24 p.m.

Council recessed from 5:24 p.m. to 7:00 p.m.

Resolution No. 2019-237:

Moved by Councillor Goyda and
Seconded by Councillor Sepulis

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

- (a) Confidential verbal report CAO/Clerk Karen Landry regarding personal matters about an identifiable individual, including municipal or local board employees and labor relations or employee negotiations – recruitment of Interim CAO.
- (b) Confidential Verbal Report from Karen Landry, CAO/Clerk regarding personal matters about an identifiable individual, including municipal or local board employees and labour relations or employee negotiations regarding the organization structure update.
- (c) Confidential verbal report CAO/Clerk Karen Landry regarding advice that is subject to solicitor-client privilege, including communications necessary for that purpose – Responsibility Agreement.

- (d) Confidential Verbal Report from Karen Landry, CAO/Clerk regarding advice that is subject to solicitor-client privilege, including communications necessary for that purpose – Swastika.
- (e) Confidential Verbal Report from Karen Landry, CAO/Clerk regarding litigation or potential litigation, including matters before administrative tribunals affecting the municipality or local board with respect to the Zoning by-law appeal- 12 Nicholas Beaver.

CARRIED

Resolution No. 2019-238:

Moved by Councillor Goyda and
Seconded by Councillor Sepulis

THAT Council moves into open session.

CARRIED

Resolution No. 2019-239:

Moved by Councillor Sepulis and
Seconded by Councillor Goyda

That Council receives the:

- (a) Confidential verbal report CAO/Clerk Karen Landry regarding personal matters about an identifiable individual, including municipal or local board employees and labor relations or employee negotiations – recruitment of Interim CAO.
- (b) Confidential Verbal Report from Karen Landry, CAO/Clerk regarding personal matters about an identifiable individual, including municipal or local board employees and labour relations or employee negotiations regarding the organization structure update;
- (c) Confidential verbal report CAO/Clerk Karen Landry regarding advice that is subject to solicitor-client privilege, including communications necessary for that purpose – Responsibility Agreement.
- (d) Confidential Verbal Report from Karen Landry, CAO/Clerk regarding advice that is subject to solicitor-client privilege, including communications necessary for that purpose – Swastika trail;
- (e) Confidential Verbal Report from Karen Landry, CAO/Clerk regarding litigation or potential litigation, including matters before administrative tribunals affecting the municipality or local board with respect to the Zoning by-law appeal- 12 Nicholas Beaver;
And that staff proceeds as directed with respect to Items (b), (d), and (e).

CARRIED

4. ADOPTION OF THE MINUTES:

- (a) Council Meeting – June 5, 2019
- (b) Public Meeting for Proposed Property Standards By-law – June 5, 2019

Resolution No. 2019-240:

Moved by Councillor Goyda and
Seconded by Councillor Sepulis

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

- (a) Council Meeting – June 5, 2019
- (b) Public Meeting for Proposed Property Standards By-law – June 5, 2019

CARRIED

5. BUSINESS ARISING OUT OF THE MINUTES:

6. PUBLIC MEETINGS:

1. Proposed Development Charges By-Law

*note this Public Information Meeting will be held on Wednesday, June 19, 2019 at 6:00 p.m. at the Municipal Complex – 7404 Wellington Rd. 34.

2. Application D14/ELL 4188 Victoria Road South

*note this Public Information Meeting will be held on Wednesday, June 19, 2019 at 6:00 p.m. at the Municipal Complex – 7404 Wellington Rd. 34.

3. Addendum to Feasibility Study for Municipal Water and Wastewater Services

*note this public information meeting will be held Monday June 24th, 2019 at 6:30pm at the Puslinch Community Centre - 23 Brock Road S.

7. COMMUNICATIONS:

- (1) Correspondence from the Association of Municipalities of Ontario (AMO) with respect to the 2019 Delegation Form.
- (2) Correspondence from the Ministry of the Environment, Conservation and Parks with respect to EBR alerts to be discontinued.
- (3) Correspondence from Watson and Associates Economists Ltd. With respect to Bill 108: Potential Changes to the Development Charges Act.
- (4) Correspondence from the City of Guelph with respect to City of Guelph's Clair-Maltby Secondary Plan response letter

7. Intergovernmental Affairs

Resolution No. 2019-241: Moved by Councillor Sepulis and
Seconded by Councillor Bulmer

That Council for the Township of Puslinch supports the reestablishment of a combined ROMA and OGRA conference;

And that this resolution be sent to the ROMA Board of Directors, outlining the Township's support for a collaborative OGRA ROMA annual conference.

CARRIED

Resolution No. 2019-242: Moved by Councillor Sepulis and
Seconded by Councillor Goyda

That the Intergovernmental Affairs correspondence items listed on the Council Agenda for the June 19, 2019 Council meeting be received.

CARRIED

8. DELEGATIONS/PRESENTATIONS

7:05 p.m. – John Arnold with respect to the elimination of cutting Fox Run Parkette until after flower blooming to allow pollinators to feed.

Resolution No. 2019-243: Moved by Councillor Sepulis and
Seconded by Councillor Goyda

That Council receives the presentation by John Arnold with respect to the elimination of cutting Fox Run Parkette until after flower blooming to allow pollinators to feed.

CARRIED

7: 10 p.m. – Volunteer Appreciation Award presented to Brenda Law.

A refreshment break followed the presentation.

7:30 p.m. – Stacey Laughlin with respect to the City of Guelph’s Clair-Maltby Secondary Plan

Resolution No. 2019-244: Moved by Councillor Goyda and
Seconded by Councillor Sepulis

That Council receives the presentation by Stacey Laughlin with respect to the City of Guelph’s Clair-Maltby Secondary Plan.

CARRIED

8:10 p.m. – Roger Will with respect to the East boundary road bypass review of Townline Road.

Resolution No. 2019-245: Moved by Councillor Goyda and
Seconded by Councillor Sepulis

That Council receives the presentation by Roger Will with respect to the East boundary road bypass review of Townline Road.

CARRIED

8:20 p.m. – Donna Christie and Dan Neundorf with respect to the proposed Rogers Telecommunications Tower at 4638 Sideroad 20 North.

Resolution No. 2019-246: Moved by Councillor Sepulis and
Seconded by Councillor Goyda

That Council receives the presentation by Donna Christie and Dan Neundorf with respect to the proposed Rogers Telecommunications Tower at 4638 Sideroad 20 North.

CARRIED

9. REPORTS:

1. Administration Department

(a) ADM-2019-021 - Organization Structure Updates

Resolution No. 2019-247: Moved by Councillor Goyda and
Seconded by Councillor Sepulis

That Report ADM-2019-021 regarding the Public Works, Parks and Facilities Operational Review and Organization Structure Update be received; and

That Council authorize the changes as outlined in Report ADM-2019-021 with an annual tax levy impact of \$31,239; and

That Staff report back on the action items as outlined in Report ADM-2019-021; and

That Staff report back on the results of the 8-month pilot program.

CARRIED

(b) Fasken Martineau DuMoulin LLP: Integrity Commissioner Special Report June 2019

Resolution No. 2019-248: Moved by Councillor Sepulis and
Seconded by Councillor Goyda

That Council directs the Integrity Commissioner to include, in the relevant statement of account the surname of the Member who made a request for advice under paragraph 4, 5 or 6 of subsection 223.3 (1) of the Municipal Act, provided that confidentiality is maintained and

the Integrity Commissioner reveals no information about the nature of the request or the content of the advice.

CARRIED

2. **Planning and Building Department**

(a) BLDG-2019-006 Building Monthly Update May 2019

Resolution No. 2019-249: Moved by Councillor Goyda and
Seconded by Councillor Sepulis

That Report BLDG-2019-006 with respect to the Building Department Monthly Update - May 2019 be received for information.

CARRIED

(b) TC-01-19 Report to Industry Canada

Resolution No. 2019-250: Moved by Councillor Sepulis and
Seconded by Councillor Goyda

That Council is not currently in support of the proposed location of the tower because the proponent has not adequately demonstrated that the tower cannot be located on a commercial/industrial property, or a vacant field property in the original search area as well as the expanded area, and accordingly requests substantiating documentation;

And that a copy of this resolution be forwarded to Wellington MP Michael Chong.

CARRIED

Resolution No. 2019-251: Moved by Councillor Sepulis and
Seconded by Councillor Goyda

That Report PD-2019-006 regarding Telecommunication Application File TC-01-2019 (A12/ROG) – Rogers site C6798 leased from L E L Farms Limited, Concession 4, Part Lot 20 Parts 2 to 3, municipally known as 4638 Sideroad 20 North, be received.

CARRIED

(c) County of Wellington Committee Report - Bill 108 - More Homes, More Choices Act, 2019

Resolution No. 2019-252: Moved by Councillor Roth and
Seconded by Councillor Bulmer

THAT Council receives the Wellington County report “Bill 108 – More Homes, More Choice Act, 2019” for information.

CARRIED

Council directed staff to send correspondence to the Ministry showing support of the Wellington County report, and requested that note be made of the short 30-day commenting period.

(d) County of Wellington - Puslinch Overview Memo May2019 - Provincially Significant Employment Zones

Resolution No. 2019-253: Moved by Councillor Bulmer and
Seconded by Councillor Roth

That Council receives the Wellington County Memorandum with respect to Provincially Significant Employment Zones.

CARRIED

3. Roads & Parks Department

(a) GM BluePlan - Fox Run Park Accessible Trail Preliminary Concept Plan

Resolution No. 2019-254: Moved by Councillor Roth and
Seconded by Councillor Bulmer

That Council receives the Fox Run Park Accessible Trail Preliminary Concept Plan by GM BluePlan;

And that the Public meeting be held on July 22, 2019 at the Puslinch Community Centre.

CARRIED

4. Puslinch Fire and Rescue Services

(a) FIR-2019-005 Memorandum of Understanding

Resolution No. 2019-255: Moved by Councillor Bulmer and
Seconded by Councillor Roth

That Report FIR-2019-005 regarding the entering into of a Memorandum of Understanding for the Activation of Tiered Response be received; and

That Council hereby authorizes the entering into the Memorandum of Understanding for the Activation of Tiered Response with Guelph Wellington Paramedic Service; and

That Council hereby authorizes the Fire Chief to execute the Memorandum of Understanding on behalf of the Township.

CARRIED

(b) FIR-2019-006 New Equipment Purchase

Resolution No. 2019-256: Moved by Councillor Sepulis and
Seconded by Councillor Roth

That Report FIR-2019-006 regarding the Purchase of New Equipment – Elliptical Exercise Machine be received; and

That Council does not authorize the purchase of the used elliptical and requests that it be removed from the facility due to liability concerns.

CARRIED

5. Mayor's Updates

(a) AMO Delegation

Council approved the following AMO Delegations:

- Ministry of Transportation with respect to the Highway 6 By-pass;
- Ministry of Transportation with respect to the inspection station;
- Ministry of Finance with respect to Nestle royalties;
- Ministry of Municipal Affairs and Housing with respect to Provincially Significant Employment Zones.

10. NOTICE OF MOTION:



Councillor Sepulis notified Council that he will be bringing forward a Notice of Motion to the July 17, 2019 Council Meeting with respect to the creation of an ad hoc committee to pursue improving internet services in Puslinch.

11. COMMITTEE MINUTES

- (a) February 19, 2019 Heritage Committee Minutes
- (b) May 14, 2019 Committee of Adjustment Meeting Minutes
- (c) May 14, 2019 Planning and Development Advisory Committee Meeting Minutes

Resolution No. 2019-257: Moved by Councillor Bulmer and
Seconded by Councillor Roth

That Council receives the following Committee Minutes:

- (a) **February 19, 2019 Heritage Committee Minutes**
- (b) **May 14, 2019 Committee of Adjustment Meeting Minutes**
- (c) **May 14, 2019 Planning and Development Advisory Committee Meeting Minutes**

CARRIED

12. MUNICIPAL ANNOUNCEMENTS

- (a) Mayor Seeley and Council acknowledged the hard work of Karen Landry, CAO/Clerk and thanked her for her dedication to Puslinch at her last Council meeting.

13. UNFINISHED BUSINESS

14. BY-LAWS:

- (a) A By-law to amend the 2019 Tax Levy By-law No. 034-2019 being the By-law to provide for the Levy and Collection of Property Taxes for the 2019 Taxation Year.
- (b) A By-law to acquire and dedicate Block 12 ON Plan 61M-230 as part of the Township of Puslinch Public Highway System, to be known as and to form part of Church Street BL2019-038
- (c) A By-law to appoint a Building Official for the Corporation of the Township of Puslinch BL2019-039
- (d) A By-law to adopt Amendment No. 1 to the Our Corridor Community Improvement Plan BL2019-040

Resolution No. 2019-258: Moved by Councillor Roth and
Seconded by Councillor Bulmer

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

- (a) **A By-law to amend the 2019 Tax Levy By-law No. 034-2019 being the By-law to provide for the Levy and Collection of Property Taxes for the 2019 Taxation Year.**
- (b) **A By-law to acquire and dedicate Block 12 ON Plan 61M-230 as part of the Township of Puslinch Public Highway System, to be known as and to form part of Church Street BL2019-038**
- (c) **A By-law to appoint a Building Official for the Corporation of the Township of Puslinch BL2019-039**
- (d) **A By-law to adopt Amendment No. 1 to the Our Corridor Community Improvement Plan BL2019-040**

CARRIED

15. CONFIRMING BY-LAW

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



Resolution No. 2019-259:

Moved by Councillor Bulmer and
Seconded by Councillor Roth

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

By-Law 041-2019 being a by-law to confirm the proceedings of Council for the Corporation of the Township of Puslinch at its meeting held on the 19th day of June 2019.

CARRIED

16. ADJOURNMENT:

Resolution No. 2019-260:

Moved by Councillor Roth and
Seconded by Councillor Bulmer

That Council hereby adjourns at 10:57 p.m.

CARRIED

James Seeley, Mayor

Karen Landry, CAO/Clerk

DATE: Wednesday June 24, 2019

TIME: 6:30 p.m.

PLACE: Puslinch Community Centre, 23 Brock Road South Puslinch

FILE: Feasibility Study for Municipal Water and Waste Water Services

MEMBERS: Mayor James Seeley - Chair
Councillor Matthew Bulmer
Councillor Ken Roth
Councillor Jessica Goyda
Councillor John Sepulis

The Chair called the meeting to order at 6: 30 p.m.

Presentations:

Stuart Winchester, Project Manager, CIMA+ provided the following overview:

- Feasibility study details;
- Development opportunities;
- Purpose of the Public Meeting being to explain why the Township is undertaking this additional study and to review the new scope;
- Overview of the Scoped Study Area which includes the Major Industrial and Commercial Users in the Township;
- Projected employment growth;
- Overview and assessment of servicing and sewage servicing options for consideration such as intra and inter municipal servicing;
- Typical usage charges;
- Project timeline.

The Chair, requested if there was anyone in attendance that wished to express their views on the proposed Feasibility Study for Municipal Water and Waste Water Services.

Margaret Hauwert inquired whether Puslinch residential taxpayers would bear the cost of the proposed water and wastewater services and inquired about what the future construction implications would be on Brock Road.

- Stuart Winchester noted that the residential tax base will not be impacted under this proposal and that a Class Environmental Study would be required to determine the location of the works.

Steve Just inquired as to why the proposed piping comes up to Gilmour Road.

- Stuart noted that the final location of the piping may change.

John Arnold inquired as to why the preliminary projected sewage flows are double the projected water demands. He also noted that displeasure with the inter-municipal option that would see the Township connect to the City of Guelph's water and wastewater systems, and also expressed concern with the project costing.

- Stuart noted that the preliminary projections allow for potential for infiltration into the sewers, and that opportunities to reduce the preliminary projected numbers would be dealt with other studies.

Ray Robinson inquired as to how many companies would be serviced by this proposal and sought clarification that the cost of the project would be absorbed by those companies.

- Stuart responded that the proposal is for 128 active businesses within the Aberfoyle area and that the funding is subject to the cost recovery plan.

Cathy Smith inquired as to how much new business growth is being sought and encouraged to come into the Township?

- Stuart noted that the Official Plan identifies a certain amount of anticipated growth.

Patricia Fleming inquired as to whether they would be forced to change their water system as they have businesses on both of their sides of their property.

- Stuart noted that the Council direction was to prepare a proposal for servicing of industrial properties only.

Margaret Hauwert inquired as to how many of the identified 128 businesses have noted that they would be interested in participating.

- Karen Landry, CAO/Clerk noted that the purpose of this public meeting was to gather feedback from the industrial, commercial sector.

Karen Thibault inquired whether the Puslinch Community Centre and the Library would be part of the study area?

- Stuart noted that they are being considered part of the study area.

Ray Robinson noted the cost per business, assuming that each business would participate and noted that he believes that there would be strong objection, considering that none of the businesses are using water as part of their operations.

Gil Rens inquired whether the Township is contacting the applicable businesses in order to determine their interest, and to inquire as to how the feasibility study is being funded.

- Karen Landry noted that close to 90% of the study is being funded through grants and that all the businesses in the area were notified. The Township will also be sending a comment form to all businesses to solicit feedback.

Bev Wozniak inquired about the effluent discharge to Mill Creek, and asked what the alternative will be if that location does not pass the Study.

- Stuart noted that Mill Creek would be fully assessed before proceeding with an alternative location.

Steve Just inquired whether there is any associated noise with the proposed water plant associated with the intra system.

- Stuart noted that the noise would be very minimal.

Justin inquired as to what the feedback has been from businesses so far, and whether they were generally in support of services.

- Stuart noted that specific feedback has not been received from businesses yet.

Ray Robinson also noted that the cost for each business would be approximately \$10 000 per employee.

Fred Prior noted that past Councils attracted low usage businesses, and would hope that we would continue to attract that type of industry.

Questions/Comments:

There were no questions or comments.

Adjournment:

The meeting adjourned at 7:36 p.m.



THE CORPORATION OF THE TOWNSHIP OF PUSLINCH
NOTICE OF PUBLIC MEETING
Fox Run Park

You are invited to attend a Public Meeting on July 22, 2019, as the Township of Puslinch is presenting a concept plan for the proposed accessible waling trail at Fox Run Park.

Map



Your attendance and comments at this meeting are welcome. It is your opportunity to express your opinion on the concept plan.

You can visit the Township's Website at www.puslinch.ca

Date: Monday, July 22, 2019
Time: 6:30 p.m.
Place: Puslinch Community Centre, 23 Brock Road South, Puslinch, ON

Unable to attend:

If you are unable to attend on June 18, 2018 please contact Karen Landry CAO/Clerk at (519) 763-1226 ext. 214 between June 19 and June 26, 2018 to make arrangements to obtain the "Survey and Comment Form" provided at the Open House.

**Wellington Common
Elements Condominium
Corporation #214 (WCECC
#214)**

**2018 Annual Operations and
Maintenance Report for the
Wastewater Treatment System**

SUBMITTED BY

Ontario Clean Water Agency
2225 Erin Mills Parkway, Suite 1200
Mississauga, ON L5K 1T9

Date: March 28, 2019

Project No: Z2133P18016-000

Rev: 1

Issue and Revision Record				
Rev. No.	Date	Prepared by:	Reviewed by:	Rev. Description
1	March 28, 2019	Vladimir Marenich, EIT	Jose Casal, PEng	Final

STATEMENT OF CONFIDENTIALITY

OCWA's Report to
Wellington Common Elements Condominium Corporation #214
(CECC #214) for the
Mini Lakes Annual Operations and Maintenance Report for
Wastewater Treatment

This document has been developed by the Ontario Clean Water Agency in response to the CECC #214 requests. Information has been provided for the express review of the CECC #214 and is not to be copied or submitted in any way or form to any person(s) or organization(s) without the written authorization of the Ontario Clean Water Agency. All copyright and intellectual rights to the material provided remain in the ownership of the Ontario Clean Water Agency.

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1 Introduction

The Ontario Clean Water Agency (OCWA) was contracted by the Wellington Common Elements Condominium Corporation #214 (CECC #214) to prepare an Annual Operations and Maintenance Report for the Mini Lakes Wastewater Treatment System (WWTS) as required by Section 2.5 of the 2014 Operations and Maintenance agreement between CECC#214 and the Township of Puslinch.

This report includes:

1. A summary of the test results from the monitoring program,
2. A list of the monitored flows with a summary of average use per unit,
3. A list of equipment or components scheduled for replacement,
4. A summary of the conditions of the treatment system,
5. A list of operating issues/problems encountered during the year and repairs made to the WWTS,
6. A copy of the Operations and Maintenance Contract for the following year.

2 Wastewater Treatment System (WWTS)

The Mini Lakes community is located on Wellington County Road #34 directly northeast of Aberfoyle in the Township of Puslinch. At present, there is an Operation and Maintenance Agreement between Mini Lakes and the Township of Puslinch to ensure the general requirements for operation and maintenance, repair and replacement of the WWTS are met.

In October 2017, the Mini Lake Board retained the Ontario Clean Water Agency (OCWA) as the Operating Authority to operate and maintain the WWTS. It should be noted that American Water Canada Corporation (AWC) was the operating authority until the end of September 2017.

At present, the system operates under the Amended Environmental Compliance Approval (ECA) number 8154-AR4J2T issued in September 18; 2017. A copy of the amended ECA is included in Appendix A.

The Mini Lakes WWTS is composed of the following areas:

- Wastewater Collection System
- Wastewater Treatment Plant
- Subsurface Disposal System

2.1 Wastewater Collection System

Domestic sewage from the residences is collected via gravity mains into five Sewage Pumping Stations (SPS). All five SPS discharge directly into the existing Wastewater Treatment Plant (WTP). A description of the five SPS is provided in Table 1.

Table 2-1: Mini Lakes Sewage Pumping Stations

SEWAGE PUMPING STATION (SPS)	DESCRIPTION
SPS-1	One 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 submersible pumps, each pump rated at 1.8 L/s at 28.98 m TDH and having a working volume of 0.405 m ³ , 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 WWTP.
SPS-2	One 1,200 mm diameter fibreglass package duplex sewage pumping station (located on Jasper Heights Drive approximately 110 m northeast of Garden Parkway servicing approximately 132 units), equipped with two submersible pumps, each pump rated at 2.225 L/s at 33.82 m TDH and having a working volume of 0.501 m ³ , and a forcemain, approx. 224 m long, extending from the pump station before discharging into the common 75 mm forcemain from PS-3, where the common forcemain continues approximately 215 m to the junction with PS-1 and a further 621 m to discharge directly to the WWTP.
SPS-3	One 1,200 mm diameter fibreglass package duplex sewage pumping station (located on Lot 62 Hemlock, servicing approximately 42 units), equipped with two submersible pumps, each pump rated at 1.075 L/s at 32.2 m TDH and having a working volume of 0.242 m ³ , and a forcemain, approx. 229 m long, extending from the pump station before discharging into the common 75 mm forcemain from PS-3, where the common forcemain continues approximately 215 m to the junction with PS-1 and a further 621 m to discharge directly to the WWTP.
SPS-4	One 1,200 mm diameter fibreglass package duplex sewage pumping station (located adjacent and on the north corner of Lot 227 on Cedarbush Crescent, servicing approximately 53 units and a community centre), equipped with two submersible pumps, each pump rated at 1.35 L/s at 7.27 m TDH and having a working volume of 0.304 m ³ , and a forcemain, approx. 358 m long, extending from the pump station before discharging directly to the WWTP.
SPS-5	One 1,200 mm diameter precast concrete duplex sewage pumping station (located at the intersection of Water Street and Basswood to service Phase 2 and 3 development, and will ultimately service approximately 79 units), equipped with two submersible pumps, each pump rated at 2.55 L/s at 14.75 m TDH and having a working volume of 0.469 m ³ , and a forcemain, approx. 207 m long, discharging into the 75 mm diameter forcemain from PS-4, where the common forcemain continues for approximately 29 m before discharging directly to the WWTP.

2.2 Wastewater Treatment Plant (WWTP)

The Mini Lakes WWTP has a rated capacity of 158 m³/d average daily flow and serves 292 residential units and common elements within the complex. The existing facility features dual RBC trains operating in parallel inside a building which also houses a primary settlement tank, intermediate clarifier, a denitrification tank and final clarifiers and effluent pump chamber. Table 2 describes the main process equipment and components currently present at the Mini Lakes WWTP.

Table 2-2: Mini Lakes WWTP

WWTP PROCESS UNITS	DESCRIPTION
Primary Settlement Tank	A concrete common primary settlement tank with cover, approx. 8.1 m wide x 8.5 m long x 1.73 m liquid depth discharging (via an outlet pipe to each treatment train) to the rotating biological contactors, complete with gear motor and drive mechanism.
Rotating Biological Contactors	Two rotating biological contactors (RBCs) with 2.35 m diameter rotor, each equipped with low profile fixed baffles and establish four zones per rotor, and providing approx. 4,179 m ² of bio-support media area.
Intermediate Clarifiers	Two hopper bottom 3 m x 3.6 m intermediate clarifiers per treatment train, complete with inlet and outlet weir, sludge and scum transfer equipment and pumping systems.
Denitrification Tanks	Two denitrification tanks (approx. 5.06 m x 3.6 m) each consisting with 4,704 m ² of submerged rigid media, complete with an adjustable flow distribution box; one 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	Chemical feed system comprising of one 2,300 L capacity polyethylene chemical storage tank and metering pump (with standby pump) capable of feeding approximately 1.5 L/hr of alum into the last stage of the RBC rotor complete with spill containment facilities.
Final Clarifiers	Two hopper bottom final clarifiers (3 m x 3.6 m) per treatment train, complete with inlet and outlet weirs and sludge transfer equipment and pumping systems.
Effluent Pump Chamber	A 50,000 L capacity effluent pump chamber equipped with five submersible pumps (with one additional standby pump), each rated at 2.7 L/s at 11 m TDH (max.), to discharge treated effluent via a splitter valve and five 75 mm diameter forcemains, one forcemain to each absorption cell of the subsurface disposal system.

2.3 Subsurface Disposal System

The Mini Lake Sewage Treatment System also contain a subsurface disposal system comprising of five shallow buried trench absorption cells, with each cell comprising of:

- Six zones with eight laterals each lateral located within a trench 18 m long and 0.6 m wide.
- A hollow inverted semi-circular chamber housing a 25 mm PVC pressurized pipe with 3.2 mm holes spaced at 1 m c/c per zone, for a total of approximately 864 m of piping per cell (total of approximately 4,320 m of piping) with distribution valve assembly and manifold.

3 Monitoring Program

The monitoring program currently in place for the Mini Lake WWTS involves a combination of monthly effluent quality sampling and groundwater and surface water quarterly sampling as follows:

3.1 Monthly Effluent Monitoring & Sampling

According to the current ECA, Mini Lakes is required to analyze monthly effluent samples to assess compliance with the effluent quality limits as per the program defined in Table 3-1.

Table 3-1: Mini Lakes WWTS Effluent Sampling Program and Effluent Compliance Limits

SAMPLING LOCATION	PARAMETER	TYPE OF SAMPLE	FREQUENCY
Effluent Pump Chamber (upstream of subsurface disposal system)	CBOD ₅ grab monthly	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
	<i>E. coli</i>	Grab	Monthly
	Dissolved Oxygen	Grab	Monthly
	pH	Grab	Monthly

3.2 Quarterly Groundwater Monitoring and Sampling

To assess the risk of possible groundwater contamination, there are nine groundwater monitoring wells and two piezometers located throughout the Mini Lakes community. These wells are required to be sampled quarterly (every 3 months) for the parameters defined in Table 3-2. In addition, groundwater depths for each of the monitoring wells must also be recorded to assess groundwater elevation and flow paths through the site.

Table 3-2: Mini Lakes Groundwater Monitoring Wells and Sampling Program

WELL	PARAMETER	TYPE OF SAMPLE	FREQUENCY
MW-1	Located near the eastern gate entrance on Bull Frog Drive, approximately 410 m North-West of the subsurface disposal system. This well is considered a background well, useful for estimating incoming groundwater flow from outside the property boundary.	CBOD ₅ , TSS, TP, TAN, Nitrate-N, Nitrite-N, TKN, <i>E. coli</i> , DOC	Grab Quarterly
MW-2	Located only 30 m northwest of the subsurface disposal system.	CBOD ₅ , TSS, TP, TAN, Nitrate-N, Nitrite-N, TKN, <i>E. coli</i> , DOC	Grab Quarterly
MW-4	Located 25 m southwest of the subsurface disposal systems.	CBOD ₅ , TSS, TP, TAN, Nitrate-N, Nitrite-N, TKN, <i>E. coli</i> , DOC	Grab Quarterly
MW-5	Located 200m southwest of the subsurface disposal systems.	CBOD ₅ , TSS, TP, TAN, Nitrate-N, Nitrite-N, TKN, <i>E. coli</i> , DOC	Grab Quarterly

WELL		PARAMETER	TYPE OF SAMPLE	FREQUENCY
MW-6	Located 220m west of MW#5 and 20m southeast of the nearest residence on Ash Avenue.	CBOD ₅ , TSS, TP, TAN, Nitrate-N, Nitrite-N, TKN, <i>E. coli.</i> , DOC	Grab	Quarterly
MW-7	Located 515m west of the subsurface disposal systems, northwest of MW#6 and on the south side of the west end of Ash Avenue.	CBOD ₅ , TSS, TP, TAN, Nitrate-N, Nitrite-N, TKN, <i>E. coli.</i> , DOC	Grab	Quarterly
MW-8	Located 750 m west of the subsurface disposal systems, located at the far west of the community. It is the most down gradient monitoring well, and is 20m from the nearest pond.	CBOD ₅ , TSS, TP, TAN, Nitrate-N, Nitrite-N, TKN, <i>E. coli.</i> , DOC	Grab	Quarterly
MW-9	Located off of Water St., 270m North-north-west of the subsurface disposal system. This well is considered a background well, useful for estimating the properties of incoming subsurface flow. The well similar to MW#1, which it is located 200 m directly west off and share several of the same properties.	CBOD ₅ , TSS, TP, TAN, Nitrate-N, Nitrite-N, TKN, <i>E. coli.</i> , DOC	Grab	Quarterly
MW-10	Located 5 m directly north-east of the subsurface disposal system.	CBOD ₅ , TSS, TP, TAN, Nitrate-N, Nitrite-N, TKN, <i>E. coli.</i> , DOC	Grab	Quarterly
MW-11 (SP1)	Located on the southeastern shore of the central pond. Installed in the fall of 2016, this well intercepts potential contamination from the subsurface disposal system entering the pond.	CBOD ₅ , TSS, TP, TAN, Nitrate-N, Nitrite-N, TKN, <i>E. coli.</i> , DOC	Grab	Quarterly
MW-12 (SP2)	Located on the northeast shoreline of the central pond. Installed in the summer of 2016, this well is to intercept potential plume contamination from the subsurface disposal system entering the central pond.	CBOD ₅ , TSS, TP, TAN, Nitrate-N, Nitrite-N, TKN, <i>E. coli.</i> , DOC	Grab	Quarterly

3.3 Quarterly Surface Water Monitoring and Sampling

In addition to the groundwater monitoring wells, there are five surface water monitoring stations at different locations throughout the Mini Lakes community which are required to be sampled quarterly (every 3 months) for the parameters as defined in Table 3-3.

Table 3-3: Mini Lakes Surface Monitoring Stations and Sampling Program

STATION	LOCATION	PARAMETER	TYPE OF SAMPLE	FREQUENCY
SW-1	Up-gradient background	TP, TAN, Nitrate-N, Nitrite-N, TKN, <i>E. coli.</i> , pH, Temperature	Grab	Quarterly
SW-3	Within the main pond	TP, TAN, Nitrate-N, Nitrite-N, TKN, <i>E. coli.</i> , pH, Temperature	Grab	Quarterly
SW-4	Outlet from the main pond	TP, TAN, Nitrate-N, Nitrite-N, TKN, <i>E. coli.</i> , pH, Temperature	Grab	Quarterly

SW-5	Up-gradient tributaries	TP, TAN, Nitrate-N, Nitrite-N, TKN, <i>E. coli.</i> , pH, Temperature	Grab	Quarterly
SW-6	Outlet from the property	TP, TAN, Nitrate-N, Nitrite-N, TKN, <i>E. coli.</i> , pH, Temperature	Grab	Quarterly

4 Sewage Effluent Flows

Figure 4-1 shows the monthly average and maximum flows for the Mini Lakes WWTP in 2018, as reported by the operating authority (OCWA).

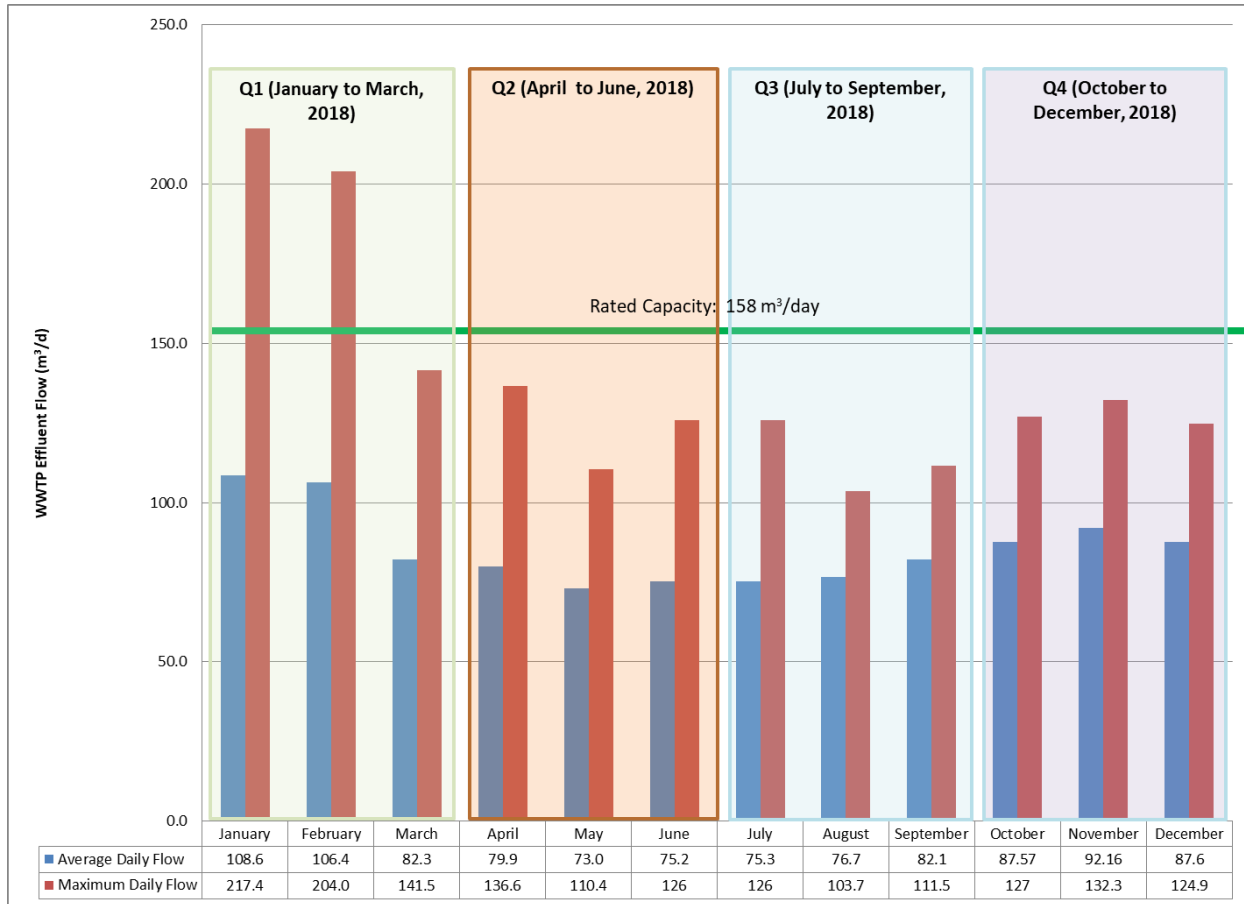


Figure 4-1: Monthly Maximum and Average WWTP Effluent Flow (2018)

As shown in Figure 4-1; during the months of January and February (Q1) the existing inflow and infiltration (I & I) issues (i.e. lack of a storm sewer, etc.) together with abnormal seasonal weather conditions (temperature and precipitation) caused flow exceedances beyond the facility’s rated capacity.

Table 4-1, shows the 10 highest effluent flows recorded for the period and how they correlate to the prevailing weather conditions in January and February (Q1). All the days where effluent flow exceedances were recorded, are associated to mild weather conditions with temperatures above the freezing mark (> 0°C) together with precipitation. Both precipitation and warmer temperatures accelerate the snow melting process; which create excess water volume. In absence of a storm water

system, the excess water volume (once the soil became saturated) most likely ran off through the sewer system ending in the sewage treatment system.

Table 4-1: Top 10 Highest Effluent Days in 2018 (Q1) with corresponding temperature and precipitation¹

Sewage Effluent Flow (m ³ /day)	Date	Temperature – High (°C)	Precipitation (mm)
217.4	23-Jan	3.9	7.6
204.0	21-Feb	12.1	6.9
184.7	20-Feb	13.8	19.7
159.9	11-Jan	11.1	9.6
158.7	26-Feb	5.7	1.5 (previous day)
155.3	27-Jan	7	1.3
147.1	16-Jan	-4.8	0
146.3	12-Jan	11.2	13.8
141.5	17-Mar	4.7	0
138.3	10-Mar	0.6	0.2 (previous day)

As also illustrated in Figure 4-1, there has been a consistent upward trend in average daily flow since the end of Q2 (June). Maximum daily flow has remained consistent. During Q4 in particular, some high flow events (Maximum Daily Flows) were recorder; however none of these high flows events ever exceeded the facility’s rated capacity.

A comparative effluent flow analysis of the past seven years (2012-2018) indicates that the effluent flows in 2018 have decreased substantially as compared to the previous years (Figure 4-3); however a direct cause of the reduced flows has not been determined.

¹ Source: The Weather Network Canada (<https://www.theweathernetwork.com/ca/monthly/ontario/mini-lakes?year=2018&month=1&dispt=calendar-container-monthly>)

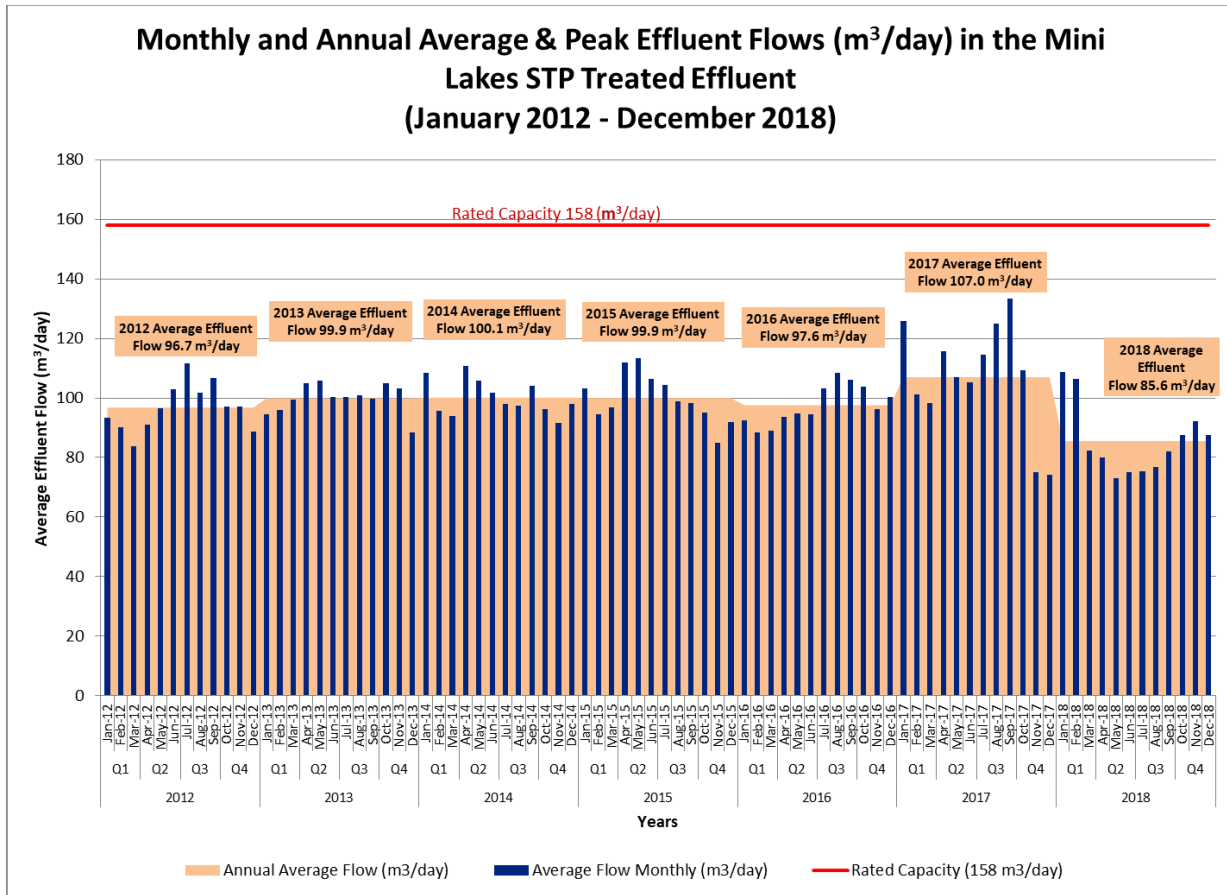


Figure 4-2: Historical Effluent Flows Trends (2012 – 2018)

5 Effluent Quality

According to the terms and conditions of the ECA currently in place, non-compliance is deemed to have occurred when the **annual average concentration** of each parameter (Total Phosphorus, Nitrate, CBOD₅ and TSS) during the calendar year exceeds the corresponding compliance limit as shown in Table 5-1.

Table 5-1: Mini Lakes Effluent Compliance Limits

EFFLUENT PARAMETERS	ANNUAL AVERAGE CONCENTRATION
CBOD ₅	20 mg/L
Total Suspended Solids (TSS)	20 mg/L
Nitrate Nitrogen (NO ₃ -N)	8 mg/L
Total Phosphorus (TP)	1 mg/L

Table 5-2 below shows the monthly/quarterly results of the effluent quality monitoring sampling completed in 2018. Highlighted text (RED) indicates monthly individual exceedances of the effluent concentration limits (Table 5-1) stated in the ECA currently in place.

Table 5-2: Mini Lakes Monthly Effluent Quality Results (2018)

2018	NITRITE (mg/L)	NITRATE (mg/L)	pH	CBOD ₅ (mg/L)	TSS (mg/L)	AMMONIA (mg/L)	TKN (mg/L)	TP (mg/L)	DO (mg/L)	E. COLI (CFU/100mL)
ECA Limit (Annual avg. conc.)		8		20	20			1		
Jan-18	0.71	9.15	7.56	7.00	14.00	2.0	3.1	0.28	8.0	11,200
Feb-18	0.71	7.78	7.44	9.50	14.50	2.4	3.9	0.32	8.9	4,000
Mar-18	0.77	8.84	7.48	12.60	13.30	2.6	3.2	0.32	7.6	30,200
Apr-18	0.66	9.94	7.54	7.00	15.00	3.6	4.6	0.32	6.6	74,000
May-18	1.41	4.13	7.35	36.00	23.00	5.3	6.5	0.34	5.7	32,800
June-18	0.88	7.87	7.42	26.00	20.00	1.7	5.1	0.28	8.1	4,200
July-18	0.80	9.88	7.32	15.00	34.00	2.6	4.8	0.76	6.8	84,000
Aug-18	1.99	11.80	7.16	7.00	20.00	1.8	2.7	0.37	5.2	42,800
Sept-18	1.81	5.85	7.88	20.00	20.00	1.1	2.6	0.30	6.6	4,880
Oct-18	1.41	7.86	7.43	27.00	24.00	1.10	2.10	0.19	3.60	77,000
Nov-18	2.25	13.70	7.42	21.00	15.00	0.30	0.50	0.09	7.20	n/a
Dec-18	2.52	12.60	7.34	19.00	32.00	0.10	2.30	0.32	5.30	14,000
2018 Average	1.33	9.12	7.28	18.00	20.25	2.05	3.45	0.33	6.63	34,389

In terms of performance, the 2018 was critical since many non-compliance exceedances were reported monthly/quarterly for all the compliance parameters except Total Phosphorus (TP). Out of the four quarters in 2018; Q4 appears to be the most critical quarter with exceedances reported in one or more months of the quarter for all compliance parameters except Total Phosphorus (TP). More importantly, the underperformance experienced in Q4 especially for the nitrates and TSS was pivotal for failing compliance with the regulatory requirements stated in the ECA.

A detailed analysis of each particular compliance parameter is discussed in the following subsections.

5.1 Total Phosphorus (TP)

Table 5-3 illustrates the historical quarterly and annual TP concentration levels in the treated effluent as compared to the compliance limit stated in the current ECA. The variations in the total phosphorus (TP) levels in Q4 of 2018 were again imperceptibles as compared with previous reporting periods (Q1, Q2, and Q3). In general, the TP levels in the treated effluent for 2018 were below the compliance limit and were similar to the historical trends experienced since 2012.

Table 5-3: Historical TP Concentrations in Effluent

TSS CONCENTRATION (mg/L)								COMPLIANCE LIMIT (mg/L)
2012	2013	2014	2015	2016	2017	2018		
Q1 Average	0.48	0.57	0.20	0.08	0.08	0.11	0.32	1.00
Q2 Average	0.43	0.36	0.21	0.06	0.11	0.09	0.31	
Q3 Average	0.47	0.29	0.82	0.06	0.07	0.15	0.48	
Q4 Average	0.32	0.39	0.23	0.12	0.08	0.09	0.20	
Annual Average	0.42	0.40	0.37	0.08	0.09	0.11	0.33	

5.2 Carbonaceous Biological Oxygen Demand (CBOD₅)

As illustrated in Table 5-2, although the annual CBOD₅ average concentration (18 mg/L) remained below the compliance limit of 20 mg/L, some monthly exceedances were reported during Q2 and Q4 of 2018.

During a site visit (October 4, 2018) to the facility, it was observed that the biofilm attached to the RBC's disks did not look as healthy and copious as seen before during previous visits to the facility. This finding could explain the high effluent CBOD₅ concentrations recorded in October, as lack of biofilm could have impacted the ability of the treatment train to effectively reduce the CBOD₅ concentrations of the effluent. Judging by the steadily decreasing trend of effluent CBOD₅ concentration from October to December 2018 (Table 5-2), the biofilm appears to have regenerated from the conditions observed in early October of 2018.

In terms of historical trend, Table 5-4 illustrates the quarterly and annual average CBOD₅ concentration in the treated effluent for the last 7 years (2012-2018) as compared to the compliance limit stated in the ECA. Highlighted text (RED) indicates monthly individual exceedances of the effluent concentration limits (Table 5-1) stated in the ECA currently in place.

Table 5-4: Historical CBOD₅ Concentrations in Effluent

CBOD CONCENTRATION (mg/L)								COMPLIANCE LIMIT (mg/L)
2012	2013	2014	2015	2016	2017	2018		
Q1 Average	13.50	8.67	16.50	8.00	6.00	12.00	12.67	20
Q2 Average	9.33	11.67	18.67	5.00	13.67	19.67	23.00	
Q3 Average	10.67	14.33	23.50	3.67	12.67	5.33	14.00	
Q4 Average	13.67	18.00	13.67	7.67	14.00	2.00	22.33	
Annual Average	11.64	12.73	18.36	6.08	11.58	11.30	18.00	

With the exception of 2014, all historical average CBOD₅ concentrations (quarterly and annual) in the treated effluent have been below the compliance limit of 20 mg/L. Although the average CBOD₅ concentrations reported for 2018 are comparable to the 2014 values; there have been far more exceedances reported in 2018 than in 2014; which clearly provides evidence of an overall decline in the CBOD₅ removal performance.

5.3 Nitrate (NO₃-N)

As illustrated in Table 5-2 above; the annual average nitrate concentration reported for 2018 was 9.12 mg/L which exceeds the compliance limit of 8 mg/L. This puts the facility in a state of non-compliance with the regulatory requirements.

Table 5-5 illustrates the historical average nitrate concentration (quarterly and annual) in the treated effluent for the last 7 years (2012-2018) as compared to the compliance limit stated in the ECA. Highlighted text (RED) indicates monthly individual exceedances of the effluent concentration limits (Table 5-1) stated in the ECA currently in place.

Table 5-5: Historical Nitrate Concentrations in WWTP Effluent

NITRATE CONCENTRATION (mg/L)								COMPLIANCE LIMIT (mg/L)
	2012	2013	2014	2015	2016	2017	2018	
Q1 Average	9.27	8.93	9.99	8.93	5.80	8.08	8.59	8
Q2 Average	6.14	7.03	2.95	5.95	5.01	6.07	7.31	
Q3 Average	2.68	3.43	2.96	2.26	3.22	4.16	9.18	
Q4 Average	3.71	3.13	4.33	2.91	7.29	7.31	11.39	
Annual Average	5.45	5.63	5.06	5.01	5.33	6.41	9.12	

For the past six years, during the first quarter (Q1), the Mini Lakes WWTP has consistently struggled to achieve a quarterly nitrate concentration in the treated effluent below the compliance limit of 8 mg/L. However as shown in Table 5-5; the nitrate removal performance improves as the year progresses resulting in a satisfactory annual average concentration of this parameter below the compliance limit in conformance with the regulatory requirements.

In contrast to this historical trend, 2018 has shown a substantial decline in the nitrate removal performance in each quarter. During Q1, the quarterly average nitrate concentration in the treated effluent showed evidence of a poor removal performance similarly to the previous years (2012-2017). Q2 showed signs of recovery with a quarterly average nitrate concentration below the compliance limit. However, the quarterly average nitrate concentration reported for Q3 and Q4 exceeded the compliance limit. The data indicates that the existing treatment system (specially the biological denitrification) is unable to effectively achieve and maintain the nitrate concentration in the treated effluent below the established compliance limit in the ECA of 8 mg/L.

Temperature and Dissolved Oxygen (DO) levels are a determining factor for nitrate removal. It should be noted that denitrification occurs only under anaerobic or anoxic conditions, when the DO concentration is less than 0.5 mg/L (ideally less than 0.2 mg/L). Given the consistently high DO levels averaging 7.8 mg/L, poor nitrate removal performance is anticipated.

5.4 Total Suspended Solids (TSS)

As illustrated in Table 5-2, the annual average TSS concentration reported for 2018 of 20.25 mg/L exceeds the compliance limit of 20 mg/L. This places the facility in a state of non-compliance with the regulatory requirements.

Table 5-6 illustrates the historical average TSS concentration (quarterly and annual) found in the treated effluent for the last 7 years (2012-2018) as compared to the compliance limit stated in the ECA. Highlighted text (RED) indicates monthly individual exceedances of the effluent concentration limits (Table 5-1) stated in the ECA currently in place.

Table 5-6: Historical TSS Concentrations in Effluent

TSS CONCENTRATION (mg/L)								COMPLIANCE LIMIT (mg/L)
	2012	2013	2014	2015	2016	2017	2018	
Q1 Average	21.00	17.33	8.50	3.00	5.33	7.00	13.33	20
Q2 Average	11.00	10.00	8.00	3.67	4.33	5.33	19.33	
Q3 Average	22.75	19.67	10.00	3.67	6.67	10.00	24.67	
Q4 Average	11.50	20.50	13.00	5.33	4.33	5.00	23.67	
Annual Average	17.18	16.55	9.92	3.92	5.17	7.20	20.25	

Similarly to nitrates, the TSS removal performance also experienced a substantial decline in 2018 as compared to the previous six years (2012-2017). In 2018, the TSS concentrations exceeded the compliance limits in every quarter but Q2.

When evaluating the solids removal performance of the plant, the following elements should be taken into consideration:

- The Mini Lakes WWTP does not have primary treatment capabilities, only a primary settling tank, so most of the gross solids (i.e. rags and other debris) are not removed and disposed-of prior to the effluent entering the plant, which cause significant process upsets. Sludge from both the intermediate and final clarifiers are pumped (returned) back to the common primary clarifier. Excess sludge build-up is only removed from the primary clarifier.
- Usually, the primary clarifier is desludged (sludge pumped out and disposed) by a certified hauler approximately every 6 weeks. As part of the standard operating procedure in place, the sludge blanket in the primary settling tank is frequently monitored and when the depth reaches 0.76 m (30 inches) a removal order is placed.
- Based on the original design drawings, the primary clarifier installed at Mini Lakes WWTP was designed with a capacity (including sludge) of 92.8 m³ and with a sludge storage time of 30 days
- Once OCWA took over the facility operations, issues with the check valves in the existing sludge return pumps were detected. Malfunction of the valve caused excess accumulation in both the intermediate and final clarifiers resulting in a significant amount sludge floating on the surface of these clarifiers (intermediate and final). As confirmed by OCWA operation staff, the check valves have been replaced resulting in less sludge accumulation in these two process units. Floating sludge however, continues to reoccur, albeit in lower concentrations despite the repairs made.
- At present, a substantial amount of solids are carried-over throughout the entire treatment process resulting in a net sludge built-up at the effluent pump chamber. The sludge accumulated in the effluent pump chamber was removed and hauled away from site at the end of August 2018. Based on information provided by the hauler, the previous operating authority usually cleaned the effluent pump chamber once year in the Spring.

As a result of these solids removal performance issues, a significant amount of the sludge accumulated inside the effluent pump chamber is pumped out to the subsurface disposal system (5 tile beds) restricting the use and performance of the tiles beds. The current conditions of the existing subsurface disposal system are further discussed in the following Section 6.

6 Subsurface Disposal System

Concerns have been raised by the Mini Lake’s Resident Board about the frequent presence of pockets of water accumulating in areas around the five tile beds (subsurface disposal system). This phenomenon appears to be exacerbated during rainy days. During a recent walkthrough (October 4, 2018), water accumulation was noted around the existing five tile beds. More importantly, there was also evidence of sludge and other solids debris in or around the tile bed area where water had accumulated.

A simple test completed onsite, using dedicated effluent pumps to each tile bed system, confirmed that there is substantial accumulation/deposition of sludge and other solid debris (i.e. rags) within the distribution pipes underground each tile bed as shown in Figure 6-1.



Figure 6-1: Sludge Deposition within the Subsurface Disposal System (Tile Beds)

Solids/debris deposition inside the tile bed distribution pipes is causing operational and performance issues with these tiles bed. Solids could plug the pores (holes) through which the final treated effluent percolates into ground, substantially increasing the pressure inside these pipes, especially during the effluent pump-out cycles. Pressure build-up may cause pipe failure resulting in overflow of sewage effluent onto to the ground surface forming wet areas (pooling).

The current conditions of the Subsurface Disposal System (SDS) warrants close attention. The system should be properly flushed to remove the excess sludge deposited inside the lines and a camera inspection (where possible) is recommended to assess the degree of damage inside the system.

7 Groundwater Monitoring Results

All nine groundwater monitoring wells and the two additional monitoring wells (to intercept the plume close to the water's edge) are required to be monitored both qualitatively and quantitatively according to the ECA.

7.1 Groundwater Level

Section 5.3 of the ECA states that the groundwater elevation and flow paths through the site must be recorded. Figure 7-1 below displays the groundwater depths reported in 2018.

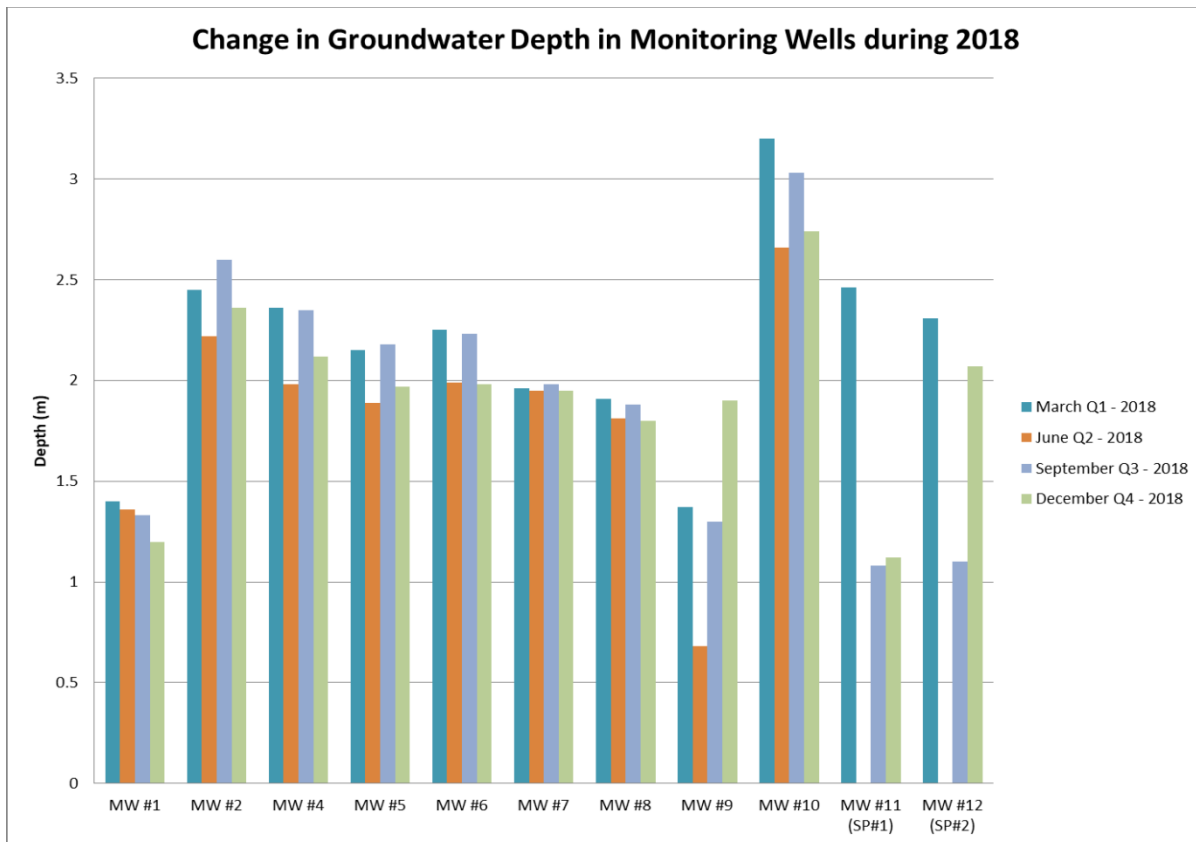


Figure 7-1: Change in Groundwater Depth in Monitoring Wells during 2018

As illustrated in Figure 7-1, during the month of June 2018 (Q2), majority of the wells experienced a seasonal drop in the water levels due to an increase in temperature and subsequent increased evaporation rates from surrounding areas of the Mini Lakes complex. During the same period, a significant drop was experienced for MW#9. It should be noted that MW#9 is one of the highest in terms of topographical elevation; it is prone to more drastic drops in water level when the water table drops in the area. Similarly, well MW#10 experienced a comparable elevation drop during second quarter of the year.

MW #11 and MW#12 appear to have had a drastic elevation drop similar to MW#9 from March of Q1 to September of Q3 2018, followed by a significant increase in December Q4 2018 of approximately 30% and 50% respectively.

During Q4, with exception of MW#9, MW#11, and MW#12, the majority of the monitoring wells experienced a slight drop in water level.

These changes are in line with seasonal variations based on the geographic location and elevation of the monitoring wells as attached in Appendix B.

Figure 7-2 illustrates the year to year comparison in groundwater level across monitoring wells at Mini Lakes. It is evident that groundwater levels experience seasonal variations, and wells MW #9, #11, and #12 experience the most variability among the wells present at Mini Lakes.

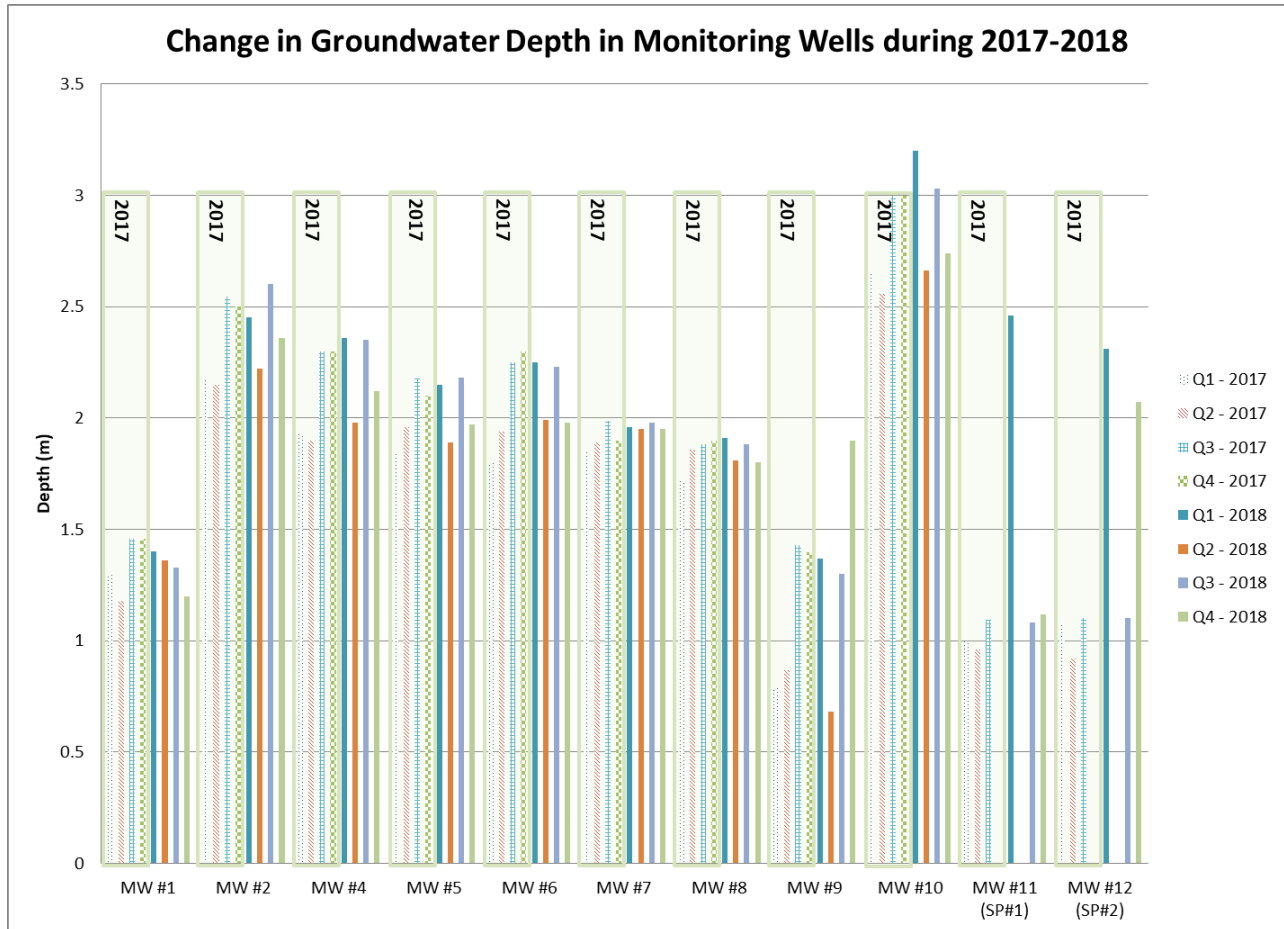


Figure 7-2: Change in Groundwater Depth in Monitoring Wells 2017-2018

7.2 Groundwater Quality

The quarterly reports include sampling results for the following parameters: nitrite, nitrate, BOD, suspended solids, TAN, TKN, phosphorus, DOC, and E. coli. The quarterly sampling results are summarized in Table 7-1. Highlighted values **(RED)** indicate exceedances of the limits stated in Ontario Drinking Water Quality Standards (ODWQS).

Table 7-1: Groundwater Monitoring Wells - Sampling Results

WELL	QUARTER	NITRITE-N (mg/L)	NITRATE-N (mg/L)	CBOD ₅ (mg/L)	TSS (mg/L)	AMMONIA-N (mg/L)	TKN (mg/L)	TP (mg/L)	DOC (mg/L)	E. COLI (cfu/100mL)
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WELL	QUARTER	NITRITE-N (mg/L)	NITRATE-N (mg/L)	CBOD ₅ (mg/L)	TSS (mg/L)	AMMONIA-N (mg/L)	TKN (mg/L)	TP (mg/L)	DOC (mg/L)	E. COLI (cfu/100mL)
ODWQS		1	10						5	ND
MW-1	Q1	<0.03	<0.06	<4	83	2	2.8	0.15	14	<2
	Q2	0.12	<0.06	<4	336	2.2	2	0.25	13	<2
	Q3	<0.03	0.15	<12	1180	1.6	1.7	0.16	11	500
	Q4	0.09	<0.06	<4	257	2.4	2	0.49	7	14
MW-2	Q1	<.03	8.66	<4	15	<.1	<.05	<0.03	<1	<2
	Q2	<0.03	5.94	<4	33	<0.1	<0.05	<0.03	2	<2
	Q3	<0.03	2.60	<4	<2	2.60	<0.5	0.04	1	<2
	Q4	<0.03	3.83	<4	5	<0.1	<0.5	<0.03	1	<2
MW-4	Q1	<.03	6.73	<4	21	0.1	<0.5	<0.03	<1	<2
	Q2	<0.03	7.68	<4	7	<0.1	<0.5	<0.03	2	<2
	Q3	<0.03	3.56	<4	3	<0.1	<0.5	0.04	1	<2
	Q4	<0.03	5.3	10	<2	<0.1	<0.5	<0.03	2	<2
MW-5	Q1	<0.03	0.38	<4	8	<0.1	<0.5	<0.03	1	<2
	Q2	<0.03	0.14	<4	70	<0.1	<0.5	<0.03	2	<2
	Q3	<0.03	0.28	<4	32	<0.1	<0.5	0.04	1	<2
	Q4	<0.03	0.34	<4	4	<0.1	<0.5	<0.03	<1	<2
MW-6	Q1	<0.03	0.66	<4	8	<0.1	<0.5	<.03	1	<2
	Q2	<0.03	0.3	<4	3	<0.1	<0.05	<0.03	1	<2
	Q3	<0.03	0.5	<4	5	<0.1	<0.5	0.03	<1	<2
	Q4	<0.03	0.56	<4	<2	<0.1	<0.5	<0.03	<1	<2
MW-7	Q1	<0.03	<.06	<4	17	0.1	<0.5	0.05	2	<2
	Q2	<0.03	<0.06	<4	2	0.2	<0.5	<0.03	2	<2
	Q3	<0.03	<0.06	<4	6	<0.1	<0.5	0.06	2	<2
	Q4	<0.03	<0.06	<4	<2	<0.1	<0.5	0.04	2	<2
MW-8	Q1	<0.03	<.06	<4	7	1.3	1.5	0.04	4	<2
	Q2	<0.03	<0.06	<4	2	1.7	1.4	0.04	6	<2
	Q3	<0.03	<0.06	<4	6	3.8	3.5	0.07	9	<2
	Q4	<0.03	<0.06	<4	5	2.4	2.3	0.04	15	<2
MW-9	Q1	<0.03	<0.06	<4	49	1.3	2	0.08	11	<2
	Q2	<0.03	<0.06	<4	11	1.4	2.3	0.07	11	3040
	Q3	<0.03	<0.06	<4	29	3.6	4.7	0.19	18	<2
	Q4	<0.03	<0.06	7	40	1.5	1.8	0.05	9	<2
MW-10	Q1	<0.03	<0.06	<4	13	<0.1	<0.5	0.04	1	<2
	Q2	<0.03	<0.06	<4	48	<0.1	<0.5	<0.03	2	<2
	Q3	<0.03	<0.06	<4	9	<0.1	<0.5	<0.03	1	<2
	Q4	<0.03	0.15	<4	10	<0.1	<0.5	<0.03	1	<2
MW-11 (SP-1)	Q1	<0.03	<0.06	<4	174	8.30	8.40	<0.03	11	<2
	Q2	<0.03	<0.06	<4	166	6.50	6.80	<0.03	9	<2
	Q3	<0.03	<0.06	<4	119	7.60	7.60	0.03	8	<2
	Q4	<0.03	<0.06	<4	9	7.50	7.30	<0.03	8	<2
MW-12 (SP-2)	Q1	<0.03	1.47	<4	100	<0.1	<0.5	0.12	11	<2
	Q2	<0.03	1.26	<4	141	<0.1	<0.5	0.08	1	<2
	Q3	<0.03	0.95	<4	15	<0.1	<0.5	<0.03	1	<2
	Q4	<0.03	<0.06	<4	9	7.9	7.5	0.06	8	<2

Highlighted cell indicates an exceedance of the Ontario Drinking Water Quality Standards (ODWQS).
Table 7-2 contains a summary of the water quality in each of the monitoring wells.

Table 7-2: Groundwater Monitoring Wells

MONITORING WELLS	WATER QUALITY REMARKS
MW#1	In 2018, the concentration levels of dissolved organic carbon were elevated, though lower than historical levels. There was an abrupt increase in phosphorus concentrations for Q4 when compared to the overall decreasing historical phosphorus trend. There were two spikes of E. coli detected in Q3 and Q4, which is not typical for this well for the last two years of monitoring.
MW#2	The monitoring well experienced low levels of phosphorus and no E. coli; however higher notable concentration of nitrate (2018 Avg: 5.3 mg/L), which is similar to 2017 recorded concentrations. It appears that the well is impacted by the proximity to the subsurface disposal systems, but is distant enough for the phosphorus to be absorbed by the soils and the E. coli to die off.
MW#4	In 2018, the monitoring well experienced high concentration levels of nitrates (Avg. 5.8 mg/L) – which is lower than previous year; low levels of phosphorus, and no E. coli. Similar to MW#2, it appears that the well impacted by the proximity to the subsurface disposal systems, while being at a great enough distance for the phosphorus and E. coli to be removed. Previous years have recorded E. coli at very low levels (<2 cfu/100 mL), which may indicate that the monitoring well is at the edge of the E. coli subsurface travel time.
MW#5	In 2018, the monitoring well showed low level nitrate concentration (0.29 mg/L). This is indicative of influence from either the agricultural area to the south, or the subsurface disposal system plume to the northeast. E. coli has never been recorded at the site, and phosphorus concentration has been low both in 2018 and historically.
MW#6	This monitoring well shows results similar to MW#5 with slightly increased concentration levels of nitrate and low phosphorus concentration levels and no presence of E. coli. As with MW#5, nitrate levels are likely due to agricultural land use to the south. Influence from the subsurface disposal systems is unlikely due to distance.
MW#7	This monitoring well does not appear to be impacted by the subsurface disposal systems, with phosphorus concentration levels averaging at 0.05mg/L due to its close proximity to the central Mini Lakes pond. No E. coli readings for 2018 with occasional recordings of <2 cfu/100 mL historically.
MW#8	E. coli was not been detected at this location in 2018 or historically. Phosphorus and nitrate concentration levels are equal to those of the neighboring pond, with nitrate average at 0.06 mg/L and phosphorus at 0.05 mg/L.
MW#9	In 2018, MW#9 saw high levels of E. coli contamination in Q2 and high levels of dissolved organic carbon. Historically, this well has experienced elevated levels of both the dissolved organic carbon and E. coli contamination.
MW#10	From the historical data and the samples taken in 2018, the well appears not to be impacted by the subsurface disposal system. In 2018; E. coli was not been detected; nitrates were below the detection limit with exception of Q4, and phosphorus concentration had only one detectable recording of 0.04 mg/L in Q1.
MW#11/SP1	From the samples taken in 2018 the low concentrations of nitrate and phosphorus, the monitoring well is not being impacted by the subsurface disposal systems. However, dissolved organic carbon is still elevated above recommended level at 9 mg/L, but the overall trend of concentration is moving downwards from historic levels.
MW#12/SP2	Unlike MW#11, there are increased concentrations for nitrate (one reading at 1.5 mg/L) and phosphorus (one reading at 0.12 mg/L) higher than the background concentration from the pond. There were no recorded readings E. coli. These parameter samples indicate that the monitoring well is either impacted by the subsurface disposal system or a leak in the sewage system, in addition to the influence from the central pond.

7.3 Nitrate

Nitrate concentrations were found to be low in all monitoring wells except MW# 2 and MW#4. Although the quarterly nitrate readings in these two wells are consistently below the Maximum Allowable Concentration (MAC) of 10 mg/L, it is suspected that the proximity of these wells to the subsurface disposal system combined with the generally higher nitrate concentrations in the effluent being discharged has impacted the nitrate levels in these two monitoring wells. In spite of this, the 2017 concentrations are consistent with historical data and therefore do not present a concern at present. These concentrations will continue to be monitored to ensure no significant trends are detected. The lower nitrate concentration in the monitoring well to the east of the beds indicates an east/west groundwater flow.

7.4 Total Phosphorus

There are no concerns regarding phosphorus concentrations as these are at all-time low. Phosphorus was high prior to 2015 and only in the monitoring wells located on the eastern side of the Mini Lakes community (MW#1 and MW#9). Monitoring well #12 is also showing concentrations of phosphorus similar to well #9. This eastern groundwater was likely carrying high phosphorus concentrations from agricultural runoff, contamination from the CBM quarry, or from a possible leak in the local sewage collection system. Regardless, the present concentrations show that phosphorus is not a concern.

7.5 Escherichia coli (*E. coli*)

The presence of *E. coli* in groundwater can be attributed to the influence of surface water, a sewage collection system leak, or from a source of *E. coli* containing water (subsurface disposal systems). Surface water can commonly contain *E. coli* concentrations between 0-100 cfu/100 mL. *E. coli* results below 100 cfu/100 mL found at shallow groundwater depths are likely the result of surface water influences rather than a sewage leak or from local subsurface disposal systems. Raw sewage can have concentrations of *E. coli* in the range of >1,000,000 cfu/100 mL.

Since the monitoring wells are shallow, the presence of *E. coli* in these wells are not indicative of microbial contamination in much deeper production well, but rather an indication of potential sources of *E. coli* contamination at or near the surface. Groundwater contamination from *E. coli* has been found over the years in several monitoring wells at the site, especially in MW#9 with historical levels up to 1,000 cfu/100 mL, and hitting as high as 3040 cfu/100 mL in Q2 of 2018 in MW#9. Given the location of MNW#9 (approximately 269 m northwest of the Subsurface Disposal System), it is unlikely that this monitoring well is impacted by the Subsurface Disposal System but instead impacted by the surface water (marshy area) in the vicinity of this well. The other groundwater sample location that contained *E. coli* was MW#1 registering a high concentration in Q3 of 2018 at 500 cfu/100 mL. The MW#1 monitoring location is at the water's edge of the local pond and is under the direct influence of the local surface water.

7.6 Dissolved Organic Carbon (DOC)

Besides the major parameters that have been discussed in Sections 7.3, 7.4 and 7.5; there was one other parameter concentration that stood out as unusual, Dissolved Organic Carbon (DOC) as shown in Table 7-1. High concentrations of DOC were found at MW#1, MW#8, MW#9, MW#11, and MW#12. The DOC

can be attributed to the local presence of water with high levels of organic material. The ponds throughout the Mini-Lakes community and the high elevation of the ground water table could explain the results seen at MW#11, MW#12 and potentially MW#8.

8 Surface Water Quality Sampling Results

The Mini Lakes site contains several small ponds around which the community was built. These lakes are interconnected and flow from a source on the western side to the ponds on the eastern side and then into the water system of the Mill Creek development.

Sampling from these lakes is important to determine the concentration of contaminants entering and leaving the Mini Lakes community, as well as, the community’s surface water quality. The provincial and federal government have guidelines for surface water quality set out in the “Canadian Environmental Quality Guidelines (CEQG)” and the “Provincial Water Quality Objectives (PWQO)”. The samples from the five surface water locations are summarized in Table 8-1 with samples that exceeded existing guidelines highlighted in red.

Table 8-1: Surface Water - Sampling Results

SURFACE WATER SAMPLE	SAMPLE DATE & TIME	QUARTER	PHOSPHORUS (TOTAL) [mg/L]	TOTAL KJELDAHL NITROGEN [AS N mg/L]	AMMONIA +AMMONIUM (N) [mg/L]	NITRITE (AS N) [mg/L]	NITRATE (AS N) [mg/L]	COUN
CEQG/PWQO			0.02				13	100
SW1 Up-gradient inflow at property boundary	3/29/17	Q1	<0.03	<0.5	<0.1	<0.03	0.12	6
	6/20/17	Q2	0.05	<0.5	0.1	<0.03	<0.06	22
	9/20/17	Q3	<0.03	<0.5	<0.1	<0.03	<0.06	14
	12/20/17	Q4	<0.03	<0.5	<0.2	<0.03	<0.10	3440
	Annual Avg.		0.04	0.5	0.13	0.03	0.09	870.5
SW3-Within Main Pond	3/29/17	Q1	<0.03	<0.5	<0.1	<0.03	0.25	<2
	6/20/17	Q2	<0.03	<0.5	<0.1	<0.03	0.22	24
	9/20/17	Q3	<0.03	<0.5	<0.1	<0.03	<0.06	56.00
	12/20/17	Q4	<0.03	<0.5	0.2	<0.03	<0.22	2.00
	Annual Avg.		<0.03	0.5	0.13	0.03	0.19	27.33
SW4-Outlet From Main Pond	3/29/17	Q1	<0.03	<0.5	<0.1	<0.03	0.26	<2
	6/20/17	Q2	0.05	<0.5	<0.1	<0.03	0.21	36
	9/20/17	Q3	<0.03	<0.5	<0.1	<0.03	<0.06	90
	12/20/17	Q4	<0.03	<0.5	0.1	<0.03	0.2	66
	Annual Avg.		0.04	0.5	0.1	0.03	0.18	64
SW5-Inflowing Tributaries at County Rd No 34	3/29/17	Q1	<0.03	<0.5	<0.1	<0.03	0.54	6
	6/20/17	Q2	0.06	<0.5	0.2	<0.03	0.45	42
	9/20/17	Q3	<0.03	<0.5	<0.1	<0.03	0.53	52
	12/20/17	Q4	<0.03	<0.5	0.4	<0.03	0.1	4
	Annual Avg.		0.04	0.5	0.2	0.03	0.41	26
SW6-Outlet From Property	3/29/17	Q1	<0.03	<0.5	<0.1	<0.03	<0.06	<2
	6/20/17	Q2	0.05	<0.5	0.2	<0.03	<0.06	34
	9/20/17	Q3	<0.03	<0.5	<0.1	<0.03	<0.06	22
	12/20/17	Q4	<0.03	<0.5	<0.1	<0.03	0.57	4
	Annual Avg.		0.04	0.5	0.13	0.03	0.19	15.5

Highlighted indicates an exceedance of Provincial Water Quality Objectives (PWQO) or Canadian Environmental Quality Guidelines (CEQG)

From the surface water samples taken in 2018, it can be concluded that the Mini Lakes water bodies are in good health and there does not appear to be any major issues in term of contamination. The one area of concern is the phosphorus concentration levels, which had several individual exceedances. Since the phosphorus spike happened across all of the monitoring locations, it is potentially related to an anthropogenic cause such as use of fertilized that ends up in the Mini Lakes water bodies following the rains as the surface run off is not absorbed by the soil. There was also relatively high *E.coli* count found at SW#1 in December 2018. Further investigations to determine whether there are sewage collection system leaks or not are advised.

8.1 Total Phosphorus

As seen in Table 8-1, each sampling location showed an occasional result of phosphorus above provincial concentration guidelines. In ponds like these, a high phosphorus concentration can lead to the generation of large amounts of algae and the potential proliferation of toxic blue-green algae.

These phosphorus concentration levels in the surface water are still relatively low, being just at or over the guideline and are not a major concern. Elimination of point sources of phosphorus contamination should be reviewed.

8.2 Escherichia coli (E. coli)

E. coli concentration of between 0-100 cfu/100 mL is expected in surface water. This pathogen is primarily attributed to the presence of local wildlife and aquatic species present in the water body (fish, ducks, and frogs). With the exception of the levels found in SW#1 in December 2018 (Q4), *E. coli* concentrations were relatively low and all times below the guideline limit (100 cfu/100 mL).

9 Summary of Operational Activities

9.1 Major Maintenance and Minor Repair

Table 9-1: Wastewater Treatment System Maintenance

MONTH	ACTIVITY
January	<ul style="list-style-type: none"> Weber Septic on site for haulage from SPS 1 & SPS 5 to Listowel WWTP for treatment
February	<ul style="list-style-type: none"> Weber Septic on site for haulage primary tank to Listowel WWTP for treatment Effluent pump 5 pulled for inspection and screen cleaned Effluent pump 4 pulled for inspection and screen cleaned
March	<ul style="list-style-type: none"> Weber Septic on site for haulage primary tank to Listowel WWTP for treatment Belwood Electric on site for RBC 2 go switch failure Alum line rebuilt and RBC lubricated Pulled sewage pump 2 for cleaning and visual inspection
April	<ul style="list-style-type: none"> Weber Septic on site for haulage: primary tank to Listowel WWTP Weber Septic on site for haulage: primary tank to Listowel WWTP Weber Septic on site for haulage: clarifiers, weirs, holding tank to Listowel WWTP Operator rebuilt chemical feed lines

May	<ul style="list-style-type: none"> • Carbon line rebuilt for better distribution • LMI carbon pump replaced with Prominent pump • Exclusive Alarms on site to remove siren alarms • Weber Septic on site • Replaced check valves for intermediate clarifier pumps(#1,#2)
June	<ul style="list-style-type: none"> • Replaced tubing in monitoring wells 11&12 • Weber Septic on site for haulage: pump stations 1-3 and floating sludge in clarifier to Listowel WWTP • Replaced check valves for intermediate clarifier pumps(#3,#4) • Belwood Electric on site for install of new flow meter on effluent pump#5 • Weber Septic on site for haulage: primary clarifier to Listowel WWTP • Programming of sewage pump auto-dialer to call out for sewage pump station high level alarms
July	<ul style="list-style-type: none"> • Replacement of chemical feed pumps to allow even dosage to RBCs allowing for even dosage into RBCs • Installed foot valves for chemical feed intake and removed alum day tank to allow direct feed from alum drums. • Weber Septic on site for haulage of biosolids from primary clarifier • SPS #1, pump #2 repairs with Weber Septic and Roberts Plumbing for broken discharge gasket, custom gasket installed
August	<ul style="list-style-type: none"> • Weber Septic on site for haulage of biosolids from primary clarifier • Final clarifier pump 2 check valve replaced • SPS #3, pump #2 flange gasket replaced with custom gasket • SPS #3, pump #1 pulled for gasket inspection followed by replacement due to wear • WWTP final effluent tank cleaned
September	<ul style="list-style-type: none"> • Replaced tubing in monitoring wells 11&12 • Weber Septic on site for haulage: pump stations 1-3 and floating sludge in clarifier to Listowel WWTP • Replaced check valves for intermediate clarifier pumps(#3,#4) • Belwood Electric on site for install of new flow meter on effluent pump#5 • Programming of sewage pump auto-dialer to call out for sewage pump station high level alarms
October	<ul style="list-style-type: none"> • 03 – SPS 1 – Top rail guide replaced on pump 1, lower rail guide replaced on pump 2 • 18 – Weber Service Technician on site for investigation to tile beds. Service Technician recommends flushing • 25 – SPS 3 – Seals replaced on ball check on both pump 1 and pump 2 with factory seals • 30 – Operator replaced piping on final clarifier pump 2 from the pump discharge to the existing check valve
November	<ul style="list-style-type: none"> • 01 – SPS 1 – Weber Septic on site for haulage of biosolids from primary clarifier as well as effluent pump 4 line repaired • 30 – SPS 5 – Belwood Electric on site for float replacement for lag pump. Repair corrected the call outs for November 24 and November 26
December	<ul style="list-style-type: none"> • 04 – Operator rebuilt Microfeed metering pump 1 with a new diaphragm • 14 – Effluent pump 5 screen cleaned by operator

- 19 – Effluent pump 1 discharge piping changed, cleaned subsurface disposal bed 1 distributor valve as well as Weber Septic on site for haulage of biosolids from primary clarifier
- 28 – Operator moved effluent pump 5 into slot for effluent pump 4

9.2 Unscheduled Work

Table 9-2: Wastewater Treatment System – Unscheduled Work

MONTH	ACTIVITY
January	<ul style="list-style-type: none"> • High Level alarm for SPS #1.
February	<ul style="list-style-type: none"> • Unscheduled power failure.
March	<ul style="list-style-type: none"> • No call backs for the reported period.
April	<ul style="list-style-type: none"> • No call backs for the reported period.
May	<ul style="list-style-type: none"> • Unscheduled power failure to all well houses due to high winds.
June	<ul style="list-style-type: none"> • No call backs for the reported period.
July	<ul style="list-style-type: none"> • Switch failure required operator reset
August	<ul style="list-style-type: none"> • Replacement of broken flange seal in SPS #3
September	<ul style="list-style-type: none"> • No call backs for the reported period.
October	<ul style="list-style-type: none"> • Effluent Pump overload alarm, line was repaired November 1st 2018
November	<ul style="list-style-type: none"> • 24 – SPS 5 high level alarm, operator reset system • 26 – SPS 5 high level alarm, operator reset system, possible lag float issue
December	<ul style="list-style-type: none"> • No call backs for the reported period.

9.3 Operational Issues and Identified Deficiencies

During 2018 some challenges/issues with the operation of the wastewater treatment system were experienced. A summary of these issues is reflected in the subsequent sections.

9.3.1 SPS Operational Issues

- SPS#1: gaskets for pumps required replacement due to failure
- SPS#3: flange seals failing, required replacement
- SPS#5 persistent high level alarm set off, lag float is suspected as main cause – was replaced in November

9.3.2 WWTP Operational Issues

- RBC #2 go switch had failed, contractor had to replace in March 2018
- Alum Line had to be replaced in March 2018
- RBC grease ports are prone to plugging.

- Effluent pumps might occasional trip off and require a reset or fail to run in automatic.
- Check valves on clarifier pumps 1-4 had to be replaced due to excessive wear and tear from the influent

9.3.3 Health and Safety Issues

- Ramp into WWTP is unsafe and should be replaced with a reduced angle, non-slip ramp.
- WWTP building leaks along seam running across the top of the plant
- New rails for SPS#2 and SPS#5

9.3.4 Other Issues

- Data collection system identified as an area in need of improvement.
- Spare pumps should be present for pump replacement in SPS.

10 Additional Studies and Investigations

During 2018, several studies/investigations were completed for the existing WWTS.

- Sewage Treatment System Trade-Off Study (including a Condition Assessment).
- Standby Power Study

In October 2018; the OCWA completed a high level visual condition assessment to the Mini Lakes WWTS as a follow up to the assessment done in December 2017. Upon completion of the Condition Assessment, a number of observations and recommendations were noted. Some of these recommendations have already been implemented by OCWA as part of its O&M contract.

Table 10-1: Outcome and Recommendations of the Second Condition Assessment (Oct 2018)

IDENTIFIED ISSUE	RECOMMENDED WORK	ISSUE CLASSIFICATION	STATUS
<u>Sewage Collection System</u>			
Pumps utilized in sewage pumping station were identified lower quality	Replace as needed with high quality pumps for long term use	Operational	Completed
Sewage pumping station 5 has damaged rails and only a single operating pump	Repair rails and add second pump	Operational	Completed
Sewage pumping station 3 has very limited space for maintenance and repair operations	No recommendation at this time	Operational, H&S	
No emergency power in place	Provide emergency power capabilities for all 5 sewage pumping stations	Operational/ Compliance	Addressed under the emergency power assessment conducted by OCWA/RVA
<u>Sewage Treatment System</u>			

IDENTIFIED ISSUE	RECOMMENDED WORK	ISSUE CLASSIFICATION	STATUS
<p>None of the proposed works in the ECA (June 1, 2016) have been completed</p> <p>Primary and intermediate clarifiers have to be vacuumed out, while filled with sewage, to remove sludge. Process is very inefficient</p> <p>Chemical dosing pumps are old and may soon require replacement</p> <p>Micro C chemical addition allows for settling and inconsistent dosing</p>	<p>Complete all proposed works</p> <p>Partition of primary clarifier into 2 compartments. Including baffle plates, sludge recirculation pumps/piping to the inlet chamber, and sludge removal piping</p> <p>Modify denitrification tank to allow crossover between trains</p> <p>New pump to recycle effluent back to inlet of primary clarifier</p> <p>Separate chemical storage building to store 900L and 2,300L tanks with metering pumps and eyewash station</p>	Compliance	Outstanding
Alum addition before RBCs may decrease biological growth due to phosphorus limitations	Alum dosage should be monitored if RBC fixed film growth or biological treatment performance deteriorates	Operational	Partially Completed
Alum addition is not equalized between both tanks.	Rework chemical tubing/valving to ensure equal split of alum between the treatment trains	Operational	Completed
Historian has limited memory (72 hrs.), limited SCADA accessibility/control. Manual data recording	Upgrade SCADA and historian	Operational	Outstanding
High flows can cause unwanted sloughing of biomass and accumulation of sludge in intermediate clarifiers	Addition of equalization tank for variable flow conditions	Operational	Outstanding
No back-up power	Installation of single back-up power for water & waste water facilities	Operational	Outstanding
Entry ramp is a slip issue	Rebuild ramp for greater traction and decreased slope	H&S	Completed
Possible ventilation issue	Assess ventilation system Increase air cycling		Completed
Emergency supplies are difficult to access	Relocate emergency supplies	Operational	Completed
There are solids carry over (i.e. rags, debris, etc.) throughout the entire process	Assess the feasibility of retrofitting some sort of preliminary treatment (i.e. bar screens, etc.). Otherwise increase frequency of sludge hauling.	Operational	Outstanding
The biomass attached to the RBC's disks does not seem to be as healthy and copious which likely could impact process performance.	Assess the operating conditions of the existing RBC and, if required, optimize the treatment process.	Operational	Outstanding
Impossible to assess performance since there is no data about the quality of the incoming raw sewage influent	Monitor the quality of the incoming raw sewage influent using the same parameters included in the ECA (plus alkalinity). Take raw sewage samples using the same frequency and requirements as described in the ECA.	Operational	Completed Raw Sewage effluent sampling started in November 2018

Subsurface Disposal System (Tile Beds)

IDENTIFIED ISSUE	RECOMMENDED WORK	ISSUE CLASSIFICATION	STATUS
There is accumulation of sludge and other solids debris (i.e. rags) within the distribution pipes placed underground each tile bed	Flush the headers and distribution lines within each tile bed. Remove and dispose excess solids within the pipes	Operational	Outstanding
Frequent presence of pockets of water accumulated in certain areas around the 5 tile beds (phenomenon which appears to exacerbate during rainy day) leads to believe the inner distribution pipes are either plugged or broken allowing the effluent to escape into the surface	Conditions of the inner pipes and other appurtenances within the tile beds are unknown. If possible complete camera inspection to assess conditions and extent of repairs. Alternatively, expose the tile beds and repair/rehabilitate pipes, appurtenances and other components	Operational	Outstanding

11 Proposed Works for 2019

The Mini Lakes WWTP is starting to see serious degradation in performance of the system. The SPS's are having numerous issues with pump operation and maintenance (rails and chains), the chemical feed system for alum and micro carbon requires replacement, and the control system has issues with data integrity.

In summary, the Mini Lakes WWTP plant has entered the point of its operational life where much of the original equipment, will requiring replacement. The control systems, chemical feed systems, and many of the system's pumps all require replacement over the next few years in order to continue with present level of operation. Alternatives to individual equipment replacement have been presented to Mini Lakes as part of the "Trade-Off Study" report.

Table 11-1: Wastewater Treatment System Proposed Improvement

IDENTIFIED ISSUE	RECOMMENDED WORK	TIME LINE
There is a lack of standby power capacity in the event of power failure for three (3) existing well houses, five (5) sewage pumping stations, one recreational centre and one wastewater treatment plant (WWTP).	The Mini Lakes Board was presented with five options (A-E) to choose from in delivering the standby power capabilities for the condominium facilities. The Mini Lakes board reviewed the study findings and decided the best suited option in their opinion is Option C. Option C is dedicated standby power to be provided at each critical location - 1 generator per critical location; the critical locations are SPSs #1, #2, #3, #5, Well Houses #2, #3; Wastewater treatment Plant; Recreational Centre, totaling 8 generators from 10 to 50 kW in ratings.	2-3 years
Wastewater Treatment System Upgrades	A Sewage Treatment System Trade-Off Study was completed in 2018 with the objective of assessing the current conditions of the existing treatment system and its ability to meet the regulatory requirements. The study concluded that the current likelihood of failure (LoF) and consequence of failure (CoF) scored the existing sewage treatment system warrants an upgrade. Two upgrade options were presented. Mini Lakes opted for upgrading the existing treatment system to a new one featuring SBR technology ((Fluidyne ISAM™-50).	2-3 years

Please see the Appendix G for full consultant report.

APPENDIX A

Environmental Compliance Approval Number 2391-9KCJUS

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 8154-AR4J2T

Issue Date: September 18, 2017

Wellington Common Elements Condominium Corporation No.214 c/o MF Property
Management Limited
28 Bett Court
Guelph, Ontario
N1C 0A5

Site Location: 7541 Wellington County Road 34
Township of Puslinch , County of Wellington
N0B2J0

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

Upgrades to the existing sewage works comprising of a sanitary collection system, pumping stations and forcemains, a sewage treatment and subsurface disposal system re-rated at approx. 158 m³/d average daily flow serving the Mini Lakes Subdivision and Common Elements Condominium comprising of a maximum of 292 units (from the original 400 units) for year round use in the Township of Puslinch as follows:

PROPOSED WORKS

Modifications to the existing wastewater treatment plant as follows:

- upgrades to primary clarifier as follows:
 - installation of a partition wall separating the chamber in two compartments; an inlet and sludge storage compartment having a working volume of 73m³ and a primary effluent compartment having a working volume of 23m³.
 - an influent baffle plate at the tank inlet.
 - an outlet weir box and baffle plate at the tank outlet.
 - sludge recirculation piping to the inlet chamber and sludge removal piping.

- modifications to the inlet of the denitrification tank to allow for crossover between trains for redundancy and option to operate on one (1) RBC train and two (2) tertiary treatment trains.
- one (1) new effluent pump and discharge piping to be located in the effluent pump chamber to recirculate treated effluent back to the inlet of the primary clarifier.
- a 3.5m x 4.12m chemical storage building housing the following:
 - a 900 L capacity chemical storage tank to provide a carbon source and three (3) chemical metering pumps (one (1) spare), all located within secondary containment facilities.
 - a 2,300 L capacity bulk chemical storage tank for phosphorus removal and three (3) chemical metering pumps (one (1) spare), all located within secondary containment facilities.
 - an eyewash/shower system.

all other controls, electrical equipment, instrumentation, pumps, piping, valves and appurtenances essential for the proper operation of the aforementioned sewage works;

all in accordance with the documents listed in Schedule 'B'.

EXISTING WORKS

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.

2. Sewage Pumping Station PS-2 (UTM NAD83: Zone 17, 569203 mE, 4814540 mN)

One (1) 1,200 mm diameter fibreglass package duplex sewage pumping station (located on Jasper Heights Drive approximately 110 m northeast of Garden Parkway servicing approximately 132 units), equipped with two (2) submersible pumps, each pump rated at 2.225 L/s at 33.82 m TDH and having a working volume of 0.501 m³, and a forcemain, approx. 224 m long, extending from the pump station before discharging into the common 75

mm forcemain from PS-3, where the common forcemain continues approximately 215 m to the junction with PS-1 and a further 621 m to discharge directly to the Wastewater Treatment Plant (WWTP) described below.

3. Sewage Pumping Station PS-3 (UTM NAD83: Zone 17, 569349 mE, 4814559 mN)

One (1) 1,200 mm diameter fibreglass package duplex sewage pumping station (located on Lot 62 Hemlock, servicing approximately 42 units), equipped with two (2) submersible pumps, each pump rated at 1.075 L/s at 32.2 m TDH and having a working volume of 0.242 m³, and a forcemain, approx. 229 m long, extending from the pump station before discharging into the common 75 mm forcemain from PS-3, where the common forcemain continues approximately 215 m to the junction with PS-1 and a further 621 m to discharge directly to the Wastewater Treatment Plant (WWTP) described below.

4. Sewage Pumping Station PS-4 (UTM NAD83: Zone 17, 569491 mE, 4814533 mN)

One (1) 1,200 mm diameter fibreglass package duplex sewage pumping station (located adjacent and on the north corner of Lot 227 on Cedarbush Crescent, servicing approximately 53 units and a community centre), equipped with two (2) submersible pumps, each pump rated at 1.35 L/s at 7.27 m TDH and having a working volume of 0.304 m³, and a forcemain, approx. 358 m long, extending from the pump station before discharging directly to the Wastewater Treatment Plant (WWTP) described below.

5. Sewage Pumping Station PS-5 (UTM NAD83: Zone 17, 569720 mE, 4814755 mN)

One (1) 1,200 mm diameter precast concrete duplex sewage pumping station (located at the intersection of Water Street and Basswood to service Phase 2 and 3 development, and will ultimately service approximately 79 units), equipped with two (2) submersible pumps, each pump rated at 2.55 L/s at 14.75 m TDH and having a working volume of 0.469 m³, and a forcemain, approx. 207 m long, discharging into the 75 mm diameter forcemain from PS-4, where the common forcemain continues for approx 29 m before discharging directly to the Wastewater Treatment Plant (WWTP) described below.

Wastewater Treatment Plant

A sewage treatment plant (with dual trains operating in parallel) to be located within a building housing a primary settlement tank, rotating biological contactors, intermediate clarifier, a denitrification tank and final clarifiers and effluent pump chamber as follows:

- 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 (RBCs) 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.

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

1. "Annual Average Concentration" means the arithmetic mean of the Monthly Average Concentrations of a contaminant in the effluent calculated for any particular calendar year;
2. "Approval" means this entire document and any Schedules attached to it, and the application;
3. "Average Daily Flow" means the cumulative total sewage flow to the sewage works during a

calendar year divided by the number of days during which sewage was flowing to the sewage works that year;

4. "BOD₅" (also known as TBOD₅) means five day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogenous oxygen demand;
5. "CBOD₅" means five day carbonaceous (nitrification inhibited) biochemical oxygen demand measured in an unfiltered sample;
6. "Daily Concentration" means the concentration of a contaminant in the effluent discharged over any single day, as measured by a composite or grab sample, whichever is required;
7. "Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;
8. "District Manager" means the District Manager of the Guelph District Office;
9. "EPA" means the *Environmental Protection Act*, R.S.O. 1990, c.E.19, as amended;
10. "Equivalent Equipment" means a substituted equipment or like-for-like equipment that meets the required quality and performance standards of a named equipment;
11. "Limited Operational Flexibility" (LOF) means any modifications that the Owner is permitted to make to the Works under this Approval;
12. "Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;
13. "Notice of Modifications" means the form entitled "Notice of Modifications to Sewage Works";
14. "Monthly Average Concentration" means the arithmetic mean of all Daily Concentrations of a contaminant in the effluent sampled or measured, or both, during a calendar month;
15. "Owner" means Wellington Common Elements Condominium Corporation No.214 and its successors and assignees;
16. "OWRA" means the *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, as amended;"Previous Works" means those portions of the sewage works previously constructed and approved under an Approval;
17. "Proposed Works" means the sewage works described in the Owner's application, this Approval, to the extent approved by this Approval;
18. "Previous Works" means those portions of the sewage works previously constructed and approved under an Approval;

19. "Rated Capacity" means the Average Daily Flow for which the Works are approved to handle;
20. "Regional Director" means the Regional Director of the West Central Region of the Ministry;
21. "Substantial Completion" has the same meaning as "substantial performance" in the Construction Lien Act; and
22. "Works" means the sewage works described in the Owner's application, and this Approval, and includes Proposed Works, Previous Works, and modifications made under Limited Operational Flexibility.

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

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

1. The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.
2. Except as otherwise provided by these conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.
3. Where there is a conflict between a provision of any document in the schedule referred to in this Approval and the conditions of this Approval, the Conditions in this Approval shall take precedence, and where there is a conflict between the documents in the schedule, the document bearing the most recent date shall prevail.
4. Where there is a conflict between the documents listed in the Schedule B submitted documents, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.
5. The Conditions of this Approval are severable. If any Condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this Approval shall not be affected thereby.

2. EXPIRY OF APPROVAL

This Approval will cease to apply to those parts of the Proposed Works which have not been constructed within five (5) years of the date of this Approval.

3. CHANGE OF OWNER

1. The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within thirty (30) days of the change occurring:
 - a. change of Owner;
 - b. change of address of the Owner;
 - c. change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the Business Names Act , R.S.O. 1990, c.B17 shall be included in the notification to the District Manager;
 - d. change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the Corporations Information Act , R.S.O. 1990, c. C39 shall be included in the notification to the District Manager;
2. In the event of any change in ownership of the Works, other than a change to a successor municipality, the Owner shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the District Manager and the Director.

4. CONSTRUCTION

1. The Owner shall ensure that the construction of the works is supervised by a licensed installer or a Professional Engineer, as defined in the Professional Engineers Act .
2. Upon construction of the works, the Owner shall prepare a statement, certified by a licensed installer or a Professional Engineer that the Works are constructed in accordance with this Approval, and upon request, shall make the written statement available for inspection by Ministry staff and staff of the local municipality.

5. MONITORING AND RECORDING

The Owner shall, upon commencement of operation of the Works, carry out the following

monitoring program:

1. All samples and measurements taken for the purposes of this Approval are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.
2. Samples of **treated effluent** (ahead of subsurface disposal system) shall be collected at the effluent pump chamber and analyzed for at least the parameters at the indicated **minimum** frequencies (**Table 1 - Treated Effluent Sampling, Schedule C**).
3. Samples of **groundwater** shall be collected from the nine (9) monitoring wells MW-1, MW-2, MW-4 to MW-10 inclusive, located upgradient of the subsurface disposal beds, immediately downgradient of the subsurface disposal beds and at the property boundary in the downgradient flow path from the subsurface disposal beds, and two (2) additional monitoring wells to intercept the plume close to the water's edge, and analyzed for at least the parameters at the indicated **minimum** frequencies (**Table 2 - Groundwater Sampling, Schedule C**). In addition, groundwater depths for each of the monitoring wells shall also be recorded to assess groundwater elevation and flow paths through the site.
4. Samples of **surface water** shall be collected at the following five (5) locations and analyzed for at least the parameters at the indicated **minimum** frequencies (**Table 3 - Surface Water Sampling, Schedule C**).

Surface water monitoring locations

- upgradient background (SW1)
 - one location within the main pond (SW3)
 - outlet from the main pond (SW4)
 - outlet from the property (SW6)
 - upgradient tributaries (SW5, located at County Road No. 34, approximately 50m upstream of the confluence of Mill Creek with the downstream location of the Mini Lakes outlet).
5. The monitoring outlined pursuant to subsections (3) and (4) shall be undertaken for a period of at least three (3) years following the start up of the Proposed Works.
 6. Prior to the startup of the Works, background groundwater quality must be established by collecting groundwater samples and having them analyzed for the parameters outlined in Table 2.
 7. The Owner shall measure and record the daily volume of effluent being discharged to subsurface disposal system.
 8. The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

- a. the Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only), as amended from time to time by more recently published editions;
 - b. the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (January 1999), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions; and
 - c. the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition), as amended from time to time by more recently published editions.
9. The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the monitoring activities required by this Approval.
10. 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 6 as evidenced by the results of the monitoring program required by this condition, the monitoring requirements may be revised by the Director if he/she is of the opinion that such a reduction is appropriate in the circumstances.

6. EFFLUENT LIMITS

1. The Owner shall operate and maintain the Works such that the concentrations of the materials named as effluent parameters are not exceeded in the effluent from the Works (**Table 4 - Effluent Limits, Schedule D**).
2. For the purposes of determining compliance with and enforcing subsection (1):
 - a. Non-compliance with respect to the effluent parameters is deemed to have occurred when the annual average concentration of any of the effluent parameters (treated effluent discharge to the subsurface disposal system) named in subsection (1) above, based on all grab samples taken in accordance with Condition 5(2) above, supplemented by spot sampling by Ministry staff as necessary, during any calendar year, exceeds its corresponding stipulated effluent concentration indicated in Table 4.
3. Paragraph (a) of subsection shall apply upon the issuance of this Approval.
4. The effluent limit set out in subsection (1) shall apply upon the issuance of this Approval.

5. Only those monitoring results collected during the corresponding time period shall be used in calculating the Annual Average Concentration.

7. OPERATIONS AND MAINTENANCE

1. The Owner shall prepare an operations manual within six (6) months of the introduction of sewage to the Works, that includes, but not necessarily limited to, the following information:
 - a. operating procedures for routine operation of the Works; and
 - b. inspection programs, including frequency of inspection, for the Works and the methods or tests employed to detect when maintenance is necessary.
2. (2) The Owner shall maintain the operations manual current and retain a copy at the location of the Works for the operational life of the Works. Upon request, the Owner shall make the manual available to Ministry staff.
3. (3) The Owner shall prepare and make available for inspection by Ministry staff, a maintenance agreement with the manufacturer for the treatment process/technology and a complete set of "as constructed" drawings within one (1) year of Substantial Completion of the Works. The maintenance agreement and drawings must be retained at the site and kept current.
4. (4) The Owner shall employ for the overall operation of the Works a person who possesses the level of training and experience sufficient to allow safe and environmentally sound operation of the Works.

8. REPORTING

1. One week prior to the start up of the operation of the Works, the Owner shall notify the District Manager (in writing) of the pending start up date of the Proposed Works.
2. The Owner shall prepare, and submit upon request, a performance report, on an annual basis, within ninety (90) days following the end of the period being reported upon. The first such report shall cover the first annual period following the commencement of operation of the Works and subsequent reports shall be submitted to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:
 - a. a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 6, including an overview of the success and adequacy of the Works;
 - b. a tabulation of the daily volumes of effluent disposed through the subsurface disposal system during the reporting period;

- c. a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;
- d. a description of any operating problems encountered and corrective actions taken.
- e. a copy of all Notice of Modifications submitted to the District Manager as a result of Schedule A, Section 1, with a status report on the implementation of each modification;
- f. a report summarizing all modifications completed as a result of Schedule A, Section 3;
- g. any other information the District Manager requires from time to time.

9. LIMITED OPERATIONAL FLEXIBILITY

1. The Owner may make modifications to the Works in accordance with the Terms and Conditions of this Approval and subject to the Ministry's "Limited Operational Flexibility Criteria for Modifications to Sewage Works", included under Schedule A of this Approval, as amended.
2. Sewage works under Limited Operational Flexibility shall adhere to the design guidelines contained within the Ministry's publication "Design Guidelines for Sewage Works 2008", as amended.
3. The Owner shall ensure at all times, that the Works, related equipment and appurtenances which are installed or used to achieve compliance are operated in accordance with all Terms and Conditions of this Approval.
4. For greater certainty, the following are **not** permitted as part of Limited Operational Flexibility:
 - a. Modifications to the Works that result in an increase of the approved Rated Capacity of the Works;
 - b. Modifications to the Works that may adversely affect the approved effluent quality criteria or the location of the discharge/outfall;
 - c. Modifications to the treatment process technology of the Works, or modifications that involve construction of new reactors (tanks) or alter the treatment train process design;
 - d. Modifications to the Works approved under s.9 of the EPA, and
 - e. Modifications to the Works pursuant to an order issued by the Ministry.

5. Implementation of Limited Operational Flexibility is not intended to be used for piecemeal measures that result in major alterations or expansions.
6. If the implementation of Limited Operational Flexibility requires changes to be made to the Emergency Response, Spill Reporting and Contingency Plan, the Owner shall, provide a revised copy of this plan to the local fire services authority prior to implementing Limited Operational Flexibility.
7. For greater certainty, any modification made under the Limited Operational Flexibility may only be carried out after other legal obligations have been complied with, including those arising from the *Environmental Protection Act, Niagara Escarpment Planning and Development Act, Oak Ridges Moraine Conservation Act, Lake Simcoe Protection Act* and *Greenbelt Act*.
8. At least thirty (30) days prior to implementing Limited Operational Flexibility, the Owner shall complete a Notice of Modifications describing any proposed modifications to the Works and submit it to the District Manager.
9. The Owner shall not proceed with implementation of Limited Operational Flexibility until the District Manager has provided written acceptance of the Notice of Modifications or a minimum of thirty (30) days have passed since the day the District Manager acknowledged the receipt of the Notice of Modifications.

SCHEDULE 'A'

Limited Operational Flexibility Criteria for Modifications to Industrial Sewage Works

1. The modifications to sewage works approved under an Environmental Compliance Approval (Approval) that are permitted under the Limited Operational Flexibility (LOF), are outlined below and are subject to the LOF conditions in the Approval, and require the submission of the Notice of Modifications. If there is a conflict between the sewage works listed below and the Terms and Conditions in the Approval, the Terms and Conditions in the Approval shall take precedence.

1.1 Sewage Pumping Stations

- a. Alter pumping capacity by adding or replacing equipment where new equipment is located within an existing sewage treatment plant site or an existing sewage pumping station site, provided that the modifications do not result in an increase of the sewage treatment plant Rated Capacity and the existing flow process and/or treatment train are maintained, as applicable.
- b. Forcemain relining and replacement with similar pipe size where the nominal diameter is not greater than 1,200mm.

1.2 Sewage Treatment Process

- a. Installing additional chemical dosage equipment including replacing with alternative chemicals for pH adjustment or coagulants (non-toxic polymers) provided that there are no modifications of treatment processes or other modifications that may alter the intent of operations and may have negative impacts on the effluent quantity and quality.
- b. Expanding the buffer zone between a sanitary sewage lagoon facility or land treatment area and adjacent uses provided that the buffer zone is entirely on the proponent's land.
- c. Optimizing existing sanitary sewage lagoons with the purpose to increase efficiency of treatment operations provided that existing sewage treatment plant rated capacity is not exceeded and where no land acquisition is required.
- d. Optimizing existing sewage treatment plant equipment with the purpose to increase the efficiency of the existing treatment operations, provided that there are no modifications to the works that result in an increase of the approved Rated Capacity, and may have adverse effects to the effluent quality or location of the discharge.
- e. Replacement, refurbishment of previously approved equipment in whole or in part with Equivalent Equipment, like-for-like of different make and model, provided that

the firm capacity, reliability, performance standard, level of quality and redundancy of the group of equipment is kept the same. For clarity purposes, the following equipment can be considered under this provision: pumps, screens, grit separators, blowers, aeration equipment, sludge thickeners, dewatering equipment, UV systems, chlorine contact equipment, bio-disks, and sludge digester systems.

1.3 Sanitary Sewers

- a. Pipe relining and replacement with similar pipe size within the Sewage Treatment Plant site, where the nominal diameter is not greater than 1,200mm.

1.4 Pilot Systems

- a. Installation of pilot systems for new or existing technologies provided that:
 - i. any effluent from the pilot system is discharged to the inlet of the sewage treatment plant or hauled off-site for proper disposal,
 - ii. any effluent from the pilot system discharged to the inlet of the sewage treatment plant or sewage conveyance system does not significantly alter the composition/concentration of the influent sewage to be treated in the downstream process; and that it does not add any inhibiting substances to the downstream process, and
 - iii. the pilot system's duration does not exceed a maximum of two years; and a report with results is submitted to the Director and District Manager three months after completion of the pilot project.
2. Sewage works that are exempt from section 53 of the OWRA by O. Reg. 525/98 continue to be exempt and are not required to follow the notification process under this Limited Operational Flexibility.
3. Normal or emergency operational modifications, such as repairs, reconstructions, or other improvements that are part of maintenance activities, including cleaning, renovations to existing approved sewage works equipment, provided that the modification is made with Equivalent Equipment, are considered pre-approved.
4. The modifications noted in section (3) above are **not** required to follow the notification protocols under Limited Operational Flexibility, provided that the number of pieces and description of the equipment as described in the Approval does not change.

Notice of Modification to Sewage Works

RETAIN COPY OF COMPLETED FORM AS PART OF THE ECA AND SEND A COPY TO THE WATER SUPERVISOR (FOR MUNICIPAL) OR DISTRICT MANAGER (FOR NON-MUNICIPAL SYSTEMS)

Part 1 – Environmental Compliance Approval (ECA) with Limited Operational Flexibility

(Insert the ECA's owner, number and issuance date and notice number, which should start with "01" and consecutive numbers thereafter)

ECA Number	Issuance Date (mm/dd/yy)	Notice number (if applicable)
ECA Owner		Municipality

Part 2: Description of the modifications as part of the Limited Operational Flexibility

(Attach a detailed description of the sewage works)

Description shall include:

1. A detail description of the modifications and/or operations to the sewage works (e.g. sewage work component, location, size, equipment type/model, material, process name, etc.)
2. Confirmation that the anticipated environmental effects are negligible.
3. List of updated versions of, or amendments to, all relevant technical documents that are affected by the modifications as applicable, i.e. submission of documentation is not required, but the listing of updated documents is (design brief, drawings, emergency plan, etc.)

Part 3 – Declaration by Professional Engineer

I hereby declare that I have verified the scope and technical aspects of this modification and confirm that the design:

1. Has been prepared or reviewed by a Professional Engineer who is licensed to practice in the Province of Ontario;
2. Has been designed in accordance with the Limited Operational Flexibility as described in the ECA;
3. Has been designed consistent with Ministry's Design Guidelines, adhering to engineering standards, industry's best management practices, and demonstrating ongoing compliance with s.53 of the Ontario Water Resources Act; and other appropriate regulations.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name (Print)	PEO License Number
Signature	Date (mm/dd/yy)
Name of Employer	

Part 4 – Declaration by Owner

I hereby declare that:

1. I am authorized by the Owner to complete this Declaration;
 2. The Owner consents to the modification; and
 3. This modifications to the sewage works are proposed in accordance with the Limited Operational Flexibility as described in the ECA.
 4. The Owner has fulfilled all applicable requirements of the *Environmental Assessment Act*.
- I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name of Owner Representative (Print)	Owner representative's title (Print)
Owner Representative's Signature	Date (mm/dd/yy)

SCHEDULE 'B'

Environmental Compliance Approval (ECA) supporting documents:

1. Application for Environmental Compliance Approval (ECA) dated June 7, 2012 signed by Tom Boyd, President, Mini Lakes Residents Association, and supporting documents prepared by Stantec Consulting Ltd., Consulting Engineers.

SCHEDULE 'C'

Table 1- Treated Effluent Sampling

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
pH	grab	monthly

Table 2- Groundwater Sampling

Parameter	Type of Sample	Minimum Frequency
CBOD5	grab	quarterly
Total Suspended Solids	grab	quarterly
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
Dissolved Organic Carbon	grab	quarterly

Table 3- Surface Water Sampling

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

SCHEDULE 'D'

Table 4- Effluent Limits

Effluent Parameters	Annual Average Concentration
CBOD5	20 mg/L
Total Suspended Solids	20 mg/L
Nitrate Nitrogen	8 mg/L
Total Phosphorus	1 mg/L

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

1. Condition 1 is imposed to ensure that the Works are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review. The condition also advises the Owners their responsibility to notify any person they authorized to carry out work pursuant to this Approval the existence of this Approval.
2. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.
3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to the approved works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.
4. Condition 4 is included to ensure that the works are constructed, and may be operated and maintained such that the environment is protected and deterioration, loss, injury or damage to any person or property is prevented.
5. Condition 5 is included to enable the Owner to evaluate and demonstrate the performance of the Works, on a continual basis, so that the Works are properly operated and maintained at a level which is consistent with the design objectives specified in the Approval.
6. Condition 6 is imposed to ensure that the effluent discharged from the Works to the subsurface disposal system meets the Ministry's effluent quality requirements thus minimizing environmental impact.
7. Condition 7 is included to require that the Works be properly operated, maintained, and equipped such that the environment is protected. As well, the inclusion of an operations manual, maintenance agreement with the manufacturer for the treatment process/technology and a complete set of "as constructed" drawings governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the owner and made available to the Ministry. Such a information is an integral part of the operation of the Works. Its compilation and use should assist the Owner in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act as a benchmark for Ministry staff when reviewing the Owner's operation of the work.
8. Condition 8 is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this Approval, so that the Ministry can work with the Owner in resolving any problems in a timely manner.

9. Condition 9 is included to ensure that the Works are operated in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider. These Conditions are also included to ensure that a Professional Engineer has reviewed the proposed modifications and attests that the modifications are in line with that of Limited Operational Flexibility, and provide assurance that the proposed modifications comply with the Ministry's requirements stipulated in the Terms and Conditions of this Approval, MOE policies, guidelines, and industry engineering standards and best management practices.

**Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s).
2391-9KCJUS issued on June 1, 2016.**

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

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

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

The Notice should also include:

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

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

This Notice must be served upon:

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

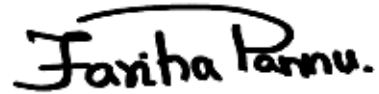
AND

The Director appointed for the purposes of Part II.1 of
the Environmental Protection Act
Ministry of the Environment and Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

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

DATED AT TORONTO this 18th day of September, 2017

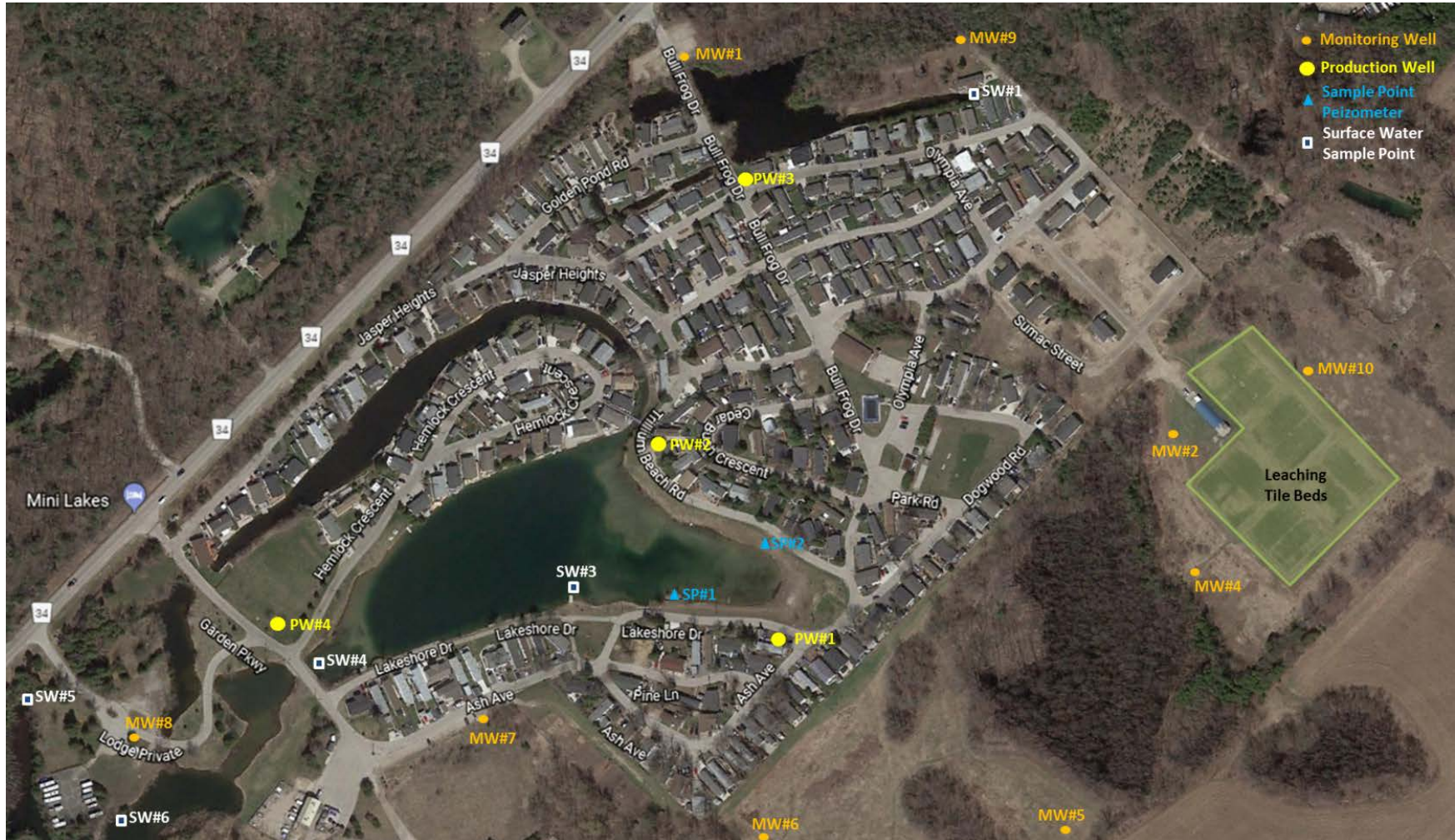


Fariha Pannu, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

JA/
c: District Manager, MOECC Guelph
n/a, Wellington Common Elements Condominium Corporation No.214 c/o MF Property Management
Limited

APPENDIX B

Groundwater Monitoring Wells and Surface Water Sampling Locations



APPENDIX C

Laboratory Certificates of Analysis for WasteWater Treatment Plant



SGS Canada Inc.

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

Works #: 1418S
Project : PO#017844

26-January-2018

OCWA-Mini Lakes RBC WWTP

Attn : Don Irvine

Date Rec. : 19 January 2018
LR Report: CA12693-JAN18

136 Main St., E.
Shelburne, ON
L9V 3K5, Canada

Copy: #1

Phone: 519-925-1938 ext. 225
Fax:

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Eff Eff-Effluent (Grab)
Sample Date & Time					18-Jan-18 12:30
Temperature Upon Receipt [°C]	---	---	---	---	10.0
Dissolved Oxygen [mg/L]	19-Jan-18	11:13	19-Jan-18	12:40	8.0
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	19-Jan-18	16:49	25-Jan-18	15:47	7
Total Suspended Solids [mg/L]	22-Jan-18	13:00	23-Jan-18	16:25	14
pH [no unit]	19-Jan-18	14:52	22-Jan-18	13:24	7.56
Phosphorus (total) [mg/L]	19-Jan-18	20:00	22-Jan-18	08:47	0.28
Total Kjeldahl Nitrogen [as N mg/L]	19-Jan-18	20:00	25-Jan-18	09:26	3.1
Ammonia+Ammonium (N) [mg/L]	19-Jan-18	18:00	22-Jan-18	10:02	2.0
Nitrite (as N) [mg/L]	23-Jan-18	14:16	25-Jan-18	15:12	0.71
Nitrate (as N) [mg/L]	23-Jan-18	14:16	25-Jan-18	15:12	9.15
Nitrate + Nitrite (as N) [mg/L]	23-Jan-18	14:16	25-Jan-18	15:12	9.86
E. Coli [cfu/100mL]	19-Jan-18	15:20	22-Jan-18	10:23	11200

*Minimal sample volume received - some results maybe elevated.

Kimberley Didsbury
Project Specialist
Environmental Services, Analytical



SGS Canada Inc.

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

Works #: 1418S
Project : PO#017844

13-February-2018

OCWA-Mini Lakes RBC WWTP

Attn : Don Irvine

Date Rec. : 07 February 2018
LR Report: CA13222-FEB18

136 Main St., E.
Shelburne, ON
L9V 3K5, Canada

Copy: #1

Phone: 519-925-1938 ext. 225
Fax:

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Eff Eff-Final Effluent
Sample Date & Time					06-Feb-18 10:00
Temperature Upon Receipt [°C]	---	---	---	---	6.0
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	07-Feb-18	17:27	13-Feb-18	09:51	12
Dissolved Oxygen [mg/L]	07-Feb-18	13:47	07-Feb-18	13:53	8.9
Total Suspended Solids [mg/L]	08-Feb-18	14:44	09-Feb-18	15:44	15
pH [no unit]	08-Feb-18	10:57	08-Feb-18	15:47	7.44
Phosphorus (total) [mg/L]	07-Feb-18	18:00	08-Feb-18	15:06	0.36
Total Kjeldahl Nitrogen [as N mg/L]	07-Feb-18	20:00	08-Feb-18	08:28	3.9
Ammonia+Ammonium (N) [mg/L]	07-Feb-18	18:00	08-Feb-18	10:14	2.4
Nitrite (as N) [mg/L]	09-Feb-18	14:15	12-Feb-18	15:32	0.71
Nitrate (as N) [mg/L]	09-Feb-18	14:15	12-Feb-18	15:32	7.78
Nitrate + Nitrite (as N) [mg/L]	09-Feb-18	14:15	12-Feb-18	15:32	8.49
E. Coli [cfu/100mL]	08-Feb-18	08:35	09-Feb-18	08:51	4000


 Carrie Greenlaw
 Project Specialist
 Environmental Services, Analytical



Waterworks/Project # **1418S** C of C LIMS No: **1418S** Page 1 of 3

Facility Name **Mini Lakes WWTP** Org. # **1418** Laboratory Section **1418** Date Rec'd: **03/29/18** Sample condition upon receipt **12988**

Quote # **1418** Attached Parameter List No Yes Date Rec'd: **03/29/18** Time Rec'd: **9:13** Initials **AW**

Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment Temperature Upon Receipt **9.73** °C

Requested Turnaround Time: App. Req'd **24-48 h** 5-7d 7-10d Other Specify: _____

Address: **136 Main St. E. Shelburne, ON L9V 3K5** Data Transfer Contact: **Don Irvine** Invoice To: **Ontario Clean Water Agency 136 Main St. E. Shelburne, ON L9V 3K5** Laboratory: **SGS Lakerfield Research Ltd 185 Concession St. Lakerfield, ON K0L 2H0**

Telephone: **519-321-9474** Fax: **519-925-0322** Email: **dlinv@ocwa.com** **dlinv@ocwa.com** **adwesthighlands@ocwa.com** **carrie.greenlaw@sgs.com**

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	# of Bottles	CI Residual		Parameters							Comments	Upload to MOE	Upload to OCWA			
					Field Total (mg/L)	Field Free (mg/L)	Combined (mg/L)	CBOD5	Total Suspended Solids	Total Phosphorous	Total Ammonia Nitrogen (TAN)	Nitrate-Nitrogen	Nitrite-Nitrogen				TKN	Dissolved Organic Carbon	E.Coli
Well	Well1	Monitoring Well #1 (MW-1)	08/03/18	0945			X	X	X	X	X	X	X	X	X	X	Well Depth = 1.40 m	Yes	Yes
Well	Well2	Monitoring Well #2 (MW-2)	0905				X	X	X	X	X	X	X	X	X	X	Well Depth = 2.45 m	Yes	Yes
Well	Well4	Monitoring Well #4 (MW-4)	0915				X	X	X	X	X	X	X	X	X	X	Well Depth = 2.15 m	Yes	Yes
Well	Well5	Monitoring Well #5 (MW-5)	1030				X	X	X	X	X	X	X	X	X	X	Well Depth = 2.36 m	Yes	Yes
Well	Well6	Monitoring Well #6 (MW-6)	1010				X	X	X	X	X	X	X	X	X	X	Well Depth = 2.15 m	Yes	Yes
Well	Well7	Monitoring Well #7 (MW-7)	1005				X	X	X	X	X	X	X	X	X	X	Well Depth = 2.35 m	Yes	Yes
Well	Well8	Monitoring Well #8 (MW-8)	0955				X	X	X	X	X	X	X	X	X	X	Well Depth = 1.96 m	Yes	Yes
Well	Well9	Monitoring Well #9 (MW-9)	0930				X	X	X	X	X	X	X	X	X	X	Well Depth = 1.37 m	Yes	Yes
Well	Well10	Monitoring Well #10 (MW-10)	0855				X	X	X	X	X	X	X	X	X	X	Well Depth = 3.2 m	Yes	Yes

Station Acronym: Cell - Cell Contents, Dis - Disinfection, Down - Downstream, Eff - Final Effluent, PBY - Primary Bypass, Raw - Raw Sewage, Sdy - Secondary Bypass, Up - Upstream, Well - Monitoring Well, Aer - Aeration, BS - Biosolids thickening, Bpd - Biosolids primary digestion, Bsd - Biosolids sec. digestion, Bss - Biosolids pd super, Bsq - Biosolids sec super, Bsq - Biosolids sludge quality Bsq - Biosolids soil quality DAF - Dissolved Air Flotation, Grl - Primary Treatment/Grl, Pct - Primary Effluent, RAS - Return Activated Sludge, SBR - Secondary Treatment/SBRs, SclF - Secondary Effluent, TMS - Thickened Waste Activated Sludge, WAs - Waste Activated Sludge, IndW - Industrial Wastewater, Psh - Pump Sln, Sapt - Septage, Lcht - Leachate, PTr - Primary Treatment, ReAr - Re-aeration, Tert - Tertiary Treatment, Ato - Aotilo, Tedy - Tertiary Bypass, Hold - Holding Tank, CSO - Combined Sewer Overflow, SSO - Sanitary Sewer Overflow

Sampler Name: **Enavel Castro**

Sampler Signature: **[Signature]**

Revision # **6** **6 PM 9:30 AM**

Revised: 2017.11.21

Waterworks/Project # **1418S**
 Facility Name **Mini Lakes WWTP**
 Org. # **1418**
 C of C LIMS No: _____
 Laboratory Section _____
 Date Rec'd: _____
 Temperature Upon Receipt _____ °C
 Sample condition upon receipt _____
 Initials _____
 Time Rec'd: _____

Requested Turnaround Time: _____
 App. Req'd _____
 24-48 h 5-7d 7-10d Other _____ Specify _____
 Data Transfer Contact: Don Irvine
 136 Main St. E
 Shelburne, ON
 L9V 3K5
 Telephone: 519-321-9474
 Fax: 519-925-0322
 Email: dilv@ocwa.com
 Invoice To: Ontario Clean Water Agency
 136 Main St. E
 Shelburne, ON
 L9V 3K5
 (519) 925-1938
 (519) 925-0322
 aolwesthighlands@ocwa.com
 Laboratory: SGS Lakeland Research Ltd
 185 Concession St.
 Lakeland, ON
 K0L 2H0
 705-652-2000
 705-652-6365
 carrie.greenlaw@sgs.com

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	# of Bottles	CI Residual			Parameters					Comments	Upload					
					Field Total (mg/L)	Field Free (mg/L)	Combined (mg/L)	CBOD5	Total Suspended Solids	Total Phosphorous	Total Ammonia Nitrogen (TAN)	Nitrate-Nitrogen		Nitrite-Nitrogen	TKN	Dissolved Organic Carbon	E.Coli	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
Well	We11	Monitoring Well #11 (MW-11)	28/03/18	3				X	X	X	X	X	X						
Well	We12	Monitoring Well #12 (MW-12)	10/5/5	3				X	X	X	X	X	X						

Well Depth = 2.46 m
 Well Depth = 2.31 m

Station Acronym: Cell - Cell Contents, Dis - Disinfection, Down - Downstream, Eff - Final Effluent, PBY - Primary Bypass, Raw - Raw Sewage, SBY - Secondary Bypass, Up - Upstream, Well - Monitoring Well, Aer - Aeration, Bg - Biosolids raw sludge, Bth - Biosolids thickening, Bnd - Biosolids primary digestion, Bnd - Biosolids sec. digestion, Bps - Biosolids per super, Bas - Biosolids sec super, Bbig - Biosolids sludge quality Biosol - Biosolids soil quality DAF - Dissolved Air Floation, Gfl - Primary Treatment/Gfl, Ptef - Primary Effluent, RAS - Return Activated Sludge, SBR - Secondary Treatment/SBRa, Scef - Secondary Effluent, TWAS - Thickened Waste Activated Sludge, WAS - Waste Activated Sludge, IndW - Industrial Wastewater, Psln - Pump Stn, Sslp - Sludge, Lcht - Leachate, PTr - Primary Treatment, ReAr - Re-aeration, Ter - Tertiary Treatment, Mo - Aclflo, Teby - Tertiary Bypass, Hold - Holding Tank
 CSO - Combined Sewer Overflow, SSO - Sanitary Sewer Overflow

Sampler Name: *Emaxel cat.o*
 Sampler Signature: *[Signature]*

Waterworks/Project # **1418S** C of C LIMS No: **Mar 13595 LC**

Facility Name **Mini Lakes WWTP** Laboratory Section

Org. # **1418** Date Recd: **03/29/18**

Quote # Temperature Upon Receipt **9.3** °C

Attached Parameter List No Yes Sample condition upon receipt

Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment Initials

Requested Turnaround Time: App. Req'd **24-48 h**

5-7d 7-10d Other Specify: _____

Address: **136 Main St. E, Shelburne, ON L9V 3K5** Data Transfer Contact: Don Irvine

Telephone: **519-321-9474** Data Transfer Contact: Don Irvine

Fax: **519-925-0322** Data Transfer Contact: Don Irvine

Email: **don@ocwa.com** Data Transfer Contact: Don Irvine

Invoice To: **Ontario Clean Water Agency**

136 Main St. E, Shelburne, ON L9V 3K5

(519) 925-1938

(519) 925-0322

apvest@ocwa.com

apvest@ocwa.com

garre@greenlaw.com

Laboratory: **SGS Lakelake Research Ltd**

185 Concession St. Lakelake, ON K0L 2H0

705-652-2000

705-652-6365

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	# of Bottles	CI Residual			Parameters					Comments	Upload to MOE	Upload to OCWA	
					Field Total (mg/L)	Field Free (mg/L)	Combined (mg/L)	Total Phosphorous	Total Ammonia Nitrogen	Nitrate-Nitrogen	Nitrite-Nitrogen	TKN				E.Coli
Hold	Hld1	SW1 - Upgradient background	27/03/18	2				X	X	X	X	X	X	PH: 8.4 T: 10.3	Yes <input checked="" type="checkbox"/>	Yes <input checked="" type="checkbox"/>
Hold	Hld3	SW3 - Within main pond	1320	2				X	X	X	X	X	X	PH: 8.4 T: 10.2	Yes <input checked="" type="checkbox"/>	Yes <input checked="" type="checkbox"/>
Hold	Hld4	SW4 - Outlet from main pond	1335	2				X	X	X	X	X	X	PH: 8.3 T: 10.4	Yes <input checked="" type="checkbox"/>	Yes <input checked="" type="checkbox"/>
Hold	Hld5	SW5 - Upgradient tributaries at County Rd No. 34	1340	2				X	X	X	X	X	X	PH: 8.2 T: 11.0	Yes <input checked="" type="checkbox"/>	Yes <input checked="" type="checkbox"/>
Hold	Hld6	SW6 - Outlet from property	1330	2				X	X	X	X	X	X	PH: 8.1 T: 10.6	Yes <input checked="" type="checkbox"/>	Yes <input checked="" type="checkbox"/>

Sampler Name: **Enoch / Castro** Sampler Signature: *[Signature]*

Station Acronym: Cell - Cell Contents, Dis - Disinfection, Down - Downstream, Eff - Final Effluent, FBy - Primary Bypass, Raw - Raw Sewage, Secy - Secondary Bypass, Up - Upstream, Well - Monitoring Well, Aer - Aeration, Bg - Biosolids raw sludge, Bth - Biosolids thickening, Bod - Biosolids primary digestion, Bod - Biosolids sec. digestion, Bss - Biosolids pit super, Bss - Biosolids soil quality, DAF - Dissolved Air Flotation, Gt - Primary Treatment/Gt, PrE - Primary Effluent, RAS - Return Activated Sludge, SBR - Secondary Treatment/SBRs, ScE - Secondary Effluent, TMS - Thickened Waste Activated Sludge, WAS - Waste Activated Sludge, IndW - Industrial Wastewater, Psh - Pump Sh, Sep - Septage, Lch - Leachate, PTr - Primary Treatment, ReA - Re-aeration, Ter - Tertiary Treatment, Aft - Aft, Tsb - Tertiary Bypass, Hld - Holding Tank

CSO - Combined Sewer Overflow, SSO - Sanitary Sewer Overflow

Revision # 6 6055078672095

PH 9:30 15 Revised: 2017.11.21



SGS Canada Inc.

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

Works #: 1418S
Project : PO#017844

19-March-2018

OCWA-Mini Lakes RBC WWTP

Attn : Don Irvine

Date Rec. : 13 March 2018
LR Report: CA12248-MAR18

136 Main St., E.
Shelburne, ON
L9V 3K5, Canada

Copy: #1

Phone: 519-925-1938 ext. 225
Fax:

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Eff Eff-Final Effluent
Sample Date & Time					12-Mar-18 09:25
Temperature Upon Receipt [°C]	---	---	---	---	9.0
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	13-Mar-18	16:36	19-Mar-18	14:08	19
Dissolved Oxygen [mg/L]	13-Mar-18	13:20	14-Mar-18	14:02	7.6
Total Suspended Solids [mg/L]	15-Mar-18	07:52	16-Mar-18	10:54	11
pH [no unit]	13-Mar-18	13:16	14-Mar-18	15:12	7.48
Phosphorus (total) [mg/L]	13-Mar-18	20:39	14-Mar-18	11:00	0.31
Total Kjeldahl Nitrogen [as N mg/L]	13-Mar-18	21:06	14-Mar-18	11:59	3.2
Ammonia+Ammonium (N) [mg/L]	14-Mar-18	06:45	15-Mar-18	11:16	2.6
Nitrite (as N) [mg/L]	14-Mar-18	03:59	15-Mar-18	12:34	0.77
Nitrate (as N) [mg/L]	14-Mar-18	03:59	15-Mar-18	12:34	8.84
Nitrate + Nitrite (as N) [mg/L]	14-Mar-18	03:59	15-Mar-18	12:34	9.61
E. Coli [cfu/100mL]	14-Mar-18	09:20	15-Mar-18	12:33	30200



Carrie Greenlaw
Project Specialist
Environmental Services, Analytical



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OCWA-Mini Lakes RBC WWTP

Attn : Don Irvine

136 Main St., E.
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L9V 3K5, Canada

Phone: 519-925-1938 ext. 225

Fax:

Works #: 1418S
Project : PO#017844

05-April-2018

Date Rec. : 29 March 2018
LR Report: CA12988-MAR18

Copy: #1

CERTIFICATE OF ANALYSIS Final Report

Sample ID	Sample Date & Time	Temperature Upon Receipt °C	Carbonaceous Biochemical Oxygen Demand (CBOD5) mg/L	Total Suspended Solids mg/L	Total Kjeldahl Nitrogen as N mg/L	Ammonia-Nitrogen (N) mg/L	Phosphorus (total) mg/L	Nitrite (as N) mg/L	Nitrate (as N) mg/L	Nitrate + Nitrite (as N) mg/L	Dissolved Organic Carbon mg/L	E. Coli cfu/100mL
1: Analysis Start Date			29-Mar-18	02-Apr-18	02-Apr-18	29-Mar-18	29-Mar-18	29-Mar-18	29-Mar-18	29-Mar-18	29-Mar-18	29-Mar-18
2: Analysis Start Time			16:05	08:38	18:00	17:00	18:10	23:35	23:35	23:35	20:13	15:40
3: Analysis Completed Date			04-Apr-18	05-Apr-18	04-Apr-18	03-Apr-18	03-Apr-18	04-Apr-18	04-Apr-18	04-Apr-18	03-Apr-18	02-Apr-18
4: Analysis Completed Time			11:59	11:06	11:49	12:57	14:23	10:33	10:33	10:33	13:48	13:48
5: Well We1-Monitoring Well #1 (MW-1)	28-Mar-18 09:45	9.0	< 4	83	2.8	2.0	0.15	< 0.03	< 0.06	< 0.06	14	< 2
6: Well We2-Monitoring Well #2 (MW-2)	28-Mar-18 09:05	9.0	< 4	15	< 0.5	< 0.1	< 0.03	< 0.03	8.66	8.66	< 1	< 2
7: Well We4-Monitoring Well #4 (MW-4)	28-Mar-18 09:15	9.0	< 4	21	< 0.5	0.1	< 0.03	< 0.03	6.73	6.73	< 1	< 2
8: Well We5-Monitoring Well #5 (MW-5)	28-Mar-18 10:30	9.0	< 4	8	< 0.5	< 0.1	< 0.03	< 0.03	0.38	0.38	1	< 2
9: Well We6-Monitoring Well #6 (MW-6)	28-Mar-18 10:10	9.0	< 4	8	< 0.5	< 0.1	< 0.03	< 0.03	0.66	0.66	1	< 2
10: Well We7-Monitoring Well #7 (MW-7)	28-Mar-18 10:05	9.0	< 4	17	< 0.5	0.1	0.05	< 0.03	< 0.06	< 0.06	2	< 2
11: Well We8-Monitoring Well #8 (MW-8)	28-Mar-18 09:55	9.0	< 4	7	1.5	1.3	0.04	< 0.03	< 0.06	< 0.06	4	< 2
12: Well We9-Monitoring Well #9 (MW-9)	28-Mar-18 09:30	9.0	< 4	49	2.0	1.3	0.08	< 0.03	< 0.06	< 0.06	11	< 2
13: Well We10-Monitoring Well #10 (MW-10)	28-Mar-18 08:55	9.0	< 4	13	< 0.5	< 0.1	0.04	< 0.03	< 0.06	< 0.06	1	< 2
14: Well We11-Monitoring Well #11 (MW-11)	28-Mar-18 10:40	9.0	< 4	174	8.4	8.3	< 0.03	< 0.03	< 0.06	< 0.06	11	< 2
15: Well We12-Monitoring Well #12 (MW-12)	28-Mar-18 10:55	9.0	< 4	100	< 0.5	< 0.1	0.12	< 0.03	1.47	1.47	1	< 2



SGS Canada Inc.

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Works #: 1418S
Project : PO#017844
LR Report : CA12988-MAR18

Carrie Greenlaw
Project Specialist
Environmental Services, Analytical



SGS Canada Inc.

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

OCWA-Mini Lakes RBC WWTP

Attn : Don Irvine

136 Main St., E.
Shelburne, ON
L9V 3K5, Canada

Phone: 519-925-1938 ext. 225

Fax:

Works #: 1418S
Project : PO#017844

02-April-2018

Date Rec. : 28 March 2018
LR Report: CA13595-MAR18

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Hold Hld1-SW1-Upgradie nt Background	6: Hold Hld3-SW3-Within Main Pond	7: Hold Hld4-SW4-Outlet From Main Pond	8: Hold Hld5-SW5-Upgradient Tributaries at County Rd No 34	9: Hold Hld6-SW6-Outlet From Property
Sample Date & Time					27-Mar-18 13:10	27-Mar-18 13:20	27-Mar-18 13:35	27-Mar-18 13:40	27-Mar-18 13:30
Temperature Upon Receipt [°C]	---	---	---	---	9.0	9.0	9.0	9.0	9.0
Field pH [no unit]					8.4	8.4	8.3	8.2	8.1
Field Temperature [celcius]					10.3	10.2	10.4	11.0	10.6
Phosphorus (total) [mg/L]	28-Mar-18	16:56	29-Mar-18	14:20	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Total Kjeldahl Nitrogen [as N mg/L]	28-Mar-18	17:20	29-Mar-18	13:31	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ammonia+Ammonium (N) [mg/L]	28-Mar-18	20:00	29-Mar-18	10:45	< 0.1	0.1	0.1	0.1	< 0.1
Nitrite (as N) [mg/L]	28-Mar-18	19:42	31-Mar-18	10:43	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	28-Mar-18	19:42	31-Mar-18	10:43	0.12	0.26	0.26	0.54	0.08
Nitrate + Nitrite (as N) [mg/L]	28-Mar-18	19:42	31-Mar-18	10:43	0.12	0.26	0.26	0.54	0.08
E. Coli [cfu/100mL]	28-Mar-18	16:40	29-Mar-18	16:15	6	< 2	< 2	6	< 2



SGS Canada Inc.

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Works #: 1418S
Project : PO#017844
LR Report : CA13595-MAR18

Kimberley Didsbury
Project Specialist
Environmental Services, Analytical



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

Works #: 1418S
Project : PO#017844

25-April-2018

OCWA-Mini Lakes RBC WWTP

Attn : Don Irvine

Date Rec. : 19 April 2018
LR Report: CA12468-APR18

136 Main St., E.
Shelburne, ON
L9V 3K5, Canada

Copy: #1

Phone: 519-925-1938 ext. 225
Fax:

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Eff Eff-Final Effluent
Sample Date & Time					18-Apr-18 09:30
Temperature Upon Receipt [°C]	---	---	---	---	8.0
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	19-Apr-18	18:28	25-Apr-18	14:29	7
Dissolved Oxygen [mg/L]	19-Apr-18	15:24	20-Apr-18	15:34	6.6
Total Suspended Solids [mg/L]	20-Apr-18	10:01	23-Apr-18	15:26	15
pH [no unit]	19-Apr-18	16:00	23-Apr-18	20:55	7.54
Phosphorus (total) [mg/L]	19-Apr-18	16:30	24-Apr-18	15:19	0.32
Total Kjeldahl Nitrogen [as N mg/L]	19-Apr-18	17:00	20-Apr-18	10:55	4.6
Ammonia+Ammonium (N) [mg/L]	19-Apr-18	16:02	20-Apr-18	13:28	3.6
Nitrite (as N) [mg/L]	21-Apr-18	04:19	24-Apr-18	15:40	0.66
Nitrate (as N) [mg/L]	21-Apr-18	04:19	24-Apr-18	15:40	9.94
Nitrate + Nitrite (as N) [mg/L]	21-Apr-18	04:19	24-Apr-18	15:40	10.6
E. Coli [cfu/100mL]	19-Apr-18	17:50	23-Apr-18	10:06	74000


 Carrie Greenlaw
 Project Specialist
 Environmental Services, Analytical



SGS Canada Inc.

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

Works #: 1418S
Project : PO#017844

01-June-2018

OCWA-Mini Lakes RBC WWTP

Attn : Don Irvine

Date Rec. : 24 May 2018
LR Report: CA13818-MAY18

136 Main St., E.
Shelburne, ON
L9V 3K5, Canada

Copy: #1

Phone: 519-925-1938 ext. 225
Fax:

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Eff Eff-Final Effluent
Sample Date & Time					23-May-18 10:05
Temperature Upon Receipt [°C]	---	---	---	---	12.0
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	24-May-18	17:07	30-May-18	14:56	36
Dissolved Oxygen [mg/L]	24-May-18	15:41	29-May-18	10:57	5.7
Total Suspended Solids [mg/L]	28-May-18	10:38	31-May-18	16:20	23
pH [no unit]	25-May-18	08:44	29-May-18	14:29	7.35
Phosphorus (total) [mg/L]	25-May-18	17:37	30-May-18	12:04	0.34
Total Kjeldahl Nitrogen [as N mg/L]	25-May-18	20:05	29-May-18	15:34	6.5
Ammonia+Ammonium (N) [mg/L]	25-May-18	16:30	29-May-18	08:27	5.3
Nitrite (as N) [mg/L]	26-May-18	15:22	30-May-18	14:47	1.41
Nitrate (as N) [mg/L]	26-May-18	15:22	30-May-18	14:47	4.13
Nitrate + Nitrite (as N) [mg/L]	26-May-18	15:22	30-May-18	14:47	5.54
E. Coli [cfu/100mL]	24-May-18	16:35	28-May-18	10:47	32800

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Project Specialist
Environmental Services, Analytical



SGS Canada Inc.

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OCWA-Mini Lakes RBC WWTP

Attn : Don Irvine

136 Main St., E.
Shelburne, ON
L9V 3K5, Canada

Phone: 519-925-1938 ext. 225

Fax:

Works #: 1418S
Project : PO#017844

20-June-2018

Date Rec. : 07 June 2018
LR Report: CA13249-JUN18

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Well We1-Monitoring Well #1 (MW-1)	6: Well We2-Monitoring Well #2 (MW-2)	7: Well We4-Monitoring Well #4 (MW-4)	8: Well We5-Monitoring Well #5 (MW-5)	9: Well We6-Monitoring Well #6 (MW-6)
Sample Date & Time					06-Jun-18 09:20	06-Jun-18 08:55	06-Jun-18 08:45	06-Jun-18 10:00	06-Jun-18 09:50
Temperature Upon Receipt [°C]	---	---	---	---	13.0	13.0	13.0	13.0	13.0
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	07-Jun-18	19:27	14-Jun-18	14:30	< 4	< 4	< 4	< 4	< 4
Dissolved Oxygen [mg/L]	07-Jun-18	15:44	11-Jun-18	22:24	7.1	8.8	9.0	9.0	8.7
Total Suspended Solids [mg/L]	11-Jun-18	06:16	20-Jun-18	15:49	336	33	7	70	3
Phosphorus (total) [mg/L]	08-Jun-18	20:00	13-Jun-18	09:17	0.25	< 0.03	< 0.03	< 0.03	< 0.03
Total Kjeldahl Nitrogen [as N mg/L]	11-Jun-18	20:42	13-Jun-18	14:58	2.0	< 0.5	< 0.5	< 0.5	< 0.5
Ammonia+Ammonium (N) [mg/L]	11-Jun-18	18:00	14-Jun-18	08:59	2.2	< 0.1	< 0.1	< 0.1	< 0.1
Nitrite (as N) [mg/L]	13-Jun-18	18:54	19-Jun-18	16:18	0.12	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	13-Jun-18	18:54	19-Jun-18	16:18	< 0.06	5.94	7.68	0.14	0.30
Nitrate + Nitrite (as N) [mg/L]	13-Jun-18	18:54	19-Jun-18	16:18	0.12	5.94	7.68	0.14	0.30
Dissolved Organic Carbon [mg/L]	11-Jun-18	20:00	14-Jun-18	11:53	13	2	2	2	1
E. Coli [cfu/100mL]	07-Jun-18	16:00	11-Jun-18	09:16	< 2	< 2	< 2	< 2	< 2



SGS Canada Inc.

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

Works #: 1418S
Project : PO#017844
LR Report : CA13249-JUN18

Carrie Greenlaw
Carrie Greenlaw
Project Specialist
Environmental Services, Analytical

Waterworks/Project # **1418S**
 C of CLIMS No: JUN 17 2018
 Facility Name **Mini Lakes WWTP**
 Laboratory Section
 Org. # **1418**
 Date Rec'd: JUN 07 2018 Time Rec'd: _____ Initials: KM
 Quote # _____ Attached Parameter List No Yes
 Sample condition upon receipt
 Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment
 Temperature Upon Receipt: 10x3 °C

Requested Turnaround Time: _____
 App. Req'd: _____ 24-48 h 5-7d 7-10d Other Specify: _____
 Data Transfer Contact: Don Irvine
 136 Main St. E
 Shelburne, ON
 L9V 3K5
 Telephone: 519-321-9474
 519-321-9474
 519-925-0322
 519-925-0322
 Email: d Irvine@ocwa.com
 Invoice To: Ontario Clean Water Agency
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apwesthighlands@ocwa.com
 Laboratory: SGS Lakefield Research Ltd
 185 Concession St.
 Lakefield, ON
 K0L 2H0
 705-652-2000
 705-652-6365
carrie.greenlaw@sgs.com

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	# of Bottles	CI Residual			Parameters						Comments	Upload to MOE	Upload to OCWA
					Field Total (mg/L)	Field Free (mg/L)	Combined (mg/L)	Total Phosphorous	Total Ammonia Nitrogen	Nitrate-Nitrogen	Nitrite-Nitrogen	TKN	E. Coli			
Hold1	-	SW1 - Upgradient background	6/6/18 ✓ 1100	2	-	-	-	X	X	X	X	X	X	X	Yes	Yes
Hold3	-	SW3 - Within main pond	1115	2	-	-	-	X	X	X	X	X	X	X	Yes	Yes
Hold4	-	SW4 - Outlet from main pond	1120	2	-	-	-	X	X	X	X	X	X	X	Yes	Yes
Hold5	-	SW5 - Upgradient tributaries at County Rd No. 34	1145	2	-	-	-	X	X	X	X	X	X	X	Yes	Yes
Hold6	-	SW6 - Outlet from property	1130	2	-	-	-	X	X	X	X	X	X	X	Yes	Yes

Sampler Name: _____
 Sampler Signature: Jesse Thomas
 Date: _____

* Station Acronym: Cell - Cell Contents, Dis - Disinfection, Down - Downstream, Eff - Final Effluent, PBY - Primary Bypass, Raw - Raw Sewage, SBy - Secondary Bypass, Up - Upstream, Well - Monitoring Well, Aer - Aeration, Brs - Biosolids-thickening, Bpd - Biosolids primary digestion, Bsd - Biosolids sec. digestion, Bps - Biosolids pri super, Bss - Biosolids sec super, Bsq - Biosolids sludge quality, Bsoq - Biosolids soil quality, DAF - Dissolved Air Flootation, Gnt - Primary Treatment/Gnt, PFCF - Primary Effluent, RAS - Return Activated Sludge, SBR - Secondary Treatment/SBRs, SCF - Secondary Effluent, TWAS - Thickened Waste Activated Sludge, WAS - Waste Activated Sludge, InoW - Industrial Wastewater, PStn - Pump Stn, Sept - Septage, Lcht - Leachate, FTr - Primary Treatment, ReAr - Re-aeration, Tert - Tertiary Treatment, Afto - Actflo, TeBy - Tertiary Bypass, Hold - Holding Tank, CSO - Combined Sewer Overflow, SSO - Sanitary Sewer Overflow

Revised: 2017.11.21

Revision # 6

R 9:30

Waterworks/Project # **1418S** C of C LIMS No: JUN 13 2019

Facility Name **Mini Lakes WWTP** Laboratory Section: JUN 07 2018

Org. # **1418** Date Rec'd: JUN 07 2018

Quote # _____ Time Rec'd: _____

Attached Parameter List No Yes Temperature Upon Receipt 13x3 °C

Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment

Requested Turnaround Time: _____ App. Req'd: 24-48 h 5-7d 7-10d Other _____

Address: Data Transfer Contact: Don Irvine 136 Main St. E Shelburne, ON L9V 3K5
 Telephone: 519-321-9474 519-321-9474
 Fax: 519-925-0322 519-925-0322
 Email: dlinne@ocwa.com dlinne@ocwa.com
 Invoice To: Ontario Clean Water Agency 136 Main St. E Shelburne, ON L9V 3K5
 Laboratory: SGS Lakefield Research Ltd 185 Concession St. Lakefield, ON K0L 2H0
 705-652-2000 705-652-6365
 Carrie.greentlaw@sgs.com

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	# of Bottles	Cl Residual			Parameters							Comments	Compliance			
					Field Total (mg/L)	Field Free (mg/L)	Combined (mg/L)	CBOD5	Total Suspended Solids	Total Phosphorous	Total Ammonia Nitrogen (TAN)	Nitrate-Nitrogen	Nitrite-Nitrogen	TKN		Dissolved Organic Carbon	E.Coli	Upload to MOE	Upload to OCWA
Well	Well1	Monitoring Well #1 (MW-1)	0920	3	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
			6/6/18																
Well	Well2	Monitoring Well #2 (MW-2)	0855	3	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Well	Well4	Monitoring Well #4 (MW-4)	0845	3	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Well	Well5	Monitoring Well #5 (MW-5)	1000	3	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Well	Well6	Monitoring Well #6 (MW-6)	0950	3	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Well	Well7	Monitoring Well #7 (MW-7)	0940	3	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Well	Well8	Monitoring Well #8 (MW-8)	0930	3	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Well	Well9	Monitoring Well #9 (MW-9)	0910	3	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X
Well	Well10	Monitoring Well #10 (MW-10)	0835	3	1	1	1	X	X	X	X	X	X	X	X	X	X	X	X

Sampler Name: Fesse Thomas Sampler Signature: [Signature]

* Station Acronym: Cell - Cell Contents, Dis - Disinfection, Down - Downstream, Eff - Final Effluent, PBy - Primary Bypass, Raw - Raw Sewage, Scky - Secondary Bypass, Up - Upstream, Well - Monitoring Well, Aer - Aeration, Bts - Biosolids thickening, Bpd - Biosolids primary digestion, Bsd - Biosolids sec. digestion, Bps - Biosolids pd super, Bss - Biosolids sec super, Bsq - Biosolids sludge quality Bsq - Biosolids soil quality DAF - Dissolved Air Flotation, Cht - Primary Treatment, PRT - Primary Effluent, RAS - Return Activated Sludge, SSR - Secondary Treatment/SSRs, SCEI - Secondary Effluent, TWS - Thickened Waste Activated Sludge, WAS - Waste Activated Sludge, IndW - Industrial Wastewater, Psh - Pump Sln, Sept - Septage, Lcht - Leachate, PTr - Primary Treatment, RadV - Re-aeration, Tert - Tertiary Treatment, Ato - Afloat, Teby - Tertiary Bypass, Hold - Holding Tank, CSO - Combined Sewer Overflow, SSO - Sanitary Sewer Overflow

Pure Water P IN : 605536435262 R 9:30 U

Revision # 6 Revised: 2017.11.21

Waterworks/Project # **1418S**
 Facility Name **Mini Lakes WWTP**
 Org. # **1418**
 Date Rec'd: Time Rec'd: Initials:
 Attached Parameter List No Yes
 Temperature Upon Receipt 13x3 °C

Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment

Requested Turnaround Time: App. Req'd 24-48 h 5-7d 7-10d Other Specify: _____

Data Transfer Contact: Don Irvine
 136 Main St. E
 Shelburne, ON
 L9V 3K5
 Telephone: 519-321-9474
 Fax: 519-925-0322
 Email: d Irvine@ocwa.com

Data Transfer Contact: Don Irvine
 136 Main St. E
 Shelburne, ON
 L9V 3K5
 Telephone: 519-321-9474
 Fax: 519-925-0322
 Email: d Irvine@ocwa.com

Invoice To: Ontario Clean Water Agency
 136 Main St. E
 Shelburne, ON
 L9V 3K5
 Telephone: 519-925-1938
 Fax: 519-925-0322
 Email: apwesthighlands@ocwa.com

Laboratory: SGS Lakefield Research Ltd
 185 Concession St.
 Lakefield, ON
 K0L 2H0
 Telephone: 705-652-2000
 Fax: 705-652-6365
 Email: carrie.greenlaw@sgs.com

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	# of Bottles	CI Residual			Parameters								Comments	Upload to MOE	Upload to OCWA
					Field Total (mg/L)	Field Free (mg/L)	Combined (mg/L)	Total Suspended Solids	Phosphorous	Total Ammonia Nitrogen (TAN)	Nitrate-Nitrogen	Nitrite-Nitrogen	TKN	D.O.	pH			
Eff	Eff	Final Effluent (Grab)	25/06/18 0955	3				X	X	X	X	X	X	X	X	Yes	Yes	
Eff	Eff	Final Effluent (Grab)	0955	1												Yes	Yes	
																Yes	Yes	
																Yes	Yes	
																Yes	Yes	
																Yes	Yes	
																Yes	Yes	
																Yes	Yes	

Station Acronym: Cell - Cell Contents, Dis - Disinfection, Down - Downstream, Eff - Final Effluent, Priby - Primary Bypass, Raw - Raw Sewage, ScBy - Secondary Bypass, Upz - Upstream, Well - Monitoring Well, Aer - Aeration, Bris - Biosolids raw sludge, Bth - Biosolids thickening, Bpd - Biosolids primary digestion, Bsd - Biosolids sec. digestion, Bps - Biosolids pfi super, Bss - Biosolids sec super, Bsq - Biosolids sludge quality, Bsoq - Biosolids soil quality, DAF - Dissolved Air Flootation, Grit - Primary Treatment/Grit, PrEF - Primary Effluent, RAS - Return Activated Sludge, SBR - Secondary Treatment/SBRs, Scef - Secondary Effluent, TWAS - Thickened Waste Activated Sludge, WAS - Waste Activated Sludge, IndW - Industrial Wastewater, PStn - Pump Stn, Sept - Septage, Lcht - Leachate, PrTI - Primary Treatment, ReAr - Re-aeration, Tert - Tertiary Treatment, Affo - Acififo, TeBy - Tertiary Bypass, Hold - Holding Tank, CSO - Combined Sewer Overflow, SSO - Sanitary Sewer Overflow

Sampler Name: Jesse Thomas Sampler Signature: Jesse Thomas

PIN: 605 536 421 601 Return 10:00 89



SGS Canada Inc.

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

OCWA-Mini Lakes RBC WWTP

Attn : Don Irvine

136 Main St., E.
Shelburne, ON
L9V 3K5, Canada

Phone: 519-925-1938 ext. 225
Fax:

Works #: 1418S
Project : PO#017844

20-June-2018

Date Rec. : 07 June 2018
LR Report: CA12203-JUN18

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Hold Hld1-SW1-Upgradi ent Background	6: Hold Hld3-SW3-Within Main Pond	7: Hold Hld4-Outlet From Main Pond	8: Hold Hld5-Upgradieint Tributaries At conty Rd No. 34	9: Hold Hld6-SW6-Outlet From Property
Sample Date & Time					06-Jun-18 11:00	06-Jun-18 11:15	06-Jun-18 11:20	06-Jun-18 11:45	06-Jun-18 11:30
Temperature Upon Receipt [°C]	---	---	---	---	10.0	10.0	10.0	10.0	10.0
Field Temperature [celcius]					14.9	17.9	17.8	12.9	17.9
Field pH [no unit]					7.70	7.88	7.99	8.04	8.00
Phosphorus (total) [mg/L]	08-Jun-18	18:00	12-Jun-18	12:21	0.05	< 0.03	0.05	0.06	0.05
Total Kjeldahl Nitrogen [as N mg/L]	11-Jun-18	20:42	13-Jun-18	14:48	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ammonia+Ammonium (N) [mg/L]	08-Jun-18	20:14	13-Jun-18	16:12	0.1	< 0.1	< 0.1	0.2	0.2
Nitrite (as N) [mg/L]	13-Jun-18	18:54	19-Jun-18	16:18	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	13-Jun-18	18:54	19-Jun-18	16:18	< 0.06	0.22	0.21	0.45	< 0.06
Nitrate + Nitrite (as N) [mg/L]	13-Jun-18	18:54	19-Jun-18	16:18	<0.06	0.22	0.21	0.45	< 0.06
E. Coli [cfu/100mL]	07-Jun-18	17:35	11-Jun-18	09:43	22	24	36	42	34



SGS Canada Inc.

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

Works #: 1418S
Project : PO#017844
LR Report : CA12203-JUN18

Carrie Greenlaw
Carrie Greenlaw
Project Specialist
Environmental Services, Analytical



SGS Canada Inc.

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

OCWA-Mini Lakes RBC WWTP

Attn : Don Irvine

136 Main St., E.
Shelburne, ON
L9V 3K5, Canada

Phone: 519-925-1938 ext. 225

Fax:

Works #: 1418S
Project : PO#017844

20-June-2018

Date Rec. : 07 June 2018
LR Report: CA13249-JUN18

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	10: Well We7-Monitoring Well #7 (MW-7)	11: Well We8-Monitoring Well #8 (MW-8)	12: Well We9-Monitoring Well #9 (MW-9)	13: Well We10-Monitoring Well #10 (MW-10)
Sample Date & Time					06-Jun-18 09:40	06-Jun-18 09:30	06-Jun-18 09:10	06-Jun-18 08:35
Temperature Upon Receipt [°C]	---	---	---	---	13.0	13.0	13.0	13.0
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	07-Jun-18	19:27	14-Jun-18	14:30	< 4	< 4	< 4	< 4
Dissolved Oxygen [mg/L]	07-Jun-18	15:44	11-Jun-18	22:24	9.0	8.0	7.9	8.6
Total Suspended Solids [mg/L]	11-Jun-18	06:16	20-Jun-18	15:49	2	2	11	48
Phosphorus (total) [mg/L]	08-Jun-18	20:00	13-Jun-18	09:17	< 0.03	0.04	0.07	< 0.03
Total Kjeldahl Nitrogen [as N mg/L]	11-Jun-18	20:42	13-Jun-18	14:58	< 0.5	1.4	2.3	< 0.5
Ammonia+Ammonium (N) [mg/L]	11-Jun-18	18:00	14-Jun-18	08:59	0.2	1.7	1.4	< 0.1
Nitrite (as N) [mg/L]	13-Jun-18	18:54	19-Jun-18	16:18	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	13-Jun-18	18:54	19-Jun-18	16:18	< 0.06	< 0.06	< 0.06	< 0.06
Nitrate + Nitrite (as N) [mg/L]	13-Jun-18	18:54	19-Jun-18	16:18	< 0.06	< 0.06	< 0.06	< 0.06
Dissolved Organic Carbon [mg/L]	11-Jun-18	20:00	14-Jun-18	11:53	2	6	11	2
E. Coli [cfu/100mL]	07-Jun-18	16:00	11-Jun-18	09:16	< 2	< 2	3040	< 2



SGS Canada Inc.

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

Works #: 1418S
Project : PO#017844
LR Report : CA13249-JUN18

Carrie Greenlaw
Project Specialist
Environmental Services, Analytical



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

Works #: 1418S
Project : PO#017844

05-July-2018

OCWA-Mini Lakes RBC WWTP

Attn : Don Irvine

Date Rec. : 26 June 2018
LR Report: CA13682-JUN18

136 Main St., E.
 Shelburne, ON
 L9V 3K5, Canada

Copy: #1

Phone: 519-925-1938 ext. 225
 Fax:

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Eff Eff-Final Effluent
Sample Date & Time					25-Jun-18 09:55
Temperature Upon Receipt [°C]	---	---	---	---	13.0
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	26-Jun-18	16:51	03-Jul-18	10:27	26
Dissolved Oxygen [mg/L]	26-Jun-18	14:22	26-Jun-18	15:54	8.1
Total Suspended Solids [mg/L]	26-Jun-18	21:23	28-Jun-18	13:25	20
pH [no unit]	26-Jun-18	15:23	27-Jun-18	14:33	7.42
Phosphorus (total) [mg/L]	26-Jun-18	20:13	30-Jun-18	08:48	0.28
Total Kjeldahl Nitrogen [as N mg/L]	26-Jun-18	19:18	28-Jun-18	12:38	5.1
Ammonia+Ammonium (N) [mg/L]	26-Jun-18	19:16	29-Jun-18	09:04	1.7
Nitrite (as N) [mg/L]	29-Jun-18	12:00	05-Jul-18	14:49	0.88
Nitrate (as N) [mg/L]	29-Jun-18	12:00	05-Jul-18	14:49	7.87
Nitrate + Nitrite (as N) [mg/L]	29-Jun-18	12:00	05-Jul-18	14:49	8.75
E. Coli [cfu/100mL]	26-Jun-18	18:05	28-Jun-18	10:56	4200


 Carrie Greenlaw
 Project Specialist
 Environmental Services, Analytical



Waterworks/Project # **1418S** C of C LIMS No: **JUL 13546**

Facility Name **Mini Lakes WWTP** Laboratory Section **JUL 25 2018** Sample condition upon receipt

Org. # **1418** Date Recd: **JUL 25 2018** Time Recd: _____ Initials **tm**

Quote # _____ Attached Parameter List No Yes Temperature Upon Receipt **11x3** °C

Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment

Requested Turnaround Time: App. Req'd 24-48 h 5-7d 7-10d Other Specify: _____

Data Transfer Contact: Don Irvine

Address: 136 Main St. E, Shelburne, ON L9V 3K5

Telephone: 519-321-9474

Fax: 519-925-0322

Email: d Irvine@ocwa.com

Invoice To: Ontario Clean Water Agency, 136 Main St. E, Shelburne, ON L9V 3K5

Telephone: 519-321-9474

Fax: 519-925-0322

Email: gdwest@highlands@ocwa.com

Laboratory: SGS Lakeland Research Ltd, 185 Concession St., Lakeland, ON K0L 2H0

Telephone: 705-652-2000

Fax: 705-652-6365

Email: carrie.greenlaw@sgs.com

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	# of Bottles	CI Residual			Parameters					Comments	Upload to MOE	Upload to OCWA	
					Field Total (mg/L)	Field Free (mg/L)	Combined (mg/L)	CBOD ₅	Total Suspended Solids	Total Phosphorous	Total Ammonia Nitrogen (TAN)	Nitrate-Nitrogen				Nitrite-Nitrogen
Eff	Eff	Final Effluent (Grab)	0835	3				X	X	X	X	X	X		Yes <input checked="" type="checkbox"/>	Yes <input checked="" type="checkbox"/>
Eff	Eff	Final Effluent (Grab)	0835	1											Yes <input checked="" type="checkbox"/>	Yes <input checked="" type="checkbox"/>
															Yes <input type="checkbox"/>	Yes <input type="checkbox"/>
															Yes <input type="checkbox"/>	Yes <input type="checkbox"/>
															Yes <input type="checkbox"/>	Yes <input type="checkbox"/>
															Yes <input type="checkbox"/>	Yes <input type="checkbox"/>
															Yes <input type="checkbox"/>	Yes <input type="checkbox"/>
															Yes <input type="checkbox"/>	Yes <input type="checkbox"/>
															Yes <input type="checkbox"/>	Yes <input type="checkbox"/>
															Yes <input type="checkbox"/>	Yes <input type="checkbox"/>

Sampler Name: _____

Sampler Signature: *Sesse Thomas*

Sampler Signature: *Gene Rowms*

Station Acronym: Cell - Cell Contents, Dis - Disinfection, Down - Downstream, Eff - Final Effluent, PkBy - Primary Bypass, Raw - Raw Sewage, ScBy - Secondary Bypass, Up - Upstream, Mon - Monitoring Well, Aer - Aeration, Bs - Biosolids raw sludge, Bth - Biosolids thickening, Bpd - Biosolids primary digestion, Bsd - Biosolids sec. digestion, Bps - Biosolids pri super, Bss - Biosolids sec super, Bsq - Biosolids soil quality, DAF - Dissolved Air Flotation, Crt - Primary Treatment/Crt, PkE1 - Primary Effluent, RAS - Return Activated Sludge, SBR - Secondary Treatment/SBRs, ScE1 - Secondary Effluent, TMS - Thickened Waste Activated Sludge, WAS - Waste Activated Sludge, IndW - Industrial Wastewater, PSm - Pump Sln, Sep - Septage, LcH - Leachate, PTT - Primary Treatment, ReA - Re-aeration, Tert - Tertiary Treatment, Alb - Aciflu, TeBy - Tertiary Bypass, Hold - Holding Tank, CSO - Combined Sewer Overflow, SSO - Sanitary Sewer Overflow

Revision # 7

Revised: 2018.01.29

PIN: 605608275711

605608275711

Rtn a 9130



Waterworks/Project #	1418S	C of C LIMS No:	AUG 12934
Facility Name	Mini Lakes WWTP	Laboratory Section	
Org. #	1418	Date Recd:	AUG 28 2018
Quote #		Temperature Upon Receipt	16.83 °C
Attached Parameter List	<input type="checkbox"/> No <input type="checkbox"/> Yes	Sample condition upon receipt	
Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment			

Requested Turnaround Time: App. Req'd 24-48 h 5-7d 7-10d Other Specify: _____

Address:	Data Transfer Contact: Don Irvine	136 Main St. E Shelburne, ON L9V 3K5	Data Transfer Contact: Don Irvine	136 Main St. E Shelburne, ON L9V 3K5	Invoice To: Ontario Clean Water Agency	136 Main St. E Shelburne, ON L9V 3K5	Laboratory: SGS Lakeland Research Ltd	185 Concession St. Lakeland, ON K0L 2H0
Telephone:	519-321-9474	519-321-9474	519-321-9474	(519) 925-1938	(519) 925-0322	705-652-2000	705-652-2000	705-652-6365
Fax:	519-925-0322	519-925-0322	519-925-0322	(519) 925-0322		705-652-6365		
Email:	dinvine@ocwa.com	dinvine@ocwa.com	dinvine@ocwa.com	apvesthighlands@ocwa.com		carrie.greenlaw@sgs.com		

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	# of Bottles	CI Residual			Parameters					Comments	Upload to MOE	Upload to OCWA		
					Field Total (mg/L)	Field Free (mg/L)	Combined (mg/L)	CBOD ₅	Total Suspended Solids	Total Phosphorous	Total Ammonia Nitrogen (TAN)	Nitrate-Nitrogen				Nitrite-Nitrogen	TKN
Eff	Eff	Final Effluent (Grab)	August 18/18	3	---	---	---	X	X	X	X	X	X	X	X	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Eff	Eff	Final Effluent (Grab)	10/15	1	---	---	---	X	X	X	X	X	X	X	X	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
																Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>

Sampler Name: Jesse Thomas
 Sampler Signature: *Jesse Thomas*

* Station Acronym: Cell - Cell Contents, Dis - Disinfection, Down - Downstream, Eff - Final Effluent, PBY - Primary Bypass, Raw - Raw Sewage, ScBy - Secondary Bypass, Up - Upstream, Well - Monitoring Well, Aer - Aeration, Bns - Biosolids raw sludge, Bin - Biosolids thickening, Bod - Biosolids primary digestion, Bsd - Biosolids sec. digestion, Bos - Biosolids opt. super, Bas - Biosolids soil quality, Baso - Biosolids soil quality, Bsdn - Dissolved Air Flotation, Gfl - Primary Treatment, Gflr - Primary Effluent, RAS - Return Activated Sludge, SBR - Secondary Treatment/SBRs, SGEF - Secondary Effluent, TWAS - Thickened Waste Activated Sludge, WAS - Waste Activated Sludge, IndWV - Industrial Wastewater, Psn - Pump Sln, Sept - Septage, Lch - Leachate, PTr - Primary Treatment, ReA - Re-aeration, Tert - Tertiary Treatment, Alp - Aclillo, TeBy - Tertiary Bypass, Hold - Holding Tank, CSO - Combined Sewer Overflow, SSO - Sanitary Sewer Overflow

Revision # 7
 PIN# 605937346357
 CA 9:30 Rtn.
 Revised: 2018.01.29

Waterworks/Project # **1418S** C of C LIMS No: **Spt 12528**

Facility Name **Mini Lakes WWTP** Laboratory Section _____ Sample condition upon receipt _____

Org. # **1418** Date Rec'd: **SEP 13 2018** Time Rec'd: _____ Initials _____

Quote # _____ Attached Parameter List No Yes Temperature Upon Receipt **12 x 3** °C

Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment

Requested Turnaround Time: _____ App. Req'd _____ 24-48 h _____ 5-7d _____ 7-10d _____ Other _____ Specify: _____

Data Transfer Contact: Don Irvine
 136 Main St. E
 Shelburne, ON
 L9V 3K5
 (519) 321-9474
 (519) 925-0322
 dirvine@ocwa.com

Invoice To: Ontario Clean Water Agency
 185 Concession St.
 Lakefield, ON
 K0L 2H0
 (519) 925-1938
 (519) 925-0322
 apwesthighlands@ocwa.com

Laboratory: SGS Lakefield Research Ltd

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	# of Bottles	CI Residual			Parameters							Comments	Upload to MOE	Upload to OCWA		
					Field Total (mg/L)	Field Free (mg/L)	Combined (mg/L)	CBOD5	Total Solids	Total Phosphorous	Total Ammonia Nitrogen (TAN)	Nitrate-Nitrogen	Nitrite-Nitrogen	TKN				Dissolved Organic Carbon	E.Coli
Well	Well1	Monitoring Well #1 (MW-1)	12/09/18 1030	3				X	X	X	X	X	X	X	X	X	Static depth	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	Well2	Monitoring Well #2 (MW-2)	0840	3				X	X	X	X	X	X	X	X	X	Well Depth = 2.60 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	Well4	Monitoring Well #4 (MW-4)	0850	3				X	X	X	X	X	X	X	X	X	Well Depth = 2.35 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	Well5	Monitoring Well #5 (MW-5)	1000	3				X	X	X	X	X	X	X	X	X	Well Depth = 2.18 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	Well6	Monitoring Well #6 (MW-6)	0950	3				X	X	X	X	X	X	X	X	X	Well Depth = 2.23 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	Well7	Monitoring Well #7 (MW-7)	1010	3				X	X	X	X	X	X	X	X	X	Well Depth = 1.98 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	Well8	Monitoring Well #8 (MW-8)	1020	3				X	X	X	X	X	X	X	X	X	Well Depth = 1.88 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	Well9	Monitoring Well #9 (MW-9)	1055	3				X	X	X	X	X	X	X	X	X	Well Depth = 1.30 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	Well10	Monitoring Well #10 (MW-10)	0905	3				X	X	X	X	X	X	X	X	X	Well Depth = 3.03 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Sampler Name: _____ Sampler Signature: *Jesse Thomas*

* Station Acronym: Cell - Cell Contents, Dis - Disinfection, Down - Downstream, Eff - Final Effluent, PBEy - Primary Bypass, Raw - Raw Sewage, SCSy - Secondary Bypass, Up - Upstream, Well - Monitoring Well, Aer - Aeration, Bs - Biosolids raw sludge, Bth - Biosolids thickening, Bpd - Biosolids primary digestion, Bsd - Biosolids sec. digestion, Bps - Biosolids pri super, Bqs - Biosolids sec super, Bsq - Biosolids sludge quality Bsq, Bst - Biosolids soil, Bt - Thickened Waste Activated Sludge, WAS - Thickened Waste Activated Sludge, indW - Industrial Wastewater, PSm - Pump Stn, Sept - Septage, Lcft - Leachate, PTr - Primary Treatment, ReAr - Re-aeration, Tert - Tertiary Treatment, Alo - Aciflo, TeBy - Tertiary Bypass, Hold - Holding Tank

CSO - Combined Sewer Overflow, SSO - Sanitary Sewer Overflow

Revision # 6

PIN # 605751027026

Revision: 2017.11.21

Waterworks/Project # **1418S**
 Facility Name **Mini Lakes WWTP**
 Org. # **1418**
 Date Rec'd: _____ Time Rec'd: _____ Initials: _____
 Attached Parameter List No Yes
 Temperature Upon Receipt _____ °C
 Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment

Requested Turnaround Time: _____
 App. Req'd 24-48 h 5-7d 7-10d Other _____ Specify: _____
 Laboratory Section _____ Sample condition upon receipt _____
 Invoice To: Ontario Clean Water Agency
 Laboratory: SGS Lakefield Research Ltd
 136 Main St. E
 Shelburne, ON
 L9V 3K5
 (519) 925-1938
 (519) 925-0322
 apwesthighlands@ocwa.com
 garrie.greenlaw@sgs.com

Station Acronym	Sample Location Name	Date & Time Collected	# of Bottles	CI Residual		CBOD5	Total Suspended Solids	Total Phosphorus	Total Ammonia Nitrogen (TAN)	Nitrate-Nitrogen	Nitrite-Nitrogen	TKN	Dissolved Organic Carbon	E. Coll	Comments	Upload to MOE	Upload to OCWA
				Field Total (mg/L)	Field Free (mg/L)												
We11	Monitoring Well #11 (MW-11)	12/09/18 0930	3			X	X	X	X	X	X	X	X	X	Static depth Well Depth = 1.08 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
We12	Monitoring Well #12 (MW-12)	0920	3			X	X	X	X	X	X	X	X	X	Well Depth = 1.10 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Station Name: _____
 Date: _____
 Sampler Signature: *Jesse Thomas*
 Station Acronym: _____

* Station Acronym: Cell - Cell Contents, Dis - Disinfection, Down - Downstream, Eff - Final Effluent, PBy - Primary Bypass, Raw - Raw Sewage, SBy - Secondary Bypass, Up - Upstream, Well - Monitoring Well, Aer - Aeration, Bns - Biosolids-raw sludge, Bth - Biosolids thickening, Bpd - Biosolids primary digestion, Bsd - Biosolids sec. digestion, Bps - Biosolids pri super, Bss - Biosolids sec super, Bsq - Biosolids sludge quality, Bsoq - Biosolids soil quality, DAF - Dissolved Air-Flotation, Grit - Primary Treatment/Grit, Pref - Primary Effluent, PAS - Return Activated Sludge, SBR - Secondary Treatment/SBRs, SdEF - Secondary Effluent, TWAS - Thickened Waste Activated Sludge, WAS - Waste Activated Sludge, IndW - Industrial Wastewater, PSIn - Pump SIn, Sept - Septage, Lcht - Leachate, RTtr - Primary Treatment, ReAr - Re-aeration, Tert - Tertiary Treatment, Ato - Actifo, TeBy - Tertiary Bypass, Hold - Holding Tank, CSO - Combined Sewer Overflow, SSO - Sanitary Sewer Overflow

Ontario Clean Water Agency - Request for Laboratory Services and CHAIN OF CUSTODY - SEWAGE (MONTHLY)

Waterworks/Project # **1418S** C of C LIMS No: **SEP 13327**

Facility Name **Mini Lakes WWTP** Laboratory Section _____ Sample condition upon receipt _____

Org. # **1418** Date Rec'd: **SEP 20 7:13 AM** Time Rec'd: _____ Initials _____

Quote # _____ Attached Parameter List No Yes Temperature Upon Receipt **15.73** °C

Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment

Requested Turnaround Time: _____

App. Req'd 24-48 h 5-7d 7-10d Other _____ Specify: _____

Data Transfer Contact: Don Irvine
 136 Main St. E
 Shelburne, ON
 L9V 3K5
 (519) 925-1938
 (519) 925-0322
d Irvine@ocwa.com

Invoice To: Ontario Clean Water Agency
 185 Concession St.
 Lakefield, ON
 K0L 2H0
 705-652-2000
 705-652-6365
carrie.greenlaw@sgs.com

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	# of Bottles	CI Residual		Total Suspended Solids	Total Phosphorous	Total Ammonia Nitrogen (TAN)	Nitrate-Nitrogen	Nitrite-Nitrogen	TKN	D.O.	pH	E. Coli	Comments	Upload to MOE	Upload to OCWA
					Field Total (mg/L)	Field Free (mg/L)												
Eff	Eff	Final Effluent (Grab)	Sept 19/18 0905	3			X	X	X	X	X	X	X	X			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Eff	Eff	Final Effluent (Grab)	0905	1													Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Sampler Name: Jesse Thomas Sampler Signature: Jesse Thomas

* Station Acronym: Cell - Cell Contents, Dis - Disinfection, Down - Downstream, Eff - Final Effluent, PrBy - Primary Bypass, Raw - Raw Sewage, ScBy - Secondary Bypass, Up - Upstream, Well - Monitoring Well, Aer - Aeration, Bra - Biosolids raw sludge, Bth - Biosolids thickening, Bpd - Biosolids primary digestion, Bsd - Biosolids sec. digestion, Bps - Biosolids pri super, Bss - Biosolids sec super, Bslg - Biosolids sludge quality, Bsoq - Biosolids soil quality, DAF - Dissolved Air Flotation, Grit - Primary Treatment/Grit, PRE1 - Primary Effluent, RAS - Return Activated Sludge, SBR - Secondary Treatment/SBRs, ScEF - Secondary Effluent, TMAAS - Thickened Waste Activated Sludge, WAS - Waste Activated Sludge, IndWV - Industrial Wastewater, PStn - Pump Stn, Sept - Septage, Lcht - Leachate, PRT1 - Primary Treatment, ReAr - Re-aeration, Tert - Tertiary Treatment, Allo - Aciflo, TeBy - Tertiary Bypass, Hold - Holding Tank, CSO - Combined Sewer Overflow, SSO - Sanitary Sewer Overflow

Revised: 2018.01.29 Revision # 7

PIN: 605999 837665 PH 10:00 RTN

Waterworks/Project # **1418S** C of C LIMS No: 09 12023

Facility Name **Mini Lakes WWTP** Laboratory Section _____

Org. # **1418** Date Rec'd: 10/10/18 Sample condition upon receipt _____

Quote # _____ Time Rec'd: _____ Initials TM

Attached Parameter List No Yes Temperature Upon Receipt 15x3 °C

Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment

Requested Turnaround Time: App. Req'd 24-48 h 5-7d 7-10d Other Specify: _____

Data Transfer Contact: Don Irvine
 Address: 136 Main St. E, Shelburne, ON L9V 3K5
 Telephone: 519-321-9474
 Fax: 519-925-0322
 Email: d Irvine@ocwa.com

Data Transfer Contact: Don Irvine
 Invoice To: Ontario Clean Water Agency
 136 Main St. E, Shelburne, ON L9V 3K5
 (519) 925-1938
 (519) 925-0322
apwesthighlands@ocwa.com

Laboratory: SGS Lakerfield Research Ltd
 185 Concession St. Lakerfield, ON K0L 2H0
 705-652-2000
 705-652-6365
carrie.greenlaw@sgs.com

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	# of Bottles	CI Residual		Parameters								Comments	Upload		
					Field Total (mg/L)	Field Free (mg/L)	Combined (mg/L)	CBOD ₅	Total Suspended Solids	Total Phosphorous	Total Ammonia Nitrogen (TAN)	Nitrate-Nitrogen	Nitrite-Nitrogen	TKN		D.O.	pH	E.Coli
Eff	Eff	Final Effluent (Grab)	Oct 27/18	3				X	X	X	X	X	X	X			Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Eff	Eff	Final Effluent (Grab)	1205	1													Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
			1205														Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>

* PFI DO on unopened CBOD bottle.

Sampler Name: Jesse Thomas Sampler Signature: Jesse Thomas

* Station Acronym: Call - Call Contents, Dis - Distinction, Down - Downstream, Eff - Final Effluent, Fby - Primary Bypass, Raw - Raw Sewage, Scby - Secondary Bypass, Up - Upstream, Well - Monitoring Well, Aer - Aeration, Bts - Biosolids raw sludge, Bth - Biosolids thickening, Bpd - Biosolids primary digestion, Bsd - Biosolids sec. digestion, Bps - Biosolids pri super, Bss - Biosolids sec super, Bstq - Biosolids sludge quality, Bsq - Biosolids soil quality, DAF - Dissolved Air Flotation, Gnt - Primary Treatment, Gnt, PFI - Primary Effluent, RAS - Return Activated Sludge, SBR - Secondary Treatment, SRS, SGEF - Secondary Effluent, TVAS - Thickened Waste Activated Sludge, WAS - Waste Activated Sludge, IndW - Industrial Wastewater, Psh - Pump Sln, Sept - Septage, Lcht - Leachate, PTr - Primary Treatment, Redt - Reseration, Ten - Tertiary Treatment, Alf - Acltic, Tdy - Tertiary Bypass, Hold - Holding Tank, CSO - Combined Sewer Overflow, SSO - Sanitary Sewer Overflow

Revision # 7
 PIN 606063296309
 S R-TN (SS)



Waterworks/Project # **1418S** C of C LIMS No: **OCF 10510**

Facility Name **Mini Lakes WWTP** Laboratory Section **OCF 19/18** Sample condition upon receipt

Org. # **1418** Date Rec'd: **Oct 19/18** Time Rec'd: **13:33** Initials **gpc**

Quote # No Yes Temperature Upon Receipt **13.33** °C

Attached Parameter List No Yes

Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment

Requested Turnaround Time: 24-48 h 5-7d 7-10d Other Specify: _____

Data Transfer Contact: Don Irvine | Data Transfer Contact: Don Irvine | Invoice To: Ontario Clean Water Agency | Laboratory: SGS Lakeland Research Ltd

Address: 136 Main St. E | 136 Main St. E | 136 Main St. E | 185 Concession St. |
Shelburne, ON | Shelburne, ON | Shelburne, ON | Lakeland, ON

Telephone: 519-321-9474 | 519-321-9474 | (519) 925-1938 | 705-652-2000 |
L9V 3K5 | L9V 3K5 | (519) 925-0322 | 705-652-6365 |

Fax: 519-925-0322 | 519-925-0322 | (519) 925-0322 | 705-652-6365 |

Email: d Irvine@ocwa.com | d Irvine@ocwa.com | apvishighlands@ocwa.com | samir.greenlaw@sgs.com

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	# of Bottles	CI Residual			Parameters							Comments	Upload to MOE	Upload to OCWA	
					Field Total (mg/L)	Field Free (mg/L)	Combined (mg/L)	CBOD ₅	Total Suspended Solids	Total Phosphorous	Total Ammonia Nitrogen (TAN)	Nitrate-Nitrogen	Nitrite-Nitrogen	TKN				D.O.
Eff	Eff	Final Effluent (Grab)	October 18/2018	3				X	X	X	X	X	X	X	X		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Eff	Eff	Final Effluent (Grab)	1310	1											X		Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>
																	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>
																	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>

Sampler Name: **Jesse Thomas** | Sampler Signature: *Jesse Thomas*

* Station Acronym: Call - Cell Contents, Dis - Disinfection, Down - Downstream, Eff - Final Effluent, P/BY - Primary Bypass, Raw - Raw Sewage, S/By - Secondary Bypass, Up - Upstream, Well - Monitoring Well, Aer - Aeration, Bns - Biosolids-sludge, Bth - Biosolids thickening, Bnd - Biosolids primary digestion, Bsd - Biosolids see digestion, Bps - Biosolids not super, Bsq - Biosolids see super, Bsqg - Biosolids sludge quality, DAF - Dissolved Air Flotation, Gnt - Primary Treatment, P/ET - Primary Effluent, RAS - Return Activated Sludge, SBR - Secondary Treatment/SBR, SclF - Secondary Effluent, T/WAS - Thickened Waste Activated Sludge, WAS - Waste Activated Sludge, IndW - Industrial Wastewater, P/Sin - Pump Sin, Stp - Septage, Lcht - Leachate, P/Tr - Primary Treatment, ReAr - Re-aeration, Tert - Tertiary Treatment, Ato - Aotifo, T/By - Tertiary Bypass, Hold - Holding Tank, CSO - Combined Sewer Overflow, SSO - Sanitary Sewer Overflow

Revision # 7

PIN 606 030 263 093

RFI

OCWA

Revised: 2018.01.29



SGS Canada Inc.

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

Works #: 1418S
Project : PO#017844

16-October-2018

OCWA-Mini Lakes RBC WWTP

Attn : Don Irvine

Date Rec. : 10 October 2018
LR Report: CA12223-OCT18

136 Main St., E.
Shelburne, ON
L9V 3K5, Canada

Copy: #1

Phone: 519-925-1938 ext. 225
Fax:

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Eff Eff-Final Effluent
Sample Date & Time					09-Oct-18 12:05
Temperature Upon Receipt [°C]	---	---	---	---	15.0
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	10-Oct-18	16:44	15-Oct-18	16:17	27
Dissolved Oxygen [mg/L]	10-Oct-18	14:10	13-Oct-18	20:31	3.6
Total Suspended Solids [mg/L]	11-Oct-18	06:20	13-Oct-18	21:43	24
pH [no unit]	10-Oct-18	15:25	11-Oct-18	15:33	7.43
Phosphorus (total) [mg/L]	10-Oct-18	12:00	12-Oct-18	10:51	0.19
Total Kjeldahl Nitrogen [as N mg/L]	10-Oct-18	18:30	12-Oct-18	16:42	2.1
Ammonia+Ammonium (N) [as N mg/L]	12-Oct-18	17:00	16-Oct-18	13:32	1.1
Nitrite (as N) [mg/L]	12-Oct-18	18:44	15-Oct-18	11:16	1.41
Nitrate (as N) [mg/L]	12-Oct-18	18:44	15-Oct-18	11:16	7.86
Nitrate + Nitrite (as N) [mg/L]	12-Oct-18	18:44	15-Oct-18	11:16	9.27
E. Coli [cfu/100mL]	11-Oct-18	08:45	15-Oct-18	12:03	NDOGEC
E. Coli [cfu/100mL]	12-Oct-18	09:05	15-Oct-18	12:08	77000 UAL

NDOGEC - No Data: Overgrown with E. coli - was re-analysed after the recommended holding time of 48 hours - UAL - Unreliable: Sample Age Exceeds Normal Limit


Carrie Greenlaw
Project Specialist
Environmental Services, Analytical



SGS Canada Inc.

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

Works #: 1418S
Project : PO#017844

22-October-2018

OCWA-Mini Lakes RBC WWTP

Attn : Don Irvine

Date Rec. : 19 October 2018
LR Report: CA12510-OCT18

136 Main St., E.
Shelburne, ON
L9V 3K5, Canada

Copy: #1

Phone: 519-925-1938 ext. 225
Fax:

CERTIFICATE OF ANALYSIS

Final Report

Sample ID	Sample Date & Time	Temperature Upon Receipt °C	E. Coli cfu/100mL
1: Analysis Start Date		---	19-Oct-18
2: Analysis Start Time		---	15:50
3: Analysis Completed Date		---	22-Oct-18
4: Analysis Completed Time		---	09:25
5: Eff Eff-Final Effluent (Grab)	18-Oct-18 13:10	13.0	26000

Carrie Greenlaw
Project Specialist
Environmental Services, Analytical

Ontario Clean Water Agency - Request for Laboratory Services and CHAIN OF CUSTODY - SEWAGE (MONTHLY)

Waterworks/Project # **1418S** C of C LIMS No: **NOV 1218S**
 Facility Name **Mini Lakes WWTP** Laboratory Section **NOV 06 2018** Sample condition upon receipt _____
 Org. # **1418** Date Rec'd: _____ Time Rec'd: _____ Initials _____
 Quota # _____ Attached Parameter List No Yes Temperature Upon Receipt **15x3** °C
 Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment

Requested Turnaround Time: 24-48 h 5-7d 7-10d Other _____ Specify: _____
 **Lab App.

Data Transfer Contact: Don Irvine
 136 Main St. E
 Shelburne, ON
 L9V 3K5
 (519) 321-9474
 (519) 925-0322
 divine@ocwa.com

Data Transfer Contact: Don Irvine
 185 Concession St.
 Lakefield, ON
 K0L 2H0
 (705) 652-2000
 (705) 652-6365
 cattle@leenhaw@sgs.com

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	# of Bottles	Field Total (mg/L)	Field Free (mg/L)	Combined (mg/L)	CBOD ₅	Total Suspended	Total Phosphorous	Total Ammonia Nitrogen (TAN)	Nitrate-Nitrogen	Nitrite-Nitrogen	TKN	D.O.	pH	E. Coll	Alkalinity	Comments	Upload to MOE	Upload to OCWA
Eff	-	Final Effluent (Grab)	Nov 5/18	3				X	X	X	X	X	X	X	X	X				Yes	Yes
Eff	-	Final Effluent (Grab)	1105	1				X	X	X	X	X	X	X	X					Yes	Yes
Raw	-	Primary Clarifier (Grab)	1115	3				X	X	X	X	X	X	X						Yes	Yes
* PUT TO USE																					
1-EC																					
PUT TO USE																					

Sampler Name: **Jesse Thomas** Signature: *Jesse Thomas*

Revision # 7

PIN 606 074 786 930

RTN 10:00 NM

Reviewed: 2015.01.29



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

Works #: 1418S
Project : PO#017844

14-November-2018

OCWA-Mini Lakes RBC WWTP

Attn : Don Irvine

Date Rec. : 06 November 2018
LR Report: CA12185-NOV18

136 Main St., E.
Shelburne, ON
L9V 3K5, Canada

Copy: #1

Phone: 519-925-1938 ext. 225
Fax:

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Eff Eff-Final Effluent (GRAB)	6: Raw Raw-Primary Clairifer (GRAB)
Sample Date & Time					05-Nov-18 11:05	05-Nov-18 11:15
Temperature Upon Receipt [°C]	---	---	---	---	15.0	15.0
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	06-Nov-18	17:04	12-Nov-18	16:42	21	98
Dissolved Oxygen [mg/L]	06-Nov-18	15:18	07-Nov-18	09:32	7.2	---
Total Suspended Solids [mg/L]	07-Nov-18	07:26	08-Nov-18	14:42	15	85
pH [no unit]	06-Nov-18	10:10	08-Nov-18	07:54	7.42	7.58
Phosphorus (total) [mg/L]	07-Nov-18	12:05	08-Nov-18	12:28	0.09	2.30
Total Kjeldahl Nitrogen [as N mg/L]	09-Nov-18	06:38	09-Nov-18	14:47	< 0.5	25.9
Ammonia+Ammonium (N) [as N mg/L]	06-Nov-18	18:30	14-Nov-18	09:24	0.3	---
Nitrite (as N) [mg/L]	08-Nov-18	01:56	12-Nov-18	14:51	2.25	---
Nitrate (as N) [mg/L]	08-Nov-18	01:56	12-Nov-18	14:51	13.7	---
Nitrate + Nitrite (as N) [mg/L]	08-Nov-18	01:56	12-Nov-18	14:51	16.0	---
E. Coli [cfu/100mL]	07-Nov-18	08:30	08-Nov-18	09:22	2240	---
Alkalinity [mg/L as CaCO3]	07-Nov-18	08:44	12-Nov-18	16:43	---	352


Carrie Greenlaw
Project Specialist
Environmental Services, Analytical

Waterworks/Project # **1418S** C of C LIMS No: Dec 1 2018
 Facility Name **Mini Lakes WWTP** Laboratory Section **DEC 1 1 2018**
 Orig. # **1418** Date Recd: _____
 Quote # _____ Sample condition upon receipt _____
 Attached Parameter List No Yes Time Recd: _____
 Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment Temperature Upon Receipt 8x3 °C
 Initials PHS

Requested Turnaround Time: **Lab App. 24-48 h 5-7d 7-10d Other Specify: _____

Data Transfer Contact: Don Irvine Invoice To: Ontario Clean Water Agency
 Address: 136 Main St. E, Shelburne, ON L9V 3K5 136 Main St. E, Shelburne, ON L9V 3K5
 Telephone: 519-321-9474 519-321-9474 (519) 925-1938
 Fax: 519-925-0322 519-925-0322 (519) 925-0322
 Email: d Irvine@ocwa.com adwesi@highlands@ocwa.com

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	# of Bottles	CI Residual			Parameters							Comments	Upload to MOE	Upload to OCWA	
					Field Total (mg/L)	Field Free (mg/L)	Combined (mg/L)	CBOD ₅	Total Suspended	Total Phosphorous	Total Ammonia Nitrogen (TAN)	Nitrate-Nitrogen	Nitrite-Nitrogen	TKN				D.O.
Eff	Eff	Final Effluent (Grab)	0915	3				X	X	X	X	X	X	X	X		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Eff	Eff	Final Effluent (Grab)	0915	1				X	X	X	X	X	X	X	X		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Raw	Raw	Primary Clarifier (Grab)	0920	3				X	X	X	X	X	X	X	X		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
																	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

3 BOTTLES Rec'd say "Raw Sample"

Sampler Name: Jesse Thomas Sampler Signature: [Signature]

* Station Acronym: Cell - Cell Contents, Dis - Disinfection, Down - Downstream, Eff - Final Effluent, P/B - Primary Bypass, Raw - Raw Sewage, S/B - Secondary Bypass, Up - Upstream, Well - Monitoring Well, Aer - Aeration, B/S - Biosolids-sludge, Bth - Biosolids thickening, Bpd - Biosolids primary digestion, Bsd - Biosolids sec. digestion, Bps - Biosolids pit super, Bas - Biosolids sec super, Bsk - Biosolids sludge quality, Bsqd - Biosolids soil quality, DAF - Dissolved Air Flotation, Grit - Primary Treatment/Grit, PEI - Primary Effluent, RAS - Return Activated Sludge, SSR - Secondary Treatment/SSRS, SEI - Secondary Effluent, TVAS - Thickened Waste Activated Sludge, WAS - Waste Activated Sludge, IndW - Industrial Wastewater, P/Sh - Pump Shn, Sept - Septage, Lcht - Leachate, P/T - Primary Treatment, Rea - Re-aeration, Tert - Tertiary Treatment, Alp - Acidlo, T/BY - Tertiary Bypass, Hold - Holding Tank, CSO - Combined Sewer Overflow, SSC - Sanitary Sewer Overflow

PIN: 606 063 322 758 9:30 AM

Waterworks/Project # **1418S**
 C of C LIMS No: **DEC 15216**
 Facility Name **Mini Lakes WWTP**
 Laboratory Section _____
 Org. # **1418**
 Date Rec'd: **12/13/18** Time Rec'd: _____ Initials: _____
 Quote # _____
 Attached Parameter List No Yes
 Temperature Upon Receipt **6°C X3**

Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment
 Requested Turnaround Time: _____
 App. Req'd 24-48 h 5-7d 7-10d Other _____ Specify: _____

Data Transfer Contact: Don Irvine
 136 Main St. E
 Shelburne, ON
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 (519) 925-9474
 (519) 925-0322
 dirvine@ocwa.com

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 L9V 3K5
 (519) 925-1938
 (519) 925-0322
 apwesthighlands@ocwa.com

Invoice To: Ontario Clean Water Agency
 Laboratory: SGS Lakefield Research Ltd
 185 Concession St.
 Lakefield, ON
 K0L 2H0
 705-652-2000
 705-652-6365
 garrie.greenlaw@sgs.com

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	# of Bottles	CI Residual		Parameters						Comments	Upload to MOE	Upload to OCWA
					Field Total (mg/L)	Field Free (mg/L)	Total Phosphorous	Total Ammonia Nitrogen	Nitrate-Nitrogen	Nitrite-Nitrogen	TKN	E Coll			
Hold	Hld1	SW1 - Upgradient background	Dec 12/18 1140	2			X	X	X	X	X	X	field data	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hold	Hld3	SW3 - Within main pond	1150	2			X	X	X	X	X	X	pH: 7.69 Temp 5.8°C	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hold	Hld4	SW4 - Outlet from main pond	1155	2			X	X	X	X	X	X	pH: 8.04 Temp 4.16°C	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hold	Hld5	SW5 - Upgradient tributaries at County Rd No. 34	1205	2			X	X	X	X	X	X	pH: 8.23 Temp 3.3°C	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Hold	Hld6	SW6 - Outlet from property	1210	2			X	X	X	X	X	X	pH: 8.58 Temp 2.8°C	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Sampler Name: **Sesse Thomas** Sampler Signature: *Sesse Thomas*

* Station Acronym: Cell - Cell Contents, Dis - Disinfection, Down - Downstream, Eff - Final Effluent, PRBy - Primary Bypass, Raw - Raw Sewage, SCSy - Secondary Bypass, Up - Upstream, Well - Monitoring Well, Aer - Aeration, Brs - Biosolids raw sludge, Eth - Biosolids thickening, Bpd - Biosolids primary digestion, Bsd - Biosolids sec. digestion, Bps - Biosolids pri super, Bss - Biosolids sec super, Bsq - Biosolids sludge quality, Bsoq - Biosolids soil quality, DAF - Dissolved Air Flotation, Grit - Primary Treatment/Grit, PFEF - Primary Effluent, PAs - Return Activated Sludge, SBR - Secondary Treatment/SBRs, SCSF - Secondary Effluent, TWAS - Thickened Waste Activated Sludge, WAS - Waste Activated Sludge, indW - Industrial Wastewater, PSlN - Pump Station, Sept - Septage, Lcht - Leachate, RTR - Primary Treatment, ReAr - Re-aeration, Tert - Tertiary Treatment, Afo - Actiflo, Teby - Tertiary Bypass, Hold - Holding Tank, CSO - Combined Sewer Overflow, SSO - Sanitary Sewer Overflow

Revision # 6
 PIN 60603028B109 R7V
 930 KHC

Waterworks/Project # **1418S** C of C LIMS No: **DEC 1521P** Sample condition upon receipt _____
 Facility Name **Mini Lakes WWTP** Laboratory Section _____
 Org. # **1418** Date Rec'd: **12/13/18** K14 Time Rec'd: _____ Initials _____
 Quote # _____ No Yes
 Attached Parameter List _____ Temperature Upon Receipt _____
 Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment

Requested Turnaround Time: _____ App. Req'd _____ 24-48 h _____ 5-7d _____ 7-10d _____ Other _____ Specify: _____

Data Transfer Contact: Don Irvine Invoice To: Ontario Clean Water Agency
 136 Main St. E 185 Concession St.
 Shelburne, ON Lakefield, ON
 L9V 3K5 K0L 2H0
 Telephone: 519-321-9474 (519) 925-1938 705-652-2000
 Fax: 519-925-0322 (519) 925-0322 705-652-6365
 Email: d Irvine@ocwa.com apwesthighlands@ocwa.com carrie.greenlaw@sgs.com

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	# of Bottles	Field Total (mg/L)	Field Free (mg/L)	CI Residual	Parameters							Comments	Upload to MOE	Upload to OCWA									
Well	Well1	Monitoring Well #1 (MW-1)	December 12/18 1005	3				Total Suspended Solids	X	Total Phosphorous	X	Total Ammonia Nitrogen (TAN)	X	Nitrate-Nitrogen	X	Nitrite-Nitrogen	X	TKN	X	Dissolved Organic Carbon	X	E.Coli	X	Well Depth = 1.20 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	Well2	Monitoring Well #2 (MW-2)	0900	3				Total Suspended Solids	X	Total Phosphorous	X	Total Ammonia Nitrogen (TAN)	X	Nitrate-Nitrogen	X	Nitrite-Nitrogen	X	TKN	X	Dissolved Organic Carbon	X	E.Coli	X	Well Depth = 2.36 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	Well4	Monitoring Well #4 (MW-4)	0915	3				Total Suspended Solids	X	Total Phosphorous	X	Total Ammonia Nitrogen (TAN)	X	Nitrate-Nitrogen	X	Nitrite-Nitrogen	X	TKN	X	Dissolved Organic Carbon	X	E.Coli	X	Well Depth = 2.12 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	Well5	Monitoring Well #5 (MW-5)	1050	3				Total Suspended Solids	X	Total Phosphorous	X	Total Ammonia Nitrogen (TAN)	X	Nitrate-Nitrogen	X	Nitrite-Nitrogen	X	TKN	X	Dissolved Organic Carbon	X	E.Coli	X	Well Depth = 1.97 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	Well6	Monitoring Well #6 (MW-6)	1040	3				Total Suspended Solids	X	Total Phosphorous	X	Total Ammonia Nitrogen (TAN)	X	Nitrate-Nitrogen	X	Nitrite-Nitrogen	X	TKN	X	Dissolved Organic Carbon	X	E.Coli	X	Well Depth = 1.98 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	Well7	Monitoring Well #7 (MW-7)	1030	3				Total Suspended Solids	X	Total Phosphorous	X	Total Ammonia Nitrogen (TAN)	X	Nitrate-Nitrogen	X	Nitrite-Nitrogen	X	TKN	X	Dissolved Organic Carbon	X	E.Coli	X	Well Depth = 1.95 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	Well8	Monitoring Well #8 (MW-8)	1020	3				Total Suspended Solids	X	Total Phosphorous	X	Total Ammonia Nitrogen (TAN)	X	Nitrate-Nitrogen	X	Nitrite-Nitrogen	X	TKN	X	Dissolved Organic Carbon	X	E.Coli	X	Well Depth = 1.80 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	Well9	Monitoring Well #9 (MW-9)	0950	3				Total Suspended Solids	X	Total Phosphorous	X	Total Ammonia Nitrogen (TAN)	X	Nitrate-Nitrogen	X	Nitrite-Nitrogen	X	TKN	X	Dissolved Organic Carbon	X	E.Coli	X	Well Depth = 0.90 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	Well10	Monitoring Well #10 (MW-10)	0935	3				Total Suspended Solids	X	Total Phosphorous	X	Total Ammonia Nitrogen (TAN)	X	Nitrate-Nitrogen	X	Nitrite-Nitrogen	X	TKN	X	Dissolved Organic Carbon	X	E.Coli	X	Well Depth = 2.74 m	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Sampler Name: Jesse Thomas Sampler Signature: Jesse Thomas

* Station Acronym: Cell - Cell Contents, DS - Disinfection, Down - Downstream, Eff - Final Effluent, P/BV - Primary Bypass, Raw - Raw Sewage, S/BV - Secondary Bypass, Up - Upstream, Well - Monitoring Well, Aer - Aeration, Bs - Biosolids raw sludge, Bth - Biosolids thickening, Bod - Biosolids primary digestion, Bsd - Biosolids sec. digestion, Bps - Biosolids pH super, Bss - Biosolids sec super, Bsq - Biosolids sludge quality, Bsoq - Biosolids soil quality, DAF - Dissolved Air Flotation, Gnt - Primary Treatment/Gnt, P/EF - Primary Effluent, PAS - Return Activated Sludge, SBR - Secondary Treatment/SBRs, SdEF - Secondary Effluent, TWAS - Thickened Waste Activated Sludge, WAS - Waste Activated Sludge, InWV - Industrial Wastewater, PSin - Pump Sln, Sept - Septage, Lcht - Leachate, PRR - Primary Treatment, ReAr - Re-aeration, Terr - Tertiary Treatment, Ato - Activ. Treby - Tertiary Bypass, Hold - Holding Tank CSO - Combined Sewer Overflow, SSO - Sanitary Sewer Overflow

Revision # 6 606030279065 Revision # 6 606030279065 Revised: 2017.11.21
 R2W 930 K41C

Waterworks/Project # **1418S** C of C LIMS No: DEC 15217
 Facility Name **Mini Lakes WWTP** Laboratory Section _____ Sample condition upon receipt _____
 Org. # **1418** Date Rec'd: 12/13/18 KJ Time Rec'd: _____ Initials _____
 Quote # _____ Attached Parameter List No Yes
 Identification of Regulation under which the sample(s) fall: No Requirement to Report Sample Results Under Any Regulation for Wastewater Treatment
 Requested Turnaround Time: _____ App. Req'd 24-48 h 5-7d 7-10d Other _____ Specify: _____

Data Transfer Contact: Don Irvine
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 519-925-0322
 dirvine@ocwa.com

Data Transfer Contact: Don Irvine
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 Shelburne, ON
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 519-925-0322
 dirvine@ocwa.com

Invoice To: Ontario Clean Water Agency
 Laboratory: SGS Lakelield Research Ltd
 185 Concession St.
 Lakelield, ON
 K0L 2H0
 705-652-2000
 705-652-6365
 carrie.greenlaw@sgs.com

Station Acronym	Station Number (Short Name)	Sample Location Name	Date & Time Collected	# of Bottles	CI Residual			Parameters								Comments	Upload to MOE	Upload to OCWA
					Field Total (mg/L)	Field Free (mg/L)	Combined (mg/L)	CBOD5	Total Suspended Solids	Total Phosphorous	Total Ammonia Nitrogen (TAN)	Nitrate-Nitrogen	Nitrite-Nitrogen	TKN	Dissolved Organic Carbon			
Well	We11	Monitoring Well #11 (MW-11)	December 12/18 1100	3				X	X	X	X	X	X	X	X		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>
Well	We12	Monitoring Well #12 (MW-12)	1115	3				X	X	X	X	X	X	X	X		Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

Sampler Name: Testa Thomas Sampler Signature: [Signature]

* Station Acronym: Cell - Cell Contents, Ds - Disinfection, Down - Downstream, Eff - Final Effluent, PrBy - Primary Bypass, Raw - Raw Sewage, ScBy - Secondary Bypass, Up - Upstream, Well - Monitoring Well / Aer - Aeration, Bs - Biosolids raw sludge, Bh - Biosolids thickening, Bpd - Biosolids primary digestion, Bsd - Biosolids sec. digestion, Eps - Biosolids pri super, Bss - Biosolids sec super, Bsq - Biosolids sludge quality, Bsoq - Biosolids soil quality, DAF - Dissolved Air Flotation, Gnt, PPEf - Primary Effluent, PAS - Return Activated Sludge, SBR - Secondary Treatment/BSRs, SOEF - Secondary Effluent, TWAS - Thickened Waste Activated Sludge, WAS - Waste Activated Sludge, indW - Industrial Wastewater, Psin - Pump Sln, Sept - Septage, Lcht - Leachate, PTr - Primary Treatment, ReAr - Re-aeration, Tert - Tertiary Treatment, Afo - Actiflo, Teby - Tertiary Bypass, Hold - Holding Tank CSO - Combined Sewer Overflow, SSO - Sanitary Sewer Overflow

Revision # 6
 Revision # 6
 RTW 930 KTC
 Revised: 2017.11.21



SGS Canada Inc.

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

OCWA-Mini Lakes RBC WWTP

Attn : Don Irvine

136 Main St., E.
Shelburne, ON
L9V 3K5, Canada

Phone: 519-925-1938 ext. 225

Fax:

Works #: 1418S
Project : PO#017844

24-December-2018

Date Rec. : 11 December 2018
LR Report: CA12318-DEC18

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Eff Eff-Final Effluent	6: Eff Eff-Final Effluent Bacti	7: Raw Raw-Primary Clarifier (Grab)
Sample Date & Time					10-Dec-18 09:15	10-Dec-18 09:15	10-Dec-18 09:20
Temperature Upon Receipt [°C]	---	---	---	---	8.0	8.0	8.0
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	11-Dec-18	16:42	24-Dec-18	09:57	19	---	---
Carbonaceous Biochemical Oxygen Demand [(CBOD5) mg/L]	17-Dec-18	16:28	24-Dec-18	09:57	---	---	917
Dissolved Oxygen [mg/L]	11-Dec-18	13:23	12-Dec-18	08:31	5.3	---	---
Total Suspended Solids [mg/L]	11-Dec-18	15:15	13-Dec-18	11:15	32	---	833
pH [no unit]	12-Dec-18	08:57	13-Dec-18	12:45	7.34	---	7.28
Alkalinity [mg/L as CaCO3]	12-dec-18	08:13	13-Dec-18	12:45	---	---	356
Phosphorus (total) [mg/L]	11-Dec-18	17:34	14-Dec-18	09:23	0.32	---	---
Phosphorus (total) [mg/L]	12-Dec-18	09:13	17-Dec-18	16:25	---	---	24.0
Total Kjeldahl Nitrogen [as N mg/L]	12-Dec-18	09:13	17-Dec-18	11:36	---	---	73.1
Total Kjeldahl Nitrogen [as N mg/L]	11-Dec-18	18:00	12-Dec-18	12:38	2.3	---	---
Ammonia+Ammonium (N) [as N mg/L]	11-Dec-18	20:00	12-Dec-18	16:03	0.1	---	---
Nitrite (as N) [mg/L]	13-Dec-18	17:42	14-Dec-18	14:53	2.52	---	---
Nitrate (as N) [mg/L]	13-Dec-18	17:42	14-Dec-18	14:53	12.6	---	---
Nitrate + Nitrite (as N) [mg/L]	13-Dec-18	17:42	14-Dec-18	14:53	15.1	---	---
E. Coli [cfu/100mL]	11-Dec-18	17:50	13-Dec-18	10:47	---	14000	---



SGS Canada Inc.

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

Works #: 1418S
Project : PO#017844
LR Report : CA12318-DEC18

Kimberley Didsbury
Project Specialist
Environmental Services, Analytical



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Lakefield - Ontario - KOL 2H0
Phone: 705-652-2000 FAX: 705-652-6365

OCWA-Mini Lakes RBC WWTP

Attn : Don Irvine

136 Main St., E.
Shelburne, ON
L9V 3K5, Canada

Phone: 519-925-1938 ext. 225
Fax:

Works #: 1418S
Project : PO#017844

20-December-2018

Date Rec. : 13 December 2018
LR Report: CA15216-DEC18

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Analysis	1: Analysis Start Date	2: Analysis Start Time	3: Analysis Completed Date	4: Analysis Completed Time	5: Hold Hld1-SW1-Upgradi ent Background	6: Hold Hld1-SW3-Within Main Pond	7: Hold Hld1-SW4-Outlet From Main Pond	8: Hold Hld1-SW5-Upgradi ent Tributaries At county Rd No 34	9: Hold Hld1-SW6-Outlet From Property
Sample Date & Time					12-Dec-18 11:40	12-Dec-18 11:50	12-Dec-18 11:55	12-Dec-18 12:05	12-Dec-18 12:10
Temperature Upon Receipt [°C]	---	---	---	---	6.0	6.0	6.0	6.0	6.0
Field pH [no unit]					7.69	8.09	8.23	8.10	8.36
Field Temperature [celcius]					5.8	4.6	3.3	3.2	2.8
Phosphorus (total) [mg/L]	13-Dec-18	17:45	14-Dec-18	10:10	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Total Kjeldahl Nitrogen [as N mg/L]	13-Dec-18	17:45	17-Dec-18	13:12	< 0.5	< 0.5	< 0.5	< 0.5	< 0.5
Ammonia+Ammonium (N) [as N mg/L]	13-Dec-18	17:30	17-Dec-18	11:57	0.2	0.2	0.1	0.4	< 0.1
Nitrite (as N) [mg/L]	17-Dec-18	10:06	20-Dec-18	11:56	< 0.03	< 0.03	< 0.03	< 0.03	< 0.03
Nitrate (as N) [mg/L]	17-Dec-18	10:06	20-Dec-18	11:56	0.10	0.22	0.20	0.10	0.57
Nitrate + Nitrite (as N) [mg/L]	17-Dec-18	10:06	20-Dec-18	11:56	0.10	0.22	0.20	0.10	0.57
E. Coli [cfu/100mL]	13-Dec-18	12:25	14-Dec-18	15:24	3440	2	66	4	4



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Works #: 1418S
Project : PO#017844
LR Report : CA15216-DEC18

Carrie Greenlaw
Carrie Greenlaw
Project Specialist
Environmental Services, Analytical



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OCWA-Mini Lakes RBC WWTP

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L9V 3K5, Canada

Phone: 519-925-1938 ext. 225

Fax:

Works #: 1418S
Project : PO#017844

24-December-2018

Date Rec. : 13 December 2018
LR Report: CA15218-DEC18

Copy: #1

CERTIFICATE OF ANALYSIS

Final Report

Sample ID	Sample Date & Time	Temperature Upon Receipt °C	Carbonaceous Biochemical Oxygen Demand (CBOD5) mg/L	Total Suspended Solids mg/L	Dissolved Organic Carbon mg/L	Phosphorus (total) mg/L	Total Kjeldahl Nitrogen as N mg/L	Ammonia+Ammonium (N) as N mg/L	Nitrite (as N) mg/L	Nitrate (as N) mg/L	Nitrate + Nitrite (as N) mg/L	E. Coli cfu/100mL
1: Analysis Start Date		---	13-Dec-18	14-Dec-18	13-Dec-18	13-Dec-18	13-Dec-18	13-Dec-18	15-Dec-18	15-Dec-18	15-Dec-18	13-Dec-18
2: Analysis Start Time		---	17:33	15:36	21:00	17:45	17:45	17:30	17:31	17:31	17:31	12:25
3: Analysis Completed Date		---	18-Dec-18	19-Dec-18	24-Dec-18	19-Dec-18	19-Dec-18	20-Dec-18	20-Dec-18	20-Dec-18	20-Dec-18	14-Dec-18
4: Analysis Completed Time		---	16:19	11:49	08:23	16:27	14:44	16:23	11:57	11:57	11:57	15:24
5: Well Wel1-Monitoring Well #1 (MW-1)	12-Dec-18 10:05	6.0	< 4	257	7	0.49	2.0	2.4	0.09	< 0.06	0.09	14
6: Well Wel2-Monitoring Well #2 (MW-2)	12-Dec-18 09:00	6.0	< 4	5	1	< 0.03	< 0.5	< 0.1	< 0.03	3.83	3.83	< 2
7: Well Wel4-Monitoring Well #4 (MW-4)	12-Dec-18 09:15	6.0	10	< 2	2	< 0.03	< 0.5	< 0.1	< 0.03	5.30	5.30	< 2
8: Well Wel5-Monitoring Well #5 (MW-5)	12-Dec-18 10:50	6.0	< 4	4	< 1	< 0.03	< 0.5	< 0.1	< 0.03	0.34	0.34	< 2
9: Well Wel6-Monitoring Well #6 (MW-6)	12-Dec-18 10:40	6.0	< 4	< 2	< 1	< 0.03	< 0.5	< 0.1	< 0.03	0.56	0.56	< 2
10: Well Wel7-Monitoring Well #7 (MW-7)	12-Dec-18 10:30	6.0	< 4	< 2	2	0.04	< 0.5	< 0.1	< 0.03	< 0.06	< 0.06	< 2
11: Well Wel8-Monitoring Well #8 (MW-8)	12-Dec-18 10:20	6.0	< 4	5	15	0.04	2.3	2.4	< 0.03	< 0.06	< 0.06	< 2
12: Well Wel9-Monitoring Well #9 (MW-9)	12-Dec-18 09:50	6.0	7	40	9	0.05	1.8	1.5	< 0.03	< 0.06	< 0.06	< 2
13: Well Wel10-Monitoring Well #10 (MW-10)	12-Dec-18 09:35	6.0	< 4	10	1	< 0.03	< 0.5	< 0.1	< 0.03	0.15	0.15	< 2
14: Well Wel11-Monitoring Well #11 (MW-11)	12-Dec-18 11:00	6.0	< 4	9	8	< 0.03	7.3	7.5	< 0.03	< 0.06	< 0.06	< 2
15: Well Wel12-Monitoring Well #12 (MW-12)	12-Dec-18 11:15	6.0	< 4	9	8	0.06	7.5	7.9	< 0.03	< 0.06	< 0.06	< 2



SGS Canada Inc.

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Lakefield - Ontario - KOL 2H0
Phone: 705-652-2000 FAX: 705-652-6365

Works #: 1418S
Project : PO#017844
LR Report : CA15218-DEC18

Kimberley Didsbury
Project Specialist
Environmental Services, Analytical

APPENDIX D

Wastewater System Operations Reports



**MINI LAKES
WASTEWATER TREATMENT PLANT**

PERFORMANCE REPORT

For the period of
JANUARY 1, 2018 TO DECEMBER 31, 2018

Prepared by:



1. Process Performance & Regulatory Compliance

1.1 Summary of Non-Compliances/ Exceedances

From **January 01, 2018** to **December 31, 2018**:

- Number of Regulatory Limit Exceedances = **0**
- Number of Non-Compliances = **0**

The Mini Lakes WWTP performed within the regulatory limits set out in:

- Amended Environmental Compliance Approval (ECA): 2391-9KCJUS

2018	Regulatory Limit Exceedances	Non-Compliances
January	0	0
February	0	0
March	0	0
April	0	0
May	0	0
June	0	0
July	0	0
August	0	0
September	0	0
October	0	0
November	0	0
December	2	2

1.1.1 Description of Non-Compliances/ Limit Exceedances

The following is a summary of the requirements of the wastewater systems effluent regulation, the environmental compliance approvals, and any orders applicable to the system that were not met at any time during the time period covered by this report; as well as the duration of the failure and the measures that were taken to correct the failure:

Non-Compliance(s)	Duration	Required Actions & Corrective Actions
n/a	n/a	n/a

1.1.2 Indication of potential issues in the treatment system

The following parameters are greater than the value listed in the ECA for the Annual Effluent Limit. Exceeding these values in a given month does not necessarily mean that the Average Annual Effluent Limit has been exceeded. The Average Annual Effluent Concentration calculation is finalized in December and will determine if the Annual Average Concentration exceeds the Annual Average Effluent Limit.

The Nitrate Nitrogen limit was exceeded in January, March, April, July, August, November and December

The CBOD₅ limit was exceeded in May, June, October, November and December

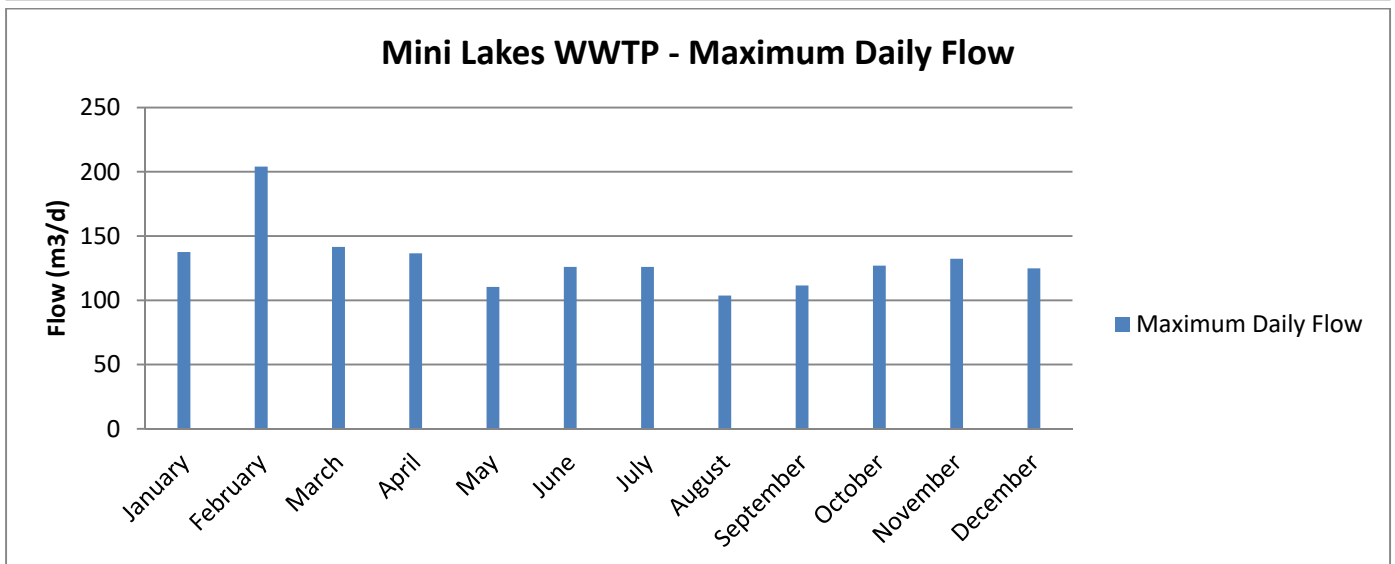
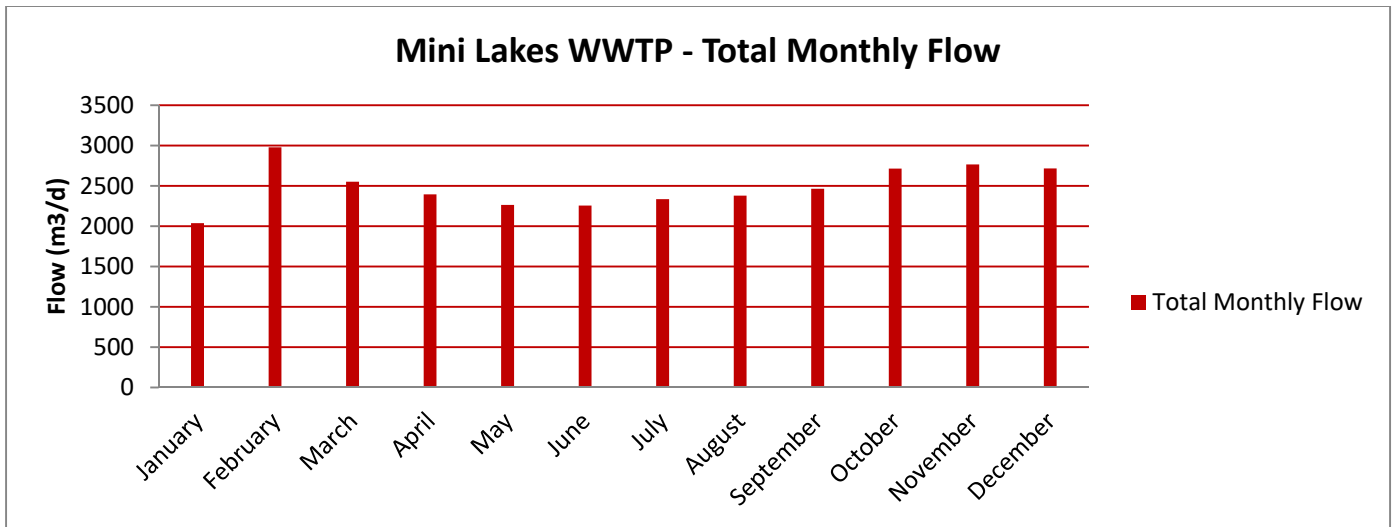
The Total Suspended Solids limit was exceeded in May, July, October and December

The Total Phosphorous limit has not yet been exceeded

1.2 Effluent Flow

The Mini Lakes WWTP operated without any interruptions to the treatment process during the reporting period.

2018	Total Effluent Flow (m ³)	Average Effluent Flow (m ³ /day)	Maximum Effluent Flow (m ³ /day)
January	2037.00	74.57	137.60
February	2979.40	106.40	204.00
March	2551.30	82.30	141.50
April	2394.00	79.90	136.60
May	2264.00	73.02	110.40
June	2256.00	75.20	126.00
July	2335.00	75.30	126.00
August	2378.00	76.70	103.70
September	2463.29	82.11	111.50
October	2715.00	87.57	127.00
November	2765.00	92.16	132.30
December	2716.00	87.60	124.90



*Note: Eramosa Engineering required retrieving missing data due to SCADA issues. An average was taken for missing days.

1.2.1 Weather Conditions

January 2018 had 113.4 mm of total precipitation which was more than the 82.2 mm of total precipitation in January 2017. The average temperature for January 2018 was -9.9 degrees Celsius while the average temperature for January 2017 was -5.9 degrees Celsius.

February 2018 had 97 mm of total precipitation which was less than the 100.2 mm of total precipitation in February 2017. The average temperature for February 2018 was -6.1 degrees Celsius while the average temperature for February 2017 was -4.9 degrees Celsius.

March 2018 had 40 mm of total precipitation which was less than the 82.6 mm of total precipitation in March 2017. The average temperature for March 2018 was -3.2 degrees Celsius while the average temperature for March 2017 was -5.5 degrees Celsius.

April 2018 had 97 mm of total precipitation which was less than the 145.3 mm of total precipitation in April 2017. The average temperature for April 2018 was 2.2 degrees Celsius while the average temperature for April 2017 was 8.6 degrees Celsius.

May 2018 had 72.3 mm of total precipitation which was less than the 108.5 mm of total precipitation in May 2017. The average temperature for May 2018 was 16.0 degrees Celsius while the average temperature for May 2017 was 11.2 degrees Celsius.

June 2018 had 59.4 mm of total precipitation which was less than the 80.1 mm of total precipitation in June 2017. The average temperature for June 2018 was 17.8 degrees Celsius while the average temperature for June 2017 was 17.9 degrees Celsius.

July 2018 had 72 mm of total precipitation which was less than the 80.3 mm of total precipitation in July 2017. The average temperature for July 2018 was 20.8 degrees Celsius while the average temperature for July 2017 was 19.8 degrees Celsius.

August 2018 had 89.7 mm of total precipitation which was more than the 59.2 mm of total precipitation in August 2017. The average temperature for August 2018 was 20.8 degrees Celsius while the average temperature for August 2017 was 17.8 degrees Celsius.

September 2018 had 51.5 mm of total precipitation which was more than the 13.5 mm of total precipitation in September 2017. The average temperature for September 2018 was 17.1 degrees Celsius while the average temperature for September 2017 was 16.5 degrees Celsius.

October 2018 had 53.6 mm of total precipitation which was more than the 37.7 mm of total precipitation in October 2017. The average temperature for October 2018 was 7.9 degrees Celsius while the average temperature for October 2017 was 11.4 degrees Celsius.

November 2018 had 71.7 mm of total precipitation which was less than the 75.9 mm of total precipitation in November 2017. The average temperature for November 2018 was 0.1 degrees Celsius while the average temperature for November 2017 was 2.0 degrees Celsius.

December 2018 had 59.2 mm of total precipitation which was more than the 21.2 mm of total precipitation in December 2017. The average temperature for December 2018 was -1.4 degrees Celsius while the average temperature for December 2017 was -6.4 degrees Celsius.

1.3 Effluent Limits

During the reporting period, the Mini Lakes WWTP operated within the effluent limits set in the ECA.

2018	CBOD ₅		Total Suspended Solids		Nitrate Nitrogen		Total Phosphorous	
	Monthly Average (mg/L)	Within Limits*? (20 mg/L)	Monthly Average (mg/L)	Within Limits*? (20 mg/L)	Monthly Average (mg/L)	Within Limits*? (8 mg/L)	Monthly Average (mg/L)	Within Limits*? (1 mg/L)
January	7	To be determined at year end	14	To be determined at year end	9.15	To be determined at year end	0.28	To be determined at year end
February	12		15		7.78		0.36	
March	19		11		8.84		0.31	
April	7		15		9.94		0.32	
May	36		23		4.13		0.34	
June	26		20		7.87		0.28	
July	15		34		9.88		0.76	
August	7		20		11.8		0.37	
September	20		20		5.85		0.30	
October	27		24		7.86		0.19	
November	21		15		13.7		0.09	
December	19		32		12.6		0.32	
Annual Average to Date	18.0		20.3		9.1		0.3	

*The limits specified in the ECA are based on an Annual Average.

*All values in orange are greater than the value listed in the ECA for the Annual Effluent Limit. Exceeding these values in a given month does not necessarily mean that the Average Annual Effluent Limit has been exceeded. The Average Annual Effluent Concentration calculation is finalized in December and will determine if the Annual Average Concentration exceeds the Annual Average Effluent Limit. A review of the infrastructure from a process stand point is highly recommended to mitigate Annual Concentration Limit exceedances and Non-Compliances.

1.4 Monitoring Data

In addition to the parameters in Section 1.3, the following section summarizes parameters that are monitored/analyzed regularly as required by the ECA.

1.4.1 Effluent (Monthly)

As required by the ECA, effluent (grab) samples are to be collected on a monthly basis and analyzed for the following parameters:

2018	Total Ammonia Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Total Kjeldahl Nitrogen (mg/L)	E.Coli (cfu/100mL)	Dissolved Oxygen (mg/L)	pH
January	2.0	0.71	3.1	11,200	8.0	7.56
February	2.4	0.71	3.9	4,000	8.9	7.44

March	2.6	0.77	3.2	30,200	7.6	7.48
April	3.6	0.66	4.6	74,000	6.6	7.54
May	5.3	1.41	6.5	32,800	5.7	7.35
June	1.7	0.88	5.1	4,200	8.1	7.42
July	2.6	0.80	4.8	84,000	6.8	7.32
August	1.8	1.99	2.7	42,000	5.2	7.16
September	1.1	1.81	2.6	4,880	6.6	7.88
October	1.1	1.41	2.1	26,000	3.6	7.43
November	0.3	2.25	<0.5	2,240	7.2	7.42
December	0.1	2.52	2.3	14,000	5.3	7.34

1.4.2 Monitoring Wells (Quarterly)

As required by the ECA, groundwater (grab) samples are to be collected on a quarterly basis, the most recent samples were collected in September 2018, the next quarterly samples are scheduled to be collected in December 2018, and analyzed for the following parameters:

MW-1

2018	CBOD ₅ (mg/L)	Total Suspended Solids (mg/L)	Dissolved Organic Carbon (mg/L)	Total Phosphorous (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Ammonia Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	E.Coli (cfu/100mL)
January	-	-	-	-	-	-	-	-	-
February	-	-	-	-	-	-	-	-	-
March	<4	83	14	0.15	2.8	2.0	<0.03	<0.06	<2
April	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-
June	<4	336	13	0.25	<0.5	2.2	0.12	<0.06	<2
July	-	-	-	-	-	-	-	-	-
August	-	-	-	-	-	-	-	-	-
September	<12	1180	11	0.16	1.7	1.6	<0.03	0.15	500
October	-	-	-	-	-	-	-	-	-
November	-	-	-	-	-	-	-	-	-
December	<4	257	7	0.49	2.0	2.4	0.09	<0.06	14

MW-2

2018	CBOD ₅ (mg/L)	Total Suspended Solids (mg/L)	Dissolved Organic Carbon (mg/L)	Total Phosphorous (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Ammonia Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	E.Coli (cfu/100mL)
January	-	-	-	-	-	-	-	-	-
February	-	-	-	-	-	-	-	-	-
March	<4	15	<1	<0.03	<0.5	<0.1	<0.03	8.66	<2
April	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-
June	<4	33	2	<0.03	<0.5	<0.1	<0.03	5.94	<2
July	-	-	-	-	-	-	-	-	-
August	-	-	-	-	-	-	-	-	-
September	<4	<2	1	0.04	<0.5	<0.1	<0.03	2.60	<2
October	-	-	-	-	-	-	-	-	-
November	-	-	-	-	-	-	-	-	-
December	<4	5	1	<0.03	<0.5	<0.1	<0.03	3.83	<2

MW-4

2018	CBOD ₅ (mg/L)	Total Suspended Solids (mg/L)	Dissolved Organic Carbon (mg/L)	Total Phosphorous (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Ammonia Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	E.Coli (cfu/100mL)
January	-	-	-	-	-	-	-	-	-
February	-	-	-	-	-	-	-	-	-
March	<4	21	<1	<0.03	<0.5	0.1	<0.03	6.73	<2
April	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-
June	<4	7	2	<0.03	<0.5	<0.1	<0.03	7.68	<2
July	-	-	-	-	-	-	-	-	-
August	-	-	-	-	-	-	-	-	-
September	<4	3	1	0.04	<0.5	<0.1	<0.03	3.56	<2
October	-	-	-	-	-	-	-	-	-
November	-	-	-	-	-	-	-	-	-
December	10	<2	2	<0.03	<0.5	<0.1	<0.03	5.3	<2

MW-5

2018	CBOD ₅ (mg/L)	Total Suspended Solids (mg/L)	Dissolved Organic Carbon (mg/L)	Total Phosphorous (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Ammonia Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	E.Coli (cfu/100mL)
January	-	-	-	-	-	-	-	-	-
February	-	-	-	-	-	-	-	-	-
March	<4	8	1	<0.03	<0.5	<0.1	<0.03	0.38	<2
April	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-
June	<4	70	2	<0.03	<0.5	<0.1	0.14	0.14	<2
July	-	-	-	-	-	-	-	-	-
August	-	-	-	-	-	-	-	-	-
September	<4	32	1	0.04	<0.5	<0.1	<0.03	0.28	<2
October	-	-	-	-	-	-	-	-	-
November	-	-	-	-	-	-	-	-	-
December	<4	4	<1	<0.03	<0.5	<0.1	<0.03	.34	<2

MW-6

2018	CBOD ₅ (mg/L)	Total Suspended Solids (mg/L)	Dissolved Organic Carbon (mg/L)	Total Phosphorous (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Ammonia Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	E.Coli (cfu/100mL)
January	-	-	-	-	-	-	-	-	-
February	-	-	-	-	-	-	-	-	-
March	<4	8	1	<0.03	<0.5	<0.1	<0.03	0.66	<2
April	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-
June	<4	3	1	<0.03	<0.5	<0.1	<0.03	0.30	<2
July	-	-	-	-	-	-	-	-	-
August	-	-	-	-	-	-	-	-	-
September	<4	5	<1	0.03	<0.5	<0.1	<0.03	0.50	<2
October	-	-	-	-	-	-	-	-	-
November	-	-	-	-	-	-	-	-	-
December	<4	<2	<1	<0.03	<0.5	<0.1	<0.03	0.56	<2

MW-7

2018	CBOD ₅ (mg/L)	Total Suspended Solids (mg/L)	Dissolved Organic Carbon (mg/L)	Total Phosphorous (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Ammonia Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	E.Coli (cfu/100mL)
January	-	-	-	-	-	-	-	-	-
February	-	-	-	-	-	-	-	-	-
March	<4	17	2	0.05	<0.5	0.1	<0.03	<0.06	<2
April	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-
June	<4	2	2	<0.03	<0.5	0.2	<0.03	<0.06	<2
July	-	-	-	-	-	-	-	-	-
August	-	-	-	-	-	-	-	-	-
September	<4	6	2	0.06	<0.5	<0.1	<0.03	<0.06	<2
October	-	-	-	-	-	-	-	-	-
November	-	-	-	-	-	-	-	-	-
December	<4	<2	2	0.04	<0.5	<0.1	<0.03	<0.06	<2

MW-8

2018	CBOD ₅ (mg/L)	Total Suspended Solids (mg/L)	Dissolved Organic Carbon (mg/L)	Total Phosphorous (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Ammonia Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	E.Coli (cfu/100mL)
January	-	-	-	-	-	-	-	-	-
February	-	-	-	-	-	-	-	-	-
March	<4	7	4	0.04	1.5	1.3	<0.03	<0.06	<2
April	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-
June	<4	2	6	0.04	1.4	1.7	<0.03	<0.06	2
July	-	-	-	-	-	-	-	-	-
August	-	-	-	-	-	-	-	-	-
September	<4	6	9	0.07	3.5	3.8	<0.03	<0.06	2
October	-	-	-	-	-	-	-	-	-
November	-	-	-	-	-	-	-	-	-
December	<4	5	15	0.04	2.3	2.4	<0.03	<0.06	<2

MW-9

2018	CBOD ₅ (mg/L)	Total Suspended Solids (mg/L)	Dissolved Organic Carbon (mg/L)	Total Phosphorous (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Ammonia Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	E.Coli (cfu/100mL)
January	-	-	-	-	-	-	-	-	-
February	-	-	-	-	-	-	-	-	-
March	<4	49	11	0.08	2.0	1.3	<0.03	<0.06	<2
April	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-
June	<4	11	11	0.07	2.3	1.4	<0.03	<0.06	3040
July	-	-	-	-	-	-	-	-	-
August	-	-	-	-	-	-	-	-	-
September	<4	29	18	0.19	4.7	3.6	<0.03	<0.06	<2
October	-	-	-	-	-	-	-	-	-
November	-	-	-	-	-	-	-	-	-
December	7	40	9	0.05	1.8	1.5	<0.03	<0.06	<2

MW-10

2018	CBOD ₅ (mg/L)	Total Suspended Solids (mg/L)	Dissolved Organic Carbon (mg/L)	Total Phosphorous (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Ammonia Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	E.Coli (cfu/100mL)
January	-	-	-	-	-	-	-	-	-
February	-	-	-	-	-	-	-	-	-
March	<4	13	1	0.04	<0.5	<0.1	<0.03	<0.06	<2
April	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-
June	<4	48	2	<0.03	<0.5	<0.1	<0.03	<0.06	<2
July	-	-	-	-	-	-	-	-	-
August	-	-	-	-	-	-	-	-	-
September	<4	9	1	<0.03	<0.5	<0.1	<0.03	<0.06	<2
October	-	-	-	-	-	-	-	-	-
November	-	-	-	-	-	-	-	-	-
December	<4	10	1	<0.03	<0.5	<0.1	<0.03	0.15	<2

MW-11

2018	CBOD ₅ (mg/L)	Total Suspended Solids (mg/L)	Dissolved Organic Carbon (mg/L)	Total Phosphorous (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Ammonia Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	E.Coli (cfu/100mL)
January	-	-	-	-	-	-	-	-	-
February	-	-	-	-	-	-	-	-	-
March	<4	174	11	<0.03	8.4	8.3	<0.03	<0.06	<2
April	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-
June	<4	166	9	<0.03	6.8	6.5	<0.03	<0.06	<2
July	-	-	-	-	-	-	-	-	-
August	-	-	-	-	-	-	-	-	-
September	<4	119	8	0.03	7.6	7.6	<0.03	<0.06	<2
October	-	-	-	-	-	-	-	-	-
November	-	-	-	-	-	-	-	-	-
December	<4	9	8	<0.03	7.3	7.5	<0.03	<0.06	<2

MW-12

2018	CBOD ₅ (mg/L)	Total Suspended Solids (mg/L)	Total Phosphorous (mg/L)	Total Ammonia Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Total Kjeldahl Nitrogen (mg/L)	E.Coli (cfu/100mL)	Dissolved Organic Carbon (mg/L)
January	-	-	-	-	-	-	-	-	-
February	-	-	-	-	-	-	-	-	-
March	<4	100	12	<0.1	1.47	<0.03	<0.5	<2	1
April	-	-	-	-	-	-	-	-	-
May	-	-	-	-	-	-	-	-	-
June	<4	141	0.08	<0.1	1.26	<0.03	<0.5	<2	1
July	-	-	-	-	-	-	-	-	-
August	-	-	-	-	-	-	-	-	-
September	<4	15	1	<0.03	<0.5	<0.1	<0.03	0.95	<2
October	-	-	-	-	-	-	-	-	-
November	-	-	-	-	-	-	-	-	-
December	<4	9	8	0.06	7.5	7.9	<0.03	<0.06	<2

1.4.3 Surface Water (Quarterly)

As required by the ECA, surface water (grab) samples are to be collected on a quarterly basis, the most recent samples were collected in September 2018, and the next quarterly samples will be collected in December 2018, and analyzed for the following parameters:

SW1: Upgradient Background

2018	Total Phosphorous (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Ammonia Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	E.Coli (cfu/100mL)
January	-	-	-	-	-	-
February	-	-	-	-	-	-
March	<0.03	<0.5	<0.1	<0.03	0.12	6
April	-	-	-	-	-	-
May	-	-	-	-	-	-
June	0.05	<0.5	0.1	<0.03	<0.06	22
July	-	-	-	-	-	-
August	-	-	-	-	-	-
September	<0.03	<0.5	<0.1	<0.03	<0.06	14
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	<0.03	<0.5	0.2	<0.03	0.10	3440

SW3: Main Pond

2018	Total Phosphorous (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Ammonia Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	E.Coli (cfu/100mL)
January	-	-	-	-	-	-
February	-	-	-	-	-	-
March	<0.03	<0.5	0.1	<0.03	0.26	<2
April	-	-	-	-	-	-
May	-	-	-	-	-	-
June	<0.03	<0.5	<0.1	<0.03	0.22	24
July	-	-	-	-	-	-
August	-	-	-	-	-	-
September	<0.03	<0.5	<0.1	<0.03	<0.06	56
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	<0.03	<0.5	0.2	<0.03	0.22	2

SW4: Main Pond Outlet

2018	Total Phosphorous (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Ammonia Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	E.Coli (cfu/100mL)
January	-	-	-	-	-	-
February	-	-	-	-	-	-
March	<0.03	<0.5	0.1	<0.03	0.26	<2
April	-	-	-	-	-	-
May	-	-	-	-	-	-
June	0.05	<0.5	<0.1	<0.03	0.21	36
July	-	-	-	-	-	-
August	-	-	-	-	-	-
September	<0.03	<0.5	<0.1	<0.03	<0.06	90
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	<0.03	<0.5	0.1	<0.03	0.20	66

SW5: Property Outlet

2018	Total Phosphorous (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Ammonia Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	E.Coli (cfu/100mL)
January	-	-	-	-	-	-
February	-	-	-	-	-	-
March	<0.03	<0.5	0.1	<0.03	0.54	6
April	-	-	-	-	-	-
May	-	-	-	-	-	-
June	0.05	<0.5	0.2	<0.03	<0.06	34
July	-	-	-	-	-	-
August	-	-	-	-	-	-
September	<0.03	<0.5	<0.1	<0.03	0.53	52
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	<0.03	<0.5	0.4	<0.03	0.10	4

SW6: Upgradient Tributaries

2018	Total Phosphorous (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Ammonia Nitrogen (mg/L)	Nitrite Nitrogen (mg/L)	Nitrate Nitrogen (mg/L)	E.Coli (cfu/100mL)
January	-	-	-	-	-	-
February	-	-	-	-	-	-
March	<0.03	<0.5	<0.1	<0.03	0.08	<2
April	-	-	-	-	-	-
May	-	-	-	-	-	-
June	0.06	<0.5	0.2	0.03	0.45	42
July	-	-	-	-	-	-
August	-	-	-	-	-	-
September	<0.03	<0.5	<0.1	<0.03	<0.06	22
October	-	-	-	-	-	-
November	-	-	-	-	-	-
December	<0.03	0.5	0.1	0.03	0.57	4

1.5 Biosolids Haulage

The handling of biosolids from the Mini Lakes WWTP is contracted to Weber Environmental where it is hauled off site to Listowel WWTP for further treatment.

2018	Haulage Dates	Volume of Biosolids (m ³)
January	January 31, 2018	5.68
February	February 22, 2018	5.25
March	March 1, 2018	14.4
April	April 4,5,11, 2018	64.0
May	May 24, 2018	34.0
June	June 12,20, 2018	28.0
July	July 17, 2018	11.0
August	August 1, 2018	35.0
September	September 19, 2018	55.0
October	n/a	0.00
November	November 1, 2018	33.0
December	December 19, 2018	26.0

1.6 Reportable Events

There were no reportable events during the period covered by this report.

2018	Date	Event	Details
January	n/a	n/a	n/a
February	n/a	n/a	n/a
March	n/a	n/a	n/a
April	n/a	n/a	n/a
May	n/a	n/a	n/a
June	n/a	n/a	n/a
July	n/a	n/a	n/a
August	n/a	n/a	n/a
September	n/a	n/a	n/a
October	n/a	n/a	n/a
November	n/a	n/a	n/a
December	n/a	n/a	n/a

1.7 Report Submissions

A summary of the reports submitted by OCWA on behalf of the Corporation are summarized in the table below:

Report	Submission Frequency	Submit To	Submission Date
Annual Performance Report	Annual - within 90 days following the end of the period	MOECC – Water Supervisor	March 28, 2018
Discharge Data Reports	45 Days after the Quarter	MOECC	February 14, 2018 (Q4 – 2017)

1.7.1 Annual Performance Report

An Annual Performance Report is submitted as required by the ECA for the Mini Lakes WWTP within 90 days following the end of the period being reported on. The following items are required to be included in the report:

- (1) One week prior to the startup of the operation of the Works, the Owner shall notify the District Manager (in writing) of the pending startup date of the Proposed Works.
- (2) The Owner shall prepare, and submit upon request, a performance report, on an annual basis, within ninety (90) days following the end of the period being reported upon. The first such report shall cover the first annual period following the commencement of operation of the Works and subsequent reports shall be submitted to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:
 - (a) A summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 6, including an overview of the success and adequacy of the Works;
 - (b) A tabulation of the daily volumes of effluent disposed through the subsurface disposal system during the reporting period;
 - (c) A summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;
 - (d) A description of any operating problems encountered and corrective actions taken.
 - (e) A Copy of all Notices of Modifications submitted to the District Manager as a result of Schedule A, Section 1, with a status report of implementation of each modification;
 - (f) A report summarizing all modifications completed as a result of Schedule A, Section 3;
 - (g) Any other information the District Manager requires from time to time.

1.7.2 Discharge Data Report (MOECC)

The Ontario Clean Water Agency (OCWA) has an arrangement with the MOECC to submit quarterly discharge data for all OCWA operated municipal sewage treatment facilities 45 days at the end of each quarter.

Monitoring data is submitted via the Ministry of Environment Wastewater System (MEWS). The MOECC stores these reports in a shared location where MOECC Inspectors can obtain and review them. There are no limits/objectives for the quarterly Discharge Data Report.

1.8 Third Party Inspections and Results

There have been no third party inspections performed during the reporting period. The last MOECC Inspection was performed on **July 25, 2011**

2. Operations & Maintenance

2.1 Major & Unscheduled Maintenance Summary

2018	Maintenance Performed
January	<ul style="list-style-type: none"> Weber Septic Services on site to haul bio solids
February	<ul style="list-style-type: none"> Weber Septic Services on site to haul bio solids
March	<ul style="list-style-type: none"> Weber Septic Services on site to haul bio solids
April	<ul style="list-style-type: none"> Weber Septic Services on site to haul bio solids
May	<ul style="list-style-type: none"> Weber Septic Services on site to haul bio solids, Exclusive Alarms for removal of sirens
June	<ul style="list-style-type: none"> Weber Septic Services on site to haul bio solids, Belwood Electric installed flow meter
July	<ul style="list-style-type: none"> Weber Septic Services on site to haul bio solids OCWA and RVA Engineers for backup power assessment Roberts Plumbing for repairs
August	<ul style="list-style-type: none"> Weber Septic Services on site to haul bio solids
September	<ul style="list-style-type: none"> Weber Septic Services on site to haul bio solids Flowmetrix on site for annual flow meter calibrations Roberts for SPS 2 pump 1 guide rail Belwood Electric for start float replacement
October	<ul style="list-style-type: none"> Weber Septic Services inspection on tile beds
November	<ul style="list-style-type: none"> Weber Septic Services on site to haul bio solids Belwood Electric on site for float issue
December	<ul style="list-style-type: none"> Weber Septic Services on site to haul bio solids

2.2 Major & Unscheduled Maintenance

January 2018

- 31 – Weber Septic on site for haulage from SPS 1 & SPS 5 to Listowel WWTP for treatment

February 2018

- 22 – Weber Septic on site for haulage of biosolids from primary tank to Listowel WWTP for treatment
- 26 – Effluent pump 5 pulled for inspection and screen cleaned
- 27 – Effluent pump 4 pulled for inspection and screen cleaned

March 2018

- 01 – Weber Septic on site for haulage of biosolids from primary tank to Listowel WWTP for treatment
- 06 – Belwood Electric on site for RBC 2 go switch failure
- 21 – Alum line rebuilt and RBC lubricated
- 29 – Pulled sewage pump 2 for cleaning and visual inspection

April 2018

- 04 – Weber Septic on site for haulage of biosolids from primary tank to Listowel WWTP for treatment
- 05 – Weber Septic on site for haulage of biosolids from primary tank to Listowel WWTP for treatment
- 11 – Weber Septic on site for haulage from intermediate clarifiers, weirs, and holding tank to Listowel WWTP for treatment
- 18 – Operator rebuilt chemical feed lines

May 2018

- 01 – Carbon line was rebuilt for better distribution by operators
- 03 – LMI carbon pump replaced with Prominent dosing pump
- 14 – Exclusive Alarms on site to remove siren alarm
- 24 – Weber Septic on site for haulage of biosolids from primary tank to Listowel WWTP for treatment
- 30 – Operator replaced check valves on intermediate clarifier pumps 1&2

June 2018

- 06 – Operator replaced tubing in monitoring wells 11 & 12
- 12 – Weber Septic on site for cleanout of pump stations 1-3, and floating sludge in clarifier, as well as operator replaced intermediate clarifier pumps 3 and 4 check valves
- 14 – Belwood Electric on site for install of new flow meter on effluent pump 5
- 20 – Weber Septic on site for haulage of biosolids from primary clarifier
- 21 – Operator programmed sewage pump station Sensaphone to page/call out and test functionality of all sewage pump station high level alarms

July 2018

- 04 – Operator replaced alum and micro feed metering pumps allowing for even dosage
- 05 – All chemical metering equipment to run off foot valves as well as switched alum from day tank to run directly from drums
- 12 – OCWA and RVA Engineers on site for backup power assessment
- 17 – Weber Septic on site for haulage of biosolids from primary clarifier
- 25 – Sewage pump station 1, pump 2 repairs with Weber Septic and Roberts Plumbing for broken discharge gasket
- 30 – Custom gasket installed and pump station back in full operation

August 2018

- 01 – Weber Septic on site for haulage of biosolids from primary clarifier
- 09 – Final clarifier pump 2 check valve replaced
- 22 – SPS 3 pump 2 flange gasket replaced with custom gasket
- 28 – Pump station 3 pump 1 pulled for gasket inspection, gasket replaced due to wear
- 31 – WWTP final effluent tank cleaned

September 2018

- 07 – Operator replaced final clarifier pump with new pump
- 11 – Roberts on site for SPS 2 pump 1 guide rail work
- 17 – Flowmetrix on site for annual flow meter calibrations

- 19 – Weber Septic on site for haulage of biosolids from primary clarifier as well as operator replaced flange gasket on pump 1 ball check valve at SPS 1
- 20 – Belwood Electric on site at SPS 2 for start float replacement
- 27 – Operator added a cable weight to SPS 4 float 1 to eliminate float from collecting grease causing alarms

October 2018

- 03 – SPS 1 – Top rail guide replaced on pump 1, lower rail guide replaced on pump 2
- 18 – Weber Service Technician on site for investigation to tile beds. Service Technician recommends flushing
- 25 – SPS 3 – Seals replaced on ball check on both pump 1 and pump 2 with factory seals
- 30 – Operator replaced piping on final clarifier pump 2 from the pump discharge to the existing check valve

November 2018

- 01 – SPS 1 – Weber Septic on site for haulage of biosolids from primary clarifier as well as effluent pump 4 line repaired
- 30 – SPS 5 – Belwood Electric on site for float replacement for lag pump. Repair corrected the call outs for Nov 24 and Nov 26

December 2018

- 04 – Operator rebuilt Microfeed metering pump 1 with a new diaphragm
- 14 – Effluent pump 5 screen cleaned by operator
- 19 – Effluent pump 1 discharge piping changed, cleaned subsurface disposal bed 1 distributor valve as well as Weber Septic on site for haulage of biosolids from primary clarifier
- 28 – Operator moved effluent pump 5 into slot for effluent pump 4

2.3 Call Back Summary

Below is a summary of call-ins during the reporting period.

January 2018

- 31 – High Level alarm for SPS 1

February 2018

- 19 – Unscheduled power failure

March 2018

- There were no after hour call backs for the reported period.

April 2018

- There were no after hour call backs for the reported period.

May 2018

- 05 – Unscheduled power failure to all Well houses like due to high winds

June 2018

- There were no after hour call backs for the reported period.

July 2018

- 22 – Go switch 2 failure, operator reset system

August 2018

- 22 – SPS 3 high level alarm, broken seal replaced on flange

September 2018

- 22 – SPS 4 high level alarm, float issue corrected, float weight ordered
- 23 – SPS 2 high level alarm, float issue corrected

October 2018

- 31 – Effluent pump overload alarm, line was repaired on November 1

November 2018

- 24 – SPS 5 high level alarm, operator reset system
- 26 – SPS 5 high level alarm, operator reset system, possible lag float issue

December 2018

- There were no after hour call backs for the reported period.

2.4 Community Complaints

Below is a summary of community complaints and public inquiries reported to OCWA staff.

January 2018

There were no community complaints reported to OCWA staff during this month.

February 2018

There were no community complaints reported to OCWA staff during this month.

March 2018

There were no community complaints reported to OCWA staff during this month.

April 2018

There were no community complaints reported to OCWA staff during this month.

May 2018

There were no community complaints reported to OCWA staff during this month.

June 2018

There were no community complaints reported to OCWA staff during this month.

July 2018

There were no community complaints reported to OCWA staff during this month.

August 2018

There were no community complaints reported to OCWA staff during this month.

September 2018

There were no community complaints reported to OCWA staff during this month.

October 2018

There were no community complaints reported to OCWA staff during this month.

November 2018

There were no community complaints reported to OCWA staff during this month.

December 2018

There were no community complaints reported to OCWA staff during this month.

3. Health & Safety

3.1 Incidents

- Number of Health and Safety Incidents Reported = **0**

2018	Health & Safety Incidents	
	# Reported	Details
January	0	n/a
February	0	n/a
March	0	n/a
April	0	n/a
May	0	n/a
June	0	n/a
July	0	n/a
August	0	n/a
September	0	n/a
October	0	n/a
November	0	n/a
December	0	n/a

3.2 Training

The following Safety topics/Training were provided to staff during the reporting period:

2018	Topics
January	<ul style="list-style-type: none"> • Frostbite & Hypothermia
February	<ul style="list-style-type: none"> • Leadership awareness
March	<ul style="list-style-type: none"> • Ergonomics and Stretching
April	<ul style="list-style-type: none"> • Respiratory Protection
May	<ul style="list-style-type: none"> • Prevention: The Key to Strengthening OCWAs Health & Safety Culture

June	<ul style="list-style-type: none"> • Ticks
July	<ul style="list-style-type: none"> • Health & Safety at Home
August	<ul style="list-style-type: none"> • Giant Hog Weed
September	<ul style="list-style-type: none"> • Preventing Back Injuries
October	<ul style="list-style-type: none"> • Mold & Mildew
November	<ul style="list-style-type: none"> • Distracted Driving
December	<ul style="list-style-type: none"> • Winter Driving Reminders

4. Proposed Alterations, Extensions or Replacements

4.1 Extracted from American Water October Report

The WWTP is currently not in compliance with the specific Environmental Compliance Approval (ECA) requirements for chemical storage. In order to achieve compliance with the ECA, a 900 L carbon tank and a 2,300 L alum tank, complete with spill containment Facilities, is required to be installed. In addition, a spare (stand-by) chemical metering pump needs to be purchased. It is worth investigation as to whether or not chemical vendors will deliver alum in bulk quantities as small as 2300L. In addition, it also needs to be considered if a tank of that size will allow for enough chemical inventories for the winter period AW Canada recommends an alternative ground cover around all effluent bed lateral caps. This will reduce damage caused by lawn mowers as well as maintaining clear access to them. New chemical pumps should be purchased. Pumps are obsolete so parts are hard to find and some repairs are required. WCECC should budget for new effluent pumps.

APPENDIX E

Mini Lakes WTS Condition Assessment (2018)

Internal Memo

To: Scott Craggs, Senior Operation Manager

From: Jose Casal, P.Eng. -Senior Water Process Engineer/PM
Hank Andres, P.Eng. - Senior Wastewater Process Engineer
Jason Younker, EIT -

cc: Karen Lorente, Regional Manager
David O'Connell, Business Development Manager
Lisa Babel, P.Eng. – Director of Project Planning and Delivery Group

Date: February 27, 2018

Project: Mini Lakes CE Support

Subject: Condition Assessment

1. Introduction and Background

The Mini Lakes community is located between the City of Guelph and the Township of Puslinch. The water and wastewater treatment services are provided on site. The Mini Lakes water and wastewater treatment systems is comprised of three production wells spread across the community, five sewage pumping stations, and a RBC wastewater treatment plant.

On December 14, 2017; OCWA Project Planning and Delivery Group (PPDG) completed a visual site inspection to the existing water and wastewater infrastructure on site with the purpose of assessing the condition of the water and wastewater treatment processes and equipment currently in place. In addition to the site visit, OCWA met onsite with representatives of the property management group to discuss relevant aspects of both treatment systems and gather additional information to support the assessment.

Statement of Confidentiality

This document has been developed by the Ontario Clean Water Agency in response to the Mini Lakes Condominium request. Information has been provided for the express review of the Mini Lakes and is not to be copied or submitted in any way or form to any person(s) or organization(s) without the written authorization of the President and CEO of the Ontario Clean Water Agency. All copyright and intellectual rights to the material provided remain in the ownership of the Ontario Clean Water Agency.

2. Facility Description

The Mini Lakes community has its own communal water and wastewater treatment systems which are owned by the Wellington Common Elements Condominium Corporation (Mini Lakes). The treatment facilities were operated by American Water (AW) until October, 2017 when the operations were assumed by the Ontario Clean Water Agency.

2.1. Water Treatment & Distribution Systems

Under the Safe Drinking Water Act (SDWA), the Mini Lakes water treatment system is classified as “non-municipal year-round residential system”.

The Mini Lakes communal drinking water supply system utilizes three groundwater production wells located within the Mini Lakes property (PW1, PW2 and PW3) and three corresponding pump-houses (PH1, PH2 and PH3). Table 1 provides a summary of the well pump capacity and design flows for each pump-house, as well as the flow requirements defined in the Permit to Take water (PTTW). A new Permit to take Water (PTTW) was issued in January 2017, consolidating all water taking into one permit, including well PW4, which is not part of the communal system.

Table 1: Mini Lakes Water Treatment System Flows

PUMP HOUSE	LOCATION	DISTRIBUTION SYSTEM ZONE	GROUNDWATER WELL	WELL PUMP CAPACITY (L/M)	DESIGN FLOWS (L/M)	PTTW (L/M)
PH 1	Northwest corner of the intersection of Ash Ave. and Lakeshore Dr.	Zone 1	Well # 1	80	90.6	136
PH 2	Northwest end of Cedarbush Cres.	Zone 2	Well # 2	110	136	182
PH3	Northeast corner of the intersection of Bullfrog Dr. and Water St.	Zone 3	Well # 3	205	222	222

The well pumps are each controlled by a pressure switch on the discharge side of the treatment system. When the pressure drops below the low-pressure setting at the switch, the pump is turned on. Conversely, when the pressure reaches the high-pressure switch setting, the pump is turned off.

Each of the three pump-houses contains an identical treatment process, with only minor variations in size or number of equipment units. The water is pumped from each well via submersible pump to each respective pump station, where the water treatment equipment is housed. The process flow for the system is as follows:

- Well Supply/Pump

- Primary Disinfection within Contact Pipe using Sodium Hypochlorite (Chlorine)
- Multi-Media Filtration (MMF)
- Pressure Retention Tanks (PRT) and Distribution

The distribution system at Mini Lakes, although fully interconnected across the development, is divided into three separate zones. As shown in **Table 1** Zone 1 is supplied by PH1, Zone 2 is supplied by PH2, and Zone 3 is supplied by PH3.

2.2. Wastewater Collection & Treatment System

The wastewater is collected through gravity drainage and pumped through forcemains from five pump stations discharging into a sewage treatment plant (with dual trains operating in parallel) with a rated capacity of 158 m³/day. The facility operates under the Amended Environmental Compliance Approval (ECA) No. 8154-AR4J2T issued in September 18, 2017.

The wastewater treatment system includes a primary settling tank, rotating biological contactors, intermediate clarifier, a denitrification tank, final clarifiers and an effluent pump chamber housed within the structure, also included:

- A concrete common primary settlement tank with cover, approx. 8.1 m wide x 8.5 m long x 1.73 m liquid depth discharging (via an outlet pipe to each treatment train) to the rotating biological contactors, complete with gear motor and drive mechanism.
- Two rotating biological contactors (RBCs) with 2.35 m diameter rotor, each equipped with low profile fixed baffles and four zones per rotor, and providing approx. 4,179 m² of bio-support media area.
- Two 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 denitrification tanks, approximately 5.06 m x 3.6 m, each consisting of 4,704 m² of submerged rigid media, complete with an adjustable flow distribution box.
- One 900 L capacity chemical tank and chemical metering pump capable of feeding a carbon source to the denitrification tanks complete with spill containment facilities.
- A 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.
- Two (2) hopper bottom 3 m x 3.6 m 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) 75 mm diameter forcemains, one forcemain to each absorption cell of the 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 18 m long and 0.6 m wide, with a hollow inverted semi-circular chamber housing a 25mm PVC pressurized pipe with 3.2 mm holes spaced at 1m c/c) per zone, for a total of approx. 864 m of

pipng per cell (total of approximately 4,320 m 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,

The amended ECA, proposed the following work/modifications to the existing wastewater treatment system:

- Upgrades to primary clarifier as follows:
 - Installation of a partition wall separating the chamber in 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 influent baffle plate at the tank inlet.
 - An outlet weir box and baffle plate at the tank outlet.
 - Sludge recirculation piping to the inlet chamber and sludge removal piping.
- Modifications to the inlet of the denitrification tank to allow for crossover between trains for redundancy and option to operate on one RBC train and two tertiary treatment trains.
- One (1) new effluent pump and discharge piping to be located in the effluent pump chamber to recirculate treated effluent back to the inlet of the primary clarifier.
- A 3.5 m x 4.12 m chemical storage building housing the following:
 - A 900 L capacity chemical storage tank to provide a carbon source and three (3) chemical metering pumps (one (1) spare); all located within secondary containment.
 - A 2,300 L capacity bulk chemical storage tank for phosphorus removal and three chemical metering pumps (one spare); all located within secondary containment.
 - An eyewash/shower system.
- All other controls, electrical equipment, instrumentation, pumps, piping, valves and appurtenances essential for the proper operation of the aforementioned sewage works.

The facility must comply with effluent concentration limits for various parameters. The effluent limits are listed below in Table 3.

Table 2: Mini Lakes Wastewater System Effluent Quality

PARAMETER	ANNUAL AVERAGE CONCENTRATION LIMIT (mg/L)
BOD ₅	20
TSS	20
Nitrate Nitrogen	8
Total Phosphorus	1

3. Site Observations

In December 14, 2017, the Ontario Clean Water Agency visited Mini Lakes and conducted a visual inspection to assess the current condition of the water and wastewater facilities. The following observations were noted:

3.1. Water Treatment

- **Equipment & Components:** In general, equipment is dated and some of the main equipment and components are due for upgrade (i.e. pressure gauges, chemical dosage pumps, pressure tanks, etc.)
 - As noted in the latest MOECC inspection report, installing auto switchover on chlorine pumps at each well house is required. This has not yet been completed.
 - There is no backup power. In the event of a power failure, the water will not be treated according to applicable provincial standards, resulting in water which may be unsafe to consume.
 - The three systems operate based on constant pressure. However the existing pressure tanks are not able to build sufficient pressure for sustained operation and hence the well pump operates in a continuous on-off mode.
 - The three pump-houses are equipped with a Multi-Media Filter (MMF) manufactured by the Water Group (WG 1465). The filters are composed of four layers of media (anthracite, silica sand, coarse garnet, and fine garnet). As indicated by the operation staff and as included in the 2006 Mini Lakes Engineering Evaluation Report prepared by Stantec, filtration is not required by regulation. However the MMF systems were installed for aesthetic improvement of the water quality due to potentially elevated levels of iron in the water supply. There are no records indicating that the existing MMF filters have been serviced and/or that the media has been replaced/regenerated.
- **Water Quality:** There are currently no complete raw water quality scans to review. However, the limited data available appears to indicate that the raw water is of good quality. At present there are no records indicating the presence of iron and/or manganese in the raw groundwater neither monitoring/sampling program for these parameters is currently in place.
- **Water Demand Fluctuation:** The continuous flow fluctuations result in improper chlorination putting the system at risk to not comply with the regulatory requirements. There is no remote access during this event resulting in at minimum a 15 minutes response delay until an operator is able to normalize the conditions. Until the system is upgraded, continuous operational oversight is recommended.
- **Disinfection:** The chlorine dosage pumps are very old and appear to be unable to provide the required chlorine dosage in an accurate and/or effective manner. The free chlorine residual concentrations fluctuate significantly resulting in a compliance issue due to the inability to meet the disinfection requirements. The auto switchover on chlorine pumps has not yet been installed.
- **Control System:** There is no SCADA system or any other electronic system for record keeping. All records are kept manually. A proper data recording system must be implemented.

- **Safety/Housekeeping:** The three existing pump houses are cramped with limited space for day to day operations and maintenance work if required.
- **Water Distribution System:** There is no reservoir, standpipe or any other type of water storage in place. Consequently, there is no fire protection in place.
 - Based on the available records, there is a significant difference between the drinking water flows and the sewage flows. It appears that the average sewage flows are less than the drinking water flows, which could indicate potential leakages within the distribution systems. A leak detection study is recommended.

3.2. Wastewater Treatment

- None of the proposed works in the Amended ECA No 8154-AR4J2T (dated September 18, 2017) have been completed.
- **Historian/SCADA:** Historian has only 72 hrs of data. Site requires frequent checking since computer failure (including historian) does occur. SCADA system has no control and can only be used for monitoring and manual data recording of system information.
- **Emergency Power:** No emergency back-up power for treatment plant or sewage pumping stations.
- **Safety:** Emergency Spill kit is isolated and would be difficult to access in an emergency
 - Entry ramps are a serious slip hazard, especially in winter conditions
 - Ventilation of building may be insufficient for proper air exchanges and circulation
- **Two train RBC treatment plant:**
 - Primary clarifier: No partition in primary clarifier.
 - Two Rotating Biological Contactors: Alum is being added before RBCs for phosphorus removal, may be decreasing effectiveness of biological growth. Distribution of alum may not be a 50/50 split between the two trains and there is not currently an effective way to control the alum dosage split.
 - Two intermediate clarifiers: Micro C mixer is not working properly. Results in settling/separation of micro C mixture and inconsistent supplemental carbon dosage to the anoxic tanks. Currently, the water hose is used to periodically mix up the Micro C solution.
 - Chemical pumps are old and parts are no longer available.
 - High flow results in sloughing of biomass from RBC and buildup of sludge in chambers.
 - Chemical tanks (Micro C and alum) are 200 L instead of 2300 L and 900 L as specified in the ECA.
 - Two denitrification chambers: Build-up of sludge in clarifiers has to be removed manually (vacuumed out). Draining of the trains is not possible. Removed sludge will be mostly liquid, meaning that it is expensive to haul away (paying for water).
 - Pump chamber with six pumps (5 duty, 1 spare)

- Five weeping tile beds: Tile beds were supposed to have been recently repaired; however, given the weather conditions the status of this repairs and the tile bed itself could not be verified.
- **Sewage Collection System (Pumping Stations)**
 - Five sewage pump stations (PS): Pumps used in PS's were not described as high quality i.e. Mini-Lakes maintenance staff described them as knock-off brand pumps that were cheap to purchase. Longevity and reliability of pumps is therefore questionable
 - Two pumps in each station except #5 that only has one. Rails damaged in PS 5
 - PS 1, 3, and 5 have 2 HP pumps. PS 3 has very limited space for maintenance/repair operations
 - PS 2 and 4 have 5 HP pumps

4. Recommended Works

The following tables outline the recommended works that should be carried out in order to bring the Mini-Lakes facilities to a proper operational condition. The table is divided into four categories, the issues identified as problems within the system, the work recommended to resolve them, the priority and the time-line in which they should be resolved.

Table 3: Mini Lakes Water Treatment & Distribution System recommended work

PRIORITY	IDENTIFIED ISSUE	ISSUE CLASSIFICATION	RECOMMENDED WORK	TIME LINE
1	Lack of raw water quality	Compliance	Complete raw water scan	Start immediately with monthly sampling for at least one year
2	No SCADA system for record keeping, manual record keeping used	Operational/Compliance	Install proper historian, data logger or any other automatic data record keeping system	Within next 6 months
3	The existing chlorine disinfection system is not reliable. During normal operations, it causes numerous fluctuations in the free chlorine residuals.	Compliance/Operational	Upgrade system for greater remote operation and stability.	Immediately
4	Chlorine dosage pumps automatic switchover	Compliance	Install auto-switchover on chlorine pumps	Immediately
6	System operation is mostly manual with no remote capabilities, increasing operator response time should emergencies or operational issues arise.	Operational	Upgrade the system; otherwise consider dedicating one operator on permanent basis to address both water and wastewater treatment system.	Immediately
6	No back-up power – water unsafe/not available during power outage	Operational/Compliance	Installation of standalone back-up power for each pump-house	Immediately
7	Based on initial assessment there is greater water produced than sewage collected. This may indicate a leak in the distribution system.	Operational	Perform leak detection study for distribution system	Immediately
8	No fire protection	Operational/H&S	Upgrading the system including fire hydrants and sufficient fire storage (reservoir) should be considered	1-2 years
9	Chlorine dosage pumps are old and appear to provide inaccurate dosage. Resulting in Chlorine	Operational/Compliance	Replace chlorine dosage pumps.	1 year

PRIORITY	IDENTIFIED ISSUE	ISSUE CLASSIFICATION	RECOMMENDED WORK	TIME LINE
10	concentration fluctuations. Old equipment (pressure tanks, dosage pumps, pressure gauges, etc.).	Operational	Upgrade/replace/rehabilitate older equipment as needed	1 year
11	Pressure tanks are insufficient in size to maintain pressure for prolonged period.		Upgrade/expand pressure tanks, especially if the 3 zone distribution system will be amalgamated and the entire water is supplied from one single groundwater well.	1-2 year
12	All 3 pump-houses are equipped with MMF filters. Filter maintenance/service/replacement history is required to determine likely replacement schedule	Operational	Assess presence of iron/manganese and any other parameters requiring the presence of these filters.	1 year
13	Pump houses have limited space. Lack of space, limits maintenance operations and space for upgrades.	Housekeeping	Consider upgrading the building.	1-2 years
14	Three (3) separate distribution systems operate independently of each other. Single closed connection separates three zones.		Combine systems into one system, will allow for improved stability in terms of pressure. Consider the possibility of single storage site for all three systems.	2-3 years

Table 4: Mini Lakes Wastewater Treatment & Collection System Recommended work

PRIORITY	IDENTIFIED ISSUE	ISSUE CLASSIFICATION	RECOMMENDED WORK	TIME LINE
1	<p>None of the proposed works in the ECA (June 1, 2016) have been completed</p> <p>Primary and intermediate clarifiers have to be vacuumed out, while filled with sewage, to remove sludge. Process is very inefficient.</p> <p>Chemical dosing pumps are old and may soon require replacement</p> <p>Micro C chemical addition allows for settling and inconsistent dosing.</p>	Compliance	<p>Complete all proposed works</p> <p>Partition of primary clarifier into 2 compartments. Including baffle plates, sludge recirculation pumps/piping to the inlet chamber, and sludge removal piping.</p> <p>Modify denitrification tank to allow crossover between trains</p> <p>New pump to recycle effluent back to inlet of primary clarifier</p> <p>Separate chemical storage building to store 900L and 2,300L tanks with metering pumps and eyewash station</p>	1-3 years
2	Alum addition before RBCs may decrease biological growth due to phosphorus limitations	Operational	Alum dosage should be monitored if RBC fixed film growth or biological treatment performance deteriorates	N/A
3	Alum addition is not equalized between both tanks.	Operational	Rework chemical tubing/valving to ensure equal split of alum between the treatment trains	1 year
4	Historian has limited memory (72 hrs.), limited SCADA accessibility/control. Manual data recording.	Operational	Upgrade SCADA and historian	1-2 years
5	Weeping tile beds condition is presently unknown	Compliance/Operational	Inspection/assessment of tile bed for the possibility for repair.	1 year
6	High flows can cause unwanted sloughing of biomass and accumulation of sludge in intermediate clarifiers.	Operational	Addition of equalization tank for variable flow conditions	4 years+
7	No back-up power	Operational	Installation of single back-up power for water & waste water facilities	2-3 years
8	Entry ramp is a slip issue	H&S	Rebuild ramp for greater traction and decreased slope	1 year

PRIORITY	IDENTIFIED ISSUE	ISSUE CLASSIFICATION	RECOMMENDED WORK	TIME LINE
9	Possible ventilation issue		Assess ventilation system Increase air cycling	1-2 years
10	Emergency supplies are difficult to access	Operational	Relocate emergency supplies	1 year
11	Pumps utilized in sewage pumping station were identified lower quality.	Operational	Replace as needed with high quality pumps for long term use	5 years+
12	Sewage pumping station 5 has damaged rails and only a single operating pump	Operational	Repair rails and add second pump	1 year
13	Sewage pumping station 3 has very limited space for maintenance and repair operations	Operational, H&S	No recommendation at this time	

5. Next Steps

The current conditions of both water and wastewater treatment systems do not guarantee a safe and reliable operation of the system nor compliance with the applicable regulatory requirements currently in place.

In general, most of the assets currently in place (especially the main process equipment and components) have surpassed its life expectancy and in some cases its day-to-day operation is unreliable. Under such circumstances, it is critical that a replacement program be started in order to prevent costly emergency repairs or compliance issues that could put at risk the health and safety of the residents of Mini Lakes.

To capture the magnitude of these upgrades in better detail, developing a “Class 5” cost estimate, and a Comprehensive Capital Plan (CCP) is recommended.

APPENDIX F

Mini Lakes Trade-Off Study (2018)



**Wellington Common Elements
Condominium Corporation
(WCECC) #214**

**Sewage Treatment System
Trade-Off Study**

SUBMITTED BY

Ontario Clean Water Agency
2225 Erin Mills Parkway, Suite 1200
Mississauga, ON L5K 1T9

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STATEMENT OF CONFIDENTIALITY

OCWA's Report to
Wellington Common Elements Condominium
Corporation (WCECC) #214 for the Sewage Treatment
System Trade-Off Study

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Appendix A: Environmental Compliance Approval (No. 8154-AR4J2T) September 18, 2017

Appendix B: STP General Arrangement Drawing (A1-TK2248-8018)

Appendix C: LoF and CoF

Appendix C: Capital Cost Estimates Breakdown

1 Introduction

The Mini Lakes community is located between the City of Guelph and the Township of Puslinch. Water supply and wastewater treatment services are provided on-site by the community. The Mini Lakes water and wastewater treatment systems are comprised of three production wells spread across the community, five sewage pumping stations, and a RBC wastewater treatment plant.

The Mini Lakes community has its own communal water and wastewater treatment systems which are owned by the Wellington Common Elements Condominium Corporation (Mini Lakes). The treatment facilities were operated by American Water (AW) until October, 2017 when the operations were assumed by the Ontario Clean Water Agency.

2 Existing Sewage Treatment System

2.1 Treatment Process Description

In general, the Mini Lakes Sewage Collection and Treatment System is composed of five, one Sewage Treatment Plant (STP) and a Subsurface Disposal System (SDS) composed of 5 Tile Beds.

The wastewater is collected through gravity drainage and pumped through forcemains from five Sewage Pumping Stations (SPS) discharging into the Sewage Treatment Plant (STP). The treated effluent is ultimately disposed into the environment via a Subsurface Disposal System (SDS) composed of five Absorption Cells (Tile Beds). The existing system operates under the Amended Environmental Compliance Approval (ECA) No. 8154-AR4J2T issued in September 18, 2017 (Appendix A).

With a rated capacity of 158 m³/day, the existing STP features the following components:

- A common, concrete, primary settlement tank with cover, approx. 8.1 m wide x 8.5 m long x 1.73 m liquid depth discharging (via an outlet pipe to each treatment train) to the rotating biological contactors, complete with gear motor and drive mechanism.
- Two rotating biological contactors (RBCs) with 2.35 m diameter rotor, each equipped with low profile fixed baffles and four zones per rotor, and providing approx. 4,179 m² of bio-support media area.
- Two bottom hopper 3 m x 3.6 m intermediate clarifiers per treatment train, complete with inlet and outlet weir, sludge and scum transfer equipment and pumping systems.
- Two denitrification tanks, approximately 5.06 m x 3.6 m, each consisting of 4,704 m² of submerged rigid media, complete with an adjustable flow distribution box.
- One 900 L capacity chemical tank and chemical metering pump capable of feeding a carbon source to the denitrification tanks complete with spill containment facilities.
- A Chemical feed system comprising of one 2,300 L capacity polyethylene chemical storage tank and metering pump (with standby pump) capable of feeding approx. 1.5 L/h of alum into the last stage of the rotating biological contactor rotor, complete with spill containment.

- Two bottom hopper 3 m x 3.6 m 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 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 75 mm diameter forcemains, one forcemain to each tile bed of the SDS.

A copy of the general arrangement drawing (A1-TK2248-8018) is included in Appendix B.

The existing SDS is comprised of five shallow buried trench absorption cells (tile beds), each cell comprising of six zones with eight laterals (each lateral located within a trench 18 m long and 0.6 m wide, with a hollow inverted semi-circular chamber housing a 25mm PVC pressurized pipe with 3.2 mm holes spaced at 1 m c/c) per zone, for a total of approximately 864 m of piping per cell (total of approximately 4,320 m of piping), and distribution valve assembly and manifold. Figure 2-1 illustrates the main process groups/areas of the existing Mini Lakes sewage collection and treatment system.

2.2 Regulatory Requirements

Based on the provisions in the currently ECA, the Mini Lakes Sewage Treatment System must comply with effluent concentration limits for the parameters listed in Table 2-1.

Table 2-1: Effluent Compliance Limits for the Mini Lakes STP

PARAMETER	FREQUENCY	EFFLUENT COMPLIANCE LIMIT
Carbonaceous Biological Oxygen Demand (CBOD ₅)	Monthly	20 mg/L
Total Suspended Solids (TSS)	Monthly	20 mg/L
Total Phosphorus (TP)	Monthly	1 mg/L
Nitrate – Nitrogen (NO ₃ -N)	Monthly	8 mg/L

According to the terms and conditions in the currently ECA, non-compliance is deemed to have occurred when the **annual average concentration** during the calendar year of any of these parameters exceeds the stated compliance limit.

To assess compliance with the above noted limits, there is an effluent monitoring and sampling program (monthly frequency) in place as included in Schedule C (Table 1) of the current ECA. In addition, Mini Lakes is also required to monitor and sample for groundwater (10 monitoring wells) and surface water (5 surface stations) on a quarterly basis as stated in Schedule C (Table 2 and Table 3) of the current ECA.

Mini Lakes is also required to provide Quarterly Reports for the Mini Lakes Sewage Collection and Treatment System (WWTS) as stated in Section 2.4 of the 2014 Operations and Maintenance agreement currently in place between Mini Lakes and the Township of Puslinch. These quarterly reports are required to assess the facility's performance during the period of reference (quarterly) and provide recommendations to address any performance or potential non-compliance issues that occurred or might occur as a result of the facility's performance.

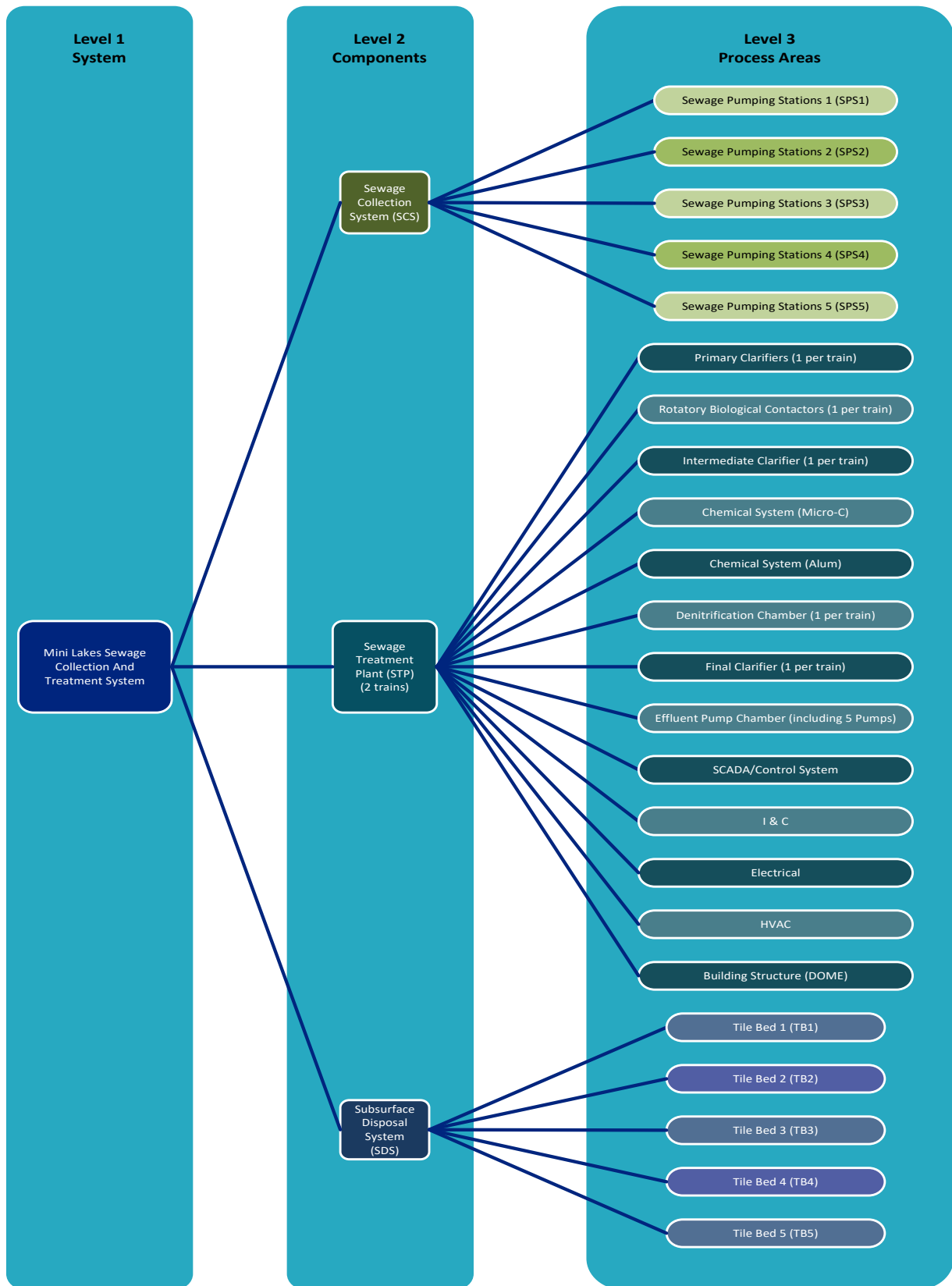


Figure 2-1: Mini Lakes Sewage Collection and Treatment System Grouped by Process Areas

3 Performance Review

Based on the compliance parameters (Table 2-1) stated in the current ECA, an overall performance analysis from the compliance (compliance parameters only) standpoint was completed. It should be noted that the discussion and interpretations made in the subsequent sections (3.1 to 3.4) express only considerations about generic performance levels achieved by similar treatment processes documented in available technical literature. The analysis made to all compliance parameters (CBOD₅, TSS, NO₃-N and TP) are based on historical operational data (effluent quality) compiled from 2012 to present.

More importantly, no definitive or representative conclusions can be drawn about the trends and performances discussed in the sections below (3.1 to 3.4) due to the following circumstances:

- Individual annual removal performance for each compliance parameters was impossible to assess due to the lack of influent (incoming raw sewage) quality data.
- The accuracy and/or representativeness of the samples and operational data collected prior to OCWA took over the facility operations (October 2017) could not be confirmed.
- The information provided in operational records prior October 2017, is somewhat limited and/or unclear as to what standard operating procedures (SOP) were followed to manage the day to day operation of the facility.

3.1 Carbonaceous Biological Oxygen Demand (CBOD₅)

Based on the literature¹, a properly designed Rotatory Biological Contactor (RBC) system should produce an effluent with a BOD concentration between 15-30 mg/L. If designed for both BOD removal and nitrification, the BOD levels in the treated effluent could be expected to be as low as 7 to 12 mg/L. The literature² also reports that the RBC's process performance is impacted by several factors such as the rotational speed, organic and hydraulic loading rates, retention time, biofilm support media, staging, temperature, influent wastewater characteristics, biofilm characteristics, dissolved oxygen levels, effluent and solids recirculation, step-feeding and medium submergence.

Figure 3-1 illustrates the historical monthly and annual CBOD₅ levels in the treated effluent as compared to the compliance limit currently in place (20 mg/L).

¹ Metcalf & Eddy, Inc. (2003). Wastewater engineering: treatment and reuse (fourth edition). Boston :McGraw-Hill

² Cortez, S., Teixeira, P., Oliveira, R. et al. Rotating biological contactors: a review on main factors affecting performance. Rev Environ Sci Biotechnol (2008) 7: 155. <https://doi.org/10.1007/s11157-008-9127-x>

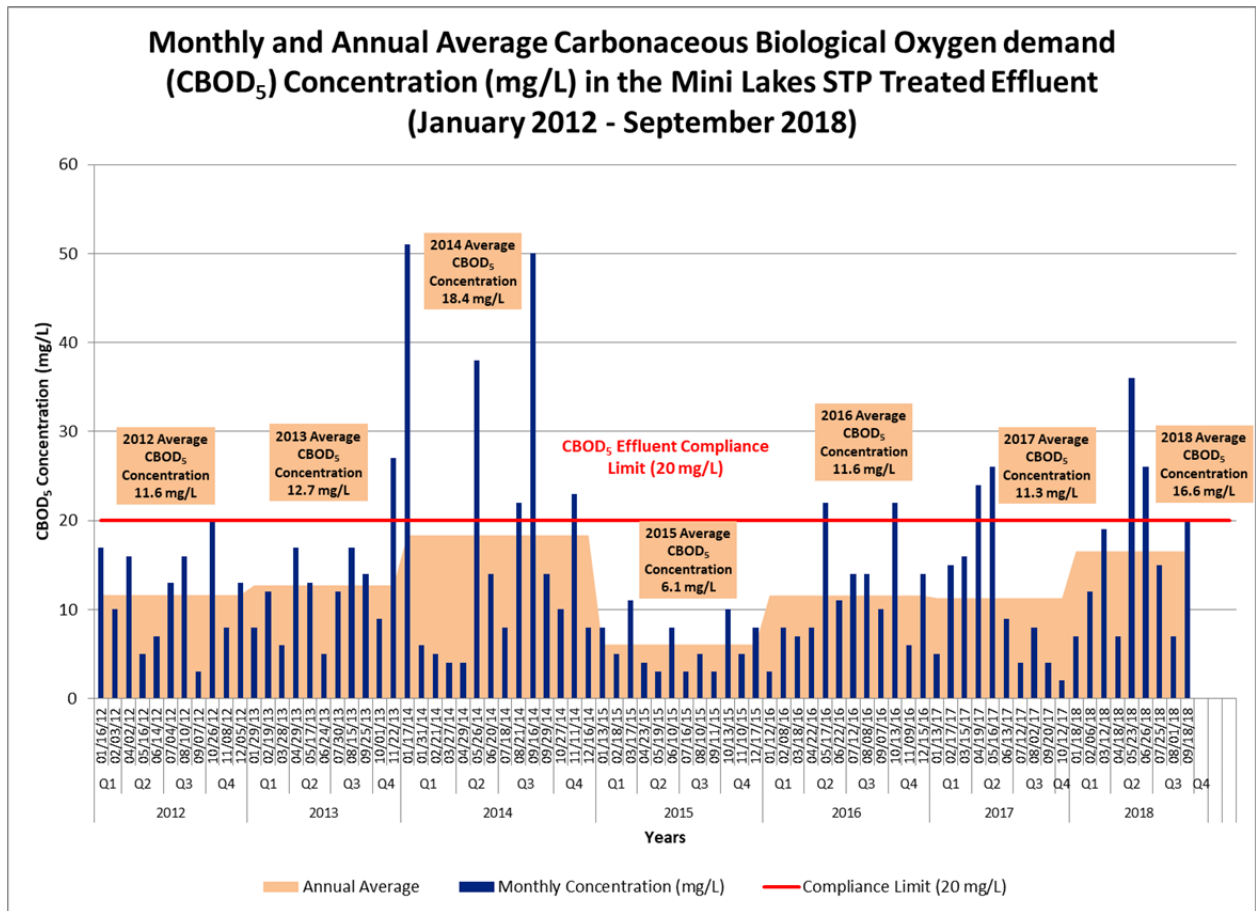


Figure 3-1: Historical CBOD₅ Levels in the Treated Effluent of Mini Lake STP (2012-2018)

Based on the information displayed in Figure 3-1, the following could be concluded:

- Although some individual monthly exceedances of the CBOD₅ limit (20 mg/L) have been reported (i.e. November 2013, January 2014, May 2016, May 2017, etc.); the existing Mini Lakes STP has always been able to meet the compliance requirements for CBOD₅ (annual concentration equal or less than 20 mg/L).
- 2014 appears to be the most critical year with an annual average CBOD₅ concentration of 18.4 mg/L.
- In 2015, a substantial drop in the effluent’s CBOD₅ levels was experienced (approximately 67% decrease as compared to 2014 levels). Based on such remarkable performance, it is suspected that the existing treatment system was either optimized and/or upgraded in order to enhance the facility’s removal performance; however there is no evidence that could confirm this assumption.
- In 2016 the annual average CBOD₅ levels in the treated effluent increased almost 90% as compared to 2015 (from 6.1 to 11.6 mg/L); which remained fairly steady throughout 2017.
- Opposite from 2016 and 2017, a substantial increase in the average CBOD₅ concentration (16.6 mg/L) in the treated effluent has been observed during the first three quarters of 2018, which represents a 40% increase from 2017 and/or a 172% increase from 2015.

- Although majority of 2018’s monthly CBOD₅ level in the treated effluent up to the end of the third quarter are below the compliance limit (20 mg/L); the exceedances reported for May and June together with the near-exceedance reported in September have significantly impacted the average to date.
- During a recent site visit (October 4, 2018) to the facility, it was observed that the biofilm attached to the RBC’s disks did not look as healthy and copious, which may be negatively impacting the CBOD₅ removal performance.
- Should the individual monthly CBOD₅ levels recorded during the fourth quarter (October – December) of this year (2018) significantly exceed the above noted ECA limit (i.e. similarly to 2013’s Q4), compliance with the regulatory requirements could be jeopardized.

3.2 Total Suspended Solids (TSS)

Similarly to the CBOD₅, non-compliance is deemed if the TSS’s **annual average concentration** during the calendar year exceeds the compliance limit (20 mg/L) stated in the ECA. Figure 3-2 illustrates the historical monthly and annual TSS levels in the treated effluent as compared to the compliance limit currently in place.

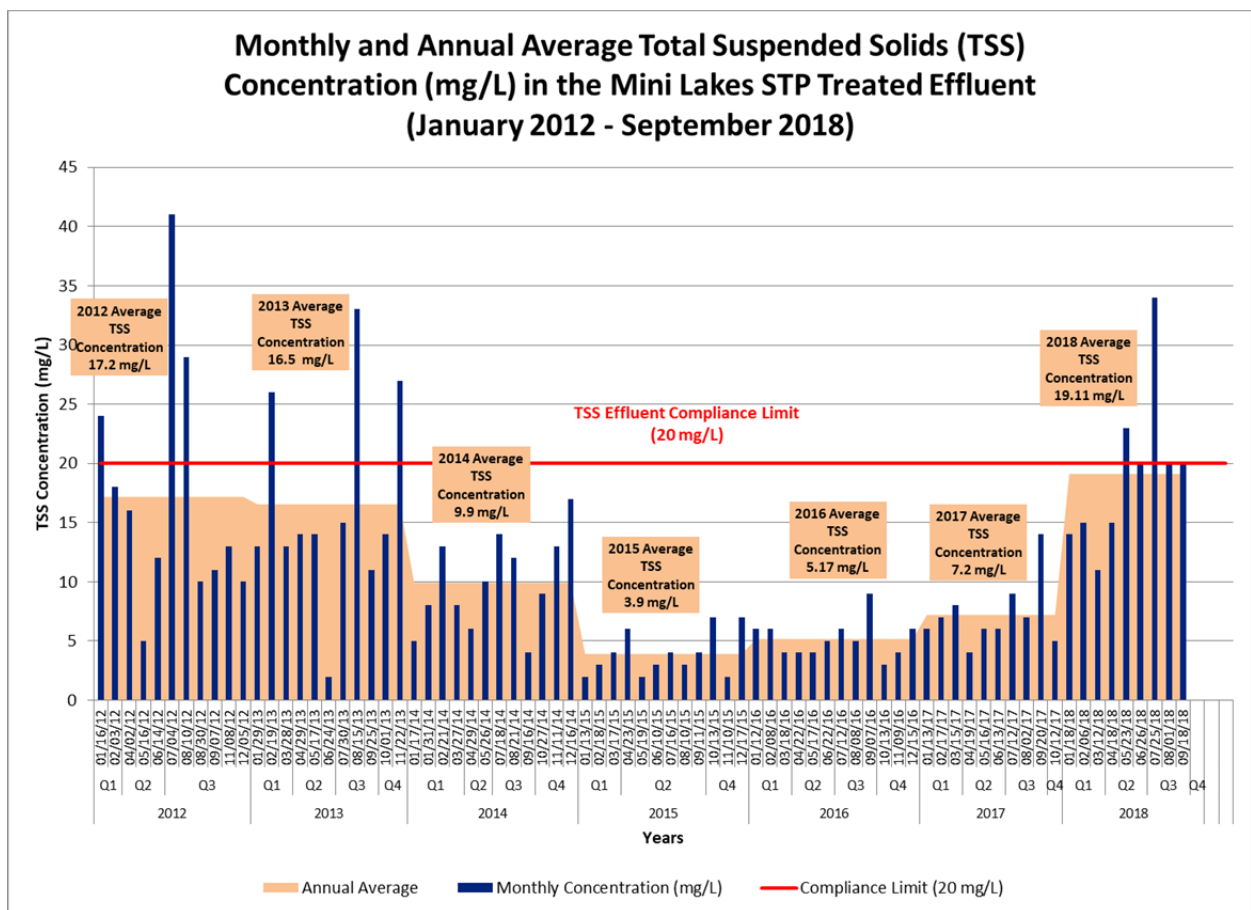


Figure 3-2: Historical TSS levels in the Treated Effluent of Mini Lake STP (2012-2018)

Based on the information displayed in Figure 3-2, the following could be concluded:

- The Mini Lakes STP has been always operated in compliance with the regulatory requirements for TSS (annual average concentration equal or less than 20 mg/L).
- Although between 2012 and 2015 (i.e. January 2012, July 2013, etc.) some individual monthly exceedances in the effluent's TSS levels were experienced; the annual average concentration featured a downward trend.
- Opposite to the 2012-2015 trend, the TSS levels in the effluent has consistently increased from 2016 to present, reaching critical levels in 2018.
- Similarly to the CBOD₅, the effluent TSS levels reported in 2015 are significantly low as compared to the rest of the years in the period of reference (2012-2018). Regretfully, there is no information supporting the rationale of such remarkable performance.
- TSS levels in the treated effluent have been consistently high throughout 2018, with a record high in July (34 mg/L).
- At the end of the third quarter, the average TSS concentration (19.9 mg/L)³ is just below the compliance limit stated in the ECA (20 mg/L).
- Should the fourth quarter results exceed the compliance limit, the Mini Lake sewage treatment system is at risk to fail compliance with the TSS regulatory requirements.

To best understand solids are managed at the Mini Lakes STP, the following operational circumstances should be noted:

- The Mini Lakes Sewage Treatment Plant (STP) does not have primary treatment capabilities, only a primary settling tank, so most of the gross solids (i.e. rags and other debris) are not removed and disposed-off prior to the effluent entering the plant, which cause significant process upsets.
- Sludge from both the intermediate and final clarifiers are pumped (returned) back to the common primary clarifier. Excess sludge build-up is only removed from the primary clarifier.
- Usually, the primary clarifier is desludged (sludge pumped out and disposed away) by a certified hauler approximately every 6 weeks. As part of the standard operating procedure in place, the sludge blanket in the primary settling tank is frequently monitored and usually when the depth reaches 0.76 m (30 inches) a removal order is placed.
- Based on the original design drawings, the primary clarifier installed at Mini Lakes WWTP was designed with a capacity (including sludge) of 92.8 m³ and with a sludge storage time of 30 days (drawing A1-TK2248-8018 in Appendix B).

³ OCWA Operations and Maintenance Quarterly Report for the Mini Lakes Waste Water Treatment System (July 2018 – Sept 2018) issued October 19, 2018.

- Upon OCWA took over the facility operations, issues with the check valves in the existing sludge return pumps were detected. The valve malfunctioning caused excess accumulation in both the intermediate and final clarifiers resulting in a significant amount sludge floating on the surface of these clarifiers (intermediate and final).
- As confirmed by the OCWA operation staff, the check valves have been replaced resulting in less sludge accumulation in these two process units. Although in lesser scale, floating sludge continues reoccur occasionally despite the repair made.
- At present, a substantial amount of solids are carried-over throughout the entire treatment process resulting in a net sludge built-up at the effluent pump chamber.
- The sludge accumulated in the effluent pump chamber was removed and hauled away from site at the end of August 2018. Based on information (unconfirmed) provided by the hauler, the previous operating authority usually cleaned the effluent pump chamber once year around spring time.

Inevitably, a significant amount of the sludge accumulated inside the effluent pump chamber is pumped out into the subsurface disposal system (5 tile beds) causing limitations in the use and performance of these tiles beds, as confirmed during a site walkthrough (October 4, 2018). The current conditions of the existing subsurface disposal system are further discussed in Section 3.5

3.3 Nitrates (NO₃-N)

In terms of compliance, the annual average TSS concentration during the calendar should not exceed 8 mg/L (NO₃-N compliance limit). Figure 3-3 illustrates the historical monthly and annual NO₃-N levels in the treated effluent as compared to the compliance limit stated in the current ECA.

Based on the information displayed in Figure 3-3, the following could be concluded:

- Despite some individual NO₃-N monthly exceedances between 2012 and 2014 (i.e. January 2012, July 2013, etc.) were experienced, the Mini Lakes STP always complied with the regulatory requirements for NO₃-N (annual average concentration equal or less than 8 mg/L).
- During the same period (2012-2014), a steady trend in the annual average NO₃-N level in the treated effluent was observed.
- In 2015, the levels of NO₃-N found in the effluent were also the lowest similarly to CBOD5 and TSS. Regretfully, there is no information supporting the rationale of such remarkable performance.
- Between 2016 until present, the average annual NO₃-N concentration in the treated effluent displays a consistent upward trend opposite to the trend experienced between 2012 and 2014.

- Up to end of September 2018 (third quarter), the average NO₃-N concentration in the treated effluent was estimated at 8.36 mg/L⁴; which already surpasses the compliance limit stated in the ECA (8 mg/L). The current circumstances suggest that the system may be at the verge of failing compliance.

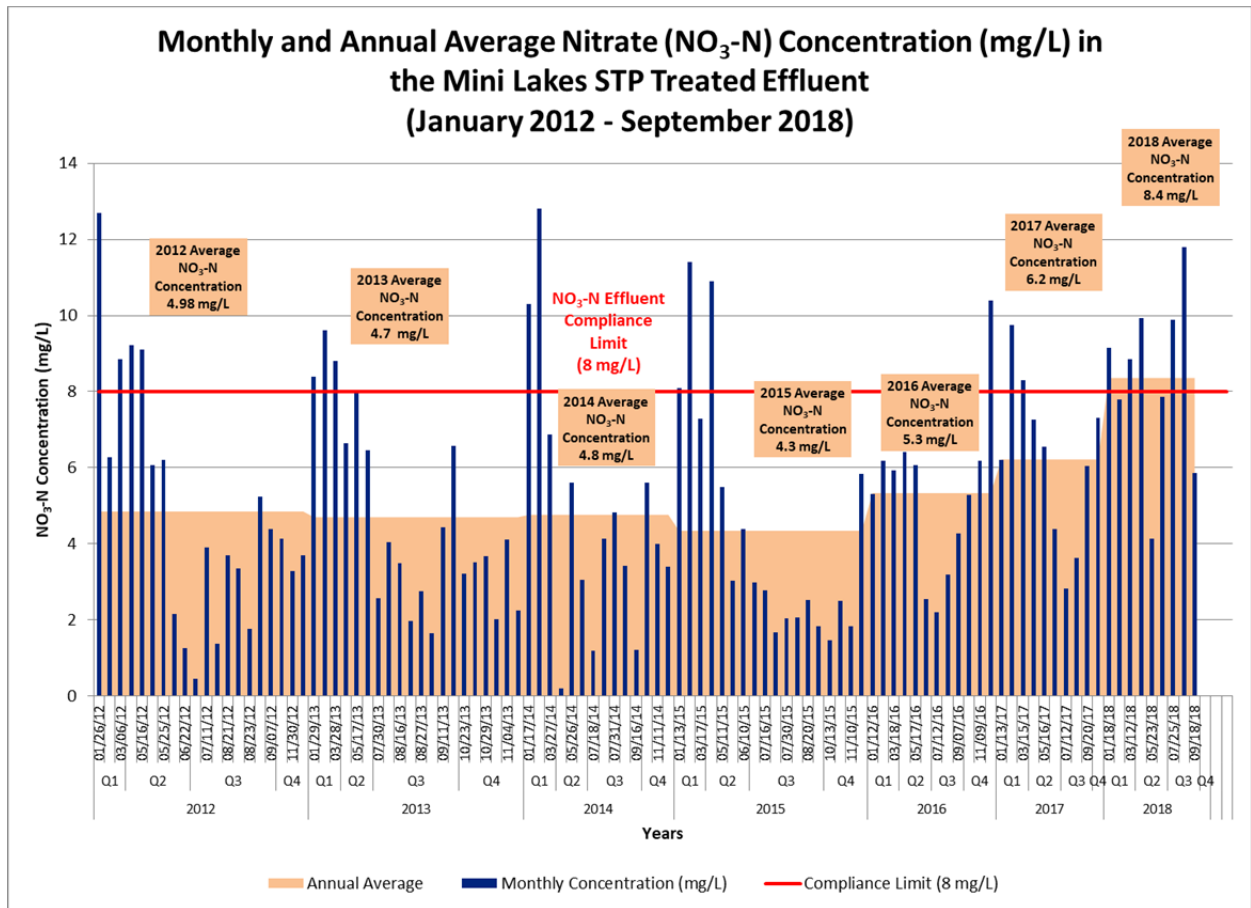


Figure 3-3: Historical NO₃-N Levels in the Treated Effluent of Mini Lakes STP (2012-2018)

In general, the existing treatment system (specially the biological denitrification portion) struggles to effectively achieve and maintain the nitrate concentration in the treated effluent below the established compliance limit in the ECA (8 mg/L).

Temperature and Dissolved Oxygen (DO) levels are determining factors for nitrogen removal. It should be noted that denitrification occurs only under anaerobic or anoxic conditions, when the DO concentration is less than 0.5 mg/L (ideally less than 0.2 mg/L).

⁴ OCWA Operations and Maintenance Quarterly Report for the Mini Lakes Waste Water Treatment System (July 2018 – Sept 2018) issued October 19, 2018.

When oxygen levels are depleted, nitrate becomes the primary oxygen source for microorganisms (denitrifying bacteria) to metabolize. More importantly, denitrifying bacteria are facultative organisms which mean they can use either dissolved oxygen or nitrate as an oxygen source for metabolism and oxidation of organic matter. Given the consistently high DO levels averaging 7.8 mg/L, poor nitrate removal performance is anticipated.

3.4 Total Phosphorus (TP)

In terms of compliance, the annual average TP concentration during the calendar should not exceed 1 mg/L (TP compliance limit). Figure 3-3 illustrates the historical monthly and annual NO₃-N levels in the treated effluent as compared to the compliance limit stated in the current ECA.

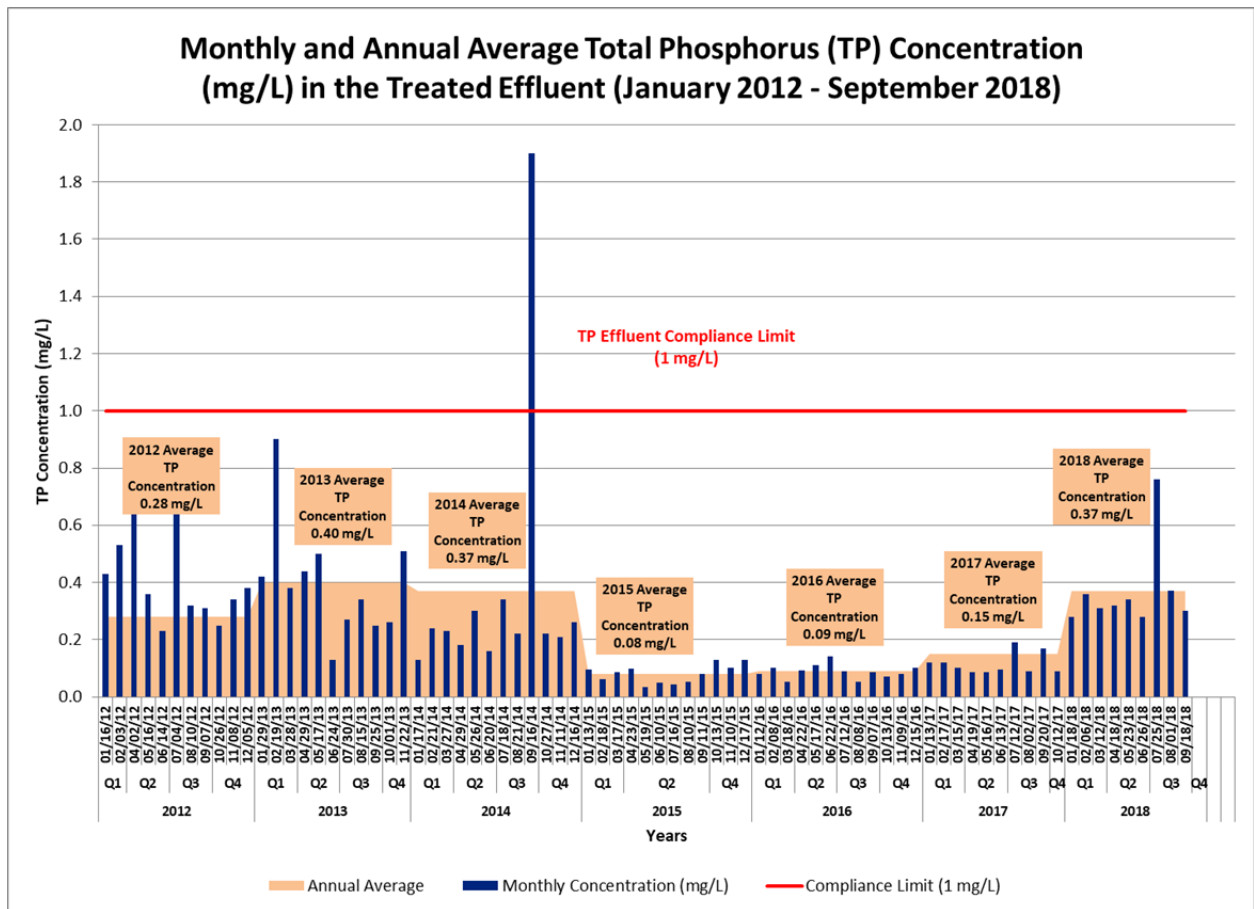


Figure 3-4: Historical TP Levels in the Treated Effluent of Mini Lake STP (2012-2018)

Based on the information displayed in Figure 3-4 the following could be concluded:

- With the exception of the concentration recorded in September 2014 (1.9 mg/L), the TP has been consistently below the required limit (1 mg/L) throughout the years.
- Between 2012 and 2013, the TP’s annual average concentration increased by 0.12 mg/L, which represents a 43% increase. However a slight decrease of approximately 8% (0.03 mg/L) was

noted between 2013 and 2014. This downward trend continued towards 2015, with a significant 78% (0.29 mg/L) decrease in the TP effluent levels between 2014 and 2015.

- Similarly to CBOD₅, TSS and NO₃-N, the effluent’s TP levels during 2015 were also the lowest of the entire period. Regretfully once more, there is no information supporting the rationale of such remarkable performance.
- Since 2015 a raising trend in the annual effluent’s TP levels has been noted. Between 2015 and 2016 a moderate 13% (0.01 mg/L) increase was experienced whereas between 2016 and 2017 a significant 67% increase (0.06 mg/L) was noted.
- Between 2017 and the end of the third quarter of 2018, the annual average TP increased by 0.22 mg/L which represents a 147% increase compared to 2017. Despite the above, there is very little risk for the existing STP to fail compliance with the TP requirements.

3.5 Subsurface Disposal System (Tile Beds)

Concerns have been raised by the Mini Lake’s resident board about frequent presence of pockets of water accumulating in areas around the five tile beds (subsurface disposal system). This phenomenon appears to be exacerbated during rainy days. During a recent walkthrough (October 4, 2018), water accumulation was noted around the existing five tile beds. More importantly, there was also evidence of sludge and other solids debris in or around the tile bed area where water had accumulated.

A simple test completed onsite, using dedicated effluent pumps to each tile bed system, confirmed that there is substantial accumulation/deposition of sludge and other solid debris (i.e. rags) within the distribution pipes underground each tile bed as shown in Figure 3-5.



Figure 3-5: Sludge Deposition within the Subsurface Disposal System (Tile Beds)

Solids/debris deposition inside the tile bed distribution pipes is known to cause limitations in the use and performance of these tiles bed. Solids could plug the pores (holes) through which the final

treated effluents percolates into ground, substantially increasing the pressure inside these pipes, especially during the effluent pump-out cycles. Pressure build-up may cause pipe failure resulting in overflow of sewage effluent onto to the ground surface forming wet areas (pooling).

4 Condition Assessment

4.1 Results of the Inspections

Since OCWA took over the operations of the sewage collection and treatment systems in October 2017, two condition assessments/inspections (visual in nature) have been conducted. The first inspection was completed in December 2017. Table 4-1 below highlights the results of the condition assessment.

Table 4-1 Outcome and Recommendations of the First Condition Assessment (Dec 2017)

IDENTIFIED ISSUE	RECOMMENDED WORK	ISSUE CLASSIFICATION
<u>Sewage Collection System</u>		
Pumps utilized in sewage pumping station were identified lower quality.	Replace as needed with high quality pumps for long term use.	Operational
Sewage pumping station 5 has damaged rails and only a single operating pump	Repair rails and add second pump.	Operational
Sewage pumping station 3 has very limited space for maintenance and repair operations	No recommendation at this time.	Operational, H&S
<u>Sewage Treatment System</u>		
None of the proposed works in the ECA (June 1, 2016) have been completed Primary and intermediate clarifiers have to be vacuumed out, while filled with sewage, to remove sludge. Process is very inefficient. Chemical dosing pumps are old and may soon require replacement Micro C chemical addition allows for settling and inconsistent dosing.	Complete all proposed works. Partition of primary clarifier into 2 compartments. Including baffle plates, sludge recirculation pumps/piping to the inlet chamber, and sludge removal piping. Modify denitrification tank to allow crossover between trains. New pump to recycle effluent back to inlet of primary clarifier. Separate chemical storage building to store 900L and 2,300L tanks with metering pumps and eyewash station.	Compliance
Alum addition before RBCs may decrease biological growth due to phosphorus limitations	Alum dosage should be monitored if RBC fixed film growth or biological treatment performance deteriorates.	Operational
Alum addition is not equalized between both tanks.	Rework chemical tubing/valving to ensure equal split of alum between the treatment trains.	Operational
Historian has limited memory (72 hrs.), limited SCADA accessibility/control. Manual data recording.	Upgrade SCADA and historian.	Operational

IDENTIFIED ISSUE	RECOMMENDED WORK	ISSUE CLASSIFICATION
High flows can cause unwanted sloughing of biomass and accumulation of sludge in intermediate clarifiers.	Addition of equalization tank for variable flow conditions.	Operational
No back-up power	Installation of single back-up power for water & waste water facilities.	Operational
Entry ramp is a slip issue	Rebuild ramp for greater traction and decreased slope.	H&S
Possible ventilation issue	Assess ventilation system Increase air cycling.	
Emergency supplies are difficult to access	Relocate emergency supplies.	Operational
Subsurface Disposal System (Tile Beds)		
Weeping tile beds condition is presently unknown	Inspection/assessment of tile bed for the possibility for repair.	Compliance/ Operational

In October 2018, a second condition assessment/inspection (visual in nature) was conducted on both the WWTP facility and the five-cell subsurface disposal system (tile beds). Table 4-2 summarizes the status of the action items and recommendation made after the first condition assessment/inspection, as well as, the new deficiencies found during the second condition assessment/inspection.

Table 4-2 Outcome and Recommendations of the Second Condition Assessment (Oct 2018)

IDENTIFIED ISSUE	RECOMMENDED WORK	ISSUE CLASSIFICATION	STATUS
Sewage Collection System			
Pumps utilized in sewage pumping station were identified lower quality	Replace as needed with high quality pumps for long term use	Operational	Completed
Sewage pumping station 5 has damaged rails and only a single operating pump	Repair rails and add second pump	Operational	Completed
Sewage pumping station 3 has very limited space for maintenance and repair operations	No recommendation at this time	Operational, H&S	
No emergency power in place	Provide emergency power capabilities for all 5 sewage pumping stations	Operational/ Compliance	Addressed under the emergency power assessment conducted by OCWA/RVA
Sewage Treatment System			
None of the proposed works in the ECA (June 1, 2016) have been completed	Complete all proposed works Partition of primary clarifier	Compliance	Outstanding

IDENTIFIED ISSUE	RECOMMENDED WORK	ISSUE CLASSIFICATION	STATUS
<p>Primary and intermediate clarifiers have to be vacuumed out, while filled with sewage, to remove sludge. Process is very inefficient</p> <p>Chemical dosing pumps are old and may soon require replacement</p> <p>Micro C chemical addition allows for settling and inconsistent dosing</p>	<p>into 2 compartments. Including baffle plates, sludge recirculation pumps/piping to the inlet chamber, and sludge removal piping</p> <p>Modify denitrification tank to allow crossover between trains</p> <p>New pump to recycle effluent back to inlet of primary clarifier</p> <p>Separate chemical storage building to store 900L and 2,300L tanks with metering pumps and eyewash station</p>		
<p>Alum addition before RBCs may decrease biological growth due to phosphorus limitations</p>	<p>Alum dosage should be monitored if RBC fixed film growth or biological treatment performance deteriorates</p>	<p>Operational</p>	<p>Partially Completed</p>
<p>Alum addition is not equalized between both tanks.</p>	<p>Rework chemical tubing/valving to ensure equal split of alum between the treatment trains</p>	<p>Operational</p>	<p>Completed</p>
<p>Historian has limited memory (72 hrs.), limited SCADA accessibility/control. Manual data recording</p>	<p>Upgrade SCADA and historian</p>	<p>Operational</p>	<p>Outstanding</p>
<p>High flows can cause unwanted sloughing of biomass and accumulation of sludge in intermediate clarifiers</p>	<p>Addition of equalization tank for variable flow conditions</p>	<p>Operational</p>	<p>Outstanding</p>
<p>No back-up power</p>	<p>Installation of single back-up power for water & waste water facilities</p>	<p>Operational</p>	<p>Outstanding</p>
<p>Entry ramp is a slip issue</p>	<p>Rebuild ramp for greater traction and decreased slope</p>	<p>H&S</p>	<p>Completed</p>
<p>Possible ventilation issue</p>	<p>Assess ventilation system Increase air cycling</p>		<p>Completed</p>
<p>Emergency supplies are difficult to access</p>	<p>Relocate emergency supplies</p>	<p>Operational</p>	<p>Completed</p>
<p>There are solids carry over (i.e. rags, debris, etc.) throughout the entire process</p>	<p>Assess the feasibility of retrofitting some sort of preliminary treatment (i.e. bar screens, etc.). Otherwise increase frequency of sludge hauling.</p>	<p>Operational</p>	<p>Outstanding</p>
<p>The biomass attached to the RBC's disks does not seem to be as healthy and copious which likely could impact process performance.</p>	<p>Assess the operating conditions of the existing RBC and, if required, optimize the treatment process.</p>	<p>Operational</p>	<p>Outstanding</p>

IDENTIFIED ISSUE	RECOMMENDED WORK	ISSUE CLASSIFICATION	STATUS
Impossible to assess performance since there is no data about the quality of the incoming raw sewage influent	Monitor the quality of the incoming raw sewage influent using the same parameters included in the ECA (plus alkalinity). Take raw sewage samples using the same frequency and requirements as described in the ECA.	Operational	Completed Raw Sewage effluent sampling started in November 2018
Subsurface Disposal System (Tile Beds)			
There is accumulation of sludge and other solids debris (i.e. rags) within the distribution pipes placed underground each tile bed	Flush the headers and distribution lines within each tile bed. Remove and dispose excess solids within the pipes	Operational	Outstanding
Frequent presence of pockets of water accumulated in certain areas around the 5 tile beds (phenomenon which appears to exacerbate during rainy day) leads to believe the inner distribution pipes are either plugged or broken allowing the effluent to escape into the surface	Conditions of the inner pipes and other appurtenances within the tile beds are unknown. If possible complete camera inspection to assess conditions and extent of repairs. Alternatively, expose the tile beds and repair/rehabilitate pipes, appurtenances and other components	Operational	Outstanding

4.2 Likelihood of Failure (LoF)

The Likelihood of Failure (LoF) can be defined as the probability of failure of a given asset within a predetermined period of time. To determine the LoF of each process group, the Asset Risk and Criticality Framework methodology developed by OCWA (2013) was followed. Based on the aforementioned methodology, all major process equipment and components from each asset group were assessed and scored based on the criteria and scale defined in Table 4-3.

Table 4-3: Likelihood of Failure (LoF) Criteria and Scale

SCALE CRITERIA	WEIGHT	1	2	3	4	5
		NEGLIGIBLE	MINOR	MODERATE	HIGH	SEVERE
Condition	25%	Very good. Only normal maintenance required. (Grade 1).	Good. Minor defects only. ~5% needs renewal. (Grade 2).	Fair. Significant maintenance required. ~10 to 20% needs renewal. (Grade 3).	Poor. Significant renewal required. ~20 to 40% needs renewal. (Grade 4).	Very poor. >50% requires renewal/replacement. Asset unserviceable. (Grade 5).
Effectiveness of O&M	18%	Optimal; all procedures documented, up-to-date and readily	Satisfactory; most procedures documented, up-to-date and	Known procedure improvements identified; 36% < 50%	Questionable; 51% < 60% unplanned work.	No protocols; > 61% unplanned work.

SCALE CRITERIA	WEIGHT	1	2	3	4	5
		NEGLIGIBLE	MINOR	MODERATE	HIGH	SEVERE
Protocols (SOP)		available; up to 20% unplanned maintenance hours	available; 21% < 35% unplanned work	unplanned work.		
Ability to Meet Functional Requirements	20%	Able to meet all Levels of Service effectively & efficiently. Fully supports public needs; MnTBF > 2	Good ability to meet most levels of service efficiently and effectively. Supports most public needs; MnTBF = 1.5 > 2	Some difficulty meeting levels of service. Increasing difficulty to fully support public needs; MnTBF = 1.25 < 1.5	Frequent difficulty meeting levels of service. Limited ability to meet public needs; MnTBF = 1 < 1.25	Does not meet levels of service and public needs; MnTBF < 1
Maintainability (MTTR)	21%	MTTR < 12hrs. Spare equipment/material available in stock or same day. Procedures to obtain parts are in-place	MTTR = 12hrs < 24hrs. Spare equipment/materials available overnight. Procedures to obtain parts are in-place	MTTR = 24hrs < 48hrs. Spare equipment/materials available within a work week. Procedures to obtain parts need improvement	MTTR = 48hrs < 120hrs. Spare equipment/materials available but will take more than a work week to receive. No procedures	MTTR > 120hrs. Equipment/materials not available or must be fabricated; no procedures
Operability	16%	Easy to Operate, Adequate Automation		Can Operate with some difficulty, Little Automation some system complexity		Poor Design, Difficult to Operate, Manual Operation or Complex System

The inspection completed for all major process equipment and components during the condition assessment walkthrough was paramount in defining the LoF of each process group. Figure 4-1 provides an overview of the LoF for each major process equipment/component currently in place at the Mini Lakes Sewage Collection and Treatment System. Ideally, the LoF rating should be closer to the center of the circle, indicating a lower likelihood of failure (LoF).

Majority of the existing process equipment and components were scored at a LoF between 2 (minor) and 3 (moderate), However based on the conclusions of the condition assessment, the subsurface disposal system (all five tile beds) and the Supervisory Control and Data Acquisition (SCADA) / Control System are the process areas most likely to fail at 4.66 and 4.64, respectively.

In general, the high LoF score of the existing sewage treatment system in Mini Lakes is mainly driven by the inability of essential process treatment components to meet functional requirements paired by their respective maintainability criteria as explained in Table 4-3. A detailed LoF calculation for each process unit can be found in Appendix B.

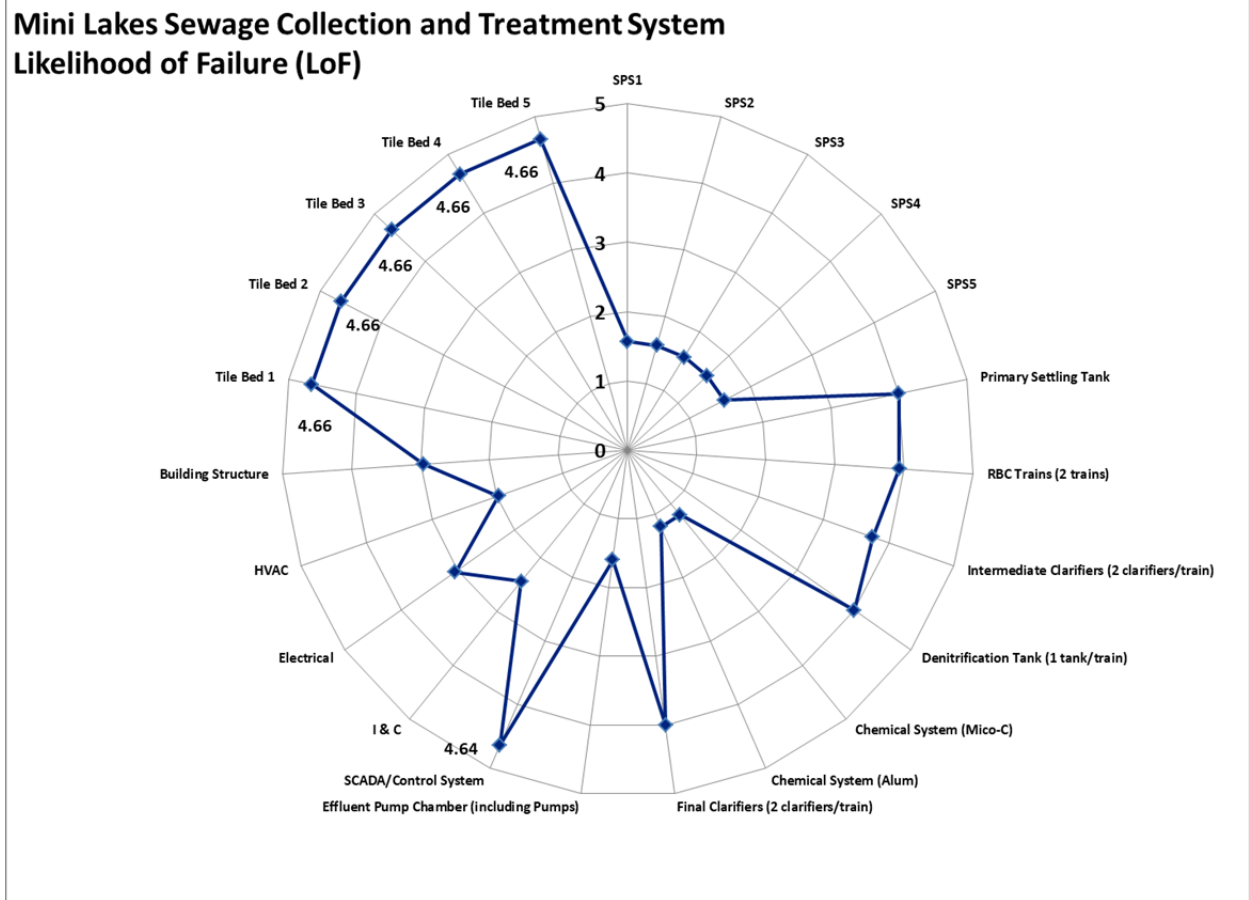


Figure 4-1 Likelihood of Failure (LoF) for the Mini Lakes Sewage Collection and Treatment System
LoF Scale (1 = Negligible, 2 = Minor, 3 = Moderate, 4 = High and 5 = Severe)

4.3 Consequence of Failure (CoF)

Consequence of Failure (CoF) is defined as the real or hypothetical outcome associated with the failure of an asset. Similarly to the LoF, the Asset Risk and Criticality Framework methodology developed by OCWA (2013) was followed. For the CoF, all major process equipment and components from each group were assessed and scored based on the criteria and scale defined in Table 4-4.

Table 4-4: Consequence of Failure (CoF) Criteria and Scale

SCALE CRITERIA	WEIGHT	1	2	3	4	5
		NEGLIGIBLE	MINOR	MODERATE	HIGH	SEVERE
Public Health & Safety	25%	Little or no disruption to normal operations. No impact to Public Health	Situation requiring reporting to MECP/MOH. Modification to normal operations is manageable.	Situation requiring immediate notification to MOE/MOH.	Likely to result in Boil Water Advisory (BWA), Drinking Water Advisory (DWA), Sewage Back-ups, Off-	Declared Public Health Emergency with expected public health impact

SCALE CRITERIA	WEIGHT	1	2	3	4	5
		NEGLIGIBLE	MINOR	MODERATE	HIGH	SEVERE
					Site Spill	
Occupational Health & Safety	21%	Little or no threat to employees	Safe work procedures required for repair	Breakdown repair results in an increased hazard requiring work plan involving more than one employee to address hazard (i.e. confined space)	Compromises Safety Systems (removes engineered control to prevent or avoid hazard)	Failure could cause injury, lead to charges, a stop work order/ major non-compliance with OHSA
Environmental Compliance	21%	No effect on ecosystem, no regulatory issue	Local impact with minor ecosystem impairment. Minor contravention, non-compliance	Widespread impact with minor ecosystem impairment, possible prosecution	Severe impact limited to local ecosystem, fines likely	Widespread and Severe impact to ecosystem, anticipated charges and fines
Disruption to the community / Public Image	12%	No social or economic impact on the businesses or the community. No disruption to the community. No media coverage.	Minor interest; local media report	Public community interest; Broad adverse media coverage	Short-term economic impact (water supply) on residential customers and/or a few businesses. Loss of Confidence in Council; national publicity; Public agitation for action.	Long-term or area-wide economic impact on numerous businesses or any "high-priority" customer. Major disruption to the community; National media coverage; management changes demanded.
Inability to meet process functional service levels	11%	100% available process capacity	75%<100% available process capacity	50%<75% available process capacity	25%<50% available process capacity	0%<25% available process capacity
All financial consequences (Fines, property damage, loss of revenue, etc.)	10%	<\$10,000	\$10,000 to \$50,000	\$50,000 to \$100,000	\$100,000 to \$500,000	>\$500,000

To complete the CoF assessment, each major process equipment/component was scored against the pre-defined criteria using a “1 to 5” scoring scale as shown in Table 4-4. An overview of the CoF for all major process areas is presented in Figure 4-2.

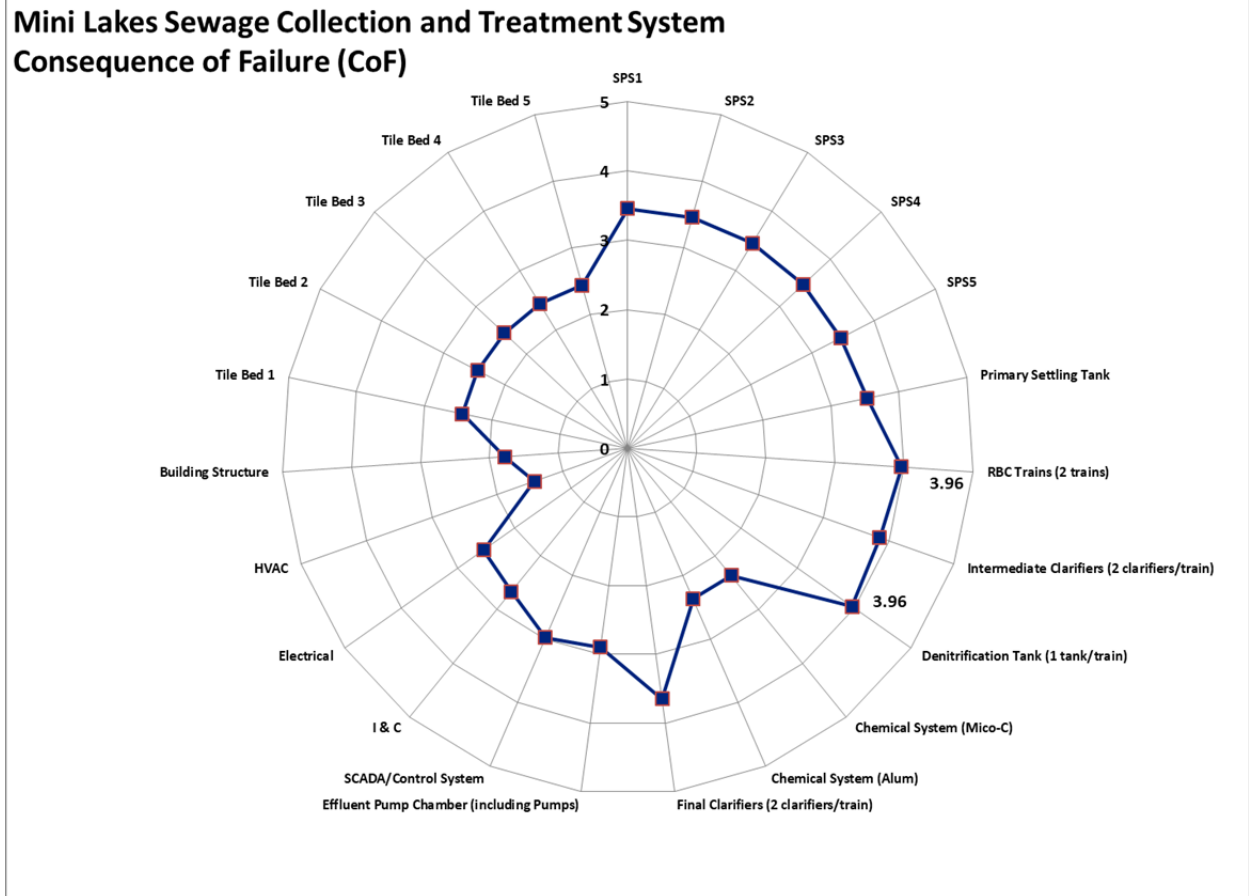


Figure 4-2 Consequence of Failure (CoF) for the Mini Lakes Sewage Collection and Treatment System
CoF Scale (1 = Negligible, 2 = Minor, 3 = Moderate, 4 = High and 5 = Severe)

Based on the CoF assessment, both the RBC trains and the denitrification area pose the highest CoF with scores of 3.96. These high CoF scores are mainly attributed to the incapacity of the treatment process to consistently meet the required environmental compliance stated in the ECA (see the quarterly Operations and Maintenance Reports (Q1, Q2 and Q3) for the Mini Lakes Waste Water Treatment System for 2018). A detailed CoF calculation per process group can be found in Appendix B.

4.4 Risk

Identifying and quantifying the risk allows mitigation activities to be prioritized from highest risk to lowest risk (for all types of work –planned, unplanned, capital, etc.). The Risk score is then used to manage events to prevent consequences from occurring and as such, is leveraged for asset prioritization for work (including capital). Risk is calculated as:

$$\text{Risk} = (\text{CoF}) \times (\text{LoF})$$

Following the calculation of Risk, the functional locations and assets are then allocated into the appropriate risk category as shown in Table 4-5 .

Table 4-5: Risk Categories

RISK SCORE	RISK LEVEL	DESCRIPTION
Less than 5 (Risk Score <= 5)	1	Marginal
Between 5 and 10 (5 < Risk Score <= 10)	2	Low
Between 10 and 15 (10 < Risk Score <= 15)	3	Moderate
Between 15 and 20 (15 < Risk Score <= 20)	4	High
Higher than 20 (Risk > 20)	5	Severe

The risk and criticality of all major process equipment/components within each process group was calculated. The overall risk for each process area was then determined as the highest risk scored by a single process equipment/component within each process area. Based on the above, the risk posed by all process groups at the Mini Lakes Sewage Collection and Treatment System were calculated as follows (Table 4-6).

Table 4-6: Risk and Criticality for Mini Lakes Sewage Collection and Treatment System

PROCESS GROUP	GROUP RISK	RISK ASSOCIATED TO:	RISK LEVEL	RISK DESCRIPTION
Sewage Collection System (SCS)	5.43	SPS	2	Low
Sewage Treatment Plant (STP)	15.84	Denitrification	4	High
Subsurface Disposal System (SDS)	11.37	Tile Beds	3	Moderate

It should be noted that the vast majority of the assets currently in place at the WWTP are the original equipment and components from approximately 18 years ago when the facility was initially commissioned. Based on the risk levels summarized in Table 4-6, the following could be concluded:

- In terms of risk, the Sewage Collection System (SCS) is the component with the lowest risk followed by the Subsurface Disposal System (SDS) with a moderate risk score and the Sewage Treatment Plant (STP) with a high risk score.
- The “Low Risk” posed by the SCS is largely attributed to the CoF and not to the current conditions (LoF) of these pumping stations which is indicative of good operating conditions, however the consequences could be deemed severe should failure of any of these pumping station occurs.
- In case of the subsurface disposal system, LoF appears to be the predominant contributing factor for the “Moderate Risk” associated to this area which is indicative of poor operating conditions of these tile beds. Should the current conditions prevail failure of these tile beds is imminent; however the consequences of such failure are not considered as catastrophic as the consequences of the WWTP failure would be deemed to be.
- The “High Risk” posed by the Mini Lakes STP is largely attributed to the combined high LoF and CoF scored by the individual process equipment and components of this facility, led by the Denitrification area.

4.5 Prioritization

Owners may often find themselves in a difficult situation where multiple projects require capital and it is difficult to prioritize the outlay of capital. Identifying a methodology to prioritize helps decision makers to allocate not only financial but other resources to effectively and efficiently manage the issues around aging infrastructure in need of major capital works.

In the context of Capital Planning and Asset Management, priority is defined as the relative importance of an action or deficiency in relation to other action or deficiencies. The Risk/Priority Map is a two dimensional matrix, comprising four quadrants plotting the relationship between the relative urgency (LoF) and importance (CoF) of individual action items as shown in Table 4-7:

Table 4-7: Components of a Priority Matrix

PRIORITY 3 (MEDIUM-LOW)	PRIORITY 1 (HIGH)
<p>Actions required for the key equipment and/or component to ensure their proper functioning, given their importance to meet the facility’s LOS. These items are MEDIUM - LOW priority Below are some of the key attributes of this quadrant:</p> <ul style="list-style-type: none"> • The LoF is relatively low (at the present time). • The CoF is relatively high. • The failure event does not yet have proximity. 	<p>Actions required restoring or upgrading a particular equipment and/or component due to its current poor conditions (LoF), which could result in significant consequences (CoF) if these actions are delayed. These items are HIGH priority. Below are some of the key attributes of this quadrant:</p> <ul style="list-style-type: none"> • The LoF is relatively high (at the present time). • The CoF is relatively high. • The failure event has proximity.
PRIORITY 4 (LOW)	PRIORITY 2 (MEDIUM-HIGH)
<p>Actions required maintaining and/or optimizing the facility’s equipment and/or components to ensure effective and efficient long term operation and functionality. These items are LOW priority Below are some of the key attributes of this quadrant:</p> <ul style="list-style-type: none"> • The LoF is relatively low (at the present time). • The CoF is relatively low. 	<p>Actions required restoring or upgrading a particular equipment and/or component due to its current conditions (LoF) but not severe consequences (CoF) may result due to its failure. These items are MEDIUM - HIGH priority Below are some of the key attributes of this quadrant:</p> <ul style="list-style-type: none"> • The LoF is relatively high (at the present time). • The CoF is relatively low. • The failure event may have proximity.

Figure 4-3 illustrates the Risk/Priority Matrix widely used to help prioritize actions based on urgency (driven by the LoF) and importance (driven by the CoF).

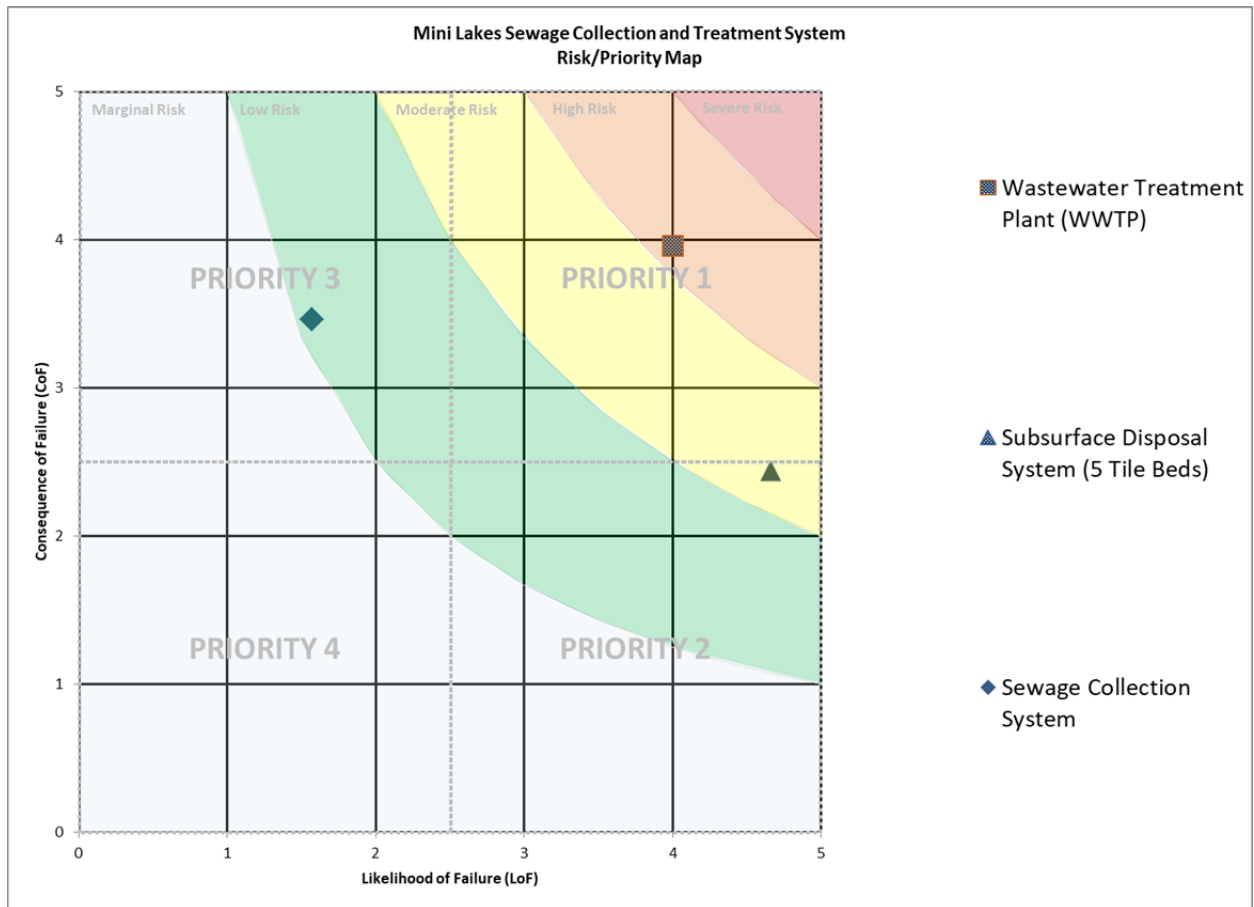


Figure 4-3 Risk/Priority Matrix for the Mini Lakes Sewage Collection and Treatment System

5 Evaluation of Alternatives

As determined in Section 4.5, priority should be given to either rehabilitate or upgrade the existing Sewage Treatment Plant (STP). For such purpose, several alternatives including but not limited to repairs/rehabilitation the existing STP, upgrade the STP were contemplated as follows:

5.1 Connecting to Puslinch’s Municipal Sewage System

Being served by the potential development of a Puslinch municipal sewage system was one of the options contemplated by the Mini Lakes Board of Residents. Recently (May 2018), CIMA (consulting engineering firm) completed a Feasibility Study for the Township of Puslinch, to assess the viability of implementing municipal water and sewage services within key areas of the Township of Puslinch. Currently, water and sewage services in the Township of Puslinch consist of individual on-site wells

and septic systems, as well as, a few small and private communal water and sewage systems servicing individual developments including the community of Mini Lakes.

As indicated in the CIMA report⁵, two potential water and sewage servicing options for the study area were identified and included Option 1 – Intra-Municipal Water or Sewage Servicing, and Option 2 – Inter-Municipal Water or Sewage Servicing. Option 2 for water and sewage servicing, consists of reliance on the Guelph water and sewage system for treatment and disposal (in the case of sewage servicing), and therefore will require the appropriate inter-municipal servicing agreements. Preliminary discussions with staff from the City of Guelph have indicated that the City would be open to discussions necessary to establish an inter-municipal servicing agreement, however, no terms and/or conditions have been identified at this stage.

Although the report concluded that on a preliminary basis and from an economic impact perspective, it appears that the Inter-Municipal servicing options for both water and sewage servicing would be preferred, recent correspondence from the City of Guelph indicates that there is limited available capacity in the Guelph systems to provide servicing to the Township of Puslinch, and that significant Capital Upgrades would be required.

More importantly based on the conclusions in CIMA's feasibility study, it appears that the future of this Inter-Municipal servicing option is uncertain therefore it has not been carried forward in this analysis as a feasible alternative to address the current issues faced by the Mini Lakes sewage treatment system.

5.2 Treatment System Rehabilitation

The recurrent underperformance faced by the Mini Lakes STP (as reported in the quarterly Operations and Maintenance Reports) warrants completing a Comprehensive Performance Evaluation (CEP) and/or Optimization exercise to further assess whether the process treatment performance could be improved thus extending the useful life of this facility or not. OCWA's Process Optimization and Technical Services (POTS) group could complete this Comprehensive Performance Evaluation (CEP) and/or Optimization exercise early 2019 for \$45,000.

In addition to the above, there are some works (as included in the ECA June 1, 2016) and some other deficiencies found during the condition assessments (Table 4-2) that are still outstanding and need to be completed/addressed.

5.3 Treatment System Upgrade

To complete a comparative analysis of prospective wastewater treatment systems, a Request for Quotation (RFQ) was sent to three equipment suppliers, including H2Flow, JNE Environmental, and FilterBoxx. The suppliers were requested to provide the following information in their submissions:

⁵ Feasibility Study for the Township of Puslinch, CIMA (May 2018)

- Description of process flow configuration, key components, and any unique features of the product.
- Preliminary system sizing, key operating parameters, and general footprints.
- Preliminary equipment layout plan.
- Budgetary price.

After receiving the RFQ, JNE environment informed OCWA that they could not provide a budgetary quotation based on the information available.

5.3.1 Sizing and Other Requirements

A set of criteria for sizing the treatment equipment was developed and provided to the vendors. The criteria combined the information from the ECA currently in place, plant design documents, and operational data. The criteria are presented in Table 6-1:

Table 6-1: Criteria for Sizing Treatment Equipment of Mini Lakes WWTS

Design Flow Rate	Value
Average Daily Flow Rate	158 m ³ /day
Peak Daily Flow Rate	218 m ³ /day
Influent Characteristics	Value
Biological Oxygen Demand (BOD ₅)	170 mg/L
Total Suspended Solids (TSS)	400 mg/L
Total Phosphorus (TP)	4.8 mg/L
Alkalinity as CaCO ₃	50 mg/L
Effluent Quality	Compliance Limit
Carbonaceous Biological Oxygen Demand (CBOD ₅)	20 mg/L
Total Suspended Solids (TSS)	20 mg/L
Total Phosphorus (TP)	1 mg/L
Nitrate – Nitrogen (NO ₃ -N)	8 mg/L

Additional design requirements requested of the Vendor equipment included:

- Provision of high efficiency and reliable denitrification process.
- Provision of primary and tertiary treatment required for removing grits and minimizing the carry-over of solids through treatment system;.
- Capability to reducing sludge production for operational cost saving.
- Modularization of the treatment systems for reducing construction costs.

5.3.2 H2Flow - Fluidyne Integrated Surge Anoxic Mix (ISAM™-50) System

H2Flow proposed a Fluidyne ISAM™-50 system. The system (Figure 5-1) has three key components, including an anaerobic chamber, a surge anoxic mix (SAM™) reactor, and a sequencing batch

reactor (SBR). It incorporates BOD, TSS, and nitrogen removal along with sludge reduction in one integrated package with rated treatment capacity of 227 m³/d.

Raw sewage enters into a covered anaerobic chamber where solids are allowed to settle, like a primary clarifier. Complex BOD in settled solids is converted to soluble BOD through anaerobic digestion and sludge volume is reduced. The influent then flows to the SAM™ reactor. One key function of the reactor tank is to provide equalization of the flow and nutrient loading rate to optimize treatment. The stream then flows into SBR basin for BOD removal and nitrification. Mixed liquor is returned by gravity to SAM™ reactor and mixed with raw influent. Anoxic de-nitrification is then carried in the reactor to remove nitrogen.

Some of the advantages featured by the ISAM's treatment system are summarized below:

- Easy to operate and maintain
- Reduced operation and maintenance cost
- SBR basin has no moving parts that require maintenance.
- Power usage is controlled through the Fluidyne control panel
- Covered anaerobic selector chamber for odor control
- More flexible than continuous flow plants
- ISAM™ performs consistently regardless of influent flow changes
- Ability to handle highly variable flows and loading. Built in flow equalization is provided in the SAM™ reactor to handle peak hourly flows
- Built in sludge reduction system
- Aeration and mixing can automatically be adjusted to optimize power and prohibit filamentous growth
- Process utilizes quiescent settle and decant periods
- Small footprint with no digesters, secondary clarifiers, RAS piping and pumping
- Produces the highest quality effluent (Typical Fluidyne ISAM™ facilities are achieving less than 10 mg/L BOD5 and TSS, less than 1 mg/L NH3-N, less than 7 mg/L total N, and less than 2 mg/L phosphorus)
- Automatic scum skimming prior to effluent discharge provides highest quality effluent
- Easily expandable by adding additional flow trains
- Unique features of the ISAM™ system include:
 - Odor control –Mixed liquor is maintained in the SAM™ reactor to react with incoming flow from anaerobic chamber to suppress odors
 - De-nitrification reactions consume organic carbons in SAM™ reactor and reduce aeration and energy requirement in SBR
 - Proprietary flow and scum control system to skim scum prior to effluent discharge provides high quality effluent.

H2Flow is also proposing a Parkson Helisieve unit as an upgrade of existing primary treatment, and a Trojan UV3000 unit for disinfection purpose if required.

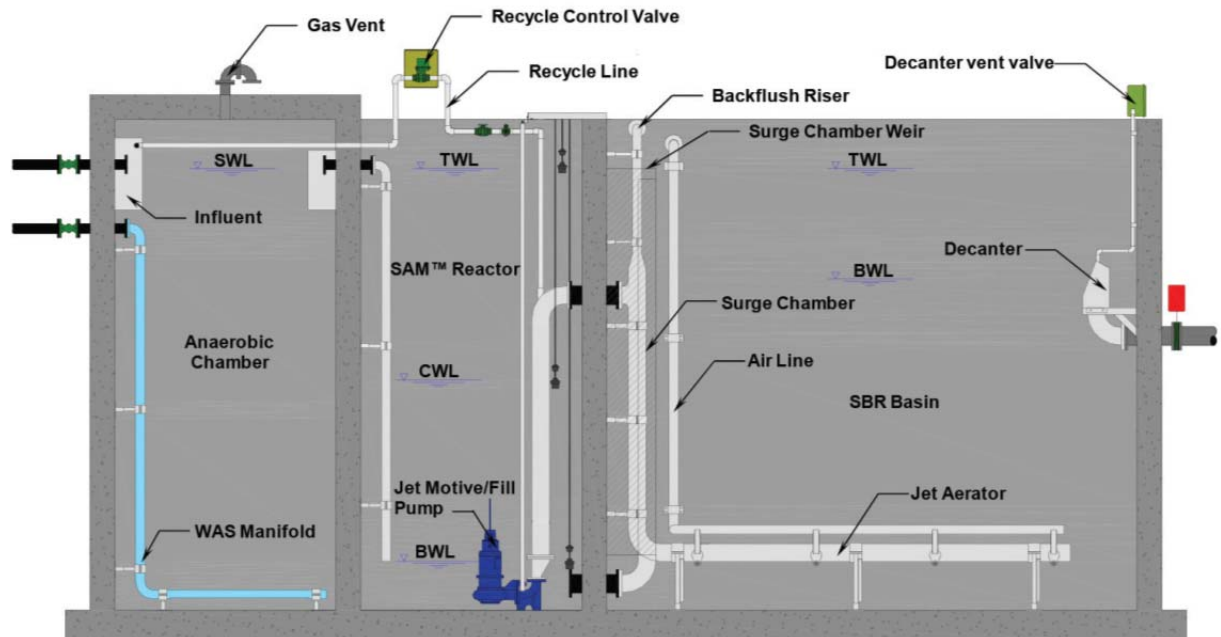


Figure 5-1 Fluidyne ISAM™ System

5.3.3 FilterBoxx – Mixed Bed Biofilm Reactor (MBBR)

FilterBoxx proposed a MBBR system that consists of following key components:

- Influent/settling/sludge tank - sized for 12 hours hydraulic retention time at average daily flow (ADF) rate;
- EQ tank - sized for 12 hours of equalization at ADF, with submersed transfer pump to transfer wastewater to aeration/MBBR tank;
- Aeration/MBBR tank - sized to provide appropriate treatment;
- One blower for aeration of both EQ tank and Aeration/MBBR tank
- Circular clarifier with sludge skimmer for solids separation and underflow (skimmed sludge) pump to return sludge to Influent/settling/sludge tank; and
- Control panel with mini-PLC and HMI.

The system would be partially skid-mounted. Equipment is assembled in a single train with no installed redundancy. Effluent from clarifier is assumed to flow by gravity to the client's discharge location (no disinfection included)

5.3.4 Capital Costs

Table 6-2 details an order of magnitude capital cost estimate which is recommended for rehabilitating the physical conditions and operational performance of the existing treatment facility

as compared with the two upgrade options available. To develop this capital costs comparison the following factor were taken into consideration:

- Budgetary purchase prices provided by equipment vendors
- Installation costs including demolishing and disposal of existing WWTP
- Approximately 30% of the equipment costs as indirect costs (also known as soft cost) which includes engineering, project management, approvals, insurance, etc.
- An additional 15% of the equipment cost for project contingency for potential building facility requirements, pricing and exchange rate fluctuations.

Table 6-2: Capital Cost Estimate (Class 5)⁶ Comparison Rehabilitation vs. Upgrade

Budgetary Items	Rehabilitation of Existing System ⁷	UPGRADE TO	
		H2Flow Fluidyne ISAM™-50	FilterBoxx MBBR
Equipment Price	-	\$588,500	\$650,000
Installation Costs	-	\$500,225	\$552,500
Indirect Costs	-	\$176,550	\$195,000
Contingency	-	\$189,791	\$209,625
Total Capital Cost	\$610,000.00	\$1,455,066	\$1,607,125

A detailed breakdown of these capital cost estimates can be found in Appendix C.

⁶ Class 5 cost estimate with (+/- 30 to 50% accuracy) as per the AACE Cost Estimate Classification System – As Applied In Engineering, Procurement, And Construction For The Process Industries (March 1, 2016).
https://web.aacei.org/docs/default-source/toc/toc_18r-97.pdf?sfvrsn=4

⁷ Entails completing a Comprehensive Performance Evaluation (CEP) and/or Optimization to the existing Facility together with the completion of the capital work upgrades included in the current ECA as well as addressing the deficiencies found during the condition assessments/site inspections in December 2017 and October 2018 respectively.

5.4 Treatment Process Comparison

A qualitative evaluation amongst different alternatives previously discussed in this in this section was completed. Except connecting to Puslinch’s Municipal Sewage System, all other alternatives including, continue using the existing STP (as is), rehabilitating the existing STP (Section 5.2) and upgrading the existing STP (Sections 5.3.2 and 5.3.3) were evaluated. The results are summarized in Table 6-3.

Table 6-3: Evaluation of Alternatives for Mini Lakes STP (Qualitative)

QUALITATIVE CRITERIA	EXISTING STP	STP REHAB	STP UPGRADE	
			FLUIDYNE ISAM™-50	FILTERBOXX MBBR
Flow Handling Capacity	Yes	Yes	Yes	Yes
Flow and Loading Equalization	No	No	Yes	Yes
Provide Primary Treatment	No	No	Yes	Not Specified
Meet CBOD ₅ Compliance Limit	Potentially	Yes	Yes	Yes
Meet TSS Compliance Limit	Potentially	Yes	Yes	Yes
Meet NO ₃ -N Compliance Limit	Doubtfully	Possibly	Yes	Yes
Meet TP Compliance Limit	Yes	Yes	Yes	Yes
Comply with Regulatory Requirements	Doubtfully	Possibly	Yes	Yes
Sludge Reduction	No	Potentially	Yes	Not Specified
Effective Process Control	Poor	Yes ⁸	Yes	Yes
Redundancy	Yes	Yes	Partial ⁹	No
Disinfection	No	No	UV	No
Operational Flexibility	No	Possibly	Yes	Yes
O&M Costs	Low	Medium-Low	<ul style="list-style-type: none"> • Medium-High¹⁰ • High¹¹ 	Medium-High
Capital Cost	Not applicable	Low	Medium	High

⁸ Provided SCADA is upgraded

⁹ Single train with redundancy of pumps, blowers, etc.

¹⁰ Aeration is energy intense

¹¹ Aeration and UV disinfection are both energy intense

6 Conclusions

Based on the results of the condition assessment the following can be concluded:

1. The high LoF and CoF scored by the Mini Lakes STP ranks it as the element with the highest risk followed by the subsurface disposal system (moderate risk) and the sewage collection system with low risk.
2. Based on the LoF scored of the Control System at the Mini Lakes STP, the SCADA system at the Mini Lakes STP should be upgraded, as soon as possible, to ensure effective and efficient process control.
3. Based on the high CoF scored by the RBC and the Denitrification Chamber at the Mini Lakes STP, completing a Comprehensive Performance Evaluation (CEP) and/or Optimization is warranted to address the current poor performance displayed by the existing treatment process.
4. The Mini Lakes STP is quickly approaching a state of non-compliance with the terms and conditions imposed in the existing ECA.
5. Failure to meet the regulatory requirements imposed in the ECA could also be deemed as a failure to meet the terms and condition under the 2014 Operations and Maintenance agreement currently in place between Mini Lakes and the Township of Puslinch. The Comprehensive Performance Evaluation (CEP) and/or Optimization study should be performed as soon as possible to ensure that the plant does not fall into a state of non-compliance.
6. Provided that the Comprehensive Performance Evaluation (CEP) and/or Optimization study yields effective results, rehabilitating the existing STP is the preferred option. Otherwise, an immediate upgrade to a new STP technology will be warranted.
7. Should an upgrade be required, Fluidyne ISAM™-50 (commercialized by H2Flow) is recommended based on both the operational advantages and capital costs.

7 Next Steps

1. Priority should be given to address the current performance issues with the WWTP. The following is recommended:
 - a. Based on the costs and potential benefits, a Comprehensive Performance Evaluation (CEP) and/or Optimization study exercise should be completed for the Mini Lake STP as soon as possible.
 - b. Upgrading the Control System, specifically the SCADA System.
2. Upon completion of the CPE/Optimization exercise the following Scenarios could occur:
 - a. Scenario A: Should the optimization of the existing STP prove to be effective, all the recommendations should be implemented immediately. In addition, the capital work upgrades included in the current ECA must be completed as well as addressing the

deficiencies found during the condition assessments/site inspections in December 2017 and October 2018. The proposed timeline for this scenario is illustrated in Table 7-1.

Table 7-1 : Repairs / Upgrades Timelines for Scenario A

INMEDIATE (WHITIN 6 MONTHS)	SHORT TERM (1/2 – 1 ½ YEARS)	MEDIUM TERM (1 ½ – 3 YEARS)	LONG TERM (4 YEARS OR MORE)
STP CPE/Optimization	Control System Upgrade (SCADA)	Complete Capital Works in the ECA and address outstanding deficiencies	STP Upgrade (Fluidyne ISAM™-50)
SDS Flush/Cleanout	SDS Camera Inspection	SDS Repair/Rehabilitation	SDS Upgrade

- b. Scenario B: Should the optimization of the existing STP results futile, Mini Lakes should make provisions to upgrade the existing treatment system to a far better alternative. Upgrading to the Fluidyne ISAM™-50 (commercialized by H2Flow) is recommended. The proposed timeline for this scenario is illustrated in Table 7-2 .

Table 7-2 : Repairs / Upgrades Timelines for Scenario B

INMEDIATE (WHITIN 6 MONTHS)	SHORT TERM (1/2 – 1 ½ YEARS)	MEDIUM TERM (1 ½ – 3 YEARS)	LONG TERM (4 YEARS OR MORE)
STP CPE/Optimization	STP Upgrade (Fluidyne ISAM™-50)		
SDS Flush/Cleanout	SDS Camera Inspection	SDS Repair/Rehabilitation	SDS Upgrade

3. Further to point 2 above, Mini Lake’s board should make provisions to upgrade the existing STP within the next 4 years (no later than August 2022) in line with the approval expiry timeframe included in Section 2 of the ECA.
4. Although with moderate risk, the current conditions of the Subsurface Disposal System (SDS) warrants close attention.
 - a. The system should be properly flushed to remove the excess sludge deposited inside the lines
 - b. A camera inspection (whether possible) is recommended to assess the degree of damage inside the system.

As time passes, the conditions and needs of the existing sewage collection (SCS), treatment (STP) and disposal (SDS) systems may change; therefore the actions, priorities and timelines recommended in this report should be reviewed from time to time to best reflect the applicable circumstances.

APPENDIX A

Environmental Compliance Approval

No. 8154-AR4J2T

September 18, 2017

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 8154-AR4J2T

Issue Date: September 18, 2017

Wellington Common Elements Condominium Corporation No.214 c/o MF Property
Management Limited
28 Bett Court
Guelph, Ontario
N1C 0A5

Site Location: 7541 Wellington County Road 34
Township of Puslinch , County of Wellington
N0B2J0

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

Upgrades to the existing sewage works comprising of a sanitary collection system, pumping stations and forcemains, a sewage treatment and subsurface disposal system re-rated at approx. 158 m³/d average daily flow serving the Mini Lakes Subdivision and Common Elements Condominium comprising of a maximum of 292 units (from the original 400 units) for year round use in the Township of Puslinch as follows:

PROPOSED WORKS

Modifications to the existing wastewater treatment plant as follows:

- upgrades to primary clarifier as follows:
 - installation of a partition wall separating the chamber in two compartments; an inlet and sludge storage compartment having a working volume of 73m³ and a primary effluent compartment having a working volume of 23m³.
 - an influent baffle plate at the tank inlet.
 - an outlet weir box and baffle plate at the tank outlet.
 - sludge recirculation piping to the inlet chamber and sludge removal piping.

- modifications to the inlet of the denitrification tank to allow for crossover between trains for redundancy and option to operate on one (1) RBC train and two (2) tertiary treatment trains.
- one (1) new effluent pump and discharge piping to be located in the effluent pump chamber to recirculate treated effluent back to the inlet of the primary clarifier.
- a 3.5m x 4.12m chemical storage building housing the following:
 - a 900 L capacity chemical storage tank to provide a carbon source and three (3) chemical metering pumps (one (1) spare), all located within secondary containment facilities.
 - a 2,300 L capacity bulk chemical storage tank for phosphorus removal and three (3) chemical metering pumps (one (1) spare), all located within secondary containment facilities.
 - an eyewash/shower system.

all other controls, electrical equipment, instrumentation, pumps, piping, valves and appurtenances essential for the proper operation of the aforementioned sewage works;

all in accordance with the documents listed in Schedule 'B'.

EXISTING WORKS

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.

2. Sewage Pumping Station PS-2 (UTM NAD83: Zone 17, 569203 mE, 4814540 mN)

One (1) 1,200 mm diameter fibreglass package duplex sewage pumping station (located on Jasper Heights Drive approximately 110 m northeast of Garden Parkway servicing approximately 132 units), equipped with two (2) submersible pumps, each pump rated at 2.225 L/s at 33.82 m TDH and having a working volume of 0.501 m³, and a forcemain, approx. 224 m long, extending from the pump station before discharging into the common 75

mm forcemain from PS-3, where the common forcemain continues approximately 215 m to the junction with PS-1 and a further 621 m to discharge directly to the Wastewater Treatment Plant (WWTP) described below.

3. Sewage Pumping Station PS-3 (UTM NAD83: Zone 17, 569349 mE, 4814559 mN)

One (1) 1,200 mm diameter fibreglass package duplex sewage pumping station (located on Lot 62 Hemlock, servicing approximately 42 units), equipped with two (2) submersible pumps, each pump rated at 1.075 L/s at 32.2 m TDH and having a working volume of 0.242 m³, and a forcemain, approx. 229 m long, extending from the pump station before discharging into the common 75 mm forcemain from PS-3, where the common forcemain continues approximately 215 m to the junction with PS-1 and a further 621 m to discharge directly to the Wastewater Treatment Plant (WWTP) described below.

4. Sewage Pumping Station PS-4 (UTM NAD83: Zone 17, 569491 mE, 4814533 mN)

One (1) 1,200 mm diameter fibreglass package duplex sewage pumping station (located adjacent and on the north corner of Lot 227 on Cedarbush Crescent, servicing approximately 53 units and a community centre), equipped with two (2) submersible pumps, each pump rated at 1.35 L/s at 7.27 m TDH and having a working volume of 0.304 m³, and a forcemain, approx. 358 m long, extending from the pump station before discharging directly to the Wastewater Treatment Plant (WWTP) described below.

5. Sewage Pumping Station PS-5 (UTM NAD83: Zone 17, 569720 mE, 4814755 mN)

One (1) 1,200 mm diameter precast concrete duplex sewage pumping station (located at the intersection of Water Street and Basswood to service Phase 2 and 3 development, and will ultimately service approximately 79 units), equipped with two (2) submersible pumps, each pump rated at 2.55 L/s at 14.75 m TDH and having a working volume of 0.469 m³, and a forcemain, approx. 207 m long, discharging into the 75 mm diameter forcemain from PS-4, where the common forcemain continues for approx 29 m before discharging directly to the Wastewater Treatment Plant (WWTP) described below.

Wastewater Treatment Plant

A sewage treatment plant (with dual trains operating in parallel) to be located within a building housing a primary settlement tank, rotating biological contactors, intermediate clarifier, a denitrification tank and final clarifiers and effluent pump chamber as follows:

- 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 (RBCs) 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.

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

1. "Annual Average Concentration" means the arithmetic mean of the Monthly Average Concentrations of a contaminant in the effluent calculated for any particular calendar year;
2. "Approval" means this entire document and any Schedules attached to it, and the application;
3. "Average Daily Flow" means the cumulative total sewage flow to the sewage works during a

calendar year divided by the number of days during which sewage was flowing to the sewage works that year;

4. "BOD₅" (also known as TBOD₅) means five day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogenous oxygen demand;
5. "CBOD₅" means five day carbonaceous (nitrification inhibited) biochemical oxygen demand measured in an unfiltered sample;
6. "Daily Concentration" means the concentration of a contaminant in the effluent discharged over any single day, as measured by a composite or grab sample, whichever is required;
7. "Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;
8. "District Manager" means the District Manager of the Guelph District Office;
9. "EPA" means the *Environmental Protection Act*, R.S.O. 1990, c.E.19, as amended;
10. "Equivalent Equipment" means a substituted equipment or like-for-like equipment that meets the required quality and performance standards of a named equipment;
11. "Limited Operational Flexibility" (LOF) means any modifications that the Owner is permitted to make to the Works under this Approval;
12. "Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;
13. "Notice of Modifications" means the form entitled "Notice of Modifications to Sewage Works";
14. "Monthly Average Concentration" means the arithmetic mean of all Daily Concentrations of a contaminant in the effluent sampled or measured, or both, during a calendar month;
15. "Owner" means Wellington Common Elements Condominium Corporation No.214 and its successors and assignees;
16. "OWRA" means the *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, as amended;"Previous Works" means those portions of the sewage works previously constructed and approved under an Approval;
17. "Proposed Works" means the sewage works described in the Owner's application, this Approval, to the extent approved by this Approval;
18. "Previous Works" means those portions of the sewage works previously constructed and approved under an Approval;

19. "Rated Capacity" means the Average Daily Flow for which the Works are approved to handle;
20. "Regional Director" means the Regional Director of the West Central Region of the Ministry;
21. "Substantial Completion" has the same meaning as "substantial performance" in the Construction Lien Act; and
22. "Works" means the sewage works described in the Owner's application, and this Approval, and includes Proposed Works, Previous Works, and modifications made under Limited Operational Flexibility.

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

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

1. The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the conditions herein and shall take all reasonable measures to ensure any such person complies with the same.
2. Except as otherwise provided by these conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.
3. Where there is a conflict between a provision of any document in the schedule referred to in this Approval and the conditions of this Approval, the Conditions in this Approval shall take precedence, and where there is a conflict between the documents in the schedule, the document bearing the most recent date shall prevail.
4. Where there is a conflict between the documents listed in the Schedule B submitted documents, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.
5. The Conditions of this Approval are severable. If any Condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder of this Approval shall not be affected thereby.

2. EXPIRY OF APPROVAL

This Approval will cease to apply to those parts of the Proposed Works which have not been constructed within five (5) years of the date of this Approval.

3. CHANGE OF OWNER

1. The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within thirty (30) days of the change occurring:
 - a. change of Owner;
 - b. change of address of the Owner;
 - c. change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the Business Names Act , R.S.O. 1990, c.B17 shall be included in the notification to the District Manager;
 - d. change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the Corporations Information Act , R.S.O. 1990, c. C39 shall be included in the notification to the District Manager;
2. In the event of any change in ownership of the Works, other than a change to a successor municipality, the Owner shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the District Manager and the Director.

4. CONSTRUCTION

1. The Owner shall ensure that the construction of the works is supervised by a licensed installer or a Professional Engineer, as defined in the Professional Engineers Act .
2. Upon construction of the works, the Owner shall prepare a statement, certified by a licensed installer or a Professional Engineer that the Works are constructed in accordance with this Approval, and upon request, shall make the written statement available for inspection by Ministry staff and staff of the local municipality.

5. MONITORING AND RECORDING

The Owner shall, upon commencement of operation of the Works, carry out the following

monitoring program:

1. All samples and measurements taken for the purposes of this Approval are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.
2. Samples of **treated effluent** (ahead of subsurface disposal system) shall be collected at the effluent pump chamber and analyzed for at least the parameters at the indicated **minimum** frequencies (**Table 1 - Treated Effluent Sampling, Schedule C**).
3. Samples of **groundwater** shall be collected from the nine (9) monitoring wells MW-1, MW-2, MW-4 to MW-10 inclusive, located upgradient of the subsurface disposal beds, immediately downgradient of the subsurface disposal beds and at the property boundary in the downgradient flow path from the subsurface disposal beds, and two (2) additional monitoring wells to intercept the plume close to the water's edge, and analyzed for at least the parameters at the indicated **minimum** frequencies (**Table 2 - Groundwater Sampling, Schedule C**). In addition, groundwater depths for each of the monitoring wells shall also be recorded to assess groundwater elevation and flow paths through the site.
4. Samples of **surface water** shall be collected at the following five (5) locations and analyzed for at least the parameters at the indicated **minimum** frequencies (**Table 3 - Surface Water Sampling, Schedule C**).

Surface water monitoring locations

- upgradient background (SW1)
 - one location within the main pond (SW3)
 - outlet from the main pond (SW4)
 - outlet from the property (SW6)
 - upgradient tributaries (SW5, located at County Road No. 34, approximately 50m upstream of the confluence of Mill Creek with the downstream location of the Mini Lakes outlet).
5. The monitoring outlined pursuant to subsections (3) and (4) shall be undertaken for a period of at least three (3) years following the start up of the Proposed Works.
 6. Prior to the startup of the Works, background groundwater quality must be established by collecting groundwater samples and having them analyzed for the parameters outlined in Table 2.
 7. The Owner shall measure and record the daily volume of effluent being discharged to subsurface disposal system.
 8. The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

- a. the Ministry's Procedure F-10-1, "Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only), as amended from time to time by more recently published editions;
 - b. the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (January 1999), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions; and
 - c. the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition), as amended from time to time by more recently published editions.
9. The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the monitoring activities required by this Approval.
 10. 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 6 as evidenced by the results of the monitoring program required by this condition, the monitoring requirements may be revised by the Director if he/she is of the opinion that such a reduction is appropriate in the circumstances.

6. EFFLUENT LIMITS

1. The Owner shall operate and maintain the Works such that the concentrations of the materials named as effluent parameters are not exceeded in the effluent from the Works (**Table 4 - Effluent Limits, Schedule D**).
2. For the purposes of determining compliance with and enforcing subsection (1):
 - a. Non-compliance with respect to the effluent parameters is deemed to have occurred when the annual average concentration of any of the effluent parameters (treated effluent discharge to the subsurface disposal system) named in subsection (1) above, based on all grab samples taken in accordance with Condition 5(2) above, supplemented by spot sampling by Ministry staff as necessary, during any calendar year, exceeds its corresponding stipulated effluent concentration indicated in Table 4.
3. Paragraph (a) of subsection shall apply upon the issuance of this Approval.
4. The effluent limit set out in subsection (1) shall apply upon the issuance of this Approval.

5. Only those monitoring results collected during the corresponding time period shall be used in calculating the Annual Average Concentration.

7. OPERATIONS AND MAINTENANCE

1. The Owner shall prepare an operations manual within six (6) months of the introduction of sewage to the Works, that includes, but not necessarily limited to, the following information:
 - a. operating procedures for routine operation of the Works; and
 - b. inspection programs, including frequency of inspection, for the Works and the methods or tests employed to detect when maintenance is necessary.
2. (2) The Owner shall maintain the operations manual current and retain a copy at the location of the Works for the operational life of the Works. Upon request, the Owner shall make the manual available to Ministry staff.
3. (3) The Owner shall prepare and make available for inspection by Ministry staff, a maintenance agreement with the manufacturer for the treatment process/technology and a complete set of "as constructed" drawings within one (1) year of Substantial Completion of the Works. The maintenance agreement and drawings must be retained at the site and kept current.
4. (4) The Owner shall employ for the overall operation of the Works a person who possesses the level of training and experience sufficient to allow safe and environmentally sound operation of the Works.

8. REPORTING

1. One week prior to the start up of the operation of the Works, the Owner shall notify the District Manager (in writing) of the pending start up date of the Proposed Works.
2. The Owner shall prepare, and submit upon request, a performance report, on an annual basis, within ninety (90) days following the end of the period being reported upon. The first such report shall cover the first annual period following the commencement of operation of the Works and subsequent reports shall be submitted to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:
 - a. a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 6, including an overview of the success and adequacy of the Works;
 - b. a tabulation of the daily volumes of effluent disposed through the subsurface disposal system during the reporting period;

- c. a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;
- d. a description of any operating problems encountered and corrective actions taken.
- e. a copy of all Notice of Modifications submitted to the District Manager as a result of Schedule A, Section 1, with a status report on the implementation of each modification;
- f. a report summarizing all modifications completed as a result of Schedule A, Section 3;
- g. any other information the District Manager requires from time to time.

9. LIMITED OPERATIONAL FLEXIBILITY

1. The Owner may make modifications to the Works in accordance with the Terms and Conditions of this Approval and subject to the Ministry's "Limited Operational Flexibility Criteria for Modifications to Sewage Works", included under Schedule A of this Approval, as amended.
2. Sewage works under Limited Operational Flexibility shall adhere to the design guidelines contained within the Ministry's publication "Design Guidelines for Sewage Works 2008", as amended.
3. The Owner shall ensure at all times, that the Works, related equipment and appurtenances which are installed or used to achieve compliance are operated in accordance with all Terms and Conditions of this Approval.
4. For greater certainty, the following are **not** permitted as part of Limited Operational Flexibility:
 - a. Modifications to the Works that result in an increase of the approved Rated Capacity of the Works;
 - b. Modifications to the Works that may adversely affect the approved effluent quality criteria or the location of the discharge/outfall;
 - c. Modifications to the treatment process technology of the Works, or modifications that involve construction of new reactors (tanks) or alter the treatment train process design;
 - d. Modifications to the Works approved under s.9 of the EPA, and
 - e. Modifications to the Works pursuant to an order issued by the Ministry.

5. Implementation of Limited Operational Flexibility is not intended to be used for piecemeal measures that result in major alterations or expansions.
6. If the implementation of Limited Operational Flexibility requires changes to be made to the Emergency Response, Spill Reporting and Contingency Plan, the Owner shall, provide a revised copy of this plan to the local fire services authority prior to implementing Limited Operational Flexibility.
7. For greater certainty, any modification made under the Limited Operational Flexibility may only be carried out after other legal obligations have been complied with, including those arising from the *Environmental Protection Act, Niagara Escarpment Planning and Development Act, Oak Ridges Moraine Conservation Act, Lake Simcoe Protection Act* and *Greenbelt Act*.
8. At least thirty (30) days prior to implementing Limited Operational Flexibility, the Owner shall complete a Notice of Modifications describing any proposed modifications to the Works and submit it to the District Manager.
9. The Owner shall not proceed with implementation of Limited Operational Flexibility until the District Manager has provided written acceptance of the Notice of Modifications or a minimum of thirty (30) days have passed since the day the District Manager acknowledged the receipt of the Notice of Modifications.

SCHEDULE 'A'

Limited Operational Flexibility Criteria for Modifications to Industrial Sewage Works

1. The modifications to sewage works approved under an Environmental Compliance Approval (Approval) that are permitted under the Limited Operational Flexibility (LOF), are outlined below and are subject to the LOF conditions in the Approval, and require the submission of the Notice of Modifications. If there is a conflict between the sewage works listed below and the Terms and Conditions in the Approval, the Terms and Conditions in the Approval shall take precedence.

1.1 Sewage Pumping Stations

- a. Alter pumping capacity by adding or replacing equipment where new equipment is located within an existing sewage treatment plant site or an existing sewage pumping station site, provided that the modifications do not result in an increase of the sewage treatment plant Rated Capacity and the existing flow process and/or treatment train are maintained, as applicable.
- b. Forcemain relining and replacement with similar pipe size where the nominal diameter is not greater than 1,200mm.

1.2 Sewage Treatment Process

- a. Installing additional chemical dosage equipment including replacing with alternative chemicals for pH adjustment or coagulants (non-toxic polymers) provided that there are no modifications of treatment processes or other modifications that may alter the intent of operations and may have negative impacts on the effluent quantity and quality.
- b. Expanding the buffer zone between a sanitary sewage lagoon facility or land treatment area and adjacent uses provided that the buffer zone is entirely on the proponent's land.
- c. Optimizing existing sanitary sewage lagoons with the purpose to increase efficiency of treatment operations provided that existing sewage treatment plant rated capacity is not exceeded and where no land acquisition is required.
- d. Optimizing existing sewage treatment plant equipment with the purpose to increase the efficiency of the existing treatment operations, provided that there are no modifications to the works that result in an increase of the approved Rated Capacity, and may have adverse effects to the effluent quality or location of the discharge.
- e. Replacement, refurbishment of previously approved equipment in whole or in part with Equivalent Equipment, like-for-like of different make and model, provided that

the firm capacity, reliability, performance standard, level of quality and redundancy of the group of equipment is kept the same. For clarity purposes, the following equipment can be considered under this provision: pumps, screens, grit separators, blowers, aeration equipment, sludge thickeners, dewatering equipment, UV systems, chlorine contact equipment, bio-disks, and sludge digester systems.

1.3 Sanitary Sewers

- a. Pipe relining and replacement with similar pipe size within the Sewage Treatment Plant site, where the nominal diameter is not greater than 1,200mm.

1.4 Pilot Systems

- a. Installation of pilot systems for new or existing technologies provided that:
 - i. any effluent from the pilot system is discharged to the inlet of the sewage treatment plant or hauled off-site for proper disposal,
 - ii. any effluent from the pilot system discharged to the inlet of the sewage treatment plant or sewage conveyance system does not significantly alter the composition/concentration of the influent sewage to be treated in the downstream process; and that it does not add any inhibiting substances to the downstream process, and
 - iii. the pilot system's duration does not exceed a maximum of two years; and a report with results is submitted to the Director and District Manager three months after completion of the pilot project.
2. Sewage works that are exempt from section 53 of the OWRA by O. Reg. 525/98 continue to be exempt and are not required to follow the notification process under this Limited Operational Flexibility.
3. Normal or emergency operational modifications, such as repairs, reconstructions, or other improvements that are part of maintenance activities, including cleaning, renovations to existing approved sewage works equipment, provided that the modification is made with Equivalent Equipment, are considered pre-approved.
4. The modifications noted in section (3) above are **not** required to follow the notification protocols under Limited Operational Flexibility, provided that the number of pieces and description of the equipment as described in the Approval does not change.

RETAIN COPY OF COMPLETED FORM AS PART OF THE ECA AND SEND A COPY TO THE WATER SUPERVISOR (FOR MUNICIPAL) OR DISTRICT MANAGER (FOR NON-MUNICIPAL SYSTEMS)

Part 1 – Environmental Compliance Approval (ECA) with Limited Operational Flexibility

(Insert the ECA's owner, number and issuance date and notice number, which should start with "01" and consecutive numbers thereafter)

ECA Number	Issuance Date (mm/dd/yy)	Notice number (if applicable)
ECA Owner	Municipality	

Part 2: Description of the modifications as part of the Limited Operational Flexibility

(Attach a detailed description of the sewage works)

Description shall include:

1. A detail description of the modifications and/or operations to the sewage works (e.g. sewage work component, location, size, equipment type/model, material, process name, etc.)
2. Confirmation that the anticipated environmental effects are negligible.
3. List of updated versions of, or amendments to, all relevant technical documents that are affected by the modifications as applicable, i.e. submission of documentation is not required, but the listing of updated documents is (design brief, drawings, emergency plan, etc.)

Part 3 – Declaration by Professional Engineer

I hereby declare that I have verified the scope and technical aspects of this modification and confirm that the design:

1. Has been prepared or reviewed by a Professional Engineer who is licensed to practice in the Province of Ontario;
2. Has been designed in accordance with the Limited Operational Flexibility as described in the ECA;
3. Has been designed consistent with Ministry's Design Guidelines, adhering to engineering standards, industry's best management practices, and demonstrating ongoing compliance with s.53 of the Ontario Water Resources Act; and other appropriate regulations.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name (Print)	PEO License Number
Signature	Date (mm/dd/yy)
Name of Employer	

Part 4 – Declaration by Owner

I hereby declare that:

1. I am authorized by the Owner to complete this Declaration;
 2. The Owner consents to the modification; and
 3. This modifications to the sewage works are proposed in accordance with the Limited Operational Flexibility as described in the ECA.
 4. The Owner has fulfilled all applicable requirements of the *Environmental Assessment Act*.
- I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name of Owner Representative (Print)	Owner representative's title (Print)
Owner Representative's Signature	Date (mm/dd/yy)

SCHEDULE 'B'

Environmental Compliance Approval (ECA) supporting documents:

1. Application for Environmental Compliance Approval (ECA) dated June 7, 2012 signed by Tom Boyd, President, Mini Lakes Residents Association, and supporting documents prepared by Stantec Consulting Ltd., Consulting Engineers.

SCHEDULE 'C'

Table 1- Treated Effluent Sampling

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
pH	grab	monthly

Table 2- Groundwater Sampling

Parameter	Type of Sample	Minimum Frequency
CBOD5	grab	quarterly
Total Suspended Solids	grab	quarterly
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
Dissolved Organic Carbon	grab	quarterly

Table 3- Surface Water Sampling

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

SCHEDULE 'D'

Table 4- Effluent Limits

Effluent Parameters	Annual Average Concentration
CBOD5	20 mg/L
Total Suspended Solids	20 mg/L
Nitrate Nitrogen	8 mg/L
Total Phosphorus	1 mg/L

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

1. Condition 1 is imposed to ensure that the Works are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review. The condition also advises the Owners their responsibility to notify any person they authorized to carry out work pursuant to this Approval the existence of this Approval.
2. Condition 2 is included to ensure that, when the Works are constructed, the Works will meet the standards that apply at the time of construction to ensure the ongoing protection of the environment.
3. Condition 3 is included to ensure that the Ministry records are kept accurate and current with respect to the approved works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.
4. Condition 4 is included to ensure that the works are constructed, and may be operated and maintained such that the environment is protected and deterioration, loss, injury or damage to any person or property is prevented.
5. Condition 5 is included to enable the Owner to evaluate and demonstrate the performance of the Works, on a continual basis, so that the Works are properly operated and maintained at a level which is consistent with the design objectives specified in the Approval.
6. Condition 6 is imposed to ensure that the effluent discharged from the Works to the subsurface disposal system meets the Ministry's effluent quality requirements thus minimizing environmental impact.
7. Condition 7 is included to require that the Works be properly operated, maintained, and equipped such that the environment is protected. As well, the inclusion of an operations manual, maintenance agreement with the manufacturer for the treatment process/technology and a complete set of "as constructed" drawings governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the owner and made available to the Ministry. Such a information is an integral part of the operation of the Works. Its compilation and use should assist the Owner in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act as a benchmark for Ministry staff when reviewing the Owner's operation of the work.
8. Condition 8 is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this Approval, so that the Ministry can work with the Owner in resolving any problems in a timely manner.

9. Condition 9 is included to ensure that the Works are operated in accordance with the application and supporting documentation submitted by the Owner, and not in a manner which the Director has not been asked to consider. These Conditions are also included to ensure that a Professional Engineer has reviewed the proposed modifications and attests that the modifications are in line with that of Limited Operational Flexibility, and provide assurance that the proposed modifications comply with the Ministry's requirements stipulated in the Terms and Conditions of this Approval, MOE policies, guidelines, and industry engineering standards and best management practices.

**Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s).
2391-9KCJUS issued on June 1, 2016.**

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

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

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

The Notice should also include:

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

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

This Notice must be served upon:

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

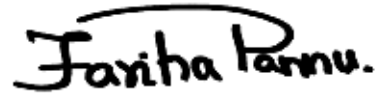
AND

The Director appointed for the purposes of Part II.1 of
the Environmental Protection Act
Ministry of the Environment and Climate Change
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 326-5370 or www.ert.gov.on.ca**

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

DATED AT TORONTO this 18th day of September, 2017

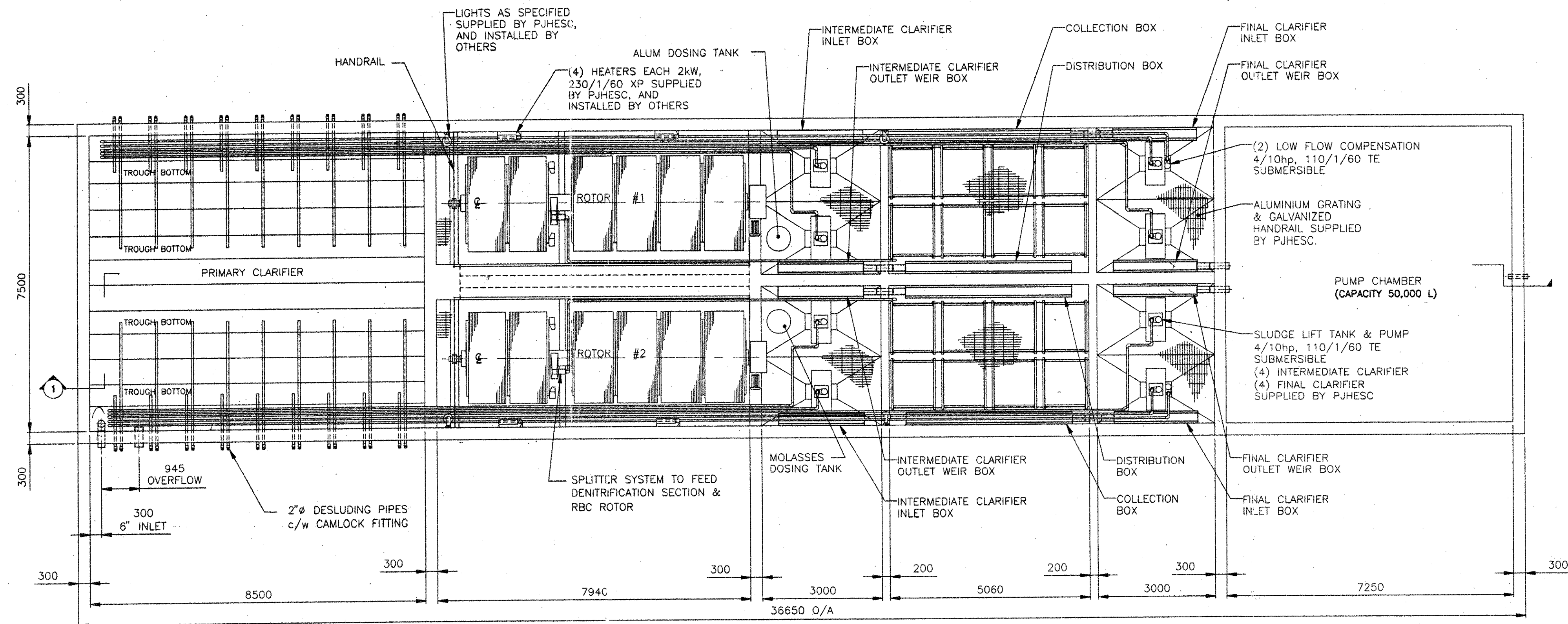


Fariha Pannu, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

JA/
c: District Manager, MOECC Guelph
n/a, Wellington Common Elements Condominium Corporation No.214 c/o MF Property Management
Limited

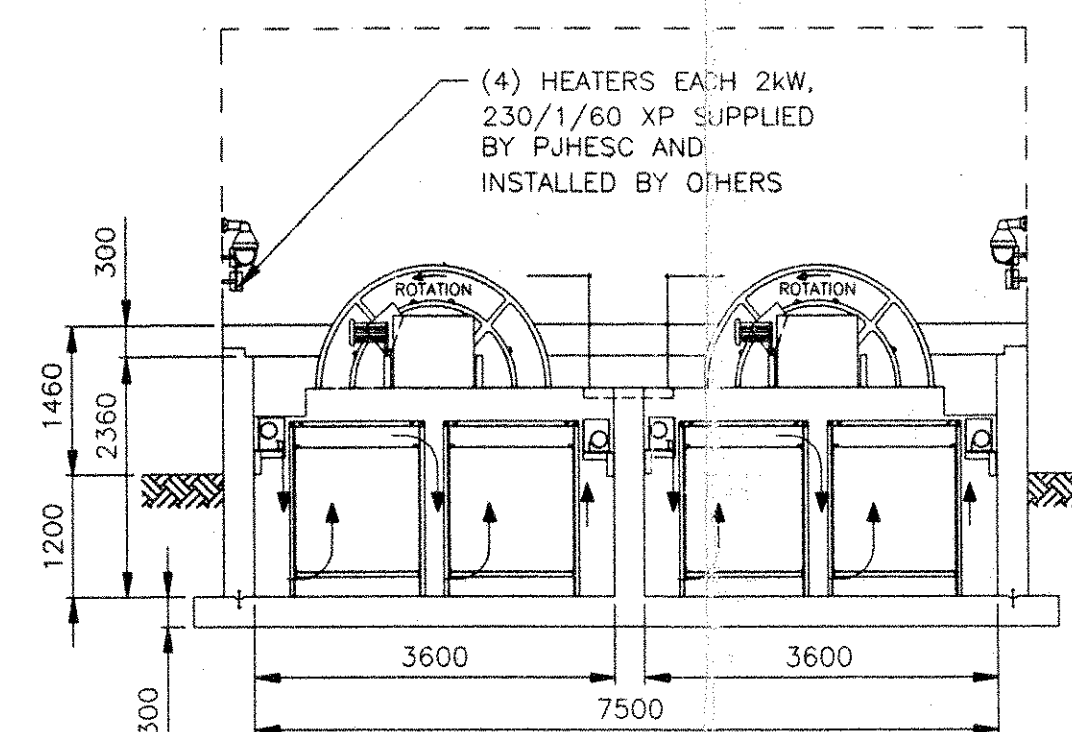
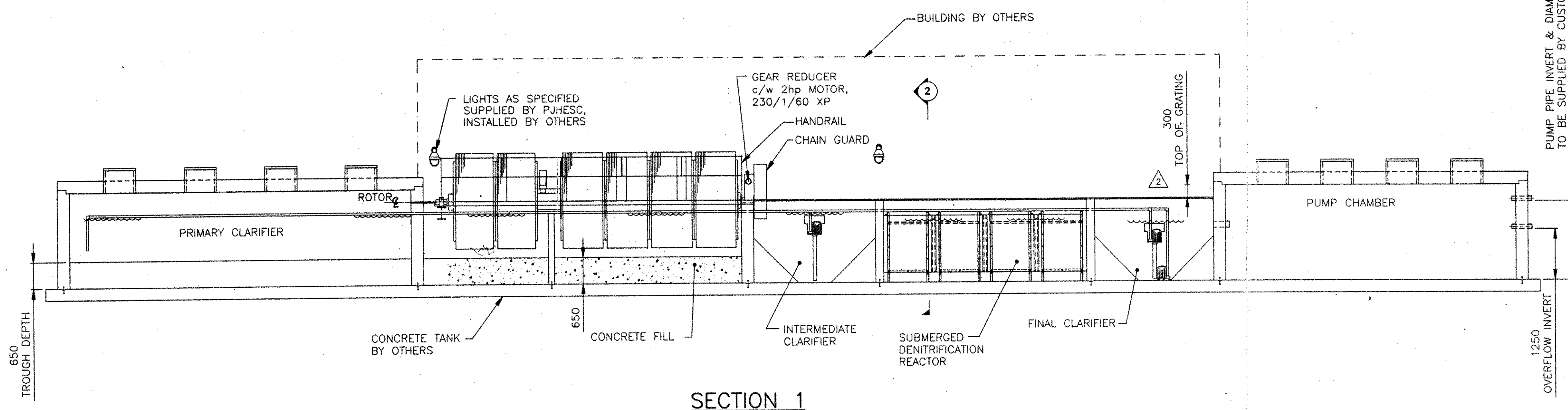
APPENDIX B

STP General Arrangement Drawing (A1- TK2248-8018)



PLAN (WITH COVER REMOVED FOR CLARITY)
SEE DRAWING A03-05-001 FOR HATCH PLACEMENT

DESIGN CRITERIA	TYPICAL	UNITS	SPECIFICS TO PROJECT
AVERAGE DAILY FLOW		M ³ /DAY	216
SOURCE: DOMESTIC SEWAGE			
PEAK FLOW		M ³ /HOUR	13.3
INFLUENT BOD TOTAL		KG/DAY	43.2
INFLUENT BOD SETTLED		KG/DAY	30.2
INFLUENT SUSPENDED SOLIDS		KG/DAY	47.5
INFLUENT NH-N		mg/l	30
INFLUENT T.K.N.		mg/l	40
INFLUENT FATS, OILS, & GREASE		mg/l	50 (MAX)
INFLUENT PHOSPHORUS		mg/l	8
EFFLUENT BOD (AVERAGE)		mg/l	≤15
EFFLUENT SUSPENDED SOLIDS (AVERAGE)		mg/l	≤15
EFFLUENT NH-N		mg/l	≤2
EFFLUENT T.K.N.		mg/l	-
EFFLUENT NO-N		mg/l	-
EFFLUENT TOTAL NITROGEN		mg/l	≤5
EFFLUENT PHOSPHORUS		mg/l	≤1
FECAL COLIFORM M.P.N./100ml			-
TEMPERATURE		°C MIN	10°
		°C MAX	20°
TECHNICAL INFORMATION			
BIO SUPPORTED MEDIA DIAMETER		M	2.35
BIO SUPPORTED MEDIA AREA		M ²	8358
DISC LOADING		GM/M ²	3.6
SUBMERGED DENITRIFICATION MEDIA AREA		M ²	4704
PRIMARY CLARIFIER			
CAPACITY (INCLUDES SLUDGE)		M ³	92.8
BALANCING VOLUME		M ³	45.5
SLUDGE STORAGE CAPACITY		M ³	13.26
SLUDGE STORAGE TIME		DAY	30
TIME IS BASED ON SLUDGE PRODUCTION OF 0.5 Kg., SLUDGE/Kg. BOD @ 5% SOLIDS			
INTERMEDIATE CLARIFIER			
CAPACITY (INCLUDES SLUDGE)		M ³	12.25
SLUDGE STORAGE CAPACITY		M ³	-
SURFACE AREA		M ²	10.8
FINAL CLARIFIER			
CAPACITY (INCLUDES SLUDGE)		M ³	11.16
SLUDGE STORAGE CAPACITY		M ³	-
SURFACE AREA		M ²	10.8
BUCKET PUMP			
FORWARD FLOW RATE		M ³ /HOUR	10.35
MINIMUM SIZES AS REQUIRED BY AVERAGE DAILY FLOW AT RAW SEWAGE STRENGTHS OF BODs 200mg/l		SHIPPING WEIGHT (6 TONNES PER ROTOR) 12 TONNES OPERATING WEIGHT 16 TONNES PER ROTOR	



NOTE:

- TANK MUST BE WATER TIGHT FROM INSIDE TO OUTSIDE AND FROM COMPARTMENT TO COMPARTMENT.
- ALL EQUIPMENT SHOWN INCLUDING GRATING AND HANDRAIL ARE TO BE SUPPLIED BY PJ HANNAH EQUIPMENT SALES CORP.
- SEE DRAWING A03-05-001 FOR POSITIONING OF ACCESS HATCHES.
- ALL PIPING BETWEEN VARIOUS PIECES OF EQUIPMENT ARE SUPPLIED BY PJ HANNAH EQUIPMENT SALES CORP.

DO NOT SCALE THIS DRAWING

DO NOT SCALE THIS DRAWING
TOUS LES DIMENSIONS EN mm SINON SPÉCIFIER AUTREMENT / ALL DIMENSIONS IN mm UNLESS OTHERWISE NOTED

PROPRIETARY DATA

PROPRIETARY DATA
THIS DRAWING IS LOANED WITH THE EXPRESSED AGREEMENT THAT THE PROPERTY OF P.J. HANNAH EQUIPMENT SALES CORP. AND WILL NOT BE REPRODUCED, COPIED, DISCLOSED TO OTHERS OR USED DIRECTLY OR INDIRECTLY IN THE MAKING OF APPARATUS OR PARTS THEREOF, EXCEPT UPON WRITTEN PERMISSION OF P.J. HANNAH EQUIPMENT SALES CORP. THE ACCEPTANCE OF THIS DRAWING WILL BE CONSTRUED AS ACCEPTANCE OF THE FOREGOING AGREEMENT.

CONSULTANT STANTEC CONSULTING LTD.

CONSULTANT STANTEC CONSULTING LTD.
PROJECT MINI LAKES TRAILER PARK
OUR REF. # TK2248 YOUR REF. # 99-7544-01
NOTRE R?F # VOTRE R?F #

GENERAL ARRANGEMENT

GENERAL ARRANGEMENT
KLARGESTER BIODISC BC18-BFP-N-DN

CONCRETE COVER UPDATED

CONCRETE COVER UPDATED
TANK SIZE LENGTH AND HEIGHT MODIFIED.
DESCRIPTION REV. DATE

CONCRETE COVER UPDATED 2 00/02/09
TANK SIZE LENGTH AND HEIGHT MODIFIED. 1 00/02/07

DESIGNER: RVDB/RG
DATE: 99/09/14
SCALE: 1:75
CHECKED: [Signature]
APPROVED: [Signature]

PJ HANNAH
EQUIPMENT SALES CORP.
VANCOUVER, TORONTO

Specialists in pollution control since 1973

DRAWING NO. A1-TK2248-8018
PLOT: 1:75

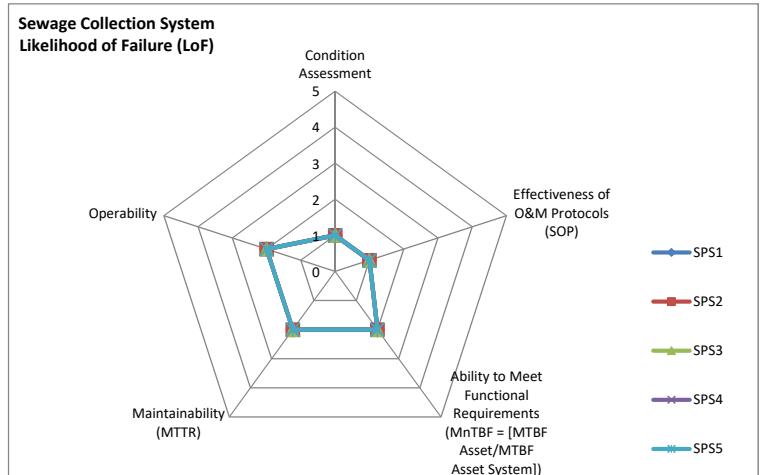
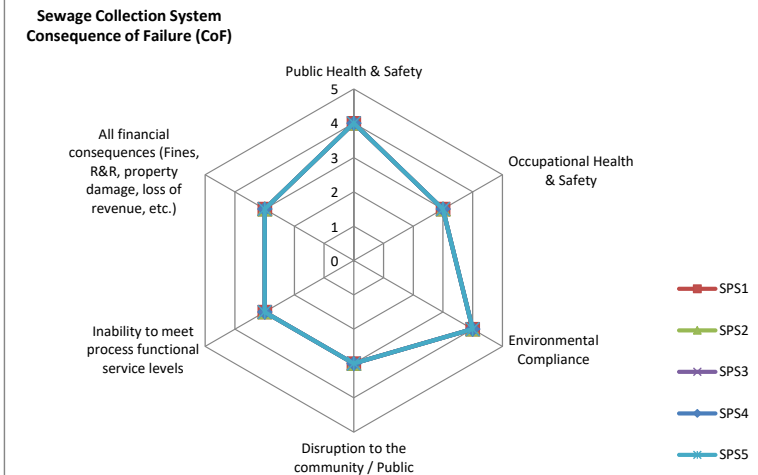
APPENDIX C

LoF and CoF

Mini Lakes Sewage Collection and Treatment System
Sewage Collection System

CONSEQUENCE OF FAILURE (CoF)	SCALE Normalized wt.	Score Assigned				
		SPS1	SPS2	SPS3	SPS4	SPS5
Public Health & Safety	25%	4	4	4	4	4
Occupational Health & Safety	21%	3	3	3	3	3
Environmental Compliance	21%	4	4	4	4	4
Disruption to the community / Public Image	12%	3	3	3	3	3
Inability to meet process functional service levels	11%	3	3	3	3	3
All financial consequences (Fines, R&R, property damage, loss of revenue, etc.)	10%	3	3	3	3	3
CoF Rating	100%	3.46	3.46	3.46	3.46	3.46

LIKELIHOOD OF FAILURE (LoF)	SCALE Normalized wt.	Score Assigned				
		SPS1	SPS2	SPS3	SPS4	SPS5
Condition Assessment	25%	1	1	1	1	1
Effectiveness of O&M Protocols (SOP)	18%	1	1	1	1	1
Ability to Meet Functional Requirements (MnTBF = [MTBF Asset/MTBF Asset System])	20%	2	2	2	2	2
Maintainability (MTTR)	21%	2	2	2	2	2
Operability	16%	2	2	2	2	2
LoF Rating	100%	1.57	1.57	1.57	1.57	1.57



RISK	Risk Score	Risk Level	Description
	Risk Score >=20	5	Severe
	15 < Risk Score Between <= 20	4	High
	10 < Risk Score Between <= 15	3	Moderate
	5 < Risk Score Between <= 10	2	Low
	Risk Score Between <= 5	1	Marginal

CRITICALITY	CoF Rating	Criticality Level	Description
	Between 0 and 1	1	Very Low
	Between 1 and 2	2	Low
	Between 2 and 3	3	Moderate
	Between 3 and 4	4	High
	Between 4 and 5	5	Very High

	Score Assigned				
	SPS1	SPS2	SPS3	SPS4	SPS5
Calculated Risk	5.4322	5.4322	5.4322	5.4322	5.4322
Risk Level	2	2	2	2	2
Risk Description	Low Risk	Low Risk	Low Risk	Low Risk	Low Risk
Criticality Level	4	4	4	4	4
Criticality Description	HIGH	HIGH	HIGH	HIGH	HIGH

Process Group	GROUP CoF	Group LoF	Group Risk	The risk of the process group is determined by the "HIGHEST RISK" scored by any of the assets identified in this group
Sewage Collection System	3.46	1.57	5.4322	

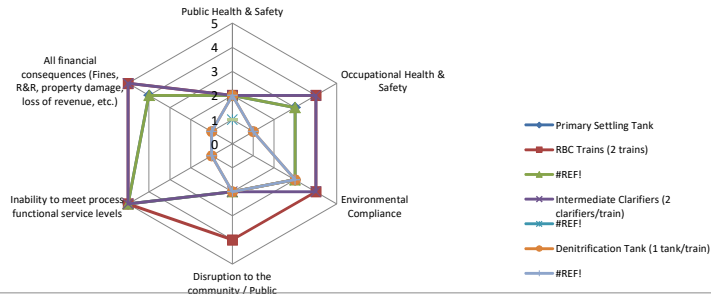
Mini Lakes Sewage Collection and Treatment System

Wastewater Treatment Plant (WWTP)

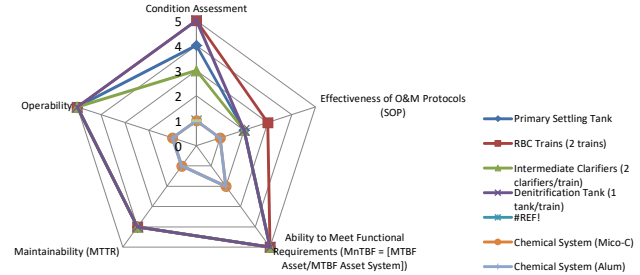
CONSEQUENCE OF FAILURE (CoF)	SCALE Normalized wt.	Score Assigned												
		Primary Settling Tank	RBC Trains (2 trains)	Intermediate Clarifiers (2 clarifiers/train)	Denitrification Tank (1 tank/train)	Chemical System (Micro-C)	Chemical System (Alum)	Final Clarifiers (2 clarifiers/train)	Effluent Pump Chamber (including Pumps)	SCADA/Control System	I & C	Electrical	HVAC	Building Structure
Public Health & Safety	25%	3	3	3	3	3	3	3	3	2	3	3	1	2
Occupational Health & Safety	21%	3	4	4	4	1	1	3	2	2	2	3	2	2
Environmental Compliance	21%	4	4	4	4	4	4	4	4	4	4	2	1	1
Disruption to the community / Public Image	12%	3	4	4	4	3	3	4	4	4	2	2	2	2
Inability to meet process functional service levels	11%	5	5	5	5	1	1	5	1	4	2	1	1	1
All financial consequences (Fines, R&R, property damage, loss of revenue, etc.)	10%	4	5	4	5	1	1	4	3	3	2	4	2	3
CoF Rating	100%	3.53	3.96	3.86	3.96	2.37	2.37	3.65	2.9	2.98	2.67	2.55	1.43	1.78

LIKELIHOOD OF FAILURE (LoF)	SCALE Normalized wt.	Score Assigned												
		Primary Settling Tank	RBC Trains (2 trains)	Intermediate Clarifiers (2 clarifiers/train)	Denitrification Tank (1 tank/train)	Chemical System (Micro-C)	Chemical System (Alum)	Final Clarifiers (2 clarifiers/train)	Effluent Pump Chamber (including Pumps)	SCADA/Control System	I & C	Electrical	HVAC	Building Structure
Condition Assessment	25%	4	3	3	4	1	1	4	1	5	2	4	1	2
Effectiveness of O&M Protocols (SOP)	18%	2	3	2	2	1	1	2	2	3	3	3	3	3
Ability to Meet Functional Requirements (MnTBF = [MTBF Asset/MTBF Asset System])	20%	5	5	5	5	2	2	5	1	5	2	2	2	3
Maintainability (MTTR)	21%	4	4	4	4	1	1	4	3	5	4	3	3	4
Operability	16%	5	5	5	5	1	1	5	1	5	1	3	1	3
LoF Rating	100%	4	3.93	3.75	4	1.2	1.2	4	1.6	4.64	2.44	3.05	1.98	2.96

Mini Lakes WWTP
Consequence of Failure (LoF)



Mini Lakes WWTP
Likelihood of Failure (LoF)



RISK		
Risk Score	Risk Level	Description
Risk Score >=20	5	Severe
15 < Risk Score Between <= 20	4	High
10 < Risk Score Between <= 15	3	Moderate
5 < Risk Score Between <= 10	2	Low
Risk Score Between <= 5	1	No Risk

CRITICALITY		
CoF Rating	Criticality Level	Description
Between 0 and 1	1	Very Low
Between 1 and 2	2	Low
Between 2 and 3	3	Moderate
Between 3 and 4	4	High
Between 4 and 5	5	Very High

	Score Assigned												
	Primary Settling Tank	RBC Trains (2 trains)	Intermediate Clarifiers (2 clarifiers/train)	Denitrification Tank (1 tank/train)	Chemical System (Micro-C)	Chemical System (Alum)	Final Clarifiers (2 clarifiers/train)	Effluent Pump Chamber (including Pumps)	SCADA/Control System	I & C	Electrical	HVAC	Building Structure
Calculated Risk	14.12	15.5628	14.475	15.84	2.844	2.844	14.6	4.64	13.8272	6.5148	7.7775	2.8314	5.2688
Risk Level	3	4	3	4	1	1	3	1	3	2	2	1	2
Risk Description	Moderate Risk	High Risk	Moderate Risk	High Risk	Marginal Risk	Marginal Risk	Moderate Risk	Marginal Risk	Moderate Risk	Low Risk	Low Risk	Marginal Risk	Low Risk
Criticality Level	4	4	4	4	3	3	4	3	3	3	3	2	2
Criticality Description	HIGH	HIGH	HIGH	HIGH	MODERATE	MODERATE	HIGH	MODERATE	MODERATE	MODERATE	MODERATE	LOW	LOW

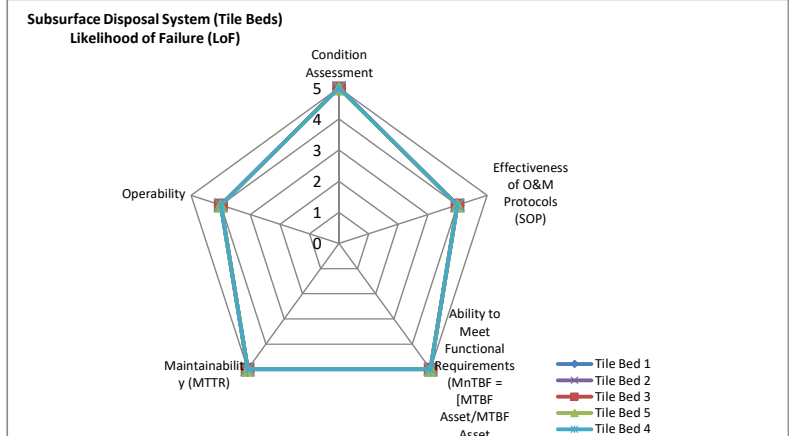
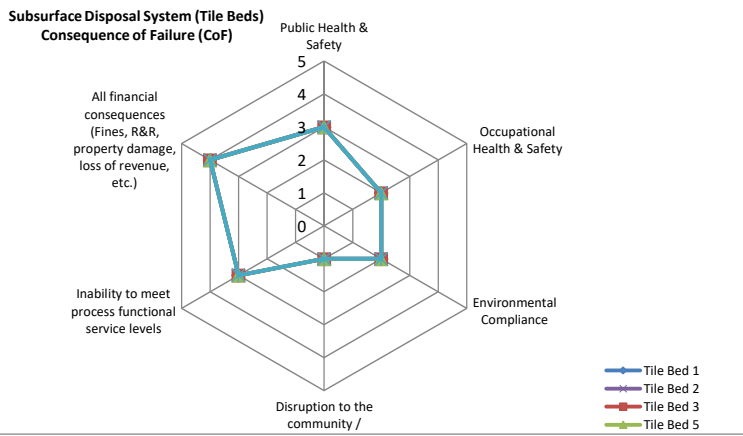
Process Group	GROUP CoF	Group LoF	Maximum Risk	The risk of the process group is determined by the "HIGHEST RISK" scored by any of the assets identified
Wastewater Treatment Plant (WWTP)	3.96	4	15.84	

Process/Asset Group	Group Risk	Group Risk Level	High Risk Due to:	Risk Description	Group Criticality Level	Criticality Description
Wastewater Treatment Plant (WWTP)	15.84	4	Denitrification Tank (1 tank/train)	High Risk	4	HIGH

Mini Lakes Sewage Collection and Treatment System
Subsurface Disposal System (5 Tile Beds)

CONSEQUENCE OF FAILURE (CoF)	SCALE Normalized wt.	Score Assigned				
		Tile Bed 1	Tile Bed 2	Tile Bed 3	Tile Bed 4	Tile Bed 5
Public Health & Safety	25%	3	3	3	3	3
Occupational Health & Safety	21%	2	2	2	2	2
Environmental Compliance	21%	2	2	2	2	2
Disruption to the community / Public Image	12%	1	1	1	1	1
Inability to meet process functional service levels	11%	3	3	3	3	3
All financial consequences (Fines, R&R, property damage, loss of revenue, etc.)	10%	4	4	4	4	4
CoF Rating	100%	2.44	2.44	2.44	2.44	2.44

LIKELIHOOD OF FAILURE (LoF)	SCALE Normalized wt.	Score Assigned				
		Tile Bed 1	Tile Bed 2	Tile Bed 3	Tile Bed 4	Tile Bed 5
Condition Assessment	25%	5	5	5	5	5
Effectiveness of O&M Protocols (SOP)	18%	4	4	4	4	4
Ability to Meet Functional Requirements (MnTBF = [MTBF Asset/MTBF Asset System])	20%	5	5	5	5	5
Maintainability (MTTR)	21%	5	5	5	5	5
Operability	16%	4	4	4	4	4
LoF Rating	100%	4.66	4.66	4.66	4.66	4.66



RISK		
Risk Score	Risk Level	Description
Risk Score >=20	5	Severe
15 < Risk Score Between <= 20	4	High
10 < Risk Score Between <= 15	3	Moderate
5 < Risk Score Between <= 10	2	Low
Risk Score Between <= 5	1	No Risk

CRITICALITY		
CoF Rating	Criticality Level	Description
Between 0 and 1	1	Very Low
Between 1 and 2	2	Low
Between 2 and 3	3	Moderate
Between 3 and 4	4	High
Between 4 and 5	5	Very High

	Score Assigned				
	Tile Bed 1	Tile Bed 2	Tile Bed 3	Tile Bed 4	Tile Bed 5
Calculated Risk	11.3704	11.3704	11.3704	11.3704	11.3704
Risk Level	3	3	3	3	3
Risk Description	Moderate Risk	Moderate Risk	Moderate Risk	Moderate Risk	Moderate Risk
Criticality Level	3	3	3	3	3
Criticality Description	MODERATE	MODERATE	MODERATE	MODERATE	MODERATE

Process Group	GROUP CoF	Group LoF	Maximum Risk	The risk of the process group is
Subsurface Disposal System (5 Tile Beds)	2.44	4.66	11.3704	

Process/Asset Group	Group Risk	Group Risk Level	High Risk Due to:	Risk Description	Group Criticality Level	Criticality Description
Subsurface Disposal System (5 Tile Beds)	11.3704	3	Tile Bed 1	Moderate Risk	3	MODERATE

APPENDIX D

Capital Cost Estimates Breakdown

OCWA Order of Magnitude Cost Estimate

Rehabilitate the Existing Sewage Treatment System (RBC technology)

Identified Issue	Recommended Work	Capital Cost ESTIMATES
<p>None of the proposed works in the ECA (June 1, 2016) have been completed</p> <ul style="list-style-type: none"> • Primary and intermediate clarifiers have to be vacuumed out, while filled with sewage, to remove sludge. Process is very inefficient • Chemical dosing pumps are old and may soon require replacement • Micro C chemical addition allows for settling and inconsistent dosing 	<p>Complete all proposed works</p> <ul style="list-style-type: none"> • Partition of primary clarifier into 2 compartments. Including baffle plates, sludge recirculation pumps/piping to the inlet chamber, and sludge removal piping • Modify denitrification tank to allow crossover between trains • New pump to recycle effluent back to inlet of primary clarifier • Separate chemical storage building to store 900L and 2,300L tanks with metering pumps and eyewash station 	\$250,000
<p>Historian has limited memory (72 hrs.), limited SCADA accessibility/control. Manual data recording</p>	<p>Upgrade SCADA and historian</p>	\$60,000
<p>High flows can cause unwanted sloughing of biomass and accumulation of sludge in intermediate clarifiers</p>	<p>Addition of equalization tank for variable flow conditions</p>	\$300,000
		\$610,000.00

OCWA Order of Magnitude Cost Estimate
Upgrade with Fluidyne Integrated Surge Anoxic Mix (ISAMTM-50) (H2Flow)

Date: November 5, 2017
 Project Number:
 Project Name: Mini Lakes Trade-Off Study
 Client: Mini Lakes Residential Condominium
 Prepared by:

Part A: Summary of Equipment Costs (includes major equipment only)

Equipment ID	Equipment Name	No. of Units	Unit Cost	Total Cost	Basis of Estimate	Comments
	Fluidyne Integrated Surge Anoxic Mix (ISAMTM-50)	1	\$365,000	\$365,000	Budgetary estimated provide by H2Flow via email on Oct 7, 2018	
	post-EQ chamber	1	\$50,000	\$50,000		
	Pre-treatment screen	1	\$80,000	\$80,000		
	Disinfection	1	\$40,000	\$40,000		
	Sub-Total Equipment Cost			\$535,000		
	Allowance for Miscellaneous Equipment (10-15%)		10%	\$53,500		
	Total Equipment Cost			\$588,500		

Part B: Installation Costs

Typical Range	Disciplines	No. of Units	% Allowance	\$ Allowance or Quoted Price	Comments
3-25%	Mechanical/Piping	L.S	25%	\$147,125	
5-8%	Civil including foundations	L.S	5%	\$29,425	
5-8%	Structural including walls, doors, etc.	L.S	5%	\$29,425	
1-5%	HVAC	L.S	10%	\$58,850	
10-15%	Electrical	L.S	15%	\$88,275	
7-12%	Control and Instrumentation	L.S	10%	\$58,850	
10-20%	Demolishing and disposal of existing WWTP	L.S	15%	\$88,275	

Sub-Total of Installation Costs \$500,225

Total Direct Cost (installed cost) \$1,088,725

Part C: Indirect Costs

Typical Range	Item	No. of Units	% Allowance	\$ Allowance or Quoted Price	Comments
15-25%	Engineering, Procurement and Construction Management	L.S	20%	\$117,700	
2-5%	Temporary Construction Services	L.S	2%	\$11,770	
2%	Insurance	L.S	2%	\$11,770	
3%	Spares	L.S	3%	\$17,655	
3%	Cold Commissioning	L.S	3%	\$17,655	

Total Indirect Costs \$176,550

Project Sub-Total \$1,265,275

Contingency Allowance (typically 30%) 15% \$189,791

Order of Magnitude Project Cost Estimate \$1,455,066

**OCWA Order of Magnitude Cost Estimate
Upgrade with MBBR skid based system (FilterBoxx)**

Date: November 5, 2017
 Project Number:
 Project Name: Mini Lakes Trade-Off Study
 Client: Mini Lakes Residential Condominium
 Prepared by:

Part A: Summary of Equipment Costs (includes major equipment only)

Equipment ID	Equipment Name	No. of Units	Unit Cost	Total Cost	Basis of Estimate	Comments
	MBBR skid based system	1	\$500,000	\$500,000	Budgetary estimated provide by FilterBoxx via email on April 2, 2018	
Sub-Total Equipment Cost				\$500,000		
Allowance for Miscellaneous Equipment (30-45%) if no details			30%	\$150,000		
Total Equipment Cost				\$650,000		

Part B: Installation Costs

Typical Range	Disciplines	No. of Units	% Allowance	\$ Allowance or Quoted Price	Comments
3-25%	Mechanical/Piping	L.S	25%	\$162,500	
5-8%	Civil including foundations	L.S	5%	\$32,500	
5-8%	Structural including walls, doors, etc.	L.S	5%	\$32,500	
1-5%	HVAC	L.S	10%	\$65,000	
10-15%	Electrical	L.S	15%	\$97,500	
7-12%	Control and Instrumentation	L.S	10%	\$65,000	
10-20%	Demolishing and disposal of existing WWTP	L.S	15%	\$97,500	
Sub-Total of Installation Costs				\$552,500	
Total Direct Cost (installed cost)				\$1,202,500	

Part C: Indirect Costs

Typical Range	Item	No. of Units	% Allowance	\$ Allowance or Quoted Price	Comments
15-25%	Engineering, Procurement and Construction Management	L.S	20%	\$130,000	
2-5%	Temporary Construction Services	L.S	2%	\$13,000	
2%	Insurance	L.S	2%	\$13,000	
3%	Spares	L.S	3%	\$19,500	
3%	Cold Commissioning	L.S	3%	\$19,500	
Total Indirect Costs				\$195,000	
Project Sub-Total				\$1,397,500	
Contingency Allowance (typically 30%)			15%	\$209,625	
Order of Magnitude Project Cost Estimate				\$1,607,125	

APPENDIX G

Mini Lakes Standby Power Study



OCWA - Mini Lakes

Feasibility Study for Standby Power Generation at Mini Lakes Condominium

December 18, 2018



Prepared for:



Ontario Clean Water Agency
Agence Ontarienne Des Eaux



R.V. Anderson Associates Limited
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December 18, 2018

RVA 184140

Ontario Clean Water Agency
Project Planning and Delivery Group (PPDG)
Sheridan Center
2225 Erin Mills Parkway, Suite 1200
Mississauga, Ontario
L5K 1T9

**Attention: Mr. Jose Casal, M.Sc., (B.Eng.), P.Eng., PMP
Senior Project Engineer**

Dear Mr. Casal:

Re: Feasibility Study for Standby Power Generation at Mini Lakes Condominium

Please find enclosed the final Report for the referenced project for your review.

Please do not hesitate to contact the undersigned if you have any questions.

Yours very truly,

A handwritten signature in blue ink, appearing to read 'Syed Q. Raza'.

Syed Q. Raza, P.Eng.
Project Manager

R.V. ANDERSON ASSOCIATES LIMITED



Ontario Clean Water Agency
Agence Ontarienne Des Eaux

OCWA - Mini Lakes

Feasibility Study for Standby Power Generation at Mini Lakes Condominium

Prepared By: Alexandre Machado

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RVA 184140

December 18, 2018

The RVA logo, consisting of a stylized blue 'r' followed by the letters 'rva' in a lowercase, sans-serif font.

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1.0 INTRODUCTION

This technical memorandum explores different possibilities for the installation of standby power generation for Mini Lakes condominium located at 7541 Wellington Road 34, Guelph ON, postal code N1H 6H9.

R.V.Anderson Associates Limited (RVA) was retained by Ontario Clean Water Agency, (OCWA) to prepare a feasibility study for providing new standby power generation systems for three (3) existing well houses, five (5) sewage pumping stations, one recreational centre and one wastewater treatment plant (WWTP).

The following scenarios were discussed with the Mini Lakes Board and OCWA during a workshop meeting held on November 02nd 2018;

- SCENARIO A - Dedicated standby power generator to be provided at each location, i.e. One (1) generator per location;
- SCENARIO B - Standby power to be provided at central locations by combining generator(s) for multiple locations, wherever feasible;
- SCENARIO C - Dedicated standby power to be provided at each critical location - 1 generator per critical location;
- SCENARIO D - Standby power to be provided at central locations for a group of critical locations by combined generator(s), wherever feasible; and
- SCENARIO E - Permanent generators for larger facilities with portable generator connection for remaining facilities.

2.0 EXISTING FACILITIES

2.1 SEWAGE PUMPING STATIONS



Fig 1 – SPS#5.

The Mini Lakes condominium has five (5) sewage pumping stations (SPS#1 to SPS#5), each comprising of a starter control panel for 2 submersible pump-motor assemblies.

The sewage pumping stations are powered by Hydro One from single-phase 120/240V services and have its dedicated hydro meters with disconnect switches, with the exception of SPS#4, which is sub-fed through well house WH#2.

For approximate location of each sewage pumping station, see Fig 5 of item 4.1.2.

2.2 WELL HOUSES



Fig 2 – WH#3.

The Mini Lakes condominium has three (3) well houses (WH#1 to WH#3), each comprising water treatment equipment in addition of lighting, receptacles and space heaters.

Each well house is powered by Hydro One from a single-phase 120/240V service and has its dedicated hydro meter with disconnect switch.

For approximate location of each well house, see Fig 5 of item 4.1.2.

2.3 WASTEWATER TREATMENT PLANT



Fig 3 – WWTP.

The Mini Lakes condominium comprises a Wastewater Treatment Plant (WWTP). The WWTP is powered by Hydro One by a single-phase 120/240V service and has wastewater treatment equipment such as pumps and fans as well as building loads such as lighting, receptacles and heaters.

For approximate location of the wastewater treatment plant, see Fig 5 of item 4.1.2.

2.4 RECREATIONAL CENTRE



Fig 4 – Recreational Centre.

The Recreational Centre of Mini Lakes condominium is powered by Hydro One by a single-phase 120/240V service and has residential type loads such as appliances, lighting and AC units.

For approximate location of the recreational centre, see Fig 5 of item 4.1.2.

2.5 EVALUATION OF CRITICALITY OF EACH FACILITY

As informed by Mini Lakes operations staff and OCWA, the condominium’s water distribution system is interconnected by manually opening existing interconnection valves. The WH#3 is capable of meeting ‘the minimum flushing toilets and running water’ demand due to its higher power pumps, therefore, is considered as “critical”, however, for redundancy purposes, well house #2 will also be considered as “critical” and only well house #1 will be excluded from scenarios C, D and E.

The wastewater treatment plant as well as all the sewage pumping stations are considered “critical” and therefore will require standby power as stated in scenarios C, D and E.

Table 2.1 below summarizes the criticality of each location.

Table 2.1 – Location criticality.

Facility	Critical (Y/N)	Description
SPS#1	Y	No backup connection to adjacent service areas
SPS#2	Y	No backup connection to adjacent service areas
SPS#3	Y	No backup connection to adjacent service areas
SPS#4	Y	No backup connection to adjacent service areas
SPS#5	Y	No backup connection to adjacent service areas
WH#1	N	Can be serviced by WH#3
WH#2	Y	For redundancy purposes
WH#3	Y	Will supply basic use water to the whole condominium
WWTP	Y	Needs to be operational at all times

3.0 Power demand evaluation of each facility

The following tables summarize the approximate load at each location (+/-20%). The loads will need to be re-evaluated at the detailed design stage.

3.1 SEWAGE PUMPING STATION

Table 3.1 and Table 3.2 below show the pumping stations load analysis. This study considers both pumps of each station to be duty and critical. The existing pumps are driven by direct-on-line (DOL) starters.

SPS#1, SPS#3 and SPS#4

Table 3.1 – Sewage pumping station load analysis - with 2 HP pumps.

S. No.	Load Description	Connected Load				Demand Factor	Demand Load		Critical load		Starting
		HP	kWe	p.f.	kVA		-	kWe	kVA	kWe	
1	Pump 1	2.0	1.8	0.66	2.7	1	1.8	2.7	1.8	2.7	DOL
2	Pump 2	2.0	1.8	0.66	2.7	1	1.8	2.7	1.8	2.7	DOL
TOTAL			3.6		5.4		3.6	5.4	3.6	5.4	

SPS#2 and SPS#5

Table 3.2 – Sewage pumping station load analysis – with 5 HP pumps

S. No.	Load Description	Connected Load				Demand Factor	Demand Load		Critical load		Starting
		HP	kWe	p.f.	kVA		-	kWe	kVA	kWe	
1	Pump 1	5.0	4.3	0.70	6.1	1	4.3	6.1	4.3	6.1	DOL
2	Pump 2	5.0	4.3	0.70	6.1	1	4.3	6.1	4.3	6.1	DOL
TOTAL				8.5	12.1		8.5	12.1	8.5	12.1	

3.2 WELL HOUSES

Table 3.3, Table 3.4 and Table 3.5 below show the drinking water well houses load analysis. This study considers all loads of each well house to be duty and critical. All existing pumps are driven by direct-on-line (DOL) starters.

Well House#1

Table 3.3 – Well House #1 load analysis.

S. No.	Load Description	Connected Load				Demand Factor	Demand Load		Critical load		Starting
		HP	kWe	p.f.	kVA		-	kWe	kVA	kWe	
1	Heat Tracing		0.35	1.00	0.4	1	0.4	0.4	0.4	0.4	DOL
2	Chemical Dosage Equipment		0.5	0.90	0.6	1	0.5	0.6	0.5	0.6	DOL
3	Water Filter		0.5	0.80	0.6	1	0.5	0.6	0.5	0.6	DOL
4	North Wall receptacle		1.0	0.90	1.1	1	1.0	1.1	1.0	1.1	DOL
5	Lighting Circuit 1		0.2	0.90	0.2	1	0.2	0.2	0.2	0.2	DOL
6	Lighting Circuit 2		0.2	0.90	0.2	1	0.2	0.2	0.2	0.2	DOL
7	Fan Forced Heater		2.5	1.00	2.5	1	2.5	2.5	2.5	2.5	DOL
8	Control Panel		1.2	0.80	1.5	1	1.2	1.5	1.2	1.5	DOL
9	Well Pump	1.5	1.4	0.57	2.4	1	1.4	2.4	1.4	2.4	DOL
TOTAL				7.8		9.5		7.8	9.5	7.8	9.5

Well House#2

Table 3.4 – Well House #2 load analysis.

S. No.,	Load Description	Connected Load				Demand Factor	Demand Load		Critical load		Starting
		HP	kWe	p.f.	kVA		-	kWe	kVA	kWe	
1	Heat Tracing		0.35	1.00	0.4	1	0.4	0.4	0.4	0.4	DOL
2	Chemical Dosage Equipment		0.5	0.90	0.6	1	0.5	0.6	0.5	0.6	DOL
3	Water Filter		0.5	0.80	0.6	1	0.5	0.6	0.5	0.6	DOL
4	West Wall receptacle		1.0	0.90	1.1	1	1.0	1.1	1.0	1.1	DOL
5	Lighting Circuit		0.2	0.90	0.2	1	0.2	0.2	0.2	0.2	DOL
6	Wall receptacle		1.0	0.90	1.1	1	1.0	1.1	1.0	1.1	DOL
7	Dehumidifier		0.5	0.80	0.6	1	0.5	0.6	0.5	0.6	DOL
8	Fan Forced Heater		2.5	1.00	2.5	1	2.5	2.5	2.5	2.5	DOL
9	Control Panel		1.2	0.80	1.5	1	1.2	1.5	1.2	1.5	DOL
10	Well Pump	1.5	1.4	0.57	2.4	1	1.4	2.4	1.4	2.4	DOL
11	SPS#4 Pump 1	2.0	1.8	0.66	2.7	1	1.8	2.7	1.8	2.7	DOL
12	SPS#4 Pump 2	2.0	1.8	0.66	2.7	1	1.8	2.7	1.8	2.7	DOL
TOTAL				12.7		16.3		12.7	16.3	12.7	16.3

Well House#3

Table 3.5 – Well House #3 load analysis.

S. No.	Load Description	Connected Load				Demand Factor	Demand Load		Critical load		Starting
		HP	kWe	p.f.	kVA		-	kWe	kVA	kWe	
1	Heat Tracing		0.35	1.00	0.4	1	0.4	0.4	0.4	0.4	DOL
2	Chemical Dosage Equipment		0.5	0.90	0.6	1	0.5	0.6	0.5	0.6	DOL
3	Water Filter		0.5	0.80	0.6	1	0.5	0.6	0.5	0.6	DOL
4	North Wall receptacle		1.0	0.90	1.1	1	1.0	1.1	1.0	1.1	DOL
5	Lighting Circuit 1		0.2	0.90	0.2	1	0.2	0.2	0.2	0.2	DOL
6	Lighting Circuit 2		0.2	0.90	0.2	1	0.2	0.2	0.2	0.2	DOL
7	Fan Forced Heater		2.5	1.00	2.5	1	2.5	2.5	2.5	2.5	DOL
8	Control Panel		1.2	0.80	1.5	1	1.2	1.5	1.2	1.5	DOL
9	Well Pump	5.0	4.3	0.70	6.1	1	4.3	6.1	4.3	6.1	DOL
TOTAL			10.7		13.2		10.7	13.2	10.7	13.2	

3.3 WASTEWATER TREATMENT PLANT

Table 3.6 below shows the WWTP load analysis. As discussed with operations staff, this study considers all loads to be duty and critical with direct-on-line (DOL) starters.

Table 3.6 –Wastewater treatment plant load analysis.

S. No.	Load Description	Connected Load				Demand Factor	Demand Load		Critical load		Starting
		HP	kWe	p.f.	kVA	-	kWe	kVA	kWe	kVA	
1	RBC 1 DRIVE	2.0	1.8	0.66	2.7	1	1.8	2.7	1.8	2.7	DOL
2	RBC 2 DRIVE	2.0	1.8	0.66	2.7	1	1.8	2.7	1.8	2.7	DOL
3	EFF. 1 - EFLUENT PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
4	EFF. 2 - EFLUENT PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
5	EFF. 3 - EFLUENT PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
6	EFF. 4 - EFLUENT PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
7	EFF. 5 - EFLUENT PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
8	EFF. 6 –EFLUENT PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
9	FCS 1 - SLUDGE PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
10	FCS 2 - SLUDGE PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
11	FCS 3 - SLUDGE PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
12	FCS 4 - SLUDGE PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
13	ISC 1 - SLUDGE PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
14	ISC 2 - SLUDGE PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
15	ISC 3 - SLUDGE PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
16	ISC 4 - SLUDGE PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
17	LFP 1 - LOW FLOW PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
18	LFP 2 - LOW FLOW PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
19	ALUM PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
20	CB PUMP	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
21	VENTILATION FAN	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
22	HEATERS		8.0	1.00	8.0	1	8.0	8.0	8.0	8.0	DOL
23	LIGHTING		1.2	0.95	1.3	1	1.2	1.3	1.2	1.3	DOL
24	FAN FORCED HEATER		2.5	1.00	2.5	1	2.5	2.5	2.5	2.5	DOL
25	BACK EXTERIOR GFCI RECEPTACLE		2.0	0.80	2.5	1	2.0	2.5	2.0	2.5	DOL
26	PRINTER		0.45	0.90	0.5	1	0.5	0.5	0.5	0.5	DOL
27	COMPUTER		0.45	0.90	0.5	1	0.5	0.5	0.5	0.5	DOL
28	LIGHTING AND WALL RECEPTACLE		2.0	0.95	2.1	1	2.0	2.1	2.0	2.1	DOL
TOTAL			29.5		39.8		29.5	39.8	29.5	39.8	

RECREATIONAL CENTRE Table 3.7 – Recreational Centre load analysis. below shows the WWTP load analysis.

Table 3.7 – Recreational Centre load analysis.

S. No.	Load Description	Connected Load				Demand Factor	Demand Load		Critical load		Starting
		HP	kWe	p.f.	kVA		-	kWe	kVA	kWe	
1	KITCHEN EXHAUST FAN	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
2	RCPT. BY FRONT ENTR.		0.5	0.80	0.6	0.8	0.4	0.5	0.4	0.5	DOL
3	KITCHEN SPLIT #1	1.0	1.0	0.57	1.7	1	1.0	1.7	1.0	1.7	DOL
4	KITCHEN SPLIT #2	1.0	1.0	0.57	1.7	1	1.0	1.7	1.0	1.7	DOL
5	SOUND SYSTEM		0.5	0.90	0.6	0.8	0.4	0.4	0.4	0.4	DOL
6	WC ELECTRIC HEATER		0.5	1.00	0.5	1	0.5	0.5	0.5	0.5	DOL
7	FURNACE ROOM SPLIT#1	5.0	4.3	0.70	6.1	1	4.3	6.1	4.3	6.1	DOL
8	FURNACE ROOM SPLIT#2	5.0	4.3	0.70	6.1	1	4.3	6.1	4.3	6.1	DOL
9	SOUND BOOTH RCPT.		0.5	0.80	0.6	0.8	0.4	0.5	0.4	0.5	DOL
10	WC HEAT TRACER #1		0.5	1.00	0.5	1	0.5	0.5	0.5	0.5	DOL
11	WC HEAT TRACER #2		0.5	1.00	0.5	1	0.5	0.5	0.5	0.5	DOL
12	NEW PUMP - BULLFROG #1	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
13	NEW PUMP - BULLFROG #2	0.5	0.5	0.55	0.9	1	0.5	0.9	0.5	0.9	DOL
14	KITCHEN SPLIT #3 GFI	1.0	1.0	0.57	1.7	1	1.0	1.7	1.0	1.7	DOL
15	WATER HEATER		1.0	0.80	1.3	1	1.0	1.3	1.0	1.3	DOL
16	OUTSIDE QUARTER		0.5	0.80	0.6	1	0.5	0.6	0.5	0.6	DOL
17	BAR SUB PANEL		5.0	0.80	6.3	0.8	4.0	5.0	4.0	5.0	DOL
18	FIRE ALARM		0.5	0.90	0.6	1	0.5	0.6	0.5	0.6	DOL
19	KITCHEN FRIDGE		0.5	0.80	0.6	1	0.5	0.6	0.5	0.6	DOL
20	KITCHEN GFI RCPT. #1		0.5	0.80	0.6	0.8	0.4	0.5	0.4	0.5	DOL
21	KITCHEN GFI RCPT.#2		0.5	0.80	0.6	0.8	0.4	0.5	0.4	0.5	DOL
22	RECEPTACLES		0.5	0.80	0.6	0.8	0.4	0.5	0.4	0.5	DOL
23	STAGE RECEPTACLE		0.5	0.80	0.6	0.8	0.4	0.5	0.4	0.5	DOL
24	MAIN ROOM LIGHTING		0.5	0.90	0.6	0.6	0.3	0.3	0.3	0.3	DOL
25	MAIN ROOM LIGHTING #2		0.5	0.90	0.6	0.6	0.3	0.3	0.3	0.3	DOL
26	BACK ROOM EXIT LIGHT		0.2	0.90	0.2	1	0.2	0.2	0.2	0.2	DOL
27	STOVE		0.5	0.90	0.6	1	0.5	0.6	0.5	0.6	DOL
28	FLUORESCENT LIGHTING		0.5	0.90	0.6	0.6	0.3	0.3	0.3	0.3	DOL
29	CEILING FANS		0.5	0.80	0.6	0.8	0.4	0.5	0.4	0.5	DOL
30	FRONT STAGE #1		0.5	0.90	0.6	0.8	0.4	0.4	0.4	0.4	DOL
31	FRONT STAGE #2		0.5	0.90	0.6	0.8	0.4	0.4	0.4	0.4	DOL
32	FLUORESCENT LIGHT. #2		0.5	0.90	0.6	0.6	0.3	0.3	0.3	0.3	DOL
33	NEW COOLER		0.5	0.80	0.6	1	0.5	0.6	0.5	0.6	DOL
34	EXIT LIGHT LADIES ROOM		0.2	0.90	0.2	1	0.2	0.2	0.2	0.2	DOL
TOTAL			30.4		40.8		27.6	37.4	27.6	37.4	

4.0 PROPOSED UPGRADES – INDIVIDUAL / COMMON GENERATORS

The installation of standby diesel generators and automatic transfer switches will allow the water and wastewater facilities shown in Section 2.0 to remain operational during power outages.

Standby Generators:

The standby power generation units are proposed to be installed outdoors on concrete pads in weatherproof and sound attenuating enclosures. A typical concrete pad detail can be seen in Section 10.0, Appendix – B. The units will have dual wall sub-base fuel tanks with 72 hours fuel capacity at full load.

The portable generator will be trailer mounted in weatherproof and sound attenuating enclosure with dual wall sub-base fuel tank with 24hr fuel capacity at full load.

Detailed analysis will be required during design stage so that selected generation units comply with applicable air and noise emission regulations from the Ministry of Environment and Climate Change (MOECC).

Grading works and vegetation removal/trimming may have to be done at some locations in order to build the concrete base for the standby units for even weight distribution.

Automatic Transfer Switches:

The automatic transfer switches (ATS) will be installed outdoor in NEMA 4X enclosures and automatically switch over the source of power from hydro to standby generator if power fails. At SPSs, the ATSS can be installed at the back of the existing panel boards or on new support structures similar to the existing. For well houses and the WWTP, the ATSS will be wall mounted outdoor on the existing building structure due to unavailability of space inside the well houses.

Manual Transfer Switches:

The manual transfer switches (MTS) will be installed outdoor in NEMA 4X enclosures and manually switch the source of power from hydro to standby generator if power fails. MTSs will be considered in Scenario E for locations being powered by portable generators. At SPSs, the MTSs can be installed at the back of the existing panel boards or on new support structures similar to the existing.

For well houses and the WWTP, the MTSs will be wall mounted on the existing building structure.

Grounding:

Grounding will be provided for the standby units and ATs as per Section 10.0 - APPENDIX - B: TYPICAL INSTALLATION DETAILS:, item 10.2.

Cables and Duct banks:

Cables connecting standby generators, ATs and distribution panels will be routed below grade in direct buried duct banks. Cables connecting ATs and existing location's panel boards will be routed as per the best practice, below or above grade, depending on each location's as built condition. Duct banks under roads and/or paved areas will be concrete encased. Duct bank details can be seen on Section 10.0 - APPENDIX - B: TYPICAL INSTALLATION DETAILS:, item 10.3.

BASIS OF GENERATOR SIZING:

Standby generators sizing was performed with the aid of "Power Suite" Cummins software and the sizing reports are provided in Section 11.0 - APPENDIX - C: GENERATOR SIZING REPORTS. The following parameters were considered for the generator sizing.

NUMBER OF GENERATOR SETS RUNNING IN PARALLEL:	1
MIN. GENSET LOAD ALLOWED, % OF RATED CAPACITY:	30%
MAX. GENSET LOAD ALLOWED, % OF RATED CAPACITY:	80%
MAX. ALLOWABLE PROJECT VOLTAGE DIP:	25%
MAX. ALLOWABLE PROJECT FREQUENCY DIP:	10%
ALTITUDE (M):	110
AMBIENT TEMPERATURE (OC):	30
MAX. ALLOWABLE ALTERNATOR TEMP RISE (OC):	105/CLASS F
EMISSIONS:	EPA, STATIONARY EMERGENCY APPLICATION
FUEL:	DIESEL
VOLTAGE:	120/240V
PHASE:	SINGLE
FREQUENCY:	60HZ
DUTY:	STANDBY

The following items 4.1, 4.2, 4.3, 4.4 and 4.5 present a summary of calculated equipment ratings and proposed equipment installation locations for each scenario.

4.1 SCENARIO A

Scenario A considers standby power to be provided individually at each location, i.e. one generator per location.

4.1.1 EQUIPMENT RATINGS

Table 4.1 shows major equipment summary for Scenario A. High-level single line diagrams, photographs of proposed installation locations and generators sizing reports can be found on Sections 4.5, 9.0 and 11.0, respectively.

Table 4.1 – Scenario A major equipment summary.

Generator TAG	Generator Size (See section 11.00)	ATS Rating	Location (See section 9.0)	Single line (See section 4.5)
G-SPS#1	10kW	70A	SPS#1	SLD-1
G-SPS#2	15kW	100A	SPS#2	SLD-1
G-SPS#3	10kW	70A	SPS#3	SLD-1
G-SPS#5	15kW	100A	SPS#5	SLD-1
G-WH#1	15kW	100A	WH#1	SLD-1
G-WH#2	20kW	150A	WH#2 (+SPS#4)	SLD-1
G-WH#3	25kW	150A	WH#3	SLD-1
G-WWTP	50kW	225A	WWTP	SLD-1
G-RECCENTRE	50kW	225A	REC CENTRE	SLD-1

The proposed location of each equipment for Scenario A is shown in Fig 5.

4.1.2 PROPOSED EQUIPMENT LOCATIONS

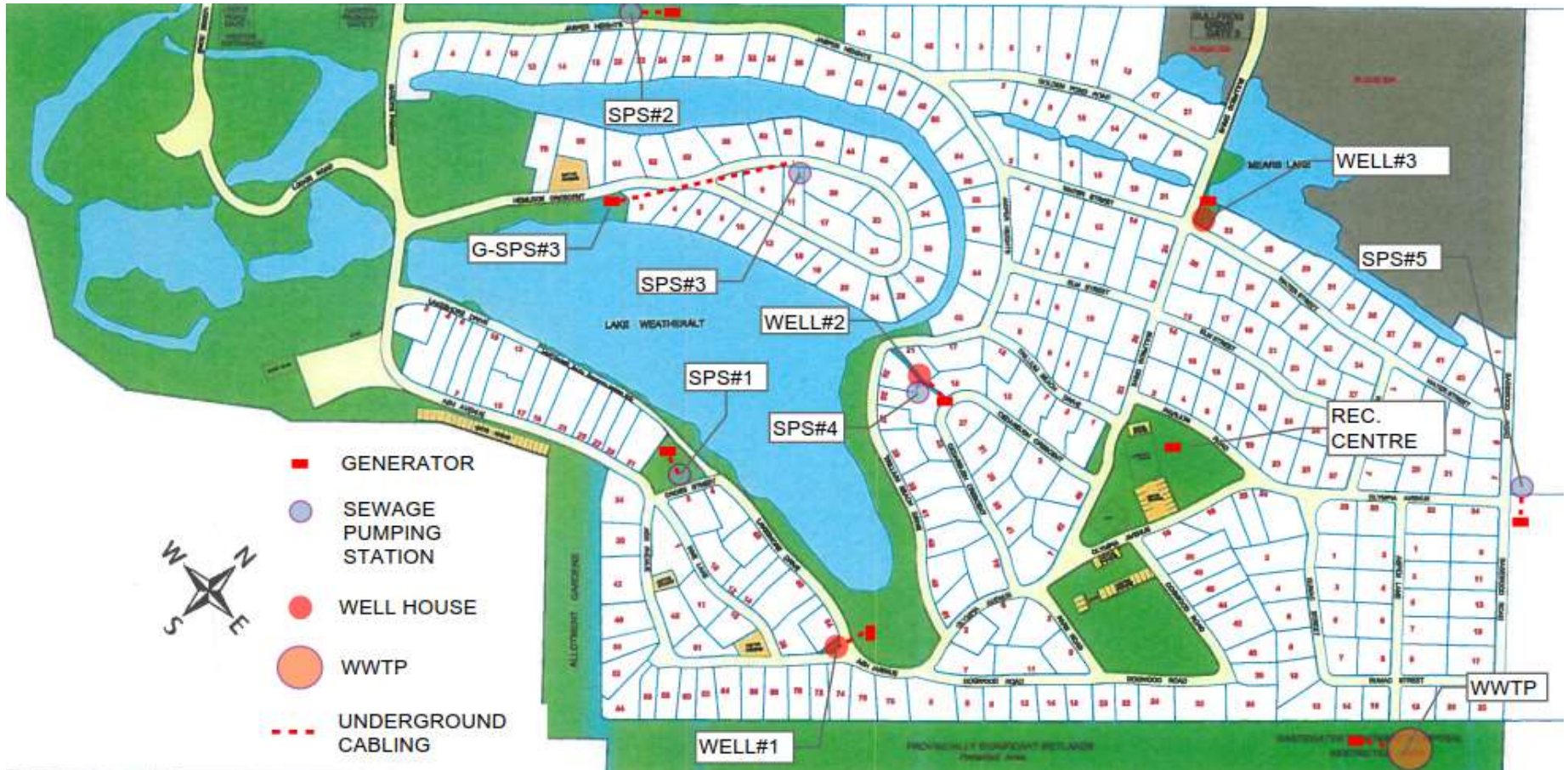


Fig 5 – Equipment location – SCENARIO A.

4.2 SCENARIO B

Scenario B considers standby power to be provided at the group locations by generators feeding multiple locations, where ever feasible. RVA has considered several alternatives for combining generators of various locations, Table 4.2 lists the most feasible combinations.

4.2.1 EQUIPMENT RATINGS

Table 4.2 shows major equipment summary for Scenario B. High level single line diagrams, photographs of proposed installation locations and generators sizing reports can be found on Sections 4.5, 9.0 and 11.0, respectively.

Table 4.2 – Scenario B major equipment summary.

Generator TAG	Generator Size (See section 11.00)	ATS Rating	Group Locations (See section 9.0)	Single line (See section 4.5)
G-1B	25kW	100A	SPS#2	SLD-2
		70A	SPS#3	
G-2B	35kW	70A	SPS#1	SLD-3
		100A	WH#1	
		150A	WH#2 (+SPS#4)	
G-3B	25kW	150A	WH#3	SLD-1
G-4B	60kW	225A	WWTP	SLD-2
		100A	SPS#5	
G- RECCENTRE	50kW	225A	REC CENTRE	SLD-1

The proposed location of each equipment for Scenario B can be seen on Fig 6.

4.2.2 PROPOSED EQUIPMENT LOCATIONS



Fig 6 – Equipment location – SCENARIO B.

4.3 SCENARIO C

Scenario C considers standby power to be provided individually for critical locations only, i.e. one generator per location. For criticality of loads refer to Table 2.1 – Location criticality.

4.3.1 EQUIPMENT RATINGS

Table 4.3 shows major equipment summary for Scenario C. High level single line diagrams, photographs of proposed installation locations and generators sizing reports can be found on Sections 4.5, 9.0 and 11.0, respectively.

Table 4.3 – Scenario C major equipment summary.

Generator TAG	Generator Size (See section 11.00)	ATS Rating	Location (See section 9.0)	Single line (See section 4.5)
G-SPS#1	10kW	70A	SPS#1	SLD-1
G-SPS#2	15kW	100A	SPS#2	SLD-1
G-SPS#3	10kW	70A	SPS#3	SLD-1
G-SPS#5	15kW	100A	SPS#5	SLD-1
G-WH#2	20kW	150A	WH#2 (+SPS#4)	SLD-1
G-WH#3	25kW	150A	WH#3	SLD-1
G-WWTP	50kW	225A	WWTP	SLD-1
G- RECCENTRE	50kW	225A	REC CENTRE	SLD-1

The proposed location of each equipment for Scenario C can be seen on Fig 7.

4.3.2 PROPOSED EQUIPMENT LOCATION C



Fig 7 – Equipment location – SCENARIO C.

4.4 SCENARIO D

Scenario D considers standby power to be provided to critical locations only by generators feeding multiple locations, where ever feasible. For criticality of loads refer to Table 2.1 – Location criticality. RVA has considered several alternatives for combining generators of various locations, Table 4.4 lists the most feasible combinations.

4.4.1 EQUIPMENT RATINGS

Table 4.4 shows major equipment summary for Scenario D. Generators sizing reports, photographs of proposed installation locations and high-level single line diagrams can be found on Sections 10.0, 8.0 and 5.0 respectively.

Table 4.4 – Scenario D major equipment summary.

Generator TAG	Generator Size (See section 10.0)	ATS Rating	Location (See section 8.0)	Single line (See section 5.0)
G-1D	25kW	100A	SPS#2	SLD-2
		70A	SPS#3	
G-2D	25kW	70A	SPS#1	SLD-2
		150A	WH#2 (+SPS#4)	
G-3D	25kW	150A	WH#3	SLD-1
G-4D	60kW	225A	WWTP	SLD-2
		100A	SPS#5	
G- RECCENTRE	50kW	225A	REC CENTRE	SLD-1

The proposed location of each equipment for Scenario D can be seen on Fig 8.

4.4.2 PROPOSED EQUIPMENT LOCATIONS



Fig 8 – Equipment location – SCENARIO D.

4.5 SCENARIO E

Scenario E considers standby power to be provided by permanent generator to WWTP, SPS#2, SPS#5, Well House #3 and Recreational Centre and by portable connections to SPS#1, SPS#3, Well House #2 and SPS#4. The portable generator will be sized for the highest of the loads and will be plugged to a manual transfer switch by means of an inlet power box.

4.5.1 EQUIPMENT RATINGS

Table 4.5 shows major equipment summary for Scenario E. Generators sizing reports, photographs of proposed installation locations and high-level single line diagrams can be found on Sections 10.0, 8.0 and 5.0 respectively.

Table 4.5 – Scenario E major equipment summary.

Generator TAG	Generator Size (See section 10.0)	TS Rating (A) Automatic (M) Manual	Location (See section 8.0)	Single line (See section 5.0)
G-1E (PORTABLE)	20kW	70A (M) 70A (M) 150A (M)	SPS#1 SPS#3 WH#2 +SPS#4	SLD-1*
G-2E	15kW	100A (A)	SPS#2	SLD-1
G-3E	25kW	150A (A)	WH#3	SLD-1
G-4E	60kW	225A (A)	WWTP	SLD-2
		100A (A)	SPS#5	
G- RECENTRE	50kW	225A (A)	REC CENTRE	SLD-1

*with a manual transfer switch and a quick connection plug.

The proposed location of each equipment for Scenario E can be seen on Fig 9.

4.5.2 PROPOSED EQUIPMENT LOCATIONS



Fig 9 – Equipment location – SCENARIO E.

5.0 SINGLE LINE DIAGRAMS

Simplified single line diagrams (SLDs) are presented in this section. The grey colour lines indicate existing equipment and bold black lines indicate new equipment or installation.

5.1 EXISTING FACILITIES

The SLD below shows the existing electrical system typical arrangement of the recreational centre, sewage pumping stations, well houses and the wastewater treatment plant. The hydro service cables pass through the hydro meters and disconnect switches before connecting to the location's panel board.

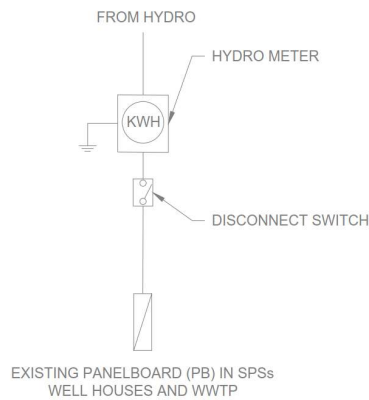


Fig 10 – Existing electrical typical installation of Mini Lakes recreational centre, water and sewage facilities

5.2 DEDICATED GENERATOR (SLD-1)

The SLD below shows the proposed solution for dedicated standby power connection. Each location will have its dedicated generator and automatic or manual transfer switch. Locations with manual transfer switches will have an enclosure for quick connection for the portable generator.

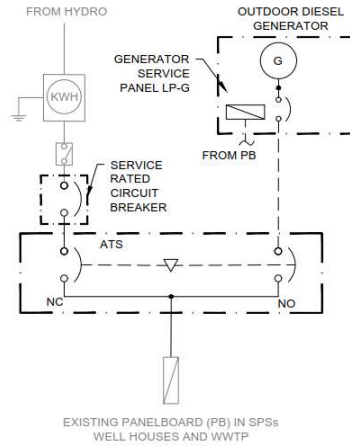


Fig 11 – Proposed electrical upgrades - Dedicated standby generator.

5.3 TWO FACILITIES ON A GENERATOR (SLD-2)

The SLD below shows the proposed solution for generators supplying power to two different locations. Such generators will have two circuit breakers directly connected to its alternator.

Each of the locations will have its dedicated ATS that will switch to standby generation upon a power outage.

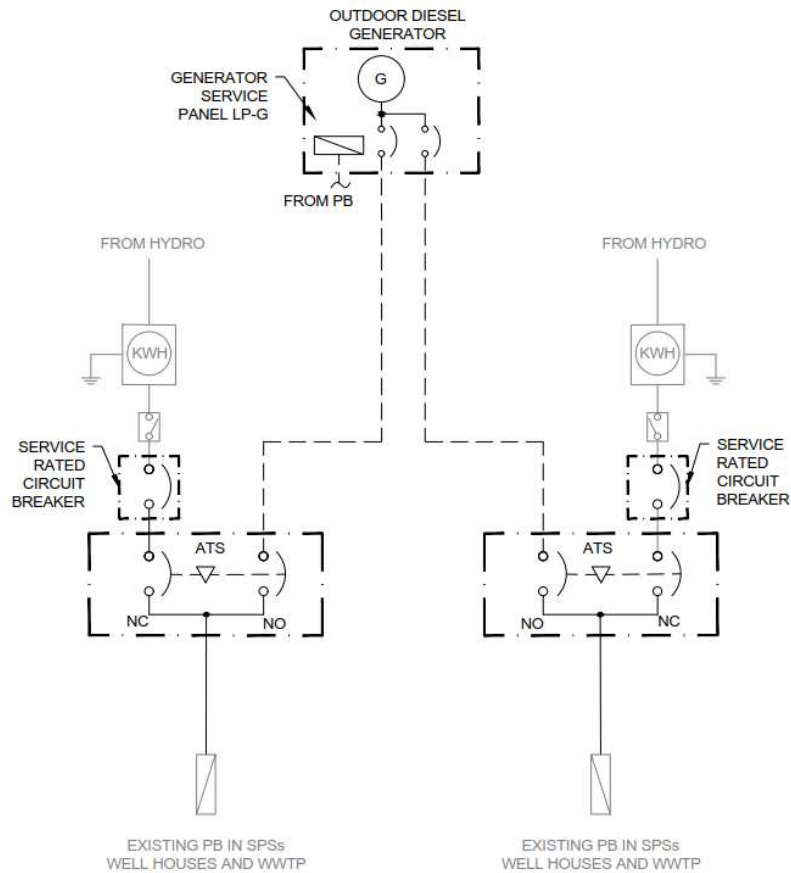


Fig 12 – Proposed electrical upgrades - Standby generator for two facilities.

5.4 THREE FACILITIES ON ONE GENERATOR (SLD-3)

The SLD below shows the proposed solution for generators supplying power to three different locations. Such generators will power a distribution panel containing three branch circuit breakers that will supply each location’s dedicated ATSS.

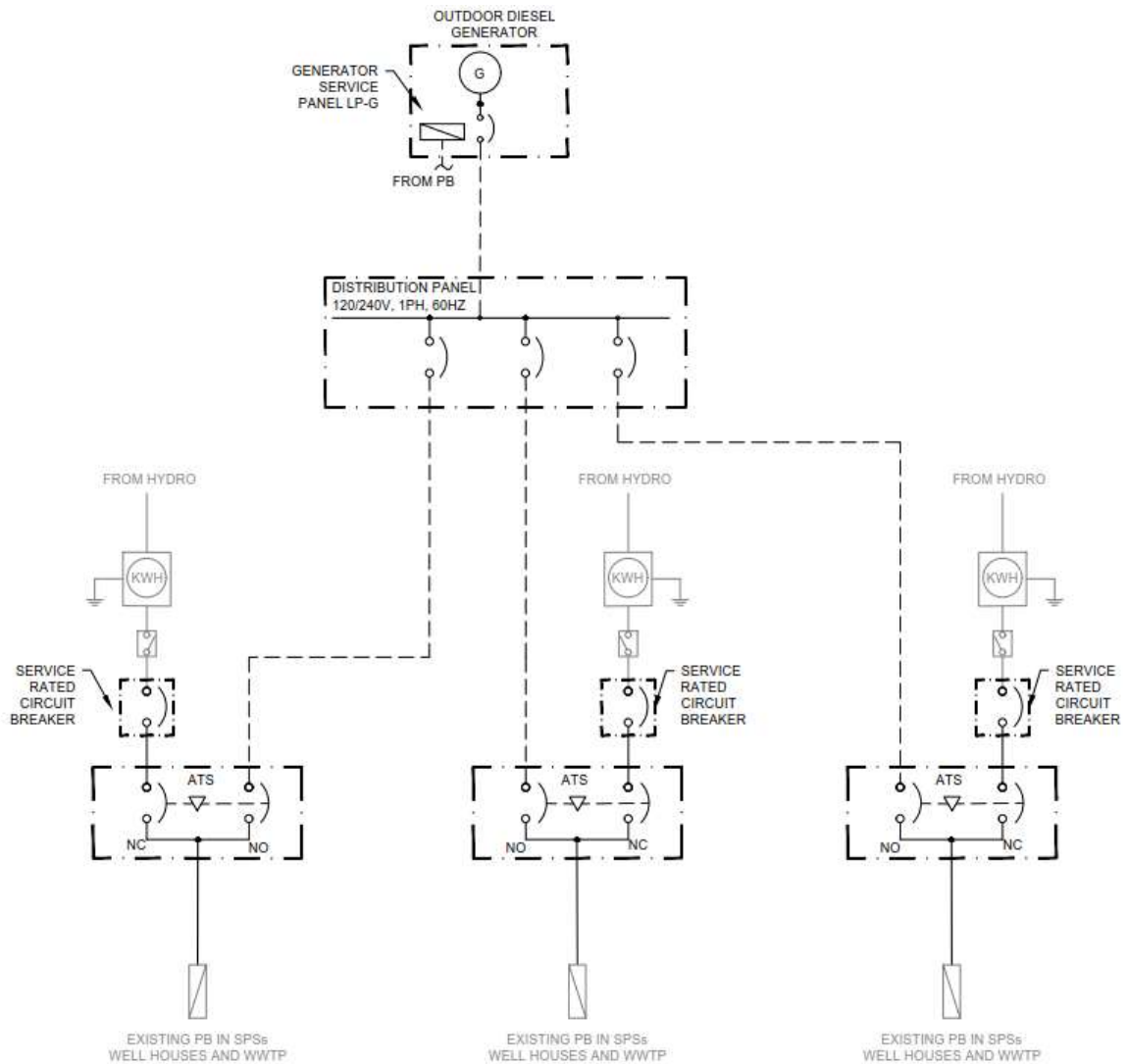


Fig 13 – Proposed electrical upgrades - Standby generator for three facilities.

6.0 EQUIPMENT SUPPLIERS

Three reliable and market known manufactures were considered while specifying the standby generators and automatic transfer switches, they are:

- Cummins;
- Generac;
- Caterpillar.

If the OCWA/Mini Lakes wishes to explore additional suppliers, new quotations can be requested before the report's final submission.

7.0 ESTIMATED CONSTRUCTION COST (CLASS - D ESTIMATE) AND ANNUAL MAINTENANCE COST

A Class D estimates are being presented in this section. The overall costs will be displayed per scenario and will consider the following items with installation labour cost included:

- Diesel generators with sub-base fuel tanks;
- Portable diesel generator;
- Automatic transfer switches;
- Manual transfer switches
- Distribution panels;
- Equipment installation;
- Duct bank installation;
- Cabling; and
- Grounding.

7.1 SCENARIO A

This scenario presents a higher number of generators and thus, a higher generator cost. Generators will be installed close to each panel board to be serviced and therefore duct bank installation and cabling costs are low. Table 7.1 presents the cost breakdown for scenario A.

Due to the lower amount of civil works, the construction time will be reduced when compared to scenarios B and D and similar to the one of scenario C. Scenario A presents a higher number of equipment when compared to Scenario E and thus presents a longer construction time.

Table 7.1 – Scenario A estimated construction cost breakdown.

Item	Qty.	Unit	Unit Cost	Total Cost
Generator 10kW	2	Each	\$ 57,500.00	\$ 115,000.00
Generator 15kW	3	Each	\$ 64,400.00	\$ 193,200.00
Generator 20kW	1	Each	\$ 66,700.00	\$ 66,700.00
Generator 25kW	1	Each	\$ 69,000.00	\$ 69,000.00
Generator 50kW	2	Each	\$ 73,600.00	\$ 147,200.00
ATS 70A	2	Each	\$ 13,800.00	\$ 27,600.00
ATS 100A	3	Each	\$ 14,950.00	\$ 44,850.00
ATS 150A	2	Each	\$ 16,100.00	\$ 32,200.00
ATS 225A	1	Each	\$ 17,250.00	\$ 34,500.00
Equipment installation				\$ 22,000.00
Duct bank installation				\$ 31,000.00
Cabling				\$ 7,500.00
Miscellaneous				\$ 10,000.00
TOTAL				\$ 800,750

The estimated maintenance cost for this scenario will be \$6,200.00.

The annual maintenance includes a 2-hour load bank test as well as oil change and filter replacement for each generator, for details see section 12.0 APPENDIX - D: MAINTENANCE COST.

7.2 SCENARIO B

This scenario presents a lower number of generators and thus, a lower generator cost. Generators will be installed far from panel boards to be serviced and therefore duct bank installation and cabling costs are high. Table 7.2 presents the cost breakdown for scenario B.

Due to a high amount of civil works, the construction time for scenario B is the longest among the explored scenarios.

Table 7.2 – Scenario B estimated construction cost breakdown.

Item	Qty.	Unit	Unit Cost	Total Cost
Generator 25kW	2	UN	\$ 69,000.00	\$ 138,000.00
Generator 35kW	1	UN	\$ 71,300.00	\$ 71,300.00
Generator 50kW	1	UN	\$ 73,600.00	\$ 73,600.00
Generator 60kW	1	UN	\$ 75,900.00	\$ 75,900.00
ATS 70A	2	UN	\$ 13,800.00	\$ 27,600.00
ATS 100A	3	UN	\$ 14,950.00	\$ 44,850.00
ATS 150A	2	UN	\$ 16,100.00	\$ 32,200.00
ATS 225A	2	UN	\$ 17,250.00	\$ 34,500.00
Equipment installation				\$ 17,000.00
Duct bank installation				\$ 223,000.00
Cabling				\$ 55,000.00
Handholes	6	UN	\$ 5,000.00	\$ 30,000.00
Distribution boards				\$ 2,500.00
Miscellaneous				\$ 20,000.00
TOTAL				\$ 845,450

The estimated maintenance cost for this scenario will be \$4,000.00.

The annual maintenance includes a 2-hour load bank test as well as oil change and filter replacement for each generator, for details see section 12.0 APPENDIX - D: MAINTENANCE COST.

7.3 SCENARIO C

Scenario C is similar to scenario A, with the exception of no standby power installation to Well#1 (non-critical location). With less equipment, duct banks and cabling, this scenario presents a low estimated construction cost. Table 7.3 presents the cost breakdown for scenario C.

The construction time of scenario C will be similar to the one of scenario A.

Table 7.3 – Scenario C estimated construction cost breakdown.

Item	Qty.	Unit	Unit Cost	Total Cost
Generator 10kW	2	UN	\$ 57,500.00	\$ 115,000.00
Generator 15kW	2	UN	\$ 64,400.00	\$ 128,800.00
Generator 20kW	1	UN	\$ 66,700.00	\$ 66,700.00
Generator 25kW	1	UN	\$ 69,000.00	\$ 69,000.00
Generator 50kW	2	UN	\$ 73,600.00	\$ 147,200.00
ATS 70A	2	UN	\$ 13,800.00	\$ 27,600.00
ATS 100A	2	UN	\$ 14,950.00	\$ 29,900.00
ATS 150A	2	UN	\$ 16,100.00	\$ 32,200.00
ATS 225A	2	UN	\$ 17,250.00	\$ 34,500.00
Equipment installation				\$ 20,000.00
Duct bank installation				\$ 28,500.00
Cabling				\$ 5,400.00
Miscellaneous				\$ 10,000.00
TOTAL				\$ 714,800

The estimated maintenance cost for this scenario will be \$5,600.00.

The annual maintenance includes a 2-hour load bank test as well as oil change and filter replacement for each generator, for details see section 12.0 APPENDIX - D: MAINTENANCE COST.

7.4 SCENARIO D

Scenario D is similar to scenario B, with the exception of no standby power installation to Well#1 (non-critical location). Generators will be installed far from panel boards to be serviced and therefore duct bank installation and cabling costs are high. Table 7.4 presents the cost breakdown for scenario D.

Due to a high amount of civil works, the construction time will be similar to the one of scenario B, which is the longest among the explored scenarios.

Table 7.4 – Scenario D estimated construction cost breakdown.

Item	Qty.	Unit	Unit Cost	Total Cost
Generator 25kW	3	UN	\$ 69,000.00	\$ 207,000.00
Generator 50kW	1	UN	\$ 73,600.00	\$ 73,600.00
Generator 60kW	1	UN	\$ 75,900.00	\$ 75,900.00
ATS 70A	2	UN	\$ 13,800.00	\$ 27,600.00
ATS 100A	2	UN	\$ 14,950.00	\$ 29,900.00
ATS 150A	2	UN	\$ 16,100.00	\$ 32,200.00
ATS 225A	2	UN	\$ 17,250.00	\$ 34,500.00
Equipment installation				\$ 17,000.00
Duct bank installation				\$ 182,000.00
Cabling				\$ 49,850.00
Handholes	6	UN	\$ 5,000.00	\$ 30,000.00
Miscellaneous				\$ 20,000.00
TOTAL				\$ 779,550

The estimated maintenance cost for this scenario will be \$4,000.00.

The annual maintenance includes a 2-hour load bank test as well as oil change and filter replacement for each generator, for details see section 12.0 APPENDIX - D: MAINTENANCE COST.

7.5 SCENARIO E

Scenario E considers a combination of portable and permanent (shared and dedicated) generators as discussed in section 4.5.

The reduced number of equipment and duct banks make this scenario to present the lowest cost among the explored scenarios. Table 7.5 presents the cost breakdown for scenario E.

Due to a low amount of civil works, the construction time will be the fastest among the considered scenarios. However, this scenario will be most labour intensive as OCWA staff will need to physically relocate the portable generator from one facility to other and connect to manual transfer switch for supplying power to the facility. This will need to be done as per pre-determined schedule to avoid flooding of sewage pumping stations.

Table 7.5 – Scenario E estimated construction cost breakdown.

Item	Qty.	Unit	Unit Cost	Total Cost
Generator 15kW	1	UN	\$ 64,400.00	\$ 64,400.00
Generator 20kW (portable)	1	UN	\$ 63,250.00	\$ 63,250.00
Generator 25kW	1	UN	\$ 69,000.00	\$ 69,000.00
Generator 50kW	1	UN	\$ 73,600.00	\$ 73,600.00
Generator 60kW	1	UN	\$ 75,900.00	\$ 75,900.00
ATS 100A	2	UN	\$ 14,950.00	\$ 29,900.00
ATS 150A	1	UN	\$ 16,100.00	\$ 16,100.00
ATS 225A	2	UN	\$ 17,250.00	\$ 34,500.00
MTS 70A	2	UN	\$ 4,600.00	\$ 9,200.00
MTS 150A	1	UN	\$ 4,900.00	\$ 4,900.00
Inlet Receptacles	3			\$ 1,250.00
Equipment installation				\$ 17,000.00
Duct bank installation				\$ 53,000.00
Cabling				\$ 16,050.00
Handholes	2	UN	\$ 5,000.00	\$ 10,000.00
Miscellaneous				\$ 20,000.00
TOTAL				\$ 558,050

The estimated maintenance cost for this scenario will be \$3,800.00.

The annual maintenance includes a 2-hour load bank test as well as oil change and filter replacement for each generator, for details see section 12.0 APPENDIX - D: MAINTENANCE COST.

7.6 SUMMARY OF CONSTRUCTION COST FOR EACH SCENARIO

Table 7.6 presents the cost breakdown for each scenario for ease of comparison.

Table 7.6 – Estimated overall cost breakdown summary.

Items	Scenario A	Scenario B	Scenario C	Scenario D	Scenario E
Generator	\$ 591,100.00	\$ 358,800.00	\$ 526,700.00	\$ 358,800.00	\$ 346,150.00
ATS/MTS	\$ 139,150.00	\$ 139,150.00	\$ 124,200.00	\$ 139,150.00	\$ 94,600.00
Equip. Installation	\$ 22,000.00	\$ 17,000.00	\$ 20,000.00	\$ 17,000.00	\$ 17,000.00
Duct Bank	\$ 31,000.00	\$ 223,000.00	\$ 28,500.00	\$ 182,000.00	\$ 53,000.00
Cabling	\$ 7,500.00	\$ 55,000.00	\$ 5,400.00	\$ 50,350.00	\$ 15,050.00
Others	\$ 10,000.00	\$ 52,500.00	\$ 10,000.00	\$ 50,000.00	\$ 31,250.00
Total	\$ 800,750.00	\$ 845,450.00	\$ 714,800.00	\$ 797,300.00	\$ 558,050.00

Table 7.7 presents the estimated annual maintenance cost for each scenario for ease of comparison.

Table 7.7 – Estimated annual maintenance cost.

Items	Scenario A	Scenario B	Scenario C	Scenario D	Scenario E
Annual Maintenance	\$ 6,200.00	\$ 4,000.00	\$ 5,600.00	\$ 4,000.00	\$ 3,800.00

7.7 ENGINEERING FEES

An amount of 15% of each scenario's estimated construction cost must be considered for Engineering fees.

8.0 CONCLUSION

Taking into consideration all the gathered and analyzed data above presented, each scenario is analyzed for:

- 1- Overall construction cost – The overall construction cost is the one presented in sections 7.1 to 7.5.
- 2- Reliability – The number of locations that would be serviced by stand by generation in the event of a hydro power outage or of stand by generator failure.
- 3- Operational Flexibility – Capacity of operations to respond to an unplanned event given the available system configuration.
- 4- Ease of maintenance – The nature and cost of required equipment maintenance.

SCENARIOS/ CATEGORY	Overall construction cost (weighting - 65%)	Reliability (weighting - 20%)	Operational Flexibility (weighting - 10%)	Ease of maintenance (weighting - 5%)	Weighted Mark
SCENARIO-A	2	5	4	1	2.75
SCENARIO-B	1	4	4	4	2.05
SCENARIO-C	3	4	4	2	3.25
SCENARIO-D	2	3	4	4	2.5
SCENARIO-E	5	2	1	5	4*

Marking = 5 is the best; 1 is the worst

*does not include OCWA hours for operation of portable generator

9.0 APPENDIX - A: PHOTOGRAPHS OF EACH PROPOSED GENERATOR LOCATION



Fig 14 – SPS#1 - Grass field beside the pump control panel along Lakeshore Drive.

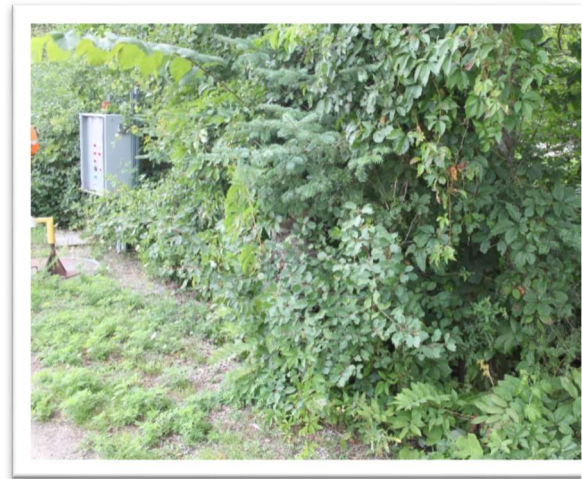


Fig 15 – SPS#2 – Green area beside the pump control panel. Landscaping needs to be done.



Fig 16 – SPS#3 - Grass field by the lake along Hemlock Crescent.



Fig 17 – SPS#5 – Green area beside the pump control panel. Landscaping needs to be done.



Fig 18 – WH#1 – Grass field by the lake across Lakeshore Drive.



Fig 19 – WH#2/SPS#4 – Grass field between SPS#4 and WH#2.



Fig 20 – WH#3 – Grass field beside the water house



Fig 21 – WWTP – Grass field beside the wastewater treatment plant.



Fig 22 – G-1B - Grass field by Garden Parkway.

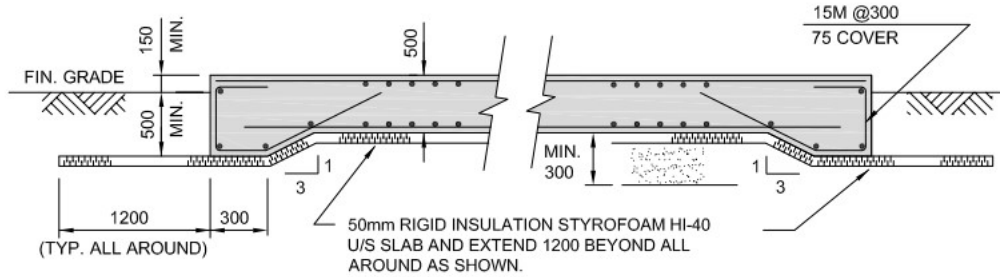


Fig 23 – G-RECCENTRE – Grass field beside Recreational Centre

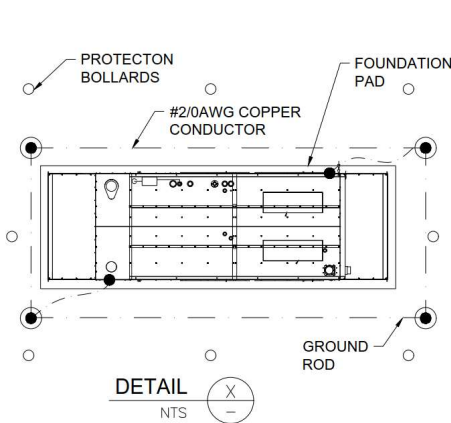
10.0 APPENDIX - B: TYPICAL INSTALLATION DETAILS:

The following items present typical installation details that will be applied in this project.

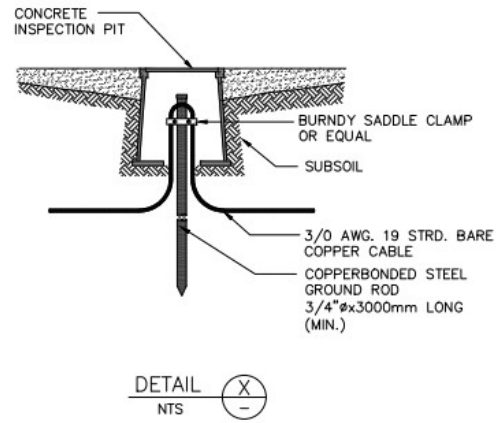
10.1 GENERATOR CONCRETE PAD



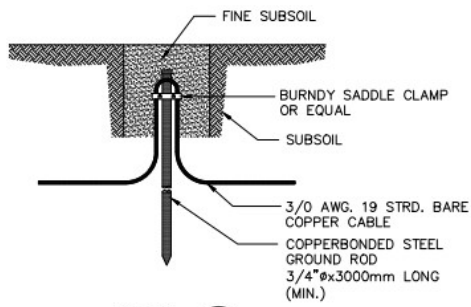
10.2 GROUNDING



STANDBY DIESEL GENERATOR
 GROUNDING DETAIL

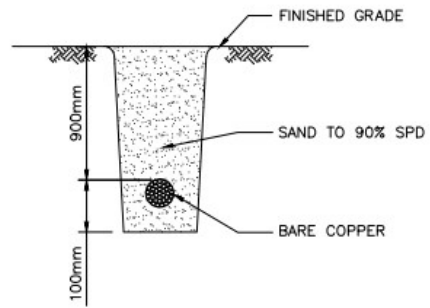


GROUND ROD
 TEST/INSPECTION BOX



DETAIL (X)
 NTS (-)

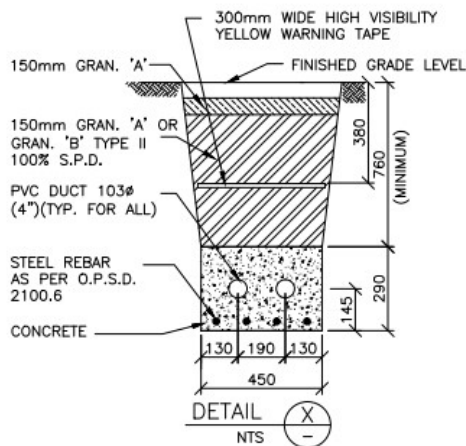
GROUND ROD
 DIRECT BURIED



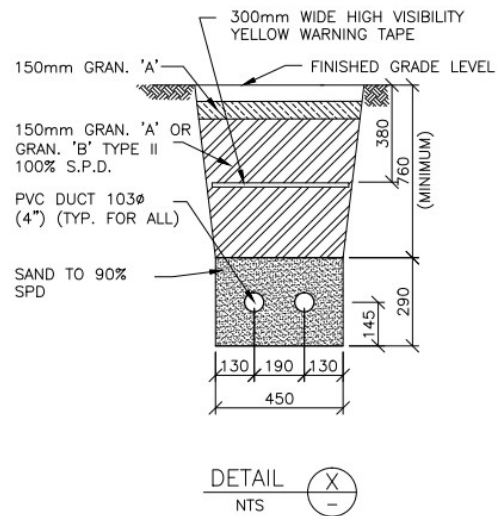
DETAIL (X)
 NTS (-)

GROUND CONDUCTOR TRENCH DETAIL

10.3 DUCT BANK DETAILS



CONCRETE ENCASED DUCT BANK



DIRECT BURIED DUCT BANK

11.0 APPENDIX - C: GENERATOR SIZING REPORTS



Recommended Generator Report - C10 D6

Project - MINILAKES G-SPS#1,G-SPS#3 AND G-SPS#4

Comments -

Project Requirements

Frequency, Hz	: 60.0	Generators Running in Parallel	: 1
Duty	: Standby	Site Altitude, ft(m)	: 361(110)
Voltage	: 120/240	Site Temperature, °C	: 25
Phase	: 1	Max. Altr Temp Rise, °C	: 105
Fuel	: Diesel	Project Voltage Distortion Limit, %	:
Emissions	: EPA, stationary emergency application		

Calculated Individual Generator Set Load Running and Peak Requirements

Running kW	: 4.6	Max. Step kW	: 7.0 In Step 1	Cumulative Step kW	: 9.2
Running kVA	: 5.9	Max. Step kVA	: 19.0 In Step 1	Cumulative Step kVA	: 21.9
Running PF	: 0.78	Peak kW	: None	Cumulative Peak kW	: None
Running NLL kVA	: 0.0	Peak kVA	: None	Cumulative Peak kVA	: None
Alternator kW	: 4.6			Pct Rated Capacity	: 50.0

Generator Set Configuration

Alternator	: CA115-J14	Engine	: D1703M
BCode	: BB94	Fuel	: Diesel
Excitation	: EBS	Displacement, cu in. (Litre)	: 100.5(1.6)
Voltage Range	: Na	Cylinders	: 3
Number of Leads	: 12	Altitude Knee, ft(m)	: 8200(2499)
Reconnectable	: Yes	Altitude Slope, % per 985ft(300.2m)	: 3
Full Single Phase Output	: No	Temperature Knee, °F(°C)	: 104(40)
Increased Motor Starting	: No	Temperature Slope, % per 18°F(10.0°C)	: 4
Extended Stack	: No	Emissions	: Tier 4i
		Cooling Package	: High Ambient

Set Performance

Load Requirements

Running At	: 50.0% Rated Capacity		
Max. Step Voltage Dip, %	: 18	Max. Allowed Step Voltage Dip	: 35 In Step 1
Max. Step Frequency Dip, %	: 3	Max. Allowed Step Frequency Dip	: 10 In Step 1
Peak Voltage Dip, %	:	Peak Voltage Dip Limit %	: 35.0
Peak Frequency Dip, %	:	Peak Frequency Dip Limit %	: 10
Site Rated Standby kW/kVA	: 10 / 10	Running kW	: 4.6
		Running kVA	: 5.9
Site Rated Max. SkW	: 14	Effective Step kW	: 8.5
Max. SkVA	: 62	Effective Step kVA	: 21.9
Temp Rise at Full Load, °C	: 105	Percent Non-Linear Load	: 0.0
Voltage Distortion	:	Voltage Distortion Limit	:
Site Rated Max Step kW Limit	:	Max Step kW	:

*Note: Higher temperature rise at full rated load.

*Note: All generator set power derates are based on open generator sets.



Recommended Generator Report - C15 D6

Project - MINILAKES **SPS#2, SPS#5**

Comments -

Project Requirements

Frequency, Hz	: 60.0	Generators Running in Parallel	: 1
Duty	: Standby	Site Altitude, ft(m)	: 361(110)
Voltage	: 120/240	Site Temperature, °C	: 25
Phase	: 1	Max. Altr Temp Rise, °C	: 105
Fuel	: Diesel	Project Voltage Distortion Limit, %	:
Emissions	: EPA, stationary emergency application		

Calculated Individual Generator Set Load Running and Peak Requirements

Running kW	: 9.1	Max. Step kW	: 11.1 In Step 1	Cumulative Step kW	: 15.6
Running kVA	: 11.4	Max. Step kVA	: 33.5 In Step 1	Cumulative Step kVA	: 39.2
Running PF	: 0.8	Peak kW	: None	Cumulative Peak kW	: None
Running NLL kVA	: 0.0	Peak kVA	: None	Cumulative Peak kVA	: None
Alternator kW	: 9.1			Pct Rated Capacity	: 60.0

Generator Set Configuration

Alternator	: CA115-L14	Engine	: D1703M
BCode	: BB94	Fuel	: Diesel
Excitation	: EBS	Displacement, cu in. (Litre)	: 100.5(1.6)
Voltage Range	: Na	Cylinders	: 3
Number of Leads	: 12	Altitude Knee, ft(m)	: 490(149)
Reconnectable	: Yes	Altitude Slope, % per 985ft(300.2m)	: 4
Full Single Phase Output	: No	Temperature Knee, °F(°C)	: 77(25)
Increased Motor Starting	: No	Temperature Slope, % per 18°F(10.0°C)	: 4
Extended Stack	: No	Emissions	: Tier 4i
		Cooling Package	: High Ambient

Set Performance

Load Requirements

Running At	: 60.0% Rated Capacity		
Max. Step Voltage Dip, %	: 27	Max. Allowed Step Voltage Dip	: 35 In Step 1
Max. Step Frequency Dip, %	: 4	Max. Allowed Step Frequency Dip	: 10 In Step 1
Peak Voltage Dip, %	:	Peak Voltage Dip Limit %	: 35.0
Peak Frequency Dip, %	:	Peak Frequency Dip Limit %	: 10
Site Rated Standby kW/kVA	: 15 / 15	Running kW	: 9.1
		Running kVA	: 11.4
Site Rated Max. SkW	: 15	Effective Step kW	: 12.6
Max. SkVA	: 78	Effective Step kVA	: 39.1
Temp Rise at Full Load, °C	: 105	Percent Non-Linear Load	: 0.0
Voltage Distortion	:	Voltage Distortion Limit	:
Site Rated Max Step kW Limit	:	Max Step kW	:

*Note: Higher temperature rise at full rated load.

*Note: All generator set power derates are based on open generator sets.



Recommended Generator Report - C10 D6

Project - MINI LAKES WELL HOUSE#1

Comments -

Project Requirements

Frequency, Hz	: 60.0	Generators Running in Parallel	: 1
Duty	: Standby	Site Altitude, ft(m)	: 361(110)
Voltage	: 120/240	Site Temperature, °C	: 30
Phase	: 1	Max. Altr Temp Rise, °C	: 105
Fuel	: Diesel	Project Voltage Distortion Limit, %	:
Emissions	: EPA, stationary emergency application		

Calculated Individual Generator Set Load Running and Peak Requirements

Running kW	: 8.4	Max. Step kW	: 8.8 In Step 2	Cumulative Step kW	: 14.3
Running kVA	: 9.5	Max. Step kVA	: 17.4 In Step 2	Cumulative Step kVA	: 23.2
Running PF	: 0.88	Peak kW	: 0.5	Cumulative Peak kW	: 8.4
Running NLL kVA	: 0.0	Peak kVA	: 0.6	Cumulative Peak kVA	: 9.5
Alternator kW	: 8.4			Pct Rated Capacity	: 80.0

Generator Set Configuration

Alternator	: CA115-J14	Engine	: D1703M
BCode	: BB94	Fuel	: Diesel
Excitation	: EBS	Displacement, cu in. (Litre)	: 100.5(1.6)
Voltage Range	: Na	Cylinders	: 3
Number of Leads	: 12	Altitude Knee, ft(m)	: 8200(2499)
Reconnectable	: Yes	Altitude Slope, % per 985ft(300.2m)	: 3
Full Single Phase Output	: No	Temperature Knee, °F(°C)	: 104(40)
Increased Motor Starting	: No	Temperature Slope, % per 18°F(10.0°C)	: 4
Extended Stack	: No	Emissions	: Tier 4i
		Cooling Package	: High Ambient

Set Performance

Load Requirements

Running At	: 80.0% Rated Capacity		
Max. Step Voltage Dip, %	: 17	Max. Allowed Step Voltage Dip	: 25 In Step 2
Max. Step Frequency Dip, %	: 4	Max. Allowed Step Frequency Dip	: 10 In Step 2
Peak Voltage Dip, %	: 1	Peak Voltage Dip Limit %	: 25.0
Peak Frequency Dip, %	: 1	Peak Frequency Dip Limit %	: 10
Site Rated Standby kW/kVA	: 10 / 10	Running kW	: 8.4
		Running kVA	: 9.5
Site Rated Max. SkW	: 14	Effective Step kW	: 11.6
Max. SkVA	: 62	Effective Step kVA	: 23.2
Temp Rise at Full Load, °C	: 105	Percent Non-Linear Load	: 0.0
Voltage Distortion	:	Voltage Distortion Limit	:
Site Rated Max Step kW Limit	:	Max Step kW	:

*Note: Higher temperature rise at full rated load.

*Note: All generator set power derates are based on open generator sets.



Recommended Generator Report - C20 D6

Project - MINI LAKES WELL HOUSE#2

Comments -

Project Requirements

Frequency, Hz	: 60.0	Generators Running in Parallel	: 1
Duty	: Standby	Site Altitude, ft(m)	: 361(110)
Voltage	: 120/240	Site Temperature, °C	: 25
Phase	: 1	Max. Altr Temp Rise, °C	: 105
Fuel	: Diesel	Project Voltage Distortion Limit, %	:
Emissions	: EPA, stationary emergency application		

Calculated Individual Generator Set Load Running and Peak Requirements

Running kW	: 13.0	Max. Step kW	: 9.1 In Step 3	Cumulative Step kW	: 19.8
Running kVA	: 15.4	Max. Step kVA	: 19.0 In Step 3	Cumulative Step kVA	: 31.5
Running PF	: 0.84	Peak kW	: 0.5	Cumulative Peak kW	: 13.0
Running NLL kVA	: 0.0	Peak kVA	: 0.6	Cumulative Peak kVA	: 15.4
Alternator kW	: 13.0			Pct Rated Capacity	: 65.0

Generator Set Configuration

Alternator	: CA115-L14	Engine	: V2203M
BCode	: BB94	Fuel	: Diesel
Excitation	: EBS	Displacement, cu in. (Litre)	: 134.1(2.2)
Voltage Range	: Na	Cylinders	: 4
Number of Leads	: 12	Altitude Knee, ft(m)	: 490(149)
Reconnectable	: Yes	Altitude Slope, % per 985ft(300.2m)	: 4
Full Single Phase Output	: No	Temperature Knee, °F(°C)	: 77(25)
Increased Motor Starting	: No	Temperature Slope, % per 18°F(10.0°C)	: 4
Extended Stack	: No	Emissions	: Tier 4i
		Cooling Package	: High Ambient

Set Performance

Load Requirements

Running At	: 65.0% Rated Capacity		
Max. Step Voltage Dip, %	: 15	Max. Allowed Step Voltage Dip	: 35 In Step 3
Max. Step Frequency Dip, %	: 4	Max. Allowed Step Frequency Dip	: 10 In Step 3
Peak Voltage Dip, %	: 1	Peak Voltage Dip Limit %	: 35.0
Peak Frequency Dip, %	: 1	Peak Frequency Dip Limit %	: 10
Site Rated Standby kW/kVA	: 20 / 20	Running kW	: 13.0
		Running kVA	: 15.4
Site Rated Max. SkW	: 20	Effective Step kW	: 16.1
Max. SkVA	: 78	Effective Step kVA	: 31.5
Temp Rise at Full Load, °C	: 105	Percent Non-Linear Load	: 0.0
Voltage Distortion	:	Voltage Distortion Limit	:
Site Rated Max Step kW Limit	:	Max Step kW	:

*Note: Higher temperature rise at full rated load.

*Note: All generator set power derates are based on open generator sets.



Recommended Generator Report - C25 D6

Project - MINI LAKES WELL HOUSE#3, G-3B AND G-3D

Comments -

Project Requirements

Frequency, Hz	: 60.0	Generators Running in Parallel	: 1
Duty	: Standby	Site Altitude, ft(m)	: 361(110)
Voltage	: 120/240	Site Temperature, °C	: 25
Phase	: 1	Max. Altr Temp Rise, °C	: 105
Fuel	: Diesel	Project Voltage Distortion Limit, %	:
Emissions	: EPA, stationary emergency application		

Calculated Individual Generator Set Load Running and Peak Requirements

Running kW	: 12.2	Max. Step kW	: 22.4 In Step 2	Cumulative Step kW	: 27.9
Running kVA	: 14.3	Max. Step kVA	: 28.0 In Step 2	Cumulative Step kVA	: 33.8
Running PF	: 0.86	Peak kW	: 0.5	Cumulative Peak kW	: 12.2
Running NLL kVA	: 0.0	Peak kVA	: 0.6	Cumulative Peak kVA	: 14.3
Alternator kW	: 12.22			Pct Rated Capacity	: 48.0

Generator Set Configuration

Alternator	: CA115-R14	Engine	: 4BT3.3-G5
BCode	: BB96	Fuel	: Diesel
Excitation	: EBS	Displacement, cu in. (Litre)	: 199.0(3.3)
Voltage Range	: NA	Cylinders	: 4
Number of Leads	: 4	Altitude Knee, ft(m)	: 10000(3048)
Reconnectable	: Yes	Altitude Slope, % per 985ft(300.2m)	: 3
Full Single Phase Output	: No	Temperature Knee, °F(°C)	: 122(50)
Increased Motor Starting	: No	Temperature Slope, % per 18°F(10.0°C)	: 6
Extended Stack	: No	Emissions	: *
		Cooling Package	: High Ambient

*Note: Consult your Cummins Power Generation Distributor for more information.

Set Performance

Load Requirements

Running At	: 48.0% Rated Capacity	Max. Allowed Step Voltage Dip	: 35 In Step 2
Max. Step Voltage Dip, %	: 22	Max. Allowed Step Frequency Dip	: 10 In Step 2
Max. Step Frequency Dip, %	: 4	Peak Voltage Dip Limit %	: 35.0
Peak Voltage Dip, %	: 1	Peak Frequency Dip Limit %	: 10
Peak Frequency Dip, %	: 1	Running kW	: 12.2
Site Rated Standby kW/kVA	: 25 / 25	Running kVA	: 14.3
Site Rated Max. SkW	: 39	Effective Step kW	: 25.0
Max. SkVA	: 93	Effective Step kVA	: 33.8
Temp Rise at Full Load, °C	: 105	Percent Non-Linear Load	: 0.0
Voltage Distortion	:	Voltage Distortion Limit	:
Site Rated Max Step kW Limit	:	Max Step kW	:

*Note: Higher temperature rise at full rated load.

*Note: All generator set power derates are based on open generator sets.



Recommended Generator Report - C50D6C

Project - MINILAKES **WWTP**

Comments -

Project Requirements

Frequency, Hz	: 60.0	Generators Running in Parallel	: 1
Duty	: Standby	Site Altitude, ft(m)	: 361(110)
Voltage	: 120/240	Site Temperature, °C	: 25
Phase	: 1	Max. Altr Temp Rise, °C	: 105
Fuel	: Diesel	Project Voltage Distortion Limit, %	:
Emissions	: EPA, stationary emergency application		

Calculated Individual Generator Set Load Running and Peak Requirements

Running kW	: 35.7	Max. Step kW	: 33.2 In Step 2	Cumulative Step kW	: 56.6
Running kVA	: 42.7	Max. Step kVA	: 69.2 In Step 2	Cumulative Step kVA	: 90.8
Running PF	: 0.84	Peak kW	: None	Cumulative Peak kW	: None
Running NLL kVA	: 0.0	Peak kVA	: None	Cumulative Peak kVA	: None
Alternator kW	: 35.68			Pct Rated Capacity	: 72.0

Generator Set Configuration

Alternator	: UCD2F	Engine	: QSB5-G13
BCode	: BB91	Fuel	: Diesel
Excitation	: PMG	Displacement, cu in. (Litre)	: 272.0(4.5)
Voltage Range	: 240/120V	Cylinders	: 4
Number of Leads	: 8	Altitude Knee, ft(m)	: 10000(3048)
Reconnectable	: No	Altitude Slope, % per 1000ft(304.8m)	: 2
Full Single Phase Output	: No	Temperature Knee, °F(°C)	: 104(40)
Increased Motor Starting	: No	Temperature Slope, % per 18°F(10.0°C)	: 16
Extended Stack	: No	Emissions	: *
		Cooling Package	: High Ambient

*Note: Consult your Cummins Power Generation Distributor for more information.

Set Performance

Load Requirements

Running At	: 72.0% Rated Capacity	Max. Allowed Step Voltage Dip	: 35 In Step 2
Max. Step Voltage Dip, %	: 17	Max. Allowed Step Frequency Dip	: 10 In Step 2
Max. Step Frequency Dip, %	: 3	Peak Voltage Dip Limit %	: 35.0
Peak Voltage Dip, %	:	Peak Frequency Dip Limit %	: 10
Peak Frequency Dip, %	:	Running kW	: 35.7
Site Rated Standby kW/kVA	: 50 / 50	Running kVA	: 42.7
Site Rated Max. SkW	: 61	Effective Step kW	: 45.8
Max. SkVA	: 153	Effective Step kVA	: 86.8
Temp Rise at Full Load, °C	: 105	Percent Non-Linear Load	: 0.0
Voltage Distortion	:	Voltage Distortion Limit	:
Site Rated Max Step kW Limit	:	Max Step kW	:

*Note: Higher temperature rise at full rated load.

*Note: All generator set power derates are based on open generator sets.



Recommended Generator Report - C25 D6

Project - MINILAKES **G-1B AND G-1D**

Comments -

Project Requirements

Frequency, Hz	: 60.0	Generators Running in Parallel	: 1
Duty	: Standby	Site Altitude, ft(m)	: 361(110)
Voltage	: 120/240	Site Temperature, °C	: 25
Phase	: 1	Max. Altr Temp Rise, °C	: 105
Fuel	: Diesel	Project Voltage Distortion Limit, %	:
Emissions	: EPA, stationary emergency application		

Calculated Individual Generator Set Load Running and Peak Requirements

Running kW	: 13.7	Max. Step kW	: 18.4 In Step 3	Cumulative Step kW	: 27.6
Running kVA	: 17.3	Max. Step kVA	: 33.5 In Step 3	Cumulative Step kVA	: 45.1
Running PF	: 0.79	Peak kW	: None	Cumulative Peak kW	: None
Running NLL kVA	: 0.0	Peak kVA	: None	Cumulative Peak kVA	: None
Alternator kW	: 13.7			Pct Rated Capacity	: 56.0

Generator Set Configuration

Alternator	: CA115-R14	Engine	: 4BT3.3-G5
BCode	: BB96	Fuel	: Diesel
Excitation	: EBS	Displacement, cu in. (Litre)	: 199.0(3.3)
Voltage Range	: NA	Cylinders	: 4
Number of Leads	: 4	Altitude Knee, ft(m)	: 10000(3048)
Reconnectable	: Yes	Altitude Slope, % per 985ft(300.2m)	: 3
Full Single Phase Output	: No	Temperature Knee, °F(°C)	: 122(50)
Increased Motor Starting	: No	Temperature Slope, % per 18°F(10.0°C)	: 6
Extended Stack	: No	Emissions	: *
		Cooling Package	: High Ambient

*Note: Consult your Cummins Power Generation Distributor for more information.

Set Performance

Load Requirements

Running At	: 56.0% Rated Capacity	Max. Allowed Step Voltage Dip	: 35 In Step 3
Max. Step Voltage Dip, %	: 25	Max. Allowed Step Frequency Dip	: 10 In Step 3
Max. Step Frequency Dip, %	: 4	Peak Voltage Dip Limit %	: 35.0
Peak Voltage Dip, %	:	Peak Frequency Dip Limit %	: 10
Peak Frequency Dip, %	:	Running kW	: 13.7
Site Rated Standby kW/kVA	: 25 / 25	Running kVA	: 17.3
Site Rated Max. SkW	: 39	Effective Step kW	: 24.9
Max. SkVA	: 93	Effective Step kVA	: 45.1
Temp Rise at Full Load, °C	: 105	Percent Non-Linear Load	: 0.0
Voltage Distortion	:	Voltage Distortion Limit	:
Site Rated Max Step kW Limit	:	Max Step kW	:

*Note: Higher temperature rise at full rated load.

*Note: All generator set power derates are based on open generator sets.



Recommended Generator Report - C50D6C

Project - **MINI LAKES G-2B**

Comments -

Project Requirements

Frequency, Hz	: 60.0	Generators Running in Parallel	: 1
Duty	: Standby	Site Altitude, ft(m)	: 361(110)
Voltage	: 120/240	Site Temperature, °C	: 25
Phase	: 1	Max. Altr Temp Rise, °C	: 105
Fuel	: Diesel	Project Voltage Distortion Limit, %	:
Emissions	: EPA, stationary emergency application		

Calculated Individual Generator Set Load Running and Peak Requirements

Running kW	: 26.2	Max. Step kW	: 13.5 In Step 1	Cumulative Step kW	: 33.0
Running kVA	: 31.1	Max. Step kVA	: 19.0 In Step 3	Cumulative Step kVA	: 47.1
Running PF	: 0.84	Peak kW	: 1.0	Cumulative Peak kW	: 26.2
Running NLL kVA	: 0.0	Peak kVA	: 1.1	Cumulative Peak kVA	: 31.1
Alternator kW	: 26.2			Pct Rated Capacity	: 52.0

Generator Set Configuration

Alternator	: UCD2F	Engine	: QSB5-G13
BCode	: BB91	Fuel	: Diesel
Excitation	: PMG	Displacement, cu in. (Litre)	: 272.0(4.5)
Voltage Range	: 240/120V	Cylinders	: 4
Number of Leads	: 8	Altitude Knee, ft(m)	: 10000(3048)
Reconnectable	: No	Altitude Slope, % per 1000ft(304.8m)	: 2
Full Single Phase Output	: No	Temperature Knee, °F(°C)	: 104(40)
Increased Motor Starting	: No	Temperature Slope, % per 18°F(10.0°C)	: 16
Extended Stack	: No	Emissions	: *
		Cooling Package	: High Ambient

*Note: Consult your Cummins Power Generation Distributor for more information.

Set Performance

Load Requirements

Running At	: 52.0% Rated Capacity	Max. Allowed Step Voltage Dip	: 35 In Step 1
Max. Step Voltage Dip, %	: 5	Max. Allowed Step Frequency Dip	: 10 In Step 1
Max. Step Frequency Dip, %	: 2	Peak Voltage Dip Limit %	: 35.0
Peak Voltage Dip, %	: 1	Peak Frequency Dip Limit %	: 10
Peak Frequency Dip, %	: 1	Running kW	: 26.2
Site Rated Standby kW/kVA	: 50 / 50	Running kVA	: 31.1
Site Rated Max. SkW	: 61	Effective Step kW	: 32.4
Max. SkVA	: 153	Effective Step kVA	: 47.1
Temp Rise at Full Load, °C	: 105	Percent Non-Linear Load	: 0.0
Voltage Distortion	:	Voltage Distortion Limit	:
Site Rated Max Step kW Limit	:	Max Step kW	:

*Note: Higher temperature rise at full rated load.

*Note: All generator set power derates are based on open generator sets.



Recommended Generator Report - C25 D6

Project - MINI LAKES **G-2D**

Comments -

Project Requirements

Frequency, Hz	: 60.0	Generators Running in Parallel	: 1
Duty	: Standby	Site Altitude, ft(m)	: 361(110)
Voltage	: 120/240	Site Temperature, °C	: 30
Phase	: 1	Max. Altr Temp Rise, °C	: 105
Fuel	: Diesel	Project Voltage Distortion Limit, %	:
Emissions	: EPA, stationary emergency application		

Calculated Individual Generator Set Load Running and Peak Requirements

Running kW	: 17.4	Max. Step kW	: 17.9 In Step 1	Cumulative Step kW	: 24.2
Running kVA	: 22.1	Max. Step kVA	: 21.4 In Step 1	Cumulative Step kVA	: 38.1
Running PF	: 0.79	Peak kW	: None	Cumulative Peak kW	: None
Running NLL kVA	: 0.0	Peak kVA	: None	Cumulative Peak kVA	: None
Alternator kW	: 17.37			Pct Rated Capacity	: 68.0

Generator Set Configuration

Alternator	: CA115-L14	Engine	: 4BT3.3-G5
BCode	: B949	Fuel	: Diesel
Excitation	: EBS	Displacement, cu in. (Litre)	: 199.0(3.3)
Voltage Range	: NA	Cylinders	: 4
Number of Leads	: 6	Altitude Knee, ft(m)	: 10000(3048)
Reconnectable	: Yes	Altitude Slope, % per 985ft(300.2m)	: 3
Full Single Phase Output	: No	Temperature Knee, °F(°C)	: 122(50)
Increased Motor Starting	: No	Temperature Slope, % per 18°F(10.0°C)	: 6
Extended Stack	: No	Emissions	: Tier 3
		Cooling Package	: High Ambient

Set Performance

Load Requirements

Running At	: 68.0% Rated Capacity	Max. Allowed Step Voltage Dip	: 25 In Step 1
Max. Step Voltage Dip, %	: 17	Max. Allowed Step Frequency Dip	: 10 In Step 1
Max. Step Frequency Dip, %	: 4	Peak Voltage Dip Limit %	: 25.0
Peak Voltage Dip, %	:	Peak Frequency Dip Limit %	: 10
Peak Frequency Dip, %	:	Running kW	: 17.4
Site Rated Standby kW/kVA	: 25 / 25	Running kVA	: 22.1
Site Rated Max. SkW	: 39	Effective Step kW	: 22.8
Max. SkVA	: 78	Effective Step kVA	: 38.1
Temp Rise at Full Load, °C	: 120	Percent Non-Linear Load	: 0.0
Voltage Distortion	:	Voltage Distortion Limit	:
Site Rated Max Step kW Limit	:	Max Step kW	:

*Note: Higher temperature rise at full rated load.

*Note: All generator set power derates are based on open generator sets.



Recommended Generator Report - C60D6C

Project - MINILAKES **G-4B AND G-4D**

Comments -

Project Requirements

Frequency, Hz	: 60.0	Generators Running in Parallel	: 1
Duty	: Standby	Site Altitude, ft(m)	: 361(110)
Voltage	: 120/240	Site Temperature, °C	: 30
Phase	: 1	Max. Altr Temp Rise, °C	: 105
Fuel	: Diesel	Project Voltage Distortion Limit, %	:
Emissions	: EPA, stationary emergency application		

Calculated Individual Generator Set Load Running and Peak Requirements

Running kW	: 44.8	Max. Step kW	: 33.2 In Step 2	Cumulative Step kW	: 57.8
Running kVA	: 54.1	Max. Step kVA	: 69.2 In Step 2	Cumulative Step kVA	: 109.7
Running PF	: 0.83	Peak kW	: None	Cumulative Peak kW	: None
Running NLL kVA	: 0.0	Peak kVA	: None	Cumulative Peak kVA	: None
Alternator kW	: 44.78			Pct Rated Capacity	: 75.0

Generator Set Configuration

Alternator	: UCD2G	Engine	: QSB5-G13
BCode	: BB91	Fuel	: Diesel
Excitation	: PMG	Displacement, cu in. (Litre)	: 272.0(4.5)
Voltage Range	: 240/120V	Cylinders	: 4
Number of Leads	: 8	Altitude Knee, ft(m)	: 8750(2667)
Reconnectable	: No	Altitude Slope, % per 1000ft(304.8m)	: 2
Full Single Phase Output	: No	Temperature Knee, °F(°C)	: 104(40)
Increased Motor Starting	: No	Temperature Slope, % per 18°F(10.0°C)	: 16
Extended Stack	: No	Emissions	: *
		Cooling Package	: High Ambient

*Note: Consult your Cummins Power Generation Distributor for more information.

Set Performance

Load Requirements

Running At	: 75.0% Rated Capacity	Max. Allowed Step Voltage Dip	: 25 In Step 2
Max. Step Voltage Dip, %	: 15	Max. Allowed Step Frequency Dip	: 10 In Step 2
Max. Step Frequency Dip, %	: 3	Peak Voltage Dip Limit %	: 25.0
Peak Voltage Dip, %	:	Peak Frequency Dip Limit %	: 10
Peak Frequency Dip, %	:	Running kW	: 44.8
Site Rated Standby kW/kVA	: 60 / 60	Running kVA	: 54.1
Site Rated Max. SkW	: 72	Effective Step kW	: 49.4
Max. SkVA	: 183	Effective Step kVA	: 104.5
Temp Rise at Full Load, °C	: 105	Percent Non-Linear Load	: 0.0
Voltage Distortion	:	Voltage Distortion Limit	:
Site Rated Max Step kW Limit	:	Max Step kW	:

*Note: Higher temperature rise at full rated load.

*Note: All generator set power derates are based on open generator sets.



Recommended Generator Report - C50D6C

Project - MINI LAKES **REC CENTRE**

Comments -

Project Requirements

Frequency, Hz	: 60.0	Generators Running in Parallel	: 1
Duty	: Standby	Site Altitude, ft(m)	: 361(110)
Voltage	: 120/240	Site Temperature, °C	: 30
Phase	: 1	Max. Altr Temp Rise, °C	: 105
Fuel	: Diesel	Project Voltage Distortion Limit, %	:
Emissions	: EPA, stationary emergency application		

Calculated Individual Generator Set Load Running and Peak Requirements

Running kW	: 30.9	Max. Step kW	: 45.1 In Step 1	Cumulative Step kW	: 63.3
Running kVA	: 39.0	Max. Step kVA	: 59.2 In Step 1	Cumulative Step kVA	: 79.5
Running PF	: 0.79	Peak kW	: None	Cumulative Peak kW	: None
Running NLL kVA	: 0.0	Peak kVA	: None	Cumulative Peak kVA	: None
Alternator kW	: 30.85			Pct Rated Capacity	: 62.0

Generator Set Configuration

Alternator	: UCD2F	Engine	: QSB5-G13
BCode	: BB91	Fuel	: Diesel
Excitation	: PMG	Displacement, cu in. (Litre)	: 272.0(4.5)
Voltage Range	: 240/120V	Cylinders	: 4
Number of Leads	: 8	Altitude Knee, ft(m)	: 10000(3048)
Reconnectable	: No	Altitude Slope, % per 1000ft(304.8m)	: 2
Full Single Phase Output	: No	Temperature Knee, °F(°C)	: 104(40)
Increased Motor Starting	: No	Temperature Slope, % per 18°F(10.0°C)	: 16
Extended Stack	: No	Emissions	: *
		Cooling Package	: High Ambient

*Note: Consult your Cummins Power Generation Distributor for more information.

Set Performance

Load Requirements

Running At	: 62.0% Rated Capacity	Max. Allowed Step Voltage Dip	: 25 In Step 1
Max. Step Voltage Dip, %	: 18	Max. Allowed Step Frequency Dip	: 10 In Step 1
Max. Step Frequency Dip, %	: 4	Peak Voltage Dip Limit %	: 25.0
Peak Voltage Dip, %	:	Peak Frequency Dip Limit %	: 10
Peak Frequency Dip, %	:	Running kW	: 30.9
Site Rated Standby kW/kVA	: 50 / 50	Running kVA	: 39.0
Site Rated Max. SkW	: 61	Effective Step kW	: 51.3
Max. SkVA	: 153	Effective Step kVA	: 78.8
Temp Rise at Full Load, °C	: 105	Percent Non-Linear Load	: 0.0
Voltage Distortion	:	Voltage Distortion Limit	:
Site Rated Max Step kW Limit	:	Max Step kW	:

*Note: Higher temperature rise at full rated load.

*Note: All generator set power derates are based on open generator sets.

12.0 APPENDIX - D: MAINTENANCE COST

Alexandre Machado

From: Sunil Karandikar <Sunil@totalpower.ca>
Sent: November 20, 2018 12:38 AM
To: Alexandre Machado
Subject: RE: 184140 - Mini Lakes Emergency Power Generators Study

Alexandre,

Here is data our service department sent

kW		
	Annual \$ 600, Semi \$ 400	10
	Annual \$ 600, Semi \$ 400	15
	Annual \$ 800, Semi \$ 400	20
	Annual \$ 800, Semi \$ 400	25
	Annual \$ 800, Semi \$ 400	50
	Annual \$ 800, Semi \$ 400	60

*for non-life safety application the semi is optional

*based on GTAA, add \$ 100 for each 100km beyond 60km outside of GTAA

*annual includes 2 hour load bank test + oil/filter change

If you need more info/ knowledge on service aspect pl contact

Grant Farrow

National Service Sales Manager

Ph: 905.670.1535 x 2246 | Fx: 905.362.1304 | Email: grant@totalpower.ca | web: www.totalpower.ca

Regards,

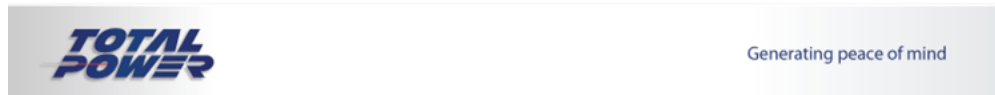
Sunil Karandikar

Senior Manager

Design & Business Development

Ph: 905.670.1535 x 2223 | Fx: 905.670.1317 | Email: sunil@totalpower.ca | web: www.totalpower.ca

“Let us know how we are doing by taking this 3 minute [Customer Satisfaction Survey](#).”



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APPENDIX H

O&M Contract



June 21, 2019
Our File: 117006-8

Township of Puslinch
RR3, 7404 Wellington Road 34
Guelph, ON N1H 6H9

Attention: Ms. Karen Landry
CAO/Clerk

Re: Wellington Common Elements Condominium
Corporation No. 214 (Mini Lakes), Review of
2018 Annual Operations and Maintenance
Report for the Water Treatment System

Dear Ms. Landry,

As requested, GM BluePlan Engineering Limited (GMBP) has reviewed the “2018 Annual Operations and Maintenance Report for the Water Treatment System” (annual report) prepared by the Ontario Clean Water Agency (OCWA) for the above-named development dated March 26, 2019. The annual report was prepared in accordance with the reporting requirements outlined in Drinking Water Systems Ontario Regulation (O. Reg.) 170/03, Section 11 and as required by the 2014 Operations and Maintenance agreement between Wellington Common Elements Condominium Corporation No. 214 (CECC # 214) and the Township of Puslinch.

The system was previously operated and maintained by American Water Canada Corporation (AWC) up to September 30, 2017. As of October 2017, the operation and maintenance contractor for the system has changed to OCWA.

Drinking Water System Description

The drinking water system servicing Mini Lakes is classified as a Non-Municipal Year-Round Residential System under Ontario Regulation (O. Reg.) 170/03.

The drinking water system consists of three (3) non-GUDI groundwater production wells located within dedicated pump houses, each with a dedicated treatment system. Treatment includes primary disinfection using 6% sodium hypochlorite with contact time, multi-media filtration (MMF) and pressure retention tanks prior to being discharged to the distribution system. Pressure retention tanks limit pump cycling and assist with maintaining consistent service pressures in the distribution system. The distribution system is comprised of primarily 50mm PVC watermain and consists of three (3) interconnected zones, with 291 existing service connections (31 being for future development) and six (6) sampling stations. Residual chlorine from the primary disinfection process is maintained at a sufficient concentration to provide secondary disinfection throughout the distribution system.

An additional well is present on site; however, it is currently off-line and is designated for non-potable use, therefore it is not part of the communal drinking water system.

Water Usage

All three well sites are equipped with electronic flow meters which record totalized flow leaving the station. For all wells, the maximum flow recorded was less than the maximum daily water taking permitted by the Permit to Take Water (PTTW).

Well/Pump	Maximum Permitted Flow (m3/day)	Maximum Water Taking (m3/day)
PW-1	146.88	50.8
PW-2	196.56	102.1
PW-3	319.68	159.3

Based on the results reported, there is no concern with available capacity to service the additional service connections for the Phase 3 development.

Sampling and Testing Results

The reported sampling and testing undertaken during the 2018 reporting period is summarized below:

- Microbiological testing of raw and treated was completed in accordance with the sampling frequencies identified in Schedule 11 of O. Reg. 170/03. There were no non-compliances reported for 2018 for raw or distribution system water. The reported levels of E.coli and Total Coliforms were reported below the Ontario Drinking Water Quality Standards (ODWQS) for these parameters (i.e. 0 colony forming units (CFUs)).
 - o Based on the reported sampling of the distribution system water for Heterotrophic Plate Count (HPC), there were detections of this microbiological parameter on several occasions. These detections were reported at 12 detections of HPC microorganisms at 1 to 4 CFUs, an increase from the previous year (i.e.). There is no standard for these parameters identified in the Ministry of the Environment, Conservation and Parks (MECP)/Health Canada guidelines. Presence of HPC is used as an indicator parameter for the overall water quality in drinking water systems but as reported by OCWA, these detections should not be used as an indicator of adverse human health effects. Trends in HPC detections are generally used as indicators of changes in general raw or treated distribution system water quality. GM BluePlan concurs with OCWA's recommendation of watermain flushing and close monitoring of HPC levels in 2019.
- Operational testing was completed in accordance with the sampling frequencies identified in Schedule 3 of O. Reg. 170/03. No non-compliances were identified.
- Operational testing was completed in accordance with the sampling frequencies identified in Schedule 8 of O. Reg. 170/03. No non-compliances were identified.
- Chlorine residual monitoring in the distribution system was undertaken in accordance with the requirements of O. Reg. 170/03. Chlorine residuals were above the minimum requirements of 0.05 mg/L throughout 2018.
 - o One (1) Adverse Water Quality Incident (AWQI) was reported to the Ministry on February 2, 2018 related to a reported faulty chlorine analyzer which recorded a chlorine residual reading of 0.06 mg/L. While not an exceedance of the Standard, this value is just above the required 0.05 mg/L concentration for a distribution system with chlorination disinfection. As reported, operations staff recalibrated the chlorine analyzer to ensure correct readings moving forward.

- Turbidity testing of the raw water sources was completed one monthly in accordance with Schedule 7 of O. Reg. 170/03. Turbidity results of the raw well water have been well below the aesthetic objective of 5 NTU throughout 2018.
- Testing for nitrates and nitrites was completed in accordance with the sampling frequencies identified in Schedule 13 of O. Reg. 170/03. No non-compliances were identified. The reported nitrate and nitrite concentrations are reported at well below the ODWQS for these parameters.
- Testing for fluoride in accordance with Schedule 13 of O. Reg. 170/03 was not required during the reporting period. Most recent testing for fluoride occurred in 2015, with the next testing event scheduled for 2020.
- Testing for sodium in accordance with Schedule 13 of O. Reg. 170/03 was not required during the reporting period. Most recent sampling for sodium was completed in 2016, with the next testing event scheduled for 2021.
- It appears that testing for trihalomethanes (THM) and haloacetic acids (HAA) in accordance with Schedule 13 of O. Reg. 170/03 appears to have been conducted in 2018 (reported on the laboratory Certificates of Analysis appended to report). The THM levels appear to be below the Maximum Allowable Concentration (MAC), however these results have not been discussed in the annual report. It is recommended that these results and required sampling frequency are discussed in the subsequent annual report. It was previously understood that a reduced sampling frequency for these parameters is permitted based on the results of historical sampling in accordance with O. Reg. 170/03.
- Testing for lead in accordance with Schedule 15.1 is conducted based on reduced sampling frequency (i.e. every three (3) years) as permitted based on the results of historical sampling in accordance with O. Reg. 170/03. The next lead sampling event is scheduled for 2019.
- Alkalinity and pH testing was conducted in the distribution system water during two (2) events in 2018. Alkalinity levels are reported as above the Health Canada recommended level for alkalinity (80-100 mg/L as calcium carbonate ((CaCO₃)). Elevated alkalinity levels are expected based on raw water source being groundwater as opposed to surface water. The pH of the distribution system water was reported as within the acceptable range for drinking water.
- Testing for inorganic parameters in accordance with Schedule 23 of O. Reg. 170/03 was not required during the reporting period, with latest testing completed in 2016. The next testing event for inorganic parameters is scheduled for 2021 (i.e. requirement of one (1) sample every 60 months (5 years)).
- Testing for organic parameters in accordance with Schedule 24 of O. Reg. 170/03 was not required during the reporting period with latest testing completed in 2016, with the next testing event scheduled for 2021.
- As reported, no additional testing was required during the reporting period as part of an approval, order or other legal instrument.
- No inspections by MECP or other regulatory agencies were conducted during 2018 at the site.

System Expenditures and Maintenance Activities

Several maintenance expenditures and repairs were completed in 2018 including items related to upgrading the chlorination systems and data collection and alarming systems, in addition to regular routine operation and maintenance tasks.

The annual report references that a condition assessment report has been prepared for the water system (date unknown) which identifies a number of recommendations for Capital and Operating Improvements.

The report indicates that several items have been addressed as part of the operations and maintenance contract for the facility. Several other capital and operating improvements remain to be completed.

It is requested that subsequent reports update on the progress of the recommended works, capital and operating improvements, particularly with respect to the instrumentation and SCADA improvements which appear to be the next critical component requiring replacement.

Reporting Requirements

Requirements to provide copies of the annual report are described in O. Reg. 170/03, section 11. Reporting requirements for the system are summarized below:

- The communal system does not serve any designated facilities; accordingly, there are no interested authorities.
- The drinking water system does not supply any other drinking water systems.
- The report will be available for viewing at the office of Wellington Common Elements Condominium Corporation # 214.
- A copy of the annual report will be provided via public request.
- No exceedances or non-compliances occurred during the reporting period and therefore no reports were made to Ministry under subsection 18 (1) of the Act or section 16-4 of Schedule 16.
 - o One (1) AWQI was reported to the Ministry resulting from a faulty chlorine analyzer which recorded a chlorine residual reading of 0.06 mg/L, or just above the required 0.05 mg/L concentration of chlorine for a distribution system with chlorination disinfection. As reported, operations staff recalibrated the chlorine analyzer to ensure correct readings moving forward. No further action was required.

All reporting requirements under O. Reg 170/03 have been satisfied.

Summary and Recommendations

Based on the information provided in the 2018 annual report by OCWA for the Mini Lakes water treatment system, we are satisfied based on the information provided that the system was operated in compliance with O. Reg. 170/03 during the reporting period.

We ask that subsequent annual report include discussion of the results of THM and HAA testing and discussion of the associated regulatory requirements with respect to monitoring for these parameters.

Further, as a number of items were identified as in need of further maintenance or upgrades, we ask that subsequent reports update on the progress of the recommended works, capital and operating improvements as well as close monitoring of HPC levels in 2019.



We trust this report is sufficient for your requirements. If you have any questions, please do not hesitate to contact us.

Yours truly,

GM BLUEPLAN ENGINEERING LIMITED

Per:

A handwritten signature in black ink, appearing to read 'Amanda Pepping'.

Amanda Pepping, P.Eng.





July 2, 2019
Our File: 199024

Township of Puslinch
RR3, 7404 Wellington Road 34
Guelph, ON N1H 6H9

Attention: Ms. Nina Lecic

Re: Wellington Common Elements
Condominium Corporation No.
214 (CECC #214), Annual
Monitoring Report - 2018

Dear Ms. Lecic,

As requested, GM BluePlan Engineering Limited (GMBP) has reviewed the '2018 Annual Operations and Maintenance Report for the Wastewater Treatment System' prepared for the Wellington Common Elements Condominium Corporation #214 (WCECC #214) by the Ontario Clean Water Agency (OCWA) dated March 28, 2019 (hereafter referred to as the annual report). The annual report is required as per the 2014 Operations and Maintenance agreement between CECC #214 and the Township of Puslinch (the Township).

WCECC #214, formerly known as the Mini Lakes Mobile Home Community, is located on Wellington County Road 34 in the Township of Puslinch and is serviced with a communal collection and Wastewater Treatment System (WWTS) with subsurface disposal beds. The Waste Water Treatment System (WWTS) serves approximately 292 residential units and common amenities and has a rated capacity of 158 m³/day average daily flow. The treatment process is a dual train aerobic system each consisting of a primary settlement tank, rotating biological contactors (RBCs), alum injection system, intermediate clarifier, denitrification tank with carbon dosing, and final clarifier. An effluent pump station discharges treated effluent to the subsurface disposal system.

In October 2017, OCWA was retained as the Operating Authority for the WWTS, which was previously operated by American Water Canada Corporation until the end of September 2017. The WWTS is operated under Ministry of the Environment, Conservation and Parks (MECP) Amended Environmental Compliance Approval (ECA) # 8154-AR4J2T dated September 18, 2017. The current ECA replaced the previously issued Amended ECA No. 2391-9KCJUS dated June 1, 2016.

1.0 EFFLUENT QUALITY

Monthly monitoring of the treated sewage effluent prior to discharge to the leaching bed is required by the ECA. Treated effluent samples are collected from the effluent pump chamber prior to discharge to the leaching bed. A total of 12 effluent quality samples were reported to be collected during 2018.

Table 1 summarizes the average effluent quality for the year 2018, presented as year to date (YTD) average concentrations (Column 2), previous YTD average (2017) (Column 3) and ECA Compliance Limit (Column 4). It is noted that the effluent limits in the ECA are based on annual average concentrations for any calendar year. As per the ECA, a non-compliance, with respect to effluent quality, occurs when the annual average

concentration of any of the treated effluent parameters, based on all grab samples collected in accordance with the ECA requirements, during any calendar year, exceeds its effluent compliance limit concentration.

Table 1. Effluent Limits, ECA No. 8154-AR4J2T

1	2	3	4
Parameters (mg/L)	YTD Avg., (Jan. 1, 2018 to Dec. 31, 2018) ^a (mg/L)	Previous YTD Avg., (Jan. 1, 2017 to Dec. 31, 2017) ^a (mg/L)	Amended ECA Compliance Limit (mg/L)
CBOD ₅ ^b	18	11.3	20
TSS ^c	20.25	7.2	20
TP ^d	0.33	0.11	1
NO ₃ ^e (Nitrate-Nitrogen)	9.12	6.41	8

- a. Year to date (YTD), or annual average concentration, as reported by OCWA.
- b. CBOD₅ = 5 day Carbonaceous Biological Oxygen Demand
- c. TSS = Total Suspended Solids
- d. TP = Total Phosphorous
- e. NO₃ = Nitrate

Based on reported concentrations, the YTD or average annual concentrations of TSS and NO₃, exceed the ECA compliance limits for these parameters. The YTD average annual concentrations of CBOD₅ and TP are within the ECA compliance limits for the 2018 monitoring period for these parameters. Additional details are discussed below.

Total Phosphorus (TP)

Effluent TP concentrations were reported below the effluent limit for this parameter during the 12 effluent quality sampling events in 2018. The average reported annual TP concentration was 0.33 mg/L, which is well below the effluent limit of 1.0 mg/L. Although elevated above the 2017 annual TP concentration, overall, the plant is considered to have performed well in terms of TP removal during the 2018 operating year suggesting an appropriate alum dose is being introduced to support precipitation and settlement of phosphorus.

Carbonaceous Biological Oxygen Demand (CBOD₅)

Effluent CBOD₅ concentrations were reported below the effluent compliance limit for 8 out of 12 monthly samples collected in 2018. The effluent CBOD₅ concentrations were reported above the compliance limit of 20 mg/L on occasions in May, June, October and November 2018 (exceedances ranging from 21 to 36 mg/L). The overall average annual CBOD₅ concentration was 18 mg/L, which remains below the effluent compliance limit for this parameter, however is higher than typical for this parameter compared to previous years. It is noted that the CBOD₅ concentration remained elevated during the first quarter 2019 sampling, as presented in the first quarter monitoring report issued in May 2019.

The reason for the increase in effluent CBOD₅ concentration is not currently clear, however the annual report notes issues with the rotating biological contactor (RBC) disk biofilm health as a potential factor. It is recommended that Operators implement regular monitoring of the RBC biofilm to establish a record of conditions and assist with establishing any correlation between biofilm issues and removal of CBOD₅, and report on the monitoring results in subsequent reports. It is further recommended that carbon dosing as

part of the denitrification process be reviewed and optimized if overdosing is determined to be a factor in elevated effluent CBOD₅ concentrations.

Nitrate (NO₃)

The NO₃ concentrations were above the limit during 7 of the 12 effluent quality sampling events in 2018. The annual average effluent NO₃ concentration was reported at 9.12 mg/L, above the ECA compliance limit of 8.0 mg/L for this parameter.

The plant has a history of challenges achieving the target NO₃ concentrations during cold weather months. This has largely been attributed to an overall reduction in denitrification due to lower temperatures, which are known to impact the denitrification process. In previous years, the effluent NO₃ concentrations have typically decreased during the warmer months, improving the overall performance trend for the year. However, in 2018 effluent NO₃ concentrations remained elevated throughout the remainder of the year and exceeded the NO₃ limit in the warmer months also, with reported concentrations higher during each quarter compared to previous years. This trend continued in the first quarter of 2019, with the highest recorded quarterly average effluent NO₃ concentration at 12.5 mg/L.

Historical effluent NO₃ concentrations from 2012 to 2018 are summarized in Table 5.5 in the report. We note that prior to the ECA amendment which occurred in 2016, the effluent NO₃ concentration limit was 5.0 mg/L. Accordingly, there are additional instances in the table which constitute an exceedance of the effluent concentration limits which are not marked in red. However, the intent of the table is understood and the upward trend in effluent NO₃ concentrations is clear.

The plant upgrades which have been previously proposed to improve the overall plant performance and consequently enhance the denitrification process, as previously approved in the June 2016/September 2018 ECA amendment, have not yet been implemented. Recommendations and proposed schedule for upgrades and maintenance has been provided by OCWA in the annual report. It is understood that the first action will be to undertake a Comprehensive Performance Evaluation / Optimization Study as soon as possible. Based on the results of the study, a plan to proceed with the remedial works/optimization (preferred) or upgrades to the plant will be made. A copy of the Comprehensive Performance Evaluation / Optimization Study should be provided for the Township for review as soon as this becomes available.

We note that there does not appear to be any discussion in the annual report regarding cleaning and maintenance of media in the denitrification tanks. It has been previously noted that solids carried through the treatment process may result in plugging of the denitrification media. It is recommended that the denitrification media be monitored and maintained regularly and reported on in subsequent reports.

While in-line with historical sampling results, it is further noted that the dissolved oxygen concentrations in the wastewater are higher (7.8 mg/L) than is typically observed in similar wastewater processes. As noted by OCWA, low dissolved oxygen, 2 mg/L or less, is ideal to promote denitrification. The reason for the high dissolved oxygen is unknown, however it is recommended that the overall treatment process be evaluated to identify opportunities (if any) to reduce oxygen entrainment.

Total Suspended Solids (TSS)

The annual average effluent TSS concentration was reported at 20.25 mg/L, which is above the effluent compliance limit of 20 mg/L. In 4 out of the 12 monthly grab samples of the treated effluent, the TSS concentrations were reported at above 20 mg/L (exceedances ranging from 23 to 32 mg/L). These recent exceedances are well above the TSS annual average concentrations reported during 2012 to 2018. The

upwards trend in effluent TSS concentrations appears to have started in the second quarter of 2018 and is continued in the 2019 first quarter monitoring report.

The annual report identifies challenges with the sludge management systems resulting in carry over of solids and debris through the treatment process as a contributor to solids removal performance. Plant upgrades previously proposed and approved in the June 2016/September 2018 ECA amendment included modifications to the sludge management systems but have yet to be implemented. As noted above, a plan to proceed with the remedial works/optimization (preferred) or upgrades to the plant will be made following completion of the proposed Comprehensive Performance Evaluation / Optimization Study.

TSS exceedances have the potential to affect the long-term performance of leaching beds and therefore it is important that this issue be addressed, especially given the reported concerns with the sewage disposal beds as discussed further below.

2.0 SUBSURFACE DISPOSAL SYSTEM

Concerns related to presence of standing water and sludge breakthrough in the vicinity of the five (5) sewage disposal beds have been identified. In October 2018, a test was completed which confirmed accumulation of sludge and other solids debris within the distribution pipes in each disposal bed.

Immediate flushing and camera inspection of the distribution piping system is recommended to remove sludge build up as well as assess the condition of the system. A report documenting the results of the assessment, as well as any necessary repairs identified and the timing for implementation, should be provided to the Township of Puslinch for review.

3.0 SEWAGE FLOWS

Flows to the plant ranged from approximately 73 m³/day (May 2018) to 108.6 m³/day (January 2018), with maximum daily flows of 217.4 m³/day on January 23, 2018 and 204.0 m³/day on February 21, 2018.

The WWTS is rated for an "Average Daily Flow" rate of 158 m³/day. "Average Daily Flow" as defined in the ECA as the *cumulative total sewage flow to the sewage works during a calendar year divided by the number of days during which sewage was flowing to the sewage works that year*. The Average Daily Flow for 2018 to the plant was 85.6 m³/day which represents approximately 54% of the current rated plant capacity. The plant is considered in compliance with the ECA with respect to effluent flows.

A slight decrease in average daily flows was observed in 2018. In the years preceding, the average daily flow rate was higher, in the range of 100 m³/day. A direct cause of the flow reduction has not been determined. It was noted in the annual report that effluent flow meters for two pumps were replaced, however it is unknown if this contributed to the reduced effluent flow values. Based on the flow results in the 2019 first quarter monitoring report, flow values appear to be returning to normal levels. It is recommended that effluent flow meters are calibrated, and plant flow rates monitored closely moving forward.

The elevated plant flows which occurred in January and February 2018 are attributed to abnormally mild temperatures (3.9 to 13.8°C) and heavy precipitation (up to 19mm of rain) which contributed to increased snow melt and inflow and infiltration (I & I) into the sewage system.

Although there is evidence that some infiltration and inflow is occurring, the “Average Daily Flow” to the plant is well within the compliance limits of the ECA and appear to be within the maximum hydraulic capacity of the plant (237 m³/day, based on a 1.5 peaking factor). It is recommended that the peak flows to the plant are closely monitored moving forward. Practices which reduce inflow may also be proactively considered, such as installation of inflow dishes on low lying maintenance hole lids.

It is noted that high groundwater elevations are known to occur in many areas of the site and are likely the main contributor to sewer system infiltration.

4.0 GROUNDWATER LEVEL AND QUALITY MONITORING

In accordance with the ECA, groundwater level and groundwater quality monitoring is completed at the site in the nine (9) existing monitoring wells. As reported, groundwater level fluctuations were observed in 2018, which is expected based on climatic conditions and seasonal variations in weather, such as the amount and type (e.g. snow vs. rainfall) of precipitation as well as regional fluctuations in groundwater levels.

With respect to sewage indicator parameters, based on the results of the quarterly groundwater quality monitoring, elevated nitrate concentrations (up to 8.66 mg/L) were reported in the two (2) monitoring wells located in close proximity and down gradient (west) of the disposal beds. Elevated nitrate concentrations near the sewage subsurface disposal beds are expected and are in-line with historical test results for these locations. These concentrations are below the Ontario Drinking Water Quality Standards (ODWQS) of 10 mg/L for nitrate. More importantly, the concentration of nitrate was reported at well below the ODWQS at the monitoring wells which are located near property lines.

Total phosphorus concentrations in the groundwater were within levels expected for shallow groundwater. Although elevated at select locations, E. coli levels were also within ranges expected in shallow groundwater, and no elevated levels of E. coli were reported in the direct vicinity of the leaching bed. Influence of surface water rather than direct influence from a sewage leak are likely the source of E. coli and TP detections in the monitoring wells located further away from the disposal beds.

5.0 SURFACE WATER QUALITY MONITORING

Quarterly surface water quality samples were collected in 2018 at six (6) locations, as required by the ECA. Generally, the analytical results of water quality with respect to key indicator parameters for surface water including nitrates, total phosphorus and ammonia are comparable for the upstream, throughout the property and downstream monitoring locations.

There does not appear to be noticeable increases in concentration of parameters related to sewage disposal in the surface water across the site. Although occasional detections of phosphorus and E. coli were reported, the slight increases in concentration were reported in the upstream, throughout the property as well as downstream monitoring locations. This is considered to be related to the overall water quality in the greater watershed rather than attributable to the presence of the onsite sewage disposal systems.

6.0 OPERATIONAL ISSUES AND SYSTEM MAINTENANCE

System maintenance activities and operational issues are summarized in the 2018 annual report. For the most part, the undertaken maintenance activities comprise general housekeeping items typically needed in the operation of a wastewater treatment plant and sewage collection system as well as upgrades to equipment identified to cause operational issues. The 2018 activities included monitoring of sludge levels and removal as needed, repair, maintenance and/or replacement of various system components including

flow meters, pumps, check valves, chemical feed lines to address identified issues and identified challenges with the operation of the WWTS.

7.0 CHEMICAL STORAGE CONTAINMENT REQUIREMENTS

The wastewater treatment plant continues to be out of compliance with the requirements for chemical storage. The June 1, 2016 Amended ECA included approval for this upgrade. In order to achieve conformance with the Amended ECA, a 900 L carbon tank and 2,300 L alum tank, complete with secondary spill containment are required to be installed. Previously it was reported that a new chemical storage building was planned to resolve this issue.

An update regarding the timing of the proposed work, to bring the wastewater treatment plant into compliance with respect to ECA requirements, is requested.

8.0 OTHER SYSTEM INVESTIGATIONS, IMPROVEMENTS AND RECOMMENDATIONS

Several operational items and recommendations to improve the overall system performance, were identified in the annual report, with some of the items reported as completed under the O&M contract with OCWA. Outstanding items identified include the following:

- Emergency power for all sewage pumping stations (SPS) recommended to take place in the next 2 to 3 years.
- June 1, 2016 ECA approved proposed upgrades have not been completed.
- SCADA and historian system upgrades to improve accessibility, control and data recording capabilities.
- Monitoring of alum dosages and RBC biofilm to improve biological treatment.
- Addition of an equalization tank for variable flow conditions to improve sludge accumulation in the intermediate clarifiers.
- Investigation of options for preliminary treatment (i.e. bar screens) or increased frequency of sludge removal to improve sludge accumulation issues.
- Assessment of operating conditions to optimize the treatment process including the state of the RBC disk biomass.
- Flushing and condition assessment of the distribution piping within each disposal bed. Rehabilitation and repair of piping, appurtenances and other components of the disposal beds to improve surface water accumulation near the disposal beds.

Several investigations were reported to have been completed at the site including a Sewage Treatment System Trade-Off Study by OCWA and a Standby Power Study by R. V. Anderson Associates Limited. In October 2018, a high level visual condition assessment of the WWTS was also conducted by OCWA. Based on the information presented in the supporting reports, we understand that a Comprehensive Performance Evaluation / Optimization Study will be initiated as soon as possible. Based on the results of the study, a plan to proceed with the remedial works/optimization (preferred) or upgrades to the plant will be made. A

copy of the report, including the timing of implementation of any proposed remedial works or improvements, shall be submitted to the Township of Puslinch for review.

It is understood that characterization of the raw (incoming) sewage commenced in late 2018. We concur that this additional sampling is beneficial and will provide useful data to assist with plant troubleshooting, performance assessment and optimization. Consideration could also be given to completing wastewater characterization at key additional (intermediate) steps in the treatment process.

It is also noted that a Wastewater Treatment System Process Flow Diagram (PFD) would be beneficial with subsequent reports to assist with overall process understanding and analysis

The above matters, and issues should be investigated, and any resolutions reported on in the subsequent quarterly and annual monitoring reports.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Based on the information provided in the '2018 Annual Operations and Maintenance Report for the Wastewater Treatment System' prepared by OCWA (March 28, 2019), the WCECC #214 wastewater treatment plant effluent did not meet the MECP ECA compliance limits for NO_3 and TSS based on an annual average effluent quality basis during 2018. The effluent did meet the compliance limits for TP and CBOD_5 .

The 2018 average effluent flow was reported at $85.6 \text{ m}^3/\text{day}$ which represents approximately 54% of the current rated plant capacity of $158 \text{ m}^3/\text{day}$ and is below the sewage flow compliance limit stipulated in the ECA.

Based on our review of the 2018 Annual Monitoring Report we recommend that;

1. The Comprehensive Performance Evaluation / Optimization Study be initiated as soon as possible. A copy of the Comprehensive Performance Evaluation / Optimization Study, including the timing for implementation of any proposed remedial works or improvements, shall be provided for the Township for review as soon as this becomes available.
2. Operators implement regular monitoring of the RBC biofilm to establish a record of conditions and assist with establishing any correlation between biofilm issues and reduction of CBOD_5 , and report on the monitoring results in subsequent reports.
3. Carbon dosing as part of the denitrification process be reviewed and adjusted (if necessary).
4. The overall treatment process be evaluated to identify opportunities (if any) to reduce oxygen entrainment.
5. Operators undertake regular monitoring and maintenance of denitrification media to ensure media plugging due to solids carry through does not occur.
6. Operators consider completing wastewater characterization at additional steps in the treatment process to assist with troubleshooting and optimization of the treatment process.

7. Immediate flushing and camera inspection of the distribution piping within each sewage disposal bed is completed. Provide a report of the results, including any remedial repairs identified and timing for implementation, to the Township of Puslinch as soon as complete.
8. Effluent flow meters are calibrated, and plant flow rates monitored closely moving forward.
9. Consider easy to implement practices to reduce sewer inflow, such as installation of inflow dishes on low lying maintenance hole lids.
10. Operators continue to closely monitor effluent parameters and take corrective action, as required.
11. The Owner and Operators take appropriate action to bring the wastewater treatment plant into compliance with respect to ECA requirements previously approved in 2016, including for improved chemical storage. An update on the timing of implementing the required work is requested.
12. Provide a Wastewater Treatment System Process Flow Diagram with subsequent reports to assist with overall process understanding and analysis.

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 LIMITED

Per:

A handwritten signature in black ink, appearing to read 'Amanda Pepping', written in a cursive style.

Amanda Pepping, P.Eng.

AP/jo



File: 2823
By: email

July 4, 2018

Address: Township of Puslinch
7404 wellington Road 34,
Puslinch, ON N0B 2J0

Attention: Ms. Mary Hasan
Director of Finance/Treasurer

Dear: Ms. Hasan

Re: Vegetation Management in Fox Run Park

As requested, I inspected the Fox Run Park on June 25, 2019 for the purpose of documenting existing vegetation conditions in the park and adjacent lands and assessing management options for this area. I also reviewed correspondence the Township received from John Arnold, a local resident, and discussed his concerns and those of other residents with Amanda Pepping. GM Blue Plan has also recently prepared a conceptual design for a fully accessible trail that would traverse the site from Dear View Ridge to Fox Run Drive and Amanda supplied me with a copy of this Plan. Based on this information, it is my understanding that scattered plantings of trees were established in the area and a landscape contractor retained by the Township periodically mows the grassy portions of the site.

My observations of existing conditions and assessment of management alternatives are outlined as follows:

- The park was recently mowed except in the eastern corner (i.e. adjacent to lots 26, 28, 40 and 42 on Fox Run Drive) where it was too wet to accommodate mowing equipment. As a result, none of the herbaceous groundcover was in flower, except for the sedges growing in the wet eastern corner of the site. It was, nonetheless possible to identify many of the herbaceous plants growing in this meadow. Aside from the common ornamental lawn grasses (e.g. Canada bluegrass, perennial rye grass etc.) there was an abundance of weed species established amongst the grass. Some of the more notable and/or abundant species include garlic mustard, common dandelion, white clover, Canada thistle, common burdock, sow thistle, smaller hop clover, sow thistle, common plantain, common mullein, ox-eye-daisy, lady's thumb and reed canary grass. Without periodic mowing these weeds will certainly increase in abundance.
- In some areas it is difficult to know where the boundary of the park is located. There appears to be some homeowner encroachments into the area.
- Several tree species have either been planted in the park or were naturally established. They occur in small patches or as scattered individuals. Trees observed include black locust, bur oak, black walnut, white and red ash, silver maple, white spruce, tamarack and balsam fir. Three butternut trees were also noted but these trees do not warrant any special protection under the Endangered Species Act because they were planted and are hybrids

based on my physical examination of them. A few chokecherry and willow shrubs have also become established in the area. Black locust is a highly invasive, non-native species, that is particularly abundant along the southwestern property boundary.

- Native trees and shrubs found on adjacent residential properties include white and red ash, trembling aspen, butternut (dying), white elm, willow, alternate leaved dogwood, white spruce, white pine, tamarack and white cedar. Non-native trees and shrubs observed on these properties include Norway spruce, Colorado blue spruce, white mulberry, pear, common lilac, tartarian honeysuckle and common buckthorn. White mulberry, common lilac, tartarian honeysuckle and common buckthorn are very aggressive, invasive species that readily spread into open areas.
- Several mature white and red ash observed on adjacent properties are dead or dying as a result of the Emerald Ash Borer (EAB). Some young red ash planted in the park have also been killed by EAB and the remaining living ash trees in the patch will soon be affected by this insect pest. As a result, the Township will have to remove all ash trees from the park in the near future.
- Several homeowners have established tree screens in their backyards.

Regardless of whether the Township decides to construct a recreational trail through the park a decision needs to be made on the following vegetation management options.

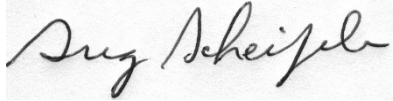
1. Continue with the current frequency of mowing. This practice will prevent the spread of invasive woody plants into the parkland and also limit the growth of herbaceous weeds. It is however, unfavourable to bees and butterflies that require flowering plants as a food source.
2. Continue to mow the area but defer the first mowing to July so that flowering plants are available to pollinators during the spring. This option is still effective in controlling the spread of weed species but will result in a heavy layer of thatch on the ground surface unless a mulch mower or something equivalent is used by the contractor. The annual mowing cost should be reduced with this option.
3. Do nothing and allow the area to naturalize. This option minimizes the maintenance cost to the Township but in the long term will result in the Park being dominated by woody and herbaceous weed species. It is, therefore, a misnomer to refer to this option as “naturalization” as there will be little vegetation that is truly natural in this area given the abundance of non-native species already established on the property and adjacent lands.
4. Discontinue mowing and reforest the area with a mix of native coniferous and deciduous trees and shrubs so that they get a head start on the non-native species that will seed into the area. Some small patches of meadow could be left unplanted at interior locations to provide habitat diversity for wildlife and visual diversity for park users. It would also be helpful to remove the black locust trees from the park prior to reforestation in order to eliminate undesirable seed sources and create more planting space for native trees. In this regard, adjacent homeowners should be encouraged to eradicate or at least try to control the abundance of non-native plants on their properties to help limit the spread of undesirable plants into the park. The reforestation cost will likely exceed the annual cost of mowing but

once the trees are established only periodic tending will be needed to maintain good survival and growth.

In my opinion, option 2 or 4 seem most reasonable from an ecological and long-term cost perspective.

Yours truly,

GWS Ecological & Forestry Services Inc.

A handwritten signature in black ink, reading "Greg Scheifele". The signature is written in a cursive style and is positioned above the printed name and title.

Greg W. Scheifele, M. A., R.P.F.
Principal Ecologist/Forester



June 27, 2019

Township of Puslinch
7404 Wellington Road 34
Puslinch, Ontario N0B 2J0

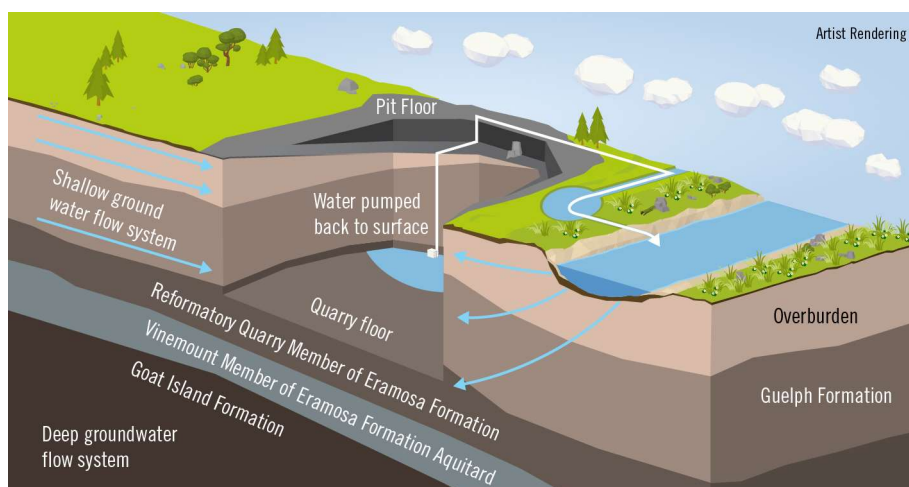
Dear Mayor Seeley and Council,

On behalf of Lafarge Canada, I am writing today to share some important information regarding our operations at the “Lafarge Wellington” site (7051 Wellington Road 124). In short, we are applying for an amendment to our Permit To Take Water and the related Industrial Sewage Works Approval, as further explained below, and we are inviting you to an Open House to meet us and our expert team.

Lafarge is Canada’s largest provider of diversified construction materials, with more than 6,000 employees and 250 sites. As you are likely aware, the Lafarge Wellington site has been in operation for nearly 50 years. The licensed site has periodically operated as a sand and gravel quarry, and also hosts a Ready Mix Concrete plant as well as an Asphalt plant operated by another company via lease.

In order to meet Ontario’s infrastructure demands, the site is being readied to re-commence aggregate production under its existing license. Before recommencing operations, we require an amendment to the existing ‘Permit to Take Water’ and ‘Industrial Sewage Works’ permits. If approved, Lafarge will be able to meet local aggregate demands through work at this site, supporting infrastructure like roads & highways, hospitals, bridges, affordable housing as well as public transit.

It is important to note that while the permit is classified as a Permit to Take Water, the word “take” can be partially misleading. Much of our water use may be better described as water handling, rather than consumption. The new uses consist of dewatering the quarry –pumping out storm water and groundwater from the quarry sump. The groundwater that seeps into the quarry from the upper bedrock aquifer will be discharged back into the wetland and Speed River, where much of it will infiltrate back into the aquifer system. This is by design as we recognize local concerns about groundwater use and consumption; we feel it is important to emphasize that the majority of the water resource is kept within the community. This design concept is illustrated in the artist’s rendering below.



Knowing the importance of groundwater Lafarge has also taken a position in this application that Lafarge will not extract aggregate below the Vinemount aquitard. This too is illustrated in the figure above. This design decision will ensure a barrier remains between the lower aquifer and our excavation. We have engaged skilled experts to conduct thorough water evaluations and studies to ensure we mitigate potential adverse effects of this proposed new water handling, including a year-long engineering and sampling program to measure and assess the site (followed by additional months of study).

Our potential groundwater radius of influence is 500m from the quarry wall, the nearest Municipal wells (City of Guelph) are 1800m to the North and Northeast and so the proposed dewatering should not limit the available pumping from these Municipal wells. As you can anticipate, the actual site hydrogeology is more complex than can be expressed in a short letter and the details of the application can be found in the technical report prepared by Golder Associates which will soon be on our project website:

www.LafargeWellington.ca starting July 7, 2019.

The table below outlines what we are proposing to change in our existing Permit To Take Water. We note that the permits are 10-yrs in duration and the maximums applied for are based on the anticipated volumes in the 10th year and are conservative. First year volumes will be much lower and the proposal includes monitoring the site's well network as the quarry gradually expands over the coming years.

Source Name	Purpose	Existing / New	First Year Maximum (est)	Applied for Max Volumes
Quarry Sump	Dewatering – Groundwater	New	1,200 m ³ /d**	6,000 m ³ /d
	Dewatering – Storm water*	New	30 m ³ /d	15,500 m ³ /d
On-Site Supply Well	Manufacturing	New	218 m ³ /d	218 m ³ /d
Source Pond / Quarry Water Management Pond	Manufacturing	Unchanged	Same	4,473 m ³ /d
Holding Pond	Manufacturing	Unchanged	Same	273 m ³ /d
Speed River	Manufacturing	Unchanged	Same	1,309 m ³ /d

*Maximum to allow for major rain events ** Based on assumptions about first year production

I also invite you to learn more at our Public Information Meeting on July 24th, 2019 at the Victoria Road Recreation Complex (151 Victoria Rd N, Guelph, ON N1E 5H4). The open house will run from 6:00pm to 8:00pm. We are committed to providing councillors and the community with all information on our operations that are needed. I would be pleased to discuss any specific questions you may have regarding the project, and can make myself available to meet with you at a time of your convenience.

Thank you in advance for reviewing this material. I am looking forward to discussing with you in further detail in the coming weeks and months.

Regards,



Robert Cumming, MAsc, P.Eng
Environment & Public Affairs Director, East Canada, Lafarge Canada Inc.



Environmental Registry of Ontario

Lafarge Canada Inc.

Instrument type: [Permit to take water \(/taxonomy/term/334\)](/taxonomy/term/334)

ERO (Environmental Registry of Ontario) number	019-0240
Ministry reference number	0821-BCSLAK
Notice type	Instrument
Act	Ontario Water Resources Act, R.S.O. 1990
Posted by	Ministry of the Environment, Conservation and Parks
Notice stage	Proposal Updated
Proposal posted	June 25, 2019
Comment period	June 25, 2019 - August 9, 2019 (36 days) Open
Last updated	July 4, 2019

We have extended the comment period by an additional 15 days. The new comment end date is August 9, 2019.

July 4, 2019

This consultation closes at 11:59 p.m. on:

August 9, 2019

Proposal summary

This proposal is for an amendment to Permit To Take Water [No. \(Number\) 2718-7S3RM7](#) for Lafarge Canada [Inc. \(Incorporated\)](#) Water will be taken from one (1) well, three (3) ponds, and one (1) watercourse for quarry dewatering and industrial purposes at the Wellington County pit and quarry.

Location details

Site address

7051 Wellington Road 124
Lot 5, 7, 8 & 10, Concession 5, Div B South of Waterloo Road
Guelph/Eramosa, ON
Canada

Site location map

The location pin reflects the approximate area where environmental activity is taking place.

[View this location on a map](https://maps.google.com/?q=43.494244,-80.279633) (<https://maps.google.com/?q=43.494244,-80.279633>)

Proponent(s)

Lafarge Canada Inc.
6509 Airport Road
Mississauga, ON
L4V 1S7
Canada

Proposal details

This proposal is for an amendment to Permit To Take Water No. (Number) 2718-7S3RM7 for Lafarge Canada Inc. (Incorporated). This amendment is to include additional sources of water at the site in order to advance the quarry.

Water will be taken from one (1) well, three (3) ponds, and one (1) watercourse for quarry dewatering and industrial purposes at the Wellington County pit and quarry located on the south side of Highway 124, in the Townships of Guelph-Eramosa and Puslinch.

Details of the water taking are as follows:

Source of water: Quarry Sump

- Purpose of taking: Quarry Dewatering
- Maximum rate per minute (Litres): 14,930
- Maximum number of hours of taking per day: 24
- Maximum volume per day (Litres): 21,500,000
- Maximum number of days of taking per year: 365
- Period of taking: January 1 to December 31 for 10 years

Source of water: On-Site Supply Well

- Purpose of taking: Industrial
- Maximum rate per minute (Litres): 303
- Maximum number of hours of taking per day: 12
- Maximum volume per day (Litres): 218,000
- Maximum number of days of taking per year: 365
- Period of taking: January 1 to December 31 for 10 years

Source of water: Source Pond/Quarry Water Management Pond

- Purpose of taking: Industrial
- Maximum rate per minute (Litres): 7,455
- Maximum number of hours of taking per day: 10
- Maximum volume per day (Litres): 4,473,000
- Maximum number of days of taking per year: 295
- Period of taking: January 1 to December 31 for 10 years

Source of water: Holding Pond

- Purpose of taking: Industrial
- Maximum rate per minute (Litres): 455
- Maximum number of hours of taking per day: 10
- Maximum volume per day (Litres): 273,000

- Maximum number of days of taking per year: 295
- Period of taking: January 1 to December 31 for 10 years

Source of water: Speed River

- Purpose of taking: Industrial
- Maximum rate per minute (Litres): 909
- Maximum number of hours of taking per day: 24
- Maximum volume per day (Litres): 1,309,000
- Maximum number of days of taking per year: 295
- Period of taking: January 1 to December 31 for 10 years

More about [Permits to Take Water \(https://www.ontario.ca/page/permits-take-water\)](https://www.ontario.ca/page/permits-take-water)


Supporting materials

View materials in person


Some supporting materials may not be available online. If this is the case, you can request to view the materials in person.

Get in touch with the office listed below to find out if materials are available.

West Central Regional Office
119 King Street West
12th floor
Hamilton, ON
L8P 4Y7
Canada

 [905-521-7640](tel:905-521-7640)

Client Services and Permissions Branch
135 St Clair Ave West
1st Floor
Toronto, ON
M4V 1P5
Canada

 [416-314-8001](tel:416-314-8001) or [1-800-461-6290](tel:1-800-461-6290)

Comment

Let us know what you think of our proposal.

Have questions? Get in touch with the contact person below. Please include the [ERO \(Environmental Registry of Ontario\)](#) number for this notice in your email or letter to the contact.

[Read our commenting and privacy policies. \(/page/commenting-privacy\)](#)

Submit by mail

Client Services and Permissions
Branch

Client Services and Permissions Branch
135 St Clair Ave West

1st Floor

Toronto, ON

M4V 1P5


Canada

Connect with

US

Contact

Client Services and Permissions
Branch

 [416-314-8001](tel:416-314-8001) or [1-800-461-6290](tel:1-800-461-6290)

 enviropemissions@ontario.ca

Courtenay Hoytfox

From: Nina Lecic
Sent: Tuesday, July 9, 2019 8:15 PM
To: James Seeley; John Sepulis; Jessica Goyda; Ken Roth; Matthew Bulmer; Courtenay Hoytfox
Subject: Fwd: Follow Up Information from Lafarge
Attachments: Lafarge Wellington Quarry 2-pager.pdf; ATT00001.htm; Lafarge Wellington Half Fold 11x17 Layout June 2019 Print FINAL.pdf; ATT00002.htm

From: "Robert CUMMING" <robert.cumming@lafargeholcim.com>
To: "Nina Lecic" <nlecic@puslinch.ca>
Subject: Follow Up Information from Lafarge

Hi Nina,

Can you pass this on to Mayor Sealy and Council?

I understand that community members may be asking for more information about our project in the coming days and we thought it may be helpful to have something on hand that can be shared with them.

To that end, please find attached a project backgrounder as well as a project brochure both of which are intended for public release. We welcome questions and comments from local stakeholders and to facilitate that we have also set up a website for the project (www.lafargewellington.ca) which provides access to the application reports as well as some related reports from the Ontario Stone, Sand, and Gravel Association. There is also information there on how to provide comments to the Ministry and how to get questions to the Lafarge team.

We will soon be posting the "Industrial Sewage Works" application documents on this site as well.

The attached 2-pager provides information on our public information session which will be held later this month.

Regards,

Rob

--

Robert Cumming, Environment & Public Affairs Director, Canada - East

Lafarge Canada - a Member of LafargeHolcim
6509 Airport Road, Mississauga, ON L4V 1S7

Office: (905) 738-7741 | **Mobile:** (613) 484-7714

This e-mail is confidential and intended only for the use of the above named addressee. If for the use of the above named addressee. If you have received this e-mail in error, please you have received this e-mail in error, please delete it immediately and notify us by e-mail or delete it immediately and notify us by e-mail or telephone.



About Lafarge

Lafarge is Canada's largest provider of diversified construction materials. With 6,000 employees and 400 sites across Canada, our mission is to provide construction solutions that build better cities and communities. The cities where Canadians live, work, and raise their families, along with the community's infrastructure, benefit from the solutions provided by Lafarge consisting of aggregates, asphalt and paving, cement, precast concrete, ready-mix concrete and infrastructure construction.

Lafarge is committed to providing solutions using sustainable manufacturing practices and improving the environment in and around its operations. The company has a sixty year history in Canada and continually works to reduce carbon dioxide emissions, restore wetlands for native plants and animals, and identify waste materials that can be recycled and used in our operations.

LAFARGE

WELLINGTON

For Media Inquires, Contact:
Adam Yahn - ayahn@summa.ca

For Additional Information, Contact:
Faith.Stewart@lafargeholcim.com

Please see our project website lafargewellington.ca for project reports.
To provide comments to the Ministry, please visit www.ero.ontario.ca and search for "Lafarge Canada Permit to Take Water" or "Lafarge Canada Industrial Sewage Works".

SUMMARY

1. When quarries are constructed, precipitation & groundwater accumulates in the excavation site, requiring it to be pumped out - this is called dewatering.

2. We've learned from local stakeholders how important groundwater is to the community. We took time to carefully assess the site and made design changes based on local knowledge.

3. In doing this assessment, Lafarge engaged experts to conduct thorough water evaluations, including over a year of monitoring, to carefully measure & assess the site, followed by additional months of study.

4. Most of the water removed from the upper bedrock aquifer due to dewatering will be discharged back into the wetland & Speed River. There it can infiltrate back into the aquifer system & minimize consumptive use. The majority of the water is being handled & not removed from the water shed.

5. Although the site's aggregate license allows extraction below the Vinemount aquitard, which shields the deep groundwater aquifer, Lafarge is only applying for operations above the aquitard to ensure a barrier between the lower aquifer sources and our excavation.

Whether a highway, a hospital, a school, an apartment building, a home, a driveway, a water main, or a myriad of other projects – we need stone and gravel.

Consultation Process

Lafarge is meeting with Provincial/Local Representatives at the Ministry of Environment, Conservation & Parks, Township of Puslinch, Township of Guelph-Eramosa, County of Wellington & City of Guelph about the Wellington Project. Lafarge has also retained experts to prepare mitigation & monitoring reports to ensure wells & the natural environment are protected. For the community, Lafarge is hosting a public open house to provide additional details & answer questions.

History & Future; Lafarge Wellington

The Lafarge Wellington site, located at 7051 Wellington Road 124, commenced operation in the 1970s. During this time it was periodically operated as a sand and gravel pit under the Aggregate Resources Act (ARA; Ontario 1990). The site also hosts a Ready Mix Concrete plant operated by Lafarge and an Asphalt plant operated by another company under a lease.



Applications Submitted

The proposed amendment to the site's Permit to Take Water (PTTW) uses the word "take", but it can be misleading. Much of the water removed from the upper bedrock aquifer due to dewatering will be discharged back into the wetland and Speed River where it can infiltrate back into the aquifer system. As a result, consumptive use is minimal by the design of the proposed operation. Similarly, the Industrial Sewage Works amendment application refers to the return of storm and groundwater back to the wetland and Speed River, not sanitary sewage.

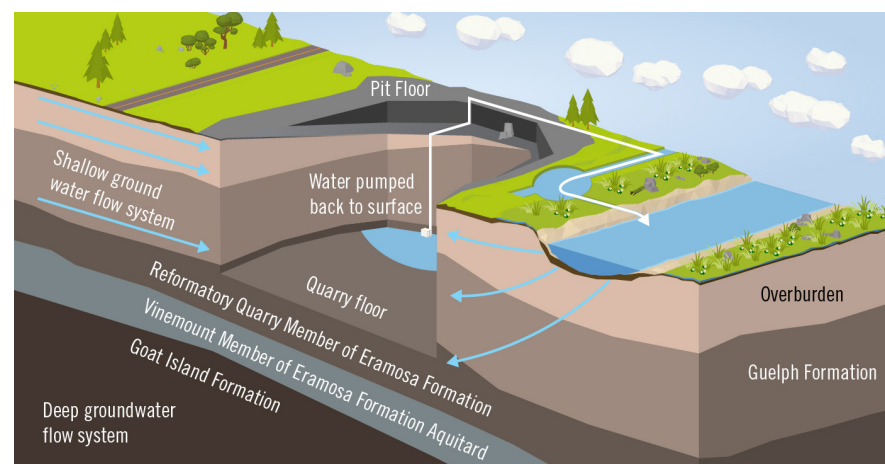


What Is Proposed? Stone and gravel are essential building materials for Ontario's infrastructure. With considerable investments being made by all governments in infrastructure projects and the exhaustion of other local quarry resources, the Wellington site is being readied to re-commence aggregate production under its existing license. Before re-commencing operations, amendments to the existing "Permit to take Water" (PTTW) Number 2718-7S3RM7, and "Industrial Sewage Works" (ISW) Approval (Col A No. 0290-6PHGPS) are required. If approved, this will allow Lafarge to meet local infrastructure demands in accordance with modern operating standards.

Why do we need to handle water? When quarries are constructed, they become an open excavation into which precipitation and groundwater seepage, through the quarry walls, can flow. Over time, the excavation would fill with water and so it is necessary to pump the water out of the quarry during operation. After proposed water handling begins, a small percentage of water will continue to be used on site while the majority will be pumped into a nearby wetland (partially recharging the upper aquifer) & the Speed River - i.e. to a large extent where it currently flows.

Gravel Production Above Aquitard

The bedrock extraction onsite is below the water table and will be limited to 285 m above sea level which is above the Vinemount Member of the Eramosa Formation. The Vinemount Member of the Eramosa Formation acts as an aquitard (rock barrier) between the Guelph Formation aquifer above it and the Goat Island & Gasport Formation aquifers below it. This ensures a separation between the lower aquifer and our operations.



Water Management Principles

A few important things to understand about aggregate extraction & water resources:

- Clean industry: Chemicals are not added in the extraction & processing of aggregates.
- Water is handled, not consumed: Lafarge handles water & returns it to the watershed in a controlled manner. Only a small percentage of water at this site will be used, while the majority will be kept in the watershed.
- Highly regulated: Extensive monitoring & reporting is required to verify the protection of water resources, including private wells, monitoring wells & the natural environment.

To that end, Lafarge has engaged Golder Associates to complete studies outlining mitigation measures that limit potential adverse effects of aggregate production. The mitigation plan also includes directing dewatering discharges to adjacent wetlands (to prevent dry conditions and partially recharge the upper aquifer) & the Speed River. The application proposes to continue the maximum amount of 6,055 m³/day of water used today by the site's manufacturing operations and to add a maximum of 15,500 m³/day for groundwater & surface water (from storm water) dewatering. These amounts are conservatively estimated for the final year of the 10-year permit. In the first year of operations we estimate adding a maximum of 1,448 m³/day to our existing use.



June, 2019

Guelph Project Backgrounder

Who is Lafarge?

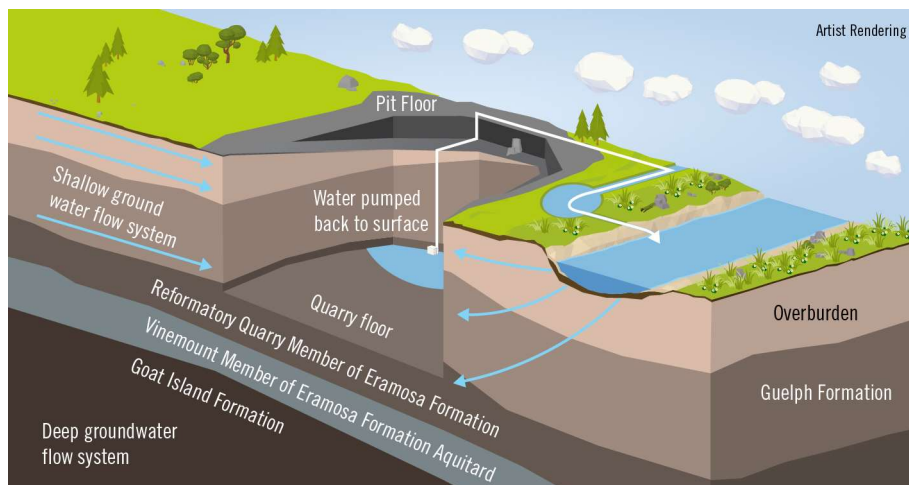
Lafarge is Canada's largest provider of diversified construction materials, with more than 6,000 employees and 250 sites. The Lafarge Wellington site has been in operation for nearly 50 years. Over this time period, the licensed site has periodically operated as a sand and gravel quarry, and also hosts a Ready Mix Concrete plant as well as an Asphalt plant operated by another company via lease.

What is being applied for?

In order to meet Ontario's infrastructure demands, the site is being readied to re-commence aggregate production, now below the water table, under its existing license. Before recommencing operations, we require an amendment to the existing 'Permit to Take Water' and 'Industrial Sewage Works' permits. If approved, Lafarge will be able to meet local aggregate demands through work at this site, supporting infrastructure like roads & highways, hospitals, bridges, affordable housing as well as public transit.

Why is Lafarge taking water?

It is important to note that while the permit is classified as a Permit to Take Water, the word "take" can be partially misleading. Much of our water use may be better described as water handling, rather than consumption. The new uses consist of dewatering the quarry –pumping out storm water and groundwater from the quarry sump. The groundwater that seeps into the quarry from the upper bedrock aquifer will be discharged back into the wetland and Speed River, where much of it will infiltrate back into the aquifer system. This is by design as we recognize local concerns about groundwater use and consumption; we feel it is important to emphasize that the majority of the water resource is kept within the community. This design concept is illustrated in the artist's rendering below.



How is Lafarge dealing with local water concerns?

Knowing the importance of groundwater Lafarge has also taken a position in this application that we will not extract aggregate below the Vinemount aquitard. This too is illustrated in the figure above. This design decision will ensure a barrier remains between the lower aquifer and our excavation. We have engaged skilled experts to conduct thorough water evaluations and studies to ensure we mitigate potential adverse effects of this proposed new water handling, which included a year-long engineering and sampling program to measure and assess the site (followed by additional months of study).

Our potential groundwater radius of influence is 500m from the quarry wall, the nearest Municipal wells (City of Guelph) are 1800m to the North and Northeast and so the modeling of proposed dewatering indicates that the available pumping from these Municipal wells will see no material effects. While the actual site hydrogeology is more complex than can be expressed in this summary, the details of the application can be found in the technical report prepared by Golder Associates which can be found on our project website: www.LafargeWellington.ca.

What are the amounts of water involved?

The table below outlines what we are proposing to change in our existing Permit To Take Water. We note that the permits are 10-yrs in duration and the maximums applied for are based on the anticipated volumes in the 10th year and are conservative. First year volumes will be much lower and the proposal includes monitoring the site's well network as the quarry gradually expands over the coming years.

Source Name	Purpose	Existing / New	First Year Maximum (est)	Applied for Max Volumes
Quarry Sump	Dewatering – Groundwater	New	1,200 m ³ /d**	6,000 m ³ /d
	Dewatering – Storm water*	New	30 m ³ /d	15,500 m ³ /d
On-Site Supply Well	Manufacturing	New	218 m ³ /d	218 m ³ /d
Source Pond / Quarry Water Management Pond	Manufacturing	Unchanged	Same	4,473 m ³ /d
Holding Pond	Manufacturing	Unchanged	Same	273 m ³ /d
Speed River	Manufacturing	Unchanged	Same	1,309 m ³ /d

*Maximum to allow for major rain events ** Based on assumptions about first year production

How can we learn more?

We invite you to learn more at our Public Information Meeting on July 24th, 2019 at the Victoria Road Recreation Complex (151 Victoria Rd N, Guelph, ON N1E 5H4). The open house will run from 6:00pm to 8:00pm.

You can also visit our website www.lafargewellington.ca for technical reports and project updates.



Dufferin Aggregates
2300 Steeles Ave W, 4th Floor
Concord, ON L4K 5X6
Canada

June 12, 2019

RECEIVED

JUN 13 2019

Township of Puslinch

Seana Richardson
Aggregates Technical Specialist
Ministry of Natural Resources and Forestry
Guelph District
1 Stone Road West
Guelph, Ontario
N1G 4Y2

Attention: Ms. Richardson

**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 May 2019.

Exceedances of the threshold value occurred at the OW5-84 to DP5CR pair on May 2 and 15. As discussed in the 2018 Coordinated Monitoring Report, the exceedances are attributed to the observed hydrogeological variability at this location. The existing OW5-84 to DP5C early warning and threshold values do not appear to be representative of the actual conditions at replacement drive point DP5CR. It is noted that on May 22 and 30, the elevations at the OW5-84 to DP5CR pair satisfied the threshold values.

If you have any questions, please do not hesitate to call.

Sincerely,

A handwritten signature in blue ink, appearing to read "Ron Van Ooteghem".

Ron Van Ooteghem
Site Manager
C.c.

Karen Landry (Township of Puslinch)
Sonja Strynatka (GRCA)
Maria Topalovic (Dufferin Aggregates)
University of Guelph

Monthly Reporting
Mill Creek Aggregates Pit
May 2019

Date	DP21 (mASL)	Threshold Value (mASL)	Exceedance
2-May-19	306.08	305.60	NO
15-May-19	306.11	305.60	NO
22-May-19	305.98	305.60	NO
30-May-19	306.03	305.60	NO

Date	BH13 (mASL)	DP21 (mASL)	Head Difference (m)	Threshold Value (m)	Exceedance
2-May-19	306.45	306.08	0.37	0.11	NO
15-May-19	306.50	306.11	0.39	0.11	NO
22-May-19	306.39	305.98	0.41	0.11	NO
30-May-19	306.50	306.03	0.47	0.11	NO

Date	DP17 (mASL)	Threshold Value (mASL)	Exceedance
2-May-19	305.44	305.17	NO
15-May-19	305.37	305.17	NO
22-May-19	305.35	305.17	NO
30-May-19	305.42	305.17	NO

Date	BH92-12 (mASL)	DP17 (mASL)	Head Difference (m)	Threshold Value (m)	Exceedance
2-May-19	305.74	305.44	0.30	0.14	NO
15-May-19	305.71	305.37	0.34	0.14	NO
22-May-19	305.63	305.35	0.28	0.14	NO
30-May-19	305.70	305.42	0.28	0.14	NO

Date	DP3 (mASL)	Threshold Value (mASL)	Exceedance
2-May-19	305.17	304.54	NO
15-May-19	305.13	304.54	NO
22-May-19	305.25	304.54	NO
30-May-19	305.04	304.54	NO

Date	DP6 (mASL)	DP3 (mASL)	Head Difference (m)	Threshold Value (m)	Exceedance
2-May-19	306.15	305.17	0.98	0.73	NO
15-May-19	306.15	305.13	1.02	0.73	NO
22-May-19	306.06	305.25	0.81	0.73	NO
30-May-19	306.14	305.04	1.10	0.73	NO

Date	DP2 (mASL)	Threshold Value (mASL)	Exceedance
2-May-19	304.32	303.69	NO
15-May-19	304.29	303.69	NO
22-May-19	304.23	303.69	NO
30-May-19	304.28	303.69	NO

Date	BH92-27 (mASL)	DP2 (mASL)	Head Difference (m)	Threshold Value (m)	Exceedance
2-May-19	304.95	304.32	0.63	0.34	NO
15-May-19	304.87	304.29	0.58	0.34	NO
22-May-19	304.81	304.23	0.58	0.34	NO
30-May-19	304.90	304.28	0.62	0.34	NO

Date	DP1 (mASL)	Threshold Value (mASL)	Exceedance
2-May-19	304.42	303.97	NO
15-May-19	304.37	303.97	NO
22-May-19	304.18	303.97	NO
30-May-19	304.37	303.97	NO

Date	BH92-29 (mASL)	DP1 (mASL)	Head Difference (m)	Threshold Value (m)	Exceedance
2-May-19	304.97	304.42	0.55	0.17	NO
15-May-19	304.99	304.37	0.62	0.17	NO
22-May-19	304.96	304.18	0.78	0.17	NO
30-May-19	305.02	304.37	0.65	0.17	NO

Date	DP5CR (mASL)	Threshold Value (mASL)	Exceedance
2-May-19	303.46	302.86	NO
15-May-19	303.49	302.86	NO
22-May-19	303.38	302.86	NO
30-May-19	303.42	302.86	NO

Date	OW5-84 (mASL)	DP5CR (mASL)	Head Difference (m)	Threshold Value (m)	Exceedance
2-May-19	303.75	303.46	0.29	0.30	YES
15-May-19	303.77	303.49	0.28	0.30	YES
22-May-19	303.69	303.38	0.31	0.30	NO
30-May-19	303.74	303.42	0.32	0.30	NO

Note: Exceedances of the threshold value occurred at the OW5-84 to DP5CR pair on May 2 and 15. The exceedances are attributed to the observed hydrogeological variability at this location. The existing OW5-84 to DP5C early warning and threshold values do not appear to be representative of the actual conditions at replacement drive point DP5CR. It is noted that on May 22 and 30, the elevations at the OW5-84 to DP5CR pair satisfied the threshold values.

Monthly Reporting
 Mill Creek Aggregates Pit
 May 2019

				Max. Allowable as per PTTW- Main Pond			Max. Allowable as per PTTW- Silt Pond					
		Kitchener/Waterloo (November Actual)		(Imperial Gallons)		(Litres)	(Imperial Gallons)		(Litres)			
Total Monthly Precipitation (mm):		79.4		2,500	per minute	11,365	2,597	per minute	11,806			
Total Monthly Normal Precipitation (mm):		82.3	Waterloo-Wellington A (30-year Normal)	1,800,000	per day	8,183,000	3,739,477	per day	17,000,000			
Date	Below Water Table Extraction Phase 2	Below Water Table Extraction Phase 1	Water Pumped from Main Pond (gals)	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-May-19	0	6,250	1,690,464	2,128,916	306.64	N	306.23	N	305.01	N	306.26	N
2-May-19	0	5,500	1,698,163	1,423,718	306.64	N	306.24	N	305.03	N	306.31	N
3-May-19	0	0	1,696,403	1,143,840	306.66	N	306.26	N	305.05	N	306.31	N
4-May-19	0	0	-	-	-	-	-	-	-	-	-	-
5-May-19	0	0	-	-	-	-	-	-	-	-	-	-
6-May-19	0	4,000	1,690,904	2,147,780	306.66	N	306.27	N	305.05	N	306.38	N
7-May-19	0	0	1,712,901	1,782,191	306.68	N	306.28	N	305.05	N	306.37	N
8-May-19	0	0	1,699,482	2,504,130	306.68	N	306.30	N	305.05	N	306.36	N
9-May-19	0	0	1,687,824	2,022,617	306.68	N	306.27	N	305.03	N	306.32	N
10-May-19	0	0	1,290,560	-	306.74	N	306.31	N	305.06	N	306.34	N
11-May-19	0	0	-	-	-	-	-	-	-	-	-	-
12-May-19	0	0	-	-	-	-	-	-	-	-	-	-
13-May-19	0	0	1,730,498	1,758,874	306.74	N	306.32	N	305.08	N	306.41	N
14-May-19	0	5,250	1,684,525	1,779,551	306.75	N	306.32	N	305.08	N	306.41	N
15-May-19	0	5,750	1,692,223	2,524,367	306.73	N	306.34	N	305.06	N	306.42	N
16-May-19	0	5,000	1,690,684	1,869,739	306.75	N	306.33	N	305.06	N	306.41	N
17-May-19	0	1,000	1,652,189	-	306.78	N	306.33	N	305.09	N	306.40	N
18-May-19	0	0	-	-	-	-	-	-	-	-	-	-
19-May-19	0	0	-	-	-	-	-	-	-	-	-	-
20-May-19	0	0	-	-	-	-	-	-	-	-	-	-
21-May-19	0	5,750	1,713,780	2,396,697	306.77	N	306.35	N	305.06	N	306.41	N
22-May-19	0	5,750	1,695,083	2,302,198	306.78	N	306.34	N	305.06	N	306.37	N
23-May-19	0	5,750	1,646,470	2,501,710	306.78	N	306.36	N	305.05	N	306.37	N
24-May-19	0	5,750	1,697,723	1,973,784	306.78	N	306.36	N	305.05	N	306.34	N
25-May-19	0	0	-	-	-	-	-	-	-	-	-	-
26-May-19	0	0	-	-	-	-	-	-	-	-	-	-
27-May-19	0	5,500	1,698,823	2,501,050	306.83	N	306.41	N	305.10	N	306.43	N
28-May-19	0	4,750	1,622,053	1,967,845	306.87	N	306.40	N	305.10	N	306.41	N
29-May-19	0	5,750	1,700,802	2,561,762	306.85	N	306.41	N	305.10	N	306.40	N
30-May-19	0	5,500	1,339,833	1,610,175	306.86	N	306.42	N	305.10	N	306.39	N
31-May-19	0	4,750	1,690,244	1,819,146	306.87	N	306.42	N	305.10	N	306.38	N
Total	-	82,000	36,421,628	40,720,090	-	-	-	-	-	-	-	-

Note: No exceedances to report.

**The Corporation of the Township of Prince
COUNCIL RESOLUTION**

Resolution 2019-	
Moved by: Councillor	Seconded by: Councillor
Signature <i>M. Matthews</i>	Signature <i>E. Palumbo</i>

Date: July 9, 2019

AGENDA ITEM

Resolution 2019- 188

Moved by: Councillor M. Matthews

Seconded by: Councillor E. Palumbo

Whereas the Ontario Good Roads Association, at their annual Conference in 2019 passed a Resolution supporting the re-establishment of a joint OGRA / ROMA Conference

Whereas several municipalities have passed Resolutions also in support of the OGRA Resolution

Whereas the establishment of a stand alone ROMA Conference has been extremely successful providing unique opportunities for municipal politicians and staff to benefit from a progressive agenda on a host of municipal issues

Whereas ROMA continues to advance municipal priorities through its advocacy work and close affiliation and collaboration with other Municipal Associations such as AMO and OGRA

Whereas a dedicated annual ROMA Conference is in the best interest of all municipalities in Ontario

Therefore Be It Resolved that the Township of Prince continues to support ROMA in its efforts for a dedicated annual conference that continues to bring benefits to all municipalities through a progressive, diversified and interesting agenda.

Further that this Resolution be circulated to OGRA, AMO, NOMA, FONOM and other municipalities in the Province of Ontario

RESOLUTION RESULT			
<input checked="" type="checkbox"/> CARRIED	Mayor & Council	YES	NO
<input type="checkbox"/> DEFEATED	Ken Lamming		
<input type="checkbox"/> DEFERRED	David Amadio		
<input type="checkbox"/> REFERRED	Ian Chambers		
<input type="checkbox"/> PECUNIARY INTEREST DECLARED	Michael Matthews		
<input type="checkbox"/> RECORDED VOTE (SEE RIGHT)	Enzo Palumbo		
<input type="checkbox"/> WITHDRAWN			
MAYOR - Ken Lamming			
<i>(Signature)</i>			

The above is a certified to be true copy of resolution number 2018 -

Peggy Greco
CAO/CLERK-TREASURER

From: [AMO Communications](#)
To: [Nina Lecic](#)
Subject: Cannabis Policy Update
Date: Wednesday, July 3, 2019 5:21:44 PM

AMO Policy Update not displaying correctly? [View the online version](#) | [Send to a friend](#)
Add Communicate@amo.on.ca to your safe list

AMO Policy Update



July 3, 2019

Cannabis Policy Update

The Ontario Government has [announced](#) a second [Alcohol and Gaming Commission of Ontario](#) (AGCO) lottery to operate additional cannabis stores in the province. Private retailers will add up to 50 stores, with 42 chosen by lottery and 8 reserved for First Nations. As in the first lottery, rules set a maximum number of stores per region.

Prospective retailers must meet prequalification criteria including access to appropriate retail space and capital to apply. The lottery will take place on August 20, 2019 with results announced within 24 hours. All municipalities that DID NOT opt out of cannabis retail are eligible, regardless of population.

Related to retail sales authorization is the Ontario Cannabis Legalization Implementation Fund (OCLIF) for municipal governments. Additional stores across Ontario and edible cannabis products, anticipated by December 2019, may alter community impacts related to legal cannabis.

The province modified the original OCLIF funding formula to give greater financial recognition to jurisdictions that host cannabis retail locations. However, all communities have had to prepare for legal recreational cannabis as illegal market access has continued and some, such as regional governments, provide services, such as policing, whose cannabis-related costs have increased even though they could not make decisions regarding retail sales. On members' behalf, AMO is continuing to discuss the status of OCLIF, the funding formula and access to the \$10 million OCLIF holdback with the province.

AMO wants to partner with the province in laying the foundation for any future federal-provincial-municipal cannabis excise tax revenue agreement past the two-year term of the current agreement, from which OCLIF funding flows, which is due for review this December.

For more cannabis retail information, contact the [AGCO](#). For information on OCLIF, see the Ministry of Finance [OCLIF web page](#). For background on cannabis policy and the evolution of Ontario rules and the OCLIF program, see

[AMO's Cannabis Resources](#) web page.

AMO Contact: Craig Reid, Senior Advisor, creid@amo.on.ca, 416-971-9856 ext. 334.

*Disclaimer: The Association of Municipalities of Ontario (AMO) is unable to provide any warranty regarding the accuracy or completeness of third-party submissions. Distribution of these items does not imply an endorsement of the views, information or services mentioned.



Please consider the environment
before printing this.

Association of Municipalities of Ontario
200 University Ave. Suite 801, Toronto ON Canada M5H 3C6
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June 2019

MAYOR JAMES SEELEY
PUSLINCH TWP
7404 WELLINGTON RD 34
PUSLINCH ON N0B 2J0

RECEIVED
JUN 17 2019
Township of Puslinch

Dear Mr. Seeley,

ConnexOntario is an organization that is funded by the Ontario Ministry of Health and Long-Term Care. Our purpose is to serve as an access point for addictions, mental health, and problem gambling services/supports for the people of Ontario. The services provided by ConnexOntario are free and confidential and our staff are available to live-answer calls and respond to emails and webchats 24/7/365. We handle 12,000 to 15,000 contacts per month from people seeking services.

Our service began in 1991 in London, Ontario as the Drug and Alcohol Registry of Treatment (DART). Our role at that time was to compile and maintain a directory of all of the government-funded programs in the province that were available to people experiencing issues with substance use. Once this inventory was created it became a powerful decision support and issues management tool for the Out-of-Province branch of the Ontario Health Insurance Program (OHIP). Two years after the DART program was created, an evaluation was done that showed it had saved nearly \$40 million in out-of-province payments for Ontario residents.

The ConnexOntario database currently tracks detailed information on thousands of programs and services that are available to help people experiencing issues with substance use, problem gambling, and/or mental health. We also track hundreds of on-campus programs that are available to post-secondary school students across the province. Additionally, ConnexOntario has partnership agreements in place with most of the railway companies in Ontario as part of an initiative to prevent tragedies from occurring on the rail lines.

Enclosed with this letter are wallet cards detailing contact information for ConnexOntario – including our toll-free number and website address. We encourage you to provide this information to any of your constituents who may need to access addiction, mental health, or problem gambling services for themselves or for a loved one. An order form is enclosed should you wish to obtain, free-of-charge, an additional supply of these wallet cards or other resource materials.

Please contact Brad Davey at 519-439-0174 or bdavey@connexontario.ca if you would like to learn more about our organization and services.

Best regards,


Brad Davey
Executive Director

Resource Materials Order Form

This information must be legible. Please print or type and complete all sections.

Contact Name: _____

Agency/Business Name: _____

Suite/Unit: _____ Street Address: _____

City: _____ Prov: _____ Postal Code: _____

Telephone: _____ Fax: _____

Access to Addiction, Mental Health and Problem Gambling Services

1.866.531.2600

www.ConnexOntario.ca

ConnexOntario Resources: 3 Helplines under one number

Wallet-sized Card (3"x2") Bilingual	1	10	25	50	100	1000	
Poster (8.5"x11") English	1	10				Other:	
Poster (8.5"x11") French	1	10				Other:	

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ConnexOntario operates/opère:

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Ligne d'aide sur la drogue et l'alcool
www.DrugAndAlcoholHelpline.ca

Ontario Problem Gambling Helpline
Ligne ontarienne d'aide sur le jeu
problématique
www.ProblemGamblingHelpline.ca

Mental Health Helpline
Ligne d'aide sur la santé mentale
www.MentalHealthHelpline.ca

1-866-531-2600

From: [Mary Hasan](#)
To: [Andrew Grunda](#)
Cc: [Nina Lecic](#)
Subject: FW: Bill 108: Current Regulatory Postings
Date: Wednesday, July 3, 2019 12:32:07 PM

From: Flaherty, Megan (MMAH) <Megan.Flaherty@ontario.ca>
Sent: Wednesday, June 26, 2019 9:10 AM
Subject: Bill 108: Current Regulatory Postings

Good morning,

As you know, *Bill 108: More Homes, More Choices Act, 2019* received Royal Assent June 6, 2019. Pursuant to the passage of the Bill, the Province will be posting a number of regulations for public comment. Currently, there are three new proposed regulations posted for public comment on the Environmental Registry of Ontario (ERO), as follows:

- [**Proposed new regulation and regulation changes under the Planning Act, including transition matters, related to Schedule 12 of Bill 108 - the More Homes, More Choice Act, 2019**](#)

Consideration of a new regulation and regulatory changes, including transitional matters, under the Planning Act which are needed as a result of Schedule 12 to Bill 108 - the More Homes, More Choice Act, 2019.

Closes for comment: **August 6, 2019**

French version: <https://ero.ontario.ca/fr/notice/019-0181>

- [**Proposed new regulation pertaining to the community benefits authority under the Planning Act**](#)

A proposal to make a new regulation under the Planning Act to prescribe matters related to the community benefits authority and make a consequential amendment to an existing regulation under the Act.

Closes for comment: **August 21, 2019**

French version: <https://ero.ontario.ca/fr/notice/019-0183>

- [**Proposed changes to O. Reg. 82/98 under the Development Charges Act related to Schedule 3 of Bill 108 - More Homes, More Choice Act, 2019**](#)

A proposal to make changes to O. Reg. 82/98, under the Development Charges Act, 1997 related to Schedule 3 of the More Homes, More Choice Act, 2019.

Closes for comment: **August 21, 2019**

French version: <https://ero.ontario.ca/fr/notice/019-0184>

Please take time to review these new proposed regulations. We encourage you to provide comments on behalf of your Municipality to help inform the content of these regulations. If you have any questions, please contact myself or your Municipal Services Office Planner directly. Planners by Region/County are as follows:

- The Region of Waterloo: Erick Boyd, Erick.Boyd@Ontario.ca, 519-873-4025
- Oxford County: Anneleis Eckert, Anneleis.Eckert@Ontario.ca, 519-873-4768
- Wellington County: Tyler Shantz, Tyler.Shantz@Ontario.ca, 519-873-4695

Kind Regards,

Megan Flaherty

Ministry of Municipal Affairs and Housing

Municipal Services Office – Western Ontario

659 Exeter Road, 2nd Floor

London ON N6E 1L3

Tel: 519 873 4037

Toll Free: 1 800 265 4736

E-mail: Megan.Flaherty@Ontario.ca

**Grand River Conservation Authority
Members Attendance
January 1 - December 31, 2019**

First Name	Last Name	January 25	February 22	March 22	April 26	May 24	June 28	July 26	August 23	September 27	October 25	November 22	December 13	Total Attendance
Marcus	Adili			X	x	x	x							
Les	Armstrong	X	X	A	x	A	x							4
Bruce	Banbury	X	X	X	x	x	x							6
Robert	Bell	A	X	X	x	x	x							5
Don	Brunk	X	X	X	x	x	x							6
Richard	Carpenter			X	x	x	x							
John	Challinor II				x	x	x							
Brian	Coleman	X	X	X	x	x	A							5
Bernie	Corbett	X	X	X	x	A	x							5
James A.	Erb	X	X	X	x	x	x							6
Susan	Foxtan	X	X	A	x	x	x							5
Guy	Gardhouse	X	X	X	x	x	x							6
Joan	Gatward	X	X	X	x	A	x							5
Rodrigo	Goller	X	X	X	x	x	x							6
Michael	Harris	X	X	X	x	x	A							5
Helen	Jowett	X	A	X	x	x	x							5
Daniel	Lawrence	X	X	X	x	A	A							4
Geoff	Lorentz	A	X	X	x	x	x							5
Cindy	Lunau	X	X	No longer a member									2	
Ian	MacRae	X	X	X	x	x	x							6
Kathryn	McGarry	A	X	A	x	A	A							2
Jane	Mitchell	X	X	X	x	x	x							6
David	Neumann	X	X	No longer a member									2	
Joe	Nowak	X	X	X	x	x	x							6
Vic	Prendergast	X	X	X	x	x	x							6
Warren	Stauch	A	X	X	x	x	x							5
George	Stojanovic	X	X	No longer a member									2	
Bruce	Whale	X	X	A	x	x	x							5
Chris	White	X	X	X	x	x	x							6
Total		22	25	21	26	21	22	0	0	0	0	0	0	

x = Present A = Absent

Audit Committee February 13, 2019			Audit Committee November 22, 2019		
Helen	Jowett	X (T)			
Jane	Mitchell	X (T)			
Guy	Gardhouse	X (T)			
David	Neumann	X (T)			
Vic	Prendergast	X			
Brian	Coleman	X			
Chris	White	X			
Special Recognition March 22, 2019					
Helen	Jowett	X	* MEMBERS MARKED X (T) ATTENDED BY TELECONFERENCE AND WILL NOT BE PAID MILEAGE		
Jane	Mitchell	X			
Sue	Foxtan	A			
Warren	Stauch	X	CAO Hiring Committee May 17, 2019		
Vic	Prendergast	X			
Chris	White	X			
Composition Review Committee June 28, 2019			Helen	Jowett	x
			Chris	White	x
			Brian	Coleman	x
Helen	Jowett	x			
Jane	Mitchell	x			
Chris	White	x			
Vic	Prendergast	x			
Marcus	Adili	x			
Sue	Foxtan	x			
Geoff	Lorentz	x			

BULLETIN

THE GTA WEST STUDY HAS RESUMED

In June 2019 the Minister of Transportation resumed the Greater Toronto Area (GTA) West Transportation Corridor Route Planning and Environmental Assessment Study [<https://news.ontario.ca/mto/en/2019/06/ontario-resumes-environmental-assessment-for-greater-toronto-area-west-highway-corridor.html>].

The GTA West Study is focusing on the planning and preliminary design of a new multimodal transportation corridor that includes a 400-series highway, transitway, and potential goods movement priority features.

The Greater Golden Horseshoe (GGH) is an economic driver for the province and addressing transportation needs in the GGH is essential to the competitiveness of our economy. The need for the GTA West Study remains and is strengthened by the GGH growth forecasts, reflecting more people and jobs by 2041.

Protecting a multimodal transportation corridor supports growing communities –it is good practice to do long-range planning for areas under development pressure.



DEC 2015

GTA West Study suspended. The Project Team had identified a Technically Preferred Route but had not yet presented the route to the public.

JUNE 2019

GTA West Study resumed. The Study is a priority to ensure that community planning can move ahead with certainty. The Project team is working to update the evaluation of the short list of routes.

FALL 2019

Present a Technically Preferred Route at Public Information Centre #2 (PIC 2).

FOLLOWING PIC 2

Information will not be released before PIC 2. Responses to questions or comments will be limited until the Project Team has had time to remobilize and update the materials.

The Preferred Route will be confirmed based on feedback and other relevant data. The Project Team will work with Advisory Groups as well as other stakeholders to arrive at a solution that balances, to the extent possible, the benefits and impacts for the local communities and the users of the transportation system.

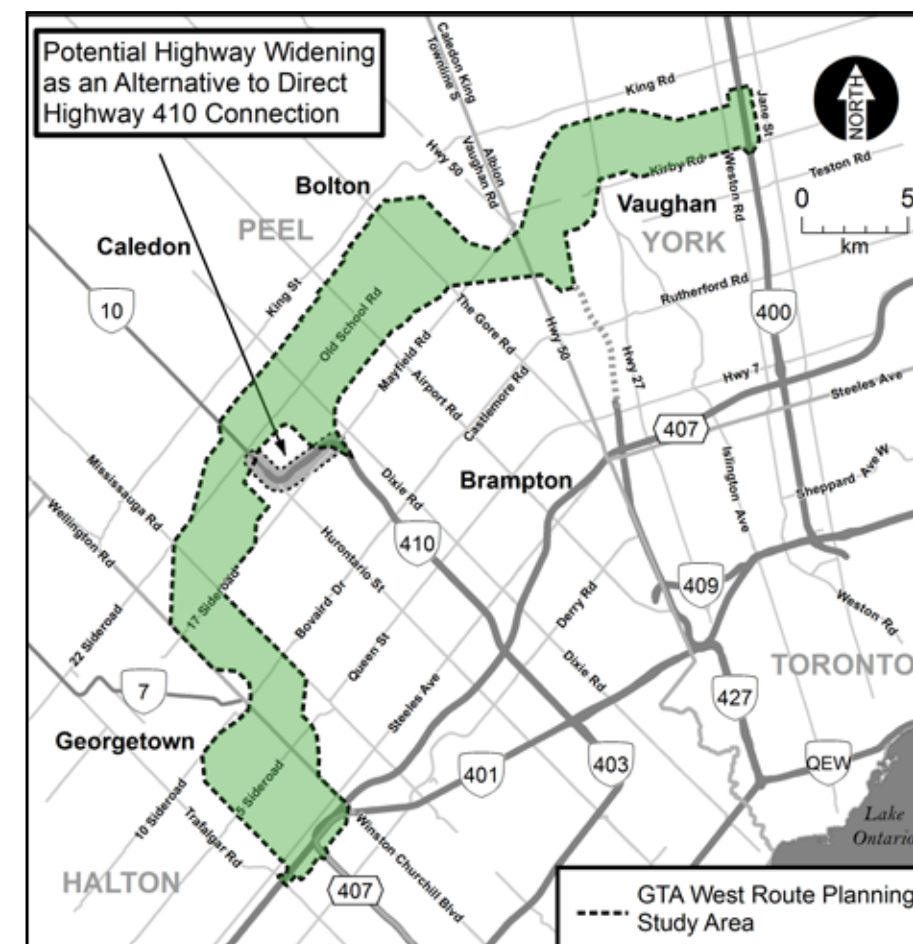
Advisory Groups (Community, Greenbelt Transportation, Municipal, Regulatory Agency) will be reconvened.

NORTHWEST GTA CORRIDOR IDENTIFICATION STUDY

With the resumption of the GTA West Study, the Ontario Ministry of Transportation and Independent Electricity System Operator (IESO) are no longer proceeding with the Northwest GTA Corridor Identification Study. In addition, the Ministry of Energy, Northern Development and Mines and IESO have initiated a new study to identify an adjacent electricity transmission corridor to support growing demand for electricity in the western GTA. For more information on the Northwest GTA Transmission Corridor Identification Study, please visit: <http://www.ieso.ca/Get-Involved/Regional-Planning/GTA-and-Central-Ontario/Northwest-GTA>.

FOCUSED ANALYSIS AREA

The 2015 Focused Analysis Area (2015 FAA) that was in place at the time of suspension of the GTA West Study is back in effect. The 2015 FAA defines which properties continue to be within an area of interest as the study progresses. You can view the 2015 FAA at www.gta-west.com. A reduced FAA will be presented at PIC 2 in Fall 2019.



WEBSITE



www.gta-west.com

EMAIL



project_team@gta-west.com

TOLL-FREE



1-877-522-6916

TWITTER



@GTAWestStudy

Des renseignements sont disponibles en français en composant (289) 835-2484 (Yannick Garnier).





OAKVILLE

July 2, 2019

The Honourable Caroline Mulroney
Minister of Transportation and
Minister of Francophone Affairs
Ministry of Transportation
Queen's Park/Minister's Office
5th Floor, 777 Bay Street
Toronto ON M7A 1Z8

minister.mto@ontario.ca

The Honourable Doug Downey
Attorney General
Ministry of the Attorney General
McMurtry-Scott Building
720 Bay Street, 11th Floor
Toronto ON M7A 2S9

attorneygeneral@ontario.ca

Her Honour the Honourable Elizabeth Dowdeswell
Lieutenant Governor of Ontario
Queen's Park
Toronto ON M7A 1A1

Subject: Traffic Calming and Speed Limit Review

At its meeting on June 24, 2019, Oakville Town Council approved the following recommendation of the Community Services Committee resulting from its meeting held on June 17, 2019, regarding the subject item noted above:

1. That the Report entitled "Traffic Calming and Speed Limit Review" from the Engineering and Construction Department dated May 27, 2019 be received.
2. That staff be directed to provide a report to the 2020 Budget Committee on the implementation of Automated Speed Enforcement (photo radar), including an analysis of the capacity to process the resulting *Provincial Offences Act* caseload, and estimated budget implications.
3. That staff be directed to provide a report to the 2020 Budget Committee with the proposed criteria, inventory and the costs associated with additional 40 km/h zones at limited high pedestrian generator areas (e.g. Business Improvement Areas (BIAs) and major active parks on local and minor collector roads).

Subject: Traffic Calming and Speed Limit Review

4. That, where not already established, staff be directed to implement Community Safety Zones at every all-day 40 km/h zone fronting an elementary school on a major road.
5. That the Updated Toolbox of Traffic Calming Measures, as detailed in the staff report from the Engineering and Construction Department dated May 27, 2019, be endorsed.
6.
 - a) That staff be directed to implement the revisions to the town's current Traffic Calming Process, as detailed in the staff report from the Engineering and Construction Department dated May 27, 2019.
 - b) That staff report on the requirements and implications to achieve a project approval process of six months or less from the time of a finding of warrant being met.
7. That staff be directed to provide a report to the 2020 Budget Committee with a multi-year Major Road Elementary School Zone Traffic Calming Program, including short-term installation of fixed Radar Speed Display Signs (RSDS) at elementary schools on major collector and minor arterial roads.
8. That staff report to a future Community Services Committee meeting on the advisability of encouraging use of the Local Improvements tool for traffic calming where the warrants are not met but residents still desire traffic calming.
9. That staff consult with the West River Residents Association to develop and test a pilot project of 40 km/h speed limits on a neighbourhood basis.
10. That the following resolution be passed:

WHEREAS on May 30, 2017, the Legislative Assembly of Ontario passed Bill 65 – *Safer School Zones Act*, authorizing municipalities to operate automated speed enforcement in community safety zones and school zones on roads under their jurisdiction;

WHEREAS municipalities would be responsible for the implementation and operational costs of automated speed enforcement on roads under their jurisdiction;

WHEREAS the bylaws designating community safety zones and school zones or implementing the automated speed enforcement would be enacted under the *Highway Traffic Act* (HTA) and would create HTA offences;

WHEREAS HTA offences are administered through the *Provincial Offences Act* (POA) courts and any HTA fine revenue collected through the POA courts would be retained by the POA court program not the local municipality;

WHEREAS the *Municipal Act, 2001* authorizes municipalities to implement an administrative monetary penalty system for parking, licensing and other bylaws enacted under that Act, and Bill 68 *Modernizing Ontario's Municipal Legislation Act, 2016* proposes to include authority for administrative monetary penalties to enforce the HTA;

WHEREAS s. 21.1 of the HTA would allow for a regulation to prescribe persons authorized to enforce prescribed offences through administrative monetary penalties rather than the POA courts;

WHEREAS penalties for offences arising out of enforcement through technology such as automated speed enforcement can be administered effectively and efficiently through an administrative monetary penalty system;

WHEREAS there is extremely limited capacity in the POA courts to prosecute the potential volume of cases arising from automated speed enforcement, and the Town of Oakville only has one half day per month of regularly scheduled POA court time to prosecute all matters; and

WHEREAS, despite a variety of traffic calming approaches utilized within the community, speeding and the enforcement of speeding laws remain a significant concern in Oakville;

BE IT RESOLVED THAT Council requests the Minister of Transportation to continue working with municipalities and the Ontario Traffic Council on the swift adoption of the regulation(s) necessary to implement automated speed enforcement, including the use of administrative monetary penalties by municipalities;

AND BE IT RESOLVED THAT Council requests the Minister of Transportation in conjunction with the Lieutenant Governor in Council to make a regulation pursuant to s. 21.1 of the HTA, that would allow for offences created by automated speed enforcement to be administered through the administrative monetary penalties by municipalities and for the Attorney General to support the necessary changes to allow technology-based enforcement to be administered through administrative monetary penalties by municipalities and that this resolution be forwarded to all Ontario municipalities.

Page 4

July 2, 2019

Subject: Traffic Calming and Speed Limit Review

The staff report may be viewed on the town website at the following link (see Item 9):
[Community Services Committee Agenda](#).

Should you have any questions regarding this matter or require additional information, please contact Jill Stephen, Director of Engineering and Construction, at 905-845-6601, extension 3308 or email jill.stephen@oakville.ca.

Yours truly,

A handwritten signature in black ink, appearing to read 'V. Tytaneck', with a long horizontal line extending to the right.

Vicki Tytaneck
Town Clerk

c. Geoff Wilkinson, Executive Director, Ontario Traffic Council

email: Ontario Municipalities

Jill Stephen, Director of Engineering and Construction



OFFICE OF THE MAYOR
CITY OF HAMILTON

June 14, 2019

The Honourable Christine Elliott, Deputy Premier and
Minister of Health and Long-Term Care
Hepburn Block, 10th Floor
80 Grosvenor Street
Toronto, ON M7A 1E9

Dear Minister Elliot,

At its May 22, 2019 meeting, Hamilton City Council discussed the changes being proposed for public health in Ontario and their potential effects. Before I convey the recommendations that arose from that discussion, I would like to commend you and your colleagues for your announcement on June 3rd that any changes to the provincial funding of public health will not affect the current fiscal year.

Hamilton's City Council recommends that any restructuring or modernization of local Public Health take into account the following principles:

- That its unique mandate to keep people and our communities healthy, prevent disease and reduce health inequities be maintained;
- That its focus on the core functions of public health, including population health assessment and surveillance, promotion of health and wellness, disease prevention, health protection and emergency management and response be continued;
- That sufficient funding and human resources to fulfill its unique mandate are ensured.
- That the focus for public health services be maintained at the community level to best serve residents and lead strategic community partnerships with municipalities, school boards, health care organizations, community agencies and residents;
- That there be local public health senior and medical leadership to provide advice on public health issues to municipal councils and participate in strategic community partnerships. The importance of this has been highlighted by the recent cluster of HIV among those using intravenous drugs in Hamilton;

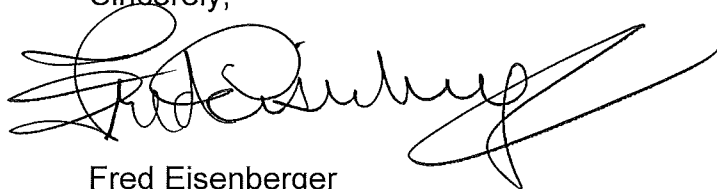
.../2

- That local public health services be responsive and tailored to the health needs and priorities of each local community, including those of vulnerable groups or those with specific needs such as the indigenous community;
- That representation of municipalities on any board of health be proportionate to both their population and to the size of the financial contribution of that municipality to the Regional Public Health Entity;
- That any transition be carried out with attention to good change management, and while ensuring ongoing service delivery.

For decades Hamilton has enjoyed and benefited from the knowledge, skills and implementation of 'preventive maintenance' that our public health staff have provided which we know has resulted in our community avoiding many costly health 'breakdowns' that would have arisen otherwise! As we move forward we also look forward to working directly with you and collaborating with our provincial colleagues through the relevant partnerships, such as the Association of Municipalities of Ontario (AMO), the Association of Local Public Health Agencies (ALPHA).

In closing, we believe consultation directly with local public health agencies, such as ours, is critical to developing the best local public health system as we move forward.

Sincerely,

A handwritten signature in black ink, appearing to read "Fred Eisenberger", with a long, sweeping flourish extending to the right.

Fred Eisenberger
Mayor

CC: Dr. Elizabeth Richardson, Medical Officer of Health, City of Hamilton

Nina Lecic

From: Sarah Wilhelm <sarahw@wellington.ca>
Sent: Thursday, July 11, 2019 12:01 PM
To: Andrew Goldie; Nathan Hyde; Ian Roger; Manny Baron; c.harrow@mintofiredept.on.ca; Nina Lecic; Michael Givens
Cc: Aldo Salis
Subject: Proposed Planning Act Regulation Changes - Bill 108 (More Homes, More Choice Act, 2019)

Hi all,

This email is to advise of the following proposals for new regulation and regulation changes under the Planning Act related to Bill 108 (the More Homes, More Choice Act, 2019) which have been posted on the Environmental Registry of Ontario:

Posting 019-0181 – Transitional and Other Matters

<https://ero.ontario.ca/notice/019-0181>

Of particular note are the sections of this proposal which address the following:

- Transitional matters regarding the processing and decision-making on certain planning matters
- Requirements and standards for an additional residential unit

Posting 019-0183 – Authority for Municipalities to Charge for Community Benefits

<https://ero.ontario.ca/notice/019-0183>

This notice primarily relates to the new community benefits charge on the following topics:

- Transition
- Reporting on community benefits
- Reporting on parkland
- Exemptions from community benefits
- Community benefits formula
- Appraisals for community benefits
- Excluded services for community benefits

We will continue to monitor for the release of the regulations and provincial training and/or implementation documents as they become available.

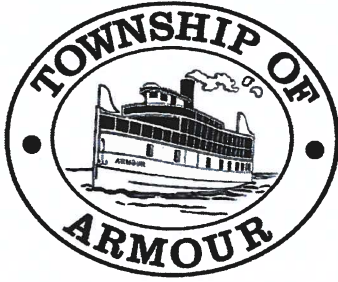
I trust that this information is of assistance.

Regards,

Sarah Wilhelm, BES, MCIP, RPP
Manager of Policy Planning
County of Wellington
74 Woolwich Street
Guelph, ON N1H 3T9
519.837.2600 x2130
sarahw@wellington.ca
www.wellington.ca

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DISTRICT OF PARRY SOUND

56 ONTARIO STREET
PO BOX 533
BURK'S FALLS, ON
P0A 1C0

(705) 382-3332

(705) 382-2954

Fax: (705) 382-2068

Email: info@armourtownship.ca

Website: www.armourtownship.ca

June 12, 2019

The Honourable Doug Ford
Premier of Ontario
Premier's Office, Legislative Building
Queen's Park
Toronto ON M7A 1A1

The Honourable Christine Elliott
Deputy Premier of Ontario
Legislative Building
Queen's Park
Toronto ON M7A 1A1

The Honourable Steve Clark
Minister of Municipal Affairs & Housing
College Park, 17th Floor
777 Bay Street
Toronto ON M5G 2E5

Re: Support Resolution

At its meeting held on June 11th, 2019, the Township of Armour passed Resolution #7 opposing Bill 115 and calls upon the Government of Ontario not to enact this legislation.

A copy of Council's Resolution #7 dated June 11th, 2019 is attached for your consideration.

Sincerely,

Louise Heintzman
Administrative Assistant

Enclosure

Cc: Honourable Norm Miller, MPP Parry Sound-Muskoka, Andrea Horwath, MPP, Leader of the New Democratic Party, AMO (Association of Municipalities of Ontario and all Ontario municipalities).



CORPORATION OF THE TOWNSHIP OF ARMOUR

RESOLUTION

Date: June 11, 2019

Motion # 7

WHEREAS the Province of Ontario is considering approving Bill 115, which would allow beer and wine sale in corner stores;

AND WHEREAS corner stores will not verify age and be as safe as the present system in place;

AND WHEREAS alcohol retail outlet density has a negative effect on public health and public health costs;

AND WHEREAS there is no clear evidence that Ontarians are asking for beer and wine at every corner;

NOW THEREFORE BE IT RESOLVED that the Council of the Township of Armour opposes Bill 115 and calls upon the Government of Ontario not to enact this legislation.

FURTHERMORE, that a copy of this resolution be sent to the Honourable Doug Ford, Premier of Ontario, the Honourable Steve Clark, Minister of Municipal Affairs and Housing, the Honourable Christine Elliott, Deputy Premier of Ontario, the Honourable Norm Miller, MPP Parry Sound - Muskoka and Andrea Horwath, MPP, Leader of the New Democratic Party.

AND FURTHERMORE, that a copy of this resolution be sent to the Association of Municipalities of Ontario (AMO) and all Ontario municipalities for their consideration.

Moved by:

Blakelock, Rod	<input type="checkbox"/>
Brandt, Jerry	<input type="checkbox"/>
MacPhail, Bob	<input type="checkbox"/>
Ward, Rod	<input checked="" type="checkbox"/>
Whitwell, Wendy	<input type="checkbox"/>

Seconded by:

Blakelock, Rod	<input checked="" type="checkbox"/>
Brandt, Jerry	<input type="checkbox"/>
MacPhail, Bob	<input type="checkbox"/>
Ward, Rod	<input type="checkbox"/>
Whitwell, Wendy	<input type="checkbox"/>

Carried / Defeated

Declaration of Pecuniary Interest by:

Recorded vote requested by:

Recorded Vote:

Blakelock, Rod
 Brandt, Jerry
 MacPhail, Bob
 Ward, Rod
 Whitwell, Wendy

For	Opposed
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>

Ministry of the Solicitor General

Office of the Fire Marshal and
Emergency Management

25 Morton Shulman Avenue
Toronto ON M3M 0B1
Tel: 647-329-1100
Fax: 647-329-1143

Ministère du Solliciteur général

Bureau du commissaire des incendies
et de la gestion des situations
d'urgence

25 Morton Shulman Avenue
Toronto ON M3M 0B1
Tél. : 647-329-1100
Télééc. : 647-329-1143



June 24, 2019

Your Worship James Seeley
Township of Puslinch
7404 Wellington Road 34
Puslinch, ON N0B2J0

Dear Mayor:

It is the responsibility of municipalities to ensure they are in compliance with the Emergency Management and Civil Protection Act (EMCPA).

The Office of the Fire Marshal and Emergency Management (OFMEM) has reviewed the documentation submitted by your Community Emergency Management Coordinator (CEMC) and has determined that your municipality was compliant with the EMCPA in 2018.

The safety of your citizens is important, and one way to ensure that safety is to ensure that your municipality is prepared in case of an emergency. You are to be congratulated on your municipality's efforts in achieving compliance in 2018.

I look forward to continuing to work with you to ensure your continued compliance in 2019.

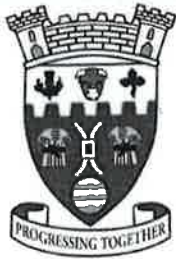
If you have any questions or concerns about the compliance monitoring process, please contact your Emergency Management Field Officer.

Sincerely,

A handwritten signature in black ink, appearing to read "Jon Pegg", with a long, sweeping underline.

Jon Pegg
Chief of Emergency Management

cc: Linda Dickson - CEMC
Drew Maddison - Field Officer - Bruce Sector



RECEIVED

JUN 07 2019

Township of Puslinch

Township of Puslinch Delegate Request

Meeting Date: *

July 17/2019 PM

Applicant Information

Last name *

McDIE

First name *

John

Mailing address *

[Redacted]

on behalf of neighbourhood group

Telephone number *

[Redacted]

Email address *

[Redacted]

[Redacted]

Purpose of delegation (state position taken on issue, if applicable): *

- expresses opposition to potential zoning change

[Redacted]

I am submitting a formal presentation to accompany my delegation: *

Yes

No

will accompany

I will require the use of audio-visual equipment (power point presentation): *

Yes

No

Note: delegations are permitted to speak for 10 minutes. Your form or letter must be received 24 hours before the preparation of the Council agenda. This usually means at least one week prior to the Council meeting.

Freedom of Information Disclaimer

Personal information collected on this form is collected under the authority of the Municipal Act and will be used only for the purpose of sending correspondence relating to matters before Council and for creating a record that is available to the general public in a hard copy format and on the internet in an electronic format in accordance with the Municipal Freedom of Information and Protection of Privacy Act. Questions regarding the collection of this information may be directed to the Township Clerk's office.

The Township of Puslinch is committed to providing accessible formats and communication supports for people with a disability. If another format would work better for you, please contact the Township Clerk's office for assistance.

GLENN JAMES - INTRODUCTION

- Resident of Puslinch for 30 years.
- Recently retired IT business founder and manager.
- 36 years in the field of Information technology, including
 - enterprise hardware computing
 - enterprise client/server software solutions
 - custom enterprise software development services
 - enterprise Software-as-a-Service solutions.
- Experience with large, complex Ontario Vendor of Record IT RFPs.
- Familiar with the history of SWIFT and the Eastern Ontario Regional Network (EORN).
- Passionate about the need for High Speed Internet for residents and businesses, regardless of where they are.

COMMUNITY HIGH-SPEED INTERNET COMMITTEE

Purpose:

- ***To help accelerate the deployment of a High-speed Internet*** infrastructure to the residents and businesses of Puslinch.
- ***Provide a voice to the Puslinch community regarding their need for High-speed internet.***
 - Provide a representative to the planned future Wellington County Steering Committee.
 - Advocate directly or indirectly to SWIFT regarding aspects of their RFPs that, through careful design, would help encourage Telecommunications Service Providers to serve rural residents and businesses.
 - Advocate directly to prospective SWIFT RFP respondents and to non-Swift RFP respondents.
 - To work inside, but also *outside* of the SWIFT construct for the deployment of High-speed Internet in Puslinch.

COMMUNITY HIGH-SPEED INTERNET COMMITTEE (CONTINUED)

Proposed Committee Make-up:

- 5 members, including a member or an observer from Puslinch Council

Committee Workplan:

- To be developed at the inception of the committee, in the next few weeks.

Proposed Meetings and Communications (to be part of Workplan):

- Professional, formal meetings with meeting minutes. Bi-weekly meetings, following Roberts Rules of Order.
- Regular updates to the residents of Puslinch and to Puslinch Council.
- 2-way Communication with Puslinch residents and businesses through social media, news articles and possible public information meeting.

COMMUNITY HIGH-SPEED INTERNET COMMITTEE (CONTINUED)

Committee members' ideal experience/qualifications:

- Telecommunications business and technical experience.
- Able to devote at least several hours a month to the committee's work.
- Experience in professional communications / public relations.
- Experience in advocacy.

Members to be chosen through their expressions of interest in response to:

- Notice on local websites
- A posting on the Friends of Puslinch Facebook page.
- Word of Mouth

COMMUNITY HIGH-SPEED INTERNET COMMITTEE (CONTINUED)

I am pleased to lead the formation of this Puslinch Community Committee and I would be pleased to represent Puslinch on the planned Wellington County High-speed internet steering committee.

Thank you!

Questions?



COUNTY OF WELLINGTON

COMMITTEE REPORT

To: Chair and Members of the Planning Committee
From: Sarah Wilhelm, Manager of Policy Planning
Date: Thursday, June 13, 2019
Subject: **A Place to Grow: Growth Plan for the Greater Golden Horseshoe 2019**

1.0 Background

Staff reported to the Committee in February 2019 about proposed “Amendment 1 to the Growth Plan, 2017”. On May 2, 2019, the Province released a new Growth Plan (the *Growth Plan for the Greater Golden Horseshoe 2019*) which incorporates Amendment 1 with minor changes. The new Plan came into effect May 16, 2019 and replaces the 2017 Growth Plan. This report provides an overview of the key changes.

2.0 Impact of 2019 Growth Plan on Wellington County

Based on our initial review, staff have identified five major areas of change in the updated Growth Plan of relevance to Wellington County:

- Natural Heritage System and Agricultural Land Base Mapping
- Intensification and Density Targets
- Settlement Area Boundaries
- Rural Settlements
- Employment Areas

Many of these changes relate to completion of a “municipal comprehensive review” or “MCR” which the Growth Plan defines as:

A new official plan, or an official plan amendment, initiated by an upper- or single-tier municipality under section 26 of the Planning Act that comprehensively applies the policies and schedules of this Plan.

A discussion of the key changes within each area follows.

2.1 Natural Heritage System and Agricultural Land Base Mapping

Key changes	Implications
NATURAL HERITAGE SYSTEM MAPPING	
A pause on implementing the provincial natural heritage system mapping	<ul style="list-style-type: none"> • Natural heritage system policies will continue to apply, but will apply to natural heritage systems mapped in the County Official Plan as of July 1, 2017. • Staff will continue to review how this relates to the Official Plan Greenlands System mapping with the Province.

Key changes	Implications
NATURAL HERITAGE SYSTEM MAPPING (continued)	
Provincial mapping will apply once implemented in County Official Plan before, or through, the municipal comprehensive review	<ul style="list-style-type: none"> This gives the County time to refine the mapping before it comes into effect, but the Province narrowly defines how to make such refinements in current provincial guidance documents.
The Province may review and update the natural heritage system for the Growth Plan in response to a municipal request	<ul style="list-style-type: none"> No guidance is available at this time regarding the circumstances under which the Province would consider such a review.
AGRICULTURAL SYSTEM MAPPING	
Outside of the Greenbelt, a pause on implementing the provincial agricultural land base mapping	<ul style="list-style-type: none"> Agricultural system policies will continue to apply, but will apply to prime agricultural areas mapped in the County Official Plan as of July 1, 2017. In Greenbelt areas, the provincial mapping and policies continue to apply.
Provincial mapping may be refined and will apply once implemented in County Official Plan before, or through, the municipal comprehensive review	<ul style="list-style-type: none"> This gives the County time to refine the mapping before it comes into effect, but the Province narrowly defines how to make such refinements in current provincial guidance documents.
The Province may review and update the agricultural land base mapping in response to a municipal request	<ul style="list-style-type: none"> No guidance is available at this time regarding the circumstances under which the Province would consider such a review.

2.2 Intensification and Density Targets

Key changes	Implications
Removal of increased minimum residential intensification targets within delineated built-up areas	<ul style="list-style-type: none"> Existing alternative intensification target of 20% residential development annually within delineated built-up areas continues to apply until municipal comprehensive review (MCR).
Previously, minimum of 50% required from time of municipal comprehensive review to 2031 and minimum of 60% required from 2031 on	<ul style="list-style-type: none"> Through the MCR process, the Plan requires Wellington to maintain or improve upon the 20% minimum residential intensification target.
Removal of increased minimum density targets for designated greenfield areas (80 residents and jobs combined per hectare)	<ul style="list-style-type: none"> Existing alternative target of 40 residents and jobs combined per hectare continues to apply.
County or the Minister may request an alternative target for designated greenfield areas	<ul style="list-style-type: none"> Policies require municipality to show that the target cannot be achieved. Such a request is subject to simplified criteria. Characteristics of municipality and adjacent communities may now be considered.

2.3 Settlement Area Boundaries

Key changes	Implications
Allows for adjustment to settlement area boundaries before municipal comprehensive review subject to criteria	<ul style="list-style-type: none"> • County Official plan may be amended to adjust boundary of designated urban centres (but not hamlets) outside of the Greenbelt area when: <ul style="list-style-type: none"> • no net increase in land within urban centre, • adjustment would support the County’s, ability to meet intensification and density targets, • location of lands added must satisfy requirements which normally apply to a settlement expansion.
Allows for expansion to settlement area boundaries before municipal comprehensive review subject to criteria	<ul style="list-style-type: none"> • County Official Plan may be amended to expand boundary of designated urban centres (but not hamlets) outside of the Greenbelt area when: <ul style="list-style-type: none"> • lands will achieve the applicable minimum density targets, • expansion criteria can be met, including 40 hectare maximum area, • urban Centre is serviced by municipal water and wastewater systems and there is enough reserve capacity to service the land, • additional lands and forecasted growth will be fully accounted for in the land needs assessment for municipal comprehensive review.

2.4 Rural Settlements

Key changes	Implications
New term “rural settlements” added	<ul style="list-style-type: none"> • Refers to “existing hamlets or similar existing small settlement areas that are long-established and identified in official plans...”. • Development in rural settlements is no longer included in the calculation of minimum density targets for designated greenfield areas.
Outside of Greenbelt area, new policy would allow minor boundary adjustments to rural settlements	<ul style="list-style-type: none"> • Must be minor rounding out of existing development, in keeping with rural character. • Other criteria apply related to servicing and Provincial Policy Statement.

2.5 Employment

Key changes	Implications
<p>Allows for conversion of employment lands to a designation that permits non-employment uses in advance of a municipal comprehensive review subject to criteria</p>	<ul style="list-style-type: none"> • County Official plan may be amended to for such conversions when: <ul style="list-style-type: none"> • there is a need for the conversion, • no adverse effects on the viability of an employment area or achievement of minimum intensification targets, • existing or planned services are in place, • significant amount of jobs are maintained on the land, • lands do not include any lands in a provincially significant employment zone.
<p>New term “Provincially Significant Employment Zones” (PSEZs) which may be identified by the Minister to support coordination of planning for jobs and economic development at a regional scale</p> <p>There are currently no provincially significant employment zones in Wellington</p>	<ul style="list-style-type: none"> • Province has identified 29 PSEZs deemed significant to the regional and provincial economy. • Zones are generally made up of lands currently designated as employment areas in municipal official plans, located inside of settlement areas, and/or meet additional criteria. • Province has outlined a process for municipalities to request changes to the zone maps (including new submissions to realign/add, create new zones, etc.).
<p>The Province will provide supplementary direction for provincially significant employment zones</p>	<p>In summer 2019, the Province intends to consult stakeholders on:</p> <ul style="list-style-type: none"> • the longer-term vision of the zones, and • how the zones can be used as tools for investments, infrastructure planning and economic activity.

3.0 Implementation

All decisions on planning matters (e.g. official plan amendments, subdivisions, condominiums, zoning by-law amendments, consents, minor variances, etc.) made on or after May 16, 2019 are required to conform with the 2019 Plan. The Growth Plan policies also require completion of a municipal comprehensive review (MCR) to implement significant policy changes. The deadline to complete the MCR process to bring official plans into conformity with the 2017 Growth Plan was July 1, 2022. The Province placed a pause on 2017 Growth Plan implementation while they completed consultations in fall 2018, prepared policy amendments and subsequently released the new Plan. Despite this delay, it now appears that the MCR implementation deadline will be May 15, 2022. Over the coming months, staff will be developing a work plan as a means of addressing the County’s need for an MCR by that time.

4.0 Summary

The Province recently released the 2019 Growth Plan and this report highlights the most important changes identified in our initial review. Staff will participate in provincial training and stakeholder sessions, if available, and continue to review and discuss the implications of the new Plan with member municipalities. Staff will provide additional reports as new information becomes available. We will also report on a work plan for the municipal comprehensive review in the fall.

Recommendation

That the report “A Place to Grow: Growth Plan for the Greater Golden Horseshoe, 2019” be received for information and circulated to member municipalities in Wellington County.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Sarah Wilhelm', with a long horizontal flourish extending to the right.

Sarah Wilhelm, BES, MCIP, RPP
Manager of Policy Planning



PLANNING REPORT for the TOWN OF PUSLINCH

Prepared by the County of Wellington Planning and Development Department

COUNCIL DATE: July 17, 2019
TO: Nina Lecic, CAO/Clerk (Acting)
Township of Puslinch
FROM: Meagan Ferris, Senior Planner
County of Wellington
SUBJECT: **PUBLIC MEETING**
Zoning By-law Amendment Application D14/ELL – Donald Elliot
Temporary Garden Suite Extension

RECOMMENDATIONS

- 1) That Council receive this Planning Report by the County of Wellington Planning and Development Department;
- 2) That Council pass a by-law to amend Zoning By-law 19/85 on the subject lands as outlined in this report dated July 17, 2019; and
- 3) That Council pass a by-law to amend Zoning By-law 023/18 on the subject lands as outlined in this report dated July 17, 2019; and

SUMMARY

The purpose of the proposed zoning by-law amendment is to extend the permission to have a garden suite on the subject property for an additional ten (10) year period.

This proposal is consistent with the Provincial Policy Statement, the Provincial Growth Plan and conforms to the applicable policies of the County of Wellington Official Plan. There were no public or agency concerns or objections raised during the circulation or at the public meeting. It is recommended that Council approve the zoning by-law amendment that will effect both the original and the new Township by-laws.

LOCATION

This rezoning application relates to land legally described as Part Lot 32, Concession 8, Township of Puslinch, municipally known as 4188 Victoria Road (see Figure 1). The property is approximately 1.4 ha (3.46 ac) in size and contains a single detached dwelling, drive shed, grain bins, and a modular garden suite. The existing garden suite is serviced with its own separate septic system.

Figure 1: Air Photo



PROPOSAL

The purpose of the proposed zoning by-law amendment is to extend the permission to have a garden suite on the subject property for an additional ten (10) year period, until 2029.

In terms of site history, in 2009, a zoning by-law amendment (01/09) was approved by Council to permit a temporary garden suite on the subject property for a period of ten (10) years. The original approval for the garden suite expired on December 2, 2018, thus necessitating the subject extension.

At the time of the original application, the *Planning Act* allowed a garden suite for a maximum time frame of ten (10) years with permissions for three (3) year extensions to be granted beyond that initial ten (10) year time frame. Since, then, in 2011, the *Planning Act* was amended and now permits a garden suite for a total time period of twenty (20) years, with permissions for three (3) year extensions after that time. This proposal is seeking an additional ten (10) year extension, which will total twenty (20) years of use, if approved, which aligns with current *Planning Act* permissions.

PROVINCIAL POLICY STATEMENT (PPS) & PROVINCIAL GROWTH PLAN

Within the Provincial Policy Statement (2014) and the Growth Plan, these policy frameworks speak to protecting prime agricultural area and limiting uses within this area. The subject proposal is a temporary use that is located on a rural residential lot and does not represent a use that is removing lands from prime agricultural use. These provincial policies further speak to providing opportunities for an appropriate range and mix of housing types. The subject extension represents a continuation of an affordable housing option which, in the context of this proposal, provides a housing opportunity for the property owners' in-laws.

GREENBELT PLAN

The subject lands are located within the Greenbelt Plan and are identified as being located within the Protected Countryside. The subject proposal represents the continuation of a temporary use on a portion of land that has legally operated as a residential use, prior to the plan coming into force and effect.

WELLINGTON COUNTY OFFICIAL PLAN

The subject property is designated PRIME AGRICULTURAL AREA under the County of Wellington Official Plan. Within the Official Plan, a garden suite is a permitted use in the Prime Agricultural Area. Section 4.4.7 of the Official Plan establishes that a garden suite may be permitted on a property provided that it is established near the farm buildings and/or main residence on a property and that adequate water supply and sewage disposal systems are available. County staff is satisfied that this proposal maintains the intent and purpose of the County's Official Plan.

ZONING BY-LAW

According to Schedule 'A' of Zoning By-law 19/85, the subject land is currently zoned Agricultural (A) Zone with a site specific provision (A-42) which permits a garden suite on the property subject to provisions under By-law 19/85. It is also noted that this site specific provision is carried forward within the new Town By-law 023/18. The subject proposal seeks to amend the original site specific provision (A-42) and the new Township by-law provision (t¹), which is the temporary use provisions, to allow the extension of the subject use.

Within by-law 19/85 and by-law 023/18, there are general provisions that speak to requirements applicable to garden suites. These provisions speak to limited access, location of the garden suite, floor area, on-site servicing, etc. The subject application represents an extension to a use that was permitted via a temporary use by-law 1/09, as such the subject was effectively reviewed against the provisions of by-law 19/85. County staff are satisfied that the subject proposal, which is an extension to an existing use, is then also consistent with by-law 023/18.

AGENCY AND PUBLIC COMMENTS

This application was circulated to statutory agencies by the Township. No issues or concerns were raised, nor were comments from the neighbouring property owners received. The Township's Planning Development Advisory Committee also provided County planning staff with comments supporting the subject proposal:

1. With the understanding that it is only to be inhabited by aging in-laws.

2. Subject to the agreement being registered on title.

County staff notes that a development agreement was entered into with the original approvals and it is understood that this agreement was registered on title (Instrument Number WC235836). County planning staff suggests that the agreement should be amended (and registered) to ensure that the agreement is up to date with the subject extension and includes the correct user names and reference to the new by-laws. County staff further notes that within these agreements, there are clauses that speak to the use being utilized by a specific person(s), ceasing to exist when the property is sold, etc., but does not reflect specific requirements of the user (i.e. age).

DRAFT AMENDING BY-LAW

Attached to this report is a draft amending by-law for both By-law 19/85 and By-law 023/18 for Council's review, which would amend the site specific zone provisions to extend the use (within each by-law) for an additional ten (10) years. These by-laws can be seen in Appendix A and B.

PLANNING OPINION

This application is consistent with provincial policy and generally conforms to the Growth Plan, and the County of Wellington Official Plan. There were no objections from Township staff, the public or the review agencies. There are no technical concerns. In planning staff's opinion, the proposed rezoning represents good planning.

Respectfully submitted

County of Wellington Planning and Development Department



Meagan Ferris, RPP MCIP
Senior Planner

Appendix A: Draft Amending Zoning By-law (By-law 19/85)

Appendix B: Draft Amending Zoning By-law (By-law 023/18)



SECOND REPORT TO INDUSTRY CANADA
REPORT PD-2019-007

TO: Mayor and Members of Council

FROM: Courtenay Hoytfox, Development and Legislative Coordinator

MEETING DATE: July 17, 2019

SUBJECT: Telecommunication Application File TC-01-2019 (A12/ROG)

RECOMMENDATION:

That Report PD-2019-007 regarding Telecommunication Application File TC-01-2019 (A12/ROG) – Rogers site C6798 leased from L E L Farms Limited, Concession 4, Part Lot 20 Parts 2 to 3, municipally known as 4638 Sideroad 20 North, be received; and

That Council authorizes the release of the Report to Industry Canada regarding the proposed 60 metre Rogers Wireless Telecommunication Antenna.

BACKGROUND:

At the June 19, 2019 Council Meeting, Council received Report PD-2019-006 (Attached as Appendix A) outlining the details of the Telecommunication Application File TC-01-2019.

Subsequent to discussion, Council passed the following Resolution:

That Council is not currently in support of the proposed location of the tower because the proponent has not adequately demonstrated that the tower cannot be located on a commercial/industrial property, or a vacant field property in the original search area as well as the expanded area, and accordingly requests substantiating documentation;

And that a copy of this resolution be forwarded to Wellington MP Michael Chong.



The resolution was forwarded to the applicant, Industry Canada and to Wellington MP Michael Chong.

PURPOSE OF REPORT:

The purpose of this report is to review comments received from Rogers in response to the June 19, 2019 Council resolution and comments and to make a decision with respect to the release of the concurrence report to Industry Canada. As such, Council has the following two options:

1. Should Council find the Rogers communication satisfactory, that the final concurrence report will be sent to Industry Canada.
2. If, after reviewing the Rogers comments, Council still does not concur with the proposed tower, a letter of non-concurrence can be sent to Industry Canada.

ATTACHMENTS:

Attachment "A" – Report PD-2019-006

Attachment "B" – Submission from Rogers



REPORT to INDUSTRY CANADA

FROM: Courtenay Hoytfox, Development and Legislative Coordinator

DATE: June 13, 2019

SUBJECT: Telecommunication Application File TC-01-2019 (A12/ROG)

RECOMMENDATIONS:

That Report PD-2019-006 regarding Telecommunication Application File TC-01-2019 (A12/ROG) – Rogers site C6798 leased from L E L Farms Limited, Concession 4, Part Lot 20 Parts 2 to 3, municipally known as 4638 Sideroad 20 North, be received; and

That Council authorize the release of the Report to Industry Canada regarding the proposed 60 metre Rogers Wireless Telecommunication Antenna.

BACKGROUND:

1. Purpose of Report

Industry Canada, the Federal department responsible for granting authorization for telecommunication facilities, requires that applicants consult with the local land use authority for telecommunication installations. The Township follows Industry Canada's default public consultation process for antenna siting, which Applicants are expected to cooperate with in order to complete the approval process as set by Industry Canada. This Report has taken into consideration all consultations, discussions and submissions of the public and Rogers.

2. Application

The purpose of the application is to construct a 60m tri-pole communication tower enclosed in a 15m X 15m fenced compound. The tower is required for a rising demand for wireless voice and data services in the area and to fill a gap in Rogers' network.

3. Location & Site Characteristics

The proposed wireless communication structure will be located on the east side Sideroad 20 North on an agricultural property owned by L E L Farms Limited. The site is located approximately 180 metres from the nearest residence on Sideroad 20 North. Surrounding the proposed tower are residential properties and the City of Guelph to the north.



4. Staff, Agency & Public Circulation Comments:

The application was circulated to various external agencies and internal departments for comment. Staff notes that no objections were received from internal departments. Grand River Conservation Authority submitted comments with respect to the site's proximity to Provincially Significant Wetlands. All comments and objections are included in Attachment "B" - Agency and Community Comments.

A public notice was placed in the Wellington Advertiser and mailed to properties within a 180 metre radius of the proposed tower, and the City of Guelph. The 180 metre circulation radius is determined by calculating the height of the tower by three, as prescribed by Industry Canada. A notice sign, as requested by Township staff was also posted on the property.

Objections from residents and Grand River Conservation Authority to the tower were received. The objections were in respect to the following:



- a) The site's Proximity to Provincially Significant Wetlands and that an Environmental Impact Study should be undertaken to ensure no negative impacts to the adjacent Natural Heritage Feature(s).
- b) Commercial / Industrial areas within the search radius exist which could provide more suitable locations for a new tower
- c) Potential Health concerns with respect to telecommunication towers
- d) Impact to property values
- e) Visibility of the tower
- f) Blinking lights on the tower

APPLICABLE LEGISLATION & REQUIREMENTS:

1. County of Wellington Official Plan Section 12.6.1, Utilities Allowed, may permit the following uses in any land use designation, subject to the provisions of the Zoning By-law: All electrical power facilities, including all works defined by the *Power Corporation Act* and telecommunications facilities and multi-use cables, provided that the development satisfies the provisions of the Environmental Assessment Act, the Environmental Protection Act and any other relevant legislation.

2. Township of Puslinch Zoning By-Law

When utility services are licensed by Industry Canada, Local, Regional and Provincial Planning documents do not apply. The proposed tower is located in the Rural Area of the Township on Agricultural (A) zoned lands. Public uses are permitted in the A Zone.

CONCLUSION:

Township Staff notes that communication facilities are federally regulated with the final decision vested with Industry Canada. Rogers has consulted with the Township prior to filing its application, and has submitted the fees, documents and reports required by Industry Canada's Default Consultation Process. Staff has concluded that the Applicant has satisfied the requirements of the consultation process and have no further comments regarding the telecommunication tower and therefore recommend the issuance of this report.

ATTACHMENTS:



Attachment "A" – Subject Property Plan
Attachment "B" – Agency and Community Comments

SITE LAYOUT DESIGN OF PROPOSED TELECOM TOWER INSTALLATION AT

4638 SIDEROAD 20 N
GUELPH, ON, N1H 6J3

PART OF LOT 20
CONCESSION 4
(GEOGRAPHIC TOWNSHIP OF PUSLINCH)
CITY OF GUELPH
COUNTY OF WELLINGTON

SCALE 1 : 500

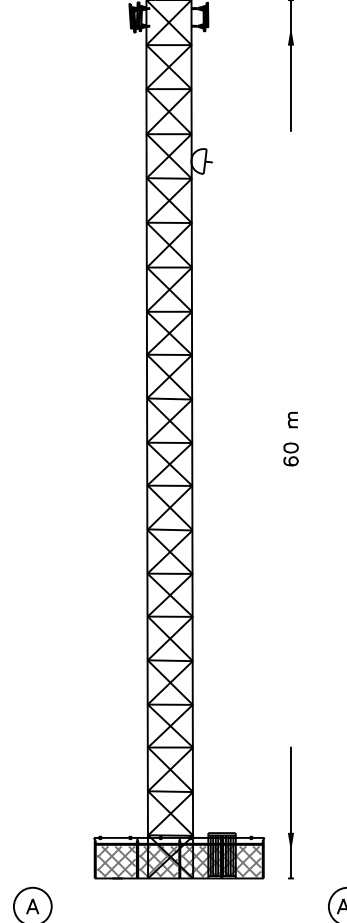
J.D. BARNES LIMITED
ONTARIO LAND SURVEYORS
© COPYRIGHT

NOTES

- (N1) PROPOSED STEEL LATTICE TRI-POLE TOWER WITH MINI-PINWHEEL WITH LIGHTNING PROTECTION SYSTEM. PAINT COLOUR SUBJECT TO NAV CANADA REQUIREMENTS. ANTENNA NUMBER AND LOCATIONS TO BE DETERMINED. FOUNDATION DESIGN PENDING SOIL REPORT.
- (N2) PROPOSED PREFABRICATED GALVANIZED STEEL WALK-IN RADIO EQUIPMENT CABINET (1.62m x 2.44m), ON CONCRETE PAD. FOUNDATION DESIGN PENDING SOIL REPORT.
- (N3) HYDRO CONNECTION AND ROUTING TO BE DETERMINED BY QUALIFIED PERSONNEL IN CONSULTATION WITH LOCAL AUTHORITY.
- (N4) REMOVE EXISTING TOPSOIL, PROOF ROLL SUBGRADE AND PLACE 300 mm GRANULAR A ACROSS COMPOUND AREA. FINISHED GRAVEL SURFACE TO BE MIN. 150 mm ABOVE EXISTING GRADE AND SLOPED AWAY FROM SHELTER AT MIN. 1% ON ALL SIDES TO PROVIDE ADEQUATE DRAINAGE.
- (N5) PROPOSED 1.8 m HIGH CHAIN LINK SECURITY FENCE TOPPED WITH BARBED WIRE SURROUNDING COMPOUND.

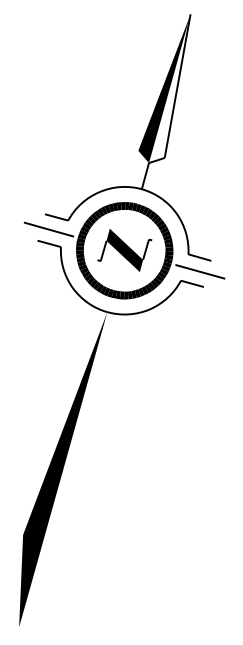
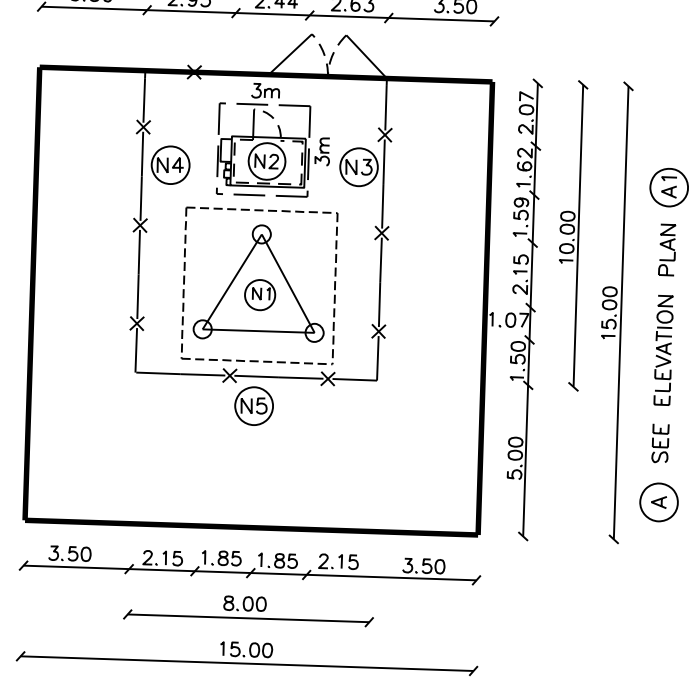
ELEVATION PLAN

NOT TO SCALE



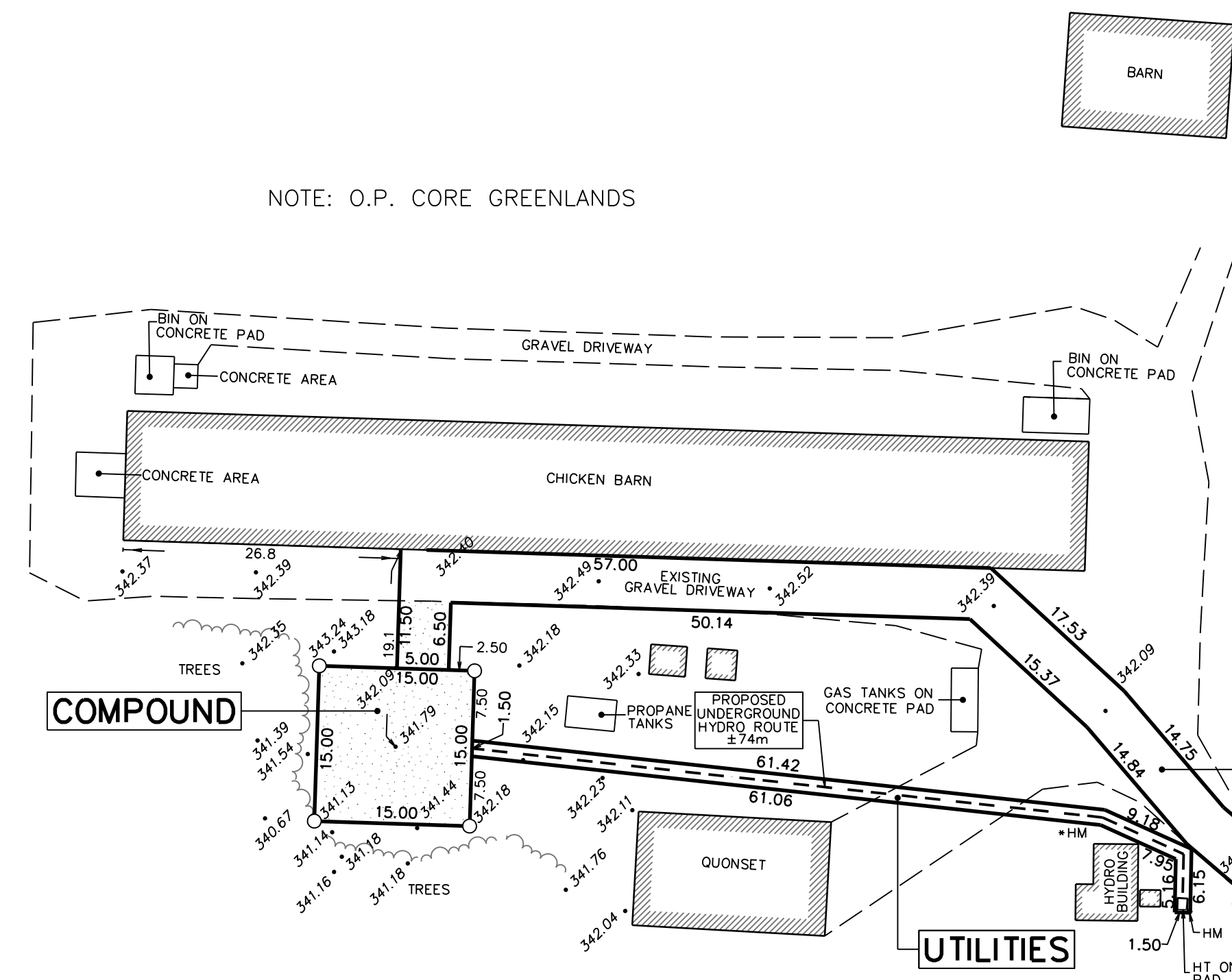
PROPOSED COMPOUND LAYOUT PLAN

SCALE 1:250



PIN 71200-0033 (LT)

NOTE: O.P. CORE GREENLANDS



PART 3 PLAN 61R-9654
PIN 71200-0036 (LT)

PART 2 PLAN 61R-9654
PIN 71200-0152 (LT)

PART 1 PLAN 61R-9654
PIN 71200-0153 (LT)

CAUTION

THIS IS NOT A PLAN OF SURVEY AND SHALL NOT BE USED EXCEPT FOR THE PURPOSE INDICATED IN THE TITLE BLOCK. BOUNDARY INFORMATION HAS BEEN COMPILED FROM AVAILABLE RECORDS AND HAS NOT BEEN VERIFIED BY FIELD SURVEY.

METRIC

DISTANCES AND/OR COORDINATES SHOWN ON THIS PLAN ARE IN METRES AND CAN BE CONVERTED TO FEET BY DIVIDING BY 0.3048.

BENCHMARK

ELEVATIONS SHOWN ON THIS PLAN ARE RELATED TO THE CANADIAN GEODETIC VERTICAL DATUM 1928, 1978 ADJUSTED AND ARE DERIVED FROM THE CITY OF GUELPH BENCHMARK No.387 HAVING A PUBLISHED ELEVATION OF 338.980 METRES.

LEGEND

- O DENOTES SPIKE
- HP DENOTES HYDRO POLE
- AN DENOTES ANCHOR
- HM DENOTES HYDRO MARKER
- PED DENOTES TELEPHONE PEDESTAL
- TRAN DENOTES TRANSFORMER
- MB DENOTES MAIL BOX
- E- DENOTES OVERHEAD ELECTRICAL

CERTIFICATE OF COMPLETION

I CERTIFY THAT:
1. THE FIELD WORK WAS COMPLETED ON SEPTEMBER 21, 2018.

DATE OCTOBER 18, 2018
JOHN YUEN
ONTARIO LAND SURVEYOR

CAUTION

LOCATIONS OF ANY UNDERGROUND SERVICES ARE APPROXIMATE. OTHER BURIED UTILITIES MAY EXIST WHICH ARE NOT SHOWN BECAUSE OF INSUFFICIENT INFORMATION. CONTACT ALL POTENTIAL OWNERS OF UNDERGROUND UTILITIES PRIOR TO COMMENCEMENT OF CONSTRUCTION

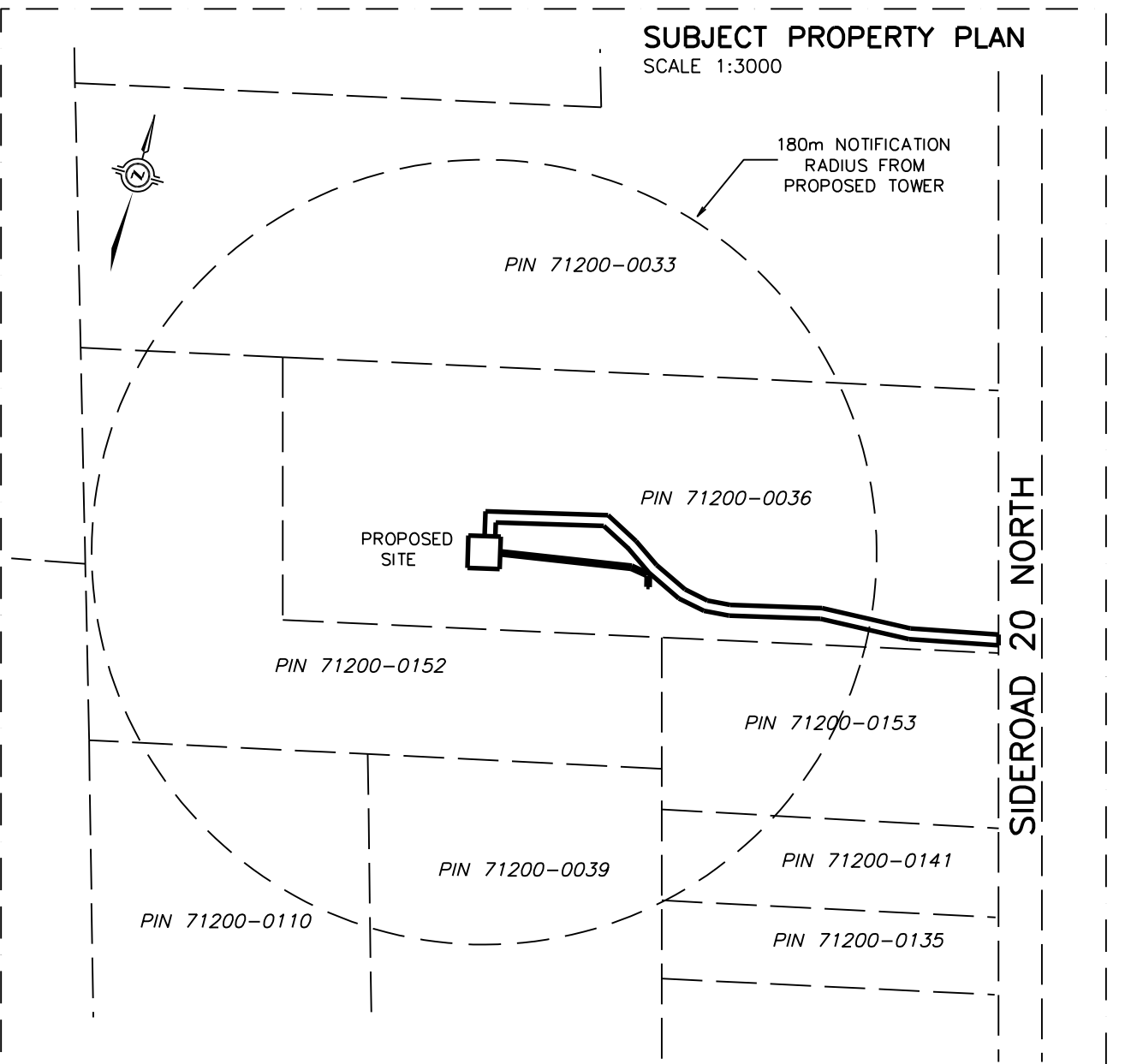
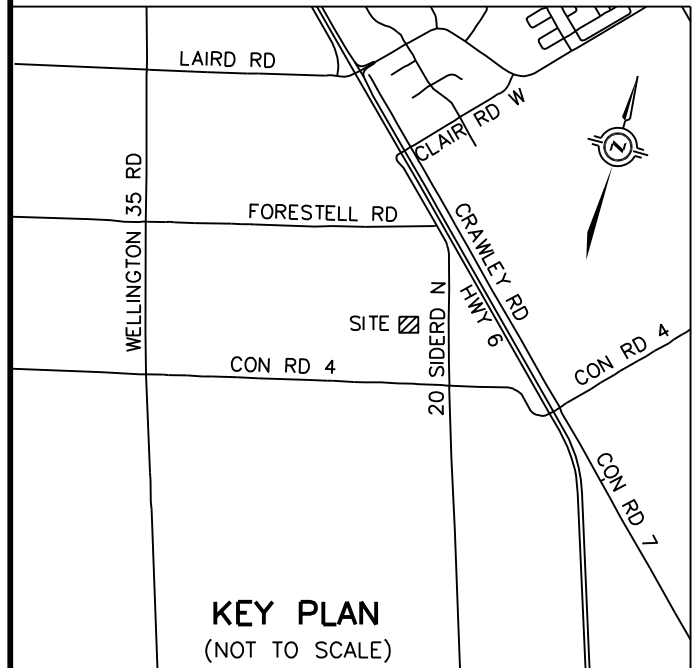
ROGERS LATITUDE N 43°28'35.8" LONGITUDE W 80°12'10.7" ELEVATION 341.8m

SITE: C6798 SOUTHGATE & CLAIR RD

J.D. BARNES LIMITED SURVEYING MAPPING GIS
LAND INFORMATION SPECIALISTS
140 RENEW DRIVE, SUITE 100, MARKHAM, ON L3R 6B3
T: (905) 477-3600 F: (905) 477-3882 www.jdbarnes.com

DRAWN BY: TL CHECKED BY: JY REFERENCE NO.: 18-15-273-00
FILE: G:\Surveys\18-15-273\00\Drawing\18-15-273-00.dgn DATED: OCTOBER 18, 2018 PLOTTED: 18/10/2018

SITE DATA	EXISTING	PROPOSED
PROPERTY AREA	4.048 ha.	
BUILDING AREA	2395.2 sq.m.	4 sq.m.
LOT COVERAGE	5.9 %	5.9 %
LEASE AREA REQUIREMENTS		
COMPOUND (EXCLUSIVE)		225.0 sq.m.
ACCESS (NON-EXCLUSIVE)		1305.6 sq.m.
UTILITIES (NON-EXCLUSIVE)		113.1 sq.m.
TOTAL		1643.7 sq.m.
UNITS		1 TOWER 1 CABINET
HEIGHT OF TOWER		60 m
SETBACKS (PROPOSED TOWER)		
FRONT		236.8 m
SIDE		34.7 m
REAR		91.5 m
SETBACKS (PROPOSED CABINET)		
FRONT		237.1 m
SIDE		39.5 m
REAR		92.5 m



Courtenay Hoytfox

From: John Sepulis
Sent: Monday, June 3, 2019 2:50 PM
To: Courtenay Hoytfox
Cc: Karen Landry; John Sepulis
Subject: Call from resident re tower on SR20N

Hi Courtenay,

This afternoon I received a call from Joanne Baggio [REDACTED] who was speaking on behalf of her father Mario Geremia who lives three properties south of the proposed tower site. He has lived there for 49 years and has the following concerns; -intrusion of tower into skyline -decrease of property value -blinking tower light She was intending to also call all councillors and the mayor as well.

I advised her the process for being a delegate and timing of the availability of the staff report. Her father may attend the Council meeting if he is feeling up to it.

For your information and records.

Regards,
John

John Sepulis
Councillor
Township of Puslinch

Courtenay Hoytfox

From: John Sepulis
Sent: Monday, June 3, 2019 4:43 PM
To: Courtenay Hoytfox
Cc: Karen Landry; John Sepulis
Subject: Call from Scott Gillingham re tower on SR20N

At around 4pm I received a call from Scott Gillingham [REDACTED] who lives at 6891 Forestell Rd which is about 400m away from the tower site.

He had sent an email to J. McKay citing his objections to the proposed tower. Scott was upset with the dismissive tone of the response.

Scott indicated that he is a veterinarian and is concerned about the effect the tower radiation may have on the chickens ie. loss of egg productivity. He is also a business partner of the proposed tower property owner and advised him accordingly. Scott's other concern is the effect radiation may have on nearby residents. He stated European studies, which in his opinion are more current than Canadian studies, indicate concerns with radiation emitted from towers for people living nearby.

For your information and records.

Regards,
John

John Sepulis
Councillor
Township of Puslinch

GillingS

Courtenay Hoytfox

From: [REDACTED]
Sent: Friday, May 31, 2019 6:47 PM
To: j_mckay@rogers.com; Courtenay Hoytfox
Subject: Cell Tower - C6798-South Gate & Clair

To Courtenay Hoytfox (Township of Puslinch) and Jeff McKay (Rogers Communication Inc),

We have reviewed the site report for, C6798-South Gate & Clair and would like to state our opposition to the site. In addition, we have a number of concerns in regard to the proposed site.

Upon reviewing the location of the new antenna and the search ring which Rogers has identified, we note there are two Commercial / Industrial areas within the search radius which could provide more suitable locations for a new tower. We suggest that the location of this proposed tower appears to be inconsistent the agricultural / residential usage of this particular area. As a result we would ask why a tower would be proposed at this particular site when other suitable sites are present?

While the report provided to us attempts to mitigate any health concerns over Radiofrequency Electromagnetic Fields by simply stating that residential areas around this site are below acceptable limits does not provide us with significant comfort that a) these limits are clearly understood or b) that our safety and that of our children is assured – particularly given the close proximity to our home (181 meters). Upon a quick Internet search, it is very quickly evident that potential health concerns are often misunderstood, not studied fully and perhaps even misrepresented in current literature. Please address how Rogers can guarantee there are no health risks associated with this particular site. In addition, what monitoring will be in place to ensure Health Canada criteria continues to be met? Furthermore, how will the local residents obtain access to this data to ensure our safety is being continually monitored?

We have had discussions with local real estate agents about potential devaluation of property from a cell tower and we have done a bit of research ourselves. Estimates appear to be in the range of a 10 – 20% decrease in property values given the proximity to a tower. We would be interested in hearing how both Rogers and the Township feel that this is acceptable for nearby residents.

Lastly, in discussion with other local residents, it appears that Rogers is not acting in the best interests of residents. This lack of open and transparent consultation with the community is further evidenced by the notification process undertaken by Rogers (very small sign at the site, inconspicuous notification in local paper). How can we be assured that concerns are being taken seriously?

Respectfully,

James and Marcia Mitchell

Sent from my iPad

Courtenay Hoytfox

From: Joanne Baggio [REDACTED]
Sent: Wednesday, May 8, 2019 7:10 PM
To: Courtenay Hoytfox
Subject: Cell tower on the Weber farm

I strongly object to the proposal for a cell tower on the Weber farm. I am a homeowner on 4620 sideroad 20N, 3 homes away from the proposed tower. I object for the following reasons:

- aesthetically this extremely tall tower with blinking lights will be visible from my home and an eye sore
- a large/tall tower this close to our residential properties will affect property values
- environmentally, this tower could affect the health of humans and the many animals that live in this area (including the large chicken raising operation that occurs on the Weber farm).

There are more industrial use areas across the Hanlon that would be better suited to such a tower. I strongly oppose to a tower of this size to be built on a property this close to residential homes.

I also feel that one home/property owner should not benefit financially for allowing this tower on their property while all the surrounding home owners will be impacted by the presence of this tower.

Please let me know what further actions need to be taken to ensure that this tower proposal does not go further.

Thank you,

Mario Geremia

Home owner 4620 Sideroad 20N
[REDACTED]

Please also respond or call Joanne as father does not have email.

[REDACTED] (daughter Joanne Geremia Baggio's cell)
[REDACTED]

Sent from [Mail](#) for Windows 10

Courtenay Hoytfox

From: Friedrich Brunmeier [REDACTED]
Sent: Wednesday, May 29, 2019 5:20 PM
To: jseelley@puslinch.ca; Courtenay Hoytfox; Karen Landry; John Sepulis; Matthew Bulmer; Ken Roth; Jessica Goyda
Subject: Communications Tower

Ladies and Gentlemen,

Having already forwarded my concern for this tower location to Mr. McKay in a earlier communication and having been assured that no negative health impact needs to be considered even as WHO say's otherwise, please allow me to forward to you a recent Canadian study by Workers Health & Safety, showing a very similar result to WHO studies, in fact our Canadian workers are advised to follow these same guidelines, why are we being allowed a considerable lower standard.

Sincerely,
Fred

[Cell tower radiation linked with cancer in new study | Workers Health & Safety Centre](#)

Courtenay Hoytfox

From: sandra pady [REDACTED]
Sent: Monday, May 13, 2019 1:13 PM
To: Courtenay Hoytfox
Cc: [REDACTED]
Subject: Fwd: Porposed Tower: Rogers Site C6798

----- Forwarded message -----

From: sandra pady [REDACTED]
Date: Mon, May 13, 2019 at 1:09 PM
Subject: Porposed Tower: Rogers Site C6798
To: <j_mckay@rogers.com>

Dear Ms Hoytfox: The purpose of this email is to express my strong opposition to the palcement of a new Rogers tower at Southgate and Clair Road in Puslinch, ON. There are several reasons for my opposition:

- The visual impact on the immediate environment, a residential community, would be dramatic. Signals would be a polluting factor in the night sky and lines of sight for at least a kilometer around would be blocked.
- The area in question is a managed forest, with several woodlots and significant wetlands. These are an important addition to our township's precious and threatened rural landscape.
- There would be definitely an impact to property values should such a massive steel structure be built which would dominate the landscape.
- Finally, the health concerns associated with such high density electirical field structures are real and documented.

For these reasons I request that the proposed telecommunications tower C6798 project be abandoned.

Sincerely, Sandra Pady, Puslinch property owner

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Sandra Pady
6985 Concession 4
Puslinch ON N0B2J0
[REDACTED]

Courtenay Hoytfox

From: Michael Briggs [REDACTED]
Sent: Sunday, May 12, 2019 9:05 PM
To: [REDACTED] Briggs; j.mckay@rogers.com; Courtenay Hoytfox; Karen Landry; James Seeley; John Sepulis; Matthew Bulmer; Ken Roth; Jessica Goyda
Subject: Rogers Tower site 4638 Side Road 20 North, Guelph, ON 71200036(LT)

Dear Sir/Madame,

We are writing to express our concerns regarding the proposed tower which is being considered at site 4638 Side Road 20 North, Guelph (71200036(LT)). This location is directly behind our property at which we have lived now for over 42 years. We ask that during the evaluation process, you consider the issues stated below. We feel that our concerns are significant and are shared by many other neighbours. This tower will have a negative impact on the surrounding properties and thus should not be permitted in this location.

First and foremost, we believe that there are other locations relatively close to the proposed site that would be far better suited for such tower. These areas include industrial and vacant lands north and east of the proposed site. In fact, the notice sent indicated that the tower site was to be at Southgate Dr. and Clair Rd. (which is north/east of proposed site). It was later that we were informed that the site was planned for a location close to our residences. Placing this type of structure in an industrial area would have a far lower impact on residences and would be much more appropriate.

The negative impact on real estate values close to this tower would be significant. This is supported by consultation with local real estate professionals as well as studies. Following a discussion by a neighbour with local appraisers and realtors we were advised that all agreed a tower in this location would reduce the value of our homes due to a narrowing of the market for the property sale. Health concerns are significant whether they are real or perceived. This further narrows the market for property sale.

The impact on the aesthetics in this neighbourhood would be significant. This tower would appear above the tree line and therefore be seen by many. It would be a visual annoyance during the day and a flashing light would be seen at night. As previously stated, we have lived in this home for over 42 years and have always managed our property and respected our neighbour's interests in country living. This tower would negatively affect our enjoyment of living in the country and we believe our neighbours will feel the same way regardless of how long they have lived here.

In closing we ask again that you carefully review our objections to this tower in this location. In addition, we request that you recommend this tower be considered for a more suitable location.

Thank you for your time,

Dr. Michael and Dorothy Briggs
7004 Concession 4, Puslinch, ON, N0B 2J0

Courtenay Hoytfox

From: Peter Mitro [REDACTED]
Sent: Monday, May 13, 2019 10:32 AM
To: Courtenay Hoytfox
Cc: Karen Landry; James Seeley; John Sepulis; Matthew Bulmer; Ken Roth; Jessica Goyda
Subject: Proposed Rogers tower @ 4638 Side Road 20 North, Puslinch

Hello:

I am in agreement with all of the points presented by Donna Christie in her opposition to this proposed communication tower.

Please add my name to the list of Puslinch residents opposed to this project.

As well, can you please advise me when this issue is going to council so that I may attend to voice my opposition.

Thank you

Peter Mitro
6987 Forestell rd RR 6 Guelph

Sent from my iPhone

Courtenay Hoytfox

From: Sharon Smith [REDACTED]
Sent: Sunday, May 12, 2019 12:53 PM
To: j_mckay@rogers.com; Courtenay Hoytfox; Karen Landry; James Seeley; John Sepulis; Matthew Bulmer; Ken Roth; Jessica Goyda
Subject: Proposed Rogers Tower at 4638 Sideroad 20 North in Puslinch

We are writing to strongly object to the location of the above proposed tower site, having only recently become aware of the proposal.

We have been residents of Puslinch township for 37 years. Our home and property at 7011 Concession 4 is less than half a kilometer from the proposed Rogers telecommunications tower at site C6798. Our residence is on 20 acres, 15 acres of which is managed forest providing habitat for many kinds of wildlife.

We believe that Rogers and Councillors have an obligation to consider the concerns and well-being of the residents who may be impacted before the tower location is finalized.

The location is situated in a beautiful environment of managed forests, agricultural fields, wood lots, meadows and wetlands. It is located close to many residential premises. The tower will stand out as an eyesore among this beautiful countryside.

It is our understanding that the owner of the proposed site will realize substantial financial gain, while surrounding neighbours will experience decreases in property values due to the tower. This is not right!

Surely there are other sites which would be more suitable, e.g. the industrial land on the opposite side of Hwy 6 or some other industrial park, which would not have such a large impact on residential homes, properties, and the environment.

We would appreciate being kept apprised of developments and notified of future meetings on this significant issue. We can be contacted via this email address [REDACTED] or by phone at [REDACTED]

Thank you for your consideration in this matter. Your support would be appreciated.

Jim and Sharon Smith
7011 Concession 4
Puslinch, ON

[REDACTED]

Courtenay Hoytfox

From: Friedrich Brunmeier [REDACTED]
Sent: Tuesday, May 14, 2019 11:30 AM
To: j_mckay@rogers.com
Cc: Courtenay Hoytfox; Karen Landry; James Seeley; John Sepulis; Matthew Bulmer; Ken Roth; Jessica Goyda
Subject: Proposed Rogers tower site C6798

Dear Mr.McKay,

This is to advise you that we wish to be part of the consultation regarding the proposed location of the Rogers tower at 4638 Sideroad 20 North, Puslinch Ontario.

The site as proposed is totally unacceptable to us for the following reasons.

The site is less than 400 meters from our property and within clear view of our house. It is a well publicized fact that a monstrosity such as this will reduce property values by up to 20% as as by recent surveys.

Further more, the negative health impact due to EMFS to occupants within a radius of less than 400 meters is a well studied and documented fact, substantiated by many international studies.

Also the negative aesthetic impact of this almost park like setting in this desirable rural/residential area is very hard for us to comprehend, begs the question why is this tower not being placed in a more industrial area available within a few hundred meters of the proposed site or piggybacked on existing towers less than 1500 meters from here.

Sincerely
Friedrich and Lisbeth Brunmeier

Courtenay Hoytfox

From: Dan Neundorf [REDACTED]
Sent: Monday, May 13, 2019 11:26 AM
To: Courtenay Hoytfox; Karen Landry; James Seeley; John Sepulis; Matthew Bulmer; Ken Roth; Jessica Goyda
Cc: j_mckay@rogers.com; [REDACTED]
Subject: Proposed Telecommunications Tower: Rogers Site C6798 - Southgate and Clair Road (4638 Sideroad 20N)

Dear Puslinch Council:

I hope this email finds you all well. I am writing to you in reference to the Proposed Telecommunications Tower: Rogers Site C6798 - Southgate and Clair Road. Some of my neighbours have highlighted their concerns, which I feel they have articulated well.

We bought our home on Sideroad 20 to enjoy the peace and quiet and raise our family, including pets. I work quite a bit from home, so it was ideal. After reading the Rogers proposal and seeing much commercial land around me, I question why this tower needs to be located so close to our home and the homes of our neighbours.

I have a few questions for each of you:

1 - if you lived on Sideroad 20 (I have heard at least one of you does), how would you feel based on the risks of property value devaluation, aesthetics to name a couple?

2 - as you look around you and see many commercial properties, would you think why here especially when it is a residential and agricultural area?

3 - if your neighbours are against it (except for the one receiving the direct benefit) would you at least reconsider this decision?

4 - Decisions of past Councils to rezone some of the areas around us to commercial have not been approved. Does this commercial entity differ in rationale from past decisions?

I am asking you these questions out of respect for those for and against this proposal. I would appreciate thoughtful consideration. I will be disappointed if you don't consider these questions and even more disappointed if the voices within your Township aren't heard.

Have an enjoyable week.

Dr. Dan Neundorf, Ed.D, MBA
[REDACTED]

Courtenay Hoytfox

From: Joanne Baggio [REDACTED]
Sent: Monday, May 13, 2019 6:52 PM
To: Courtenay Hoytfox
Subject: rogers tower proposal on Weber farm

Dear Courtenay

I received a response from Jeff and would like to reiterate my strong objections to ensure that they are added to your report.

I strongly object to the proposal for a cell tower on the Weber farm. I am a homeowner on 4620 sideroad 20N, 3 homes away from the proposed tower. I object for the following reasons:

- aesthetically this extremely tall tower with blinking lights will be visible from my home and an eye sore
- a large/tall tower this close to our residential properties will affect property values
- environmentally, this tower could affect the health of humans and the many animals that live in this area (including the large chicken raising operation that occurs on the Weber farm).

There are more industrial use areas across the Hanlon that would be better suited to such a tower. I strongly oppose to a tower of this size to be built on a property this close to residential homes.

I also feel that one home/property owner should not benefit financially for allowing this tower on their property while all the surrounding home owners will be impacted by the presence of this tower.

Please let me know what further actions need to be taken to ensure that this tower proposal does not go further.

Thank you,

Mario Geremia

Home owner 4620 Sideroad 20N
[REDACTED]

Courtenay Hoytfox

From: M&S Lawson [REDACTED]
Sent: Saturday, May 18, 2019 5:50 PM
To: j_mckay@rogers.com
Cc: Courtenay Hoytfox; John Sepulis; [REDACTED] Scott Lawson
Subject: Your Proposed Tower Site C6798

To: Jeff McKay, Site Acquisition Specialist
Rogers Communications Inc.

date: 2019-05-18

This letter is in regards to your current proposal – Site no. C6798 - to install a large cellular telephone antenna tower at 4638 Sideroad 20 North, Puslinch, Ont. I wish to place on record the strongest possible objection to the subject proposal, for reasons outlined below.

I am a pensioner of Ontario Hydro, now known as Ontario Power Generation and Hydro One Networks. As you are aware, these companies are major users of large antenna towers for microwave data transmission (for remote monitoring and control of unmanned stations, etc.). As the Power companies know, and you should too, these antenna towers are never welcome neighbours in residential areas and so the Power companies make strenuous efforts to locate them on land as free as feasible of residential occupancy. This of course recognizes both their visually obtrusive nature and the unresolved public concern about health effects of radiated microwave energy.

I would expect Rogers as a responsible corporation operating in the Canadian public interest to behave just as the power companies do, to strenuously avoid putting large towers that have obtrusive visual impact and handle radiated microwave energy, in or near residential areas. These criteria apply with particular force when the availability of apparently suitable nearly unoccupied and commercially zoned land on the adjacent east side of Highway 6 is excellent.

Therefore, I call upon Rogers to cease and desist with the current tower proposal and reformulate it to use land on the east side of the Hanlon Expressway.

Thank you for your attention. Scott Lawson PhD, P.Eng. 6999 Concession 4, Puslinch
N0B 2J0 [REDACTED]

Cc: D and J Christie
C Hoytfox – Twp of Puslinch
J Sepulis – Puslinch Council

Courtenay Hoytfox

From: Donna Christie [REDACTED]
Sent: Monday, May 13, 2019 12:19 PM
To: j_mckay@rogers.com
Cc: Courtenay Hoytfox; Karen Landry; James Seeley; John Sepulis; Matthew Bulmer; Jessica Goyda; Ken Roth
Subject: Rogers tower site 4638 Side Road 20 North, Guelph

Dear Jeff,

Thank you for your response to our letter.

For now, we would like to make just a few comments regarding your justifications for choosing this site.

Aesthetics, Visual Impact

In regards to aesthetics and visual impact on the area .. obviously this is very subjective and easy to dismiss if you do not actually own property and live here and attach value to such a beautiful setting. We strongly disagree with the statement that it will have no impact on this country living, special forest, etc. and all that it is and all that happens there, such as the walking, riding and camping. This spot is tranquil and serene and ethereal and a cell tower in its midst is unimaginable. At 180 feet it will be visible for up to 100 feet above the tree tops. It appears that your environmental assessment is not conducted with sensitivity after all nor is there interest in our real concerns - an extreme difference of opinions here - our concerns are real and are being dismissed. You say that this site was chosen in part because of the forest - but we say that the forest is a reason to NOT locate there. It is a jewel in nature and should be treated as such.

Regarding residential homes The tower will sit within 200 feet of our property line. The radius you use for notification purposes is extremely small and unreasonable. There are many homes in the surrounding area which will be impacted by this structure in a variety of ways. These residents also treasure and value this special parcel of country side.

The large residential home on the other side of the site (south) is in very close proximity but will not raise a concern, since it was purchased by the site property owner and has family living in it.

Effect on Property Value

Studies can be produced to prove both sides of any argument. There are lots of studies out there which DO support the fact that cell towers have a negative impact on real estate values. We mentioned just one such study from The National Institute for Science, Law and Public Policy. In addition and more importantly, the feedback from both local experienced realtors and appraisers ... all unanimous in their comments cell towers narrow the market for property sales and decrease value. Are we to ignore their findings and expertise? You mention subdivisions and residences being built next to existing towers. I'm sure the selling prices had to take that into consideration. That is a very different scenario from our situation, with our homes here and established and the cell tower coming later - not our choice to live next to one.

Health Concerns

I believe that our point was missed here. We are aware of Health Canada's statements and are not saying that health issues are or are not a reality at this point in time. Real or perceived. We are saying that many people are still concerned, not convinced and thus shy away from purchasing property near a tower. This thinking reduces the number of potential buyers and negatively impacts the property price.

Location

This location is totally unacceptable - the proposed tower will affect the only spot in this search area that features both a beautiful piece of nature and also many residences, when properties all around that are vacant, stripped of nature, non residential and/or industrial would not suffer negative impact in the ways outlined. We notice that the proposed site is not within the search ring. We urge you to continue to look outside of the search ring. In the printed literature that you distribute, under the section titled Private Candidate Review Process, you state that you started in the centre of the search area and moved out in a radial pattern until a large enough COMMERCIAL OR INDUSTRIAL property option was available that could MITIGATE PUBLIC CONCERN We and the neighbours are zoned agriculture and are assessed Residential - and in our case, Managed Forest as well. We fail to see how this proposed site choice is mitigating public concern.

We feel that all our concerns and findings have not been taken seriously but have been quickly dismissed.

That is all for now.

Thank you.

Jim and Donna Christie

Courtenay Hoytfox

From: Joanne Baggio [REDACTED]
Sent: Tuesday, May 14, 2019 3:02 PM
To: Courtenay Hoytfox
Subject: weber farm rogers tower proposal

Hi Courtenay,

I am asking another question on behalf of my father. We know that the area in question for the proposed tower is zoned agricultural. The Weber farm has a residence, a chicken barn and another business that they are now proposing to add with this cell tower. It is my understanding that they will be paid for having this tower on this property.

We are aware of the strict rules the township has about building on the land in this zone. My father has 9 acres and most of our neighbours have the same or more and we are very limited as to subdividing, selling and so forth. My question is what parameters or bylaws are there that limit various commercial uses on individual residences?

Sent from [Mail](#) for Windows 10

Courtenay Hoytfox

From: Morrisey, John (MTO) <John.Morrisey@ontario.ca>
Sent: Monday, April 29, 2019 9:37 AM
To: Courtenay Hoytfox
Cc: j_mckay@rogers.com
Subject: TC-01/19 Rogers Telecommunication Installation Site C6798

Courtenay,

Ministry of Transportation review, approval and permits are not required for this installation.

Regards,

John Morrisey
Corridor Management Planner
Corridor Management Section
Engineering Office
Ministry of Transportation
659 Exeter Road, London, ON
N6E 1L3
Telephone 519-873-4597
Fax 519-873-4228
John.morrisey@ontario.ca

Courtenay Hoytfox

From: Fred Natolochny <fnatolochny@grandriver.ca>
Sent: Thursday, June 13, 2019 3:31 PM
To: Courtenay Hoytfox
Subject: GRCA and Proposed Telecommunications Tower 4638 Sideroad 20 North Puslinch

I believe our comments at this time would be that:

The site shown is immediately adjacent to a wooded area containing a Provincially Significant Wetland. The compound appears to be proposed approximately 25 metres from the wetland. Provincial and County policy suggests that an Environmental Impact Study should be undertaken to ensure no negative impacts to the adjacent Natural Heritage feature(s).

We will not be pursuing the permit requirement as an issue.

From: Melissa Larion <mlarion@grandriver.ca>
Sent: April 30, 2019 10:56 AM
To: Fred Natolochny <fnatolochny@grandriver.ca>
Cc: Beth Brown <bbrown@grandriver.ca>
Subject: RE: C6798: Proposed Telecommunications Tower 4638 Sideroad 20 North Puslinch

I think federal projects like this are exempt as his email states below. Federal telecommunication facilities/towers aren't subject to the Planning Act process either (they are supposed to consult though). Although it's not explicitly written in the CA Act that the feds have an exemption for this type of project, they would be the "responsible authority" to ensure an assessment of environmental impacts (under the CEAA process). It goes with their whole "one project-one review" initiative....

From: Beth Brown
Sent: April 29, 2019 4:12 PM
To: Fred Natolochny; Melissa Larion
Subject: RE: C6798: Proposed Telecommunications Tower 4638 Sideroad 20 North Puslinch

Fred – This question has been raised at permit review – and at that time – our opinion was that telecommunications tower were not exempt (as not included in exceptions below). They operate under federal legislation, but they are not performing functions on behalf of the Government of Ontario (ie. MTO). I didn't do a detailed review of the email though – so Melissa your review would be of assistance.

Exceptions under CA Act

28 (10) No regulation made under subsection (1),

(a) shall limit the use of water for domestic or livestock purposes;

(b) shall interfere with any rights or powers conferred upon a municipality in respect of the use of water for municipal purposes;

(c) shall interfere with any rights or powers of any board or commission that is performing its functions for or on behalf of the Government of Ontario; or

(d) shall interfere with any rights or powers under the Electricity Act, 1998 or the Public Utilities Act, 1998, c. 15, Sched. E, s. 3 (8); 1998, c. 18, Sched. I, s. 12.

Activities under the Aggregate Resources Act

(11) A requirement for permission of an authority in a regulation made under clause (1) (b) or (c) does not apply to an activity approved under the Aggregate Resources Act after the Red Tape Reduction Act, 1998 received Royal Assent. 1998, c. 18, Sched. I, s. 12.

From: Fred Natolochny
Sent: Monday, April 29, 2019 3:38 PM
To: Melissa Larion; Beth Brown
Subject: FW: C6798: Proposed Telecommunications Tower 4638 Sideroad 20 North Puslinch
Importance: High

Any comments?

From: j_mckay@rogers.com [mailto:j_mckay@rogers.com]
Sent: April 29, 2019 2:40 PM
To: Fred Natolochny; 'Lynne Banks'; 'Jameson Pickard'
Cc: Courtenay Hoytfox
Subject: C6798: Proposed Telecommunications Tower 4638 Sideroad 20 North Puslinch
Importance: High

Dear Fred,

We acknowledge your notification from the GRCA that this site requires review and permitting. As you may not be aware, proposed federal undertakings of telecommunication towers and associated areas of development are exempt from review and permitting from the provincial conservation authorities in accordance with the *Conservation Authorities Act*, R.S.O 1990, C.27.

In the case that the Applicant's Site Plan overlaps areas under provincial regulatory controls (O. Reg 150/06), the Applicant's Site Plan is designed for compatibility with these regulations in accordance with industry standards, but ISED Canada has strict approval authority for the Plan, as otherwise valid municipal and provincial regulatory bylaws and controls purporting to regulate a federal undertaking are read down under the provisions of interjurisdictional immunity.

Further, as the Site Plan Approval falls strictly within ISED Canada jurisdiction, the applicant is exempt from Planning Act/ Site Plan Controls and the GRCA is a commenting body only, to the Applicant and ISED Canada.

As a federal telecommunications undertaking, the site falls within the federal jurisdiction of CEEA (2012). With respect to your comment regarding the potential impacts of radiocommunication towers on the environment, only the radiocommunication antenna and supporting structures that are part of or incidental to projects that are designated by the *Regulations Designating Physical Activities* or otherwise designated by the Minister of the Environment as requiring an environmental assessment would be subject to the *Canadian Environmental Assessment Act, 2012*. In addition, where ISED Canada (IC) approves a radiocommunication antenna and supporting structure on federal lands, it is subject to a determination by IC that the structure will not cause significant adverse environmental affects.

The Act and Regulations, which were introduced in July of 2014 and can be found at the following link <http://www.ceaa.gc.ca/default.asp?lang=En&n=9EC7CAD2-1> were introduced to ensure the continued protection of the environment while providing an overall benefit to Canadian businesses and industry stakeholders. They will result in federal environmental assessments that focus resources on large projects rather than the small, routine projects that often have little or no environmental impact and that are typically subject to other regulatory mechanisms.

Projects which require EIS/EA are discussed here: <https://laws-lois.justice.gc.ca/eng/acts/C-15.21/page-3.html#h-8>

Please confirm with GRCA's Regulations Analyst/Official that this is correct.

Regards,

Jeff McKay CFP CIM FMA FCSI MBA
Site Acquisition Specialist
Rogers Communications Inc.
☎ Cell: (519) 566-9267
✉ eMail: j_mckay@rogers.com

From: Fred Natolochny <fnatolochny@grandriver.ca>
Sent: April 29, 2019 11:42 AM
To: Jeff McKay <j_mckay@rogers.com>; Lynne Banks <lbanks@puslinch.ca>; Jameson Pickard <jamesonp@wellington.ca>
Subject: Proposed Telecommunications Tower 4638 Sideroad 20 North Puslinch

The site shown is immediately adjacent to a wooded area containing a Provincially Significant Wetland. The compound appears to be proposed approximately 25 metres from the wetland. Provincial and County policy suggests that an Environmental Impact Study should be undertaken to ensure no negative impacts to the adjacent Natural Heritage feature(s).

A permit will be required from the GRCA at the time of construction as the site is within the area regulated under O. Reg. 150/06.

From: Jeff McKay [mailto:j_mckay@rogers.com]
Sent: April 29, 2019 8:53 AM
To: nlecic@puslinch.ca; choytfox@puslinch.ca; lbanks@puslinch.ca; mfowler@puslinch.ca; gmoore@puslinch.ca; lgomes@puslinch.ca; jseeley@puslinch.ca; jgoyda@puslinch.ca; jsepulis@puslinch.ca; kroth@puslinch.ca; mbulmer@puslinch.ca; John.morrissey@ontario.ca; Fred Natolochny; curtism@wellington.ca; mreid@get.on.ca
Cc: Industry Canada (CWOD); Jonathan Bergen; Zachary Baum
Subject: Rogers C6798 "Southgate & Clair" (Puslinch); Notice of Proposed Telecommunications Tower to commenting bodies

Please note that you are included in the notification list as a commenting body to the Township of Puslinch and ISED Canada for the subject telecommunications tower. Site Plan control and approval falls within ISED Canada jurisdiction.

Any comments you wish to make on the application are due no later than May 29, 2019 to the Applicant at j_mckay@rogers.com.

Public Notification Packages will be mailed today, April 29, 2019, to property owners within the stipulated consultation radius.

Best Regards,

Jeff McKay CFP CIM FMA FCSI MBA
Site Acquisition Specialist
Rogers Communications Canada Inc.
☎ Cell: (519) 566-9267
✉ eMail: j_mckay@rogers.com

Detailed Steps of the Candidate Selection process

- 1) The Carrier's responsible *Network Planner* issues a Land Acquisition Spec that identifies a **general area** for which coverage is deficient in meeting the Carrier's coverage mandate as defined by the Telecommunications Act. The initial basis of this proposed location is generally equidistant spacing between the existing nearest facilities of the Carrier, in order to minimize / eliminate coverage overlap on one side of the cell, together with eliminating the comparable associated deficiency on the opposite side of the cell. Most often, deficiencies are evidenced by large numbers of subscriber service complaints.
- 2) Approximate GPS coordinates are provided to the responsible *RF Engineer*, who issues an initial Search Area Map (SAM). The RF Engineer determines the structure height in order to best fill the gap between existing facilities. The RF Engineer does not perform detailed review of potential candidates and the associated coverage attainment at the point of Search Map creation, but rather, waits until a primary candidate is submitted for coverage analysis.
- 3) The *Site Acquisition Specialist (SAS)* is contracted to acquire the location that best meets the coverage objective, in view of all considerations; one of which is the Search Map.
- 4) The SAS performs detailed property reviews for potential candidates in and around the general area defined by the Search Map and submits the best initial candidate for detailed study of signal coverage plots to the RF Engineering department. While there are many factors that make up a site that can be built, **coverage is the primary and absolutely necessary requirement**, as an adjustment of even 50m to the location can sterilize the site. The proponent **must** optimize the technical siting to achieve and optimize the coverage objective. Once this is done, the secondary requirements are analysed. **The SAS must obtain clearance from RF and Planning by way of a formal pre-qualification, certifying that the required coverage objective is met** before proceeding with the project development.
- 5) ***If the resulting coverage plots indicate that coverage is neither optimal nor acceptable to support the business case to erect the facility at the candidate location, the coverage plots are used to identify the location that does meet the coverage objective. In this case, the Search Map is replaced by the signal coverage plots to pinpoint an acceptable final location.***
- 6) With an acceptable (RF/TX Qualified) location defined, the SAS then reviews all available properties that appear to best meet all considerations of siting. These include:
 - a) Commercial availability of property. The Landlord must be a willing participant to enter into a lease for the proponent's site/compound.
 - b) Compliance with siting guidelines defined by the governing protocol, including but not limited to:
 - i) Exclusion / disqualification of any available co-location or existing structure options
 - ii) Compliance with zoning conformity favoring industrial, commercial or agricultural-zoned property
 - iii) Mitigation of the total number of residential-use properties within the industry guideline impact zone of 3x tower height
 - iv) Mitigation of visual issues of concern by utilizing natural and other features to obscure tower visibility in the best manner possible, and where available to do so
 - v) Compliance with health (SC6) limits, such that the tower does not represent a health risk to any member of the public at any accessible location
 - vi) Avoidance of natural and heritage features within the proponent's Site Plan area

- vii) Subscriber density: The proponent does not build towers to cover empty land or yet undeveloped lands with future potential. Facility costs must be recovered by subscriber fees such that they meet the minimum business terms of the Carrier.
- c) Compliance with engineering and site technical standards required to ensure a site can be built, which include:
 - i) Sufficient space to erect a compound allowing enough space for foundation design
 - ii) Legal access to site for utilities/ fibre and laneway
 - iii) Financially feasible costs of erection considering the local environment
 - iv) Stable soils
 - v) Elevation and avoidance of property with large grade changes
- d) The proponent's obligations are not absolute; they must secure and defend the site which, at a minimum, meets the technical requirements and further mitigates all factors of local concern to the greatest extent possible without violating the technical constraints of required coverage.
- e) The municipality has no jurisdiction over the siting (in particular, the facility location) in recognition that facilities must be situated where they fulfil the coverage mandate as authorized under the Constitution Act S. 91 and 92(10)a, and the Telecommunications Act as a necessary infrastructure project for the public good. In infrastructure undertakings it is recognized that there are often few projects that generate no public concern or comment. The proponent's obligation is to do and defend its actions as the best it can do in consideration of the local environment. The proponent cannot change the local environment.

Commercial / Industrial Land Use Opportunities east of the Hanlon Expressway:

The Township of Puslinch has asked that the proponent provide its candidate review information for properties which may be commercially available, and located east of the Hanlon in the Southgate Business Park.

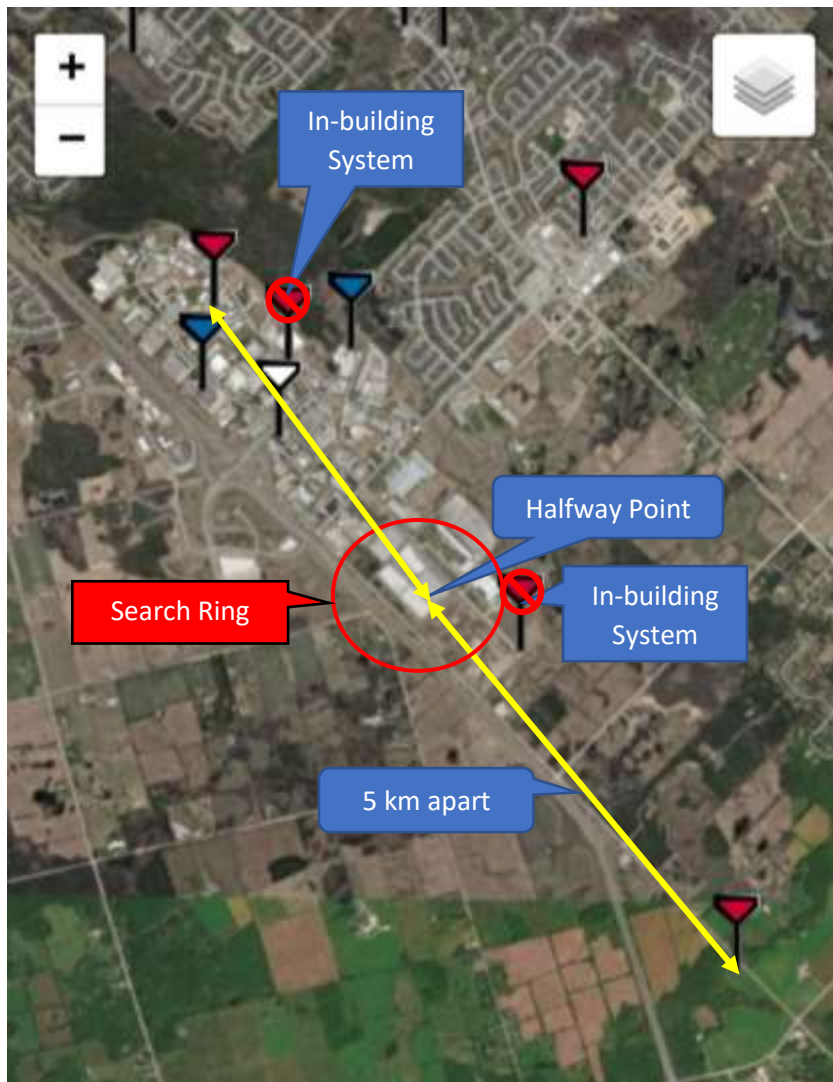
It is important to understand that facility siting is not done by an analysis of commercial opportunities, and this is growing particularly important as mature networks are being densified to meet future bandwidth requirements of new technology, where search areas are much more exacting to avoid overlap and deficiency. While past practice with (typically) analog technology often allowed much greater leeway in tower siting, today's coverage radii are much smaller such that a match between particular real estate opportunities and coverage requirements can seldom now be met.

This report contains the exhibits for each of the properties east and northwest of the Hanlon that were reviewed and determined to be unsuitable for the proponent's use.

Establishment of the initial Search Area Map

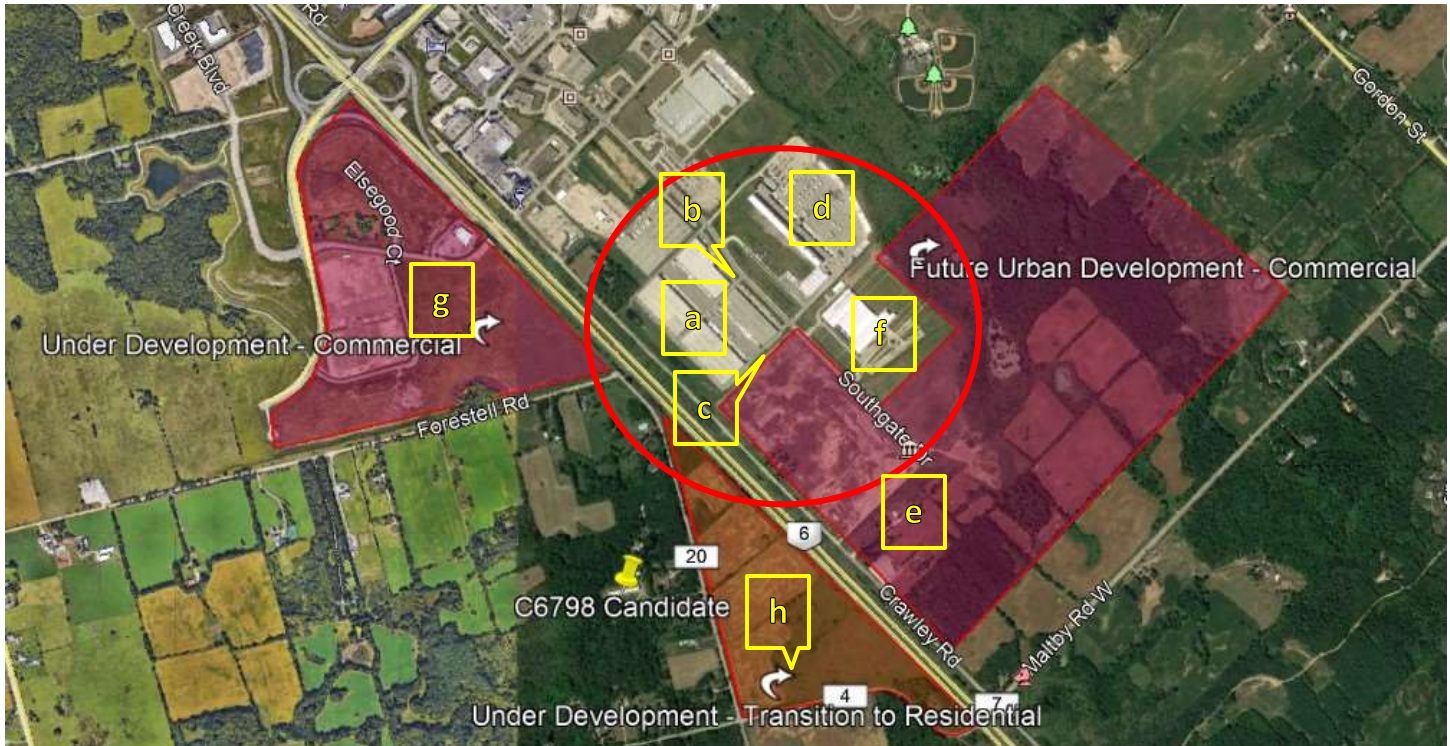
A Search Area Map is created by the responsible RF Engineer, generally finding the halfway point between existing telecommunication towers. In particular, the nearest towers belong to Rogers and consist of a self-support tower to the North and a guyed tower to the South. The distance between these towers is 5km (yellow arrow below). The Search Area Map provided proposed a small initial search area (red circle) 2.5km away from each existing tower.

Existing signal density/coverage levels are not verified/confirmed until an initial/primary candidate is presented to RF for a pre-qualification clearance. Accordingly, the SAM coordinates may change after this analysis is done. This is in fact the case with this site. (After technical review, the search centre was moved southwest)



Potential Siting Location Options Based on Initial Search Map Area

The diagram below shows the initial Search Area in the context of the local environment. All



properties within this area were reviewed for existing technical/signal coverage and civil / real estate qualification potential.

Candidate Summary

Candidate 1 - Nomantel

- a) This large property in the middle is part of Southgate Business Park. After a study of the property was conducted it was determined that there is insufficient space for a tower to be located anywhere on this property. The proponent requires a 15m x 15m compound space.
- b) There is a storm water management system on the southwest side of the property that provides no siting opportunity. A small block in the southwestern-most corner was reviewed and determined to lack sufficient space and includes a material grade change not conducive to the compound.
- c) On the northeast border of the property there is another strip of buffer land. This is too close to maintain minimum setbacks from the primary hydro line and has inadequate space for the tower and compound.

Candidate 2 – RBI / TDL

- d) A potential candidate identified was the RBI plaza on the northeast edge of the Search Map. This candidate supports the commercial opportunity and has availability of sufficient compound space but fails qualification on the technical coverage requirement.

Candidate 3 – MRE / MGS

- e) The MRE property has been recently sold for future commercial development. This property will not be developed until sometime in the future. This puts it outside the time horizon of the proponent. Generally, a tower lease on new property conflicts with highest and best use objectives for commercial development and no surplus lands are likely when this property develops. Furthermore, the proponent does not build facilities in advance of the development occurring.
- f) The MGS Guelph Data Centre is located East of RBI buildings. This property is a highly secured facility with an existing tower of insufficient height to meet the proponent’s coverage requirement.

Candidate 4 – Guelph Land Holdings

- g) Located West of Hanlon Pkwy and North of Forestell Rd there is an area of commercial-zoned land currently under development and already fully covered to acceptable signal levels. There is neither a requirement for increased coverage, nor any siting options that would meet the proponent’s requirements anywhere in this area. Accordingly, no further real estate/civil review was conducted for this area.

Candidate 5 - McEnergy

- h) This property was recently sold, and we understand from our discussion with the owner the intention is to transition it to future residential use. There is neither a commercial opportunity, nor compliance with the telecom facility siting guidelines available on this property. Moreover, the property area is fully covered by existing excellent signal density levels.

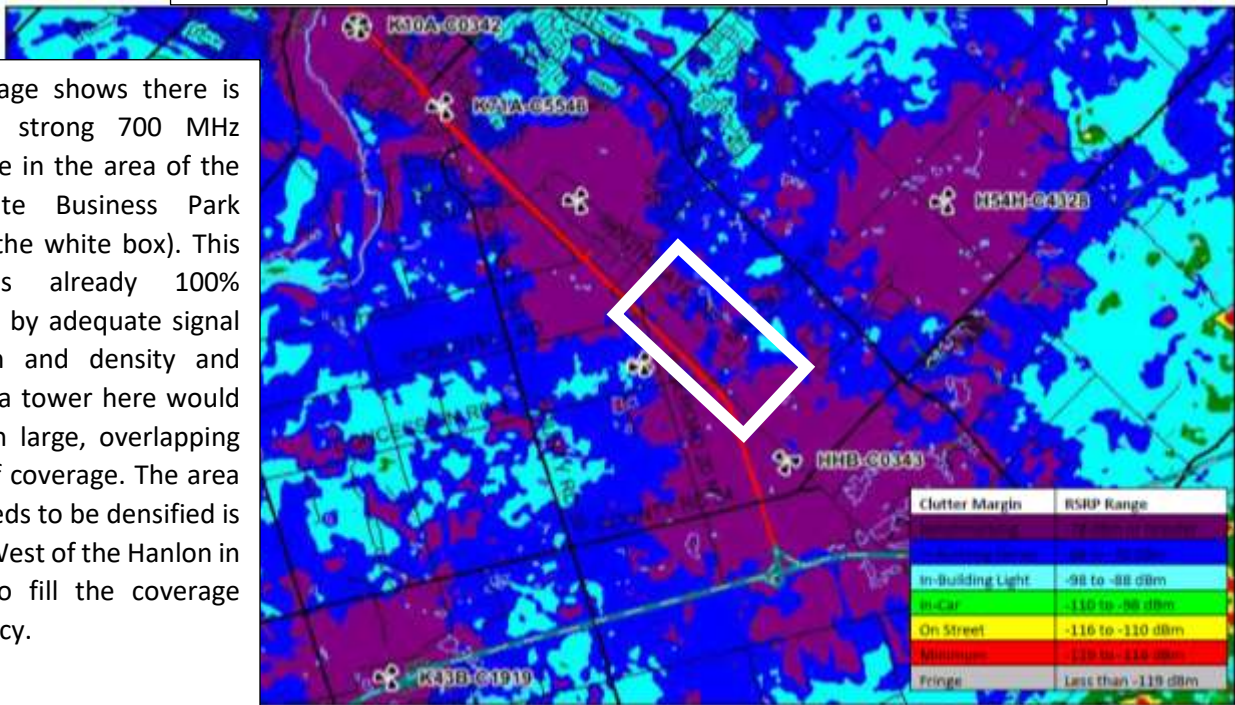
Analysis of Existing Local Area Signal Coverage

The following scatter plots demonstrate existing wireless coverage in the local area. These plots are generated by the RF engineers using industry standard software and systems and show pictorially exactly the levels of signal density experienced in this area. Coverage is demonstrated in colour ranges that represent different service coverage levels in accordance with the following chart/legend. The highest band in the chart represents the greatest coverage attained.

Clutter Margin	RSRP Range
Benchmarking	-78 dBm or Greater
In-Building Dense	-88 to -78 dBm
In-Building Light	-98 to -88 dBm
In-Car	-110 to -98 dBm
On Street	-116 to -110 dBm
Minimum	-119 to -116 dBm
Fringe	Less than -119 dBm

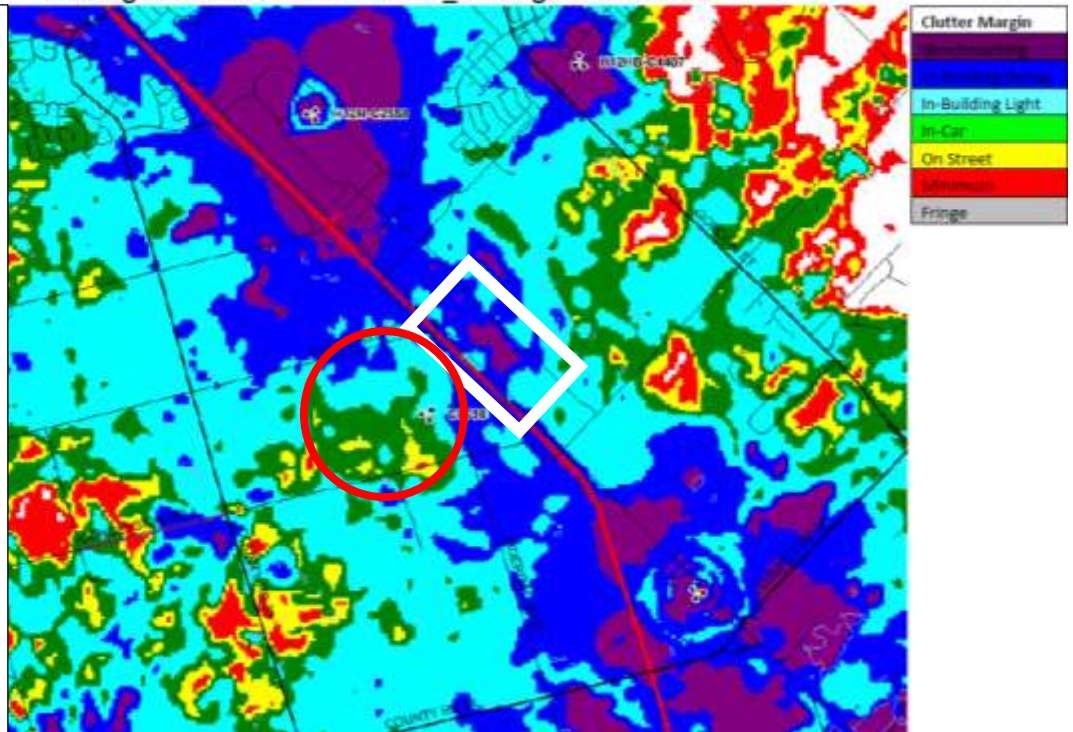
Existing 700 MHz LTE RSRP Plots for C6798 – Southgate & Clair Rd

This image shows there is existing strong 700 MHz coverage in the area of the Southgate Business Park (inside the white box). This area is already 100% covered by adequate signal strength and density and placing a tower here would result in large, overlapping areas of coverage. The area that needs to be densified is in fact West of the Hanlon in order to fill the coverage deficiency.



Existing LTE RSRP Plots for C6798_Southgate & Clair Rd

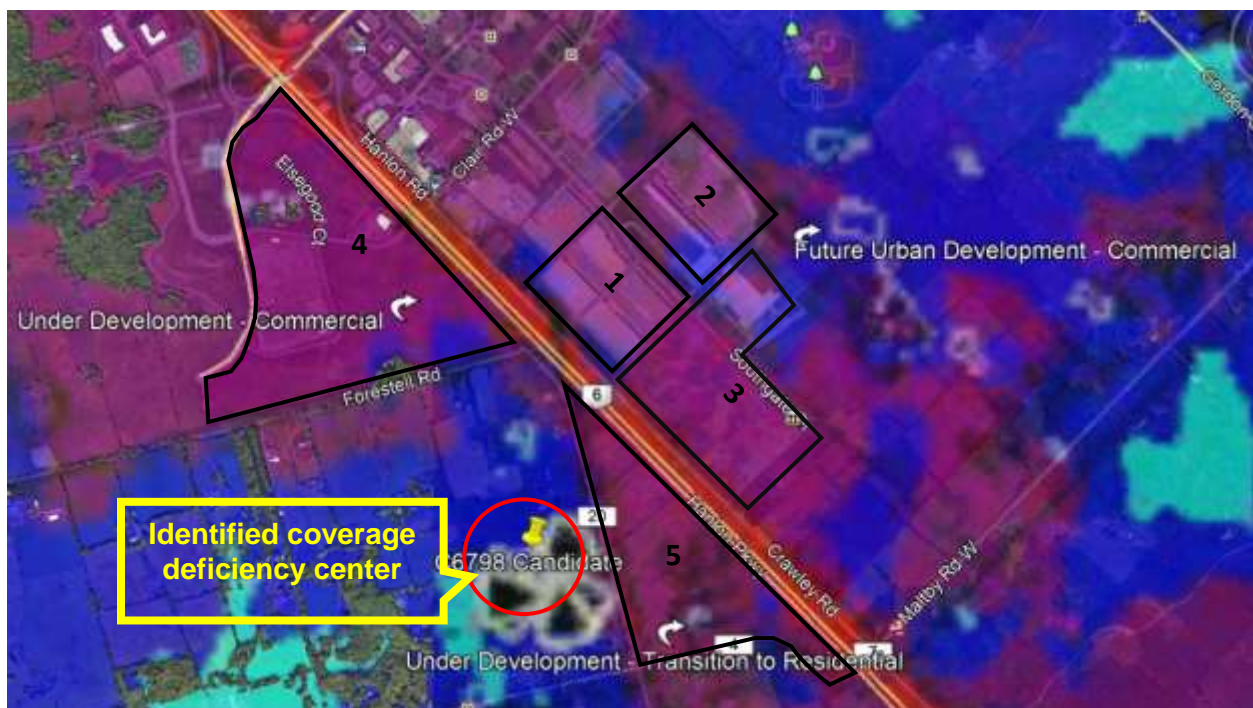
Similarly, this image shows there is existing strong 1200 MHz coverage in the developed area of the Southgate Business Park (inside the white box). This area is already 100% covered by adequate signal strength and density and placing a tower here would result in large, overlapping areas of coverage. **The area that needs to be densified is even more apparent in the 2100 MHz band and appears as the green/yellow/red overlay to the left of the white box, within the red circle.**



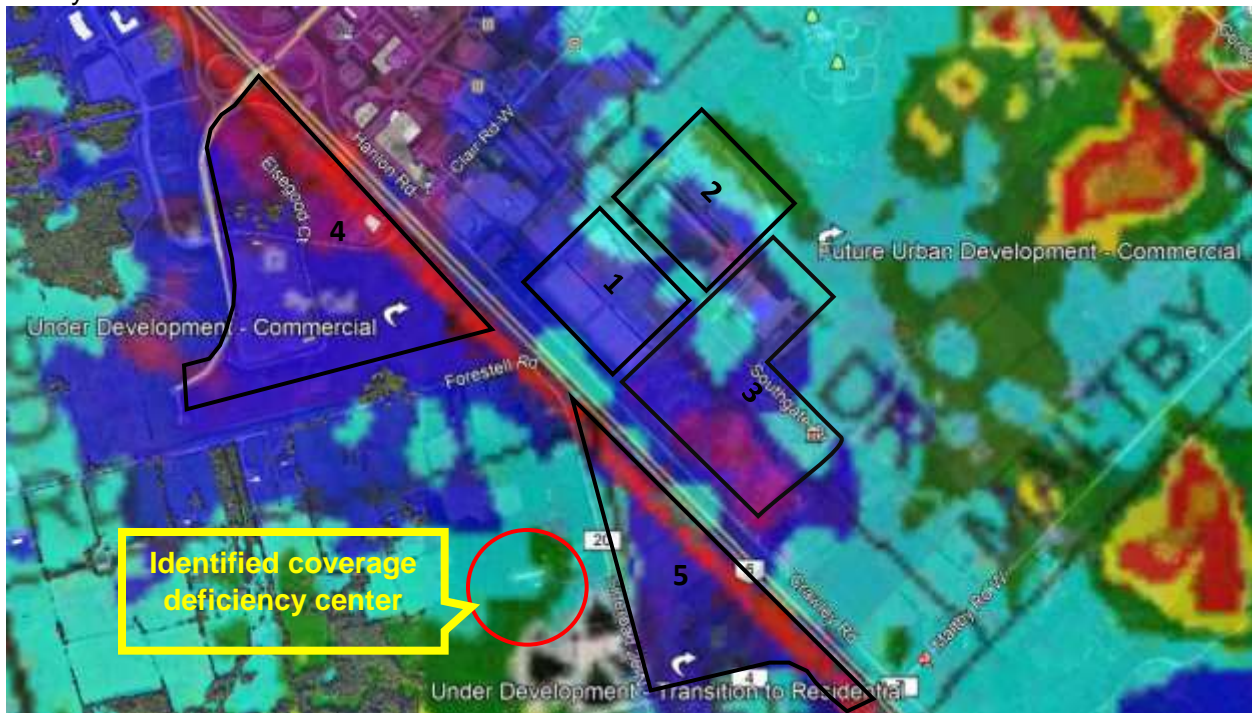
Existing Signal Coverage at Local Property Level

Now overlaying the coverage plots over the property maps, we can see definitively the current signal levels evidenced at local properties which have been considered as potential candidates in the Southgate Business Park area east of the Hanlon. The first plot is the proponent's 700 MHz LTE band.

It can be seen that there is excellent signal density existing at each of the candidate properties east of the Hanlon such that a new facility is unwarranted and cannot be qualified. This signal ranges from a minimum of -88 dBm to -78 dBm or greater.



Similarly, for 2100 MHz, it is seen that there is existing coverage no worse than *in-building light* for the area representing the subscriber base. The area showing in green/yellow/red to the east is not yet developed and accordingly is not intended to be addressed by the current required facility.



Again, it can be seen clearly that the coverage deficiency exists west of the Hanlon, south of Forestell Rd. A facility at that location will both meet the coverage requirement as defined herein and boost the existing coverage east of the Hanlon to consistently better than -88 dBm. A facility in the Southgate Business Park will not.

Coverage Conclusion

This report demonstrates that candidate locations within the initial Search Area do not meet the proponent's technical coverage requirements. A tower cannot be justified where 60% or more of the signal overlaps existing coverage areas.

Accordingly, after detailed review, it has been determined that in order to meet the technical requirements, a candidate is required west of the Hanlon, south of Forestell Rd.

This is where the proponent's selected candidate is located.

Candidate Specific Information

Candidate 1: Nomantel GP (Southgate Business Park)

GeoWarehouse Address 945 SOUTHGATE DRIVE, GUELPH	Ownership Type Freehold	Registration Type Certified (Land Titles)
Land Registry Office Wellington (61)	Land Registry Status Active	PIN 711990117
Owner Names NOMANTEL GP INC.		
GeoWarehouse Address 935 SOUTHGATE DR, GUELPH, N1L0B9	Ownership Type Freehold	Registration Type Certified (Land Titles)
Land Registry Office Wellington (61)	Land Registry Status Active	PIN 711990118
Owner Names NOMANTEL GP INC.		

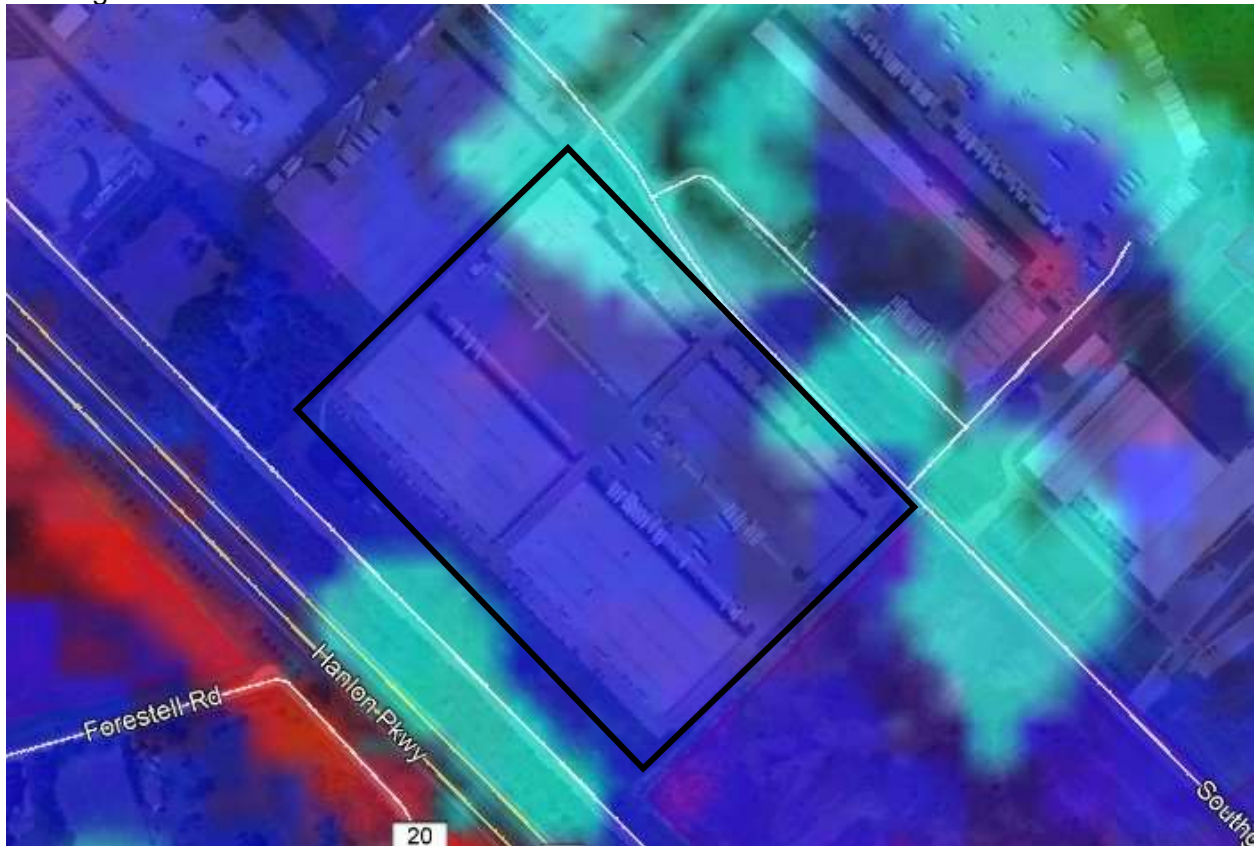
Technical coverage Analysis and Site Suitability:

Existing 700 MHz LTE RSRP Coverage



This plot overlay clearly demonstrates that a facility in this location is redundant.

Existing 1200 MHz LTE RSRP



This plot overlay clearly demonstrates that a facility in this location is redundant.

There is adequate existing coverage centering directly on this property. This coverage provides a level of signal density for the local environment of -88dBm or better. It is visible from the coverage plots that a facility placed on this property would essentially have a wasted coverage overlap of some 70% or greater. **Accordingly, a new facility does not meet the technical requirements and cannot be qualified for this location, irrespective of whether there are real estate siting opportunities.**

Property Civil / Real Estate Review, Nomantel Candidate (1):



There is insufficient space for a tower to be located on this property (compound size is 15m by 15m). In particular, section a) is a truck access route. A compound here would obstruct the flow of vehicular traffic. Section b) and c) are too close to maintain minimum primary hydro setbacks and have inadequate space for the tower and compound. Section d) is a very small strip of land on the edge of the property. The land is on a slope change and has inadequate space. Section e) is used for storm water management. There is insufficient space, plan conformance deficiency and no access is permitted here. Section f) is a drainage/access spur to the surge pond area, and lastly section g) (flagpole block) lacks enough space.

All potential siting opportunities on this property have been Real Estate / civil disqualified for insufficient space, grade change, hydro line setbacks, Storm Water Management O.Reg 179/06 overlap or interference with vehicular movement provisions.

Candidate 2: RBI /TDL Group Corp.

GeoWarehouse Address
950 SOUTHGATE DR, GUELPH, N1L1S7

Ownership Type
Freehold

Registration Type
Certified (Land Titles)

Land Registry Office
Wellington (61)

Land Registry Status
Active

PIN
711990069

Owner Names
THE TDL GROUP CORP.

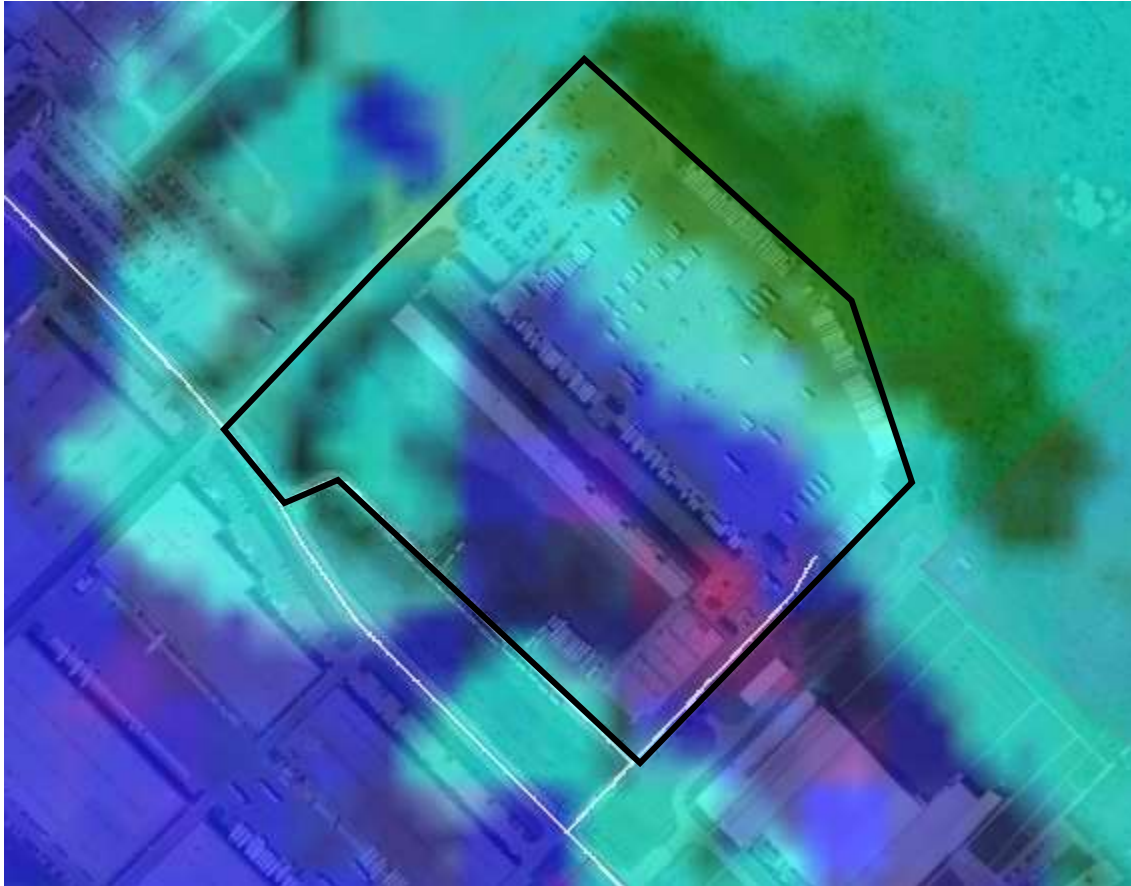
Technical coverage Analysis and Site Suitability

Existing 700 MHz LTE RSRP Coverage



This plot overlay clearly demonstrates that a facility in this location is redundant.

Existing 1200 MHz LTE RSRP Coverage



This plot overlay clearly demonstrates that a facility in this location is redundant.

There is adequate existing coverage on this property. Furthermore, the location of this property does not satisfy coverage requirements, as it is too far northeast. Siting a tower at this location would overlap large areas of existing coverage, while provide sparse areas meaningless coverage. **Accordingly, a new facility does not meet the technical requirements and cannot be qualified for this location.**

Property Civil / Real Estate Review; RBI /TDL Group Candidate (2):



There are potential candidate options on the property that would meet the civil requirements for adequate compound space. Both options a) and b) provide sufficient space and maintain suitable setbacks from hydro, along with residential or sensitive use areas. Option c) however, is used for storm water management and would not allow for a tower to be placed here, so has been disqualified.

After reviewing both the technical coverage analysis and civil / real estate it becomes apparent that even though this candidate supports the commercial opportunity, it does not satisfy the coverage requirement, and has been disqualified.

Candidate 3: MRE Gon Corp. and MGS Guelph Data Centre

GeoWarehouse Address
GUELPH

Ownership Type
Freehold

Registration Type
Certified (Land Titles)

Land Registry Office
Wellington (61)

Land Registry Status
Active

PIN
711990172

Owner Names
MRE GON CORP.

GeoWarehouse Address
1000 SOUTHGATE DR, GUELPH, N1L1S7

Ownership Type
Freehold

Registration Type
Certified (Land Titles)

Land Registry Office
Wellington (61)

Land Registry Status
Active

PIN
711990077

Owner Names

HER MAJESTY THE QUEEN IN RIGHT OF ONTARIO AS REPRESENTED BY THE MINISTER OF ENERGY AND INFRASTRUCTURE

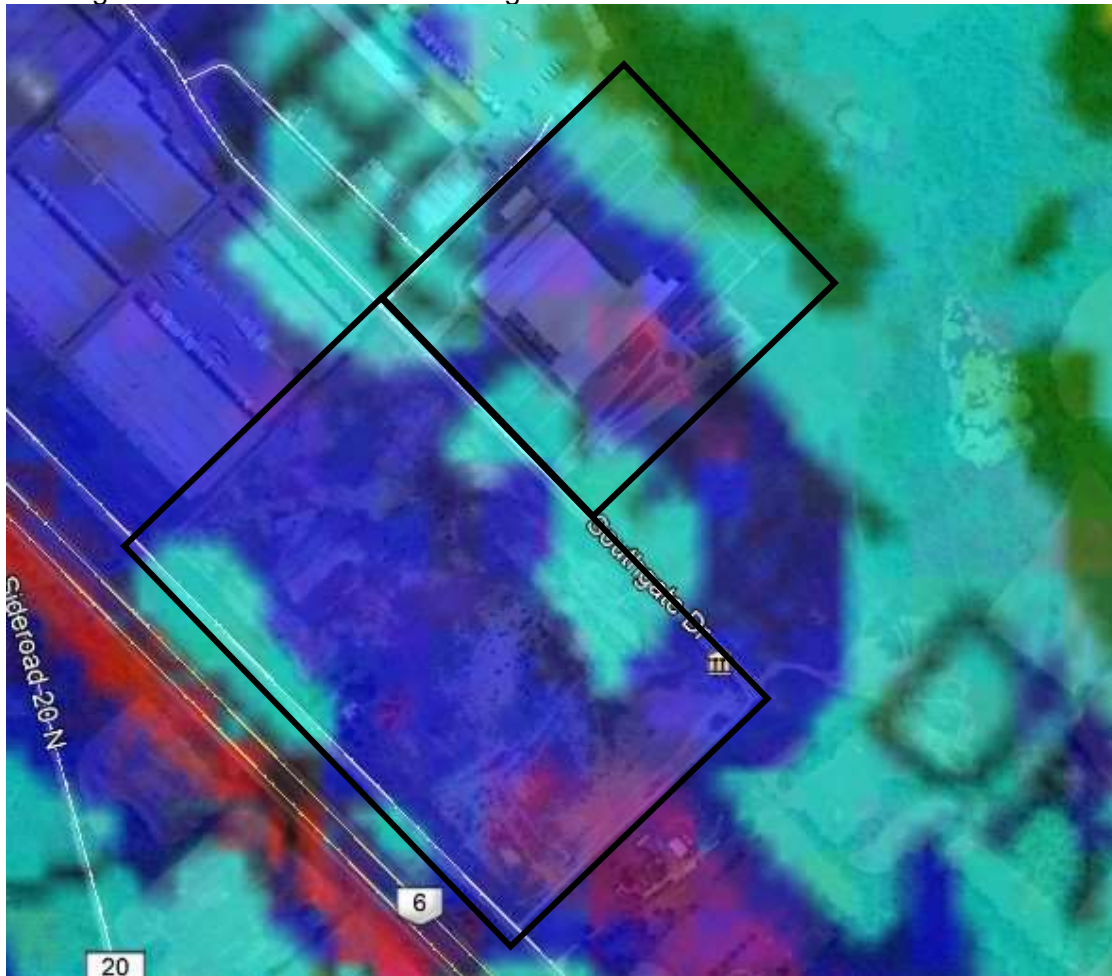
Technical coverage Analysis and Site Suitability

700 MHz LTE RSRP Coverage



This plot overlay clearly demonstrates that a facility in this location is redundant.

Existing 1200 MHz LTE RSRP Coverage



This plot overlay clearly demonstrates that a facility in this location is redundant.

On each of the identified properties there is adequate existing coverage centering directly on these properties. A facility placed on this property would essentially have a large wasted coverage overlap. The property on the top, MGS Guelph Data Centre is situated too far north to meet current coverage requirements and would result in large overlaps of coverage. **Accordingly, a new facility does not meet the technical requirements and cannot be qualified for this site.**

Property Civil / Real Estate Review; MRE Gon Corp. and MGS Candidate (3):



Property a, The MGS Guelph Data Centre is a highly secured facility with an existing tower on their property. This tower is of insufficient height to support the proponent's coverage requirement and falls within a currently well-served coverage area. Property b, currently owned by MRE Gon Corp. has recently been sold for future commercial development. A tower lease on new property generally conflicts with highest and best use objectives for commercial development and no surplus lands are likely when this property develops. This currently represents undeveloped land which does not offer a real estate/commercial opportunity within the proponent's time horizon.

All potential siting opportunities on this property have been disqualified for failing to address the coverage requirement and falling outside of the area of existing subscriber base.

Candidate 4: Guelph Land Holdings Inc.

GeoWarehouse Address
GUELPH

Land Registry Office
Wellington (61)

Owner Names
GUELPH LAND HOLDINGS INC.

Ownership Type
Freehold

Land Registry Status
Active

Registration Type
Certified (Land Titles)

PIN
712000279

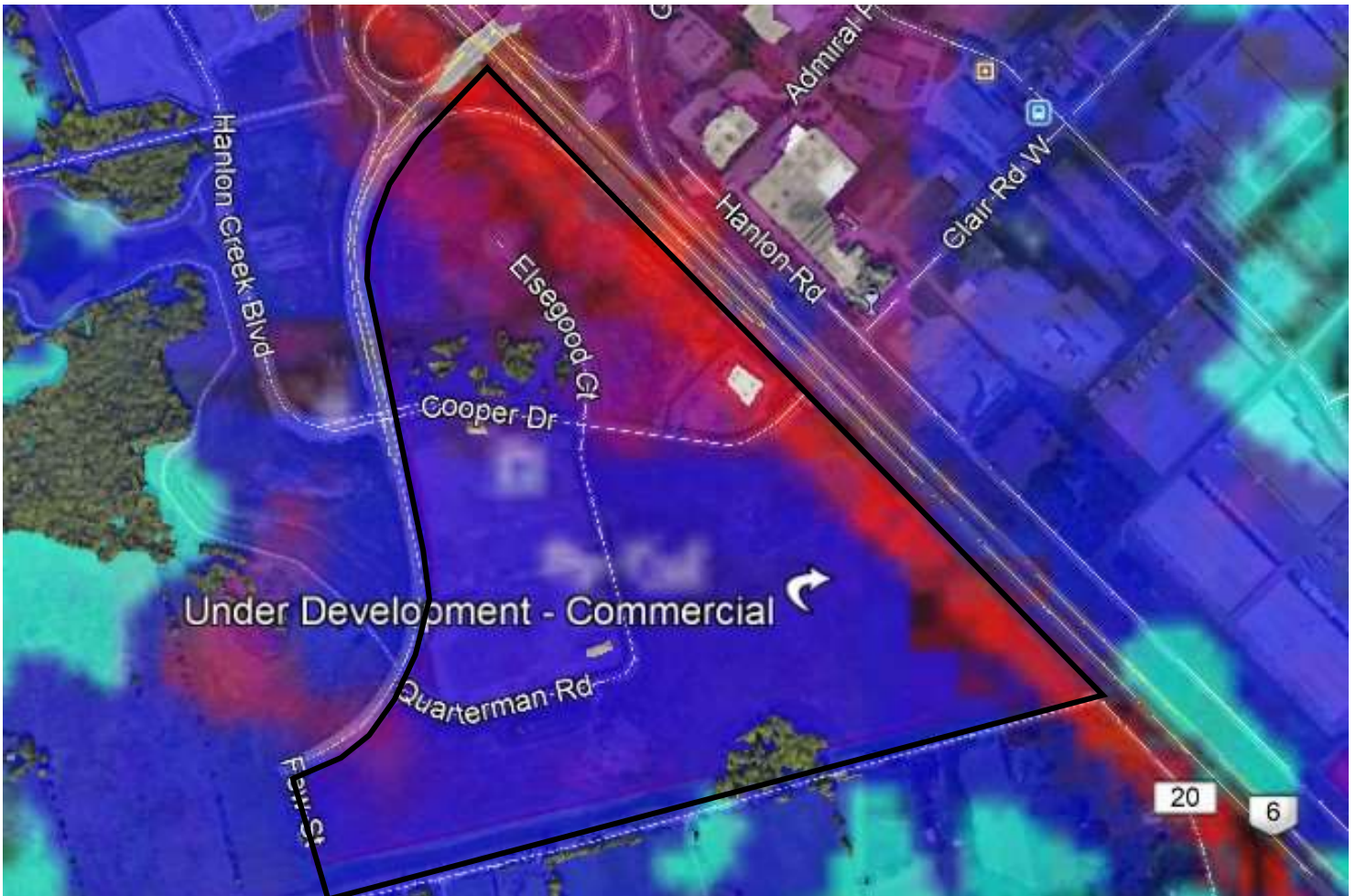
Technical coverage Analysis and Site Suitability

Existing 700 MHz LTE RSRP Coverage



This plot overlay clearly demonstrates that a facility in this location is redundant.

Existing 1200 MHz LTE RSRP Coverage



This plot overlay clearly demonstrates that a facility in this location is redundant.

There is significant existing coverage centering directly on this property. This coverage provides a level of signal density for the local environment of -88dBm or better. Siting a tower at this location would fail to meet the coverage objective for the new facility as it would overlap large areas of existing coverage. **Accordingly, a new facility does not meet the technical requirements and cannot be qualified for this location.**

Property Civil / Real Estate Review; Guelph Land Holdings Candidate (4):



This property, located West of Hanlon Pkwy and North of Forestell Rd is currently owned by Guelph Land Holdings Inc. This is an area of commercial-zoned land currently under development. Detailed real estate / civil review has not been conducted for this area as it is outside of the planned facilities coverage area.

All potential siting opportunities in this area have been disqualified for technical insufficiency, in that there is currently acceptable coverage in the entire local area.

Candidate 5: McEnergy Industries Limited; Karalee Developments Limited

GeoWarehouse Address
4631 SIDEROAD 20 N, TOWNSHIP OF PUSLINCH

Ownership Type
Freehold

Registration Type
Certified (Land Titles)

Land Registry Office
Wellington (61)

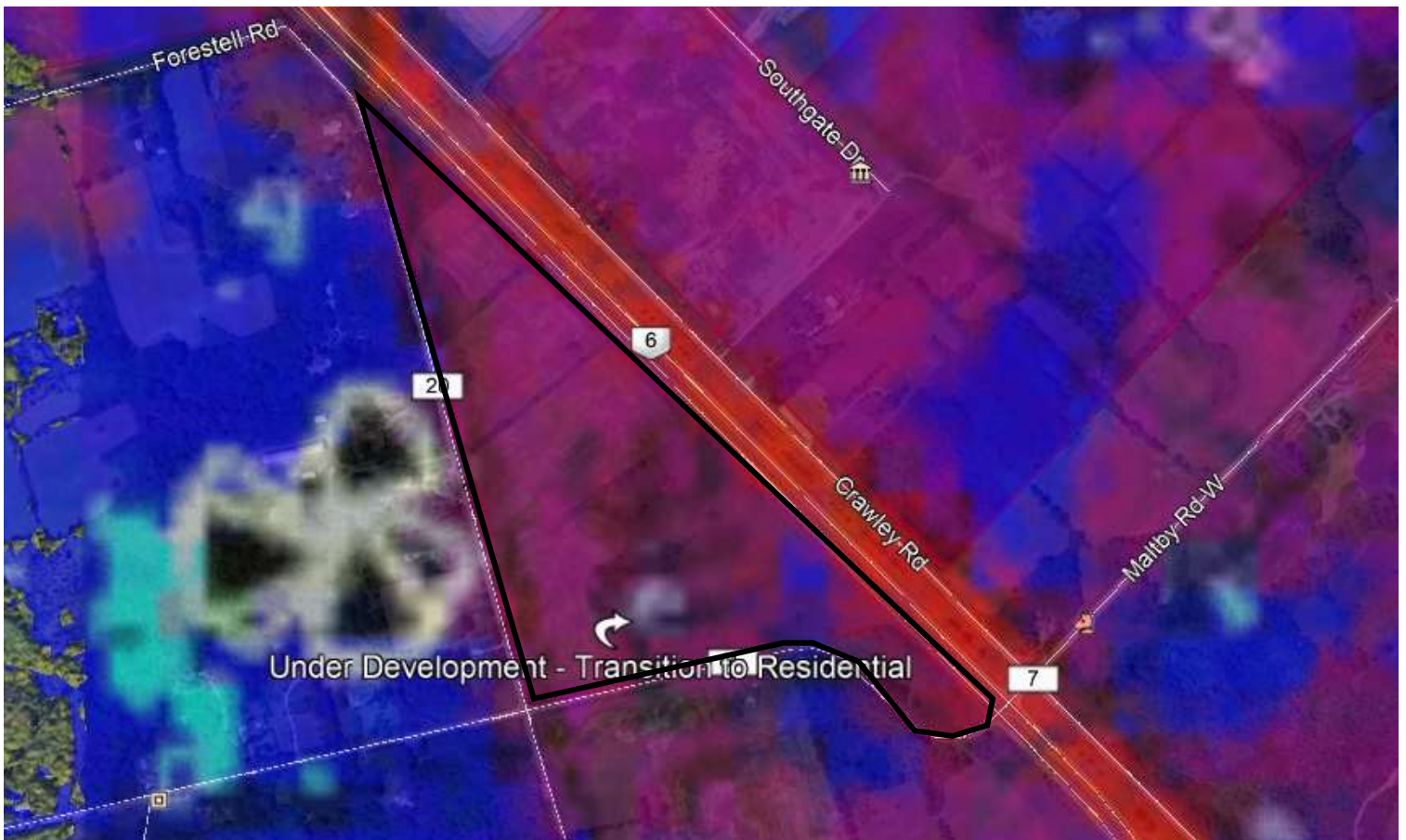
Land Registry Status
Active

PIN
712000041

Owner Names
MCENERY INDUSTRIES LIMITED; KARALEE DEVELOPMENTS LIMITED

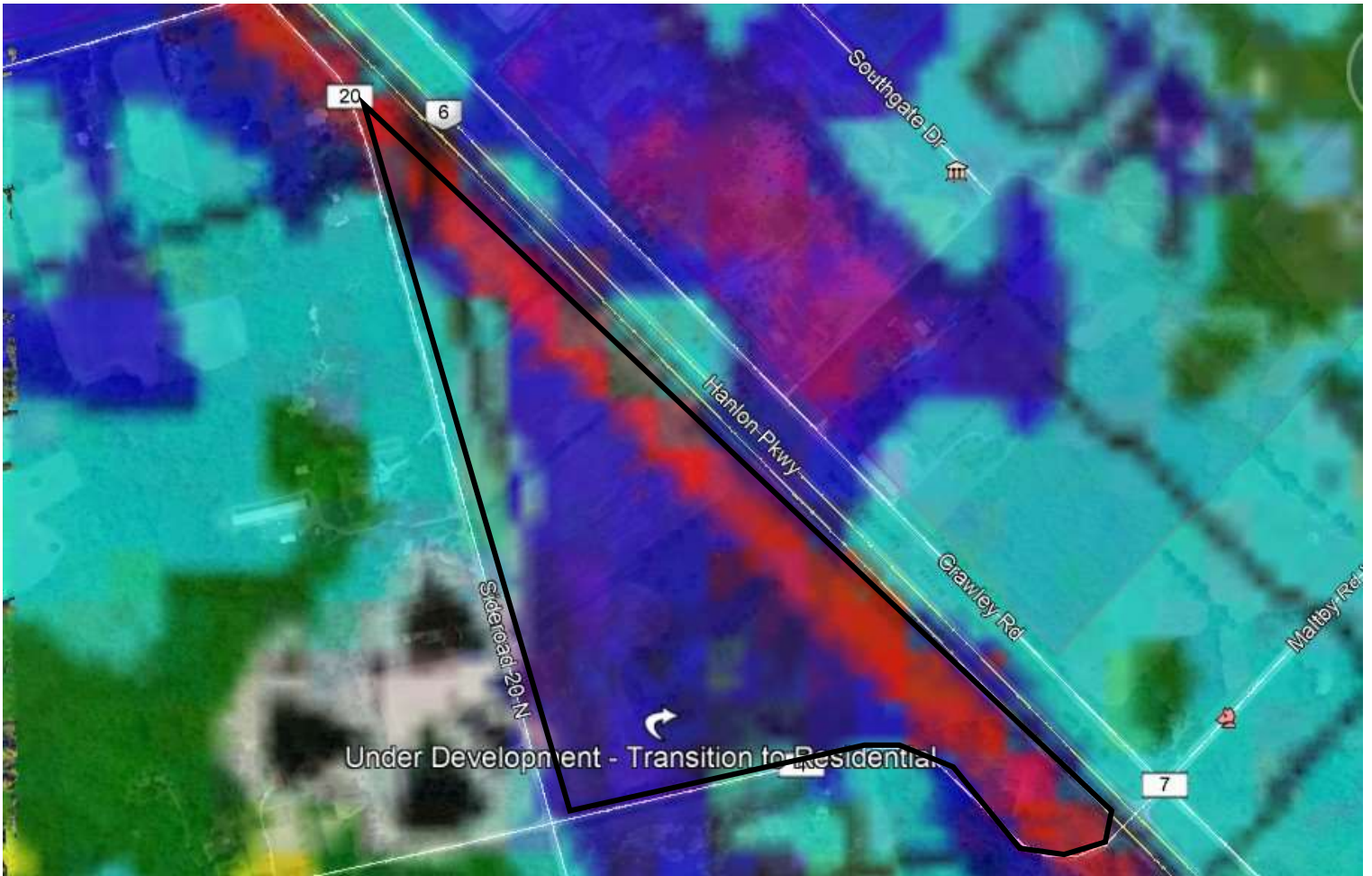
Technical coverage Analysis and Site Suitability:

Existing 700 MHz LTE RSRP Coverage



This plot overlay clearly demonstrates that a facility in this location is redundant.

Existing 1200 MHz LTE RSRP Coverage



This plot overlay clearly demonstrates that a facility in this location is redundant.

There is adequate existing coverage on this property. It is visible from the coverage plots that a facility placed on this property would essentially have a wasted coverage overlap of some 70% or greater. **Accordingly, a new facility does not meet the technical requirements and cannot be qualified for this site.**

Property Civil / Real Estate Review:

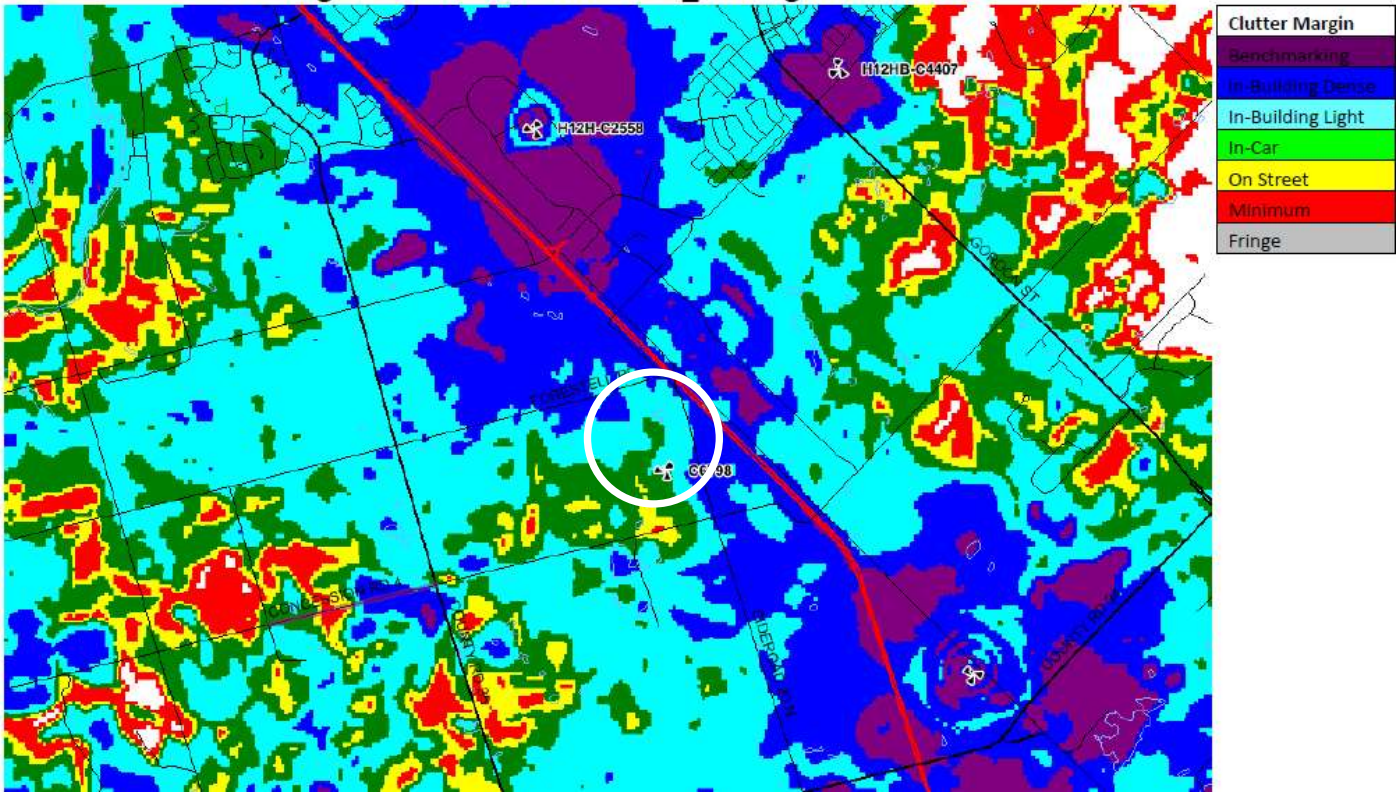


This plot of land is currently owned by McEnery Industries Limited and Karalee Developments Limited. This is an area of agricultural-zoned land for which the owner's intent is a transition to residential.

All potential siting opportunities on this property have been disqualified for technical insufficiency and incompatibility with future land use.

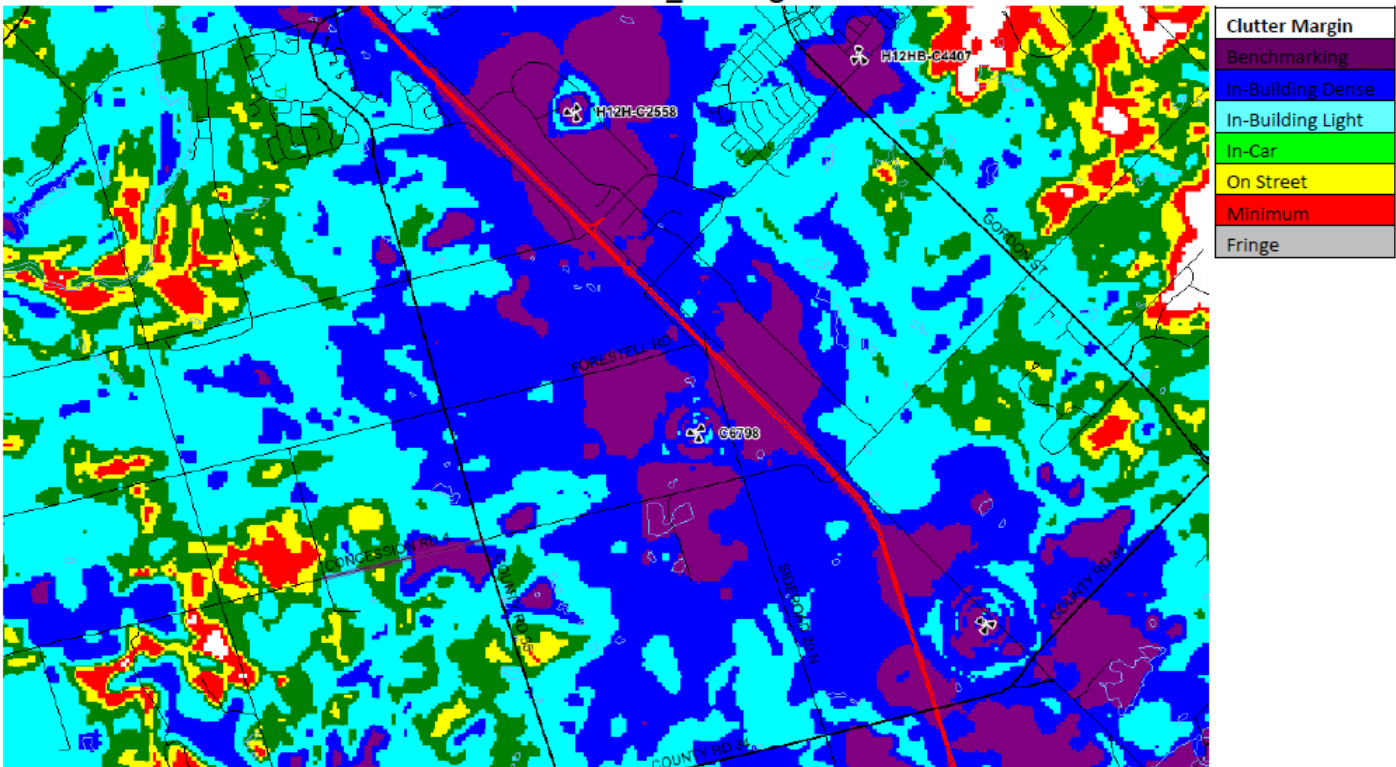
Technical Coverage Conclusion

Existing LTE RSRP Plots for C6798_ Southgate & Clair Rd



The relocated circle shows definitively the area the tower must be located in.

After LTE RSRP Plots for C6798_ Southgate & Clair Rd



The resulting scatter plot shows how the coverage deficiency has been met with the candidate proposed by the applicant. The coverage is dense and extends to Wellington Rd 35, from Forestell Road to County Rd 34

Other issues raised during public consultation

Comments summarily dismissed

Public respondents expressed concern that they felt their comments had been summarily dismissed by the proponent. While the proponent is certainly not insensitive to perceptions or feelings, it is important to note that there is an established protocol (CPC-2-0-03) that governs the proponent's public commenting responses.

In this respect, the proponent is required to address comments that are **relevant** to the tower siting exercise.

In accordance with CPC section 4.2 :

“Examples of concerns that proponents are to address may include:

- Why is the use of an existing antenna system or structure not possible?*
- Why is an alternate site not possible?*
- What is the proponent doing to ensure that the antenna system is not accessible to the general public?*
- How is the proponent trying to integrate the antenna into the local surroundings?*
- What options are available to satisfy aeronautical obstruction marking requirements at this site?*
- What are the steps the proponent took to ensure compliance with the general requirements of this document including the Canadian Environmental Assessment Act (CEAA), Safety Code 6, etc.?*

Concerns that are not relevant include:

- disputes with members of the public relating to the proponent's service, but unrelated to antenna installations;*
- potential effects that a proposed antenna system will have on property values or municipal taxes;*
- questions whether the Radiocommunication Act, this document, Safety Code 6, locally established by-laws, other legislation, procedures or processes are valid or should be reformed in some manner. “*

All proponents raising initial comments that were determined by protocol to be **not relevant** were provided the basis for why the comment was not relevant, together with notice that these comments were not relevant.

In particular, these comments include:

- Effects on property value, whether perceived or real
- Disagreement over sufficiency of health protection offered by SC6 certification whether perceived or real
- Disagreement over sufficiency of compliance with environmental requirements
- Dissatisfaction with the established rules for public notice and the extent of required consultation
- Concerns of residents far outside of the stipulated consultation radius / impact zone
- Disregard of proponent's reliance on full compliance with established good siting guidelines, including siting on an acceptable agriculture-zoned property

- Dissatisfaction with the established methods of mitigation of visual concerns using available natural features
- Dissatisfaction with the legislation allowing telecom infrastructure undertakings on agricultural-zoned lands
- Dissatisfaction that although the proponent had complied with all regulatory and siting requirements within its scope, it had not and could not address the potential negative public perceptions relating to items that are excluded from the scope by ISED

The proponent has addressed in detail each and every **reasonable and relevant** concern raised by members of the public. Comments that are defined as **not relevant** are dismissed by the CPC protocol and not within the proponent's scope of work to engage in further debate on. The tower siting exercise is not a forum for debating enacted legislation.

Environmental Protection and Legislation

The GRCA was circulated as a neighbouring commenting LUA, noting proximity to environmentally sensitive lands. The proponent's Site Plan does not fall within the regulated area, although part of the host property does. Accordingly, the proponent is governed under the federal regulations of CEAA 2012 and does not require intake or permitting under provincial jurisdiction, and this has been acknowledged by the GRCA.

The federal level CEAA jurisdiction ensures that minor projects without meaningful impact pose no environmental concerns. Debate over whether this impact is "none" or "minimal" is not relevant to the proponent's scope of work. What is relevant is that it complies with the governing legislation.

Proponent's Assessment

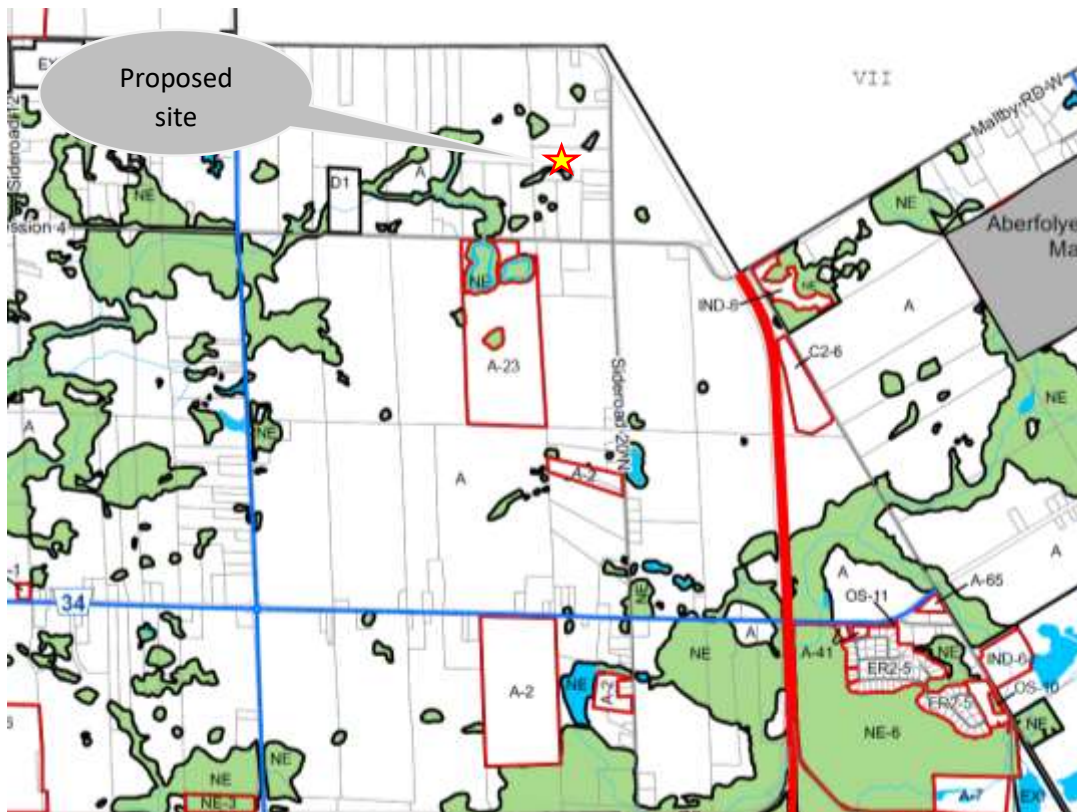
The proponent's assessment is that while local area residents acknowledge that the proposed site complies with the letter of the law with respect to siting practice and guidelines, it does not address the negative perceptions and feelings that they have over their properties as a result, despite the assurances built in to the regulatory structure to protect all citizens. **There is one (1) non-landlord residence within the direct consultation radius; the remainder of public respondents stretch to distant properties.**

This is a dilemma faced with any infrastructure undertaking being done for the public good. While it is impossible to entirely mitigate all factors of public concern, the project represents a mandate where the proponent's standard of duty is held to one of mitigating all factors of concern to the extent possible in consideration of the local environment and within the technical constraints of the coverage requirements.

The proponent attests that there is no alternative site that better complies with all good siting guidelines and mitigates issues of concern to a greater extent in the aggregate, while still being able to meet the coverage requirement. **All reasonable attempts to secure an alternate site that will meet the coverage objective have been exhausted and failed.**

The decision of Site Plan approval rests with ISED. The Township of Puslinch has concurred that the proponent has fulfilled its stipulated duties of municipal and public consultation as defined by the CPC.

Proposed Facility Location



Township of Puslinch

Zoning By-Law No. 19/85
Schedule 'A'



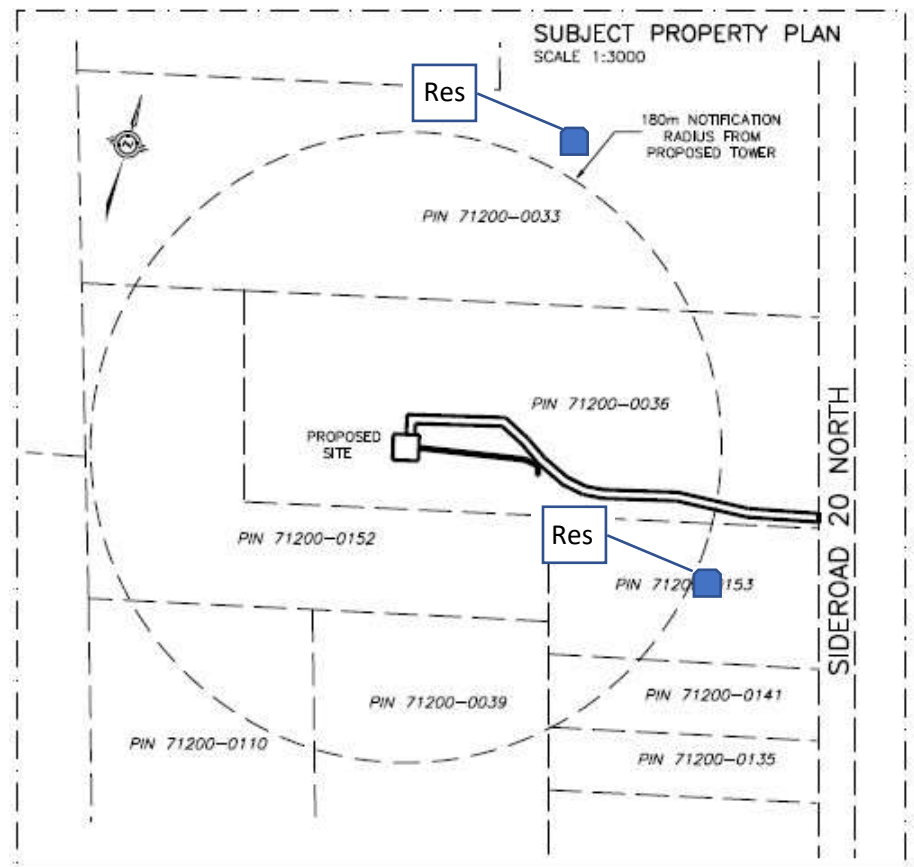
- Legend**
- Former Waste Disposal Site
 - Flood Special Policy Area
 - Site Specific Exemption
 - Zoning
 - Natural Environment
- Zone Descriptions**
- A AGRICULTURAL
 - HR HAMLET RESIDENTIAL
 - RC RESIDENTIAL COMMUNITY
 - RR RESORT RESIDENTIAL
 - ML MINI LAKES
 - ER1 ESTATE RESIDENTIAL TYPE 1
 - ER2 ESTATE RESIDENTIAL TYPE 2
 - RJR RURAL RESIDENTIAL
 - MR MILL CREEK RESIDENTIAL AREA
 - C1 HAMLET COMMERCIAL
 - C2 HIGHWAY COMMERCIAL
 - C3 AGRICULTURAL COMMERCIAL
 - C4 RESORT COMMERCIAL
 - IND INDUSTRIAL
 - EXI EXTRACTIVE
 - DI DISPOSAL INDUSTRIAL
 - I INSTITUTIONAL
 - OS OPEN SPACE
 - NE NATURAL ENVIRONMENT
 - (h) HOLDING PROVISION



Residential Setback Map



Local Properties in
Notification Radius



Proponent Contact:

Jeff McKay FCSI MBA
Site Acquisition Specialist
**Rogers Communications
Canada Inc.**
☎ Cell: (519) 566-9267
✉ eMail:
j_mckay@rogers.com

Public Comment/Reply Summary Report

Proposed Telecommunications Tower: Rogers Site C6798 - Southgate & Clair Rd

- **Part Of PIN:** 712000036 (LT)
- **GPS Coordinates:** 43 28 35.8N 80 12 10.7W
- 4638 SIDEROAD 20 N., GUELPH ON N1H 6J3; PIN

The Township of Puslinch does not have a locally-enacted protocol for the siting of telecommunications facilities. Accordingly, the proponent is required under the stipulations of the default governing federal protocol (CPC-2-0-03 i5) to conduct and conclude a public commenting and reply process in accordance with Section 4.2 and 4.3 of the protocol. The Township of Puslinch is a commenting body only to the applicant and ISED Canada, and this does not represent a Planning Act development. As a federal undertaking authorized under the *Constitution Act* s. 91 and 92, and mandated under the *Telecommunications Act*, approval of the site and design falls strictly under the jurisdiction of ISED, and it is exempt from the application of otherwise-valid provincial and municipal legislation including *The Planning Act*, *OBC*, *Site Plan Controls*, zoning bylaws, etc. under the law of federal paramountcy and interjurisdictional immunity.

In this respect:

- Public Notification Packages required under s. 4.2.1 and 4.2.1.1 were mailed to **13** property owners on April 26th 2019, for which the Township of Puslinch provided mailing labels. **We note that of the 13 owners' names provided, only 3 fell within the protocol-defined "3x tower height" of s. 4.2.1.1 as "local environment" and the remainder were circulated voluntarily, to ensure that concerns for a broader area were heard.**
- Newspaper publication in the Wellington Advertiser of the Public Ad was May 2nd 2019 for the benefit of the general public. In accordance with CPC footnote 9: *"The notice must be synchronized with the distribution of the public notification package. It must be legible and placed in the public notice section of the newspaper. The notice must include: a description of the proposed installation; its location and street address; proponent contact information and mailing address; and an invitation to provide public comments to the proponent within 30 days of the notice. In areas without a local newspaper, other effective means of public notification must be implemented. Proponents may contact the local Industry Canada office for guidance."*
- The 30-day initial commenting period concluded on June 7, 2019, allowing a 5 day buffer for first class mail delivery of the packages.
- Together, these stipulated methods of communication provided both local residents within the 3x radius, and the general public of a broader area the opportunity to participate in the process under the established rules. It is recognized that as respondents exceed setbacks of the defined consultation radius, their comments rapidly diminish in relevance with distance from the facility.
- The public was provided contact information for the submission of comments, together with the deadline dates for receipt. This process ensures that the appropriate review of public comments is done by copy of all correspondence to both the Township and ISED, such that secondary or competing processes do not interfere with the defined scope of federally-defined consultation.
- After the distribution of and/or commitment for all public forms of notice, the Township requested that the applicant voluntarily erect a property sign notice and participate in a Town Hall Meeting being hosted by Council, and the proponent agreed to both.

Consultation Process Summary:

- A total of 10 public respondents supplied “initial comments” within the commenting window. Three (3) of these parties fell within the defined local radius. The remaining seven (7) were well outside of the area to demonstrate any material impact. In practice, this is a relatively low number; there are sites which evidence as many as hundreds of dwellings within the 3x radius.
 - Residents both within the local environment (3) and the general public area (7) shared notes and documents in an organized attempt to inflate the issues of concern, and they were further advised to reach out beyond the stipulated process to members of Council and Parliament. This had the effect that **each and every respondent essentially submitted the same comments relating to four (4) issues of concern:**
 - Visibility,
 - effect on property valuation,
 - health concerns, and
 - choice of location.
 - Two (2) commenters also raised the additional issue of financial compensation to the facility landlord, which is not relevant to the tower siting exercise or scope of duty under the stipulated process.
 - Each and every respondent was provided an acknowledgement of receipt and a formal reply to their concerns, and each and every concern was addressed, whether relevant or not. **The ISED protocol defines what is relevant and what isn’t.**
 - Copies of all communications both incoming and outgoing were provided both to the Township and ISED Canada for review.
 - Initial commenters are provided an additional 21 days to supply an additional response following receipt of our formal Comment1 reply. Only 2 parties did so; one raised the same issues again, and the second’s reply was not relevant, in that they expressed that they would cease to be a Rogers subscriber.
 - All 21-day provisions for further commenting threads concluded before or by **June 12, 2019**, such that each and every respondent had both the opportunity for initial and second reply comments to be included in the completed process.
 - The Township has not advised us that they had received any comments or concerns which we are to address.
- A “Town Hall” is scheduled to take place at Puslinch Town Hall, 7404 Wellington County Rd 34; Wednesday, June 19th, 2019 at 7:00pm to provide a summary of the issues raised throughout the stipulated consultation period. The process is now closed to the intake of new comments as each of the issues has been addressed in the stipulated manner.

Summary of Public Concerns raised:

As all respondents raised the same issues, it is easy to contain the responses:

1. **Visibility:** Infrastructure undertakings are projects developed for the public good, and while it is impossible to entirely mitigate factors of concern and complaint entirely, the proponent’s obligation is to design and defend its actions in mitigating factors to the extent of its ability within the technical limitations of coverage requirements and land use opportunities. The proponent has effectively used large areas of old growth forest for substantial mitigation of tower visibility issues, such that all that remains visible of the tower is the top section which must be above the trees to provide coverage. Detailed studies were conducted of the visibility issues for each and every respondent’s home location to provide meaningful photo-renderings and quantified visual size measurements that in all cases (even the closest residents) demonstrate a visual structure size that would be a fraction of the visual size of a single wooden hydro pole on their property. There are no cases

which demonstrate a **visual or objectionable monstrosity of significant material consequence to property value or safe use, as claimed**. The use of surrounding bush provides far greater mitigation of visibility issues than is common on virtually all comparable facilities. Moreover, in relation to comparable sites, the residents are situated sparsely and at a great distance from the tower, such that visual concerns diminish to negligible. **No further mitigative issues are available to better this issue in the aggregate of considerations.**

2. **Effect on Property Valuation:** In accordance with CPC section 4.2 Public Reply Comments, “*Concerns that are not relevant include:*

...

• *potential effects that a proposed antenna system will have on property values or municipal taxes;* “

3. **Health Concerns:** The proponent’s obligation as it relates to health concerns is one of *compliance with governing regulations at all times*. In this respect, the proponent has met this duty and provided a copy of the Engineer’s SC6 certification indicating that the site will operate at 1.397% of the established limit = ~71.6 times below the allowable SC6 limit at the base of the tower. Each of the respondents have been advised of this and given further information and links should they want to understand it better. The proponent’s obligation of addressing this matter has been fully complied with. In accordance with CPC section 4.2 Public Reply Comments, “*Concerns that are not relevant include:*

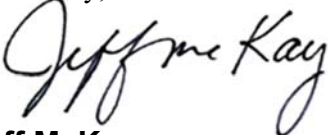
...

• **questions whether** the *Radiocommunication Act*, this document, **Safety Code 6**, locally established by-laws, other legislation, **procedures or processes are valid or should be reformed in some manner**. The proponent has provided the necessary proof that this site represents **no health risk to any member of the public at any accessible location**. Accordingly, any further debate about the process is offside with the proponent’s obligations under the protocol.

4. **Choice of Location:** The respondents’ collective response is that this area is a residential area that is not appropriate siting for a telecommunications facility. **The Proponent has sited this facility on agricultural-zoned property and is entitled to rely on the official designation of this property for compliance with siting guidelines**. This area is neither zoned residential nor rural residential, and complies fully with the siting guidelines, and does not demonstrate residential density. In the countryside, agricultural zoning is the designation for commercial farming operations which allow such structures as the commercial chicken farming operation co-existing on this property, and telecommunications facilities are routinely sited in this manner.

Public suggestions were made that the proponent should relocate the site some 1.2kms or more to the east in a yet-undeveloped commercial area, where the proponent had no commercially available candidates and no subscribers to service, and the orderly development of the network would be impaired by coverage misalignment. **The proponent asserts that in the aggregate, it has selected the site location that mitigates relevant factors of concern to the greatest extent possible, within the limitations of the technical coverage requirement and available real estate opportunities, and compliant with ALL siting guidelines.**

Sincerely,



Jeff McKay CFP CIM FMA FCSI MBA

Site Acquisition Specialist

Rogers Communications Canada Inc.

☎ Cell: (519) 566-9267

✉ eMail: j_mckay@rogers.com

Scope of the Public Commenting and Reply Process: (Reprinted from CPC 2-0-03 i5)

4.2 Industry Canada's Default Public Consultation Process

Proponents must follow Industry Canada's Default Public Consultation Process where the local land-use authority does not have an established and documented public consultation process applicable to antenna siting. Industry Canada's default process has three steps whereby the proponent:

1. provides written notification to the public, the land-use authority and Industry Canada of the proposed antenna system installation or modification (i.e. public notification);
2. engages the public and the land-use authority in order to address relevant questions, comments and concerns regarding the proposal (i.e. responding to the public); and
3. provides an opportunity to the public and the land-use authority to formally respond in writing to the proponent regarding measures taken to address reasonable and relevant concerns (i.e. public reply comment).

Public Notification

1. Proponents must ensure that the local public, the land-use authority and Industry Canada are notified of the proposed antenna system. As a minimum, proponents must provide a notification package (see Appendix 1) to the local public (including nearby residences, community gathering areas, public institutions, schools, etc.), neighbouring land-use authorities, businesses, and property owners, etc.

The radius is measured from the outside perimeter of the supporting structure. For the purpose of this requirement, the outside perimeter begins at the furthest point of the supporting mechanism, be it the outermost guy line, building edge, face of the self-supporting tower, etc. Public notification of an upcoming consultation must be clearly marked, making reference to the proposed antenna system, so that it is not misinterpreted as junk mail. The notice must be sent by mail or be hand delivered. The face of the package must clearly reference that the recipient is within the prescribed notification radius of the proposed antenna system.

Responding to reasonable and relevant concerns may include contacting a party by telephone, engaging in a community meeting or having an informal, personal discussion. Between steps 1 and 2 above, the proponent is expected to engage the public in a manner it deems most appropriate. Therefore, the letter at step 2 above may be a record of how the proponent and the other party addressed the concern at hand.

Public Reply Comments

As indicated in step 3 above, the proponent must clearly indicate that the party has **21 days** from the date of the correspondence to reply to the response. The proponent must also keep a record of all correspondence/discussions that occurred within the **21-day** public reply comment period. This includes records of any agreements that may have been reached and/or any concerns that remain outstanding.

The factors that will determine whether a concern is reasonable or relevant according to this process will vary but will generally be considered if they relate to the requirements of this document and to the particular amenities or important characteristics of the area surrounding the proposed antenna system. Examples of concerns that proponents are to address may include:

- Why is the use of an existing antenna system or structure not possible?
- Why is an alternate site not possible?
- What is the proponent doing to ensure that the antenna system is not accessible to the general public?
- How is the proponent trying to integrate the antenna into the local surroundings?
- What options are available to satisfy aeronautical obstruction marking requirements at this site?

• What are the steps the proponent took to ensure compliance with the general requirements of this document including the *Canadian Environmental Assessment Act (CEAA)*, Safety Code 6, etc.?

Concerns that are not relevant include:

- disputes with members of the public relating to the proponent's service, but unrelated to antenna installations;
- potential effects that a proposed antenna system will have on property values or municipal taxes;
- questions whether the *Radiocommunication Act*, this document, Safety Code 6, locally established by-laws, other legislation, procedures or processes are valid or should be reformed in some manner.

4.3 Concluding Consultation

The proponent may only commence installation/modification of an antenna system after the consultation process has been completed by the land-use authority, or Industry Canada confirms concurrence with the consultation portion of this process, and after all other requirements under this process have been met. Consultation responsibilities will normally be considered complete when the proponent has:

1. concluded consultation requirements (Section 4.1) with the land-use authority;
2. carried out public consultation either through the process established by the land-use authority or Industry Canada's Default Public Consultation Process where required; and
3. addressed all reasonable and relevant concerns.

C6798 - Southgate & Clair Rd : Public Consultation Summary

Within Consultation Radius	1st Response	Via	Date Received	Infrastructure Visibility / Aesthetics	Effect on Property Valuation	Health Concerns	Location	Financial gain to the Landlord	Date of Formal Response	21 day 2nd Reply date	2nd Reply Rec'd	Consultation Concludes
✓	Christie, Donna	email	07-May-19	x	x	x	x		07-May-19	28-May-19	13-May-19	13-May-19
	Geremia, Mario & Joanne (Baggio)	email	08-May-19	x	x	x	x	x	09-May-19	30-May-19		30-May-19
	Smith, Jim & Sharon	email	12-May-19	x	x	x	x	x	12-May-19	02-Jun-19		02-Jun-19
✓	Briggs, Michael & Dorothy	email	12-May-19	x	x	x	x		13-May-19	03-Jun-19		03-Jun-19
	Mitro, Peter	email	13-May-19	x	x	x	x		13-May-19	03-Jun-19		03-Jun-19
✓	Neundorf, Dan	email	13-May-19	x	x	x	x		13-May-19	03-Jun-19		03-Jun-19
	Pady, Sandra	email	13-May-19	x	x	x	x		13-May-19	03-Jun-19		03-Jun-19
	Brunnmeier, Frederick & Lisbeth	email	14-May-19	x	x	x	x		14-May-19	04-Jun-19		04-Jun-19
	Lawson, Scott	email	18-May-19	x	x	x	x		21-May-19	11-Jun-19		12-Jun-19
	Gillingham, Scott	email	27-May-19	x	x	x	x		27-May-19	17-Jun-19	28-May-19	28-May-19

3

10

Within Consultation Radius	2nd Response	Via	Date Received	Infrastructure Visibility / Aesthetics	Effect on Property Valuation	Health Concerns	Location	Financial gain to the Landlord	Date of Formal Response
✓	Christie, Donna	email	13-May-19	x	x	x	x		13-May-19
	Gillingham, Scott	email	28-May-19						x



RESOLUTION
MUNICIPAL COUNCIL
THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

2019-

Date: July 17, 2019

Moved by: _____ Seconded by: _____

That Council does hereby authorize the applications for Cancellation, Reduction or Refund of Taxes chapter 25, section 357 or 358 of the Municipal Act, 2001 as follows:

Year	Application #	Roll #	Write Off Amount
2019	01/19	5-09117	\$-722.11

RECORDED VOTE	YES	NO	CONFLICT	ABSENT
Councillor Bulmer				
Councillor Roth				
Mayor Seeley				
Councillor Sepulis				
Councillor Goyda				
TOTAL				

MAYOR: _____

CARRIED	LOST
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REPORT FIN-2019-026

TO: Mayor and Members of Council

FROM: Mary Hasan, Director of Finance/Treasurer

MEETING DATE: July 17, 2019

SUBJECT: 2019 Corporate Energy Conservation and Demand Management Plan
File No. E17 ENE

RECOMMENDATIONS

THAT Report FIN-2019-026 regarding the 2019 Corporate Energy Conservation and Demand Management Plan be received; and

That Council commits to the allocation of the necessary resources to implement the Corporate Energy Conservation and Demand Management Plan as outlined in Schedule A to Report FIN-2019-026.

DISCUSSION

Purpose

The purpose of this report is to obtain a Council resolution for the commitment to the allocation of the necessary resources to implement the Corporate Energy Conservation and Demand Management Plan (CEMP) as outlined in Schedule A to Report FIN-2019-026.

Background

Ontario Regulation 507/18 of the Electricity Act requires that all municipalities develop and publish a CEMP every five years.

The Township's previous CEMP was passed on June 18, 2014 through Council Resolution No. 2014-250. The 2014 CEMP is attached as Schedule B to this Report.

The Township engaged Local Authority Services (LAS) in partnership with Blue Sky Energy Engineering and Consulting Inc. to complete the 2019 CEMP for the Township.

FINANCIAL IMPLICATIONS

The CEMP as outlined in Schedule A including the Action List of specific projects identified will be reviewed in conjunction with the Township's annual budgeting processes.

APPLICABLE LEGISLATION AND REQUIREMENTS

Ontario Regulation 507/18 of the Electricity Act

ATTACHMENTS

Schedule A: 5 Year Energy Conservation and Demand Management Plan – 2019 – 2024

Schedule B: Energy Conservation and Demand Management Plan – July 1, 2014 to June 30, 2019



5 Year Energy Conservation and Demand Management Plan

Corporation of the Township of Puslinch 2019 - 2024



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1. Introduction

Energy management has become increasingly important across Ontario Municipalities as energy prices continue to rise and our interest in reducing our environmental impact increases. The Township of Puslinch (“Township”) is committed to the energy conservation journey to ensure municipal funds are used wisely and the impact of the Township’s services on greenhouse gas (GHG) production is minimized.

As part of this commitment across Ontario, Regulation 507/18 of the Electricity Act requires all municipalities to develop and publish a Corporate Energy Conservation and Demand Management Plan (CEMP) every five years. The plan, which helps support energy conservation efforts at the Township, is accompanied by a regulated annual report which publishes the total annual energy consumed for each of the buildings and facilities at the Township.

The Township has developed the CEMP (this plan) to support, focus, communicate and celebrate our energy conservation efforts.

The plan includes the following key elements:

- A clear corporate vision and policy that includes objectives, targets and strategic priorities;
- A summary of past conservation improvements and successes;
- Detailed energy metrics summarizing energy consumed and progress towards targets; and,
- Specific and actionable inventory of energy conservation projects planned for the next five (5) years.

The Township intends on revisiting and updating this Plan every five years as required under O.Reg. 507/18.

2. Our Commitment to Energy Conservation

2.1. Declaration of Commitment

The Township commits to the allocation of the necessary resources to implement the CEMP.

2.2. Vision

The Township's vision is to be as energy efficient as possible by leveraging our organization and by using new and efficient technology where ever it is cost effective to do so. We will wisely and continually seek to reduce energy consumption while still maintaining an effective level of service to our customers and the general public.

2.3. Objectives and Goals

- Create a culture of conservation across Township operations;
- Increase the visibility of facility energy consumption data to the senior management team through enhanced monitoring and tracking;
- Implement energy audits on all municipal facilities during the next five years;
- Finish retrofitting all lighting fixtures with high efficiency lighting technologies;
- Incorporate energy efficiency criteria (life cycle costing) into capital equipment purchasing practices.

2.4. Targets

Our target is to reduce our consumption of fuels and electricity in all municipal operations by an average of 10% (127 eMWh) over a five-year period compared to 2017 levels.

3. Our Energy Report Card

3.1. Facilities Included in the Plan

The requirements of Regulation 507/18 of the Electricity Act specify that the plan is to cover only the built environment (facilities that are heated), whose facilities are currently owned and operated by the Township. The full list of the Township's facilities included in the plan can be found in Table 1 below. Street lights, as an exception to this rule, have been included in this plan as they are a significant consumer of energy, on a relative basis.

TABLE 1: Puslinch Facilities and Infrastructure within the Boundaries of this Plan

Name	Address	Use	Area (m ²)
FACILITIES			
Community Centre	23 Brock Road	Community Centre	777
Community Centre Shed	23A Brock Road	Storage Facility	140
Township Office	7404 Wellington Rd	Administrative Office	407
Optimist Recreation Centre	23 Brock Road	Other	1,152
Public Works Shed	7404 Wellington Rd	Community Centre	465
Public Works Shop	7404 Wellington Rd	Equipment or Vehicle Maintenance	961
Puslinch Fire Hall	7404 Wellington Rd	Fire Station	245
STREET LIGHTS			
Street Lights	Various	Other	-

3.2. Energy Consumption at the Township

In order to track progress, an energy baseline was established from which annual energy consumption was compared. Energy consumption data was provided through the Local Authority Service's (LAS) Energy Planning Tool (EPT) system which currently tracks both electricity and natural gas for each of the Township's buildings.

The resulting dataset represents the Township's baseline and current level of energy performance. Table 2 below presents the Township's 2017 energy data by fuel type expressed in equivalent kilowatt hours (ekWh), compared to the baseline year of 2013. The energy consumption data shown below does not include some of the Township's smaller accounts like outdoor park lighting and facilities that are not heated (see Table 1 for a full list of included facilities). Additionally, the data has not been corrected for yearly weather variations.

TABLE 2: Puslinch Energy Consumption (2017) Compared to Baseline

Account Centre	Electricity (kWh)	Natural Gas (m ³)	Natural Gas (ekWh) ¹	2017 Total Energy (ekWh)	2013 Baseline (ekWh) ²	% Change
Facilities	356,448	65,756	679,259	1,035,708	1,104,348	-6.2 ↓
Streetlights	239,203	N/A	N/A	239,203	241,352	-0.9 ↓
Total (ekWh)	595,651	65,756	679,259	1,274,911	1,345,700	-5.3 ↓
Total Greenhouse Gas Emissions (tonnes)				131.0	163.8	-20% ↓

Note 1: ekWh (equivalent kWh) is a calculated value using Natural Gas's thermal content to convert consumption in volume units to "equivalent" kWh for comparison.

Note 2: The baseline of 2013 was selected instead of the standard 2012 because Streetlighting data was unavailable.

In 2013, the Township consumed approximately 1,345 eMWh and was responsible for 163.8 tonnes of associated GHG emissions. As indicated in Table 2 above, Puslinch achieved an 5.3% reduction in energy consumption and 20% reduction in GHG emissions over the five-year period ending in 2017 (using 2013 as a baseline).

This improvement does not include the additional, and significant, savings that will be measurable in 2019 and beyond, through the recent streetlighting upgrade.

The following figures illustrate energy use broken down by facility and fuel type. As indicated above, the Township consumes two main fuels, electricity and natural gas. The breakdown is shown in Figure 1 below.

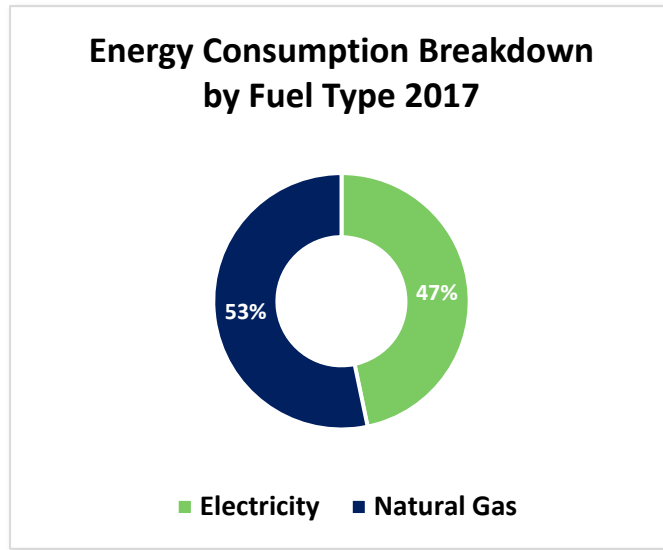


Figure 1: Energy Consumption Breakdown by Fuel Type.

Figure 2 below indicates the total energy consumed at the Township (reported buildings only) by year. The graph indicates a significant reduction in energy consumption over the five-year period.

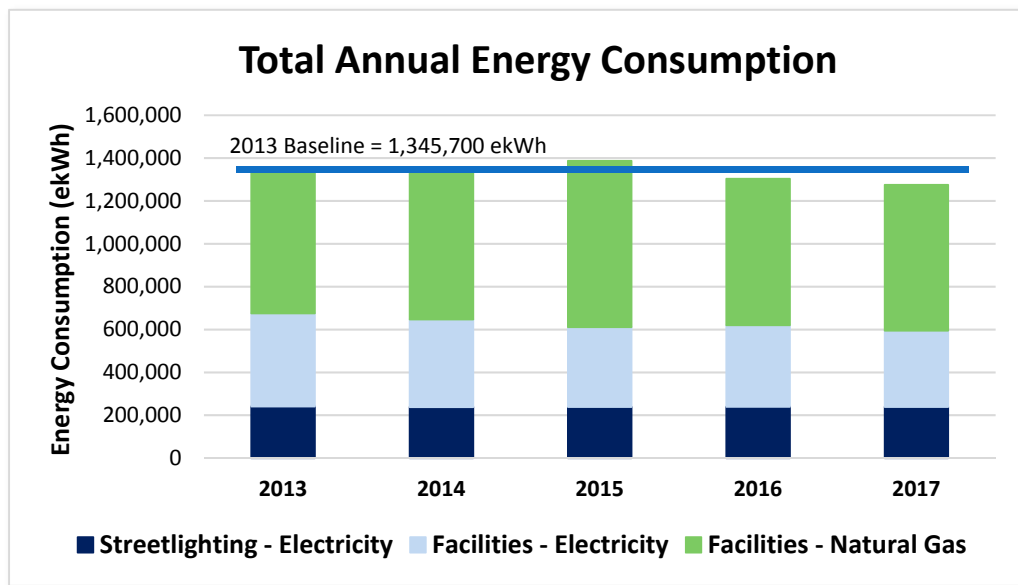


Figure 2: Total Annual Energy Consumption (ekWh) for all Reported Puslinch Facilities

As shown in Figure 2 above, facilities (electricity and natural gas combined) consume approximately 82% of the energy, the remainder is used by street lighting. Over the five-year period, approximately 70,789 ekWh were avoided compared to the baseline year of 2013. This

translates to an overall GHG reduction of 32.8 tonnes over the five-year period, equalling 6.3 cars removed from the road for one year or 492 trees being planted.

Figure 3 below, shows energy consumption at various Township facilities over a five-year period. The Optimist Recreation Centre is the largest energy consumer in the Township.

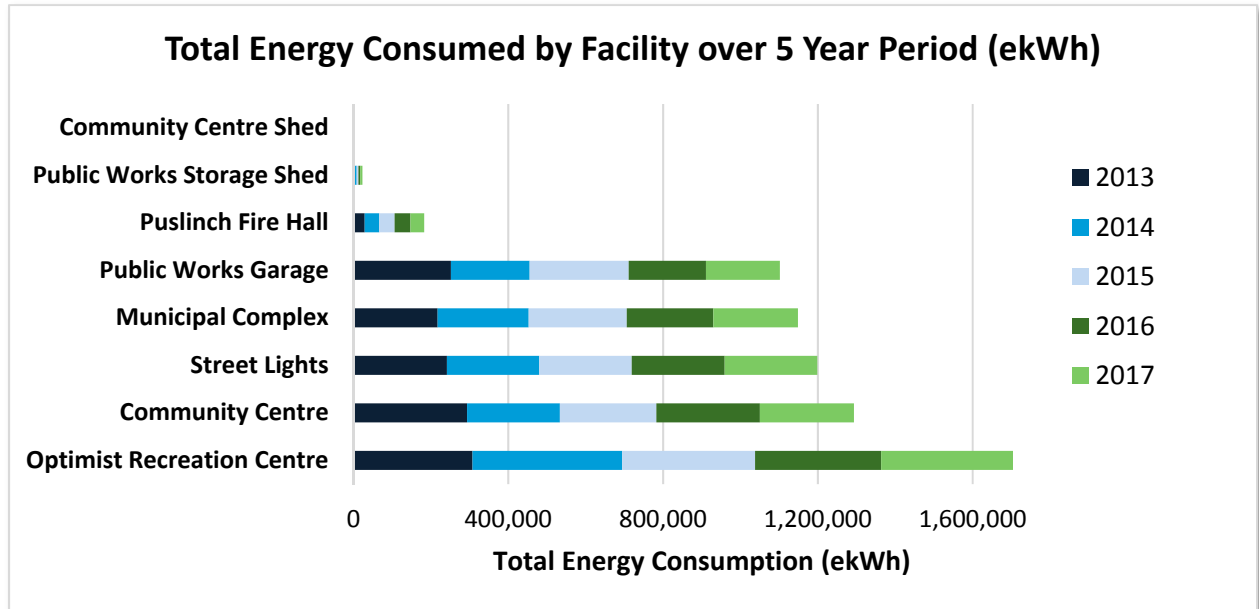


Figure 3: Total Energy Consumption by Facility over a 5 Year Period

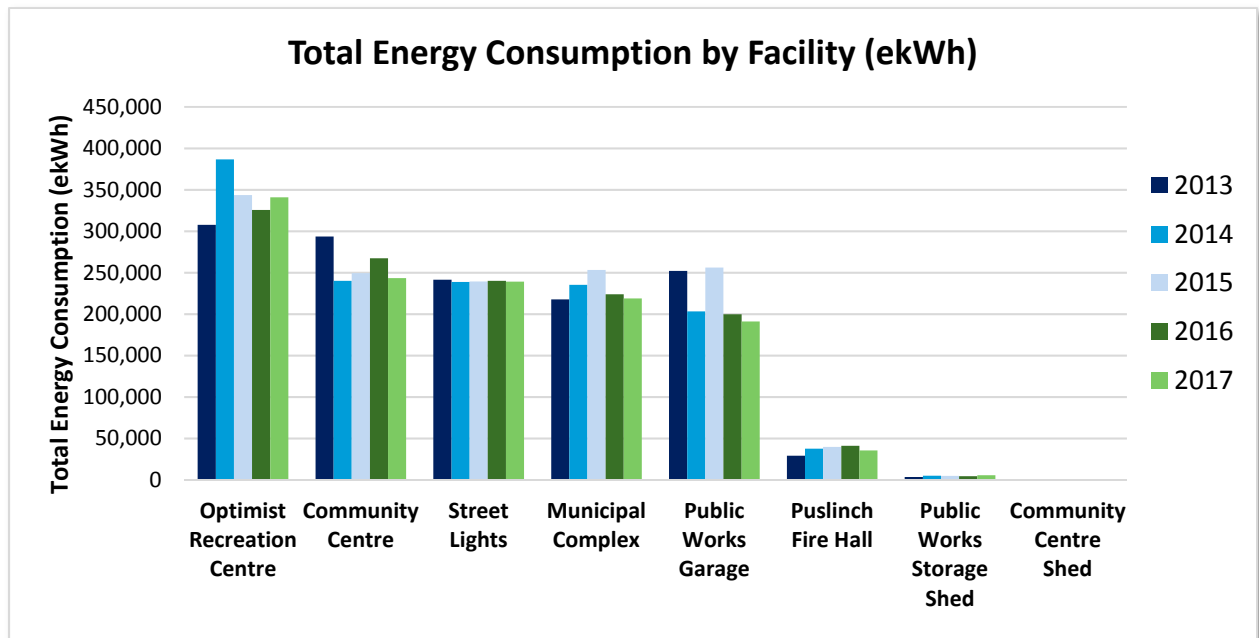


Figure 4: Annual Energy Consumption by Facility

4. Our Conservation Successes

Township staff have been continuously delivering upgrades and changes to facilities and processes which contribute to lower energy consumption and costs. The following section outlines a few of the improvements made.

By far the largest project has been the past year's project of replacing all of the streetlighting with high efficiency LED cobra heads and decorative fixtures. Figure 5 below shows several of the new streetlight fixtures.



Figure 5: Photographs of the new LED outdoor street lighting

There have been several energy upgrades to the Community Center over the past five years which are listed below and shown in Figure 6:

- New high efficiency HVAC unit
- Replacement of two water heaters with one on-demand high efficiency natural gas water heater
- New LED outdoor lighting
- Replacement of incandescent pot lighting with LED
- New weather stripping around exterior doors
- Motion sensors

Analysing the monthly electricity consumption for the Community Centre and factoring out the effect of weather, a 33,700 kWh savings was measured over the four month period between November 2017 and the end of February 2018 compared to previous years. This equates to over a \$3,700 savings (assuming 11¢/kWh) for this four month period which will be realized every heating season going forward and can be attributed directly to the HVAC upgrades.



Figure 6: Photographs of the new high efficiency HVAC unit, instantaneous water heater and a motion sensor installed at the Community Centre.

The Township Offices and Fire Hall have also installed several energy measures recently as shown in Figure 7 below.

- LED outdoor lighting
- New weather stripping around exterior doors

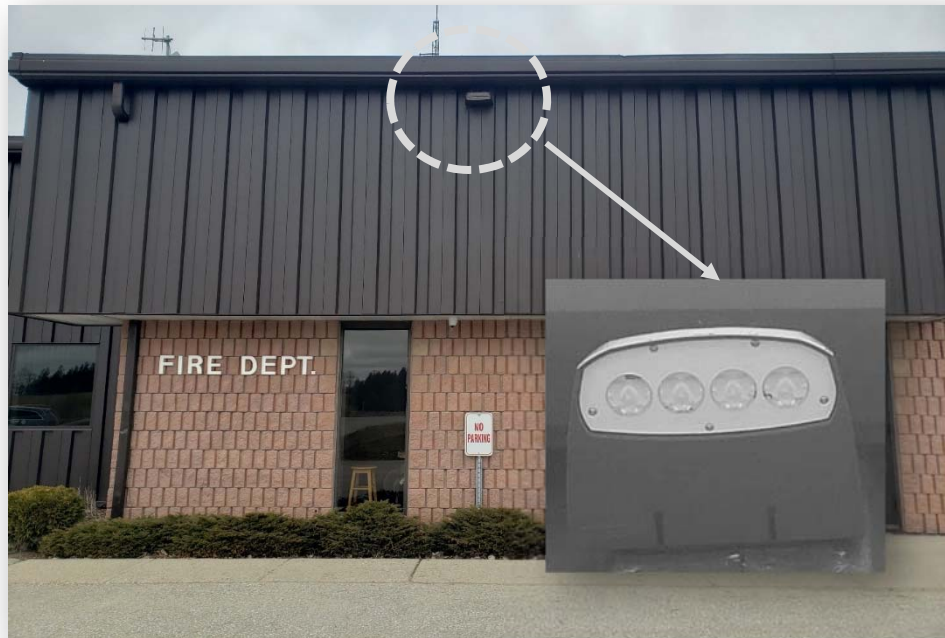


Figure 7: Photographs of the new LED outdoor wall lighting at the Fire Hall. This lighting was also installed on several other buildings including the Township Office and Community Centre.

5. The Energy Conservation Team

The facility staff at the Township have provided the leadership required to achieve energy conservation savings across the built environment. The team, described below, will be responsible for delivering this plan's objectives and goals as well as maintaining the Township's focus on energy management in the years to come.

5.1. Energy Conservation Leader - Finance

The role of Finance is to provide clear guidance, assistance and support to the energy conservation team on internal and external funding mechanisms and to include the team in relevant decision-making and budget discussions.

Finance will also be responsible for providing the energy consumption data to the facilities staff and Council for review.

Finance will support the use of life cycle costing and discounted cash flow-based assessments for capital projects and will include energy efficiency in procurement criteria where relevant. In addition, Finance will ensure that suppliers offer energy efficient alternatives/options where available and include energy criteria/performance in service contracts.

5.2. Energy Conservation Team – Facilities Staff and Fire Chief

The Energy Conservation Team will have direct knowledge of the Township's major energy-using facilities and assets and are responsible for developing and maintaining the focus on energy conservation. The conservation team will ensure the delivery of energy conservation measures in each of the facilities and will be responsible for the consumption of energy within their respective departments. As such, they will be tasked with reviewing facility energy consumption data and managing energy issues as required.

6. Renewable Energy

The Township does not currently have any installed renewable energy technologies nor any short-term plans to install renewable energy generation in the next few years.

7. Update and Review Process

Energy Plan Review: As part of any energy management strategy, continuous monitoring, verification, and reporting is an essential tool to track consumption and cost savings/avoidance as a result of implemented initiatives.

The monitoring and reporting for this plan will align with the requirements of Regulation 507/18 of the Electricity Act and/or any subsequent legislation related to energy management.

8. Energy Conservation Action Plan

The Township has developed a key project list which will help ensure our energy reduction goals are met.

The plan includes projects that will support several pillars of a strong energy management plan:

- Detailed list of specific actions needed to achieve the desired goals and objectives;
- Monitoring and tracking mechanisms; and,
- Communication and organizational development.

8.1. Projects

The detailed list of projects included in the plan, which covers a period from July 2019 to June 2024, can be found in Appendix A.

The projects fall under the following broad categories; lighting, HVAC, building envelope, and general equipment improvements. The following items can be found in the action plan:

- Upgrading space heating and cooling controls with programmable thermostats;
- Replacing older interior lighting systems with LED;
- Installing motion sensors where possible;
- Replacing plug in floor heaters with low wattage radiant panel heaters; and,
- Upgrading windows and doors with high efficiency replacements.

Appendix A: Puslinch Energy Conservation Action List

Township of Puslinch Corporate Energy Management Plan - Action List

No.	Facility	Project Type	Measure	Description	Forecasted Timing	Quantity	Cost Estimate (\$)	Total Estimated Cost	Incentives	Payback Period
1	Township Office	Building Envelope	Windows/Doors	Upgrade exterior windows and doors to reduce heat transfer and infiltration.	2024	4 doors (3 single, 1 double) 12 windows	\$1,850 per single door, \$3,500 per double door, \$850 per window	\$19,250	N/A	TBD
2	Township Office	Heating	Upgrade	Replace plug in floor heaters with low wattage radiant panel heaters.	2020/2021	1	\$140 each	\$140	N/A	1.5 years
3	Township Office	Lighting	Upgrade	Upgrade interior fluorescent lighting to LED.	2020/2021	Assuming 35 4x4' T8 Fixtures to LED	\$140 each	\$4,900	Yes, included in price	5 years
4	Township Office	Lighting	Controls	Investigate installing motion sensors for lighting located in the back area of the Township Office towards the washrooms.	2020/2021	TBD	TBD	TBD	TBD	TBD
5	Township Office	Building Envelope	New Technology	Consider installing air curtain on front doors of office to reduce infiltration. Up to \$1,000 in incentives from Union Gas.	2024	1	\$3,500 for 72" door	\$3,500	Yes, \$600	9 years
6	Community Centre	Building Envelope	Windows/Doors	Upgrade exterior windows and doors to reduce heat transfer and infiltration.	2024	4 single doors 5 windows	\$1,850 per single door, \$850 per window	\$11,650	N/A	TBD
7	Community Centre	Lighting	Upgrade	Upgrade interior fluorescent lighting to LED.	2020/2021	Assuming 19 4x4' T8 Fixtures to LED	\$140 each	\$2,660	Yes, included in price	3 years
8	Community Centre	Building Envelope	New Technology	Consider installing air curtain on front doors and exterior doors off of main community room to reduce infiltration. Up to \$1,000 in incentives from Union Gas.	2024	1	\$3,500 for 72" door	\$3,500	Yes, \$600	9 years
9	Fire Hall	Building Envelope	Weather Stripping	Review and maintain weather stripping and sealing around exterior person doors as necessary in bay area, and around building.	2024	1	\$100	\$100	N/A	2 years
10	Fire Hall	Building Envelope	Controls	Install remote controls for bay doors to reduce time doors are open.	2020	3	\$750 each	\$2,250	N/A	TBD
11	Fire Hall	Heating	Controls	Replace older thermostats on bay radiant natural gas heaters to a programmable model. Program temperature setback for space heating during unoccupied periods.	2020	2	\$200 each	\$400	N/A	2.0 year
12	Fire Hall	Heating	Operation	Ensure ceiling fans in equipment bay are on all the time during the heating season.	N/A	N/A	\$0	\$0	N/A	Immediate
13	Fire Hall	HVAC	Controls	Ensure that temperature setbacks have been programmed for unoccupied periods in office area using existing thermostat.	N/A	N/A	\$0	\$0	N/A	Immediate
14	Fire Hall	Lighting	Upgrade	Convert existing fluorescent fixtures in bay area to LED.	2020/2021	Assuming 21 4x4' T8 Fixtures to LED	\$140 each	\$2,940	Yes, included in price	8 years
15	Fire Hall	Lighting	Upgrade	Convert existing fluorescent fixtures in office/kitchen/common areas to LED.	2020/2021	Assuming 16 4x4' T8 Fixtures to LED	\$140 each	\$2,240	Yes, included in price	8 years
16	Fire Hall	Lighting	Controls	Install motion sensors in washrooms for lighting and fan.	2020/2021	2	\$100 each	\$200	Yes	2 years
17	Fire Hall	Lighting	Controls	Investigate installing motion sensors for lighting on the apparatus floor.	2020/2021	TBD	TBD	TBD	TBD	TBD

Township of Puslinch Corporate Energy Management Plan - Action List

No.	Facility	Project Type	Measure	Description	Forecasted Timing	Quantity	Cost Estimate (\$)	Total Estimated Cost	Incentives	Payback Period
18	Optimist Recreation Centre	HVAC	New	Install demand controlled ventilation in gymnasium.	2020	1	\$1,200	\$1,200	Yes, \$500	4 years
19	Optimist Recreation Centre	Lighting	Upgrade	Upgrade gym lighting from fluorescent to LED.	2020/2021	Assuming 9 4x4' T8 fixtures to LED	\$140 each	\$1,260	Yes, included in price	2 years
20	Optimist Recreation Centre	Lighting	Upgrade	Upgrade outdoor rink lighting from fluorescent to LED.	2020/2021	Assuming 42 4x4' T8 Fixtures to LED	\$140 each	\$5,880	Yes, included in price	6 years
21	Public Works Shed (7404 Wellington)	Heating	Controls	Upgrade thermostats on unit heaters with programmable models. Program temperature setbacks for space heating during unoccupied periods.	2020	2	\$200 each	\$400	N/A	2 years
22	Public Works Shed (7404 Wellington)	Lighting	Upgrade	Upgrade interior fluorescent fixtures with LED.	2020/2021	Assuming 12 4x4' T8 Fixtures to LED	\$140 each	\$1,680	Yes, included in price	6 years
23	Public Works Shop	Building Envelope	Weather Stripping	Replace/maintain weather stripping on roll up doors as required.	2024	1	\$100	\$100	N/A	2.5 years
24	Public Works Shop	Building Envelope	Door	Replace exterior door in shop with insulated model to reduce infiltration and heat transfer.	2024	1	\$1,000	\$1,000	N/A	TBD
25	Public Works Shop	HVAC	Controls	Replace older thermostats with programmable models. Program temperature setbacks for space heating during unoccupied periods.	2020	4	\$200 each	\$800	N/A	2 years
26	Public Works Shop	Lighting	Upgrade	Upgrade interior fluorescent lighting to LED. Investigate whether motion sensors could be beneficial at this time.	2020/2021	Assuming 39 4x4' T8 fixtures to LED	\$140 each	\$5,460	Yes, included in price	5 years



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**ENERGY CONSERVATION AND DEMAND MANAGEMENT PLAN FOR THE
CORPORATION OF THE TOWNSHIP OF PUSLINCH**

EFFECTIVE DATES: JULY 1, 2014 TO JUNE 30, 2019

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1.0 COMMITMENT

1.1 Declaration of Commitment

The Corporation of the Township of Puslinch (“Township”) commits to the allocation of the necessary resources to implement the Energy Conservation and Demand Management Plan (CDM).

1.2 Vision

The vision of the Township is to reduce energy consumption through the wise and efficient use of energy and resources, while still maintaining an efficient and effective level of service to our customers and general public.

1.3 Goals

The Township will aim to improve the energy efficiency of our facilities and processes in order to reduce our operating costs and energy consumption.

1.4 Overall Target

Our goal is to reduce our consumption of fuels and electricity in all municipal operations by an average of 1% per year between 2015 and 2019.

1.5 Objectives:

- Create a culture of conservation in municipal operations
- Provide a forum for discussion for employees
- Implement energy audits on all municipal facilities during the next five years

2.0 ORGANIZATIONAL UNDERSTANDING

2.1 Summary of Current Energy Consumption and Green House Gas Emissions

Our current energy consumption (average of 2011 and 2012 electricity and natural gas consumption) is 404,938 ekWh per year. Our current Green House Gas Emissions (average of 2011 and 2012 Green House Gas Emissions) is 622,031 kg CO₂e per year.

2.2 Renewable Energy Utilized or Planned

The Township does not currently use renewable energy in its facilities but will investigate such opportunities should they arise.

3.0 STRATEGIC PLANNING

3.1 Links with Other Municipal Plans

The CDM plan will be coordinated with the Township's Budgeting and Asset Management processes.

4.0 RESOURCES PLANNING

4.1 Energy Leader

Leadership and overall responsibility for preparing the CDM plan and yearly consumption reporting is designated to the Finance department.

5.0 PROJECTS EXECUTION

5.1 Municipal Level

We will carry out energy conservation measures and implement them methodically according to the planned timelines within the resource constraints that apply. Since we all use energy in our daily activities, it will also be the responsibility of all Township staff to be aware of their energy use and work towards a culture of conservation.

5.2 Asset Level

In order to sustain a culture of conservation, staff will participate in various energy conservation initiatives that will encourage the effective use of energy resources in the workplace.

6.0 REVIEW

6.1 CDM Plan Review

We will review and evaluate our CDM plan every year by referring to our energy consumption data submitted to the Ministry of Energy to ensure we are on target.

7.0 EVALUATION PROGRESS

7.1 Energy Consumption

The Township's energy consumption in 2012 was reduced to 739,599 ekWh per year from 2011 levels of 880,154 ekWh per year.

8.0 PROGRAMS

Description	Facility	Contact	Date	Status
Energy Awareness included on Agendas of Department Head Meetings	Municipal Complex	Mary Hasan, Director of Finance/Treasurer	2014-12-01	Pending
Details	Discuss the Conservation Energy Demand Management Plan with Department Heads and explore energy conservation opportunities at the meetings. Discuss measures other municipalities are undertaking to lower energy use in municipal facilities. The costs for this program are minimal and the payback is immediate.			
Employee participation program: Identification of improvements	Municipal Complex	Mary Hasan, Director of Finance/Treasurer	2015-12-01	Pending
Details	Explore opportunities to conserve energy with staff and obtain feedback for improvements. The costs for this program are minimal and the payback is immediate.			
Visual Displays	Municipal Complex	Mary Hasan, Director of Finance/Treasurer	2014-09-16	Pending
Details	Make use of visual displays to remind staff to be more conscious of their energy consumption ie. Lights off campaign. The costs for this program are minimal and the payback is immediate.			

9.0 PROCESSES

Description	Facility	Contact	Date	Status
Daylight & Shading	Municipal Complex	Mary Hasan, Director of Finance/Treasurer	Ongoing	Pending
Details	Close blinds and shades in the warmer months to reduce reliance on air conditioning and open blinds and shades in the colder months to reduce the reliance on heaters. The costs for this process are minimal and the payback is immediate.			
Prioritize Energy Conservation	Municipal Complex	Mary Hasan, Director of Finance/Treasurer	2014-12-16	Pending
Details	Ensure that energy conservation is regularly on the agenda of Department Head meetings. Link the Energy Plan to the Budgeting and Asset Management processes to ensure future expenditures assist in creating operational efficiencies. The costs for this process are minimal and the payback is immediate.			
Power bars	Municipal Complex	Mary Hasan, Director of Finance/Treasurer	2015-08-14	Pending
Details	Use power bars for electronic equipment and turn off at night. The costs for this process are minimal and the payback is immediate.			
Energy Reports	Municipal Complex	Mary Hasan, Director of Finance/Treasurer	2018-08-22	Pending
Details	Distribution of energy consumption and costing reports to Department Heads and Council semi-annually.			

10.0 Projects

Description	Facility	Contact	Date	Status
Lighting Upgrade	Community Centre	Donna Tremblay, Deputy Clerk	2014-12-31	Pending
Details	Replace (37) incandescent pot lights with LED lamps, replace lamps in (3) exit signs with LED, upgrade lights in Pepsi fridge to LED stick lights. The cost for this project is approximately \$3,040 with saving estimates of approximately \$670 per year.			
Lighting Upgrade	Community Centre	Donna Tremblay, Deputy Clerk	2018-09-30	Pending

Description	Facility	Contact	Date	Status
Details	Upgrade exterior pole and wall packs from HID to LED technology. The cost for this project is approximately \$10,000 with savings of approximately \$1,800 per year.			
Lighting Upgrade	Municipal Office	Mary Hasan, Director of Finance/Treasurer	2015-09-30	Pending
Details	Replace incandescent lamps with LED/CFL technology, de-lamp fixtures in photocopier room, and replace front entrance soffit lighting and add photocell control. The cost for this project is approximately \$500 with saving estimates of approximately \$200 per year.			
Controls Upgrade	Municipal Complex	Mary Hasan, Director of Finance/Treasurer	2017-09-30	Pending
Details	Install occupancy sensors in various key rooms. The cost for this project is approximately \$150 per room with saving estimates of approximately \$120 per year.			
Controls Upgrade	Community Centre	Donna Tremblay, Deputy Clerk	2014-12-31	Pending
Details	Relocate (1) and add (1) occupancy sensor in new washroom, re-program thermostats to deeper setback based on occupied schedule, and install timer on Pepsi fridge and kitchen fridge. The costs for this project are minimal and the payback is immediate.			

10.0 Projects Continued

Description	Facility	Contact	Date	Status
Weather-Stripping	Community Centre	Donna Tremblay, Deputy Clerk	2014-12-31	Pending
Details	Weather-strip around exit door near delivery entrance. The cost for this project is approximately \$150.			
Weather-Stripping	Municipal Complex	Mary Hasan, Director of Finance/Treasurer	2014-12-31	Pending
Details	Replace insulation in Finance office's wall (due to previous water leak) and weather strip around exit door in lunchroom. The cost for this project is approximately \$3,150.			
HVAC	Community Centre	Donna Tremblay, Deputy Clerk	2018-12-31	Pending
Details	Upgrade furnaces to high efficiency systems. The cost for this project is			

Description	Facility	Contact	Date	Status
	approximately \$44,000 based on a report dated December 1, 2013 from Prime Air Systems. Incorporate a natural gas dehumidification system when the furnaces have been upgraded.			
HVAC	Municipal Office and Roads Superintendent Office	Mary Hasan, Director of Finance/Treasurer	2018/12/31	Pending
Details	Re-commission HVAC system and re-balance air flows. After the HVAC system has been re-commissioned and re-balanced, the thermostat in the Roads Superintendent office will work more effectively and the electric heater can be disabled. The costs for this project are approximately \$10,500 with saving estimates of approximately \$1,200 per year.			
Water	Roads Area	Don Creed, Director of Finance/Treasurer	2018/12/31	Pending
Details	Replace electric hot water system with a natural gas model to save on energy consumption.			
Water	Roads Area	Don Creed, Director of Finance/Treasurer	2015/12/31	Pending
Details	Insulate the hot water tank and install pipe insulation on the outgoing hot water line to reduce standby heat loss through the tank and distribution system.			
Appliances	Fire Hall	Steve Goode, Fire Chief	2014/12/31	Immediate
Details	Unplug auxiliary fridge in the storage room during the late fall, winter and early spring. The Fire Department requires the fridge during the summer months.			
Lighting Upgrade	Fire Hall	Steve Goode, Fire Chief	2015/12/31	Pending
Details	Upgrade lighting in exterior sign to T8 or LED technology. The costs for this project are approximately \$300 for six 2-lamp fixtures with saving estimates of approximately \$115 per year.			

10.0 Projects Continued

Description	Facility	Contact	Date	Status
Energy Audit	Optimist Recreation Centre	Don Creed, Director of Public Works and Parks	2015-12-31	Pending
Details	Implement an energy audit in the Optimist Recreation Centre facility.			
Exterior	Municipal Office	Mary Hasan, Director of	2017-12-31	Pending

Description	Facility	Contact	Date	Status
Lighting	including Fire Hall and Roads Area	Finance/Treasurer		
Details	Replace exterior HID lighting with LED technology. The cost for this project is approximately \$4,500 with saving estimates of approximately \$540 per year.			
Water	Community Centre	Donna Tremblay, Deputy Clerk	2018-12-31	Pending
Details	Replace toilet and aerator in washroom off kitchen with water saving devices and replace two water heaters in electrical room with single high efficiency gas unit. The costs for these projects are approximately \$8,300.			
Water	Community Centre	Donna Tremblay, Deputy Clerk	2014-12-31	Pending
Details	Insulate hot water pipes at hot water heaters. This project has an estimated cost of \$200 with savings of \$20-\$45 per year.			
Water	Municipal Office including Fire Hall and Roads Area	Mary Hasan, Director of Finance/Treasurer	2016-12-31	Pending
Details	Replace toilets with low-flush toilets and low flow urinals, install low flow aerators on hand sinks in washrooms, and insulate hot water pipes at hot water heaters. The costs for these projects are approximately \$2,750.			



REPORT FIN-2019-025

TO: Mayor and Members of Council

FROM: Mary Hasan, Director of Finance/Treasurer

MEETING DATE: July 17, 2019

SUBJECT: 2019 Development Charges Background Study and By-law
File No. F21 DEV

RECOMMENDATIONS

THAT Report FIN-2019-025 regarding the 2019 Development Charges Background Study and By-law be received; and

That the Township's 2019 Development Charges Background Study dated May 17, 2019 attached as Schedule A to Report FIN-2019-025 be approved; and

That Council approve the capital project listing set out in Chapter 5 of the Development Charges Background Study attached as Schedule A to Report FIN-2019-025 subject to further annual review during the budget process; and

That Council enact a by-law to adopt the 2019 Development Charges By-law to be effective September 3, 2019.

DISCUSSION

Purpose

The purpose of this report is to obtain Council approval on the 2019 Development Charges Background (DC) Study dated May 17, 2019 and to enact a development charges by-law.

Background

DC's are collected to pay for growth-related capital infrastructure. All municipalities in Ontario must follow the Development Charges Act, 1997 (DCA) and related regulations in order to collect DC's. The DCA is based on the core principle that "growth pays for growth".

The DCA requires that a DC background study be completed prior to updating development charge by-laws. The Township's current Township-wide development charge by-law, By-law No. 054/14, will expire on September 3, 2019. In accordance with the DCA, the Township commenced the DC background study process in 2018 through a kick-off meeting with Watson & Associates Economists Ltd. ("Watson") on October 31, 2018 to discuss the overall process and requirements of Township staff. Township staff met with Watson on May 7, 2019 to discuss capital projects to be identified in the DC study and review by-law policy considerations.

A draft of the Township's DC Background Study and proposed by-law was made available to the public on May 17, 2019 in advance of the statutory public meeting of Council which took place on June 19, 2019.

Public Comments Regarding Proposed Background Study and By-law

There were no comments raised from the Public at the Public Meeting held on June 19, 2019.

DC Background Study

The DC Background Study provides full details and supporting materials for the proposed DC by-law, including:

- The requirements under the DCA, 1997;
- The Township's current DC policy and rates;
- Anticipated development in the Township;
- The approach to the calculation of the DC, including statutory reductions to the cost of growth-related infrastructure that will be borne by developers;
- Proposed DC eligible cost analysis by service area;
- DC policy recommendations and development charge by-law rules;
- Asset Management considerations; and
- By-law implementation

A copy of the DC Background Study is attached as Schedule A to Report FIN-2019-025.

For the purposes of this DC update, the anticipated future development is based upon the approved growth projections in the County of Wellington Official Plan. However, the DC is calculated over the 10-year forecast period to 2029 reflective of the underlying expression of needs.

Growth Related Infrastructure by Service Area

The growth related infrastructure by service area is included in Chapter 5 of the DC Background Study and summarized below.

Administration Studies

- Master Fire Plan – 2025
- DC Study - 2019 and 2024
- Recreation Master Plan - 2025
- Traffic Count Study - 2020
- Transportation Master Plan including Pavement Condition Index Updates - 2021
- Asset Management Plan – 2019
- Community Based Strategic Plan - 2025
- Municipal Servicing Standards - 2019

Parks and Recreation Services

- Soccer Fields at the Puslinch Community Centre Park – 2019 to 2020
- Phase 1 of the Parks Master Plan – 2021
- Phase 2 of the Parks Master Plan – 2022
- Playground area at Boreham Park (also known as Arkell Park) - 2026
- Fox Run Park Trail – 2019

Please note, many of the projects in the Parks and Recreation Services area are contingent on obtaining third party grant funding. As required under the DCA, these anticipated contributions are reflected in the determination of the DC recoverable cost share.

Roads and Related Services

- Various growth related roads, bridges, and culverts projects in accordance with the 2019 Asset Management Plan and 2019 Capital Budget and Forecast (10 year forecast period)
- Gravel Packer – New Equipment for Grader – 2019

Fire Services

- Provision for additional facility space from 2019 to 2021
- Design of a Fully Serviced Station – 2019
- Provision for Equipment for New Firefighters (9) – 2019 to 2028
- Motorized Water Vessel – 2022 to 2024
- Cargo Trailer – 2022 to 2024

The specifics of the above provisions in the Fire Services Service Area will be detailed upon Council's consideration of the cost estimates received from an engineering firm for the design of a fully serviced Satellite Fire Station (including water, septic and hydro costs) as approved in the 2019 Capital Budget. This project has been deferred until such time as the County-wide efficiencies review is completed.

Next Steps

Subject to Council approval, the Township will provide notice of the passage of the by-law via the newspaper and Township website. Written notice will be provided to the County of Wellington, School Boards, Ministry of Municipal Affairs and Housing, and interested parties.

FINANCIAL IMPLICATIONS

Based on the Township's 2019 DC Background Study (attached as Schedule A to this report), the proposed change in DC rates for future developments effective September 3, 2019 are as follows:

Type of Development	Current DC Rates	Proposed DC Rates	Unit of Measure	Increase/ (Decrease)
Single and Semi-Detached Dwelling	\$5,483	\$5,208	Per unit	-\$275
Apartments – 2 Bedrooms +	\$3,322	\$2,832	Per unit	-\$490
Apartments – Bachelor and 1 Bedroom	\$2,248	\$2,407	Per unit	\$159
Other Multiples	\$4,169	\$3,896	Per unit	-\$273
Non-Residential	\$2.56	\$1.60	Per sq. foot	-\$0.96

The decrease in the proposed residential charge compared to the 2014 DC study is relatively modest, with a reduction of \$275 per single detached residential unit (or 5% of the current charge). This is reflective of the historic level of service investment for existing services and the anticipated spending on roads within the Township's Asset Management Plan. The decrease in the proposed non-residential charge compared to the 2014 DC study is greater, i.e. a reduction of \$0.96 per square foot of gross floor area (or 38% of the current charge). This is reflective of the lower amount of employment growth projected over the 10-year forecast period and the lower land density of employment as compared to the 2014 DC study.

APPLICABLE LEGISLATION AND REQUIREMENTS

Development Charges Act, 1997

ATTACHMENTS

Schedule A: 2019 Development Charges Background Study



Development Charges Background Study

Township of Puslinch

For Public Circulation and Comment

May 17, 2019

Watson & Associates Economists Ltd.
905-272-3600
info@watsonecon.ca

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List of Acronyms and Abbreviations

Acronym	Full Description of Acronym
D.C.	Development charge
D.C.A.	Development Charges Act, 1997, as amended
G.F.A.	Gross floor area
L.P.A.T.	Local Planning Appeal Tribunal
N.F.P.O.W.	No Fixed Place of Work
O.M.B.	Ontario Municipal Board
O.P.A.	Official Plan Amendment
O.Reg.	Ontario Regulation
P.O.A.	Provincial Offences Act
P.P.U.	Persons per unit
S.D.E.	Single detached equivalent
S.D.U.	Single detached unit
s.s.	Subsection
sq.ft.	square foot

Report



Chapter 1

Introduction



1. Introduction

1.1 Purpose of this Document

This background study has been prepared pursuant to the requirements of the D.C.A. (s.10) and, accordingly, recommends new D.C.s and policies for the Township of Puslinch (Township).

Watson & Associates Economists Ltd. (Watson) was retained by the Township to undertake the D.C. study process in October 2018. Watson worked with the Township's senior staff in preparing the D.C. analysis and policy recommendations specific to this background study.

This D.C. background study, containing the proposed D.C. by-law, will be distributed to members of the public in order to provide interested parties with sufficient background information on the legislation, the study's recommendations and an outline of the basis for these recommendations.

This report has been prepared, in the first instance, to meet the statutory requirements applicable to the Township's D.C. background study, as summarized in Chapter 4. It also addresses the requirement for "rules" (contained in Chapter 7) and the proposed by-law to be made available as part of the approval process (included as Appendix E).

In addition, the report is designed to set out the Township's current D.C. policies (Chapter 2) and the policies underlying the proposed by-law, to make the exercise understandable to those who are involved. Finally, the study addresses post-adoption implementation requirements (Chapter 9) which are critical to the successful application of the new policy.

The Chapters in the report are supported by Appendices containing the data required to explain and substantiate the calculation of the charge. A full discussion of the statutory requirements for the preparation of a background study and calculation of a D.C. is provided herein.



1.2 Summary of the Process

The public meeting required under Section 12 of the D.C.A., has been scheduled for June 19, 2019. Its purpose is to present the study to the public and to solicit public input. The meeting is also being held to answer any questions regarding the study's purpose, methodology and the proposed modifications to the Township's D.C.s.

In accordance with the legislation, the background study and proposed D.C. by-law will be available for public review on at least 60 days prior to by-law passage.

The process to be followed in finalizing the report and recommendations includes:

- consideration of responses received prior to, at, or immediately following the Public Meeting; and
- finalization of the report and Council consideration of the by-law subsequent to the public meeting.

Figure 1-1 outlines the proposed schedule to be followed with respect to the D.C. by-law adoption process.

Figure 1-1
Schedule of Key D.C. Process Dates

Process Steps	Dates
1. Project initiation meetings with Township staff	October 31, 2018
2. Data collection, staff interviews, preparation of D.C. calculations	July – April, 2019
3. Council Information Session	May 15, 2019
4. Preparation of draft D.C. background study and review of draft findings with staff	April – May, 2019
5. D.C. background study and proposed D.C. by-law available to public	May 17, 2019



Process Steps	Dates
6. Statutory notice of Public Meeting advertisement placed in newspaper(s)	20 days prior to public meeting
7. Public Meeting of Council	June 19, 2019
8. Council considers adoption of D.C. background study and passage of by-law	July 17, 2019
9. Newspaper notice given of by-law passage	By 20 days after passage
10. Last day for by-law appeal	40 days after passage
11. Township makes available D.C. pamphlet	by 60 days after in force date



Chapter 2

Township of Puslinch Current D.C. Policy



2. Township of Puslinch Current D.C. Policy

2.1 By-law Enactment

The Township passed By-law 054/14 on August 13, 2014 under the D.C.A, 1997. The by-law came into effect on September 3, 2014 and will expire on September 2, 2019. By-law 054/14 imposes uniform municipal-wide D.C.s for all services in the by-law.

2.2 Services Covered

The following services are covered under By-law 054/14:

- Roads and Related;
- Fire Protection;
- Parks and Recreation; and
- Administration - Studies.

2.3 Timing of D.C. Calculation and Payment

D.C.s are payable at the time of building permit issuance except those for roads and related services which may, at the discretion of Council, be payable upon entering into a subdivision agreement or consent agreement. D.C.s are collected by the Township's Building Department.

2.4 Indexing

The rates contained in the by-law are indexed on January 1st of each year by the percentage change recorded in the most recent Non-Residential Building Construction Price Index produced by Statistics Canada.

Table 2-1 provides the charges currently in effect, as well as a breakdown of the charges by service component.



Table 2-1
Current Schedule of D.C.s

Service	RESIDENTIAL				NON-RESIDENTIAL
	Single and Semi-Detached Dwelling	Apartments - 2 Bedrooms +	Apartments - Bachelor and 1 Bedroom	Other Multiples	(per ft ² of Gross Floor Area)
Municipal Wide Services:					
Roads and Related	\$ 3,184	\$ 1,929	\$ 1,305	\$ 2,419	\$ 1.83
Fire Protection Services	\$ 1,661	\$ 1,007	\$ 681	\$ 1,262	\$ 0.53
Parks and Recreation	\$ 361	\$ 219	\$ 148	\$ 274	\$ 0.04
Administration - Studies	\$ 277	\$ 167	\$ 114	\$ 210	\$ 0.16
Total Municipal Wide Services	\$ 5,483	\$ 3,322	\$ 2,248	\$ 4,165	\$ 2.56

2.5 Redevelopment Allowance

The by-law provides D.C. credits where as a result of redevelopment of land, a building or structure existed on the same land within 12 months prior to the date of payment of D.C.s. The amount of the credit provided cannot exceed the total D.C.s that would otherwise be payable.

2.6 Exemptions

The following non-statutory exemptions are provided under By-law 054/14:

- Temporary uses permitted under a zoning by-law under section 39 of the *Planning Act*,
- Accessory Use;
- A home occupation;
- Non-residential farm buildings used for agricultural purposes; and
- Institutional use.



Chapter 3

Anticipated Development in the Township of Puslinch



3. Anticipated Development in the Township of Puslinch

3.1 Requirement of the Act

Chapter 4 provides the methodology for calculating a D.C. as per the D.C.A. Figure 4-1 presents this methodology graphically. It is noted in the first box of the schematic that in order to determine the D.C. that may be imposed, it is a requirement of Section 5 (1) of the D.C.A. that “the anticipated amount, type and location of development, for which development charges can be imposed, must be estimated.”

The growth forecast contained in this chapter (with supplemental tables in Appendix A) provides for the anticipated development for which the Township of Puslinch will be required to provide services, over a 10-year (mid-2019 to mid-2029) and a longer term (mid-2019 to mid-2039) time horizon.

3.2 Basis of Population, Household and Non-Residential Gross Floor Area Forecast

The D.C. growth forecast has been derived from the Wellington County Official Plan, June 1, 2018. In preparing the growth forecast, the following additional information sources were consulted to further assess the residential and non-residential development potential for the Township of Puslinch over the forecast period, including:

- The Township of Puslinch 2014 Development Charges Background Study, Watson & Associates Economists Ltd., June 5, 2014 (Including Addendum dated July 10, 2014);
- Wellington County Population, Household and Employment Forecast Update, Final, 2011-2041, Watson & Associates Economists Ltd., May 5, 2015 (as amended January 8, 2016);
- 2006, 2011 and 2016 population, household and employment Census data;
- Historical residential and non-residential building permit data; and
- Discussions with Wellington County staff regarding anticipated residential and non-residential development in the Township of Puslinch.



3.3 Summary of Growth Forecast

A detailed analysis of the residential and non-residential growth forecasts is provided in Appendix A and the methodology employed is illustrated in Figure 3-1. The discussion provided herein summarizes the anticipated growth for the Township and describes the basis for the forecast. The results of the residential growth forecast analysis are summarized in Table 3-1 below, and *Schedule 1* in Appendix A.

As identified in Table 3-1 and Appendix A, *Schedule 1*, the Township's population is anticipated to reach approximately 8,970 by mid-2029 and 9,240 by mid-2039, resulting in an increase of 1,200 and 1,480 persons, respectively, over the 10-year and longer-term forecast periods.¹

Provided below is a summary of the key assumptions and findings regarding the Township of Puslinch D.C. growth forecast.

1. Housing Unit Mix (Appendix A – Schedules 1 and 6)
 - The housing unit mix for the Township was derived from a detailed review of historical development activity (as per Schedule 6) and discussions with Township staff regarding anticipated development trends for Puslinch.
 - Based on the above indicators, the 2019 to 2041 household growth forecast is comprised of a unit mix of 100% low density (single detached and semi-detached), 0% medium density (multiples except apartments) and 0% high density (bachelor, 1-bedroom and 2-bedroom apartments).
2. Geographic Location of Residential Development (Appendix A – Schedule 2)
 - Schedule 2 summarizes the anticipated amount, type and location of development for the Township of Puslinch by urban area and the rural area.

¹ The population figures used in the calculation of the 2019 D.C. exclude the net Census undercount, which is estimated at approximately 4.1%.



Figure 3-1
Population and Household Forecast Model

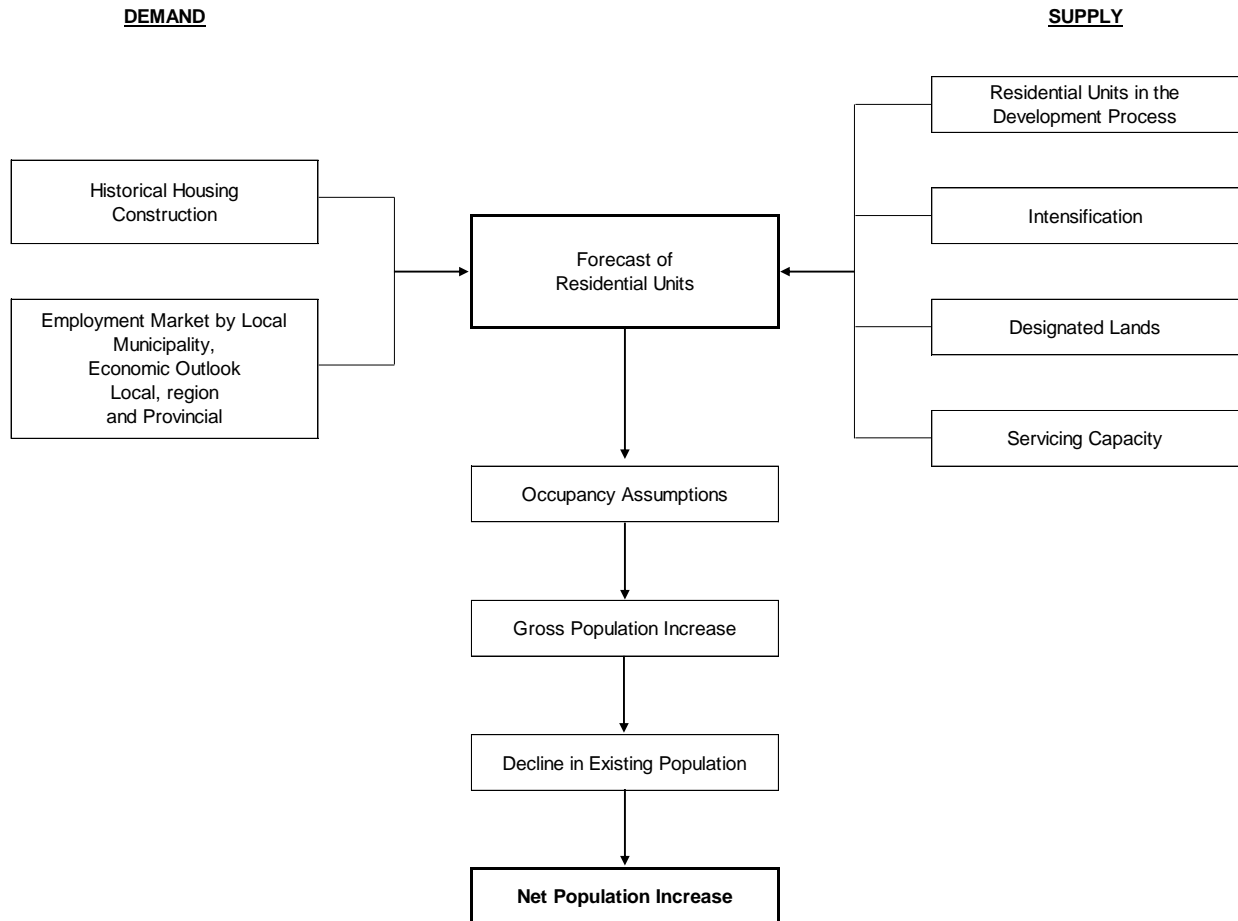




Table 3-1
Township of Puslinch
Residential Growth Forecast Summary

	Year	Population (Including Census Undercount) ¹	Excluding Census Undercount			Housing Units				Person Per Unit (P.P.U.): Total Population/ Total Households	
			Population	Institutional Population	Population Excluding Institutional Population	Singles & Semi- Detached	Multiple Dwellings ²	Apartments ³	Other		Total Households
Historical	<i>Mid 2006</i>	6,960	6,689	124	6,565	2,270	30	20	20	2,340	2.859
	<i>Mid 2011</i>	7,320	7,029	99	6,930	2,158	15	31	330	2,534	2.774
	<i>Mid 2016</i>	7,640	7,336	46	7,290	2,555	35	20	85	2,695	2.722
Forecast	<i>Mid 2019</i>	8,080	7,763	49	7,714	2,714	35	20	85	2,854	2.720
	<i>Mid 2029</i>	9,335	8,965	56	8,909	3,145	35	20	85	3,285	2.729
	<i>Mid 2039</i>	9,615	9,238	58	9,180	3,269	35	20	85	3,409	2.710
	<i>Mid 2041</i>	9,655	9,272	58	9,214	3,285	35	20	85	3,425	2.707
Incremental	Mid 2006 - Mid 2011	360	340	-25	365	-112	-15	11	310	194	
	Mid 2011 - Mid 2016	320	307	-53	360	397	20	-11	-245	161	
	Mid 2016 - Mid 2019	440	427	3	424	159	0	0	0	159	
	Mid 2019 - Mid 2029	1,255	1,202	7	1,195	431	0	0	0	431	
	Mid 2019 - Mid 2039	1,535	1,475	9	1,466	555	0	0	0	555	
	Mid 2019 - Mid 2041	1,575	1,509	9	1,500	571	0	0	0	571	

Derived from Wellington County Official Plan (Updated June 1, 2018) forecast for the Township of Puslinch by Watson & Associates Economists Ltd., 2019. Housing forecast has been updated to reflect recent P.P.U. trends.

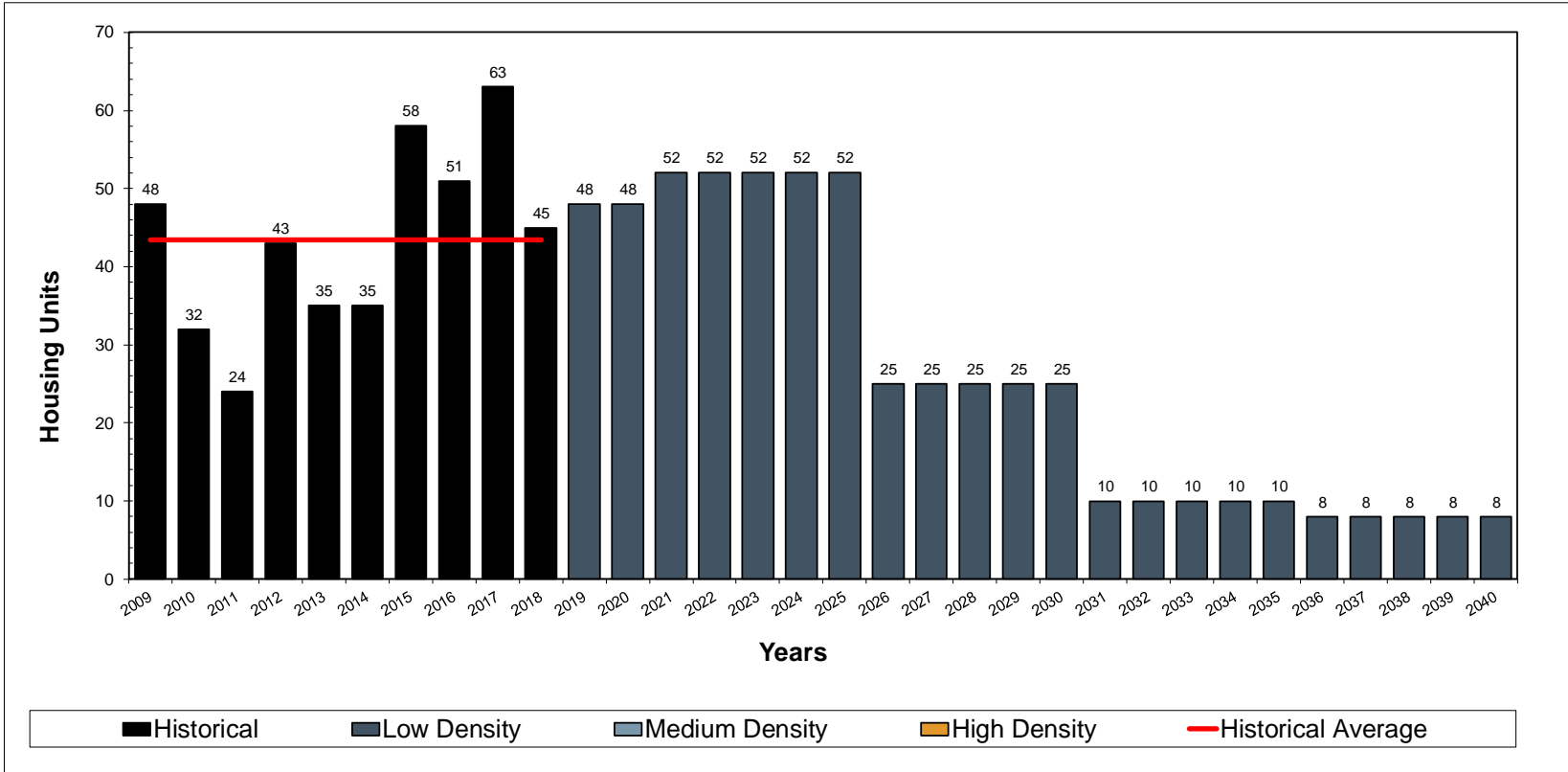
¹ Census undercount estimated at approximately 4.1%. Note: Population including the undercount has been rounded.

² Includes townhouses and apartments in duplexes.

³ Includes bachelor, 1-bedroom and 2-bedroom+ apartments.



Figure 3-2
Township of Puslinch
Annual Housing Forecast



Source: Historical housing activity derived from 2009, 2010 and 2018 Statistics Canada building permit data, 2011 to 2017 based on Wellington County building permit data for the Township of Puslinch.

1. Growth forecast represents calendar year.



- In accordance with forecast demand and available land supply, the percentage of forecast housing growth between 2019 and 2039 by development location is summarized below.

Development Location	Percentage of Housing Growth, 2019 to 2039
Aberfoyle	2%
Morrison	8%
Rural	90%
Township Total	100%

3. Planning Period

- Short and longer-term time horizons are required for the D.C. process. The D.C.A. limits the planning horizon for certain services, such as parks, recreation and libraries, to a 10-year planning horizon. Services related to a highway, public works, fire, police, stormwater, water and wastewater services can utilize a longer planning period.

4. Population in New Housing Units (Appendix A - Schedules 3, 4 and 5)

- The number of housing units to be constructed in the Township of Puslinch during the short- and long-term periods is presented on Figure 3-2. Over the 2019 to 2039 forecast period, the Township is anticipated to average approximately 28 new housing units per year.
- Institutional population¹ is anticipated to grow modestly by 9 persons between 2019 to 2039.
- Population in new units is derived from Schedules 3, 4, and 5, which incorporate historical development activity, anticipated units (see unit mix

¹ Institutional includes special care facilities such as nursing home or residences for senior citizens. A P.P.U. of 1.100 depicts 1-bedroom and 2 or more bedroom units in these special care facilities.



discussion) and average persons per unit (P.P.U.) by dwelling type for new units.

- Schedules 7a and 7b summarize the P.P.U. for the new housing units by age and type of dwelling based on a 2016 custom Census data. The total calculated P.P.U. for all density types has been adjusted accordingly to account for the P.P.U. trends which has been recently experienced in both new and older units. Forecasted 25-year average P.P.U.s by dwelling type are as follows:
 - Low density: 2.967
 - Medium density: 2.220
 - High density¹: 1.537

5. Existing Units and Population Change (Appendix A - Schedules 3, 4 and 5)

- Existing households for early-2019 are based on the 2016 Census households, plus estimated residential units constructed between mid-2016 and 2019 assuming a 6-month lag between construction and occupancy (see Schedule 3).
- The decline in average occupancy levels for existing housing units is calculated in Schedules 3 through 5, by aging the existing population over the forecast period. The forecast population decline in existing households over the 2019 to 2039 forecast period is approximately 180.

6. Employment (Appendix A, Schedules 9a, 9b, 9c, 10 and 11)

- Employment projections are largely based on the activity rate method, which is defined as the number of jobs in a municipality divided by the number of residents. Key employment sectors include primary, industrial, commercial/ population-related, institutional, and work at home, which are considered individually below.

¹ Includes bachelor, 1-bedroom and 2 or more bedroom apartments



- 2016 employment data¹ (place of work) for the Township of Puslinch is outlined in Schedule 9a. The 2016 employment base is comprised of the following sectors:
 - 110 primary (2%);
 - 515 work at home employment (11%);
 - 2,513 industrial (53%);
 - 1,388 commercial/population related (30%); and
 - 205 institutional (4%).
- The 2016 employment by usual place of work, including work at home, is estimated at 4,730. An additional 878 employees have been identified for the Township in 2016 that have no fixed place of work (N.F.P.O.W.).² The 2016 employment base, including N.F.P.O.W., totals approximately 5,610.
- Total employment, including work at home and N.F.P.O.W., for the Township of Puslinch is anticipated to reach approximately 6,530 by mid-2029 and 7,020 by mid-2039. This represents an employment increase of 1,080 for the 10-year forecast period and 1,270 for the 20-year forecast period.
- Schedule 9b, Appendix A, summarizes the employment forecast, excluding work at home employment and N.F.P.O.W. employment, which is the basis for the D.C. employment forecast. The impact on municipal services from work at home employees has already been included in the population forecast. The need for municipal services related to N.F.P.O.W. employees has largely been included in the employment forecast by usual place of work (i.e. employment and gross floor area generated from N.F.P.O.W. construction employment). Furthermore, since these employees have no fixed work address, they cannot be captured in the non-residential gross floor area (G.F.A.) calculation.

¹ 2016 employment is based on Statistics Canada 2016 Place of Work Employment dataset by Watson & Associates Economists Ltd.

² Statistics Canada defines "No Fixed Place of Work" (N.F.P.O.W.) employees as, "persons who do not go from home to the same work place location at the beginning of each shift. Such persons include building and landscape contractors, travelling salespersons, independent truck drivers, etc."



- Total employment for the Township of Puslinch (excluding work at home and N.F.P.O.W. employment) is anticipated to reach approximately 4,790 by mid-2029 and 5,150 by mid-2039. This represents an employment increase of 690 and 860 over the 10-year and 20-year forecast periods, respectively.

7. Non-Residential Sq.ft. Estimates (Gross Floor Area (G.F.A.), Appendix A, Schedule 9b)

- Square footage estimates were calculated in Schedule 9b based on the following employee density assumptions:
 - 1,400 sq.ft. per employee for industrial;
 - 550 sq.ft. per employee for commercial/population-related; and
 - 700 sq.ft. per employee for institutional employment.
- The Township-wide incremental Gross Floor Area (G.F.A.) increase is anticipated to be 354,000 sq.ft. over the 10-year forecast period and 734,000 sq.ft. over the 20-year forecast period.
- In terms of percentage growth, the 2019 to 2039 incremental G.F.A. forecast by sector is broken down as follows:
 - industrial – 80%;
 - commercial/population-related – 16%; and
 - institutional – 4%.

8. Geographic Location of Non-Residential Development (Appendix A, Schedule 9c)

- Schedule 9c summarizes the anticipated amount, type and location of non-residential development for Township of Puslinch by area.
- In accordance with forecast demand and available land supply, the percentage of forecast total non-residential growth between 2019 and 2039 by development location is summarized below.



Development Location	Percentage of Non-Residential G.F.A., 2019 to 2039
Aberfoyle	1%
Morrison	1%
Rural	98%
<i>Township Total</i>	<i>100%</i>



Chapter 4

The Approach to the Calculation of the Charge



4. The Approach to the Calculation of the Charge

4.1 Introduction

This chapter addresses the requirements of s.s.5(1) of the D.C.A. with respect to the establishment of the need for service which underpins the D.C. calculation. These requirements are illustrated schematically in Figure 4-1.

4.2 Services Potentially Involved

Table 4-1 lists the full range of municipal service categories which are provided within the Township.

A number of these services are defined in s.s.2(4) of the D.C.A. as being ineligible for inclusion in D.C.s. These are shown as “ineligible” on Table 4-1. Two ineligible costs defined in s.s.5(3) of the D.C.A. are “computer equipment” and “rolling stock with an estimated useful life of (less than) seven years...” In addition, local roads are covered separately under subdivision agreements and related means (as are other local services). Services which are potentially eligible for inclusion in the Township’s D.C. are indicated with a “Yes.”

4.3 Increase in the Need for Service

The D.C. calculation commences with an estimate of “the increase in the need for service attributable to the anticipated development,” for each service to be covered by the by-law. There must be some form of link or attribution between the anticipated development and the estimated increase in the need for service. While the need could conceivably be expressed generally in terms of units of capacity, s.s.5(1)3, which requires that Township Council indicate that it intends to ensure that such an increase in need will be met, suggests that a project-specific expression of need would be most appropriate.



Figure 4-1
The Process of Calculating a Development Charge under the Act
that must be followed

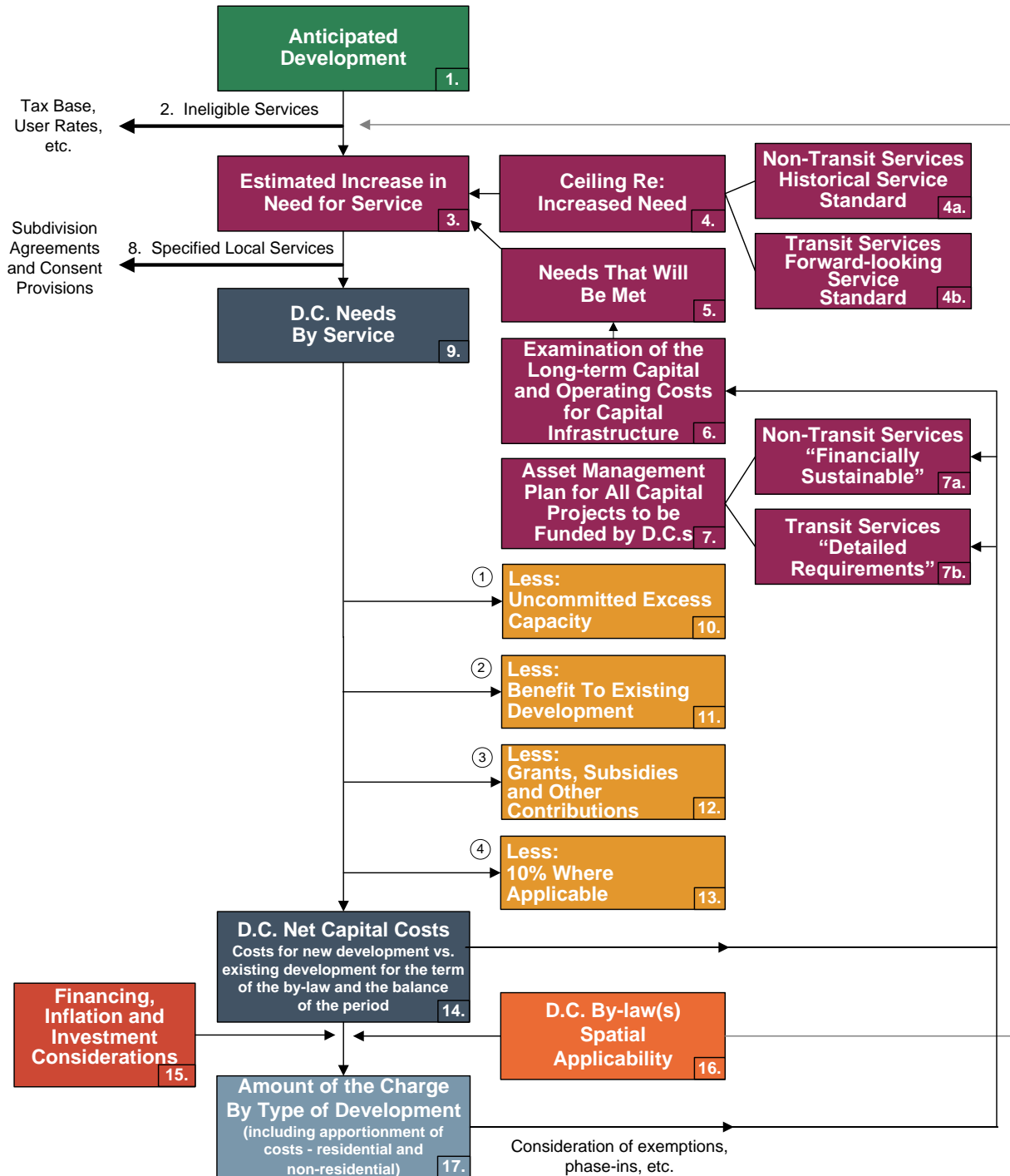




Table 4-1
Categories of Municipal Services to be Addressed as Part of the Calculation

Categories of Municipal Services	Eligibility for Inclusion in the D.C. Calculation	Service Components	Maximum Potential D.C. Recovery %
1. Services Related to a Highway	Yes	1.1 Arterial roads	100
	Yes	1.2 Collector roads	100
	Yes	1.3 Bridges, Culverts and Roundabouts	100
	Ineligible	1.4 Local municipal roads	0
	Yes	1.5 Traffic signals	100
	Yes	1.6 Sidewalks and streetlights	100
	Yes	1.7 Active Transportation	100
2. Other Transportation Services	n/a	2.1 Transit vehicles ¹ & facilities	100
	n/a	2.2 Other transit infrastructure	100
	n/a	2.3 Municipal parking spaces - indoor	90
	No	2.4 Municipal parking spaces - outdoor	90
	Yes	2.5 Works Yards	100
	Yes	2.6 Rolling stock ¹	100
	n/a	2.7 Ferries	90
	n/a	2.8 Airport	90
3. Stormwater Drainage and Control Services	No	3.1 Main channels and drainage trunks	100
	No	3.2 Channel connections	100
	No	3.3 Retention/detention ponds	100
4. Fire Protection Services	Yes	4.1 Fire stations	100
	Yes	4.2 Fire pumpers, aerials and rescue vehicles ¹	100
	Yes	4.3 Small equipment and gear	100

¹with 7+ year life time

*same percentage as service component to which it pertains
computer equipment excluded throughout



Categories of Municipal Services	Eligibility for Inclusion in the D.C. Calculation	Service Components	Maximum Potential D.C. Recovery %
5. Outdoor Recreation Services (i.e. Parks and Open Space)	Ineligible	5.1 Acquisition of land for parks, woodlots and E.S.A.s	0
	Yes	5.2 Development of area municipal parks	90
	Yes	5.3 Development of district parks	90
	Yes	5.4 Development of municipal-wide parks	90
	Yes	5.5 Development of special purpose parks	90
	Yes	5.6 Parks rolling stock ¹ and yards	90
6. Indoor Recreation Services	Yes	6.1 Arenas, indoor pools, fitness facilities, community centres, etc. (including land)	90
	Yes	6.2 Recreation vehicles and equipment ¹	90
7. Library Services	n/a	7.1 Public library space (incl. furniture and equipment)	90
	n/a	7.2 Library vehicles ¹	90
	n/a	7.3 Library materials	90
8. Electrical Power Services	Ineligible	8.1 Electrical substations	0
	Ineligible	8.2 Electrical distribution system	0
	Ineligible	8.3 Electrical system rolling stock	0
9. Provision of Cultural, Entertainment and Tourism Facilities and Convention Centres	Ineligible	9.1 Cultural space (e.g. art galleries, museums and theatres)	0
	Ineligible	9.2 Tourism facilities and convention centres	0
10. Wastewater Services	n/a	10.1 Treatment plants	100
	n/a	10.2 Sewage trunks	100
	Ineligible	10.3 Local systems	0
	n/a	10.4 Vehicles and equipment ¹	100

¹with 7+ year life time



Categories of Municipal Services	Eligibility for Inclusion in the D.C. Calculation	Service Components	Maximum Potential D.C. Recovery %
11. Water Supply Services	n/a	11.1 Treatment plants	100
	n/a	11.2 Distribution systems	100
	Ineligible	11.3 Local systems	0
	n/a	11.4 Vehicles and equipment ¹	100
12. Waste Management Services	Ineligible	12.1 Landfill collection, transfer vehicles and equipment	0
	Ineligible	12.2 Landfills and other disposal facilities	0
	n/a	12.3 Waste diversion facilities	90
	n/a	12.4 Waste diversion vehicles and equipment ¹	90
13. Police Services	n/a	13.1 Police detachments	100
	n/a	13.2 Police rolling stock ¹	100
	n/a	13.3 Small equipment and gear	100
14. Homes for the Aged	n/a	14.1 Homes for the aged space	90
	n/a	14.2 Vehicles ¹	90
15. Child Care	n/a	15.1 Child care space	90
	n/a	15.2 Vehicles ¹	90
16. Health	n/a	16.1 Health department space	90
	n/a	16.2 Health department vehicles ¹	90
17. Social Housing	n/a	17.1 Social Housing space	90
18. Provincial Offences Act (P.O.A.)	n/a	18.1 P.O.A. space	90
19. Social Services	n/a	19.1 Social service space	90
20. Ambulance	n/a	20.1 Ambulance station space	90
	n/a	20.2 Vehicles ¹	90
21. Hospital Provision	Ineligible	21.1 Hospital capital contributions	0

¹with 7+ year life time



Categories of Municipal Services	Eligibility for Inclusion in the D.C. Calculation	Service Components	Maximum Potential D.C. Recovery %
22. Provision of Headquarters for the General Administration of Municipalities and Area Municipal Boards	Ineligible	22.1 Office space	0
	Ineligible	22.2 Office furniture	0
	Ineligible	22.3 Computer equipment	0
23. Other Services	Yes	23.1 Studies in connection with acquiring buildings, rolling stock, materials and equipment, and improving land ² and facilities, including the D.C. background study cost	0-100
	Yes		23.2 Interest on money borrowed to pay for growth-related capital

¹with a 7+ year life time

²same percentage as service component to which it pertains

Eligibility for Inclusion in the D.C. Calculation	Description
Yes	Township provides the service – service has been included in the D.C. calculation.
No	Township provides the service – service has not been included in the D.C. calculation.
n/a	Township does not provide the service.
Ineligible	Service is ineligible for inclusion in the D.C. calculation.

4.4 Local Service Policy

Some of the need for services generated by additional development consists of local services related to a plan of subdivision. As such, they will be required as a condition of



subdivision agreements or consent conditions. The Township's Local Service Policy is included in Appendix D.

4.5 Capital Forecast

Paragraph 7 of s.s.5(1) of the D.C.A. requires that “the capital costs necessary to provide the increased services must be estimated.” The Act goes on to require two potential cost reductions and the Regulation sets out the way in which such costs are to be presented. These requirements are outlined below.

These estimates involve capital costing of the increased services discussed above. This entails costing actual projects or the provision of service units, depending on how each service has been addressed.

The capital costs include:

- a) costs to acquire land or an interest therein (including a leasehold interest);
- b) costs to improve land;
- c) costs to acquire, lease, construct or improve buildings and structures;
- d) costs to acquire, lease or improve facilities, including rolling stock (with a useful life of 7 or more years), furniture and equipment (other than computer equipment), materials acquired for library circulation, reference or information purposes;
- e) interest on money borrowed to pay for the above-referenced costs;
- f) costs to undertake studies in connection with the above-referenced matters; and
- g) costs of the D.C. background study.

In order for an increase in need for service to be included in the D.C. calculation, Township Council must indicate “...that it intends to ensure that such an increase in need will be met” (s.s.5 (1)3). This can be done if the increase in service forms part of a Council-approved Official Plan, capital forecast or similar expression of the intention of Council (O.Reg. 82/98 s.3). The capital program contained herein reflects the Township's approved and proposed capital budgets and master servicing/needs studies.



4.6 Treatment of Credits

Section 8, paragraph 5, of O.Reg. 82/98 indicates that a D.C. background study must set out “the estimated value of credits that are being carried forward relating to the service.” Subsection 17, paragraph 4, of the same Regulation indicates that “...the value of the credit cannot be recovered from future D.C.s,” if the credit pertains to an ineligible service. This implies that a credit for eligible services can be recovered from future D.C.s. As a result, this provision should be made in the calculation, in order to avoid a funding shortfall with respect to future service needs. The Township has no outstanding credit obligations.

4.7 Existing Reserve Funds

Section 35 of the D.C.A. states that:

“The money in a reserve fund established for a service may be spent only for capital costs determined under paragraphs 2 to 8 of subsection 5(1).”

There is no explicit requirement under the D.C.A. calculation method set out in s.s.5(1) to net the outstanding reserve fund balance as part of making the D.C. calculation; however, s.35 does restrict the way in which the funds are used in future.

For services which are subject to a per capita based, service level “cap,” the reserve fund balance should be applied against the development-related costs for which the charge was imposed once the project is constructed (i.e. the needs of recent growth). This cost component is distinct from the development-related costs for the next 10-year period, which underlie the D.C. calculation herein.

The alternative would involve the Township spending all reserve fund monies prior to renewing each by-law, which would not be a sound basis for capital budgeting. Thus, the Township will use these reserve funds for the Township’s cost share of applicable development-related projects, which are required but have not yet been undertaken, as a way of directing the funds to the benefit of the development which contributed them (rather than to future development, which will generate the need for additional facilities directly proportionate to future growth).



The Township's D.C. Reserve Fund balances, by service, as at December 31, 2018 are presented in Table 4-1 below. The adjustments shown below reflect a reconciliation of reserve fund draws for D.C. eligible actual project expenditures.

Table 4-1
December 31, 2018 Adjusted Reserve Fund Balances

Service	2018 Year-End Reserve Fund Balance	Adjustments	Adjusted Balance
Fire	\$ 342,918	\$ (143,420)	\$ 199,498
Roads and Related	\$ 143,617	\$ (173,524)	\$ (29,907)
Parks and Recreation	\$ 63,157	\$ (11,238)	\$ 51,919
Administration	\$ 25,574	\$ (56,966)	\$ (31,392)
Total	\$ 575,266	\$ (385,148)	\$ 190,118

4.8 Deductions

The D.C.A. potentially requires that five deductions be made to the increase in the need for service. These relate to:

- the level of service ceiling;
- uncommitted excess capacity;
- benefit to existing development;
- anticipated grants, subsidies and other contributions; and
- 10% reduction for certain services.

The requirements behind each of these reductions are addressed as follows:

4.8.1 Reduction Required by Level of Service Ceiling

This is designed to ensure that the increase in need included in 4.3 does "...not include an increase that would result in the level of service (for the additional development increment) exceeding the average level of the service provided in the Township over the 10-year period immediately preceding the preparation of the background study..."

O.Reg. 82.98 (s.4) goes further to indicate that "...both the quantity and quality of a service shall be taken into account in determining the level of service and the average level of service."



In many cases, this can be done by establishing a quantity measure in terms of units as floor area, land area or road length per capita and a quality measure, in terms of the average cost of providing such units based on replacement costs, engineering standards or recognized performance measurement systems, depending on circumstances. When the quantity and quality factor are multiplied together, they produce a measure of the level of service, which meets the requirements of the Act, i.e. cost per unit.

With respect to transit services, the changes to the Act as a result of Bill 73 have provided for an alternative method for calculating the services standard ceiling. Transit services must now utilize a forward-looking service standard analysis, described later in this section.

The average service level calculation sheets for each service component in the D.C. calculation are set out in Appendix B.

4.8.2 Reduction for Uncommitted Excess Capacity

Paragraph 5 of s.s.5(1) requires a deduction from the increase in the need for service attributable to the anticipated development that can be met using the Township's "excess capacity," other than excess capacity which is "committed."

"Excess capacity" is undefined, but in this case must be able to meet some or all of the increase in need for service, in order to potentially represent a deduction. The deduction of uncommitted excess capacity from the future increase in the need for service would normally occur as part of the conceptual planning and feasibility work associated with justifying and sizing new facilities, e.g. if a road widening to accommodate increased traffic is not required because sufficient excess capacity is already available, then widening would not be included as an increase in need, in the first instance.

4.8.3 Reduction for Benefit to Existing Development

Section 5(1)6 of the D.C.A. provides that, "The increase in the need for service must be reduced by the extent to which an increase in service to meet the increased need would benefit existing development." The general guidelines used to consider benefit to existing development included the following:



- the repair or unexpanded replacement of existing assets that are in need of repair;
- an increase in average service level of quantity or quality (compare water as an example);
- the elimination of a chronic servicing problem not created by growth; and
- providing services where none previously existed (generally considered for water or wastewater services).

This step involves a further reduction in the need, by the extent to which such an increase in service would benefit existing development. The level of services cap in 4.4 is related but is not the identical requirement. Sanitary, storm and water trunks are highly localized to growth areas and can be more readily allocated in this regard than other services such as services related to a highway, which do not have a fixed service area.

Where existing development has an adequate service level which will not be tangibly increased by an increase in service, no benefit would appear to be involved. For example, where expanding existing library facilities simply replicates what existing residents are receiving, they receive very limited (or no) benefit as a result. On the other hand, where a clear existing service problem is to be remedied, a deduction should be made accordingly.

In the case of services such as recreation facilities, community parks, libraries, etc., the service is typically provided on a Township-wide system basis. For example, facilities of the same type may provide different services (i.e. leisure pool vs. competitive pool), different programs (i.e. hockey vs. figure skating) and different time availability for the same service (i.e. leisure skating available on Wednesday in one arena and Thursday in another). As a result, residents will travel to different facilities to access the services they want at the times they wish to use them, and facility location generally does not correlate directly with residence location. Even where it does, displacing users from an existing facility to a new facility frees up capacity for use by others and generally results in only a very limited benefit to existing development. Further, where an increase in demand is not met for a number of years, a negative service impact to existing development is involved for a portion of the planning period.



4.8.4 Reduction for Anticipated Grants, Subsidies and Other Contributions

This step involves reducing the capital costs necessary to provide the increased services by capital grants, subsidies and other contributions (including direct developer contributions required due to the local service policy) made or anticipated by Council and in accordance with various rules such as the attribution between the share related to new vs. existing development (O.Reg. 82.98 s.6). That is, some grants and contributions may not specifically be applicable to growth or where Council targets fundraising as a measure to offset impacts on taxes. Moreover, Gas Tax revenues are typically used to fund non-growth-related works or the non-growth share of D.C. projects, given that the contribution is not being made in respect of particular growth-related capital projects.

4.8.5 The 10% Reduction

Paragraph 8 of s.s. (1) of the D.C.A. requires that, “the capital costs must be reduced by 10 percent.” This paragraph does not apply to water supply services, waste water services, storm water drainage and control services, services related to a highway, police and fire protection services. The primary services to which the 10% reduction does apply include services such as parks and recreation, libraries, childcare/social services, the Provincial Offences Act, ambulance, homes for the aged, and health.

The 10% is to be netted from the capital costs necessary to provide the increased services, once the other deductions have been made, as per the infrastructure costs sheets in Chapter 5.

4.9 Municipal-wide vs. Area Rating

This step involves determining whether all of the subject costs are to be recovered on a uniform municipal-wide basis or whether some or all are to be recovered on an area-specific basis. Under the D.C.A., it is now mandatory to “consider” area-rating of services (providing charges for specific areas and services), however, it is not mandatory to implement area-rating. Further discussion is provided in section 7.3.8.



4.10 Allocation of Development

This step involves relating the costs involved to anticipated development for each period under consideration and using allocations between residential and non-residential development and between one type of development and another, to arrive at a schedule of charges.



Chapter 5

D.C.-Eligible Cost Analysis by Service



5. D.C.-Eligible Cost Analysis by Service

5.1 Introduction

This chapter outlines the basis for calculating eligible costs for the D.C.s to be applied on a uniform basis. In each case, the required calculation process set out in s.5(1) paragraphs 2 to 8 in the D.C.A. and described in Chapter 4, was followed in determining D.C. eligible costs.

The nature of the capital projects and timing identified in the Chapter reflects Council's current intention. However, over time, municipal projects and Council priorities change and accordingly, Council's intentions may alter and different capital projects (and timing) may be required to meet the need for services required by new growth.

5.2 Service Levels and 10-Year Capital Costs for D.C. Calculation

This section evaluates the development-related capital requirements for all services over a 10-year planning period. Each service component is evaluated on two format sheets: the average historical 10-year level of service calculation (see Appendix B), which "caps" the D.C. amounts; and, the infrastructure cost calculation, which determines the potential D.C. recoverable cost.

5.2.1 Roads and Related Services

The Township has a current inventory of 183 kilometres of roads, excluding local roads. In addition to roadways, the Township provides and maintains, 23 bridges and culverts, 3.4 kilometres of sidewalks, and 275 traffic signals and streetlights. Furthermore, the Township operates 12,870 sq.ft. of depots and domes and 15 vehicles and equipment items in the provision of this service.

The total historical level of infrastructure investment equates to a \$8,704 per capita level of service. When applied to the forecast population growth to 2028 (i.e. 1,195 population), a maximum D.C. eligible cost of \$10.4 million could be expected to meet the future increase in needs for service.



Review of the Township's Asset Management Plan, capital budget, and discussion with staff have identified future needs required to service new development in the Township over the 10-year forecast period. These capital needs include roads resurfacing projects, bridge and culvert upgrades, and a new gravel packer to maintain the infrastructure. In total, \$11.1 million in gross capital costs have been identified in the roads and related services program. A total of \$9.6 million has been deducted from the growth-related capital needs, recognizing the benefit to existing development. The net growth-related capital costs total \$1.6 million including the reserve fund deficit.

Net growth-related capital costs for roads and related services have been allocated between future residential and non-residential development based on the relationship of incremental population and employment growth over the 10-year forecast period (i.e. 78% residential and 22% non-residential).

5.2.2 Fire Services

The Township currently provides fire protection services from 7,700 sq.ft. of facility spaces. In addition to facility space, the Township also provides fire protection services through the operation of 7 vehicles and 253 items of fire equipment and gear, including equipment for 42 firefighters. In total, the per capita average level of service provided through the capital infrastructure has been \$862. In aggregate the maximum D.C. eligible amount that could be included in the calculation of the charge for fire protection services is \$1.0 million.

The Township anticipates the need to provide additional fire facility space for servicing the west-end of the municipality, additional firefighters, a motorized water vessel and a cargo trailer. In total, \$1.3 million in gross capital costs have been identified for the fire services capital program.

The gross capital costs for the capital program discussed above have been reduced by \$307,635 to reflect the benefit to existing development of the replacement of existing infrastructure. After deducting the existing D.C. reserve fund balances of \$199,498 to reflect funds already having been collected towards these needs, a total of \$761,408 in growth-related fire services needs have been included in the calculation of the D.C.



The net growth-related costs for Fire Services have been allocated between residential and non-residential development, 78% residential and 22% non-residential, based on forecast incremental population and employment growth over the period.

5.2.3 Parks and Recreation Services

With respect to Parks and Recreation Services, the Township currently maintains 50 acres of developed parkland within its jurisdiction. In addition, the Township provides 15 major amenities (e.g. baseball diamonds, horse paddock, picnic pavilion etc.), 720 metres of trails, and 33,895 sq.ft. of indoor recreation space. The Township uses 10 vehicles and equipment to maintain these assets.

The Township's total level of service over the historical 10-year period averaged \$1,337 per capita. In total, the maximum D.C. eligible amount for parks and recreation services over the 10-year forecast period is \$1.3 million based on the established level of service.

Over the 10-year forecast period the Township will begin implementing the recommendations from the Parks and Recreation Master Plan. The Township has also identified soccer fields at Puslinch Community Centre Park, a playground at Boreham Park, as well as the Fox Run Park Trail as part of its parks and recreation services capital program.

The gross capital cost of these projects is \$2.5 million. Of this cost \$704,783 has been deducted as a post period benefit reflecting the express oversizing for future development beyond the 2028 for which the Parks and Recreation Master Plan needs were projected. Approximately, \$686,251 has been deducted from the capital costs, to reflect the benefit to existing development, as well as \$683,251 being deducted for the growth-related portion of anticipated third-party funding towards these projects. The statutory 10% deduction for soft services required under the D.C.A., totals \$39,384 for parks and recreation services. After deducting a further \$51,919 reflective of existing D.C. reserve fund balances collected towards these needs, a net capital costs of \$302,538 has been included in the collection of the charge.

While parks and recreation services usage is predominately residential-based, there is some use of the services by non-residential users. To acknowledge this use, the



growth-related capital costs have been allocated 95% residential and 5% non-residential.

5.2.4 Administration

The D.C.A. permits the inclusion of studies undertaken to facilitate the completion of the Township's capital works program and to support the preparation of future D.C. background studies. The Township has made provision for the inclusion of new studies undertaken to facilitate this D.C. process, as well as other studies which benefit growth (in whole or in part). The list of studies includes future D.C. Background Studies, as well as other planning studies and servicing studies.

The total cost of these studies is \$274,500, of which \$114,503 is attributable to the benefit to existing development. After deducting \$9,360 for the mandatory 10% deduction, and including the D.C. reserve fund deficit balance, a net capital cost of \$182,029 and has been included in the D.C. calculation.

These costs have been allocated 78% residential and 22% non-residential based on the incremental growth in population to employment for the 10-year forecast period.



Infrastructure Costs Covered in the D.C. Calculation – Roads and Related Services

Prj .No	Increased Service Needs Attributable to Anticipated Development 2019-2028	Asset Number	Timing (year)	Gross Capital Cost Estimate (2019\$)	Post Period Benefit	Net Capital Cost	Less:		Potential D.C. Recoverable Cost		
							Benefit to Existing Development	Grants, Subsidies and Other Contributions Attributable to New Development	Total	Residential Share 78%	Non-Residential Share 22%
	Roads										
1	Victoria Road South: County Road 36 (Badenoch Street) to Gilmour Road	124	2019	382,500	-	382,500	330,475		52,025	40,579	11,445
2	Victoria Road South: Gilmour Road to entrance to Aberfoyle Pit #2	125A	2019	127,500	-	127,500	110,158		17,342	13,526	3,815
3	Concession 7: Concesion 2A to Mason Road	115	2021	156,675	-	156,675	135,365		21,310	16,622	4,688
4	Concession 7: Mason Road to McLean Road West	116	2021	52,225	-	52,225	45,122		7,103	5,541	1,563
5	Concession 2: Side Road 20 South to Sideroad 25 South (Truck Route)	35	2021	346,200	-	346,200	299,113		47,087	36,728	10,359
6	Concession 2: Sideroad 25 South to Concession 7 (Truck Route)	36	2021	173,100	-	173,100	149,556		23,544	18,364	5,180
7	Watson Road South: bridge to Leslie Road West	134	2023	86,000	-	86,000	74,303		11,697	9,124	2,573
8	Watson Road South: County Road 36 (Badenoch Street) to Bridge	136	2023	129,000	-	129,000	111,454		17,546	13,686	3,860
9	Watson Road South: Leslie Road West to McRae Station Road	133	2023	127,400	-	127,400	110,072		17,328	13,516	3,812
10	Morrison Traffic Calming		2028	100,000	-	100,000	86,399		13,601	10,609	2,992
11	Concession 1- Sideroad 10 to Wellington Rd 35	14	2027	255,000	-	255,000	220,317		34,683	27,053	7,630
12	Concession 11 railway crossing - County Road 34 to Sideroad 17	144	2019	50,000	-	50,000	43,199		6,801	5,304	1,496
13	Concession 1 - Sideroad 20 South to Concession 7	16, 17	2020	520,000	-	520,000	449,274		70,726	55,166	15,560
14	Concession 4- Sideroad 10 to 32	56	2024	450,000	-	450,000	388,795		61,205	47,740	13,465
15	McLean Rd E and Winer Rd	212A, 158	2024	365,000	-	365,000	315,356		49,644	38,723	10,922
16	Mason Crt Concession 7 to dead end	38	2024	38,100	-	38,100	32,918		5,182	4,042	1,140
17	Maple Leaf Lane County Road 46 to dead end	52	2024	45,800	-	45,800	39,571		6,229	4,859	1,370
18	Concession 4- Hwy 6 to 35	160, 161	2025	390,000	-	390,000	336,955		53,045	41,375	11,670
19	Watson Road South: Maltby Road East to County Road 34	139, 140	2026	480,000	-	480,000	414,714		65,286	50,923	14,363
20	Watson Rd - Wellington Road 34 to Wellington Road 36	137	2026	500,000	-	500,000	431,994		68,006	53,045	14,961



Infrastructure Costs Covered in the D.C. Calculation – Roads and Related Services (Cont'd)

Prj.No	Increased Service Needs Attributable to Anticipated Development 2019-2028	Asset Number	Timing (year)	Gross Capital Cost Estimate (2019\$)	Post Period Benefit	Net Capital Cost	Less:		Potential D.C. Recoverable Cost		
							Benefit to Existing Development	Grants, Subsidies and Other Contributions Attributable to New Development	Total	Residential Share 78%	Non-Residential Share 22%
	Roads										
21	Gore Road - Valens Road to Concession 7	5	2026	270,000	-	270,000	233,277		36,723	28,644	8,079
22	Church and Victoria Street	28_Surface	2026	50,000	-	50,000	43,199		6,801	5,304	1,496
23	Leslie Rd West- Victoria Rd South to East limit	21, 22, 23, 25	2027	645,000	-	645,000	557,272		87,728	68,428	19,300
24	Gore Rd-Sideroad 20 to Valens Rd	4	2027	365,000	-	365,000	315,356		49,644	38,723	10,922
25	Sideroad 20 North - Wellington Road 34 to Forestell Road	166	2028	375,000	-	375,000	323,996		51,004	39,783	11,221
26	Roszell Road - Townline Road to Forestell Road	90, 54a	2028	287,500	-	287,500	248,397		39,103	30,501	8,603
27	Maltby Road - Victoria Road to Watson Road	63A, 63B	2028	262,500	-	262,500	226,797		35,703	27,848	7,855
28	Concession 4- Sideroad 10 North to Sideroad 12 North	57	2019	112,000	-	112,000	96,767		15,233	11,882	3,351
29	Concession 1 -County Road 35 to Sideroad 20 South	15	2019	303,000	-	303,000	261,788		41,212	32,145	9,067
30	Brock Road Sidewalk - 304	304	2019-2020	235,000	-	235,000	203,037		31,963	24,931	7,032
31	Leslie Road West - Watson Road South to Bridge 5 (Mountsberg)	22	2021-2022	620,000	-	620,000	535,673		84,327	65,775	18,552
32	Fox Run Drive - transition to curb to County Road 46	205, 206	2022	63,000	-	63,000	54,431		8,569	6,684	1,885
33	Concession 4 - County Road 35 to Sideroad 20 North	59	2025	282,739	-	282,739	244,283		38,456	29,996	8,460
	Bridges and Culverts										
34	Galt Creek Bridge Gore Road Lot 2	1008	2021	170,000	-	170,000	146,878		23,122	18,035	5,087
35	Little's Bridge	1003	2022-2023	525,000	-	525,000	453,594		71,406	55,697	15,709
36	Moyer's Bridge - 0004	1004	2024	25,000	-	25,000	21,600		3,400	2,652	748
37	Moyer's Bridge - 0004	1004	2025	500,000	-	500,000	431,994		68,006	53,045	14,961
38	Gilmour Culvert	2009	2023-2025	600,000	-	600,000	518,393		81,607	63,654	17,954
39	Victoria Road Culvert Over Galt Creek	2006	2024	105,000	-	105,000	90,719		14,281	11,139	3,142
40	Victoria Road Culvert North of Leslie	2013	2024	105,000	-	105,000	90,719		14,281	11,139	3,142
41	Ellis Road Culvert Over Puslinch Lake Irish Creek	2010	2026	250,000	-	250,000	215,997		34,003	26,522	7,481
42	Irish Creek Culvert on Townline Road	2007	2026	180,000	-	180,000	155,518		24,482	19,096	5,386
	Roads & Related Vehicles										
43	Gravel Packer - New Equipment for Grader	8002	2019	26,000	-	26,000	-		26,000	20,280	5,720
	Reserve Fund Adjustment/Unfunded Balance					29,907			29,907	23,328	6,580
	Total			11,131,239	-	11,161,146	9,594,795	-	1,566,351	1,221,754	344,597



Infrastructure Costs Covered in the D.C. Calculation – Fire Services

Prj .No	Increased Service Needs Attributable to Anticipated Development	Timing (year)	Gross Capital Cost Estimate (2019\$)	Post Period Benefit	Net Capital Cost	Less:		Potential D.C. Recoverable Cost		
						Benefit to Existing Development	Grants, Subsidies and Other Contributions Attributable to New Development	Total	Residential Share	Non-Residential Share
	2019-2028								78%	22%
	Fire Stations									
1	Provision for Additional Facility Space	2019-2021	1,151,750	-	1,151,750	287,938		863,813	673,774	190,039
2	Design a Fully Services Station	2019	10,000	-	10,000	2,500		7,500	5,850	1,650
3	Provision for Equipment for New Firefighters (9)	2019-2028	48,792	-	48,792	12,198		36,594	28,543	8,051
4	Motorized Water Vessel	2022-2024	50,000	-	50,000	5,000		45,000	35,100	9,900
5	Cargo Trailer	2022-2024	8,000	-	8,000	-		8,000	6,240	1,760
	Reserve Fund Adjustment/Unfunded Balance				(199,498)			(199,498)	(155,609)	(43,890)
	Total		1,268,542	-	1,069,044	307,635	-	761,408	593,898	167,510



Infrastructure Costs Covered in the D.C. Calculation – Parks and Recreation Services

Prj.No	Increased Service Needs Attributable to Anticipated Development	Timing (year)	Gross Capital Cost Estimate (2019\$)	Post Period Benefit	Net Capital Cost	Less:		Subtotal	Less: Other (e.g. 10% Statutory Deduction)	Potential D.C. Recoverable Cost		
						Benefit to Existing Development	Grants, Subsidies and Other Contributions Attributable to New Development			Total	Residential Share 95%	Non-Residential Share 5%
2019-2028												
1	Soccer Fields at Puslinch Community Centre Park	2019-2020	698,169	280,239	417,930	69,817	269,249	78,865	7,886	70,978	67,429	3,549
2	Phase 1 of Parks Master Plan	2021	701,907	73,496	628,411	537,115	59,343	31,954	3,195	28,758	27,320	1,438
3	Phase 2 of Parks Master Plan	2022	874,580	351,048	523,532	60,000	306,596	156,936	15,694	141,242	134,180	7,062
4	Playground area at Boreham Park (also known as Arkell Park)	2026	75,000	-	75,000	7,500		67,500	6,750	60,750	57,713	3,038
5	Fox Run Park Trail	2019	118,500	-	118,500	11,850	48,064	58,586	5,859	52,728	50,091	2,636
	Reserve Fund Adjustment/Unfunded Balance							(51,919)		(51,919)	(49,323)	(2,596)
	Total		2,468,156	704,783	1,763,373	686,281	683,251	341,922	39,384	302,538	287,411	15,127



Infrastructure Costs Covered in the D.C. Calculation – Administration Studies

Prj.No	Increased Service Needs Attributable to Anticipated Development	Timing (year)	Gross Capital Cost Estimate (2019\$)	Post Period Benefit	Net Capital Cost	Less:		Subtotal	Less:	Potential D.C. Recoverable Cost		
						Benefit to Existing Development	Grants, Subsidies and Other Contributions Attributable to New Development		Other (e.g. 10% Statutory Deduction)	Total	Residential Share	Non-Residential Share
2019-2028										78%	22%	
1	Master Fire Plan	2025	44,000	-	44,000	17,600		26,400	-	26,400	20,592	5,808
2	Development Charges Study	2019	21,000	-	21,000	-		21,000	2,100	18,900	14,742	4,158
3	Recreation Master Plan	2025	50,000	-	50,000	20,000		30,000	3,000	27,000	21,060	5,940
4	Traffic Count Study	2020	25,000	-	25,000	10,000		15,000	-	15,000	11,700	3,300
5	Transportation Master Plan including PCI Updates	2021	25,000	-	25,000	10,000		15,000	-	15,000	11,700	3,300
6	Development Charges Study	2024	21,000	-	21,000	-		21,000	2,100	18,900	14,742	4,158
7	Asset Management Plan	2019	48,500	-	48,500	41,903		6,597	660	5,937	4,631	1,306
8	Community Based Strategic Plan	2025	30,000	-	30,000	15,000		15,000	1,500	13,500	10,530	2,970
9	Municipal Servicing Standards	2019	10,000	-	10,000	-		10,000	-	10,000	7,800	2,200
	Reserve Fund Adjustment/Unfunded Balance							31,392		31,392	24,486	6,906
	Total		274,500	-	274,500	114,503	-	191,388	9,360	182,029	141,982	40,046



Chapter 6

D.C. Calculation



6. D.C. Calculation

Table 6-1 presents the Township-wide D.C. calculation for all Township-wide services over the 10-year planning horizon (i.e. 2019-2028).

The calculation for residential development is generated on a per capital basis and is based upon four forms of housing types (single and semi-detached, apartments 2+ bedrooms, apartment's bachelor and 1 bedroom, and all other multiples). The non-residential D.C. has been calculated uniformly on a per sq.ft. of G.F.A. basis.

Table 6-2 summarizes the recommended schedule of charges, reflecting the maximum D.C.s by residential dwelling type, per sq.ft. of G.F.A. for non-residential development.

Table 6-3 compares the Township's existing charges to the charges proposed herein (Table 6-2), for a single detached residential dwelling unit and per sq.ft. of G.F.A. for non-residential development. The calculated charges are \$5,208 for a single detached residential dwelling unit, and \$1.60 per sq.ft. of non-residential G.F.A. The residential charges for a single detached dwelling unit represent an 11% decrease (-\$275) over the current charges of \$5,483. The non-residential charges per sq.ft. of G.F.A. represent a 46% decrease (-\$0.96) over the current charges of \$2.56 per sq.ft. of G.F.A.

Table 6-1
Municipal-Wide Services D.C. Calculation
2019-2028

SERVICE	2019\$ D.C.-Eligible Cost		2019\$ D.C.-Eligible Cost	
	Residential	Non-Residential	S.D.U.	per sq.ft.
	\$	\$	\$	\$
1. Roads and Related	1,221,754	344,597	2,834	0.98
2. Fire Protection Services	593,898	167,510	1,378	0.47
3. Parks and Recreation Services	287,411	15,127	667	0.04
4. Administration - Studies	141,982	40,046	329	0.11
TOTAL	2,245,045	\$567,280	\$5,208	\$1.60
D.C.-Eligible Capital Cost	2,245,045	\$567,280		
10-Year Gross Population/GFA Growth (sq.ft.)	1,279	354,300		
Cost Per Capita/Non-Residential GFA (sq.ft.)	\$1,755	\$1.60		
By Residential Unit Type	P.P.U.			
Single and Semi-Detached Dwelling	2.967	\$5,208		
Apartments - 2 Bedrooms +	1.613	\$2,831		
Apartments - Bachelor and 1 Bedroom	1.371	\$2,407		
Other Multiples	2.220	\$3,897		



Table 6-2
Schedule of Calculated D.C.s

Service	RESIDENTIAL				NON-RESIDENTIAL
	Single and Semi-Detached Dwelling	Apartments - 2 Bedrooms +	Apartments - Bachelor and 1 Bedroom	Other Multiples	(per sq.ft. of Gross Floor Area)
Municipal Wide Services:					
Roads and Related	\$ 2,834	\$ 1,541	\$ 1,310	\$ 2,120	\$ 0.98
Fire Protection Services	\$ 1,378	\$ 749	\$ 637	\$ 1,031	\$ 0.47
Parks and Recreation Services	\$ 667	\$ 363	\$ 308	\$ 499	\$ 0.04
Administration - Studies	\$ 329	\$ 179	\$ 152	\$ 246	\$ 0.11
Total Municipal Wide Services	\$ 5,208	\$ 2,832	\$ 2,407	\$ 3,896	\$ 1.60

Table 6-3
Comparison of Current and Calculated D.C.s

Residential (Single Detached) Comparison			Non-Residential (per sq.ft.) Comparison		
Service	Current	Calculated	Service	Current	Calculated
Municipal Wide Services:			Municipal Wide Services:		
Roads and Related	\$ 3,184	\$ 2,834	Roads and Related	\$ 1.83	\$ 0.98
Fire Protection Services	\$ 1,661	\$ 1,378	Fire Protection Services	\$ 0.53	\$ 0.47
Parks and Recreation Services	\$ 361	\$ 667	Parks and Recreation Services	\$ 0.04	\$ 0.04
Administration - Studies	\$ 277	\$ 329	Administration - Studies	\$ 0.16	\$ 0.11
Total Municipal Wide Services	\$ 5,483	\$ 5,208	Total Municipal Wide Services	\$ 2.56	\$ 1.60



Chapter 7

D.C. Policy Recommendations and D.C. By-law Rules



7. D.C. Policy Recommendations and D.C. By-law Rules

7.1 Introduction

This chapter outlines the D.C. policy recommendations and by-law rules.

s.s.5(1)9 states that rules must be developed:

“...to determine if a development charge is payable in any particular case and to determine the amount of the charge, subject to the limitations set out in subsection 6.”

Paragraph 10 of the section goes on to state that the rules may provide for exemptions, phasing in and/or indexing of D.C.s.

s.s.5(6) establishes the following restrictions on the rules:

- the total of all D.C.s that would be imposed on anticipated development must not exceed the capital costs determined under 5(1) 2-8 for all services involved;
- if the rules expressly identify a type of development, they must not provide for it to pay D.C.s that exceed the capital costs that arise from the increase in the need for service for that type of development; however, this requirement does not relate to any particular development;
- if the rules provide for a type of development to have a lower D.C. than is allowed, the rules for determining D.C.s may not provide for any resulting shortfall to be made up via other development; and

With respect to “the rules,” Section 6 states that a D.C. by-law must expressly address the matters referred to above re s.s.5(1) paragraphs 9 and 10, as well as how the rules apply to the redevelopment of land.

The rules provided are based on the Township’s existing policies and recommendations based on best practices.



7.2 D.C. By-law Structure

It is recommended that:

- the Township uses a uniform Township-wide D.C. calculation for all municipal services; and
- one municipal D.C. by-law be used for all services.

7.3 D.C. By-law Rules

The following subsections set out the recommended rules governing the calculation, payment and collection of D.C.s in accordance with Section 6 of the D.C.A.

It is recommended that the following sections provide the basis for the D.C.s:

7.3.1 *Payment in any Particular Case*

In accordance with the D.C.A., s.2(2), a D.C. be calculated, payable and collected where the development requires one or more of the following:

- 1) the passing of a zoning by-law or of an amendment to a zoning by-law under Section 34 of the Planning Act;
- 2) the approval of a minor variance under Section 45 of the Planning Act;
- 3) a conveyance of land to which a by-law passed under Section 50(7) of the Planning Act applies;
- 4) the approval of a plan of subdivision under Section 51 of the Planning Act;
- 5) a consent under Section 53 of the Planning Act;
- 6) the approval of a description under Section 50 of the Condominium Act; or
- 7) the issuing of a building permit under the Building Code Act in relation to a building or structure.

7.3.2 *Determination of the Amount of the Charge*

The following conventions be adopted:

- 1) Costs allocated to residential uses will be assigned to different types of residential units based on the average occupancy for each housing type constructed during the



previous decade. Costs allocated to non-residential uses will be assigned to industrial, commercial and institutional uses based on the G.F.A. constructed.

- 2) Costs allocated to residential and non-residential uses are based upon a number of conventions, as may be suited to each municipal circumstance. These are summarized in Chapter 5 herein.

7.3.3 Application to Redevelopment of Land (Demolition and Conversion)

If a development involves the demolition of and replacement of a building or structure on the same site, or the conversion from one principal use to another, the developer shall be allowed a credit equivalent to:

- 1) the number of dwelling units demolished/converted multiplied by the applicable residential D.C. in place at the time the D.C. is payable; and/or
- 2) the gross floor area of the building demolished/converted multiplied by the current non-residential D.C. in place at the time the D.C. is payable.

The demolition credit is allowed only if the land was improved by occupied structures, and if the demolition permit related to the site was issued less than 5 years prior to the issuance of a building permit. This is a proposed revision to the Township's current practice of providing a 1-year period between demolition and building permit for witnessing redevelopment credits. This proposal reflects industry best practices, and the need to reassess the increase in needs of new development at least every five years under the D.C.A.

No credit shall be given with respect to the redevelopment, conversions, demolition, or change of use of a building or structure or part thereof where the existing building or structure or part thereof would have been exempt from D.C.s in accordance with the active by-law. The credit can, in no case, exceed the amount of D.C.s that would otherwise be payable.



7.3.4 Exemptions (full or partial)

a) Statutory exemptions

- industrial building additions of up to and including 50% of the existing gross floor area (defined in O.Reg. 82/98, s.1) of the building; for industrial building additions which exceed 50% of the existing gross floor area, only the portion of the addition in excess of 50% is subject to D.C.s (s.4(3)) of the D.C.A.;
- buildings or structures owned by and used for the purposes of any municipality, local board or Board of Education (s.3);
- residential development that results only in the enlargement of an existing dwelling unit, or that results only in the creation of up to two additional dwelling units (based on prescribed limits set out in s.2 of O.Reg. 82/98).

For clarity in applying the exemption for industrial building expansions described in section 4 of the D.C.A., the D.C. by-law will include provisions to reflect the following:

"Existing Industrial Building" means a building or buildings existing on a site on the day this by-law is passed, or the first building or buildings constructed on a vacant site pursuant to site plan approval, under Section 41 of the *Planning Act*, subsequent to the passage of this by-law for which full development charges were paid, that is used for or in conjunction with:

- the production, compounding, processing, packaging, crating, bottling, packing or assembly of raw or semi-processed goods or materials in not less than seventy five percent of the total gross floor area of the building or buildings on a site ("manufacturing") or warehousing related to the manufacturing use carried on in the building or buildings;
- research or development activities in connection with manufacturing in not less than seventy five percent of the total gross floor area of the building or building on the site;
- retail sales by a manufacturer, if retail sales are at the site where manufacturing is carried out; such retail sales are restricted to goods manufactured at the site, and the building or part of a building where such retail sales are carried out does not constitute greater than twenty five percent of the total gross floor area of the building or buildings on the site; or



- office or administration purposes if they are:
 - carried out as an accessory use to the manufacturing or warehousing, and
 - in or attached to the building or structure used for such manufacturing or warehousing.

b) Non-statutory exemptions

- Temporary uses permitted under a zoning by-law under section 39 of the *Planning Act*;
- Accessory Use;
- A home occupation;
- Non-residential farm buildings used for agricultural purposes. For the purpose of this exemption the following definition is proposed.
 - “Farm Building” means a building or structure associated with and located on land devoted to the practice of farming and that is used essentially for the housing of farm equipment or livestock or the production, storage or processing of agricultural and horticultural produce or feeds and as part of or in connection with a bona fide farming operation and includes barns, silos and other buildings or structures ancillary to that farming operation, including greenhouses, but excludes:
 - a residential use, with the exception of a bunk house for seasonal farm workers required for that farm operation; and
 - any building or portion thereof used or intended to be used for any other Non-Residential Use, including, but not limited to: retail sales; commercial services; restaurants; banquet facilities; hospitality and accommodation facilities; gift shops; contractors’ shops; services related to grooming, boarding, or breeding of household pets; and alcohol and marijuana production facilities.
- Institutional use.

7.3.5 Phasing in

No provisions for phasing in the D.C. are provided in the D.C. by-law.



7.3.6 Timing of Collection

A D.C. that is applicable under Section 5 of the D.C.A. shall be calculated and payable:

- where a permit is required under the *Building Code Act* in relation to a building or structure, the owner shall pay the D.C. prior to the issuance of a permit or prior to the commencement of development or redevelopment as the case may be; and
- despite the above, Council, from time to time and at any time, may enter into agreements providing for all or any part of a D.C. to be paid before or after it would otherwise be payable.

7.3.7 Indexing

All D.C.s will be subject to mandatory indexing annually on January 1st of each year, in accordance with provisions under the D.C.A.

7.3.8 D.C. Spatial Applicability

The D.C.A. historically has provided the opportunity for a municipality to impose municipal-wide charges or area specific charges. Sections 2(7) and 2(8) of the D.C.A. provide that a D.C. by-law may apply to the entire municipality or only part of it and more than one D.C. by-law may apply to the same area. Amendments to the D.C.A. now require municipalities to consider the application of municipal-wide and area-specific D.C.s. s.10(2)(c.1) requires Council to consider the use of more than one D.C. by-law to reflect different needs from services in different areas. Most municipalities in Ontario have established uniform, municipal-wide D.C.s. This has been the Township's approach in prior D.C. by-laws. When area-specific charges are used, it is generally to underpin master servicing and front-end financing arrangements for more localized capital costs.

The rationale for maintaining a municipal-wide D.C. approach is based, in part, on the following:

- The ten-year service level from all applicable services across the municipality can be included to establish an upper ceiling on the amount of funds which can be collected. If a D.C. by-law applied to only a part of the municipality, the level of service cannot exceed that which would be determined if the by-law applied to the whole municipality. As such, when applied to forecast growth within the



specific area, it would establish an area specific level of service ceiling which could reduce the total revenue recoverable for the municipality, potentially resulting in D.C. revenue shortfalls and impacts on property taxes and user rates.

- Municipal-wide D.C.s ensures a consistent approach to financing the entire cost associated with growth-related capital projects. For example, user rates and property taxes are required to finance the share of growth-related capital projects not recoverable by D.C.s and all associated operating costs. Therefore, the use of area specific D.C.s results in a share of growth-related capital costs being recovered from a specific area, with the remaining capital costs of the projects (i.e. non-D.C. recoverable share) and the associated operating costs with those new assets being recovered from uniform user rates and property taxes, applied to the entire municipality.
- Attempting to impose an area-specific D.C. potentially causes equity issues in transitioning from a municipal-wide approach to an area-specific approach. An area of a municipality that is less developed and becomes subject to an area specific D.C., could face a significant increase in D.C. rates, as the municipality will not benefit from drawing on the pool of D.C. funding and may have contributed regional D.C.s to fund capital required to support development in other communities of the municipality. Whereas, another part of the municipality that has experienced significant growth which required substantial capital investments, benefitted from the capital investments being financed by municipal-wide D.C.s. The implementation of area specific development charges could result in varying D.C.s across the municipality, which may impact the ability to attract investment into parts of the community.
- Services are generally available across the Township, used often by all residents and are not restricted to one specific geographic area. The use of a municipal-wide D.C. approach reflects these system-wide benefits of service and more closely aligns with the funding principles of service provision (e.g. uniform municipal-wide property tax rates, etc.).

Based on the foregoing and discussions with Township staff, there is no apparent justification for the establishment of area-specific D.C.s at this time. The recommendation is to continue to apply municipal-wide D.C.s for all services.



7.4 Other D.C. By-law Provisions

7.4.1 Categories of Services for Reserve Fund and Credit Purposes

It is recommended that the Township's D.C. collections be contributed into four (4) separate reserve funds, including: Roads and Related Services, Fire Protection Services, Parks and Recreation Services, and Administration Studies.

7.4.2 By-law In-force Date

The proposed by-law under D.C.A., 1997 will come into force on the day it is passed.

7.4.3 Minimum Interest Rate Paid on Refunds and Charged for Inter-Reserve Fund Borrowing

The minimum interest rate is the Bank of Canada rate on the day on which the by-law comes into force (as per s.11 of O.Reg. 82/98).

7.5 Other Recommendations

It is recommended that Council:

“Approve the capital project listing set out in Chapter 5 of the D.C. Background Study dated May 17, 2019, subject to further annual review during the capital budget process;”

“Approve the D.C. Background Study dated May 17, 2019”

“Determine that no further public meeting is required;” and

“Approve the D.C. By-law as set out in Appendix E.”



Chapter 8

Asset Management Plan



8. Asset Management Plan

8.1 Introduction

The changes to the D.C.A. (new section 10(c.2)) in 2016 require that the background study must include an Asset Management Plan (A.M.P) related to new infrastructure. Section 10 (3) of the D.C.A. provides:

The A.M.P. shall,

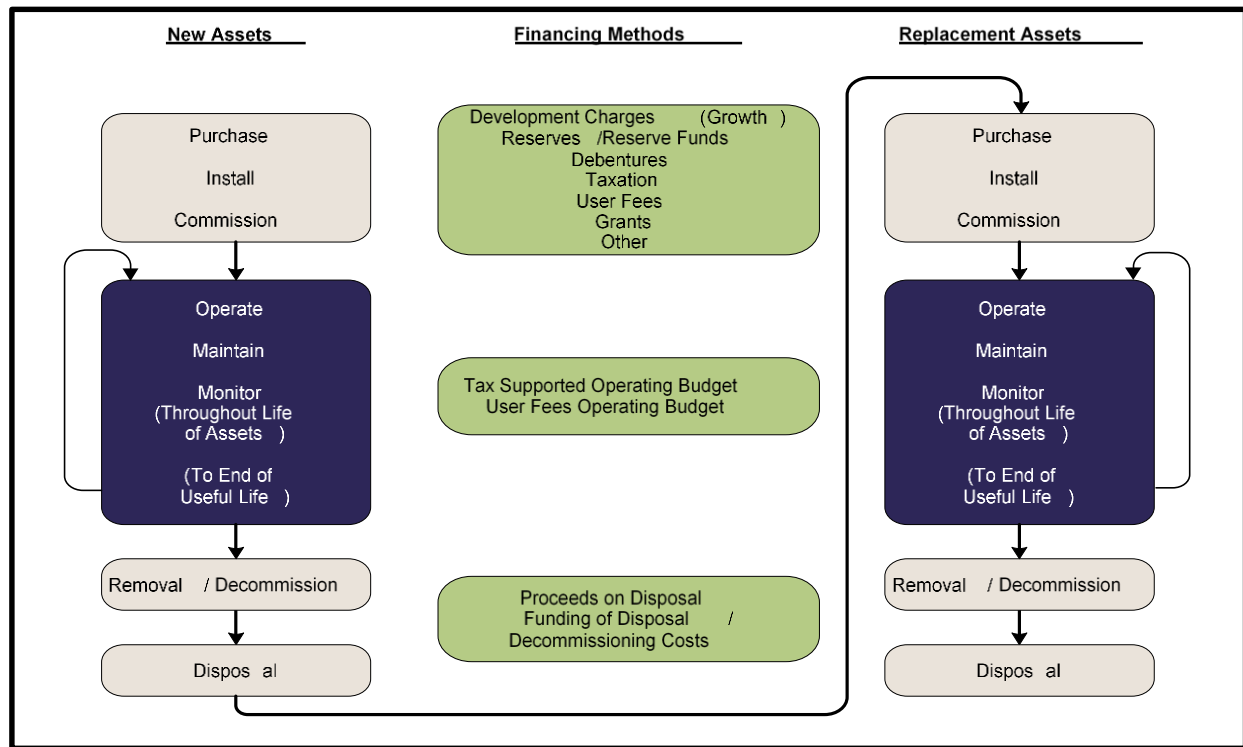
- a) deal with all assets whose capital costs are proposed to be funded under the development charge by-law;**
- b) demonstrate that all the assets mentioned in clause (a) are financially sustainable over their full life cycle;**
- c) contain any other information that is prescribed; and**
- d) be prepared in the prescribed manner.**

At a broad level, the A.M.P. provides for the long-term investment in an asset over its entire useful life along with the funding. The schematic below identifies the costs for an asset through its entire lifecycle. For growth-related works, the majority of capital costs will be funded by the D.C. Non-growth-related expenditures will then be funded from non-D.C. revenues as noted below. During the useful life of the asset, there will be minor maintenance costs to extend the life of the asset along with additional program related expenditures to provide the full services to the residents. At the end of the life of the asset, it will be replaced by non-D.C. financing sources.

In 2012, the Province developed Building Together: Guide for Municipal Asset Management Plans which outlines the key elements for an A.M.P., as follows:

State of local infrastructure: asset types, quantities, age, condition, financial accounting valuation and replacement cost valuation.

Desired levels of service: defines levels of service through performance measures and discusses any external trends or issues that may affect expected levels of service or the municipality's ability to meet them (for example, new accessibility standards, climate change impacts).



Asset management strategy: the asset management strategy is the set of planned actions that will seek to generate the desired levels of service in a sustainable way, while managing risk, at the lowest lifecycle cost.

Financing strategy: having a financial plan is critical for putting an A.M.P. into action. By having a strong financial plan, municipalities can also demonstrate that they have made a concerted effort to integrate the A.M.P. with financial planning and municipal budgeting, and are making full use of all available infrastructure financing tools.

The above provides for the general approach to be considered by Ontario municipalities. At this time, there is not a mandated approach for municipalities hence leaving discretion to individual municipalities as to how they plan for the long-term replacement of their assets. The Township has recently completed its A.M.P. in 2019, however, the A.M.P. did not address all growth-related assets. As a result, the asset management requirement for this D.C. Background Study must be undertaken in the absence of this complete information.

In recognition to the schematic in Section 8.1, the following table (presented in 2019\$) has been developed to provide the annualized expenditures and revenues associated with new growth. Note that the D.C.A. does not require an analysis of the non-D.C.



capital needs or their associated operating costs so these are omitted from the table below. Furthermore, as only the present infrastructure gap been considered at this time within the A.M.P., the following does not represent a fiscal impact assessment (including future tax/rate increases) but provides insight into the potential affordability of the new assets:

1. The non-D.C. recoverable portion of the projects which will require financing from Township financial resources (i.e. taxation, rates, fees, etc.). This amount has been presented on an annual debt charge amount based on 20-year financing.
2. Lifecycle costs for the 2019 D.C. capital works have been presented based on a sinking fund basis. The assets have been considered over their estimated useful lives.
3. Incremental operating costs for the D.C. services (only) have been included.
4. The resultant total annualized expenditures are \$393,824.
5. Consideration was given to the potential new taxation and user fee revenues which will be generated as a result of new growth. These revenues will be available to finance the expenditures above. The new operating revenues are \$644,006. This amount, totalled with the existing operating revenues of \$6.4 million, provides annual revenues of \$7.1 million by the end of the period.
6. In consideration of the above, the capital plan is deemed to be financially sustainable.



Table 8-1
Township of Puslinch
Asset Management – Future Expenditures and Associated Revenues (2019\$)

Description	2029 (Total)
Expenditures (Annualized)	
Annual Debt Payment on Non-Growth Related Capital ¹	\$204,840
Annual Debt Payment on Post Period Capital ²	\$51,859
Lifecycle:	
Annual Lifecycle - Town Wide Services	\$87,560
Incremental Operating Costs (for D.C. Services)	\$47,944
Total Expenditures	\$392,203
Revenue (Annualized)	
Total Existing Revenue ⁴	\$6,437,270
Incremental Tax and Non-Tax Revenue (User Fees, Fines, Licences, etc.)	\$644,006
Total Revenues	\$7,081,276

¹ Non-Growth Related component of Projects including 10% mandatory deduction on soft services

² Interim Debt Financing for Post Period Benefit

³ All infrastructure costs included in Area Specific by-laws have been included

⁴ As per Sch. 10 of FIR



Chapter 9

By-law Implementation



9. By-law Implementation

9.1 Public Consultation Process

9.1.1 Introduction

This chapter addresses the mandatory, formal public consultation process (Section 9.1.2), as well as the optional, informal consultation process (Section 9.1.3). The latter is designed to seek the co-operation and participation of those involved, in order to produce the most suitable policy. Section 9.1.4 addresses the anticipated impact of the D.C. on development from a generic viewpoint.

9.1.2 Public Meeting of Council

Section 12 of the D.C.A. indicates that before passing a D.C. by-law, Council must hold at least one public meeting, giving at least 20 clear days' notice thereof, in accordance with the Regulation. Council must also ensure that the proposed by-law and background report are made available to the public at least two weeks prior to the (first) meeting.

Any person who attends such a meeting may make representations related to the proposed by-law.

If a proposed by-law is changed following such a meeting, Council must determine whether a further meeting (under this section) is necessary (i.e. if the proposed by-law which is proposed for adoption has been changed in any respect, Council should formally consider whether an additional public meeting is required, incorporating this determination as part of the final by-law or associated resolution. It is noted that Council's decision, once made, is final and not subject to review by a Court or the Local Planning Appeal Tribunal (L.P.A.T.) (formerly the Ontario Municipal Board (O.M.B.)).

9.1.3 Other Consultation Activity

There are three broad groupings of the public who are generally the most concerned with municipal D.C. policy:

1. The first grouping is the residential development community, consisting of land developers and builders, who are typically responsible for generating the majority



of the D.C. revenues. Others, such as realtors, are directly impacted by D.C. policy. They are, therefore, potentially interested in all aspects of the charge, particularly the quantum by unit type, projects to be funded by the D.C. and the timing thereof, and municipal policy with respect to development agreements, D.C. credits and front-ending requirements.

2. The second public grouping embraces the public at large and includes taxpayer coalition groups and others interested in public policy.
3. The third grouping is the industrial/commercial/institutional development sector, consisting of land developers and major owners or organizations with significant construction plans, such as hotels, entertainment complexes, shopping centres, offices, industrial buildings and institutions. Also involved are organizations such as Industry Associations, the Chamber of Commerce, the Board of Trade and the Economic Development Agencies, who are all potentially interested in municipal D.C. policy. Their primary concern is frequently with the quantum of the charge, gross floor area exclusions such as basements, mechanical or indoor parking areas, or exemptions and phase-in or capping provisions in order to moderate the impact.

9.2 Anticipated Impact of the Charge on Development

The establishment of sound D.C. policy often requires the achievement of an acceptable balance between two competing realities. The first is that high non-residential D.C.s can, to some degree, represent a barrier to increased economic activity and sustained industrial/commercial growth, particularly for capital intensive uses. Also, in many cases, increased residential D.C.s can ultimately be expected to be recovered via higher housing prices and can impact project feasibility in some cases (e.g. rental apartments).

On the other hand, D.C.s or other Township capital funding sources need to be obtained in order to help ensure that the necessary infrastructure and amenities are installed. The timely installation of such works is a key initiative in providing adequate service levels and in facilitating strong economic growth, investment and wealth generation.



9.3 Implementation Requirements

9.3.1 Introduction

Once the Township has calculated the charge, prepared the complete background study, carried out the public process and passed a new by-law, the emphasis shifts to implementation matters.

These include notices, potential appeals and complaints, credits, front-ending agreements, subdivision agreement conditions and finally the collection of revenues and funding of projects.

The sections which follow overview the requirements in each case.

9.3.2 Notice of Passage

In accordance with s.13 of the D.C.A., when a D.C. by-law is passed, the Township clerk shall give written notice of the passing and of the last day for appealing the by-law (the day that is 40 days after the day it was passed). Such notice must be given no later than 20 days after the day the by-law is passed (i.e. as of the day of newspaper publication or the mailing of the notice).

Section 10 of O.Reg. 82/98 further defines the notice requirements which are summarized as follows:

- notice may be given by publication in a newspaper which is (in the Clerk's opinion) of sufficient circulation to give the public reasonable notice, or by personal service, fax or mail to every owner of land in the area to which the by-law relates;
- s.s.10(4) lists the persons/organizations who must be given notice; and
- s.s.10(5) lists the eight items which the notice must cover.

9.3.3 By-law Pamphlet

In addition to the "notice" information, the Township must prepare a "pamphlet" explaining each D.C. by-law in force, setting out:

- a description of the general purpose of the D.C.s;



- the “rules” for determining if a charge is payable in a particular case and for determining the amount of the charge;
- the services to which the D.C.s relate; and
- a general description of the general purpose of the Treasurer’s statement and where it may be received by the public.

Where a by-law is not appealed to the L.P.A.T., the pamphlet must be readied within 60 days after the by-law comes into force. Later dates apply to appealed by-laws.

The Township must give one copy of the most recent pamphlet without charge, to any person who requests one.

9.3.4 Appeals

Sections 13 to 19 of the D.C.A. set out the requirements relative to making and processing a D.C. by-law appeal and L.P.A.T. Hearing in response to an appeal. Any person or organization may appeal a D.C. by-law to the L.P.A.T. by filing a notice of appeal with the Township clerk, setting out the objection to the by-law and the reasons supporting the objection. This must be done by the last day for appealing the by-law, which is 40 days after the by-law is passed.

The Township has carried out a public consultation process in order to address the issues that come forward as part of that process, thereby avoiding or reducing the need for an appeal to be made.

9.3.5 Complaints

A person required to pay a D.C., or his agent, may complain to the Township Council imposing the charge that:

- the amount of the charge was incorrectly determined;
- the reduction to be used against the D.C. was incorrectly determined; or
- there was an error in the application of the D.C.

Sections 20 to 25 of the D.C.A. set out the requirements that exist, including the fact that a complaint may not be made later than 90 days after a D.C. (or any part of it) is payable. A complainant may appeal the decision of Township Council to the L.P.A.T.



9.3.6 Credits

Sections 38 to 41 of the D.C.A. set out a number of credit requirements, which apply where a Township agrees to allow a person to perform work in the future that relates to a service in the D.C. by-law.

These credits would be used to reduce the amount of D.C.s to be paid. The value of the credit is limited to the reasonable cost of the work which does not exceed the average level of service. The credit applies only to the service to which the work relates, unless the Township agrees to expand the credit to other services for which a D.C. is payable.

9.3.7 Front-Ending Agreements

The Township and one or more landowners may enter into a front-ending agreement which provides for the costs of a project which will benefit an area in the Township to which the D.C. by-law applies. Such an agreement can provide for the costs to be borne by one or more parties to the agreement who are, in turn, reimbursed in future by persons who develop land defined in the agreement.

Part III of the D.C.A. (Sections 44 to 58) addresses front-ending agreements and removes some of the obstacles to their use which were contained in the D.C.A., 1989. Accordingly, the Township assesses whether this mechanism is appropriate for its use, as part of funding projects prior to Township funds being available.

9.3.8 Severance and Subdivision Agreement Conditions

Section 59 of the D.C.A. prevents a municipality from imposing directly or indirectly, a charge related to development or a requirement to construct a service related to development, by way of a condition or agreement under s.51 or s.53 of the Planning Act, except for:

- “local services, related to a plan of subdivision or within the area to which the plan relates, to be installed or paid for by the owner as a condition of approval under section 51 of the Planning Act;” and
- “local services to be installed or paid for by the owner as a condition of approval under section 53 of the Planning Act.”



It is also noted that s.s.59(4) of the D.C.A. requires that the municipal approval authority for a draft plan of subdivision under s.s.51(31) of the Planning Act, use its power to impose conditions to ensure that the first purchaser of newly subdivided land is informed of all the D.C.s related to the development, at the time the land is transferred.

In this regard, if the municipality in question is a commenting agency, in order to comply with subsection 59(4) of the D.C.A. it would need to provide to the approval authority, information regarding the applicable municipal D.C.s related to the site.

If the municipality is an approval authority for the purposes of section 51 of the Planning Act, it would be responsible to ensure that it collects information from all entities which can impose a D.C.

The most effective way to ensure that purchasers are aware of this condition would be to require it as a provision in a registered subdivision agreement, so that any purchaser of the property would be aware of the charges at the time the title was searched prior to closing a transaction conveying the lands.

Appendices



Appendix A

Background Information on Residential and Non- Residential Growth Forecast



Schedule 1
Township of Puslinch
Residential Growth Forecast Summary

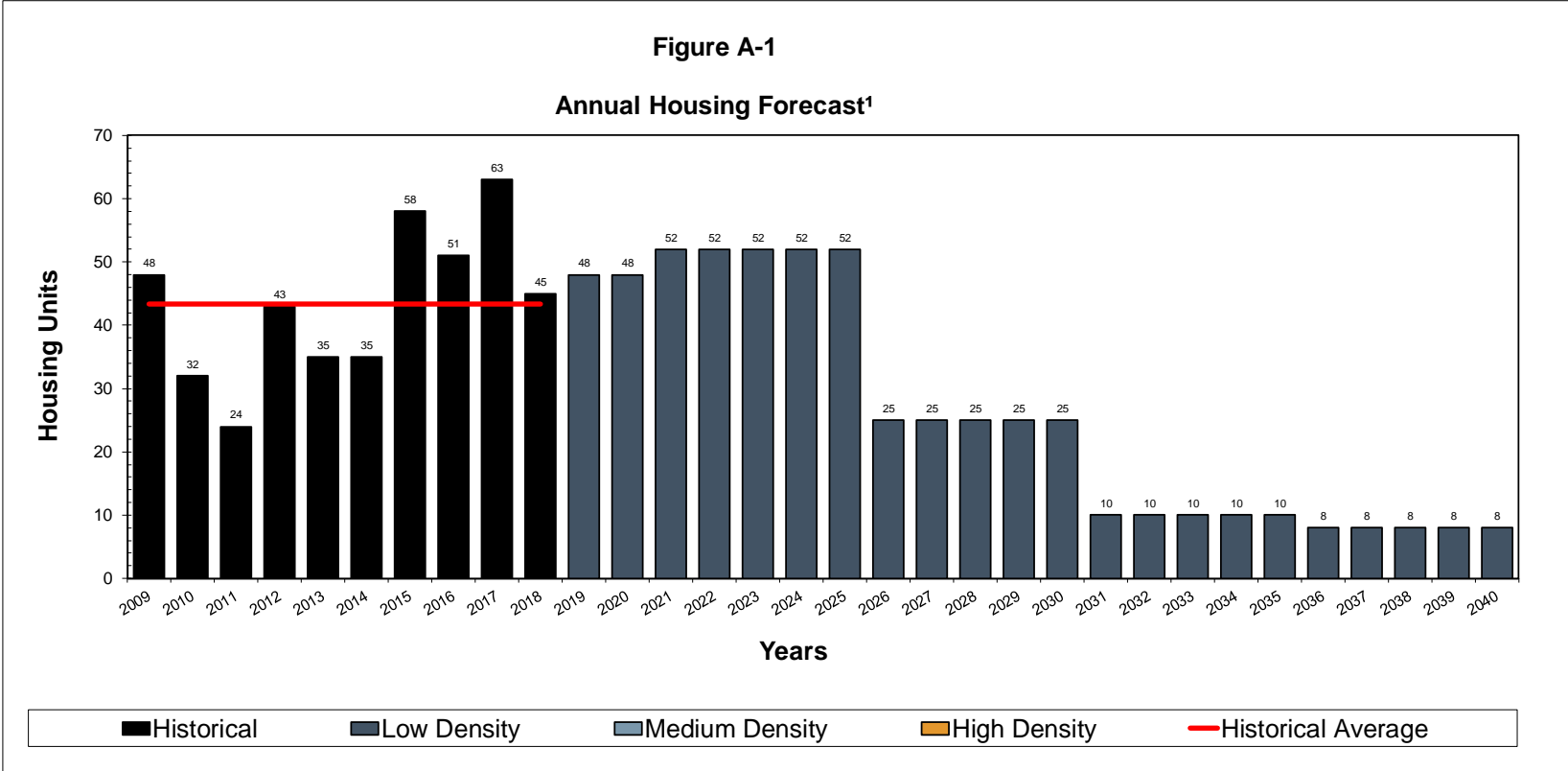
	Year	Population (Including Census Undercount) ¹	Excluding Census Undercount			Housing Units				Person Per Unit (P.P.U.): Total Population/ Total Households	
			Population	Institutional Population	Population Excluding Institutional Population	Singles & Semi- Detached	Multiple Dwellings ²	Apartments ³	Other		Total Households
Historical	<i>Mid 2006</i>	6,960	6,689	124	6,565	2,270	30	20	20	2,340	2.859
	<i>Mid 2011</i>	7,320	7,029	99	6,930	2,158	15	31	330	2,534	2.774
	<i>Mid 2016</i>	7,640	7,336	46	7,290	2,555	35	20	85	2,695	2.722
Forecast	<i>Mid 2019</i>	8,080	7,763	49	7,714	2,714	35	20	85	2,854	2.720
	<i>Mid 2029</i>	9,335	8,965	56	8,909	3,145	35	20	85	3,285	2.729
	<i>Mid 2039</i>	9,615	9,238	58	9,180	3,269	35	20	85	3,409	2.710
	<i>Mid 2041</i>	9,655	9,272	58	9,214	3,285	35	20	85	3,425	2.707
Incremental	Mid 2006 - Mid 2011	360	340	-25	365	-112	-15	11	310	194	
	Mid 2011 - Mid 2016	320	307	-53	360	397	20	-11	-245	161	
	Mid 2016 - Mid 2019	440	427	3	424	159	0	0	0	159	
	Mid 2019 - Mid 2029	1,255	1,202	7	1,195	431	0	0	0	431	
	Mid 2019 - Mid 2039	1,535	1,475	9	1,466	555	0	0	0	555	
	Mid 2019 - Mid 2041	1,575	1,509	9	1,500	571	0	0	0	571	

Derived from Wellington County Official Plan (Updated June 1, 2018) forecast for the Township of Puslinch by Watson & Associates Economists Ltd., 2019. Housing forecast has been updated to reflect recent P.P.U. trends.

¹ Census undercount estimated at approximately 4.1%. Note: Population including the undercount has been rounded.

² Includes townhouses and apartments in duplexes.

³ Includes bachelor, 1-bedroom and 2-bedroom+ apartments.



Source: Historical housing activity derived from 2009, 2010 and 2018 Statistics Canada building permit data, 2011 to 2017 based on Wellington County building permit data for the Township of Puslinch by Watson & Associates Economists Ltd., 2019.

1. Growth forecast represents calendar year.



Schedule 2
Township of Puslinch
Estimate of the Anticipated Amount, Type and Location of
Residential Development for Which Development Charges can be Imposed

Development Location	Timing	Single & Semi-Detached	Multiples ¹	Apartments ²	Total Residential Units	Gross Population In New Units	Existing Unit Population Change	Net Population Increase, Excluding Institutional	Institutional Population	Net Population Including Institutional
Aberfoyle	2019 - 2029	7	0	0	7	21	(8)	12	0	12
	2019 - 2039	10	0	0	10	30	(18)	12	0	12
Morriston	2019 - 2029	35	0	0	35	104	(4)	100	0	100
	2019 - 2039	46	0	0	46	136	(9)	127	0	128
Rural	2019 - 2029	389	0	0	389	1,154	(71)	1,083	7	1,090
	2019 - 2039	499	0	0	499	1,481	(154)	1,327	9	1,336
Township of Puslinch	2019 - 2029	431	0	0	431	1,279	(84)	1,195	7	1,202
	2019 - 2039	555	0	0	555	1,647	(181)	1,466	9	1,475

Derived from Wellington County Official Plan (Updated June 1, 2018) forecast for the Township of Puslinch by Watson & Associates Economists Ltd., 2019. Housing forecast has been updated to reflect recent P.P.U. trends.

¹ Includes townhouses and apartments in duplexes.

² Includes accessory apartments, bachelor, 1-bedroom and 2-bedroom+ apartments.

Note: Numbers may not add to totals due to rounding.



Schedule 3
Township of Puslinch
Current Year Growth Forecast
Mid 2016 to Mid 2019

		Population
Mid 2016 Population		7,336
Occupants of New Housing Units, Mid 2016 to Mid 2019	<i>Units (2)</i>	159
	<i>multiplied by P.P.U. (3)</i>	3,485
	<i>gross population increase</i>	554
		554
Occupants of New Equivalent Institutional Units, Mid 2016 to Mid 2019	<i>Units</i>	3
	<i>multiplied by P.P.U. (3)</i>	1,100
	<i>gross population increase</i>	3
		3
Decline in Housing Unit Occupancy, Mid 2016 to Mid 2019	<i>Units (4)</i>	2,695
	<i>multiplied by P.P.U. decline rate (5)</i>	-0.048
	<i>total decline in population</i>	-130
		-130
Population Estimate to Mid 2019		7,763
<i>Net Population Increase, Mid 2016 to Mid 2019</i>		427

(1) 2016 population based on Statistics Canada Census unadjusted for Census undercount.

(2) Estimated residential units constructed, Mid-2016 to the beginning of the growth period assuming a six-month lag between construction and occupancy.

(3) Average number of persons per unit (P.P.U.) is assumed to be:

Structural Type	Persons Per Unit ¹ (P.P.U.)	% Distribution of Estimated Units ²	Weighted Persons Per Unit Average
<i>Singles & Semi Detached</i>	3.485	100%	3.485
<i>Multiples (6)</i>	2.000	0%	0.000
<i>Apartments (7)</i>	1.477	0%	0.000
Total		100%	3.485

¹ Based on 2016 Census custom database

² Based on Building permit/completion activity

(4) 2016 households taken from Statistics Canada Census.

(5) Decline occurs due to aging of the population and family life cycle changes, lower fertility rates and changing economic conditions.

(6) Includes townhouses and apartments in duplexes.

(7) Includes bachelor, 1 bedroom and 2 bedroom+ apartments.

Note: Numbers may not add to totals due to rounding.



**Schedule 4a
Township of Puslinch
Ten Year Growth Forecast
Mid 2019 to Mid 2029**

		Population
Mid 2019 Population		7,763
Occupants of New Housing Units, Mid 2019 to Mid 2029	<i>Units (2)</i>	431
	<i>multiplied by P.P.U. (3)</i>	2,967
	<i>gross population increase</i>	1,279
Occupants of New Equivalent Institutional Units, Mid 2019 to Mid 2029	<i>Units</i>	6
	<i>multiplied by P.P.U. (3)</i>	1,100
	<i>gross population increase</i>	7
Decline in Housing Unit Occupancy, Mid 2019 to Mid 2029	<i>Units (4)</i>	2,854
	<i>multiplied by P.P.U. decline rate (5)</i>	-0.029
	<i>total decline in population</i>	-84
Population Estimate to Mid 2029		8,965
Net Population Increase, Mid 2019 to Mid 2029		1,202

(1) Mid 2019 Population based on:

2016 Population (7,336) + Mid 2016 to Mid 2019 estimated housing units to beginning of forecast period (159 x 3.485 = 554) + (3 x 1.100 = 3) + (2,695 x -0.048 = -130) = 7,763

(2) Based upon forecast building permits/completions assuming a lag between construction and occupancy.

(3) Average number of persons per unit (p.p.u.) is assumed to be:

Structural Type	Persons Per Unit ¹ (P.P.U.)	% Distribution of Estimated Units ²	Weighted Persons Per Unit Average
<i>Singles & Semi Detached</i>	2.967	100%	2.967
<i>Multiples (6)</i>	2.220	0%	0.000
<i>Apartments (7)</i>	1.537	0%	0.000
<i>one bedroom or less</i>	1.371		
<i>two bedrooms or more</i>	1.613		
Total		100%	2.967

¹ Persons per unit based on adjusted Statistics Canada Custom 2016 Census database.

² Forecast unit mix based upon historical trends and housing units in the development process.

(4) Mid 2019 households based upon 2,695 (2016 Census) + 159 (Mid 2016 to Mid 2019 unit estimate) = 2,854

(5) Decline occurs due to aging of the population and family life cycle changes, lower fertility rates and changing economic conditions.

(6) Includes townhouses and apartments in duplexes.

(7) Includes bachelor, 1 bedroom and 2 bedroom+ apartments.

Note: Numbers may not add to totals due to rounding.



Schedule 4b
Township of Puslinch
Twenty Year Growth Forecast
Mid 2019 to Mid 2039

		Population
Mid 2019 Population		7,763
Occupants of New Housing Units, Mid 2019 to Mid 2039	<i>Units (2)</i>	555
	<i>multiplied by P.P.U. (3)</i>	2,967
	<i>gross population increase</i>	1,647
Occupants of New Equivalent Institutional Units, Mid 2019 to Mid 2039	<i>Units</i>	8
	<i>multiplied by P.P.U. (3)</i>	1,100
	<i>gross population increase</i>	9
Decline in Housing Unit Occupancy, Mid 2019 to Mid 2039	<i>Units (4)</i>	2,854
	<i>multiplied by P.P.U. decline rate (5)</i>	-0.063
	<i>total decline in population</i>	-181
Population Estimate to Mid 2039		9,238
<i>Net Population Increase, Mid 2019 to Mid 2039</i>		1,475

(1) Mid 2019 Population based on:

2016 Population (7,336) + Mid 2016 to Mid 2019 estimated housing units to beginning of forecast period (159 x 3.485 = 554) + (3 x 1.100 = 3) + (2,695 x -0.048 = -130) = 7,763

(2) Based upon forecast building permits/completions assuming a lag between construction and occupancy.

(3) Average number of persons per unit (p.p.u.) is assumed to be:

Structural Type	Persons Per Unit ¹ (P.P.U.)	% Distribution of Estimated Units ²	Weighted Persons Per Unit Average
<i>Singles & Semi Detached</i>	2.967	100%	2.967
<i>Multiples (6)</i>	2.220	0%	0.000
<i>Apartments (7)</i>	1.537	0%	0.000
<i>one bedroom or less</i>	1.371		
<i>two bedrooms or more</i>	1.613		
Total		100%	2.967

¹ Persons per unit based on Statistics Canada Custom 2016 Census database.

² Forecast unit mix based upon historical trends and housing units in the development process.

(4) Mid 2019 households based upon 2,695 (2016 Census) + 159 (Mid 2016 to Mid 2019 unit estimate) = 2,854

(5) Decline occurs due to aging of the population and family life cycle changes, lower fertility rates and changing economic conditions.

(6) Includes townhouses and apartments in duplexes.

(7) Includes bachelor, 1 bedroom and 2 bedroom+ apartments.

Note: Numbers may not add to totals due to rounding.



Schedule 5
Township of Puslinch
2041 Growth Forecast
Mid 2019 to Mid 2041

		Population
Mid 2019 Population		7,763
Occupants of New Housing Units, Mid 2019 to Mid 2041	<i>Units (2)</i>	571
	<i>multiplied by P.P.U. (3)</i>	2,967
	<i>gross population increase</i>	1,694
Occupants of New Equivalent Institutional Units, Mid 2019 to Mid 2041	<i>Units</i>	8
	<i>multiplied by P.P.U. (3)</i>	1,100
	<i>gross population increase</i>	9
Decline in Housing Unit Occupancy, Mid 2019 to Mid 2041	<i>Units (4)</i>	2,854
	<i>multiplied by P.P.U. decline rate (5)</i>	-0.068
	<i>total decline in population</i>	-194
Population Estimate to Mid 2041		9,272
<i>Net Population Increase, Mid 2019 to Mid 2041</i>		1,509

(1) Mid 2019 Population based on:

2016 Population (7,336) + Mid 2016 to Mid 2019 estimated housing units to beginning of forecast period (159 x 3.485 = 554) + (3 x 1,100 = 3) + (2,695 x -0.048 = -130) = 7,763

(2) Based upon forecast building permits/completions assuming a lag between construction and occupancy.

(3) Average number of persons per unit (p.p.u.) is assumed to be:

Structural Type	Persons Per Unit ¹ (P.P.U.)	% Distribution of Estimated Units ²	Weighted Persons Per Unit Average
<i>Singles & Semi Detached</i>	2.967	100%	2.967
<i>Multiples (6)</i>	2.220	0%	0.000
<i>Apartments (7)</i>	1.537	0%	0.000
<i>one bedroom or less</i>	1.371		
<i>two bedrooms or more</i>	1.613		
Total		100%	2.967

¹ Persons per unit based on Statistics Canada Custom 2016 Census database.

² Forecast unit mix based upon historical trends and housing units in the development process.

(4) Mid 2019 households based upon 2,695 (2016 Census) + 159 (Mid 2016 to Mid 2019 unit estimate) = 2,854

(5) Decline occurs due to aging of the population and family life cycle changes, lower fertility rates and changing economic conditions.

(6) Includes townhouses and apartments in duplexes.

(7) Includes bachelor, 1 bedroom and 2 bedroom+ apartments.

Note: Numbers may not add to totals due to rounding.



Schedule 6

Township of Puslinch
Historical Residential Building Permits
Years 2009 to 2018

Year	Residential Building Permits			
	Singles & Semi Detached	Multiples ¹	Apartments ²	Total
2009	48	0	0	48
2010	32	0	0	32
2011	24	0	0	24
2012	43	0	0	43
2013	35	0	0	35
Average (2009 - 2013)	36	0	0	36
% Breakdown	100.0%	0.0%	0.0%	100.0%
2014	35	0	0	35
2015	58	0	0	58
2016	51	0	0	51
2017	63	0	0	63
2018	45	0	0	45
Sub-total	252	0	0	252
Average (2014 - 2018)	50	0	0	50
% Breakdown	100.0%	0.0%	0.0%	100.0%
2009 - 2018				
Total	287	0	0	287
Average	43	0	0	43
% Breakdown	100.0%	0.0%	0.0%	100.0%

Source: Historical housing activity derived from 2009, 2010 and 2018 Statistics Canada building permit data, 2011 to 2017 based on Wellington County building permit data for the Township of Puslinch by Watson & Associates Economists Ltd., 2019.

¹ Includes townhouses and apartments in duplexes.

² Includes bachelor, 1 bedroom and 2 bedroom+ apartments.



Schedule 7a
Township of Puslinch
Persons Per Unit By Age and Type of Dwelling
(2016 Census)

Age of Dwelling	Singles and Semi-Detached						25 Year Average	25 Year Forecast ¹
	< 1 BR	1 BR	2 BR	3/4 BR	5+ BR	Total		
1-5	-	-	-	2.750	-	3.485		
6-10	-	-	1.579	2.879	-	2.627		
11-15	-	-	1.619	2.629	4.077	2.586		
16-20	-	-	-	2.829	-	2.537		
20-25	-	-	-	2.818	-	3.086	2.864	2.967
25-35	-	-	-	2.833	3.769	2.979		
35+	-	-	2.000	2.744	3.200	2.673		
Total	-	1.929	1.827	2.767	4.013	2.750		

Age of Dwelling	All Density Types					
	< 1 BR	1 BR	2 BR	3/4 BR	5+ BR	Total
1-5	-	-	-	2.810	-	3.211
6-10	-	-	1.737	2.969	-	2.623
11-15	-	-	1.565	2.706	4.308	2.554
16-20	-	-	1.769	2.833	-	2.569
20-25	-	-	-	2.783	-	2.850
25-35	-	-	-	2.806	3.769	2.843
35+	-	-	2.125	2.768	3.000	2.644
Total	-	1.370	1.785	2.795	3.922	2.695

¹ PPU has been forecasted based on 2001 to 2016 historical trends.

Note: Does not include Statistics Canada data classified as 'Other'

P.P.U. Not calculated for samples less than or equal to 50 dwelling units, and does not include institutional population.



Schedule 7b
Wellington County
Persons Per Unit By Age and Type of Dwelling
(2016 Census)

Age of Dwelling	Multiples ¹						25 Year Average	25 Year Forecast ³
	< 1 BR	1 BR	2 BR	3/4 BR	5+ BR	Total		
1-5	-	-	1.722	2.000	-	2.000		
6-10	-	-	1.667	2.600	-	2.156		
11-15	-	-	1.632	2.583	-	2.064		
16-20	-	-	-	2.889	-	2.632		
20-25	-	-	-	2.533	-	2.364	2.243	2.220
25-35	-	-	-	2.667	-	2.273		
35+	-	1.071	2.227	2.565	-	2.230		
Total	-	1.500	1.811	2.575	-	2.228		

Age of Dwelling	Apartments ²						25 Year Average	25 Year Forecast ³
	< 1 BR	1 BR	2 BR	3/4 BR	5+ BR	Total		
1-5	-	1.438	1.386	-	-	1.477		
6-10	-	-	1.750	-	-	1.650		
11-15	-	-	1.412	-	-	1.385		
16-20	-	-	1.692	-	-	1.600		
20-25	-	-	1.609	-	-	1.471	1.516	1.537
25-35	-	1.162	1.735	-	-	1.542		
35+	-	1.126	1.597	2.320	-	1.494		
Total	0.900	1.191	1.590	2.225	-	1.503		

Age of Dwelling	All Density Types					
	< 1 BR	1 BR	2 BR	3/4 BR	5+ BR	Total
1-5	-	1.435	1.611	3.069	4.681	2.734
6-10	-	1.261	1.765	3.015	4.643	2.822
11-15	-	1.316	1.726	2.953	4.322	2.781
16-20	-	1.542	1.656	2.995	4.321	2.838
20-25	-	1.545	1.618	2.935	4.478	2.800
25-35	-	1.317	1.816	2.819	3.875	2.695
35+	-	1.267	1.828	2.776	4.077	2.618
Total	-	1.320	1.768	2.852	4.198	2.690

¹ Includes townhouses and apartments in duplexes.

² Includes bachelor, 1 bedroom and 2 bedroom+ apartments.

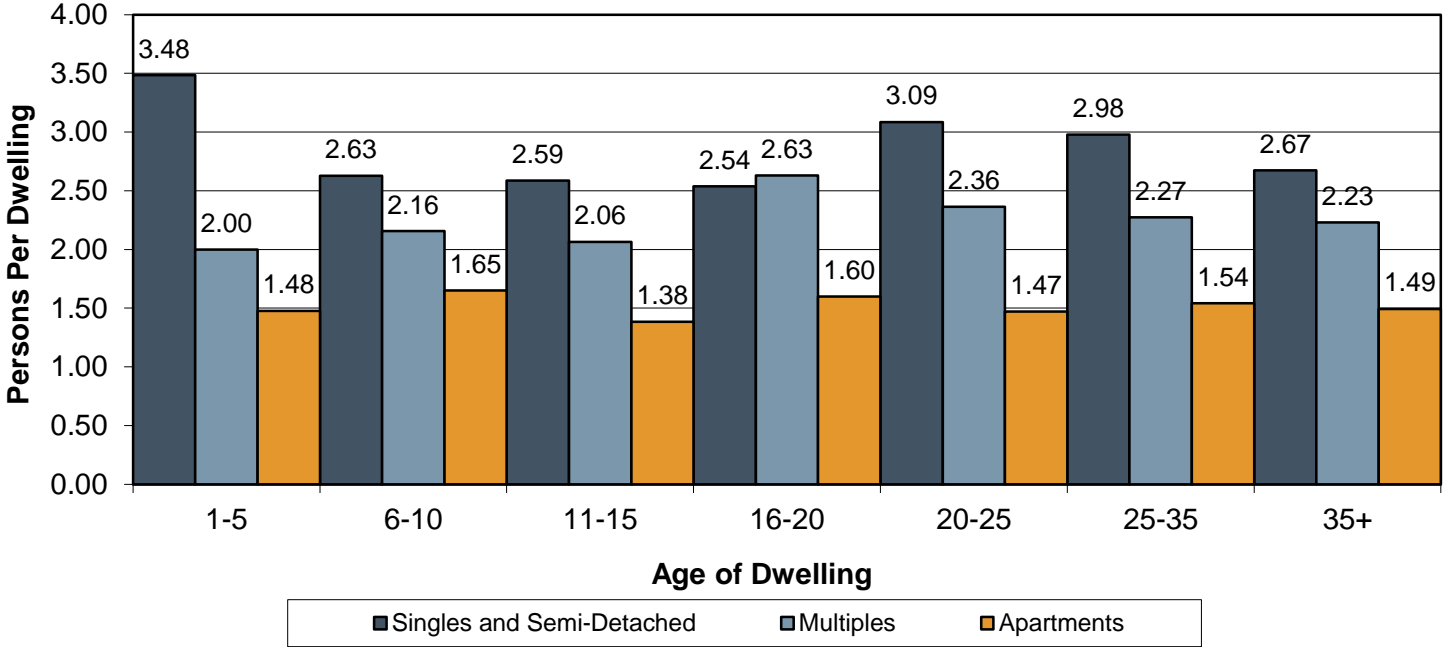
³ PPU has been forecasted based on 2001 to 2016 historical trends.

Note: Does not include Statistics Canada data classified as 'Other'

P.P.U. Not calculated for samples less than or equal to 50 dwelling units, and does not include institutional population.



**Schedule 8
Township of Puslinch
Persons Per Unit By Structural Type and Age of Dwelling
(2016 Census)**



Multiple and Apartment P.P.U.s are based on Wellington County.



**Schedule 9a
Township of Puslinch
Employment Forecast, 2019 to 2041**

Period	Population	Activity Rate								Employment								Employment Total (Excluding Work at Home and N.F.P.O.W.)
		Primary	Work at Home	Industrial	Commercial/ Population Related	Institutional	Total	N.F.P.O.W. ¹	Total Including N.F.P.O.W.	Primary	Work at Home	Industrial	Commercial/ Population Related	Institutional	Total	N.F.P.O.W. ¹	Total Employment (Including N.F.P.O.W.)	
Mid 2006	6,689	0.017	0.073	0.335	0.093	0.016	0.534	0.055	0.589	115	485	2,240	620	110	3,570	370	3,940	3,085
Mid 2011	7,029	0.014	0.057	0.265	0.098	0.018	0.452	0.053	0.505	100	400	1,863	688	130	3,180	370	3,550	2,780
Mid 2016	7,336	0.015	0.070	0.342	0.189	0.028	0.645	0.120	0.764	110	515	2,513	1,388	205	4,730	878	5,608	4,215
Mid 2019	7,763	0.014	0.071	0.342	0.189	0.028	0.645	0.120	0.765	110	553	2,659	1,468	217	5,007	929	5,936	4,454
Mid 2029	8,965	0.012	0.074	0.318	0.175	0.028	0.608	0.121	0.729	110	665	2,855	1,570	251	5,451	1,082	6,533	4,786
Mid 2039	9,238	0.012	0.081	0.334	0.182	0.028	0.638	0.122	0.760	110	745	3,090	1,684	262	5,891	1,126	7,017	5,146
Mid 2041	9,272	0.012	0.082	0.342	0.187	0.031	0.655	0.123	0.778	110	762	3,176	1,735	289	6,072	1,138	7,210	5,310
Incremental Change																		
Mid 2006 - Mid 2011	340	-0.003	-0.016	-0.070	0.005	0.002	-0.081	-0.003	-0.084	-15	-85	-378	68	20	-390	0	-390	-305
Mid 2011 - Mid 2016	307	0.0008	0.0133	0.0775	0.0913	0.0094	0.1924	0.0670	0.2594	10	115	650	700	75	1,550	508	2,058	1,435
Mid 2016 - Mid 2019	427	-0.0008	0.0010	0.0000	0.0000	0.0000	0.0002	0.0000	0.0002	0	38	147	81	12	277	51	328	239
Mid 2019 - Mid 2029	1,202	-0.0019	0.0030	-0.0240	-0.0140	0.0000	-0.0369	0.0010	-0.0359	0	112	196	102	34	444	153	597	332
Mid 2019 - Mid 2039	1,475	-0.0023	0.0094	-0.0080	-0.0068	0.0005	-0.0072	0.0022	-0.0050	0	192	431	216	45	884	197	1,081	692
Mid 2019 - Mid 2041	1,509	-0.0023	0.0110	0.0000	-0.0020	0.0032	0.0099	0.0030	0.0129	0	209	517	267	72	1,065	209	1,274	856
Annual Average																		
Mid 2006 - Mid 2011	68	-0.00059	-0.00312	-0.01398	0.00102	0.00041	-0.01626	-0.00054	-0.01680	-3	-17	-76	14	4	-78	0	-78	-61
Mid 2011 - Mid 2016	61	0.0002	0.0027	0.0155	0.0183	0.0019	0.0385	0.0134	0.0519	2	23	130	140	15	310	102	412	287
Mid 2016 - Mid 2019	142	-0.0003	0.0003	0.0000	0.0000	0.0000	0.0001	0.0000	0.0001	0	13	49	27	4	92	17	109	80
Mid 2019 - Mid 2029	120	-0.00019	0.00030	-0.00240	-0.00140	0.00000	-0.00369	0.00010	-0.00359	0	11	20	10	3	44	15	60	33
Mid 2019 - Mid 2039	74	-0.00011	0.00047	-0.00040	-0.00034	0.00002	-0.00036	0.00011	-0.00025	0	10	22	11	2	44	10	54	35
Mid 2019 - Mid 2041	69	-0.00010	0.00050	0.00000	-0.00009	0.00015	0.00045	0.00014	0.00059	0	10	24	12	3	48	10	58	39

Source: Watson & Associates Economists Ltd., 2019.

¹ Statistics Canada defines no fixed place of work (N.F.P.O.W.) employees as "persons who do not go from home to the same work place location at the beginning of each shift". Such persons include building and landscape contractors, travelling salespersons, independent truck drivers, etc.
Note: Employment forecast has been adjusted from the Wellington County Official Plan, June 1, 2018, to reflect the 2016 Census.



Schedule 9b
Township of Puslinch
Employment & Gross Floor Area (G.F.A) Forecast, 2019 to 2039

Period	Population	Employment					Gross Floor Area in Square Feet (Estimated) ¹				
		Primary	Industrial	Commercial/ Population Related	Institutional	Total	Industrial	Commercial/ Population Related	Institutional	Total	
Mid 2006	6,689	115	2,240	620	110	3,085					
Mid 2011	7,029	100	1,863	688	130	2,780					
Mid 2016	7,336	110	2,513	1,388	205	4,215					
Mid 2019	7,763	110	2,659	1,468	217	4,454					
Mid 2029	8,965	110	2,855	1,570	251	4,786					
Mid 2039	9,238	110	3,090	1,684	262	5,146					
Incremental Change											
Mid 2006 - Mid 2011	340	-15	-378	68	20	-305					
Mid 2011 - Mid 2016	307	10	650	700	75	1,435					
Mid 2016 - Mid 2019	427	0	147	81	12	239	205,100	44,300	8,400	257,800	
Mid 2019 - Mid 2029	1,202	0	196	102	34	332	274,400	56,100	23,800	354,300	
Mid 2019 - Mid 2039	1,475	0	431	216	45	692	603,400	118,800	31,500	753,700	
Annual Average											
Mid 2006 - Mid 2011	68	-3	-76	14	4	-61					
Mid 2011 - Mid 2016	61	2	130	140	15	287					
Mid 2016 - Mid 2019	142	0	49	27	4	80	68,367	14,767	2,800	85,933	
Mid 2019 - Mid 2029	120	0	20	10	3	33	27,440	5,610	2,380	35,430	
Mid 2019 - Mid 2039	74	0	22	11	2	35	30,170	5,940	1,575	37,685	

Source: Watson & Associates Economists Ltd., 2019.

¹ Square Foot Per Employee Assumptions

Industrial 1,400

Commercial/ Population Related 550

Institutional 700

* Reflects Mid 2019 to Mid 2039 forecast period

Note: Numbers may not add to totals due to rounding.



Schedule 9c
Estimate of the Anticipated Amount, Type and Location of
Non-Residential Development for Which Development Charges can be Imposed

Development Location	Timing	Industrial G.F.A. S.F. ¹	Commercial G.F.A. S.F. ¹	Institutional G.F.A. S.F. ¹	Total Non- Residential G.F.A. S.F.	Employment Increase ²
Aberfoyle	2019 - 2029	-	4,400	700	5,100	9
	2019 - 2039	-	7,700	2,100	9,800	17
Morrison	2019 - 2029	-	2,800	700	3,500	6
	2019 - 2039	-	5,500	2,800	8,300	14
Rural	2019 - 2029	274,400	49,000	22,400	345,800	317
	2019 - 2039	603,400	105,600	26,600	735,600	661
Township of Puslinch	2019 - 2029	274,400	56,100	23,800	354,300	332
	2019 - 2039	603,400	118,800	31,500	753,700	692

Source: Watson & Associates Economists Ltd., 2019.

¹ Square feet per employee assumptions:

Industrial 1,400

Commercial 550

Institutional 700

² Employment Increase does not include No Fixed Place of Work.

*Reflects Mid 2019 to Mid 2039 forecast period

Note: Numbers may not add to totals due to rounding.



Schedule 10
Township of Puslinch
Non-Residential Construction Value
Years 2007 to 2016
(000's 2018 \$)

YEAR	Industrial				Commercial				Institutional				Total			
	New	Improve	Additions	Total	New	Improve	Additions	Total	New	Improve	Additions	Total	New	Improve	Additions	Total
2007	1,893	343	407	2,643	489	0	0	489	0	0	0	0	2,382	343	407	3,132
2008	2,247	172	0	2,419	15,269	182	0	15,452	0	0	0	0	17,516	355	0	17,871
2009	8,090	286	1,409	9,785	1,417	243	396	2,055	0	0	0	0	9,507	529	1,805	11,840
2010	2,510	67	1,282	3,859	1,476	456	0	1,932	1,949	0	0	1,949	5,935	523	1,282	7,740
2012	398	185	0	583	43,643	2,763	632	47,038	0	27	0	27	44,041	2,975	632	47,648
2013	13,645	320	0	13,965	1,499	1,340	0	2,839	0	0	0	0	15,145	1,660	0	16,805
2014	191	5,378	0	5,569	0	94	0	94	0	2	0	2	191	5,474	0	5,665
2015	282	1,602	0	1,884	945	247	0	1,192	0	4	0	4	1,227	1,853	0	3,080
2016	574	1,097	0	1,672	445	272	0	717	0	114	0	114	1,020	1,483	0	2,503
Subtotal	30,242	9,837	4,751	44,830	67,257	5,637	1,028	73,921	1,949	941	0	2,890	99,447	16,415	5,779	121,642
Percent of Total	67%	22%	11%	100%	91%	8%	1%	100%	67%	33%	0%	100%	82%	13%	5%	100%
Average	3,024	984	1,188	4,483	7,473	626	514	7,392	1,949	188	0%	482	9,945	1,642	1,156	12,164
2007 - 2011 Period Total				21,157				22,041				2,743				45,942
2007 - 2011 Average				4,231				4,408				549				9,188
% Breakdown				46.1%				48.0%				6.0%				100.0%
2012 - 2016 Period Total				23,673				51,880				147				75,700
2012 - 2016 Average				4,735				10,376				29				15,140
% Breakdown				31.3%				68.5%				0.2%				100.0%
2007 - 2016 Period Total				44,830				73,921				2,890				121,642
2007 - 2016 Average				4,483				7,392				289				12,164
% Breakdown				36.9%				60.8%				2.4%				100.0%

Source: Statistics Canada Publication, 64-001-XIB

Note: Inflated to year-end 2017 (January, 2018) dollars using Reed Construction Cost Index



Schedule 11
Township of Puslinch

Employment to Population Ratio by Major Employment Sector, 2006 to 2016

NAICS	Employment & Gross Floor Area (G.F.A) Forecast, 2016 To Buildout	Year			Change		Comments
		2006	2011	2016	06-11	11-16	
Employment by industry							
<u>Primary Industry Employment</u>							
11	<i>Agriculture, forestry, fishing and hunting</i>	130	150	135	20	-15	Categories which relate to local land-based resources
21	<i>Mining and oil and gas extraction</i>	80	15	40	-65	25	
Sub-total		210	165	175	-45	10	
<u>Industrial and Other Employment</u>							
22	<i>Utilities</i>	0	0	10	0	10	Categories which relate primarily to industrial land supply and demand
23	<i>Construction</i>	315	380	460	65	80	
31-33	<i>Manufacturing</i>	1,015	835	1,115	-180	280	
41	<i>Wholesale trade</i>	385	290	305	-95	15	
48-49	<i>Transportation and warehousing</i>	600	405	675	-195	270	
56	<i>Administrative and support</i>	50	58	78	8	20	
Sub-total		2,365	1,968	2,643	-398	675	
<u>Population Related Employment</u>							
44-45	<i>Retail trade</i>	120	110	290	-10	180	Categories which relate primarily to population growth within the municipality
51	<i>Information and cultural industries</i>	20	15	0	-5	-15	
52	<i>Finance and insurance</i>	40	40	50	0	10	
53	<i>Real estate and rental and leasing</i>	15	55	55	40	0	
54	<i>Professional, scientific and technical services</i>	180	165	260	-15	95	
55	<i>Management of companies and enterprises</i>	0	0	20	0	20	
56	<i>Administrative and support</i>	50	58	78	8	20	
71	<i>Arts, entertainment and recreation</i>	55	85	145	30	60	
72	<i>Accommodation and food services</i>	160	205	525	45	320	
81	<i>Other services (except public administration)</i>	190	165	230	-25	65	
Sub-total		830	898	1,653	68	755	
<u>Institutional</u>							
61	<i>Educational services</i>	65	85	95	20	10	
62	<i>Health care and social assistance</i>	90	55	105	-35	50	
91	<i>Public administration</i>	10	10	60	0	50	
Sub-total		165	150	260	-15	110	
Total Employment		3,570	3,180	4,730	-390	1,550	
Population		6,689	7,029	7,336	340	307	
<u>Employment to Population Ratio</u>							
Industrial and Other Employment		0.35	0.28	0.36	-0.07	0.08	
Population Related Employment		0.12	0.13	0.23	0.00	0.10	
Institutional Employment		0.02	0.02	0.04	0.00	0.01	
Primary Industry Employment		0.03	0.02	0.02	-0.01	0.00	
Total		0.53	0.45	0.64	-0.08	0.19	

Source: Statistics Canada Employment by Place of Work

Note: 2006-2016 employment figures are classified by North American Industry Classification System (NAICS) Code



Appendix B

Historical Level of Service Calculations



**Township of Puslinch
Service Standard Calculation Sheet**

Service: Roads
Unit Measure: km of roadways

Description	Asset No.	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 Value (\$/km)
Hard Top Roads - Single Lift	Various	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	107.00	\$318,000
Hard Top Roads - Double Lift	Various	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	22.00	\$461,000
Gravel Roads	Various	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	\$177,500
Surface Treated Roads	Various	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	7.00	\$56,000
Less Local Roads:												
Currie Drive	180	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	0.62	\$318,000
Ochs Drive	181	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58	\$318,000
Laing Court	210	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	0.11	\$318,000
Winer Court	209	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	\$461,000
Telfer Glen Street	190	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	0.70	\$461,000
Settler's Court	191	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	\$461,000
Bridle Path	204_Surface, 185 Surface	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	1.56	\$461,000
Carriage Lane	201_Surface	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	0.74	\$461,000
Daymond Drive	203_Surface	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	\$461,000
Cassin Court	202_Surface	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	0.28	\$461,000
Fox Run Drive	205, 206, 207, 196	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	1.43	\$461,000
Deer View Ridge	195	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	0.67	\$461,000
Boreham Drive	208_Surface	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	\$461,000
Total		183	183	183	183	183	183	183	183	183	183	

Population	6,928	6,999	7,029	7,036	7,112	7,159	7,206	7,336	7,443	7,591
Per Capita Standard	0.0264	0.0262	0.0261	0.0260	0.0258	0.0256	0.0254	0.0250	0.0246	0.0241

10 Year Average	2009-2018
Quantity Standard	0.0255
Quality Standard	\$278,020
Service Standard	\$7,090

D.C. Amount (before deductions)	10 Year
Forecast Population	1,195
\$ per Capita	\$7,090
Eligible Amount	\$8,471,953



Township of Puslinch
Service Standard Calculation Sheet

Service: Bridges, Culverts & Structures
 Unit Measure: Number of Bridges, Culverts & Structures

Description	Asset No.	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 Value (\$/item)
Bridges												
Cook's Mill Bridge	1001	1	1	1	1	1	1	1	1	1	1	\$593,190
Little's Bridge	1003	1	1	1	1	1	1	1	1	1	1	\$219,765
Leslie Road West	1005	1	1	1	1	1	1	1	1	1	1	\$445,900
Concession 1	1006	1	1	1	1	1	1	1	1	1	1	\$783,510
French's Bridge	1007	1	1	1	1	1	1	1	1	1	1	\$309,140
Galt Creek Bridge	1008	1	1	1	1	1	1	1	1	1	1	\$745,875
Moyer's Bridge	1009	1	1	1	1	1	1	1	1	1	1	\$495,040
Stroy's Bridge	N/A	1	1	1	-	-	-	-	-	-	-	\$1,420,900
Culverts												
Culvert of Cook's Mill Race	2002	1	1	1	1	1	1	1	1	1	1	\$97,200
McFarlane's Culvert	2004	1	1	1	1	1	1	1	1	1	1	\$126,585
Victoria Road Culvert over Galt Creek	2006	1	1	1	1	1	1	1	1	1	1	\$225,630
Irish Creek Culvert on Townline Rd	2007	1	1	1	1	1	1	1	1	1	1	\$239,400
7th Concession Culvert (#2008)	2008	1	1	1	1	1	1	1	1	1	1	\$55,688
Gilmour Rd Culvert over Aberfoyle Creek	2009	1	1	1	1	1	1	1	1	1	1	\$138,600
Ellis Rd Culvert over Puslinch Lake Irish Creek	2010	1	1	1	1	1	1	1	1	1	1	\$283,500
Ellis Rd Culvert at Lot 10 Conc. 2	2011	1	1	1	1	1	1	1	1	1	1	\$131,670
Concession 2 Bridge/Culvert over Mill Creek	2012	1	1	1	1	1	1	1	1	1	1	\$560,700
Victoria Road Culvert North of Leslie	2013	1	1	1	1	1	1	1	1	1	1	\$177,165
Leslie Road Culvert West of Victoria	2014	1	1	1	1	1	1	1	1	1	1	\$171,450
Culvert of Flamborough T/L West of Victoria	2015	1	1	1	1	1	1	1	1	1	1	\$264,735
Flamborough T/L Bridge/Culvert East of Macpherson Ln	2016	1	1	1	1	1	1	1	1	1	1	\$219,240
Gore Rd Culvert	2017	1	1	1	1	1	1	1	1	1	1	\$84,546
Gore Rd Dual Culvert	2018	1	1	1	1	1	1	1	1	1	1	\$63,135
7th Concession Culvert (#2019)	2019	1	1	1	1	1	1	1	1	1	1	\$194,400
Total		24	24	24	23	23	23	23	23	23	23	

Population	6,928	6,999	7,029	7,036	7,112	7,159	7,206	7,336	7,443	7,591
Per Capita Standard	0.0035	0.0034	0.0034	0.0033	0.0032	0.0032	0.0032	0.0031	0.0031	0.0030

10 Year Average	2009-2018
Quantity Standard	0.0032
Quality Standard	\$307,594
Service Standard	\$984

D.C. Amount (before deductions)	10 Year
Forecast Population	1,195
\$ per Capita	\$984
Eligible Amount	\$1,176,239



**Township of Puslinch
Service Standard Calculation Sheet**

Service: Sidewalks
Unit Measure: km of roadways

Description	Asset No.	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 Value (\$/km)
Watson Road Sidewalk	300	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	\$143,000
Arkell Road Sidewalk	301	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	\$143,000
Church Street Sidewalk	303	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	\$143,000
Victoria Street Sidewalk	307	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	\$143,000
Brock Road Sidewalk	304	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	\$143,000
Badenoch Road Sidewalk	305	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	\$143,000
Calfass Road Sidewalk	308	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	\$143,000
Queen Street Sidewalk	309	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	\$143,000
Main Street Sidewalk	310	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	\$143,000
Total		3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	

Population	6,928	6,999	7,029	7,036	7,112	7,159	7,206	7,336	7,443	7,591
Per Capita Standard	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0004

10 Year Average	2009-2018
Quantity Standard	0.0005
Quality Standard	\$133,800
Service Standard	\$67

D.C. Amount (before deductions)	10 Year
Forecast Population	1,195
\$ per Capita	\$67
Eligible Amount	\$79,946



**Township of Puslinch
Service Standard Calculation Sheet**

Service: Traffic Signals & Streetlights
Unit Measure: No. of Traffic Signals

Description	Asset No.	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 Value (\$/item)
Cobrahead Streetlights	Various	184	184	184	184	184	184	184	184	184	184	\$515
Decorative - Acorn Post Top Streetlights	Various	11	11	11	11	11	11	11	11	11	11	\$1,780
Decorative - Top Hat	Various	1	1	1	1	1	1	1	1	1	1	\$1,100
Decorative - Victorian Lantern Post Top	Various	76	76	76	76	76	76	76	76	76	76	\$2,185
Sentinel	Various	3	3	3	3	3	3	3	3	3	3	\$1,013
Total		275	275	275	275	275	275	275	275	275	275	

Population	6,928	6,999	7,029	7,036	7,112	7,159	7,206	7,336	7,443	7,591
Per Capita Standard	0.0397	0.0393	0.0391	0.0391	0.0387	0.0384	0.0382	0.0375	0.0369	0.0362

10 Year Average	2009-2018
Quantity Standard	0.0383
Quality Standard	\$1,031
Service Standard	\$40

D.C. Amount (before deductions)	10 Year
Forecast Population	1,195
\$ per Capita	\$40
Eligible Amount	\$47,203



**Township of Puslinch
Service Standard Calculation Sheet**

Service: Depots and Domes
Unit Measure: ft² of building area

Description	Asset No.	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Value/sq.ft. with land, site works, etc.
Works Depot	95MC, 56MC, 46MC, 77MC, 59MC, 21MC, 1MC, 15002, 41MC	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	7,800	\$140
Roads Storage Building	92RSB, 95RSB, 7RSB, 24RSB, 15RSB, 81RSB, 86RSB	-	5,070	5,070	5,070	5,070	5,070	5,070	5,070	5,070	5,070	\$123
Total		7,800	12,870	12,870	12,870	12,870	12,870	12,870	12,870	12,870	12,870	

Population	6,928	6,999	7,029	7,036	7,112	7,159	7,206	7,336	7,443	7,591
Per Capita Standard	1.1259	1.8388	1.8310	1.8291	1.8096	1.7977	1.7860	1.7543	1.7291	1.6954

10 Year Average	2009-2018
Quantity Standard	1.7197
Quality Standard	\$134
Service Standard	\$230

D.C. Amount (before deductions)	10 Year
Forecast Population	1,195
\$ per Capita	\$230
Eligible Amount	\$274,838



**Township of Puslinch
Service Standard Calculation Sheet**

Service: Roads and Related Vehicles
Unit Measure: No. of vehicles and equipment

Description	Asset No.	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 Value (\$/Vehicle)
2008 Backhoe #6	8001	1	1	1	1	1	1	1	1	1	1	\$125,000
1999 Grader #501	8002	1	1	1	1	1	1	1	1	1	1	\$350,000
2000 Grader #502	8003	1	1	1	1	1	1	1	1	1	1	\$350,000
1999 Dump/Plow #302	N/A	1	1	-	-	-	-	-	-	-	-	\$250,000
2002 Dump/Plow #301	N/A	1	1	1	-	-	-	-	-	-	-	\$250,000
2003 Dump/Plow #304	N/A	1	1	-	-	-	-	-	-	-	-	\$250,000
2006 Dump/Plow #303	N/A	1	1	1	1	1	1	-	-	-	-	\$225,000
2011 Dump/Plow #304	8013	-	-	1	1	1	1	1	1	1	1	\$250,000
2012 Dump/Plow #302	8014	-	-	1	1	1	1	1	1	1	1	\$250,000
2013 Dump/Plow (International) #301	8016	-	-	-	1	1	1	1	1	1	1	\$250,000
2007 Pickup #4	N/A	1	1	-	-	-	-	-	-	-	-	\$40,000
2002 Pickup #5	N/A	1	1	1	-	-	-	-	-	-	-	\$52,000
2008 One Tonne Dump/Plow #305	7003	1	1	1	1	1	1	1	1	1	1	\$100,000
2011 Pickup #4	7008	-	-	1	1	1	1	1	1	1	1	\$40,000
2012 Pickup #5	N/A	-	-	-	1	1	1	1	1	-	-	\$52,000
2007 Mower	N/A	1	1	1	1	-	-	-	-	-	-	\$11,500
Anti-Ice Equipment	8015-1, 8015-2, 8015-3	-	-	-	1	1	1	1	1	1	1	\$24,000
2005 Sweeper	N/A	1	1	1	1	1	1	1	1	1	1	\$9,100
2003 Trailer	N/A	1	1	1	1	1	-	-	-	-	-	\$5,000
2002 Water Pump and Hose	2002PW	1	1	1	1	1	1	1	1	1	1	\$51,200
2015 Pickup # 3	8019	-	-	-	-	-	-	1	1	1	1	\$40,000
2015 Dump/Plow #303	8017	-	-	-	-	-	-	1	1	1	1	\$225,000
2017 Pickup #5	7009	-	-	-	-	-	-	-	-	1	1	\$52,000
2015 Brush Chipper	8018	-	-	-	-	-	-	1	1	1	1	\$40,000
Total		14	14	14	15	14	13	15	15	15	15	

Population	6,928	6,999	7,029	7,036	7,112	7,159	7,206	7,336	7,443	7,591
Per Capita Standard	0.0020	0.0020	0.0020	0.0021	0.0020	0.0018	0.0021	0.0020	0.0020	0.0020

10 Year Average	2009-2018
Quantity Standard	0.002
Quality Standard	\$146,780
Service Standard	\$294

D.C. Amount (before deductions)	10 Year
Forecast Population	1,195
\$ per Capita	\$294
Eligible Amount	\$350,804



**Township of Puslinch
Service Standard Calculation Sheet**

Service: Fire Facilities
Unit Measure: ft² of building area

Description	Asset No.	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Value/sq.ft. with land, site works, etc.
Fire Building C.R.34	95MC, 56MC, 46MC, 77MC, 59MC, 21MC, 1MC, 15002, 41MC	7,700	7,700	7,700	7,700	7,700	7,700	7,700	7,700	7,700	7,700	\$365
Total		7,700	7,700	7,700	7,700	7,700	7,700	7,700	7,700	7,700	7,700	

Population	6,928	6,999	7,029	7,036	7,112	7,159	7,206	7,336	7,443	7,591
Per Capita Standard	1.1114	1.1002	1.0955	1.0944	1.0827	1.0756	1.0686	1.0496	1.0345	1.0144

10 Year Average	2009-2018
Quantity Standard	1.0727
Quality Standard	\$365
Service Standard	\$392

D.C. Amount (before deductions)	10 Year
Forecast Population	1,195
\$ per Capita	\$392
Eligible Amount	\$467,878



**Township of Puslinch
Service Standard Calculation Sheet**

Service: Fire Vehicles
Unit Measure: No. of vehicles

Description	Asset No.	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 Value (\$/Vehicle)
1986 Pumper #32	N/A	1	1	1	1	-	-	-	-	-	-	\$300,000
2004 Pumper #31	5031	1	1	1	1	1	1	1	1	1	1	\$468,000
1988 Tanker #39	N/A	1	-	-	-	-	-	-	-	-	-	\$410,000
1990 Telesquirt #33 (Aerial)	N/A	1	1	1	1	1	1	1	1	-	-	\$500,000
2000 Rescue #35	5035	1	1	1	1	1	1	1	1	1	1	\$520,000
2006 Tanker #38	5038	1	1	1	1	1	1	1	1	1	1	\$450,000
2010 Tanker #37	7006	-	1	1	1	1	1	1	1	1	1	\$410,000
2013 Pumper # 32	5040	-	-	-	-	1	1	1	1	1	1	\$300,000
Used Quint Truck (Aerial 33 Truck-used)	5033	-	-	-	-	-	-	-	-	1	1	\$500,000
Pickup Truck	7005A	-	-	-	-	-	-	-	-	1	1	\$27,873
Total		6	6	6	6	6	6	6	6	7	7	

Population	6,928	6,999	7,029	7,036	7,112	7,159	7,206	7,336	7,443	7,591
Per Capita Standard	0.0009	0.0009	0.0009	0.0009	0.0008	0.0008	0.0008	0.0008	0.0009	0.0009

10 Year Average	2009-2018
Quantity Standard	0.0009
Quality Standard	\$410,700
Service Standard	\$370

D.C. Amount (before deductions)	10 Year
Forecast Population	1,195
\$ per Capita	\$370
Eligible Amount	\$441,708



**Township of Puslinch
Service Standard Calculation Sheet**

Service: Fire Small Equipment and Gear
Unit Measure: No. of equipment and gear

Description	Asset No.	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 Value (\$/item)
Equiped Fire Fighters	Various	37	37	37	37	37	41	41	42	42	42	\$3,021
Pagers	4_35FE	42	42	42	42	42	42	42	42	42	42	\$500
Mobile/Truck Radios	3_18FE	10	10	10	10	10	10	10	7	7	7	\$5,000
Base Radio	FE_Bas_1	1	1	1	1	1	1	1	1	1	1	\$5,000
Base Radio County	FE_Bas_2	1	1	1	1	1	1	1	1	1	1	\$5,000
Antennae Roof	FE_Ant_3	1	1	1	1	1	1	1	1	1	1	\$600
Antennae Tower	FE_Ant_4	1	1	1	1	1	1	1	1	1	1	\$11,400
Antennae	FE_Ant_5	1	1	1	1	1	1	1	1	1	1	\$2,000
Panda Vox Recorder Radio	FE_Pan_6	2	2	2	2	2	2	2	2	2	2	\$1,400
Panda Vox Recorder	FE_Pan_7	1	1	1	1	1	1	1	1	1	1	\$5,700
Blue tooth Headset	FE_Blu_8	-	-	-	-	1	1	1	1	2	2	\$2,200
Portable Radios	2_46FE	31	31	31	31	31	31	31	31	31	33	\$1,900
Communication Equipment including Radio Communication Interface	6012	1	1	1	1	1	1	1	1	1	1	\$41,898
Automated External Defibrillators - Fire Trucks	12_41FE	3	3	3	3	3	3	3	3	3	3	\$5,000
Self Contained Breathing Apparatus	Various	18	18	18	18	22	22	22	22	22	22	\$7,450
Self Contained Breathing Apparatus Cylinder 4500 PSI	Various	46	46	46	46	52	52	52	52	52	52	\$1,500
Air Cylinder Compressor	1_26FE	1	1	1	1	1	1	1	1	1	1	\$29,490
Automated External Defibrillators - Public Access	1212_41FE	3	3	3	3	3	3	3	3	3	3	\$1,500
Self Contained Breathing Apparatus Masks	67_17FVT	28	28	28	28	28	28	28	28	28	28	\$439
Vehicle Extrication Equipment	5_44FE	1	1	1	1	1	1	1	1	1	1	\$25,000
Power Hydraulic Toolset	6_70FE	1	1	1	1	1	1	1	1	1	1	\$52,500
Edraulic Combination Tool	7_82FE	-	-	-	-	1	1	1	1	1	1	\$15,000
Thermal Imaging Camera	8_93FE	1	1	1	1	1	1	1	1	1	1	\$6,000
Washer/Extractor	9_104FE	-	-	-	-	-	-	-	-	1	1	\$10,000
Gear Dryer	10_2FE	-	-	-	-	-	-	-	-	1	1	\$6,000
Rapid Deployment Watercraft	11_103FE	-	1	1	1	1	1	1	1	1	1	\$6,000
Portable Pumps	13_89FE	2	2	2	2	2	2	2	2	2	2	\$7,500
Total		233	234	234	234	246	250	250	248	251	253	

Population	6,928	6,999	7,029	7,036	7,112	7,159	7,206	7,336	7,443	7,591
Per Capita Standard	0.0336	0.0334	0.0333	0.0333	0.0346	0.0349	0.0347	0.0338	0.0337	0.0333

10 Year Average	2009-2018
Quantity Standard	0.0339
Quality Standard	\$2,974
Service Standard	\$101

D.C. Amount (before deductions)	10 Year
Forecast Population	1,195
\$ per Capita	\$101
Eligible Amount	\$120,468



**Township of Puslinch
Service Standard Calculation Sheet**

Service: Parkland Development
Unit Measure: Acres of Parkland

Description	Asset No.	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 Value (\$/Acre)
Puslinch Community Centre	2301000006140000000	14.4	14.4	14.4	24.1	24.1	24.1	24.1	24.1	24.1	24.1	
Morrison Meadows Park	2301000005090200000	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	
Old Morrison Park	2301000005092000000	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	6.1	
Arkell Park	2301000008113700000	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	
Badenoch Soccer Pitch	2301000007046500000	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	5.5	
Fox Run Park	2301000006054310000	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	
Morrison Historic Corner Block Park Area	2301000005121000000	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
Total		40.2	40.2	40.2	50.0	50.0	50.0	50.0	50.0	50.0	50.0	

Population	6,928	6,999	7,029	7,036	7,112	7,159	7,206	7,336	7,443	7,591
Per Capita Standard	0.0058	0.0057	0.0057	0.0071	0.0070	0.0070	0.0069	0.0068	0.0067	0.0066

10 Year Average	2009-2018
Quantity Standard	0.0065
Quality Standard	\$0
Service Standard	\$0

D.C. Amount (before deductions)	10 Year
Forecast Population	1,195
\$ per Capita	\$0
Eligible Amount	\$0



**Township of Puslinch
Service Standard Calculation Sheet**

Service: Parkland Amenities
Unit Measure: No. of parkland amenities

Description	Asset No.	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 Value (\$/item)
Community Centre Complex: Soccer Field	3080	1	1	1	1	1	1	1	1	1	1	\$575,000
Community Centre Complex: Baseball Diamond	3013, 3013-1, 3014, 3015, 3016, 3017, 3019, 3020, 3024	1	1	1	1	1	1	1	1	1	1	\$277,226
Community Centre Complex: Aberfoyle Playground	3031, 3032	1	1	1	1	1	1	1	1	1	1	\$28,930
Community Centre Complex: Tennis Courts	14003, 14005	1	1	1	1	1	1	1	1	1	1	\$66,240
Community Centre Complex: Horse Paddock	14004, 14006, 3036, 3037	1	1	1	1	1	1	1	1	1	1	\$66,140
Community Centre Complex: Puslinch Community Gardens Benches	3823	1	1	1	1	1	1	1	1	1	1	\$500
Morrison Meadows: Morrison Playground	3041	1	1	1	1	1	1	1	1	1	1	\$25,000
Morrison Meadows: Picnic Pavillion, Morrison Meadows Park	3010, 3043	1	1	1	1	1	1	1	1	1	1	\$33,500
Morrison Meadows: Basketball Court	3044, 3279	1	1	1	1	1	1	1	1	1	1	\$23,425
Morrison Meadows: Baseball Diamonds	3046, 3047, 3048, 3049, 3050, 3051, 3052, 3053, 3055	2	2	2	2	2	2	2	2	2	2	\$70,977
Old Morrison: Baseball Diamond	3057, 3058, 3059, 3060, 3061, 3063, 3064, 3065	1	1	1	1	1	1	1	1	1	1	\$243,807
Badenoch Soccer Field	3068	1	1	1	1	1	1	1	1	1	1	\$2,000
Boreham Drive Park: Basketball Court	3074, 3260	1	1	1	1	1	1	1	1	1	1	\$23,425
Boreham Drive Park: Arkell Playground	3075	1	1	1	1	1	1	1	1	1	1	\$25,000
Total		15	15	15	15	15	15	15	15	15	15	

Population	6,928	6,999	7,029	7,036	7,112	7,159	7,206	7,336	7,443	7,591
Per Capita Standard	0.0022	0.0021	0.0021	0.0021	0.0021	0.0021	0.0021	0.0020	0.0020	0.0020

10 Year Average	2009-2018
Quantity Standard	0.0021
Quality Standard	\$101,638
Service Standard	\$213

D.C. Amount (before deductions)	10 Year
Forecast Population	1,195
\$ per Capita	\$213
Eligible Amount	\$255,061



**Township of Puslinch
Service Standard Calculation Sheet**

Service: Parkland Trails
Unit Measure: Linear Metres of Paths and Trails

Description	Asset No.	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 Value (\$/ Linear Metre)
Wayne Stokley Trail	3079	-	-	-	-	-	-	-	450	450	450	\$32
Telfer Glen Trail	3077	270	270	270	270	270	270	270	270	270	270	\$32
Total		270	270	270	270	270	270	270	720	720	720	

Population	6,928	6,999	7,029	7,036	7,112	7,159	7,206	7,336	7,443	7,591
Per Capita Standard	0.0390	0.0386	0.0384	0.0384	0.0380	0.0377	0.0375	0.0981	0.0967	0.0948

10 Year Average	2009-2018
Quantity Standard	0.0557
Quality Standard	\$32
Service Standard	\$2

D.C. Amount (before deductions)	10 Year
Forecast Population	1,195
\$ per Capita	\$2
Eligible Amount	\$2,127



**Township of Puslinch
Service Standard Calculation Sheet**

Service: Recreation Vehicles and Equipment
Unit Measure: No. of vehicles and equipment

Description	Asset No.	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019 Value (\$/Vehicle)
Trailer	8012	1	1	1	1	1	1	1	1	1	1	\$5,000
Lawn Tractor	7007	1	1	1	1	1	1	1	1	1	1	\$30,000
Pitching Machines	N/A	2	2	2	2	2	2	2	2	2	1	\$11,500
Ultraviolet Units	N/A	4	4	4	4	4	4	4	4	4	3	\$3,400
Olympia Ice Machine	8020	-	1	1	1	1	1	1	1	1	1	\$80,000
Floor Scrubber	4060	-	1	1	1	1	1	1	1	1	1	\$8,000
Generators	210PCC	2	2	2	2	2	2	2	2	2	2	\$37,500
Total		10	12	12	12	12	12	12	12	12	10	

Population	6,928	6,999	7,029	7,036	7,112	7,159	7,206	7,336	7,443	7,591
Per Capita Standard	0.0014	0.0017	0.0017	0.0017	0.0017	0.0017	0.0017	0.0016	0.0016	0.0013

10 Year Average	2009-2018
Quantity Standard	0.0016
Quality Standard	\$19,513
Service Standard	\$31

D.C. Amount (before deductions)	10 Year
Forecast Population	1,195
\$ per Capita	\$31
Eligible Amount	\$37,308



**Township of Puslinch
Service Standard Calculation Sheet**

Service: Indoor Recreation Facilities
Unit Measure: ft² of building area

Description	Asset No.	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	Value/sq.ft. with land, site works, etc.	
Community Centre, Badenoch	N/A	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500	-	\$360	
Concession Booth and Washrooms, Morriston Meadows	3009MM	500	500	500	500	500	500	500	500	500	500	\$74	
Morrison Meadows: Picnic Pavilion, Morrison Meadows Park	3010, 3043	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200	\$55	
Concession Booth and Washrooms, Old Morrison Park	3009OMM	400	400	400	400	400	400	400	400	400	400	\$74	
Puslinch Community Centre	53PCC, 67PCC, 9PCC, 46PCC, 93PCC, 26PCC, 40PCC, 41PCC	7,071	7,071	7,071	7,071	8,323	8,323	8,323	8,323	8,323	8,323	\$180	
Blue Storage Building Behind Puslinch Community Centre	64BSBBPCC, 71BSBBPCC, 66BSBBPCC, 14BSBBPCC, 70BSBBPCC, 89BSBBPCC, 44BSBBPCC	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	3,200	\$74	
Community Centre Complex: Concession Booth At Community Centre Ball Diamond, County Road 46	3011	252	252	252	252	252	252	252	252	252	252	\$74	
Community Centre Complex: Storage Building and Announcer's Booth at Horse Paddock	3035	300	300	300	300	300	300	300	300	300	300	\$74	
Outdoor Rink/Gymnasium and Change Rooms, Optimist Recreation Centre (ORC)	33OCC, 66OCC, 51OCC, 44OCC, 97OCC, 22OCC, 18OCC, 39OCCIR, 95OCCIR, 13OCCIR, 58OCCIR, 17OCCIR, 51OCCIR, 88OCCIR, 41OCCIR,	-	19,600	19,600	19,600	19,600	19,600	19,600	19,600	19,600	19,600	19,600	\$314
Badenoch Soccer Field: Storage Shed	3067	120	120	120	120	120	120	120	120	120	120	\$74	
Total		14,543	34,143	34,143	34,143	35,395	35,395	35,395	35,395	35,395	33,895		

Population	6,928	6,999	7,029	7,036	7,112	7,159	7,206	7,336	7,443	7,591
Per Capita Standard	2.0992	4.8783	4.8574	4.8526	4.9768	4.9441	4.9119	4.8248	4.7555	4.4652

10 Year Average	2009-2018
Quantity Standard	4,5566
Quality Standard	\$239
Service Standard	\$1,091

D.C. Amount (before deductions)	10 Year
Forecast Population	1,195
\$ per Capita	\$1,091
Eligible Amount	\$1,303,566



Appendix C

Long-Term Capital and Operating Cost Examination



Appendix C: Long-Term Capital and Operating Cost Examination

As a requirement of the D.C.A. under subsection 10(2)(c), an analysis must be undertaken to assess the long-term capital and operating cost impacts for the capital infrastructure projects identified within the D.C. As part of this analysis, it was deemed necessary to isolate the incremental operating expenditures directly associated with these capital projects, factor in cost saving attributable to economies of scale or cost sharing where applicable and prorate the cost on a per unit basis (i.e. sq.ft. of building space, per vehicle, etc.). This was undertaken through a review of the Township's approved 2017 Financial Information Return (FIR).

In addition to the operational impacts, over time the initial capital projects will require replacement. This replacement of capital is often referred to as lifecycle cost. By definition, lifecycle costs are all the costs which are incurred during the life of a physical asset, from the time its acquisition is first considered, to the time it is taken out of service for disposal or redeployment. The method selected for lifecycle costing is the sinking fund method which provides that money will be contributed annually and invested, so that those funds will grow over time to equal the amount required for future replacement.

Table D-1 depicts the annual operating impact resulting from the proposed gross capital projects at the time they are all in place. It is important to note that, while municipal program expenditures will increase with growth in population, the costs associated with the new infrastructure (i.e. facilities) would be delayed until the time these works are in place.

Table D-1
Operating and Capital Expenditure Impacts for Future Capital Expenditures

SERVICE	ANNUAL LIFECYCLE EXPENDITURES	ANNUAL OPERATING EXPENDITURES	TOTAL ANNUAL EXPENDITURES
Roads and Related	56,086	10,193	66,280
Fire Protection Services	43,301	24,545	67,845
Parks and Recreation Services	77,517	13,206	90,723
Administration - Studies	-	-	-
Total	176,904	47,944	224,848



Appendix D

Local Service Policy



Appendix D: Local Service Policy

The following provides the local service and developer contribution policy for the Township.

1. Collector Roads

- 1.1. Collector Roads Internal to Development – Direct developer responsibility under s.59 of the D.C.A. (as a local service).
- 1.2. Roads (collector and arterial) external to development - Include in D.C. calculation to the extent permitted under s.5(1) of the D.C.A. (dependent on local circumstances).
- 1.3. Stream crossing and rail crossing road works, excluding underground utilities but including all other works within lands to be dedicated to the Township or rail corridors - include in D.C. calculation to the extent permitted under s.5(1) of the D.C.A. (dependent on local circumstances).

2. Traffic Signals

- 2.1. Traffic signalization within or external to development – Include in D.C. calculation to the extent permitted under s.5(1) of the D.C.A.

3. Intersections Improvements

- 3.1. New roads (collector and arterial) and road (collector and arterial) improvements – Include as part of road costing noted in item 1, to limits of ROW.
- 3.2. Intersections improvements within specific developments and all works necessary to connect to entrances (private and specific subdivision) to the roadway - Direct developer responsibility under s.59 of D.C.A. (as a local service).
- 3.3. Intersections with county roads and provincial highways – Include in D.C. calculation to the extent that they are Township responsibility.
- 3.4. Intersection improvements on other roads due to development growth increasing traffic – Include in D.C. calculation.



4. Streetlights

- 4.1. Streetlights on external roads – Include in D.C. calculation (linked to collector road funding source in item 1).
- 4.2. Streetlights within specific developments – Direct developer responsibility under s.59 of D.C.A. (as a local service).

5. Sidewalks

- 5.1. Sidewalks on provincial and county roads – Include in D.C. calculation or, in exceptional circumstances, may be local improvement or direct developer responsibility through local service provisions (s.59 of D.C.A.).
- 5.2. Sidewalks on area municipal roads - Linked to collector road funding source in item 1.
- 5.3. Other sidewalks external to development (which are a local service within the area to which the plan relates) - Direct developer responsibility as a local service provision (under s.59 of D.C.A.).

6. Traffic Control Signals

- 6.1. Include in D.C. calculation.

7. Land Acquisition for Road Allowances

- 7.1. Land Acquisition for arterial roads – Dedication under the *Planning Act* subdivision provisions (s.51) through development lands; in areas with limited or no development, include in D.C. calculation (to the extent eligible).
- 7.2. Land Acquisition for collector roads – Dedication under the *Planning Act* subdivision provision (s.51) through development lands (up to 27 metre right-of-way); in areas with limited or no development, include in D.C. calculation (to the extent eligible).

8. Land Acquisition for Easements

- 8.1. Easement costs external to subdivisions shall be included in D.C. calculation.



9. Stormwater Management

- 9.1. Quality and Quantity Works, direct developer responsibility through local service provisions (s. 59 of D.C.A.).



Appendix E

Proposed D.C. By-law



Appendix E: Proposed D.C. By-law

THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

BY-LAW NUMBER ___/19

A by-law to establish development charges for the
Corporation of the Township of Puslinch

WHEREAS the Township of Puslinch will experience growth through development and re-development; and

WHEREAS development and re-development requires the provision of physical and social services by the Township of Puslinch; and

WHEREAS Council desires to ensure that the capital cost of meeting growth-related demands for or burden on municipal services does not place an excessive financial burden on the Township of Puslinch or its existing taxpayers while at the same time ensuring new taxpayers contribute no more than the net capital cost attributable to providing the current level of municipal services; and

WHEREAS the *Development Charges Act, 1997* (the "Act") provides that the council of a municipality may by by-law impose development charges against land to pay for increased capital costs required because of increased needs for services; and

WHEREAS a development charge background study has been completed in accordance with the Act; and

WHEREAS the Council of The Corporation of the Township of Puslinch has given notice of and held public meetings on the 19th day of June, 2019 in accordance with the Act and the regulations thereto.

NOW THEREFORE the Council of the Corporation of the Township of Puslinch enacts as follows:

1. INTERPRETATION

1.1 In this by-law the following items shall have the corresponding meanings:



"Act" means the *Development Charges Act*, as amended, or any successor thereof;

"accessory use" means where used to describe a use, building, or structure that the use, building or structure is naturally and normally incidental, subordinate in purpose of floor area or both, and exclusively devoted to a principal use, building or structure;

"agricultural use" means the use of land and buildings for apiaries, fish farming, animal husbandry or the cultivation of trees, shrubs, flowers, grains, sod, fruits, vegetables and other crops or ornamental plants;

"apartment unit" means any residential unit within a building containing three or more dwelling units where access to each residential unit is obtained through a common entrance or entrances from the street level and the residential units are connected by an interior corridor;

"bedroom" means a habitable room larger than seven square metres, including a den, study or other similar area, but does not include a bathroom, living room, dining room or kitchen;

"benefiting area" means an area defined by map, plan or legal description in a front-ending agreement as an area that will receive a benefit from the construction of a service;

"board of education" has the same meaning as set out in the *Education Act*, R.S.O. 1990, Chap. E.2, as amended, or any successor thereof;

"Building" means a permanent enclosed structure occupying an area greater than ten square metres (10 m²) and, notwithstanding the generality of the foregoing, includes, but is not limited to:

- (a) An above-grade storage tank;
- (b) An air-supported structure;
- (c) An industrial tent;
- (d) A roof-like structure over a gas-bar or service station; and



(e) An area attached to and ancillary to a retail development delineated by one or more walls or part walls, a roof-like structure, or any one or more of them.

"Building Code Act" means the *Building Code Act*, S.O. 1992, as amended, or any successor thereof;

"canopy" means a canopy as defined O.Reg. 332/12 under the Building Code Act, 1992, S.O. c. 23, and includes a roof-like structure over a gas bar or service station;

"capital cost" means costs incurred or proposed to be incurred by the Township or a local board thereof directly or by others on behalf of and as authorized by the Township or local board,

- (a) to acquire land or an interest in land, including a leasehold interest,
- (b) to improve land,
- (c) to acquire, lease, construct or improve buildings and structures,
- (d) to acquire, construct or improve facilities including,
 - (i) furniture and equipment other than computer equipment, and
 - (ii) material acquired for circulation, reference or information purposes by a library board as defined in the Public Libraries Act, R.S.O. 1990, Chap. P.44, as amended, or any successor thereof; and
 - (iii) rolling stock with an estimated useful life of seven years or more, and
- (e) to undertake studies in connection with any matter under the Act and any of the matters in clauses (a) to (d) above, including the development charge background study

required for the provision of services designated in this by-law within or outside the Township, including interest on borrowing for those expenditures under clauses (a) to (e) above that are growth-related;



"commercial" means any use of land, structures or buildings for the purposes of buying or selling commodities and services, but does not include industrial or agricultural uses, but does include hotels, motels, motor inns and boarding, lodging and rooming houses;

"Council" means the Council of the Township;

"development" means the construction, erection or placing of one or more buildings or structures on land or the making of an addition or alteration to a building or structure that the effect of increasing the size of usability thereof, and includes redevelopment;

"development charge" means a charge imposed with respect to this by-law;

"dwelling unit" means any part of a building or structure used, designed or intended to be used as a domestic establishment in which one or more persons may sleep and may be provided with culinary and sanitary facilities for their exclusive use;

"existing" means the number, use and size that existed as of the date this by-law was passed;

"Existing Industrial Building" means a building or buildings existing on a site on the day this by-law is passed, or the first building or buildings constructed on a vacant site pursuant to site plan approval, under Section 41 of the *Planning Act*, subsequent to the passage of this by-law for which full development charges were paid, that is used for or in conjunction with:

- (a) the production, compounding, processing, packaging, crating, bottling, packing or assembly of raw or semi-processed goods or materials in not less than seventy five percent of the total gross floor area of the building or buildings on a site ("manufacturing") or warehousing related to the manufacturing use carried on in the building or buildings;
- (b) research or development activities in connection with manufacturing in not less than seventy five percent of the total gross floor area of the building or building on the site;
- (c) retail sales by a manufacturer, if retail sales are at the site where manufacturing is carried out; such retail sales are restricted to goods



manufactured at the site, and the building or part of a building where such retail sales are carried out does not constitute greater than twenty five percent of the total gross floor area of the building or buildings on the site;
or

- (d) office or administration purposes if they are:
 - (i) carried out as an accessory use to the manufacturing or warehousing, and
 - (ii) in or attached to the building or structure used for such manufacturing or warehousing.

“farm Building” means a building or structure associated with and located on land devoted to the practice of farming and that is used essentially for the housing of farm equipment or livestock or the production, storage or processing of agricultural and horticultural produce or feeds and as part of or in connection with a bona fide farming operation and includes barns, silos and other buildings or structures ancillary to that farming operation, including greenhouses, but excludes:

- (a) a residential use, with the exception of a bunk house for seasonal farm workers required for that farm operation; and
- (b) any building or portion thereof used or intended to be used for any other Non-Residential Use, including, but not limited to: retail sales; commercial services; restaurants; banquet facilities; hospitality and accommodation facilities; gift shops; contractors’ shops; services related to grooming, boarding, or breeding of household pets; and alcohol and marijuana production facilities.

"gross floor area" means: the sum total of the total areas of the floors in a building or structure, whether at, above, or below grade, measured between the exterior faces of the exterior walls of the building or structure or from the centre line of a common wall separating two uses, or from the outside edge of a floor where the outside edge of the floor does not meet an exterior or common wall, and:

- (a) includes the floor area of a mezzanine and air -supported structure and the space occupied by interior walls partitions; and



- (b) in the case of non- residential uses, excludes any parts of the building or structure used for mechanical equipment related to the operation or maintenance of the building or structure, stairwells, elevators, washrooms, and the parking and loading of vehicles, and;
- (c) where a building does not have any walls, the Gross Floor Area shall be the sum total of the area of land directly beneath the roof of the building and the total areas of the floors in the building or structure.

"industrial" means lands, buildings or structures used or designed or intended for use for manufacturing, processing, fabricating or assembly of raw goods, warehousing or bulk storage of goods, and includes office uses and the sale of commodities to the general public where such uses are accessory to an industrial use, but does not include the sale of commodities to the general public through a warehouse club;

"institutional" means land, buildings, structures or any part thereof used by any organization, group or association for promotion of charitable, educational or benevolent objectives and not for profit or gain;

"local board" means a local board as defined in section 1 of the Municipal Affairs Act other than a board as defined in subsection 1 (1) of the Education Act.

"local services" means those services, facilities or things which are under the jurisdiction of the Township and are related to a plan of subdivision or within the area to which the plan relates in respect of the lands under Sections 41, 51 or 53 of the Planning Act, R.S.O. 1990, Chap. P.13, as amended, or any successor thereof;

"multiple dwellings" means all dwellings other than single-detached, semi-detached and apartment unit dwellings;

"non-residential use" means a building or structure of any kind whatsoever used, designed or intended to be used for other than a residential use;

"Official Plan" means the Official Plan adopted by the County of Wellington for the Township, as amended and approved;



"owner" means the owner of land or a person who has made application for an approval for the development of land upon which a development charge is imposed'

"place of worship" means that part of a building or structure that is exempt from taxation as a place of worship under the *Assessment Act*, R.S.O. 1990, Chap. A.31, as amended, or any successor thereof;

"rate" means the interest rate established weekly by the Bank of Canada based on Treasury Bills having a term of 91 days;

"regulation" means any regulation made pursuant to the Act;

"residential dwelling" means a building, occupied or capable of being occupied as a home, residence or sleeping place by one or more persons, containing one or more dwelling units including modular homes but not including motels, hotels, tents, truck campers, tourist trailers, mobile camper trailers or boarding, lodging or rooming houses;

"residential use" means the use of a building or structure or portion thereof for one or more dwelling units. This also includes a dwelling unit on land that is used for an agricultural use;

"row dwelling" means a building containing three or more attached dwelling units in a single row, each of which dwelling units has an independent entrance from the outside and is vertically separated from any abutting dwelling unit;

"school, private" means a private school defined under the Education Act or any successor thereto, being "an institution at which instruction is provided at any time between the hours of 9 a.m. and 4 p.m. on any school day for five or more pupils who are of, or over compulsory school age in any of the subjects of the elementary or secondary school courses of study".

"semi-detached dwelling" means a dwelling unit in a residential building consisting of two dwelling units having one vertical wall or one horizontal wall, but not other parts, attached or another dwelling unit where the residential unit are not connected by an interior corridor;



"service" means a service designed in Schedule "A" to this by-law, and "services" shall have a corresponding meaning;

"servicing agreement" means an agreement between a landowner and the Township relative to the provision of municipal services to specified land within the Township;

"single detached dwelling unit" means a residential building consisting of one dwelling unit and not attached to another structure;

"Township" means the corporation of the Township of Puslinch and/or the land within the geographic limits of the Township of Puslinch; and

"Zoning by-law" means the Zoning By-Law of the Township of Puslinch or any successor thereof passed pursuant to Section 34 of the Planning Act, S.O. 1998.

2. DESIGNATION OF SERVICES

2.1 The categories of services for which development charges are imposed under this by-law are as follows:

- (a) Roads and Related;
- (b) Fire Protection Services;
- (c) Parks and Recreation Services; and
- (d) Administration Services

2.2 The components of the services designated in section 2.1 are described in Schedule A.

3. APPLICATION OF BY-LAW RULES

3.1 Development charges shall be payable in the amounts set out in this by-law where:

- (a) the lands are located in the area described in section 3.2; and



- (b) the development of the lands requires any of the approvals set out in subsection 3.4(a)

Area to Which by-law Applies

- 3.2 Subject to section 3.3, this by-law applies to all lands in the Township whether or not the land or use thereof is exempt from taxation under s. 13 or the Assessment Act.
- 3.3. Notwithstanding clause 3.2 above, this by-law shall not apply to lands that are owned by and used for the purposes of:
 - (a) the Township or a local board thereof;
 - (b) a board of education; or
 - (c) the County of Wellington or any local board thereof;

Approvals for Development

- 3.4 (a) Development charges shall be imposed on all lands, buildings or structures that are developed for residential or non-residential uses if the development requires one or more of the following:
 - (i) the passing of a zoning by-law or of an amendment to a zoning bylaw under section 34 of the Planning Act;
 - (ii) the approval of a minor variance under section 45 of the Planning Act;
 - (iii) a conveyance of land to which a by-law passed under subsection 50(7) of the Planning Act applies;
 - (iv) the approval of a plan of subdivision under section 51 of the Planning Act;
 - (v) a consent under section 53 of the Planning Act;
 - (vi) the approval of a description under section 50 of the Condominium Act, R.S.O. 1990, Chap. C.26, as amended, or any successor thereof; or



(vii) the issuing of a building permit under the Building Code Act in relation to a building or structure.

(b) No more than one development charge for each service designated in subsection 2.1 shall be imposed upon any lands, buildings or structures to which this by-law applies even though two or more of the actions described in subsection 3.4(a) are required before the lands, buildings or structures can be developed. shall be imposed if the subsequent action has the effect of increasing the need for services.

(c) Despite subsection 3.4(b), if two or more of the actions described in subsection 3.4(a) occur at different times, additional development charges shall be imposed if the subsequent action has the effect of increasing the need for services.

Exemptions

3.5 Notwithstanding the provisions of this by-law, development charges shall not be imposed with respect to:

- (a) an enlargement to an existing dwelling unit;
- (b) one or two additional dwelling units in an existing single detached dwelling;
or
- (c) one additional dwelling unit in any other existing residential building;

3.6 Notwithstanding section 3.5(b), development charges shall be imposed if the total gross floor area of the additional one or two units exceeds the gross floor area of the existing dwelling unit.

3.7 Notwithstanding section 3.5, development charges shall be imposed if the additional unit has a gross floor area greater than

- (i) in the case of a semi-detached or row dwelling, the gross floor area of the existing dwelling unit; and
- (ii) in the case of any other residential building, the gross floor area of the smallest dwelling unit contained in the residential building.



3.8 Exemption for Industrial Development:

3.8.1 Notwithstanding any other provision of this by-law, no development charge is payable with respect to an enlargement of the gross floor area of an existing industrial building where the gross floor area is enlarged by 50 percent or less.

3.8.2 If the gross floor area of an existing industrial building is enlarged by greater than 50 percent, the amount of the development charge payable in respect of the enlargement is the amount of the development charge that would otherwise be payable multiplied by the fraction determined as follows:

- 1) determine the amount by which the enlargement exceeds 50 percent of the gross floor area before the enlargement;
- 2) divide the amount determined under subsection 1) by the amount of the enlargement

3.9 For the purpose of section 3.8 herein, "existing industrial building" is used as defined in the Regulation made pursuant to the Act.

3.10 Other Exemptions:

Notwithstanding the provision of this by-law, development charges shall not be imposed with respect to:

- (a) Temporary use permitted under a zoning by-law under Section 39 of the Planning Act;
- (b) Accessory use;
- (c) A home occupation;
- (d) Non-residential farm buildings used for agricultural purposes; and
- (e) Institutional use.



Amount of Charges

Residential

3.11 The development charges set out in Schedule B shall be imposed on residential uses of lands, buildings or structures, including a dwelling unit accessory to a non-residential use and, in the case of a mixed use building or structure, on the residential uses in the mixed use building or structure, according to the type of residential unit, and calculated with respect to each of the services according to the type of residential use.

Non-Residential

3.12 The development charges described in Schedule B to this by-law shall be imposed on non-residential uses of lands, buildings or structures, and, in the case of a mixed use building or structure, on the non-residential uses in the mixed use building or structure, and calculated with respect to each of the services according to the total floor area of the non-residential use.

Reduction of Development Charges for Redevelopment

3.13 Despite any other provisions of this by-law, where, as a result of the redevelopment of land, a building or structure existing on the same land within 12 months prior to the date of payment of development charges in regard to such redevelopment was, or is to be demolished, in whole or in part, or converted from one principal use to another principal use on the same land, in order to facilitate the redevelopment, the development charges otherwise payable with respect to such redevelopment shall be reduced by the following amounts:

- (a) in the case of a residential building or structure, or in the case of a mixed-use building or structure, the residential uses in the mixed-use building or structure, an amount calculated by multiplying the applicable development charge under subsection 3.11 by the number, according to type, of dwelling units that have been or will be demolished or converted to another principal use; and



- (b) in the case of a non-residential building or structure or, in the case of mixed-use building or structure, the non-residential uses in the mixed-use building or structure, an amount calculated by multiplying the applicable development charges under subsection 3.12, by the gross floor area that has been or will be demolished or converted to another principal use;

provided that such amounts shall not exceed, in total, the amount of the development charges otherwise payable with respect to the redevelopment.

Time of Payment of Development Charges

- 3.14 Development charges imposed under this by-law are calculated, payable, and collected upon issuance of a building permit for the development, except for roads and related services where at the discretion of Council shall be payable immediately upon the owner entering into subdivision agreement or consent agreement.
- 3.15 Despite section 3.14, Council from time to time, and at any time, may enter into agreements providing for all or any part of a development charge to be paid before or after it would otherwise be payable, in accordance with section 27 of the Act.

4. PAYMENT BY SERVICES

- 4.1 Despite the payment required under subsections 3.11 and 3.12, Council may, by agreement, give a credit towards a development charge in exchange for work that relates to a service to which a development charge relates under this by-law.

5. INDEXING

- 5.1 Development charges imposed pursuant to this by-law shall be adjusted annually, without amendment to this by-law, on January 1st of each year, in accordance with the prescribed index in the Act.



6. **SCHEDULES**

6.1 The following schedules shall form part of this by-law:

Schedule A - Components of Services Designated in subsection 2.1

Schedule B - Residential and Non-Residential Schedule of Development Charges

7. **CONFLICTS**

7.1 Where the Township and an owner or former owner have entered into an agreement with respect to land within the area **to** which this by-law applies, and a conflict exists between the provisions of this by-law and such agreement, the provisions of the agreement shall prevail to the extent that there is a conflict.

7.2 Notwithstanding section 7.1, where a development which is the subject of an agreement to which section 7.1 applies, is subsequently the subject of one or **more** of the actions described in subsection 3.4(a), an additional development charge in respect of the development permitted by the action shall be calculated, payable and collected in accordance with the provisions of this by-law if the development has the effect of increasing the need for services, unless such agreement provides otherwise.

8. **SEVERABILITY**

8.1 If, for any reason, any provision of this by-law is held to be invalid, it is hereby declared to be the intention of Council that all the remainder of this by-law shall continue in full force and effect until repealed, re-enacted, amended or modified.

9. **DATE BY-LAW IN FORCE**

9.1 This by-law shall come into effect at 12:01 AM on July 18, 2019.

10. **DATE BY-LAW EXPIRES**

10.1 This by-law will expire at 12:01 AM on July 18, 2024 unless it is repealed by Council at an earlier date.



10. EXISTING BY-LAW REPEALED

11.1 By-law 054/14 is hereby repealed as of the date and time of this by-law coming into effect.

READ A FIRST, SECOND AND THIRD TIME AND FINALLY PASSED THIS 17th DAY OF JULY, 2019.

James Seeley, Mayor

Karen M. Landry, CAO



SCHEDULE "A" TO BY-LAW

COMPONENTS OF SERVICES DESIGNATED IN SUBSECTION 2.1

100% Eligible Services

Roads and Related

Roads

Bridges and Culverts

Public Works Facilities

Vehicles and Equipment

Fire Protection Services

Fire Facilities

Fire Vehicles

Fire Fighter Equipment

90% Eligible Services

Administration Services

Growth Related Studies

Parks and Recreation

Parkland Development

Recreation Facilities

Parks and Recreation Vehicles and Equipment



SCHEDULE "B"

BY-LAW NO. ___/19

SCHEDULE OF DEVELOPMENT CHARGES

Service	RESIDENTIAL				NON-RESIDENTIAL
	Single and Semi-Detached Dwelling	Apartments - 2 Bedrooms +	Apartments - Bachelor and 1 Bedroom	Other Multiples	(per sq.ft. of Gross Floor Area)
Municipal Wide Services:					
Roads and Related	\$ 2,834	\$ 1,541	\$ 1,310	\$ 2,120	\$ 0.98
Fire Protection Services	\$ 1,378	\$ 749	\$ 637	\$ 1,031	\$ 0.47
Parks and Recreation Services	\$ 667	\$ 363	\$ 308	\$ 499	\$ 0.04
Administration - Studies	\$ 329	\$ 179	\$ 152	\$ 246	\$ 0.11
Total Municipal Wide Services	\$ 5,208	\$ 2,832	\$ 2,407	\$ 3,896	\$ 1.60



June 13, 2019

The Honourable Jeff Yurek
Ministry of Transportation
5th Floor
777 Bay St.
Toronto, ON M7A 1Z8

Sent via Email: jeff.yurekco@pc.ola.org

Dear Honourable Yurek,

RE: Highway 6 By-Pass File No: T08MOR

I am writing you today as a follow up too many correspondences received by your Ministry in regards to the Morriston By-pass. I understand the difficulties the Province has in funding projects of this magnitude.

The By-pass is affecting our community on several fronts. Economic Development being one of the most affected. There are numerous properties that have holds on them by the MTO for future widening of the 401 as well as the highway by-pass. These properties are located directly adjacent to the 401/Hanlon Expressway, are ideal for industrial growth which contributes to our local tax base significantly. These lands adjacent to the 401 have been sitting vacant for close to 20 years, all waiting on an announcement of the by-pass/widening construction or a release of the holds on the lands

In conjunction with lands along the 401 corridor, we have lands similarly located along Provincial Route 6 North, that have not been developed due to again the lack of an announcement of the by-pass. These lands located in the area of Maltby Road/Highway 6 north have had multiple offers of purchase not proceed past the due diligence stage. This has occurred due to the fact that the Maltby/Hanlon highway improvements are contingent on an announcement of the by-pass. Investors have purchased land to develop to contribute to the growing economy only to have the deals not survive past the due diligence stage. I have included the correspondence from Marlene Walker from Persian Investments in regards to the property located at the intersection of Maltby Road/Highway 6 North.



The Provincial Government is promoting Ontario as “Open for Business”. However, our roads are closed for business. In the month of May and June there were multiple incidents of the **ONLY** multi lane arterial road that is designed to keep Ontario’s economy moving, doing the exact opposite, the 401 was a parking lot. On May 22/2019 the 401 was brought to a stand still from at a minimum 10 hours straight. I live in Morriston just South of the 401. I attended the Municipal office shortly after 11:00 am, crossing over the 401 at the Highway 6 south overpass. The last time I crossed over that over pass at 9:00 pm the issue had not been resolved. If the traffic jam was only from Guelph line exit (East Bound) west to the Hanlon (which I highly doubt), the traffic jam was 18 km long for 10+ hours. I ask what is the cost to the economy when this is happening several times a month? It isn’t unreasonable for these traffic jams to extend far past the Hanlon exchange making them 25-30 km long. Without a by-pass this traffic does not have an alternative route.

If the province is truly committed to being open for business (facilitating transportation of goods and services), committed to transportation infrastructure and finally economic development, we ask that the Government commit to the Highway 6 by-pass. Having a by-pass in place will allow traffic flow South to the 403 and thus preventing the economic or at least mitigating the economic impact of traffic congestion due to unforeseen events (Emergency response). Having a by-pass may not be in the GTA, however the GTA and GGHS will benefit tremendously, this is not a **LOCAL** issue, rather a regional improvement. Committing to the by-pass will provide excellent economic development along the 401 Corridor as well as the Hanlon corridor, providing new jobs and excellent tax base increase **NOT** on residential properties, all of which would support that Ontario is in fact open for business.

Along with the correspondence from Persian investments I am providing the Morriston by-pass coalition PDF that builds the business case with the support of significant corporate citizens. Thank you for your consideration on this matter.

Mayor James Seeley



RESOLUTION
MUNICIPAL COUNCIL
THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

2019-
 Date: July 17, 2019

Moved by: _____ Seconded by: _____

WHEREAS adequate internet service is lacking in most parts of Puslinch;

AND WHEREAS Wellington County, in conjunction with SWIFT, is proceeding with a pilot project for the County for the summer 2019;

AND WHEREAS there a need for a knowledgeable Township representative on the County's Steering Committee when it is convened;

AND WHEREAS the provision of any internet services provided by the pilot project in Puslinch will still likely leave the majority of Puslinch underserved;

THEREFORE BE IT RESOLVED that Council acknowledges the formation of a community led committee to advance the provision of improved internet services for the Township;

AND THAT Council supports the appointment of Glenn James as Puslinch's representative on the Wellington County Steering Committee;

AND THAT Council appoints a member of Council to the community Committee;

And that Councillor _____ be appointed as the Council representative for the 2018-2022 Term of Council;

And that this motion be forwarded to Wellington County for their furtherance.

RECORDED VOTE	YES	NO	CONFLICT	ABSENT
Councillor Bulmer				
Councillor Roth				
Mayor Seeley				
Councillor Sepulis				
Councillor Goyda				
TOTAL				

MAYOR: _____

CARRIED	LOST
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Minutes of Meeting

Held on Monday June 10, 2019 10 to 11am

Wellington County Offices Governors Residence

Purpose: to discuss high speed internet service for Puslinch

Present:

Jana Burns	Director of Economic Development Wellington County
Doug Waram	Director of Information Technology Wellington County
Glenn James	Puslinch Resident
Matthew Bulmer	Puslinch Councillor
John Sepulis	Puslinch Councillor

CC:

Karen Landry	Puslinch CAO
James Seeley	Puslinch Mayor

1. Introductions

All present introduced themselves. Puslinch attendees explained their interest in pursuing high speed internet service for the residents of Puslinch. Glenn outlined his extensive experience with Information Technology and desire to have community involvement in implementing improved internet service in Puslinch.

2. Existing Coverage (see attachment 1)

Glenn presented a map derived from the SWIFT website which depicted the extent of availability of fibre optic cable in Puslinch. Doug indicated that the map only indicates the location of high speed internet (50Mbps/10Mbps) voluntarily identified by various service providers (includes both Fibre and Cable connections).

Matt indicated that he is aware of fibre located on WR 32 south of WR 35 but is not accessible to the nearby home owners.

3. Mississippi Mills/EORN

Glenn outlined the experience at Mississippi Mills with mention of successful implementation of internet service to the small hamlet Clayton. Basically the project was led by a community organization MM2020 which reported through the Mayor to Council (see attachments 2 and 3). The work was done independently of EORN which was the equivalent of SWIFT in eastern Ontario.

The lessons learned by EORN was briefed noted (see attachment 4). EORN is no longer active.

4. SWIFT \$12M Pilot Project

The scope of SWIFT'S pilot project is the installation of fibre optic network with splice points every 1.5 kilometres. The splice points are locations where an area can connect into the fibre optic network. A RFP may be issued by SWIFT as early as the summer to qualified companies to bid on any part of the County in the RFP. In SWIFT'S evaluation criteria they give points to scalable technologies (fibre), but any carrier that offers 50/10 service, including wireless, can part take. The RFP will provide the existing service map of Wellington County, including exclusion areas with existing 50/10 service, and request best outcome solutions.

Some discussion ensued about the fact that the vendors would be only interested in providing the backbone and services where there is a massing of potential customers. It was understood that some areas have so few households that provision of fibre optic cable would never be commercially viable and would have to rely on external funding. Once the backbone was in it was thought that smaller internet vendors would be approached to serve areas not covered by the vendors who installed the backbone system.

Jana and Doug also noted that SWIFT'S intent also includes reinvesting 5% of vendor'S cost to funding future fibre optic installations.

The installation of the fibre optic backbone would likely start next year.

Success of the pilot project would be value of the investment brought in by vendors compared to the allocation of the \$12M in funding.

5. Opportunities for Community Involvement

Jana and Doug advised that SWIFT is currently working with the SWIFT board representatives of the three successful pilot communities to confirm next steps with respect to the RFP process. There may be a County Steering Committee comprised of staff from the various municipalities. Jana and Doug indicated that it would of importance to the project to have Puslinch identify the extent of existing high speed internet and appropriate locations for splice points. They also would agree to have a community representative such as Glenn on the committee as well.

There was some discussion regarding Puslinch having a group of citizens similar to Friends of Mill Creek to champion the implementation of local internet service which would be connected to the fibre optic backbone at the splice points. Jana and Doug would be supportive of such a group. Matt and John agreed to bring forward to Council the notion of having a such a group which would liaise through one person with the Steering Committee.

Jana and Doug indicated that they could provide a list of smaller vendors who may interested in providing services from fibre optic backbone into areas of Puslinch.

6. Next Steps

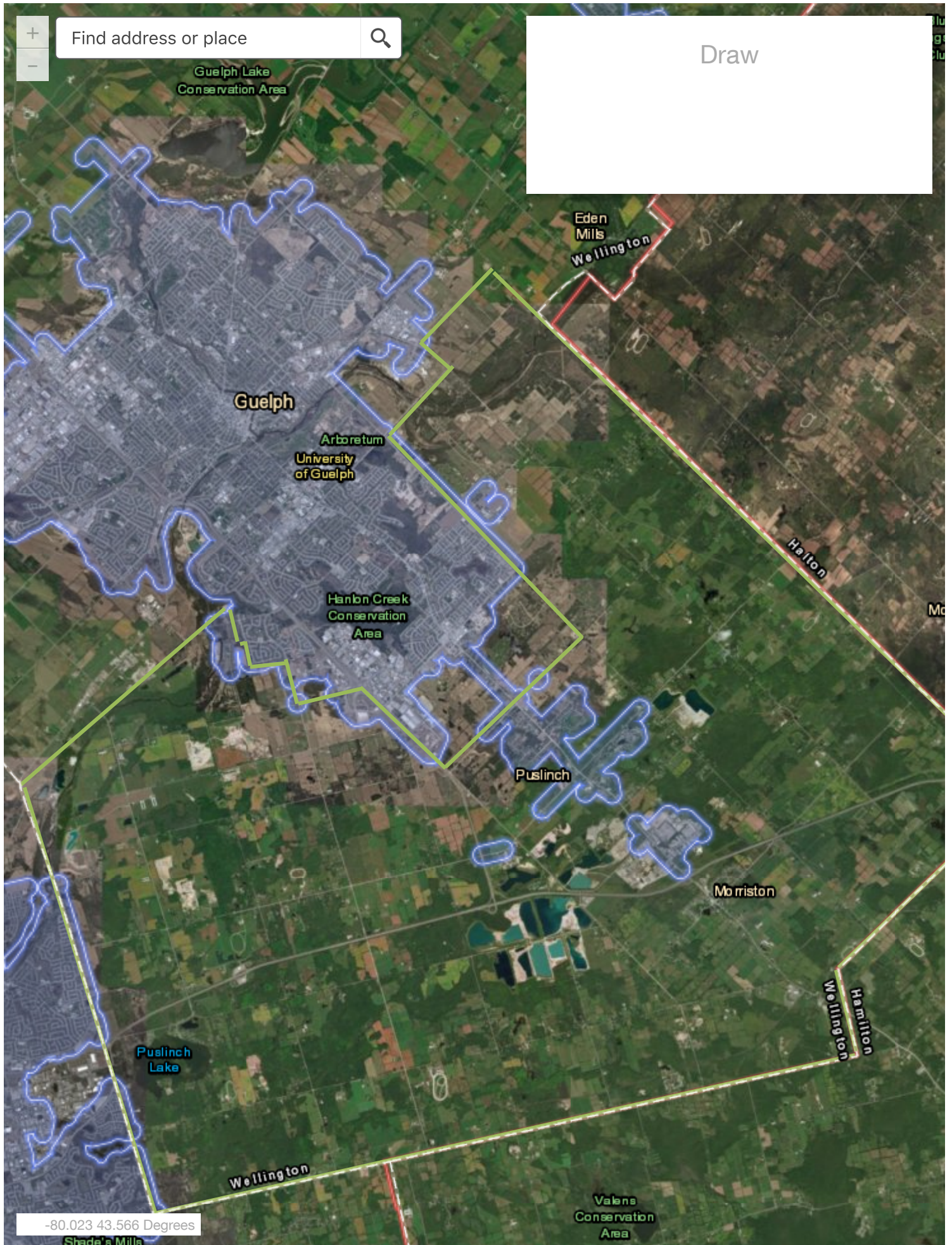
Matt and John will pursue the creation of a Puslinch community group to move forward the implementation of internet service and having citizen representation on the County Steering Committee.

Matt and John will bring back to Puslinch the need to identify the extent of existing high speed internet and appropriate locations for splice points.

7. Adjournment

Meeting adjourned at 11:10am.

Minutes taken by John Sepulis and amended to reflect comments on minutes by Jana Burns and Doug Waram.





MM2020 Update

PRESENTATION TO MISSISSIPPI MILLS COUNCIL

MARK JOYNES

JANUARY 8TH, 2019

Why MM2020?

- ▶ Natural technical evolution favours **Urban** environments – proven trickle-down to rural communities
- ▶ A number of forces eroding rural viability – demographic conundrum
- ▶ Broadband technologies can allow rural communities to reverse the trend
- ▶ Broadband Infrastructure every bit as critical as transport infrastructure to viability and growth – Now
- ▶ **MM2020** exists to:
 - ▶ **Assess** and **Inform** regarding Mississippi Mills broadband requirements;
 - ▶ **Promote & Facilitate** accelerated broadband deployment for **ALL** of Mississippi Mills; and is
 - ▶ Targeting the **year 2020** for delivery to **every household**



Background

- ▶ 2017 Success: Solutions for Almonte & Appleton – 2018 deployments
- ▶ 2018 – Mississippi Mills Rural Broadband a different proposition – More than 50% of population not serviced
 - ▶ Community surveys conducted in Clayton and Pakenham areas Spring/Summer 2018
 - ▶ April 17, 2018 presentation to MM Council
 - ▶ Lanark County Corporate Services committee May 9
 - ▶ Approval of \$10k by MM Council to support a business plan in June
 - ▶ MM2020 website and Facebook page were revamped
 - ▶ Business Planning RFQ in Oct/Nov and contracted to Sonoptic Media & Communications Corp. in December

Community survey results

- ▶ Total of 1600 homes across the areas of Clayton, Pakenham & Blakeney
- ▶ About 50% of homes completed surveys (typical would be 10% -15%)
- ▶ Results identical in both communities
- ▶ Vast majority of residents not satisfied with their internet service or cell phone service (in Clayton)
- ▶ 38% telecommute and 28% have a home-based business
- ▶ Almost 90% would consider signing a contract with a broadband provider

The Broadband Imperative for Agriculture



10+% of Mississippi Mills responding home-based business is in Agriculture; the trend is towards expanding acreage and automation

e.g. Dairy farm with a \$1M+ robotic milking system. Broadband needed for monitoring of animal health and milk production

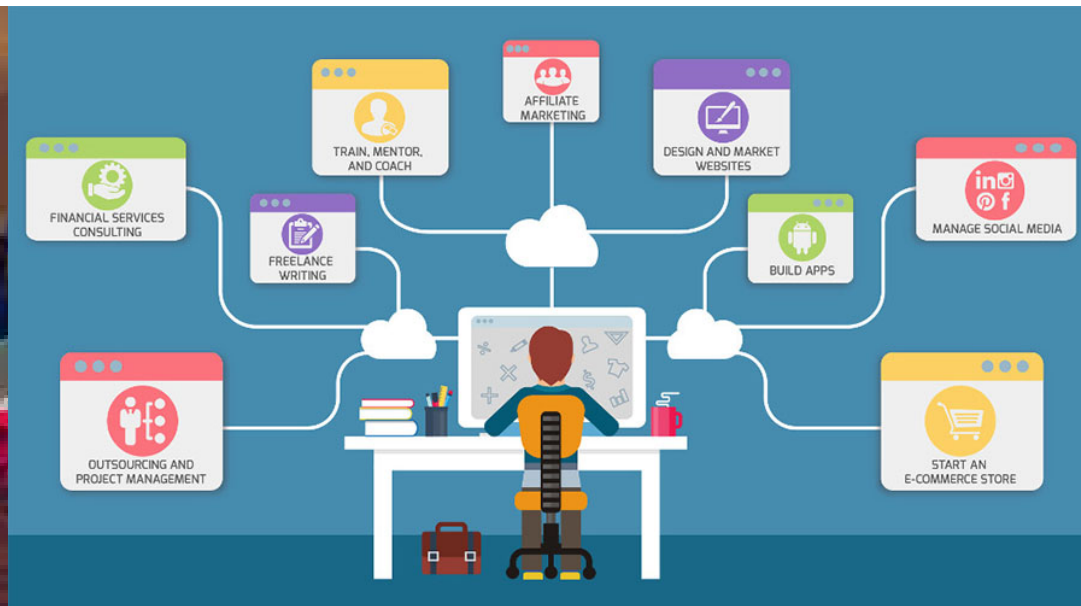
The Broadband Imperative for Health & Emergency Services



In 2021 the peak of the Baby-boom hits 65; and their health needs increase.
Baby Boom 54 – 75 - - Digital health services - - 38 – 53 Gen X

e.g. 85 year old is able to remain in her home of 40 years, aided by online monitoring of her health and online pharmaceutical services

The Broadband Imperative for Knowledge Workers



Large % of Mississippi Mills responding home-based business is in Consulting Services, IT & Sales

e.g. High Tech Global Business Development Consultant in Digital Identity & Border Control
 - Video Chat – Webinar Delivery – International Research

The Broadband Imperative for the Digital Native



Growth of the young adult population (age 25 to 44) is a key factor in the well-being and prosperity of Mississippi Mills

e.g. Young family – mother and father in Kanata high tech. 2 young teens at home
Streaming video – Homework/Telework – Gaming - Digital Assistants

Clayton Pilot project Demonstrating Commitment

- ▶ 150 homes can sign up
- ▶ **Roadbed access approved** from Lanark County & Mississippi Mills achieved but **permits outstanding**
- ▶ Residents canvassed to sign a 1 year contract
- ▶ Minimum **75% Uptake** to move forward is required – we're close
- ▶ Vendor now poised to begin as soon as the frost clears – anticipate **May 2019 start**
- ▶ Criteria to be deemed success / limited success / non-contributing
 - ▶ Committed timeline and delivery
 - ▶ Employing an architecture scalable to the entire MM rural community, and achieving acceptable up/down metrics regardless of municipal address
 - ▶ Employing a financial model scalable to the entire MM rural community

Broadband Business Planning for Mississippi Mills

- ▶ MM2020 Targeting Broadband access **for all rural areas of Mississippi Mills in 2020**
- ▶ Business Case needed to document the need for broadband and outline funding approaches for accelerating commercial delivery of the infrastructure – completion in 1st Qtr of 2019
- ▶ Business Analysis contracted to **Sonoptic Media & Communications** at cost of \$15K
- ▶ Project Structure
 - ▶ Phase 1 – **Business Analysis**
 - ▶ Phase 2 – **Viability** of Single Vendor option
 - Decision on Phase 3 Option
 - ▶ Phase 3 a – Assess Single Vendor Deployment Plan & Schedule (**Achievable?**)
 - ▶ Phase 3 b – Document requirements for **multi-vendor RFP?**

The Demographic Conundrum

Business Analysis Teaser

▶ Trending Indicators

- ▶ Natural Demographic predictions not favourable for Mississippi Mills economic growth
- ▶ Aging population – migration from rural to urban for access to support services
- ▶ Median age 48 compared to provincial average of 41
- ▶ Employment in rural core industries declining e.g. farming
- ▶ Youth/Young Family Turnover – Age 25-44 only 21% of population -- Nets to 0 growth for that demographic
- ▶ Millennials: Age 22 – 37 set to replace Baby Boomers as largest component of population – MM attractiveness?

▶ Glimpse of Potential

- ▶ MM Median Family Income comparatively healthy - \$100K vs. Lanark \$87K & Prov \$91K
- ▶ MM 2011 – 2016 growth figures: 6% vs. Lanark and Prov. at 4.6%
- ▶ Level of nascent MM home-based business activity

Summary

- ▶ Market is not naturally delivering Broadband Infrastructure to rural Mississippi Mills – Innovative Approach required
- ▶ Municipality – Much appreciated support but enabling to-date
- ▶ MM2020 – Citizen Group – Your voice regarding the need – no official standing
- ▶ 2019 continued advocacy and formal recommendation
- ▶ The vision for **Mississippi Mills leadership** in addressing the **Rural Broadband Imperative** - Anticipating the need for **active engagement of Council**
- ▶ Council's **February Agenda** to share Phase 1 outputs & seek Council direction

Thank-You!

Questions?



LET'S BRING

BROADBAND SERVICE TO THE PAKENHAM AREA!

(High-speed, High-capacity telephone, TV, and Internet over optical fibre)

Please complete our online community survey at <https://www.surveymonkey.ca/r/SN9YNB8>.

MM2020 is a community volunteer group, supported by the Municipality of Mississippi Mills, working to provide broadband access to all Mississippi Mills residents by the year 2020. See their Facebook page at <https://www.facebook.com/MMhighspeed/>

MM2020 has identified Pakenham as a community in critical need of technology update due to:

- 1) Unreliable internet service falling below the CRTC minimum**
- 2) Spotty Cellular service**
- 3) Home phone service in decline due to aging infrastructure**
- 4) No level of government or service provider having plans for comprehensive broadband service in the Pakenham area.**

Among the impacts of this situation are **lower property values, significant public safety concerns**, and barriers to effective operation of Pakenham's growing business community. Current digital access needs as well as contemporary Voice-over-IP and Video-chat supporting emerging application services such **telehealth** require infrastructure supporting unlimited bandwidth.

MM2020 is building on its recent success in Appleton and Clayton communities as a model to bring high-speed broadband to the Pakenham area. We have formed the **MM2020 Pakenham Working Group** to lead the project. Our purpose is to survey the entire population of Pakenham (hamlet, Cedar Hill, and the surrounding rural catchment area) to inform all residents of the opportunity represented by the MM2020 Broadband plan, and to create a unified Pakenham buying group tasked to replace obsolete and expensive telephone, TV and internet delivery with reliable high-speed broadband service. At this time, MM2020 has two companies interested in working with the Pakenham community.

Community ownership of the rural broadband network is also under favorable consideration. It would allow a basic service offering to be made available, of particular value to residents with school age children, or those with medical needs that can be monitored or improved by basic high-speed broadband access, and who may not be able to afford full service broadband.

Our goal is to have ***solutions in place by the end of 2018.***

Please complete our community survey at <https://www.surveymonkey.ca/r/SN9YNB8>.

Hard copies are available at the Pakenham General Store, Nicholson's Sundries or the Pakenham Branch Library and can be left there. All information will be kept confidential and used for no other project than this. We would appreciate your contact information so that we can share updates.

Please let us know if you can serve as a Road Representative, to talk to your neighbours about the project and get their input on the survey. We'd like a 100% return rate.

To get involved or ask questions, please contact Doris Rankin at rankin@storm.ca or 613-624-5580 or Mark Joynes at mjoynes@gmail.com or 613-624-5734.

FASTER, FURTHER:

A Best Practices Review of the Eastern Ontario Regional Network Project

September 26, 2017

Innovative Public-Private Partnership
Generates Success for Regional
Broadband Initiative



imagine. transform. sustain.
Natural Capital Resources Inc.

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This Best Practices Review follows a template developed by Alwazae, Perjons, and Johannesson, Department of Computer and System Sciences, and evaluated in *Applying a Template for Best Practice Documentation*, in Elsevier B.V., 2015 and presented as an open access article through the Creative Commons and www.sciencedirect.com. Some modifications have been made to Best Practice properties to tailor them to EORN's specific situation.

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1 Executive Summary

1.1 Overview

In April of 2007, municipal officials in the Eastern Ontario, Canada conceived a bold initiative to improve high-speed internet infrastructure and services in a 50,000-square kilometre, mostly rural region that was experiencing significant economic deterioration and job loss. The geographic scale of the project was unprecedented in Canada, as was its complexity, and the business and organizational models that would be developed to drive the project toward its intended results. More than a decade later, the Eastern Ontario Regional Network is in place and in full operation, created from a carefully-designed web of existing and new technology assets, and operating within a partnership framework of public and private organizations and resources. As its advocates intended, the region's residents, businesses and other organizations are adopting broadband at a brisk pace, supporting local business retention and growth, connecting residents to vital public services, and opening up access to the world.

The special purpose organization created to execute this regional broadband initiative, the Eastern Ontario Regional Network Inc. (hereafter referred to EORN Inc.), delivered a \$175 million project on time and on budget while meeting or exceeding expectations as articulated in funding agreements with provincial and federal governments as well as those articulated by the lead municipal investors. The construction or 'build' phase of the broadband network incorporated 5,500 kilometres of fibre, 160 Points of Presence (PoPs), more than 250 new Digital Subscriber Lines (DSL) areas, more than 200 towers for fixed wireless service, and significant service from two satellites. Making this network accessible to potential users meant engaging dozens of internet service providers (ISPs), all of which had some market coverage in the region, negotiating 26 contracts to connect ISPs to the network, and opening up the network to potential subscribers in fifteen (15) zones encompassing rural areas, small towns and cities, and four (4) First Nation communities.

The network's operation is characterized by a requirement for open access to the backbone for all ISPs, comparable pricing for rural/remote subscribers (as compared to their urban counterparts) and built-in contractual commitments for the private sector network operators to keep technology current when ownership of network assets financed by public funds transfers to the operators in 2017.

Beyond the deliverables included in EORN Inc.'s Contribution Agreement with funders, the Eastern Ontario broadband project also earned high marks from stakeholders on a range of measures related to project design and formulation, governance, execution and relationship management, financial management and administration.

This report was commissioned by EORN Inc. to document the project's evolution and execution as well as to capture 'lessons learned' and best practices that were either introduced into the project or can be derived from the Eastern Ontario experience. As a result, this report provides invaluable guidance to other regions – within or outside Canada – that are considering similar initiatives in historically economically-challenged, under-serviced areas. It is also intended to guide EORN Inc.'s self-evaluation and provide a roadmap for success in any future endeavors.

1.2 Eastern Ontario: Nearly A Million People Widely Dispersed

The **Eastern Ontario region** is largely rural with many small towns and villages. Total population of the region (excluding the nation's capital Ottawa) was 1.14 million people in 2011, with citizens distributed over roughly 50,000 square kilometres – a geographic area larger than 109 countries in the world – with an average population density of just 23 people per square kilometre [1]*.

Without Broadband, Region is Hard to Serve, Hard to Grow. As has been well-documented over the last decade [2], rural Eastern Ontario (compared to the other parts of Ontario, has below-average median incomes; unemployment typically runs several percentage points above other regions, with limited post-2008 recession bounce-back. Households are more dependent on government transfers rather than employment earnings. Youth migrate out of the region for work and for higher education (often not returning); as a result, the regional population is aging faster than large urban centres. Health, education and social services organizations – as well as governments – moving to service delivery via the internet – were experiencing increasing difficulty reaching the region's householders (e.g. 100 schools in the region had no access to broadband) [3].

Although broadband is considered a "given" for businesses, those in Eastern Ontario – especially the estimated 30,000 small businesses – were often unable to get online to undertake online market research, maintain an online marketing presence for their products and services, capitalize on online education, training, and social media opportunities, or use broadband for wide range of administrative and business management services. The absence of broadband began to show up in business retention surveys conducted by the region's economic development authorities: local businesses were finding it increasingly difficult to compete in a wired world and were now explicitly considering broadband availability as a factor in plans for staying or growing in their existing host communities.

*References Cited in the Review can be found in Appendix C, page 77

1.3 The Problem to be Addressed: A Classic Case of Market Failure

Although rural Eastern Ontario lies in the middle of three of Canada’s largest cities – Toronto, Ottawa and Montreal, the average population density in Eastern Ontario (23 persons per square kilometre) was well below the threshold that would support a business case for broadband service provided by the private sector alone. At the time the EOWC conceived its regional broadband project, high-speed internet access was available mostly in the region’s densely populated pockets (such as Kingston, Belleville, and Brockville); the only available internet options in less densely populated areas *at that time* were either torturously slow (e.g. dial-up) or extremely expensive (e.g. satellite). Wired and fixed wireless (terrestrial towers) were limited and the service from them was usually less than 5 Mbps.

1.4 Results Compared to Expected Outcomes

The following table summarizes the actual results of the Eastern Ontario regional broadband initiative as compared to the outcomes expected of the project at its inception. In virtually all cases, the EORN project met or exceeded the established targets.

Expected Outcome	Actual Results
Coverage target: 85 per cent of households and businesses @ up to 10Mbps	89 per cent
Transport Network Target: 800 kms of fibre	5,855 kms (due to Bell decision to link 5,000 km into network)
No business park connection target	63 business parks connected
60 PoPs identified based on initial design	More than 160 PoPs
Speed targets: Up to 10 Mbps download; 1 Mbps upload	10/1 Mbps available at target speeds
Access/last mile Target: ISPs in EORN access zones participating in network	Target met
Increased competition by ISPs	Increased number of ISP competitors in some EORN zones
Comparable rural-urban pricing for end users	Target met
Capital raise target: \$160M (beyond EOWC commitment of \$10M)	Exceeded by \$5M
Project executed within budget for network build	Under budget while exceeding deliverables for budgeted work
Positive ROI on municipal investment	Exceeded: 16:1
Long-term economic development	Positive anecdotal reports; research needed in next 3-5 years to validate adoption

1.5 Lessons Learned from the Eastern Ontario Experience

Despite stakeholders' initial inclinations, at its heart, a regional broadband initiative like the Eastern Ontario Regional Network is not a technology-driven venture. Rather, it is a strategy for preventing further economic and social decline – indeed to stimulate economic activity and social vibrancy – in an era characterized by digital transformation. The strategy utilizes financing from public and private sources to aggregate demand for an essential form of physical infrastructure and associated utility-like service that connects organizations and populations to the rest of the world. In this sense, a regional broadband network is an economic and social platform for addressing the needs and aspirations of a region's citizens and organizations, in the absence of a conventional market-based approach. While technology-laden, the network is created not for the sake of technology but for the sake of an economy, businesses and citizens.

According to stakeholders familiar with the Eastern Ontario project, the EORN initiative offers many 'lessons learned', all of which are noteworthy for similar future projects. In particular, stakeholders noted the importance of:

- **Recognizing that a broadband network is a different kind of infrastructure and must be structured and executed accordingly.** Such a network spans different geographic distribution patterns that do not normally align with political boundaries, is often heavily regulated with 'public good' characteristics in mind, while simultaneously being largely private sector in both ownership and operation. The EOWC quickly understood that the ultimate success of its initiative would be dictated in significant measure, by their ability to change funders' notions of appropriate business models and agreements through which to deliver regional broadband infrastructure.
- **Seizing the moment.** In addition to developing an unconventional public-private partnership approach (typically described as a '3P'), the EOWC chose to act at a time when the importance of Information and Communications Technology (ICT) was growing rapidly, and governments were eager to invest to support their commitments to social and economic development, as well as be part of the emerging transformation to a knowledge-based economy.

At the time the Eastern Ontario initiative was being conceived, it was clear that the early stages of a revolutionary societal transformation based on digitization, were under way. This transformation is now highly visible through the Internet of Things (technology embedded in machines and devices), significant data traffic shifts from desktops to mobile devices, and exponential increase in bandwidth requirements. The EOWC chose the right time to act.

- **Identification of enduring champions early and nurturing them throughout the initiative.** Broadband infrastructure is a long-term, capital-intensive proposition; municipalities and other investors need to add it into their capital asset plans, particularly in regions where it is unlikely there will be a (private) business case any time soon. In the case of Eastern Ontario, development and execution of the Eastern Ontario network was a decade-long initiative. Proponents of the regional network placed early and regular emphasis on identifying and nurturing enduring champions – those that were committed to staying the course on what promised to be a challenging, decade-long project. In contrast to other types of infrastructure (e.g. roads, water/wastewater treatment facilities etc.), regional broadband is likely to require a long-term view. Yet, with rapid ongoing advances in information and communications technology, stakeholders understand that they will need to keep an eye on the sufficiency of the regional network, and be prepared to champion and make additional investments to keep pace. Long-term engagement by champions becomes extremely important.

Eastern Ontario's ability to identify, activate and nurture regional champions with a long-term commitment, was key to navigating ever-changing public policy landscapes, turnover and transitions in both funder and regulatory organizations, and energizing those at the forefront of efforts to obtain approvals for, and launch the regional broadband initiative.

- **Capitalizing on the political support, reputation and credibility of the champions.** The Eastern Ontario regional broadband initiative was conceived by the Eastern Ontario Wardens' Caucus, an organization representing more than 100 local governments across the region. At the time, the EORN project was conceived, the EOWC had already earned credibility with upper levels of government on *regional issues* and development of strategies/policy positions to address those issue; as a result, the EOWC's mandate and scope of influence was congruent with those of a *regional* broadband initiative. Therefore, the EOWC was an effective and appropriate spokesperson/advocate for a regional broadband project. Through the EOWC, EORN Inc. became a strong supporter in capturing and holding the support of elected officials and senior public servants throughout the project.

In addition to advocacy support, the EOWC – and its member municipalities – also provided vital assistance for such business functions as cash flow management, procurement, and financial services. EORN Inc. has built on the EOWC's reputation (as well as establishing its own) to advocate with the Canadian Radio-Television and Telecommunications Commission (CRTC) for spectrum allocations for municipal services, as well as for mobile broadband.

- **Deciding to create and staff a separate organization (EORN Inc.) for this initiative was the right choice for Eastern Ontario.** A separate organization allowed those working on the project to focus solely on bringing the high-profile, multi-year, large budget network to life, rather than being expected to execute the project 'off the side of their desks'.
- **Deciding early on the appropriate role(s) and a congruent business model for a regional broadband project.** In Eastern Ontario, the decision was to take a catalytic role rather than a long-term, owner-operator model. This strategic choice set the stage for use of a business model that positioned EORN Inc. as an implementation, financial, legal, risk and accountability management organization, using specialized external resources (partners) on a time-limited, targeted basis rather than being directly responsible for all aspects of the project. In this role, EORN Inc.'s governance relationships included having a Board representative of funders as well as possessing domain expertise, and regular reporting to the EOWC, under whose auspices EORN Inc. had been created.
- **Aligning the staffing model with the governance and business models.** The Eastern Ontario project used what could be described as an 'empowered 3P' staffing model (professional, passionate, purpose-driven). These terms were used repeatedly by stakeholders to describe EORN staff and champions, and were seen as a key factor in EORN's success, matching role and outcomes that the EOWC and other funders anticipated.
- **Building the dedicated organization's (EORN Inc.) operating style** based on a firm commitment to achieving the project's original objectives combined with a constructive problem-solving attitude, creativity, flexibility and nimbleness to respond to in-project challenges, all on a solid administrative foundation that ensures accountability to partners and investors. The operating style was one that aligned with the 'empowered 3P' staffing model.
- **Creating and implementing a project plan with built-in flexibility,** conferred by the regional nature of the project (allowing different approaches in different parts of the region) a phased approach that allowed in-project learning – for EORN Inc. and internet service providers – and recalibration for future work in response to unexpected challenges and opportunities. This approach to project design and implementation was consistent with the governance and business model, and the operating style adopted for EORN Inc.
- The **diversity of landscapes, population situations, and appropriate technologies** to deliver broadband services varied significantly across the Eastern Ontario region. This created a demand for customized solutions in particular areas.

- **Designing the network for maximum accessibility**, both in terms of geographic coverage and end user pricing, even if that means a mix of technology solutions (which was the case in Eastern Ontario).
- **Structuring implementation based on multiple competitive bidding processes** that provided an opportunity for firms of all sizes to participate in the network's construction, operation and utilization.
- **Making significant investments in relationship management (stakeholders and subscribers) and communications**, despite the challenges of working indirectly (e.g. through/with ISPs on behalf of subscribers) and seeking customized solutions. While it would be expected that any infrastructure investment project would include an ongoing program of partner and stakeholder engagement, as well as communication from the project's inception through to completion, the Eastern Ontario project found expectations management to be especially challenging.
- It would have been useful to put **more project emphasis on the elusive nature of 'enough' broadband**. The project unfolded in an era of **exponentially increasing demand for bandwidth** (that has not abated and appears to be accelerating). Despite having set what was at the time, a relatively high speed target (10Mbps down; 1Mbps up), and building in significant capacity to scale up the backbone as demand increased, the available bandwidth is being taken up faster than anticipated. As a result, there has been network congestion between the backbone and the end user, in some parts of the region.

For EORN, the lesson is that the quest for more bandwidth will likely be a long-term challenge; as a result, a broadband project is unlikely to ever be 'finished'. Broadband proponents, particularly for initiatives in rural areas, are well-advised to convey to subscribers the elusive nature of "enough" bandwidth. Whether for personal use (such as Netflix which was just emerging as the Eastern Ontario project got underway), for public services (such as education or healthcare), or business purposes (video conferencing, training, product installation guidance, or a host of other applications), video streaming is placing ever increasing demand on available bandwidth generating network congestion, usage-based overage charges, and/or throttling of download speeds. While understandable (and, in fact, a sign of strong utilization of the network), these issues require finely-tuned attention to expectations management. Without it, as EORN has found, some subscribers can end up feeling as though the network's promise has not been fulfilled.

- **Knowing that success is only attained if the completed network is used** by those for whom it was created. As a result, EORN Inc.'s plan for a second phase to the project, in which the emphasis shifts from the 'build' phase of the network to encouraging adoption, is important to the network's long-term success.

1.6 Best Practices Derived from the Eastern Ontario Experience

A review of the Eastern Ontario project and the operation of EORN Inc. suggests the following best practices:

- 1. Help champions, funders and other stakeholders recognize from the outset that broadband is a different kind of infrastructure** than is normally an investment target for public authorities. A network operates across political boundaries, and has historically been owned and operated by the private sector. These factors introduce new policy and contractual considerations, some of which can be perplexing and challenging. Project leaders need to be prepared to listen and develop creative solutions so that a broadband project can move forward.
- 2. Understand your region thoroughly.** This knowledge is key to network design, structuring budgets and financing, creating effective procurement processes and contract negotiations, and the ability to work with existing service providers and stakeholders to deliver intended outcomes.
- 3. Identify champions who will lead the charge and stay the course.** Regional broadband projects are a long-term venture. Champions must understand that their support and contributions will be needed for years not months.
- 4. Get political support early and often,** in part because of the long-term nature of the project, and because the scale of public investment for a regional project will be larger than for those focused on individual communities. In addition, inter-governmental participation can raise multiple sets of expectations that must be negotiated. Regular communication and re-engagement can build consensus and willingness to compromise in order to see the project move forward.
- 5. Consider the wisdom of technology agnosticism** – because potential partners may want to propose different technology solutions for different applications within the larger regional project, and because technologies that were not mainstream at the project's inception may be so by the time you finalize the network design and begin to build. Early commitment to relatively few, specific technologies (such as specifying them in an RFP) can lead some potential suppliers and partners to decline participation if they believe they will be at a disadvantage without the identified technologies.

- 6. Choose intended project outcomes carefully.** Agreements with funders will almost certainly contain specific outcomes you will be expected to deliver. Make sure you choose outcomes that are relevant for your region, that you can deliver, and that you can afford.
- 7. Hand the implementation assignment to an organization or team that is focused on one mission.** An expectation that a regional broadband network project can be executed by an organization or team with multiple priorities is ill-founded. Such a project is too large, complex and fraught with risk to be undertaken as part of a suite of projects or responsibilities.
- 8. Structure the project to build in flexibility,** in part, because regional projects are often introduced in areas with significant on-the-ground variability and because the multi-year nature of a regional broadband project may generate surprises. Use the scale of a regional project to 'average out' variations and to be able to respond to surprises (that may be opportunities, not problems).
- 9. Consider your business model carefully.** It affects investor/funder, partner and stakeholder perceptions of the project, their willingness to work with you, and invest their own resources in the initiative. It also affects the risk profile of the venture since there are different types of risks – and opportunities – associated with different business models. While most stakeholders associated with the Eastern Ontario project believe EORN Inc. was the right business model and might well work in other jurisdictions, there was a cautionary note that any business model needs to be assessed against a region's particular circumstances and needs. Similarly, a business model that works well for one ICT project may be inappropriate for another one.
- 10. Invest in risk management and top-notch talent.** The scale and complexity of a regional broadband network, and the comfort level of funders, argue for significant attention to risk management. Since a significant share of the risk is either 'baked in' or avoided in the project's initial stages project, securing top-notch talent for such assignments as legal work, procurement and contract negotiations, technology and engineering, governance oversight and project management, communications, and customer relations will pay dividends in avoiding costly or damaging mistakes and in cost-effective project delivery. Remember that these costs are a small proportion of total project costs (in EORN Inc.'s case, 5.7 percent of the total project budget). Scrimping on these expenditures will not free up significant resources to cover implementation costs.

Finally, funders, partners and other stakeholders will have greater confidence in a team that demonstrates exceptional professionalism and expertise, and may be more willing to consider changes in strategy or reallocation of resources to deliver better results.

11. Project design and rollout can accomplish objectives beyond getting a network built and subscribers online. The scale of a regional broadband network can have a significant short-term direct economic impact within the region, as well as sparking longer-term impacts during the network's operating phase. It can also help to achieve other objectives such as stimulating greater competition in the ICT marketplace; enabling both ongoing economic and community development aspirations; and potentially enhancing the brand or reputation of the region and participating stakeholder organizations. Consider all the objectives proponents might have for this project, within the project itself and the broader community.

12. Managing expectations is key to perceptions of success, especially in an era of rapidly advancing technologies and applications. For instance, it is now clear that demand for broadband services will continue to grow dramatically, leaving network operators and ISPs in a state of perpetual catch-up. Make sure you can deliver on the expectations you are setting with stakeholders, end users, citizens and funders.

Given the relative paucity of evaluations and best practice derivations for regional broadband initiatives, the preceding 'lessons learned' and best practice considerations are presented as an early contribution to this field of analysis. By virtually all measures, the EORN initiative has been deemed successful – a conclusion borne out by this review (for which evidence has been presented). For that reason, the conclusions of this report warrant more than passing interest for anyone considering a regional broadband project or having best practice interest in the ICT sector.

2 Introduction

2.1 Challenges Across a Region

At the time the Eastern Ontario Regional Network project was conceived – nearly a decade ago – the ‘digital divide’ terminology had entered the public lexicon, often in reference to the significant variation in high-speed internet availability and pricing between urban and rural areas. These variations were viewed as having developed because of ‘market failure’ (a situation where private technology companies cannot justify network investments in an area because there are either too few potential subscribers or they are too widely dispersed to be cost-effective). With the pervasive movement to a digital world – from public service delivery to video streaming – the signs of the emerging digital world abounded. The rapid proliferation of communications devices – from desktops to mobile devices and embedded sensors in all sorts of physical assets – made it clear that those areas without high-speed internet would be left behind.

The implications of this economic and social transformation were particularly disturbing for the 50,000-square kilometre region of Eastern Ontario, Canada. From 1995 to 2005, more than 12,000 jobs had disappeared in the region’s rural areas. Traditional industries such as forestry and agriculture were reeling. In many areas of rural Eastern Ontario, there was either no internet coverage at all, or the only options were dial-up or satellite. Business retention surveys revealed that to keep businesses (or attract new ones), high-speed internet would be a pivotal consideration. In other words, if the region was to participate in the transition to a knowledge-based economy, preserve its communities, and maintain economic prosperity, action was required. A (then) informal coalition of the region’s municipal governments, known as the Eastern Ontario Wardens’ Caucus (EOWC), identified high-speed internet/broadband as an infrastructure imperative. While the EOWC’s mandate had focused on advocacy related to municipal government, the deteriorating economic conditions in the region prompted them to become more active in supporting economic transition. So began the mission to address the digital divide.

2.2 Timeline for the Project

This detailed project timeline is included to underscore both the complexity and multi-year nature of regional broadband projects such as the Eastern Ontario initiative. It is intended to flag the many tasks that must be undertaken before a project can be launched, and highlight the leadership and administrative capacity that must be in place to execute a project of this type successfully. The following timeline is drawn from materials provided by EORN Inc. [4],[5],[6],[7],[8],[9]

- **June, 2002: Local Governments in rural Eastern Ontario come together.**
On an informal basis, they begin to analyze the circumstances of the region's communities. Having first begun meeting in the late 1990s to collaborate on issues affecting the financial health of the region's rural municipalities, the **Eastern Ontario Wardens Caucus** (EOWC) took an important evolutionary step to formalize its efforts to rise above local/community-specific issues to work together for the betterment of the entire region. The 2002 Financial Directions update notes that "there is a broadly held view that Eastern Ontario Counties are not faring well financially and that the situation is likely to worsen without effective Provincial/County coordination and collaboration within the region."
- **May, 2003: Province of Ontario announces the \$55 million COBRA program.**
Connect Ontario: Broadband Regional Access was intended to complement the federal BRAND program (Broadband for Rural and Northern Development) that was announced in 2002 and ran until 2007. In 2007, the Province of Ontario announced investments in its Rural Connections program totalling \$30 million. All of these programs were targeted at specific/individual communities rather than enhancing regional infrastructure (such as backhaul capacity) that crosses local government boundaries and links local economies to the outside world; some programs such as BRAND emphasized local partnerships with business, institutions and other community groups but specifically excluded telecommunications service suppliers. As a result, projects funded under these programs had difficulty making significant improvements in rural broadband availability. A June 2015 **thematic analysis** of Canadian broadband policy and programs (including many at the provincial level) described them as "increasingly unambitious."

June 2002 – Local governments begin analysis of the circumstances of the region's communities.

May 2003 – Ontario announces \$55 million COBRA program.

June, 2005 – Momentum builds when regional policy report flags broadband issue.

May, 2006 – Federal Eastern Ontario Development Program funds a broadband gap analysis.

- June, 2005: Momentum builds when regional policy report flags broadband issue.** The Eastern Ontario Opportunity Action Plan identified broadband access as “basic infrastructure” and identified connectivity as an early action priority. This was followed up in 2007 with the release of the EOWC’s [Eastern Ontario Prosperity Plan](#), identifying broadband as an “infrastructure imperative,” urging the Provincial to fund it immediately and separately from other infrastructure (transportation, water & sewer). This report advocated a regional – rather than the conventional single-community – approach, and proposed that a regional stakeholder group oversee implementation and accountability for use of public funds.
- May, 2006: Federal Eastern Ontario Development Program funds a Broadband Gap Analysis.** The analysis assessed the geographic distribution of availability of high-speed internet service among the region’s homes and businesses. For the purposes of this study, ‘high-speed’ was then defined as at least 1.5 Mbps for download and 0.50 Mbps for upload. The analysis revealed that more than 200,000 people and businesses had poor or no access to the internet across the region (nearly 27 per cent of its rural population). Note that the target speeds were increased significantly for the regional broadband network project.
- April, 2007: The EOWC seizes the moment.** In mid-decade, local governments in Eastern Ontario witnessed dramatic changes to the region’s economy: more than 12,000 jobs in traditional industries (manufacturing, forestry, agriculture) had been lost and not replaced. In their search for strategies to replace jobs and rejuvenate a rapidly declining regional economy, the EOWC identified broadband service as essential to business retention, attraction and economic growth. Without it, they faced a future of further economic and social decline, deteriorating infrastructure, and inability to support essential local services. Regional broadband was viewed as ‘doable’ by local government and the EOWC embraced the challenge of bringing it to life.
- September, 2008: The plan comes together.** The EOWC began to build pan-regional support and associated preliminary planning on how a regional broadband network could come to life. A year later, EOWC members unanimously committed to a total expenditure of \$10 million to demonstrate the importance of broadband to the region and their willingness to support an initiative with their own (municipal) resources.



- 2008-2009: Request for Expressions of Interest provides order-of magnitude cost estimates.** Based on the gap analysis, ground-truthing (on-the-ground verification) and additional research, the EOWC issued a request for expressions of interest for private sector firms interested in undertaking the network 'build'. The rationale for the REI process was to gain more clarity on what the network could look like, in technical and bandwidth terms, and on the associated costs, to support an eventual funding application. On the advice of federal officials, the EOWC incorporated into the EOWC Inc. in readiness for the potential receipt of public funding.
- March, 2009: Digital Summit focuses on user uptake.** The EOWC and its partners organized a Digital Summit in Kingston, Ontario to bring stakeholders together to begin thinking about how to utilize the improved broadband capacity anticipated for the region. Opportunities and applications in e-learning, e-government, e-business and e-health were explored.
- May, 2009: First Funding Application Made.** Initial Application was made for a new, high-speed, high-capacity broadband network to serve Eastern Ontario filed under the Build Canada Fund Major Initiatives program, by the Eastern Ontario Wardens' Caucus. The Eastern Ontario Wardens Caucus submitted additional information supplementing the original proposal in March 2010.
- May, 2009: EOWC makes first funding application:** The Eastern Ontario Wardens' Caucus made the initial application for a new, high-speed high-capacity broadband network to serve Eastern Ontario, filed under the Build Canada Fund Major Initiatives program. The Eastern Ontario Wardens' Caucus submitted additional information supplementing the original proposal in March 2010.
- July 30, 2009: Two years of discussions produce an agreement.** The federal and provincial (Ontario) governments agreed to co-fund \$110 million in financial support for an Eastern Ontario regional broadband network. The project was estimated to cost \$175 million. It was expected to take three years to fully complete the network portion, but residents would begin to receive access and higher capacities as the network was built out.

July 30, 2009 – Two years of negotiations produce an agreement.

December 1, 2009 – RFPs issued.

December 17, 2009 – Proponents chosen.

March 2010 – Application made to federal program.

May 2010 – EORN becomes incorporated.

**2006 Results: Eastern Ontario Broadband Gaps 207,223
Homes with No Access to Broadband**

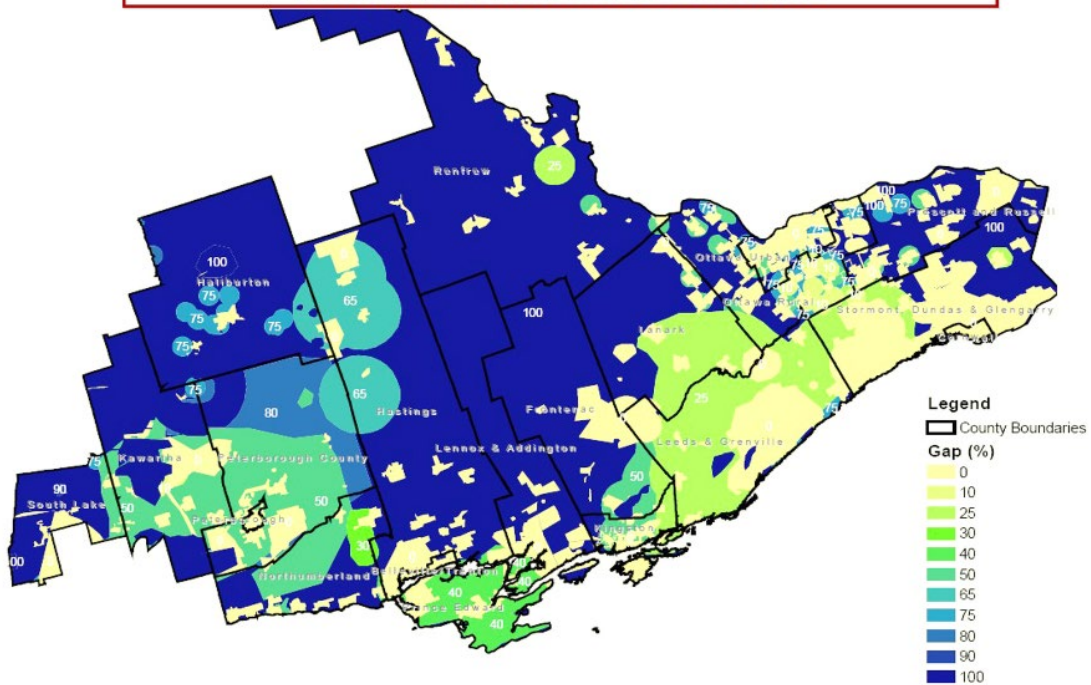


Figure 1 - Summary of Analysis from EODP-funded broadband gap analysis executed by the Eastern Ontario Broadband Coalition.

- December 1, 2009: Two EORN RFPs issued by the EOWC broadband team closed.** One RFP was for the construction of the high-capacity fibre ring backhaul transport component of the proposed project. The second was for the acquisition of dedicated satellite capacity for the region.
- December 17, 2009: Proponents chosen.** EOWC Board of Directors accepted a recommendation from the EORN project team that Bell Alliant be selected as the leading proponent for the backhaul/transport ring. The Board also accepted a recommendation that Barrett Xplornet Inc. be selected as the preferred proponent to provide dedicated satellite capacity.

June 2010 – Contribution agreements negotiated, project management team established.

August 2010 – Contribution begins on 'Backbone' of Eastern Ontario network.

January 2011 – The EOWC begins to award local access contracts.

October 2011 – A new high-throughput 4G satellite was launched.

December 2011 – Backbone construction completed and improved internet access available.

- **March, 2010: Application made to federal program.** The Final Report on the Eastern Ontario Broadband Network (EORN) Proposal was submitted to the Building Canada Fund.
- **May, 2010: EORN becomes incorporated.** The Eastern Ontario Regional Network Inc. was incorporated without share capital, to manage the EOWC project to improve internet access to at least 95 per cent of the homes and businesses (85 per cent of which are targeted to receive speeds of up to 10 Mbps/1 Mbps) in Eastern Ontario, with the support of the Federal, Provincial and Municipal governments and the private sector. For the first year of its operations, EORN Inc. operated on advances from the EOWC, with interest payable at five per cent per annum based on contribution agreements between the EOWC and each of its municipalities.
- **June, 2010: EORN negotiates Contribution Agreements and establishes project management team.** EORN Inc. created a team that blended contracted employees with consulting resources retained for specialized assignments (technical/engineering, legal services and some communication services).
- **August, 2010: Construction begins on 'backbone' for Eastern Ontario Network.**
- **2010-2011: The EOWC begins to award Local Access Contracts.** These contracts allow thousands of homes and businesses in the region to connect to high-speed internet. Altogether, EORN issued 15 access RFPs and awarded 26 contracts (not including those for the Business Parks).
- **October, 2011: A new high-throughput 4G satellite launches.** Xplornet Communications Inc. is a partner on a new satellite, setting the stage for a new suite of internet services for customers across Eastern Ontario. A second satellite was launched in December 2016.
- **December, 2011: Backbone construction is completed and improved internet access becomes available.** The **Embrun zone** of the EORN project was the first of 15 zones to launch and saw an immediate jump in broadband use among businesses and households.

September 2012 – Provincial & Federal governments announced the completion of negotiations.

April 2013 – Shifting attention to technology deployment.

September 2013 – 5,500kms of fibre are installed and all POPs are confirmed in service.

October 2013 – EORN Inc. becomes one of the five organizations short-listed for an award from the world broadband forum.

November 2014 – The last of 15 EORN launch zones goes live.

- **April, 2013: EORN looks at technology deployment on network.** EORN began exploring remote patient monitoring across the Eastern Ontario region, given that the use of such technology might reduce or delay admission to long-term care. Half of the cost of long-term care is borne by local government, and the technology might dovetail effectively with paramedic and community paramedic services, both of which are operated by local governments.
- **September 15, 2013: 5,500-kms of fibre and all 160 backbone Points of Presence (POPs) come into service.** Four months ahead of schedule and \$11 million under budget, the project delivered nearly three times as many POPs as originally anticipated, driving broadband penetration more deeply into the region. Overall project implementation was ahead of schedule and under budget which gave residents broadband access faster than originally anticipated.
- **October, 2013: EORN Inc. becomes one of five organizations short-listed for a global award.** The **Broadband World Forum short-listed EORN** in recognition of efforts to improve broadband penetration.
- **November, 2014: The Thousand Islands zone, the last of 15 EORN launch zones, goes live.** The final local access network improved internet access available in that zone.
- **February, 2015: EORN develops a Digital Strategy.** Recognizing that ‘uptake is everything’, once the network build phase was complete, EORN reoriented its attention to focus on extracting economic value from the network. This second phase had been part of EORN’s plan since the project’s inception and is reflected in the Contribution Agreements that EORN signed with upper levels of government. Ultimately, the key metrics for the success of the regional broadband network are a) employment – retention and job growth, and b) business start-ups and investment. The advocates of a regional broadband initiative also knew that theirs was a region of small and medium-sized employers, with many home-based businesses across the region.

February 2015 – EORN developed and approved a Digital Strategy.

March 2015 – EORN partnered with Magnet.

June 2015 - EORN invites Request for Information submissions about cellular service in Eastern Ontario.

July 2015 - EORN invites RFP submissions to provide high speed connectivity to municipal government operations.

September 2016 - A review of the first four Eastern Ontario release areas is published in the Journal of Rural Studies.

- **March, 2015: Digital Strategy implementation begins.** EORN Phase 1 Broadband 'build' is complete and funding from upper levels of government ends. Although not included in the original funding, EORN Phase 2 – EORN began to implement a regional Digital Strategy. EORN partners with Magnet, an innovative online jobs portal developed to help jobseekers connect to meaningful employment opportunities across the province, including Eastern Ontario.
- **June, 2015:** Although not part of the original broadband project, EORN invites Requests for Information submissions from qualified firms to provide information about cellular services in Eastern Ontario.
- **July, 2015:** EORN invites Request for Proposal submissions from qualified firms to provide high-speed connectivity to municipal government operations.
- **September, 2016:** A review of the first four Eastern Ontario release areas ([Broadband for a Sustainable Digital Future of Rural Communities: A Reflexive Interactive Assessment](#)) is published in the Journal of Rural Studies. The report used a case study report to test a conceptual approach to transitions toward more sustainable rural communities.

Phased Approach to Rolling Out High-Speed Internet across Eastern Ontario:

- December, 2011 – Embrun zone
- February, 2012 – Prescott-Russell zone
- September, 2012 – Alderville First Nation
- April, 2013 – Quinte-Loyalist zone; Northumberland zone
- June, 2013 – South Nation zone
- July, 2013 – Highlands zone
- April, 2014 – Ottawa Valley South zone
- August, 2014 – Ottawa Valley North zone; Kawartha Lakes, Peterborough zones; Stormont, Dundas and Glengarry zone; Haliburton and Hastings North zone
- November, 2014 – Thousand Islands zone

2.3 Overall Project Description

The following descriptive information outlines the scope, scale, governance, operational structure, partnership, and financial characteristics associated with the Eastern Ontario regional broadband initiative and the EORN model that is now in place. These characteristics may be helpful to proponents considering a similar initiative and wanting to capitalize on the Eastern Ontario experience.

- **\$175 Million Project Implemented Fibre Backbone, Wireless and Satellite Blend:** The EORN project involved a Gigabit Ethernet backhaul transport and access network, and last mile access via wired Asymmetric Digital Subscriber Line (ADSL), fixed wireless and next-generation satellite solutions for more than 500,000 homes and businesses across 50,000 kms² of challenging terrain. The backbone's total 5,855 kilometres of fibre is scalable (1 Gb to 100 Gb), to meet future bandwidth demands.
- **Formalized Governance Enabled Local Stakeholders to Lead:** To negotiate with other levels of government, receive funding for a regional broadband project, and provide accountability to funders, the EOWC coalition formalized into a corporation without share capital, then created a separate corporation, also without share capital, called Eastern Ontario Regional Network Inc., to develop and manage the broadband project.
- **Decade-Long Project Timeline:** Conceptual development, governance changes and expressions of interest were completed in 2009, followed by securing of funding/financing in 2010 and multiple RFPs in 2011. The backbone build, initial access builds, and satellite launches took place in 2012, with the first three zones going live before year-end. The remaining zones went live in 2013-14.
- **Largest Project of Its Kind in Canada:** The size of EORN's budget and geographic coverage make it the largest broadband project of its kind in Canada and perhaps North America. In addition to local governments in the region's rural areas, EORN Inc. addressed the needs of six participating independent cities and towns as well as four First Nations communities.
- **Champion with a Solid Regional Reputation:** The EOWC Inc. is a corporation without share capital whose mandate is to present a unified voice on behalf of eastern Ontario municipalities engaging both the federal and provincial governments in developing new programs and policies that support the goal of realizing the region's full potential for sustainable economies and communities.

Membership includes the counties of Northumberland, Peterborough, Haliburton, Hastings, Lennox & Addington, Lanark, Frontenac, Renfrew, as well as the United Counties of Stormont, Dundas and Glengarry, the United Counties of Leeds & Grenville, the United Counties of Prescott & Russell and the single-tier municipalities of the City of Kawartha Lakes and the County of Prince Edward. The municipalities include nearly one million people.

- **Self-Managed Project Implementation** (not outsourced): EORN established its own project implementation team rather than out-sourcing this function. This approach kept project management costs to just under six (5.7) per cent of total operating expenses, preserving funds to extend the network's reach (connectivity to rural business parks) and stimulate end user uptake.
- **Competition Spurred by Multiple Request for Proposal (RFP) Processes:** The approach was used for construction of the fibre, terrestrial wireless and satellite services, and for ISP services in the region. This also allowed smaller organizations to compete in the local marketplace. Rather than follow municipal boundaries, the network's design clustered service delivery into 15 zones with 26 last mile access contracts to encourage 'last mile' competition within zones.
- **Bridging the Urban-Rural Pricing Gap:** By design, EORN Inc. was able to lower wholesale costs to ISPs, permitting them to offer comparable broadband prices (for same level of service) to end users.
- **Open Access Requirement:** The private network operator is contractually prohibited from denying access to or charging higher wholesale toll charges to ISPs for network use. This requirement extends to 2024.
- **Network Ownership Now, Ultimate Transfer to Private Sector:** EORN Inc. currently owns 51 per cent of network assets; it will transfer these assets to the private sector in 2017, with an agreement that the private sector will refresh the network with modern technology at its own expense. Ownership was a condition of funding (given that it was an infrastructure project). Transfer to the private sector was an acknowledgement that the life of ICT infrastructure is considerably less than other assets such as bridges or buildings; as a result, transfer allowed EORN Inc. to limit its long-term liability for the network.
- **Enormous Leverage for Local Funding:** By securing significant funding/ contributions of assets from upper levels of government and the private sector, EORN Inc. achieved an average of 16:1 leverage from the EOWC's \$10 million investment, exceeded its \$50 million private sector cash target, and attracted an additional \$50 million in private sector assets into the project, raising total project value to \$260 million.

2.4 Five Main Components of the Project

The EORN project had five major components, four of which have now been implemented (the fifth was in process at the time this review was completed):

- Installation of a **backbone** throughout the rural region (a backbone is a principal data route between large, strategically interconnected networks and core routers on the internet). Backbones require high-speed bandwidth connections and higher-performance servers/routers to handle the data traffic associated with modern internet utilization. A sufficiently robust backbone, with the opportunity to increase the amount of data that can be handled effectively determines the maximum number of users and/or speeds with which they can use the network.
- Establishing or linking to at least 160 **Points of Presence** (POPs) across the region. A point of presence (POP) is an artificial interface (demarcation point) between communicating entities. Typically, POPs house servers, routers, network switches, multiplexers, and other network interface equipment.
- Securing agreements with internet service providers (ISPs) that would address local **distribution within communities**, often referred to as the 'last mile' between the POP and the end user's premises. Across Eastern Ontario, there were more than 40 ISPs in operation at the time of the EORN project, including both public (municipal utilities) and private firms.
- **Satellite capacity**, the low population density across the region combined with variable terrain meant that it was highly unlikely that all residents and businesses interested in accessing high-speed internet could do so. As a result, the EORN team understood from the beginning that for some, satellite internet might be the only option.
- Implementation of **adoption strategies**, to encourage businesses (particularly small businesses) and households to begin to use broadband or use it to engage more intensively in their communities, with their prospects and customers, to learn, and to improve their economic prospects. This phase must necessarily follow the implementation and availability of high-speed internet service; as a result, this component of the project is now under way but cannot be evaluated until sufficient time passes for adoption strategies to be implemented and for end users to make adoption decisions.

3 Methodology

3.1 A Note on Best Practices Documentation

A Best Practice can be defined as “a technique or methodology that, through experience and research, has proven to reliably lead to a desired result. A commitment to using the best practices in any field is a commitment to using all the knowledge and technology at one’s disposal to ensure success.” [11] The derivation – or application – of best practices can only take place in organizations with a commitment to knowledge management (“the process of creating, sharing, using and managing the knowledge and information of an organization”) [12]. The preparation of this report indicates the commitment of EORN Inc. and the EOWC to knowledge management not just within their own organizations but also with other organizations for whom it might be useful.

The approach to Best Practice analysis used in this review is based on adaptation of a template developed by Alwazae, Perjons and Johannesson [13] and shared in a presentation to the Third Information Systems International Conference, 2015. This template identifies the information considered useful in best practice work, grouped in the following categories (adapted slightly for use in reviewing a regional broadband initiative). The Summary of Results, Lessons Learned, and Best Practices sections of the review are presented through this lens. Additional detail on the original template is presented in Appendix B.

Best Practice Template Categories

- **Summary** (title, summary/short description of contents)
- **Best Practice Description** (statement of problem, solution and context)
- **Requirements for Application of Best Practice(s)** (intended effect of best practice application; what/who is needed to apply it; skills and competence required by end user; costs of best practice application; potential obstacles and/or problems; procedures to address obstacles/problems)
- **Best Practice Actors** (community of practice, need/role of best practice champion, owner of best practice, training needs for best practice implementation; degree of acceptance by domain experts)

- **Best Practice Characteristics** (usability, comprehensiveness in addressing problem/solution; significance of problem addressed; evidence that best practice solves the problem; concrete proposals to solve problem; relatedness of best practices; consistency with knowledge/vocabulary in sector/domain; appropriate level of detail; adaptability to other situations; identification of tasks to apply best practice; integration with other best practices or knowledge management)
- **Best Practice Implementation** (demonstration of success, time required to introduce and implement, and to apply best practice in an organization, experiences and feedback from users; indicators for measuring quality and performance).

3.2 Conceptual Approach: Broadband as a Form of Infrastructure

As with other types of large infrastructure investments, there is “considerable uncertainty in policymaking and research communities over the appropriate frameworks and models for assessing the outcomes and impacts of large-scale broadband/Internet infrastructure investment programs” [14], let alone deriving best practices from these programs and projects. This evaluation challenge (e.g. was the investment and the project through which the investment flowed successful?) also makes it difficult to discern best practices from large-scale broadband projects. After all, characterization of structures, approaches, decisions and actions as ‘best practices’ requires that they be deemed to have generated success (the best solution to a problem).

Evaluating a regional broadband initiative is especially challenging because:

- **Such investments – and their impacts – have extended time frames** (the EORN initiative was nearly a decade in the making). Beyond the immediate economic impact of the network’s creation, many other effects are indirect, diffuse and take time to emerge (e.g. impact on household or individual behaviours, on social economic characteristics of the community, on the growth and development of businesses, or on the competitive marketplace for internet services).
- **The distributed nature of these assets** means that stakeholder expectations and perceived benefits can be quite different depending on geographic location or a stakeholder’s role in the network. Large-scale broadband/internet infrastructure networks are distributed over multiple jurisdictions, with implementation, ongoing operations, ownership and governance vested with multiple organizations.
- **In an ‘open’ market, it is challenging to isolate the impact on stakeholders and end users of investments** of this complexity and duration. Other changes or initiatives taking place in the same timeframe as a broadband initiative may have had significant impact on stakeholders and end users and thereby influenced the degree of success – positively or negatively – of a particular investment or project.

As noted by Hambly et al. (ibid), evaluation of the EORN project requires a multi-level approach, combining more “linear” program-focused approaches (the degree to which an investment achieved anticipated results based on certain inputs) and in-project adaptations as an initiative moves forward, based on real-time learning. The first approach is akin to input-output analysis while the second draws on learning and innovation strategies. The relative paucity of impact studies on large-scale infrastructure network investments suggested that both approaches would be necessary in EORN’s case, for both evaluation and best practice identification.

One analysis of factors influencing the success of “broadband supply gaps” was a 2010 survey of eight (8) projects in rural and urban communities in Germany [15] that identified best practice examples from economic, administrative and technological perspectives. This report, undertaken by the federal Ministry of Economics and Technology in Germany, also provides detailed checklists for community broadband projects and emphasizes many of the broadband challenges facing rural municipalities that EORN was designed to address. The checklists reflect many of the approaches and strategies that the EORN project utilized – from mapping the gaps in service and using requests for information to gather information on the cost of solutions, to developing regional objectives, and formulating short and long-term strategies. Another report, consolidating case studies from across the European Union, echoed many of the same factors that were understood to be important in the Eastern Ontario initiative [16].

As a result of these considerations, this Best Practice Review focused on internal/project-specific criteria of success, examined by addressing three questions:

1. To what extent did the EORN project fulfil its input-output expectations as articulated in the funders’ Contribution Agreement with EORN? (Did the investment achieve the outcomes sought?)
2. What factors do stakeholders who were part of the EORN project believe were the greatest contributors to the project’s success or lack thereof? (What were their experiences and feedback?)
3. Is there evidence of in-project learning that triggered changes that then influenced outcomes? (How important was in-project learning in the project’s success and to what extent is this phenomenon a best practice from an implementation perspective?)

The answers to these questions were then used to identify best practices for consideration by other groups pursuing similar projects (large-scale broadband network investments).

3.3 Methodology: A Mixed Methods Approach

The preceding questions were investigated using five different methodologies:

- **Secondary Data Review:** Literature and documentation reviewed (with emphasis on contribution agreements).
- **Project Leadership Interviews:** Consultation interviews and discussions with project and governance leadership (EORN Board of Directors and senior staff).
- **Stakeholder Interviews:** Consultation interviews with a cross-section of stakeholders representing funders, private sector partners, recipient communities and public sector policymakers) – see Appendix D.
- **Gap Analysis:** ‘Distance’ between expected and actual results; falling short, achieving or overachieving on anticipated results.
- **Qualitative Assessment:** Stakeholders’ evaluation of the success of the EORN project and factors influencing that success (or lack thereof). Recurring themes were identified and assessed in relation to lessons learned and best practices. When multiple, disparate stakeholders identified the same factors as being responsible for project outcomes, these were given greater credence in explaining project results and deriving best practices. Some of these factors were related to overall project design including but not limited to governance, business model, project management, and operating style. Others were related to the capacity for in-project learning and adjustment.

3.4 Review of Documentation to Understand Expectations, Progress Milestones

EORN Inc. provided significant amounts of background documentation, leading back to and including its first application for funding to Build Canada, as well as the formal Contribution Agreement for upper level of government funding support, financial reports, Board reports, presentations, and results of their own internal discussions regarding ‘lessons learned’. See Appendix C for a summary of the documentation reviewed.

3.5 Consultation with Project Leadership to Understand Expected Outcomes, Learning

At the outset of the preparation of this report, the consultant met with the EORN Board on two separate occasions for extended discussions, to probe their perceptions of the relative success of the project against committed outcomes, and the factors that contributed to or reduced the project's success. There was broad and detailed participation in these discussions and keen interest in seeing the final report, including the sentiments and assessments of other stakeholders. Staff and contractors participated in these discussions and were provided with other opportunities for input and feedback, including through submission of individual reflections on the project.

3.6 Key Informant Interviews Provide Stakeholder Feedback

In conjunction with EORN co-chairs and senior staff, the consultant developed a list of 111 stakeholders who could contribute to a post-project evaluation. From this list, 26 stakeholders were interviewed by telephone and face-to-face, using a standardized discussion guide included in an appendix to this report. This group represented municipal, provincial and federal governments, private and public sector partners in the ICT sector (large and small), elected officials, and members of the research community. The specific comments made by each interviewee were held in confidence and aggregated for inclusion in the report. Some individual comments, that illustrated a particular theme, were used on an unattributed basis but may be considered representative of comments made by other stakeholders. Another 15 individuals participated in other discussions (e.g. EORN Board and staff meetings). Outreach to other stakeholder groups such as First Nations communities was also pursued.

3.7 Review of Consolidated Information, Analysis, Report with EORN Representatives

Following distillation of all the aforementioned information into a report, the consultant provided EORN with a highlights presentation and a full draft report for comment and feedback. The emphasis in this review was on correcting any errors and noting any omissions. A highlights presentation was made to the EORN Board before preparation of the final report.

4 Summary of Results

4.1 Results Compared to Expected Outcomes (Contribution Agreement)

4.1.1 Household and Business Coverage Target Surpassed

The Eastern Ontario Regional Network project had as its target, to achieve 85 per cent coverage of all households and businesses in the defined region, with an up to 10Mbps/1Mbps service, with another 10 per cent able to access a 1.5Mbps service (total: 95 per cent with at least a 1.5Mbps service). The target referred to ensuring access to up to 10 Megabits per second download speed and 1 Megabit per second upload speed. **EORN met and exceeded this target, bringing high-speed internet to a geographic area that encompassed 89 per cent of the region.**

How Did EORN Assess Success in Meeting the Target? The EORN project used detailed and verified (by on-the-ground tests) mapping of the region to establish the distribution of households (and potential users) across the region, as well as current internet service levels and the proportion of the region that would have access to the 1.5 and 10Mbps service levels. The project used the hexagon mapping structure used by the Province of Ontario and Industry Canada. Municipalities were also able to correlate hexagon data with their GIS systems. Through extensive discussion with ISPs (to understand the areas they could not reach with existing equipment), the entire region was mapped in roughly 25 square kilometer hexagons, then further sub-divided into sub-hexes. This approach provided a more granular picture of areas where a) there was no service at all, b) service was defined as affordable, sustained 1.5Mbps, c) service ranged from 1.5Mbps to 7Mbps (with affordability considerations), and d) affordable 10 Mbps service was available.

How Did EORN Go Beyond Meeting the Target? Because EORN was able to achieve its household and business coverage targets within prescribed budgets and timelines, the project team was able to go back to the market late in the 'build' phase to add to the region's coverage. Additional access capacity was added into eight zones for both fixed wireless and wireline providers. This opportunity to go back after the initial builds were completed allowed EORN to fill in coverage and capacity gaps that were subsequently identified.

In addition, EORN was able to contract with four organizations to bring fibre connections to 63 business parks across the region. The business park builds had not been part of EORN's initial aspirations for improved business connectivity (they were not part of the Contribution Agreement with provincial and federal governments) because it was not clear there would be sufficient resources to execute this piece of

work. When it became clear that some portions of the project were under budget, EORN was able to return to the business park work and move forward with it.

Further, although not part of the original project, EORN is also pursuing a second strategy to extend coverage/reach of the network, which is to improve high-speed internet to municipal offices in support of e-government services. Some of the 113 municipal governments in the region did not have access to high-speed internet until the regional network was implemented.

4.1.2 Build Phase Completed, Beyond Original Expectations

Transport Network Fibre (Backhaul) in Place: The original target for the regional network was to install at least 800 kilometres of fibre across the region, connecting to other (private) network fibre at key points. However, with Bell Alliant’s decision to contribute more than 5,000 kilometres of their fibre to the project (fibre in their current network), **EORN was able to put in place another 855 kilometres of new cabling in the region, and achieve a more deeply embedded high capacity regional network than originally envisaged.** Note that even without Bell’s contribution, EORN would have met the expected outcome on this measure.

The Gigabit Ethernet technology deployed in the EORN project not only delivers the desired bandwidth services but also serves as a platform that can be used to cost-effectively deliver new internet-based applications such as video, Web 2.0 (higher user interactivity and collaboration), and electronic commerce (online financial transactions).



Figure 2 - Backhaul Fibre Network in Eastern Ontario (Conceptual illustration)

Business Park Connections across the Region Represent an Unanticipated Deliverable:

Because the implementation of the transport network fibre benefited from Bell Alliant's contributed assets (5,500 kilometres of fibre), the EORN project was able to redirect some of its budget to extend fibre to organizations or sites where there were prospects for new or expanded business activity. Business parks were a class of physical asset that the EORN team had considered connecting as part of the project but the team did not expect to have sufficient financial resources to execute this component. The EORN team issued a separate RFP for this work and received multiple submissions; in the end, four public and private organizations were selected to implement this portion of the plan. Their work resulted in 63 business parks across the region being connected to high-speed internet.

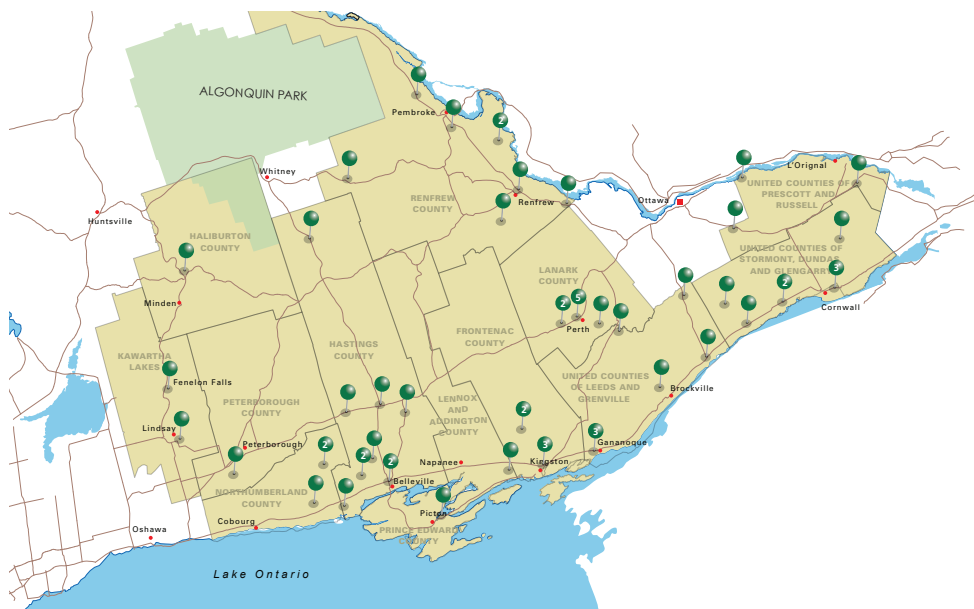


Figure 3 - Map showing locations of Business Parks connected through the EORN Project (numbers indicate if there is more than one business area connected)

In stakeholder interviews, the inclusion of business parks was not commented on extensively but the majority of those referring to it were positive about its inclusion. There was some comment however, that in this situation, a filter should have been more rigorously applied to ensure that EORN's resources went to business parks with the best near-term potential for generating a return on that public investment.

Access-Last Mile Target Reached: The central objective of the EORN project was to increase access to high-speed internet/ broadband across the region, focusing particularly on households and businesses. Putting a network in place across the region would not make any difference to regional participation in the digital economy unless an internet service provider made the connection between the network and the end user, and offered that connection (typically referred to as the last mile) to end users at a reasonable price. Through additional RFPs, achieved through multiple rounds of sub-regional RFPs, EORN was able to keep pushing out last mile access in the most cost-effective manner.

4.1.3 Technology Goals Met

Backhaul Target Exceeded: The initial design expected to have 60 PoPs throughout the region, and Bell/Bell Aliant's completed design resulted in over 160 PoPs. The technology objective of the EORN project was a regional network that could scale to at least 10 Gigabits (this is a measure of the 'size of the pipe' not the capacity of any individual user). This target was set with careful use of public funds in mind (e.g. not overbuilding capacity that wouldn't be used for years. EORN's initial estimate was that within 15 years (by 2024), required network capacity would be 7.5 Gigabits. EORN's appreciation of the rapid growth in demand for broadband services has been borne out: by 2016 (just two years after the network was activated region-wide), backhaul capacity utilization was well above projected levels. Nonetheless, EORN met and exceeded its backhaul target since the design capability allows for scaling to over 100G capable.

In issuing RFPs for the network 'build' phase, EORN fulfilled the requirement of its Contribution Agreement to be technology neutral, encouraging proponents to recommend technologies that would best achieve the prescribed project objectives in the geographic areas or zones identified. In addition to encouraging submissions from multiple proponents with different technologies (particularly in a region with many small ISPs), this approach also reduced prospects for obsolete or inadequate technology within a few years. (Note that with the rapid development of information and communications technologies, there cannot be a guarantee that any technology choice will be 'leading edge' for long. However, known technologies with scalability can provide some predictability of extended usability for at least a few years into the future.)

"Electronics do not have long life cycles (i.e. less than 10 years). However, a short life cycle does not mean that the equipment is not capable of supporting the required services. In fact, equipment can outlive its life cycle significantly if the service being delivered adequately meets the demand."

EORN submission to Building Canada Fund, March 2010

The proposal of the backhaul proponent (Bell Alliant), was based on known technology (multi-strand fibre and Alcatel 7750 access trunk switching equipment) as well as Multi-Protocol Label Switching (MPLS) based service to carry and direct traffic from one network node to the next. These technologies provided the opportunity to start with 10 Gigabits and scale to 100 Gigabits in future. This spare capacity is good insurance for the apparently insatiable demand for bandwidth. For instance, the CRTC's [Communications Monitoring Report for 2016](#) found that broadband internet usage jumped 40 per cent from 2014 to 2015, while mobile data usage saw an even larger 44-per-cent spike. There is little reason to think this upward trend will end. Eastern Ontario's experience parallels the national experience of exponential increases in capacity demand. Network designs that predated the deployment of services such as Netflix, ended up – in some areas – being rapidly oversubscribed, and continue to be so despite ongoing Network upgrades driven by EORN's service level agreements.

4.1.4 Speed Targets Achieved with Scaling Opportunities Built in

Establishing and meeting speed targets (typically measured in Megabits per second down and up – download and upload) required judgment of:

- a) what constitutes high-speed internet in a contemporary era?
- b) what might funders be willing to support?
- c) what are the anticipated near-term and long-term needs for users across the region?
- d) what are the realistic technology options to deliver high-speed internet?
- e) what might the costs be to implement networks based on speed aspirations and available technology?

In taking forward its proposal to funders, the EOWC provided multiple project options, each with different service targets and different total costs (e.g. \$175 million, \$200 million and \$250 million). The one most palatable to funders was the target of 10Mbps with an associated \$175 million cost.

At the time, the standard definition of “high-speed” internet was 1.5 Mbps not just within the Canadian provincial and federal governments but in Europe as well. Recognizing that the minimum speed expected by consumers would rise steadily in the years ahead, the EOWC proposal also incorporated a significant commitment to preparing “now” for anticipated surges in broadband use – at any speed.

The Eastern Ontario initiative strove to achieve “up to 10 Mbps” speeds, recognizing that a) this target was pushing the limits of what available technology (such as fixed wireless radios) could provide at that time, and b) subscribers might not require – at least initially – the full 10 Mbps and might choose a slightly slower speed at less cost. Internet service providers were able to offer varied packages to meet subscribers’ needs. Several years into full operation of the network, they are beginning to offer faster access – up to 25 Mbps and higher in some areas.

In December 2016, the CRTC also raised the bar by declaring broadband internet a “**basic telecommunications service**” and set new targets for internet service providers to offer customers in all parts of the country download speeds of at least 50 Mbps and upload speeds of at least 10 Mbps, as well as offering the option of unlimited data.

4.1.5 Points of Presence Target Surpassed

The original plan for the high-speed internet network to be introduced through the EORN project envisaged 60 ‘points of presence’ (POPs) or nodes across the region. A POP is an interface point where multiple communications entities interconnect and exchange information or transfer traffic between users. In its submission, Bell Alliant proposed to (and did) bring 160 POPs (266 per cent of the POPs requested), allowing the project to push fibre much deeper into the region. A denser distribution of POPs also made ISP service expansion more cost-effective.

4.2 Financial Targets Met and Exceeded

4.2.1 Capital Raise Targets Surpassed

The initial approved budget for the EORN initiative was \$160 million, with the provincial and federal governments each contributing \$55 million, building on the initial \$10 million pledged by the 13 members of the Eastern Ontario Wardens' Caucus. The private sector was expected to contribute another \$55 million, matching the upper levels of government. The total approved budget for the project would therefore have been \$175 million. However, EORN exceeded the capital raise target significantly, attracting \$58 million in private capital and another \$93 million in in-kind assets now accessible through the project. As a result, EORN achieved the targeted funding from all three levels of government, attracted more private capital than had been anticipated, and was able to incorporate additional in-kind private sector assets into the network.

4.2.2 Project Under Budget for Build Phase

On the expenditure front, the EORN initiative was expected to fully expend the approved budget to achieve the access and pricing targets described earlier. In fact, efficiencies in the early phases of the project (due to Bell Alliant bringing in additional fibre capacity), as well as access providers (predominately Xplornet Inc) delivering under budget, opened up an opportunity to further invest in additional access coverage and capacity in selected areas throughout the region. In addition, the project was able to give consideration to a component of the project that was not part of the original plan and for which financial resources had not been available: connecting 63 business parks across the region to the network. In this way, EORN Inc. could further extend the reach into the business sectors of communities across the region. EORN Inc. was able to address another desired aspect of connectivity: connecting municipal offices. This project is under way and is expected to be completed in 2017. At its conclusion, the budget for entire regional network project was fully expended.

Throughout the project, financial management has been thoroughly scrutinized, with EORN going through an annual audit that is reported to both the EORN and EOWC boards of Directors and four independent audits, emerging with full compliance in all cases. In one on one interviews, the quality of financial management was cited as very well-handled by multiple stakeholders with direct interaction with EORN on financial matters.

4.3 Return on Investment Metrics Promising

For the Eastern Ontario regional broadband network project, return on investment was defined in three ways:

- For all stakeholders, return on investment was assessed based on *each stakeholder's definition of 'value for money'* and their assessment of the project's performance against that definition. This assessment is discussed in greater detail in a following section but as a rule, stakeholders saw the project as being a cost-effective allocation of funds that preserved the opportunity for the region's residents, businesses and other organizations to keep pace in a rapidly changing world.
- For municipal partners, short-term Return-on-Investment was defined as *leverage value of municipal investment* (for every dollar of municipal investment how much funding was leveraged from upper levels of government and the private sector?) The original target, based on a \$175 million total with \$10 million in municipal contribution was 16:1. Using leverage value allowed municipalities to assess the degree to which they were able to execute a project of much larger scale and impact than municipalities could have afforded on their own. Given that total cash contributions to the project exceeded \$175 million, the Eastern Ontario project can be said to have exceeded its leverage value target.
- For all stakeholders, including funders, the long-term return on investment in Eastern Ontario's broadband project is expected to be seen in *improved or increased economic performance, support and/or enhancement of communities (social cohesion), and improved access to service* with corresponding positive impacts on population health, education, income and employment levels and other similar characteristics of healthy communities. Although it is too early to assess the project's success on this measure, there are early anecdotal indications of positive economic impact from individual businesses and municipalities seeing an upturn in growth and development. It is not clear how much of this impact is due to the availability of broadband but observers are noting a correlation in timing (improvements began just after broadband availability improved). At some point in the future, there would be merit in a study on this phenomenon.

4.4 Summary of Actual Results Compared to Expected Outcomes

The following table summarizes the actual results of the Eastern Ontario regional broadband initiative as compared to the outcomes expected of the project at its inception. In virtually all cases, the EORN project met or exceeded the established targets.

Expected Outcome	Actual Results
Coverage target: 85 per cent of households and businesses @ up to 10Mbps	89 per cent
Transport Network Target: 800 kms of fibre	5,855 kms (due to Bell decision to link 5,000 km into network)
No business park connection target	63 business parks connected
60 PoPs identified based on initial design	More than 160 PoPs
Speed Targets: Up to 10 Mbps download; 1 Mbps upload	10/1 Mbps available at target speeds
Access/last mile Target: ISPs in EORN access zones participating in network	Target met
Increased competition by ISPs	Increased number of ISP competitors in some EORN zones
Comparable rural-urban pricing for end users	Target met
Capital Raise Target: \$160M (beyond EOWC commitment of \$10M)	Exceeded by \$5M
Project executed within budget for network build	Under budget while exceeding deliverables for budgeted work
Positive ROI on municipal investment	Exceeded: 16:1
Long-term economic development	Positive anecdotal reports; research needed in next 3-5 years to validate adoption

4.5 Beyond the Build: Success of the EORN Project on Other Measures

Beyond the construction and implementation of the regional broadband network, the Eastern Ontario project included other desired outcomes, associated with the network's market impact. As with the formal expectations articulated in the Contribution Agreement, the Eastern Ontario project achieved much on these broader outcomes.

4.5.1 Expectations of Increased Competition

One of the expectations of the EORN project was that pricing for end users in rural areas would be comparable to pricing in urban areas where household density makes it possible to establish a business case for provision high-speed internet service. The EORN project anticipated that the provision of public funds to address capital costs of putting the network in place would help to strengthen the business case for private sector firms and therefore increase the number of competitors at the local level, particularly Internet Service Providers (ISPs). Rural-urban price comparisons are challenging, especially over a period of years, because the ICT environment is a dynamic one; there are often consolidations/mergers in this sector, and as ISPs introduce new services and associated packages, 'apples and apples' comparisons become difficult.

The EORN initiative did result in many communities (which previously had one ISP option or none at all) having more options from which to choose. There was some consolidation among ISPs early in the project timeframe but there is no reason to think that these developments were the result of the EORN project. Through the access portion of the project, the EORN team provided opportunities for multiple ISPs to bid on access contracts; in areas where there was an existing local telephone company that met the internet service objectives, EORN did not fund an over-build.

4.5.2 Bandwidth Expectations and Congestion

At the time the EORN project was conceived, the international definition of 'high-speed' internet was a minimum of 1.5Mbps (e.g. in the European Union). EORN sought to deliver 10Mbps and took that requirement into negotiations with service providers, including it in technology and tower tests. Given the economic diversity and internet needs in the region, EORN did require its service providers to provide a range of package sizes that would provide more choice flexibility for the region's end users. As a result, providers were able to offer packages providing "up to 10Mbps".

EORN did not incur the expense of developing a firm estimate of the number of new end users that might increase their internet usage if a new regional network was in place. Part of the reason for this was based on the notion that broadband is now an essential infrastructure service so would be needed as a matter of course. Secondly, there was established literature indicating that the addition of broadband in a rural community imparts a positive social and economic impact in rural areas (roughly 0.2 to 0.3 per cent increase in GDP).

4.5.3 Broadband Access Metrics

EORN has exceeded its original target for percentage of homes and businesses with access via terrestrial solutions – from 85 per cent to 89 per cent. In addition, two new satellites launched by XCI in 2011-2012 are providing access to up to 10Mb satellite service for more than 95 per cent of all the region's residents.

The emphasis on lowering wholesale prices for ISPs has erased much of the ISP pricing disadvantage in comparison to the Greater Toronto Area and southwestern Ontario. EORN has also negotiated a long-term commitment to satellite costs that are five per cent lower in Eastern Ontario than anywhere else in Canada. These strategies have significantly improved the business case for ISPs, encouraging them to offer last mile access to rural homes and businesses.

4.5.4 Broadband Uptake

Although there was no specific target set for uptake of the newly-available high-speed internet service, there is an expectation that over time, a significant share of the 200,000 households and businesses without service will become high-speed broadband service subscribers. The first EORN zone to go live (Embrun in 2012) exceeded ISP (and EORN) expectations with congestion beginning to affect service in that zone only a few months after the go-live date. As a result, planning for service upgrades (for example, more radios on towers) that were expected to be several years away were needed for rural areas almost immediately. EORN's short-term uptake impact on communities is measurable now that all zones are live.

4.5.5 Economic Impact of Network Build

The economic impact of the Eastern Ontario regional broadband project may be assessed in three ways:

- **The short-term impact from expenditure of more than \$175 million on the construction/build phase and the follow-on adoption phase.** Although not all of the project's budget would have been spent on goods and services in the region, a conservative infrastructure construction-phase input-output multiplier of 1.25 (taking leakage into account) would suggest that the impact of the \$175 million budget would have been at least \$212 million, with an associated positive impact on local employment. While public funders are interested in this form of economic impact, they are typically more interested in the economic impact of broadband as it enters the operating phase.
- **The operating-phase impact of the introduction of broadband on expenditures by residents, businesses and other organizations** as they capitalize on broadband to expand their businesses, hire more people, see their incomes increase due to higher quality jobs and spend more of their money in the local economy on everything from new homes, consumer goods, entertainment or other purchases. As indicated in an earlier section of this report, it is too early to assess the project's economic impact on this basis [17]. However, macroeconomic modelling carried out through the Monieson Centre at the School of Business at Queen's University suggests that there will be a positive economic impact in the rural areas of the region. This study found that the long-term impact to a rural regional economy of greater broadband access is likely to be an additional 0.2 to 0.3 per cent on the region's Gross Domestic Product along with job retention and creation in the ICT sector and beyond. [18] Broadband projects were not found to have the same impact in urban areas that are already well served by broadband.

"A year ago, I started this company – now we have 11 full-time employees and we're hiring more every three months. We're in Picton and we couldn't do this without Broadband."

*Craig Schoen,
President and Founder,
Dealer Plus Inc. Picton, Ontario*

*"From the Internet to biotech and even shale gas, the US State has been the key driver of innovation-led growth– willing to invest in the most uncertain phase of the innovation cycle and let business hop on for the easier ride down the way. ... **A key part of this lesson should be to learn how to organize, direct and evaluate State investments, so that they can be strategic, flexible and mission-oriented...**"*
(emphasis added)

*Mariana Mazzucato in
The Entrepreneurial State:
Debunking Public vs Private
Sector Myths, 2015*

- **Impact on individual businesses.** While the long-term impact cannot be assessed with any degree of accuracy yet, there is anecdotal evidence of impact on individual businesses. The impact of the Eastern Ontario regional broadband network is being cited by some businesses as an accelerator for growth and development of individual businesses. Several stakeholders were skeptical about the extent to which broadband would stimulate business development in some areas; a study of this phenomenon in the next several years could validate or disprove the ongoing economic impact hypothesis.

Over the longer term, the region might expect to see economic growth due to the availability of broadband in its business parks. This is a service that is assumed to be present in highly-urbanized communities and it almost always is. According to Eric Duncan, Warden of the United Counties of Stormont, Dundas and Glengarry, “Expanding high-capacity, high-speed internet fibre to these business parks will help our communities to attract and retain local businesses. It is a real boon for economic development.”

4.5.6 Reputational Value Impacts

Both directly and by association, stakeholders are finding that participation in the EORN project has been a positive experience – one that they identify with publicly.

- Internet Service Providers (ISPs) have been extremely active in using access to the network in their marketing and promotion, showcasing the pricing they offer as a result of the new backbone.
- EORN is attracting expressions of interest in partnerships from developers of web-based technologies and organizations rolling out online services in such sectors as health care and education.
- Because EORN has met or exceeded its targets, upper levels of government view EORN as a success and see it as a model for other regions. This conclusion has been confirmed in the stakeholder interviews (see the subsequent section).
- The EORN team regularly receives invitations to present at international conferences (e.g. Dallas, Texas, London, England and Amsterdam) and to offer advice to other regional groups on development of their own broadband initiatives. In 2013, the EORN project earned an honourable mention in the international **Broadband Infovision Awards**.

“We are very excited and thankful for the efforts by the County of Renfrew and Eastern Ontario Regional Network to finally bring broadband service to Whitewater Region. This will allow us to move forward with new business development, reliable online booking and communications with our guests and enable us to meet our guest expectations for high bandwidth communications during their stay with us.”

*Margaret Maloney,
Owner RiverRun Rafting and
Wilderness Resort,
Renfrew County*

4.6 Results Against Stakeholders' Expectations

4.6.1 Approach and Summary of Results

As a result of the in-depth evaluation discussions with the EORN Board, the consultant developed a discussion guide (see Appendix E) for use with a target list of stakeholders including federal and provincial funders, private sector partners, municipal representatives and key staff. The initial target list numbered 35 individuals, of which 26 were available for/agreed to interviews (see Appendix D). The following results summarize the feedback and perspectives of those stakeholders.

Overall, stakeholders see the EORN project has having been quite successful and many were able to identify elements of the project that had most contributed to its success. Stakeholders were also able to translate factors contributing to success into potential best practices for regional broadband projects but also had a few cautionary notes on the ease with which the EORN model might work in the future or in other areas of ICT. In general, stakeholders' assessments and advice focused on:

- The need to recognize, think through and plan for the differences between broadband and other forms of infrastructure
- The importance of all aspects of a regional project – from champions and pre-launch activity to careful project management
- The complexity of a regional broadband project, typically involving both private and public sectors, stakeholders and partners of different sizes and capacities, and the expectations of end users in a rapidly evolving digital world.

4.6.2 Ratings for the Overall Success of the EORN Project

When invited to provide a one to ten score to represent the success (or lack thereof) of the EORN project in meeting the original expectations of the project (a summary of key points having been provided in advance), all interviewees gave EORN a rating in the 7 to 10 range. Some interviewees specified a ratings range (8 to 9 was very common) and some applied different ratings to different parts of the initiative. The average rating for the entire interview group was 8.75 (which includes two interviewees who did not feel comfortable in providing a rating).

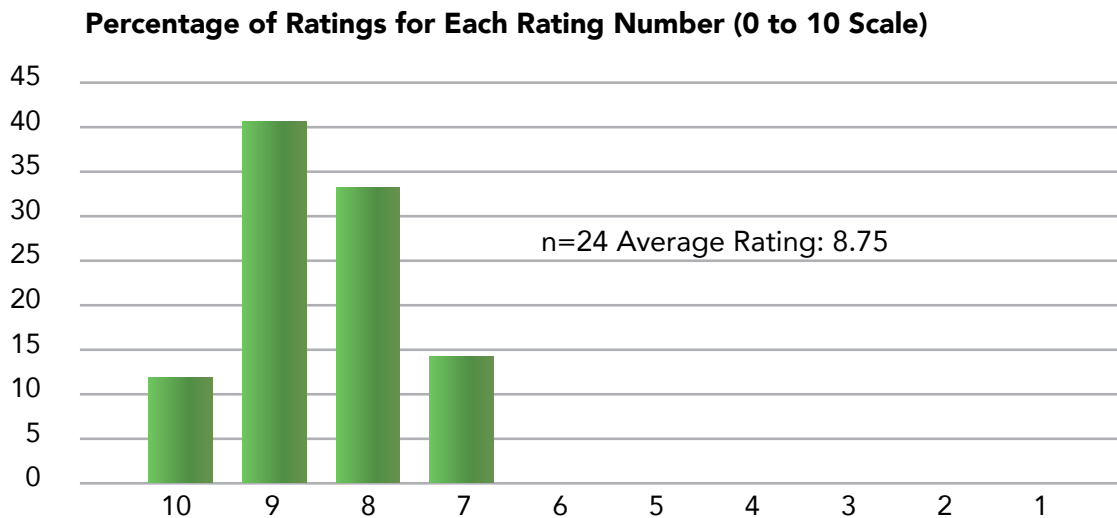


Figure 4 - Distribution of Overall Success Scores for the EORN Project (based on 1 to 10 scale)

4.6.3 Most and Least Successful Aspects of the Project

Most Successful:

Timing: Several interview subjects noted that part of EORN's success can be attributed to 'getting the timing right'. They observed that as the EOWC was bringing forward its plans to create a regional broadband network, high-speed internet was increasingly being seen as an essential service without which residents and places of employment would not be able to participate in economic and civic life. Secondly, stakeholders noted that at that same time, governments and other public organizations were seen as moving to an online world for provision of information and access to public services – with the same concern about the degree to which all citizens could access information/services via the internet.

Right Business Model: Many stakeholders commented that the specific business model used in the EORN project (serve as an aggregator and catalyst with long-term objective of private operation of the network) was the right choice for this project. (Following sections elaborate on this point in more detail).

Great People: Unsolicited, many stakeholders commented on the quality and professionalism of the 'EORN team'; their definition of the team typically included those municipal employees who took the lead on advocacy as well as the paid staff and contractors to EORN Inc. Often, stakeholders noted that the right people had been recruited for their particular assignments, handled their assignments extremely well, and maintained an attitude of openness and collegiality as the project unfolded. The descriptive terms/phrases: 'professional', 'passionate', and 'focused on the project purpose' were used frequently.

In many cases, stakeholders cited just first names when commenting on performance, indicating that they were on a first-name basis with staff and contractors (due to frequent communications), and found them all to be extremely good to work with.

Strong Administrative and Project Management Capacity: Although it would not be obvious to most observers, EORN Inc. leveraged its relationship with the EOWC to establish solid administrative processes for the broadband initiative. The full scope of finance services was provided to EORN Inc. by the County of Hastings, a long established two-tier municipal government in the region and an EOWC member.

Procurement services, considered to be best-in-class for municipal governments, were provided to EORN Inc. by the County of Peterborough (also in the region and an EOWC member). These services were backstopped by strong (contracted) legal services with experience in contract negotiations in the information technology sector.

EORN's administrative strengths were in evidence as the organization went through annual internal audits, as well as four independent audits, with 100 per cent compliance. In addition, EORN Inc. maintained comprehensive documentation for in-project changes and interpretations of Contribution Agreement language that were negotiated with provincial and federal funders. This documentation was extremely important to keep the initiative moving forward and avoid changes in interpretation, given frequent staffing changes in funder organizations.

Least Successful:

Stakeholders interviewed in the course of this review had a difficult time suggesting aspects of the project that would be considered 'least successful'. However, a few stakeholders said they were uncertain if a different business model that retained EORN Inc. as the network operator would have had advantages, potentially in maintaining the network over time and providing oversight to ensure that ISPs continued to offer comparable pricing to subscribers. The respondents did note however the potential cost of maintaining the network as technologies evolve and the fact that EORN Inc. would be providing oversight on private sector commitments until 2024.

There was some suggestion that a regionally-designed network can pose challenges for local operators and owners of existing ICT-related assets as the two levels look for ways to link these assets into a regional system, and avoid putting the regional network and local systems in direct competition with one another. There were several mentions of potential partnerships related to existing infrastructure that could have been incorporated into the regional network (but weren't) and that those partnership opportunities may still exist in the years ahead. EORN was encouraged to keep the door to partnerships open across the region.

There was also comment that the regional effort to influence pricing to subscribers posed administrative and marketing challenges to private firms that operate in jurisdictions beyond Eastern Ontario.

There was also a sense among some stakeholders that the early stages of the 'build' phase were not handled as sure-footedly as later stages (access zones), creating an impression that the backbone construction award was a 'done deal'. However, these stakeholders noted that EORN Inc. responded to the misunderstanding quickly and addressed private partner concerns quickly.

Overall, these stakeholders offering the preceding comments still consider the Eastern Ontario project to have been a major success.

4.7 Stakeholder Comment on Specific Aspects of Project

Stakeholders were invited to comment on whether EORN had 'got it right' on specific aspects of the project (reported on in this section and referenced in Appendix E). Overwhelmingly, the sentiment was that yes, the project had 'gotten it right':

Q: Was it the right or wrong choice to scope the project regionally?

A: Right choice.

There was virtually unanimous support for scoping a broadband project at a larger geographic scale than just one or a handful of communities. In this sense, EORN 'got it right'. The reasons for preferring a regional scale project varied by stakeholder but included:

- Larger projects get more attention from governments and from the private sector, particularly IT companies. Funders are interested in impact, which is perceived to be greater from larger-scale projects. In other words, the project needs to be large enough to 'move the needle' in terms of broadband accessibility or improved service levels.
- The private sector is interested in cost-effective implementation of projects; this is seen to be more likely with larger projects than smaller ones. In addition, both government and the private sector are more likely to see themselves as having a project partner that is able to provide roll-out support with potential users and Internet Service Providers.
- There was a view that, in EORN's case, the scale of the project was appropriate for the technology available for deployment and a good match for the proposed public-private partnership model.
- There was also the recognition that – especially in rural areas and small towns – broadband does not align with municipal boundaries so regional projects provide the opportunity to establish common interest across those boundaries rather than having communities viewing one another as competitors for investment resources.
- Larger projects are seen as offering flexibility within the project to adjust schedules and budgets if there are holdups, surprises or unforeseen opportunities. Budgets that are developed with 'average costs per zone' may be reallocated internally by zone if one comes in under budget but another one needs some additional financial support beyond that contemplated. With a regional project, project managers can still respond to variability in on-the-ground circumstances and maintain their commitment to deliver access and affordable pricing across the participating communities.

Many interview subjects noted that EORN had capitalized on regional project scale to achieve all of these benefits. There was some indication that regional scale may have worked against EORN slightly during the 'build' phase (discussed in another section of this Review) but sensitivity and responsiveness to these issues mitigated detrimental impact.

Q: How important was the ongoing support of an established organization (EOWC)?

A: Vital.

There was virtually unanimous endorsement of the importance of ongoing support from an established organization (in this case the Eastern Ontario Wardens' Caucus) and a cautionary note that a major broadband project could easily flounder without this kind of backing. Interview subjects provided the following rationale for the need for high-profile support:

- **Securing political support from all levels of government.** This was seen by interview subjects as critical to a broadband project getting off the ground and maintaining its momentum. Political support is viewed as an essential prelude to securing funding. Although the EOWC's initial financial commitment of \$10 million represented less than 10 per cent of the proposed project budget, it signalled to other stakeholders that the municipalities in the region considered broadband to be of considerable importance, especially given the other competing demands for municipal infrastructure investment.
- **Organizational stability.** Before either government or the private sector agrees to participate in any project, they look to the robustness of the organization leading the charge. Working with an established organization suggests organizational stability, increasing the prospects that proponents will have the staying power to carry multi-year projects through to fruition. In EORN's case, the timeframe from initial conception to completion of the build and access phases was roughly a decade. Because the EOWC was an established organization, their leadership was viewed as a sign that a coalition of more than 110 municipalities would hold together to see the project through. The significant financial and reputational commitments being made by all parties argues for a strong organizational anchor for the project.
- **Appropriate direct role in project execution.** On EORN's behalf, the established organization (in this case, the EOWC) was viewed by interview subjects as having contributed mightily – and very specifically – to the project's ultimate results, particularly in the project's formative stages. Through the efforts of champions such as the two co-chairs (Messrs. Jim Pine and Gary King) as well as other municipal government employees (e.g. Mmes. Lisa Severson and Sheridan Graham), EOWC members and particular staff members contributed

relationship capital, knowledge of both municipal government operations and the expectations of upper levels of government, an understanding of the importance of engaging First Nations, a willingness to lead with their peers across the region, and engage with media to bring profile to the region's aspirations. In EORN's case, one EOWC member (the County of Peterborough) was viewed as having first-rate procurement policies and practices that EORN could deploy; the County of Hastings had ample experience serving as the financial administrator for EOWC activities and projects, and provided this support to EORN.

Interview subjects were clear in distinguishing between EOWC support for the project and taking responsibility for project management. Multiple stakeholders noted that the EOWC and EORN had resisted the temptation to have the EOWC lead the implementation of the project. In their view, creating a separate organization was arguably one of the best – and most important – decisions the EOWC made in relation to EORN (see below for additional commentary on this point).

Q: Should Proponents Create a Separate Organization to Manage a Project? (EORN Inc.)

A: Yes. Very Wise.

Based on the EORN experience, there was virtual unanimity that creating a separate organization to develop and manage the region's broadband project is a wise strategy. In Eastern Ontario, that organization was EORN Inc., a privately-held corporation of the Eastern Ontario Wardens' Caucus. Created by the EOWC in 2010, EORN Inc. has its own board of directors, with representation from the EOWC, participating members of the Eastern Ontario Mayors' Caucus, and the private sector. The Board also incorporated representation from First Nations. The rationale for creating a separate, dedicated organization for the project was based on:

- **Ability to Focus:** In the view of interview subjects, creating a separate broadband-focused organization ensured that the project would get the deserved undivided attention; with the day-to-day responsibilities of managing municipalities or other organizations, elected officials and their staffs simply could not have given focused attention to a major broadband initiative. EORN Inc. was able to access significant political capital through the EOWC, especially in the formative stages of the project, but none of the individuals undertaking these advocacy assignments were considered to be in a position to take on full responsibility for day-to-day management.

- **Buffer between Project Management and Politics:** As a separate organization, EORN Inc. was viewed as a very important buffer between elected officials and the management/business needs of a major project. The buffer responsibility was balanced against the need to ensure accountability to the 'parent' organization (EOWC). Accountability measures included regular updates from EORN to both the EORN Board (which has direct EOWC representation) and to the EOWC Board (which meets every second month; the EOWC CAOs meet on alternating months between EOWC meetings). In addition, EORN brought all contracts to the EOWC for review, prior to signing.
- **Responsiveness to In-Project Changes:** In addition to appreciating the organization's focus on achieving the prescribed outcomes, stakeholders (particularly private sector partners) also appreciated the organization's ability to respond to changing circumstances as the project unfolded, respecting what each enterprise could bring to the table, and being active players in devising solutions. With EORN, this responsiveness and collaborative spirit appeared to external stakeholders to be a mindset rather than part of a job description. Some stakeholders sensed a connection between the mindset and the EOWC's original motivation to effect positive change in the region rather than just complete a project.
- **'Buttoned-down' Project Administration:** Multiple stakeholders specifically mentioned EORN Inc.'s strong negotiating capabilities, their high-quality procurement processes, and buttoned-down project administration (from knowledgeable technical/engineering team members and project management capabilities to claims submissions and cash flow planning/financial management).
- **Unprompted Praise for 'Top-Notch' Staff:** Although the discussion guide did not ask about staff and contractors associated with the EORN project, the quality of the people working in or with EORN Inc. was cited unprompted by the majority of interview subjects. (There were no negative comments.) They described the EORN organization as extremely professional, 'top-notch' with really good people in each aspect of the assignment: "they had the right people in the right jobs". Stakeholders mentioned that they knew who to talk to for each type of interaction and were able to work with those individuals directly on a case-by-case basis to resolve any issues quickly.

Q: Self-Management of Implementation Rather than Contracting Out?

A: It Worked for EORN.

While few stakeholders interviewed said they would always recommend creating and staffing a specific organization to implement a regional broadband project, rather than contracting out that assignment to a specialized project management firm, most believe that self-management was the right choice for the EORN project. The main reasons for this view were:

- A belief that having a team composed of individuals with a deep commitment to the outcomes of the project (as opposed to fulfilment of a particular contract) would lead to more creativity and willingness to look for new or different ways to get things done.
- The observation that the EORN team had been well-assembled with high-calibre people, who were credible in the eyes of funders and other stakeholders.

Q: Using Market Failure as a Guiding Principle in Design and Negotiations?

A: Quite Well Done.

For a region like Eastern Ontario, the urgency behind investment in broadband infrastructure was based on defining the jurisdiction as subject to 'market failure', a situation in which the conditions necessary for the normal workings of a market (in this case, for high-speed internet services) are absent. In these situations, there is no business case for private investment in these services at a price that consumers might be prepared to pay.

In cases where market failure can be demonstrated, governments may intervene in the market to reduce costs in some way, improving the private sector business case and making the service more cost-effective. While government intervention to address market failure may be justified in the name of social equity among citizens, it is not without its detractors. In EORN's case, most stakeholders acknowledged that market

"Rather than analysing the State's active role through its correction of 'market failures'..., it is necessary to build a theory of the State's role in shaping and creating markets..."

Mariana Mazzucato
*In The Entrepreneurial State:
Debunking Public vs Private
Sector Myths, 2015*

failure was present in Eastern Ontario for high-speed internet services. However, some mentioned alternative descriptions of the situation, including a desire to find alternative language (e.g. 'accelerating availability of service') or the wisdom of acknowledging the skewing effects that public investment can have on the (private) competitive marketplace. Some stakeholders noted that even if a particular region has relatively few private sector firms in a market, intervention in that market will have a ripple effect outside the jurisdiction as firms consider how their packages and pricing in one market now compare to what they offer in another. In addition, small firms that have been serving an area overlooked by larger firms may now face competition from those firms with public financial incentives as a stimulant.

"The conceptual design was brilliant... strong partnership, the project team had outstanding people... all of them! They were absolutely instrumental in the project's success... constantly adapting"

Comment from Funder

For EORN Inc., managing this terrain was challenging. Private sector organizations were already active in some parts of the region but broadband coverage was far from complete. Putting a network in place to serve the region required construction of a backbone that would connect with existing services within or on the edges of the region. The approach that EORN Inc. took to balancing the desire to address market failure without making inappropriate use of public funds was to:

- Break the project into two main phases for contracting purposes. The first was to issue a Request for Proposal to build the backbone into which access providers would connect in a fair and open way. The second was to define seven 'access zones' and issue Requests for Proposal for each of those zones. In that way, ISPs could compete in whichever zone(s) they wished. EORN Inc. did not assume that there would be only one proponent selected in each access zone.
- Avoid intrusions in areas with small legacy telephone companies (offering landline telephone services) that might or might not be expanding into provision of internet services.
- Negotiating an open access provision to the network backbone that would ensure that service providers would be guaranteed the ability to connect to the network at competitive rates.
- Deploying most of the public funds toward the creation of the backbone including a dramatic increase in the number of Points of Presence, thereby reducing the capital costs for service providers, and driving availability of connection points deeper into the region.

"The EORN team was a delight to work with... I feel honoured to have touched this project."

Public Sector Stakeholder

Q: Bringing in People with Technology/Technical Knowledge While Remaining Technology Neutral?

A: Yes. Well Done.

Generally, stakeholders were pleased with, and respectful of, the technical capability within EORN. Some stakeholders reported that despite some initial reservations about whether technical staff/engineering contractors retained by EORN could be unbiased in their review of technologies proposed for the Eastern Ontario network (given their career paths), they confirmed that EORN did bring on very capable people who were able to provide strong and unbiased technical support to the organization. This question prompted unsolicited comments about other members of the EORN team.

Many stakeholders commented on the quality and professionalism of the entire EORN 'team'. For external stakeholders, the definition of the team typically included not just the paid staff, the number of which was relatively small, but also:

- Municipal employees who took the lead on early project development and advocating for resources to execute the project
- Municipal employees who supported EORN Inc. by providing procurement and financial services
- Contractors to EORN Inc. providing technical and engineering, legal, communications and marketing services, and
- Board of Directors, drawn from municipal partners and the technology sector.

From an internal perspective, the EORN 'team' was comprised of administrators and a CEO, engineers, finance and procurement specialists, and project managers, each responsible for particular functions within the organization.

External Stakeholders: Virtually all external stakeholders interviewed noted that 'the right people' had been recruited for their particular assignments, handled their assignments extremely well, and maintained an attitude of openness and collegiality as the project unfolded. Multiple stakeholders – in both private and public sector organizations – mentioned the EORN staff's accessibility (ability to contact quickly and easily), willingness to problem-solve and be flexible in order to achieve project goals, and being fundamentally committed to the project's success.

The closeness of the working relationships established between external stakeholders and members of the EORN team was underscored by the significant number of first name references to team members (e.g. "I have great respect for Jim", "David is very sharp", "Lisa did a terrific job", "Laura knew her stuff", "Claudio was on top of his work").

Q: Choosing to Be a Catalyst Rather than Owning, Managing the Network Long Term?

A: Yes. Good Choice.

There was virtually unanimous agreement among stakeholders interviewed that EORN's choice of role and business model was the right choice for this project. Reasons given included: a) concern that running an ICT enterprise was not municipal government's strength or mandate so they might not be able to execute and manage over the long term; b) closeness to government might skew decision-making away from good business and financial decisions; c) a publicly-owned entity managing a network could lead to conflicts of interest; d) philosophically, some stakeholders see ICT as being a very competitive, rapidly changing arena that is better left to the private sector; and e) taxpayers could be exposed to significant, unexpected liabilities if EORN had long-term responsibility for maintaining the network.

For others, the catalytic role was seen as the best way to get action on an important issue without falling prey to the tyranny of perfection. In these sorts of complex projects (what some might consider an unconventional public-private partnership), there is a risk that nothing will be done out of fear of criticism if it can't be done 'perfectly' (meet everyone's needs, execute without a single misstep). Those prepared to play the role of catalyst do so knowing there will be complexity and criticism... but their *raison d'être* is to stimulate action. The EORN project certainly did that.

Q: Customer Relations on Behalf of End Users in Interactions with ISPs.

A: Unusual Approach but Effective.

A majority of stakeholders expressed the view that EORN's intervention with service providers was atypical for a network build project (given that the contractual relationship is between the subscriber and the ISP). However, EORN's efforts to establish respectful relationships with ISPs so that recurring issues could be flagged and potentially resolved in a collaborative way was noted. A minority of stakeholders thought this role was inappropriate for EORN but a larger number suggested it was necessary and advisable for EORN to "keep its hand in" to provide oversight, ensuring that the ISPs "lived up to their commitments." This can be a challenging role when the issues that subscribers are facing are related to network-level demand outstripping supply, and the lag time inherent in adding new capacity.

Q: Incorporating First Nations into the Initiative from its Earliest Formulation?

A: Yes, For the Most Part.

Relatively few stakeholders were able to comment on this question due to lack of exposure to these considerations in the project. However, those that did tended to see EORN as appreciating the importance of their duty-to-consult obligations even if they did “scramble a bit at the beginning” to launch this part of the project’s design and implementation work. Others commended EORN for going beyond the consultation requirement to engage First Nations in broadband projects in their own communities. EORN also provided for First Nations’ representation directly on the Board of Directors. As one respondent noted “EORN Inc. and Lisa Severson in particular took the duty to consult very seriously and did a great job at it.”

Q: Including Comparable Pricing for Services in Negotiations with Internet Service Providers?

A: Mixed Responses

Some stakeholders were unaware of EORN’s efforts to secure comparable (rural-urban) pricing for high-speed internet services and some considered these efforts to be an awkward intervention into the marketplace. When an ISP serves areas in and outside of Eastern Ontario, multiple price structures can be challenging in terms of marketing and sales, finance, and customer service. Others considered the effort to secure comparable pricing to be an essential element of the project, inextricably linked to accessibility and social equity.

As noted elsewhere, EORN’s negotiations have significantly reduced the region’s pricing disadvantage in comparison to the GTA and southwestern Ontario. EORN has also negotiated a long-term commitment to satellite costs that are five per cent lower in Eastern Ontario than anywhere else in Canada.

Q: Managing Expectations in an Era of Exponentially Increasing Demand for Broadband Service?

A: Ongoing Challenge. EORN has done well so far.

Most respondents provided a qualified answer to this question, noting that the dramatic increases in demand from broadband are an industry-wide challenge, not just one faced by one region or one organization. In the face of this phenomenon, EORN was considered to have done reasonably well. Although the upsurge in demand may not have been not quite as apparent when the EOWC first decided to take on the high-speed internet challenge a decade ago, EORN was credited with building in network scalability (to support future expansion) and set the speed target higher than what was defined as 'high-speed' at the time. Stakeholders suggested that it would not be possible to meet consumer expectations for very long, particularly not in a single project undertaken at one point in time.

Some stakeholders also questioned whether it was realistic to strive for 100 per cent coverage/availability of broadband service (which EORN did not do, but citizens might have expected) given the extremely high marginal cost to provide service in some areas. It was viewed as more important to establish *minimum* download and upload speeds to be achieved – fast enough for the most common uses for which subscribers are likely to use the network. To that end, several stakeholders commended EORN for setting a target download speed of 10Mbps in an era when 1.5Mbps was considered the standard definition of high-speed internet. At the time the EORN project was being developed, online video/live streaming was just gaining steam. Other stakeholders suggested that EORN would have been wise to specify the same download and upload speeds.

Q: Was the Eastern Ontario Regional Network Investment Good Value for Money?

A: Yes, as Defined by Stakeholders

In a separate 'wrap-up' question, interview subjects were invited to provide an assessment of whether the EORN project was good value for the money invested in it. Virtually all stakeholders agreed that the public (and private) expenditures on the Eastern Ontario Regional Network initiative had achieved good value for the investment. However, the definition of 'value for money' tended to vary from stakeholder to stakeholder. Provincial and federal stakeholders tend to assess value for money based on the degree to which the investment helps to meet equity commitments. Municipal stakeholders tend to view 'value for money' from the points

of view of a) leveraging municipal resources, and b) stimulating economic development at the local level. Private firms tend to view 'value for money' based on what can be achieved in terms of technology deployment and ongoing subscriber business in their service areas. Others use measures related to percentage share of total budget devoted to cost of administration and project management or cost-effectiveness of the EORN ('reach' for budget resources) as compared to other similar projects. Regardless of measures, the EORN project was viewed as having delivered good value for money.

"It has been one of my career highlights to have worked on this project."

Stakeholder with direct involvement in EORN Project

Q: Importance of Broadband for Long-Term Health of Rural and Small-Town Economies?

A: Very important.

As noted in Hambly et. al (ibid), "stakeholders should understand that technology is necessary but not sufficient for rural and regional innovation and societal transitions." Hambly suggested that use of digital technologies "best align with strategies for diversified financing or revenue streams, risk management, social media engagement, skills training and marketing."

However, stakeholders commenting on the importance of broadband for the long-term health of rural and small-town economies sounded a more urgent note. In their view, the absence of broadband in a region constitutes a significant long-term disadvantage to the people and businesses in that region, making service accessibility, human development, social inclusion, employment growth, and business growth and development extremely challenging. In effect, stakeholders reported that in their view the absence of broadband infrastructure puts a region at a long-term disadvantage from which it is unlikely to recover.

"The more isolated you are, the more you need (broadband) technology."

Stakeholder commenting on the importance of broadband

Examples of the responses offered by stakeholders were:

- "If you're communicating with the rest of the world you need broadband."
- "For the last five years, rural areas have needed broadband for banking, healthcare, business applications, customer relationship management software, collaboration spaces, tourism, business-government services... How are you going to function if you don't have it?"
- "If you unplug it [broadband], they're dead... It can stop people from having to flee rural areas."

- “We need to focus more on urban areas, not more remote areas.”
- “It’s difficult to imagine how individual communities will be sustainable without broadband.”
- “There is not one employee who doesn’t need it as a work tool; they can’t do without it.”
- “You’re going to be cut off doing business (if you don’t have it)... It’s incredibly important. It’s also important for your personal needs; governments have moved to digital platforms and citizens need to be able to access them.”
- “Broadband is critical... You can’t get people to move to rural areas without it. It also matters to cottagers. It’s valuable for video links for education and for engagement of First Nations communities.”
- “It’s incredibly important... Now Internet is more important than TV. It’s important to farming/agriculture, to SMEs, and to other commercial enterprises.”
- “Some of the most important benefits of broadband are telehealth, business education and tourism... It’s the IT superhighway.”
- “Broadband is important but it is a double-edged sword, raising the question of rationalizing additional health services. Internet does open up massive availability of information.”
- “Broadband is extremely important – affordability and reliability are key. Without broadband, people are ‘out of the loop’; people would otherwise be running to the cities. Urbanization has economies of scale, but it also has higher crime levels, stress, pollution, smog... The nation will lose on other levels.”
- “Broadband is an essential service now. You can’t get people to move to your community without it.”

The centrality of broadband infrastructure suggests that governments risk entrenching weakened social and economic conditions in a region by waiting for the emergence of a business case for private sector response. This situation may never materialize. As a result, many stakeholders felt that public investments in projects like the Eastern Ontario regional network initiative were justified as a way to keep target communities “in the game,” let alone experiencing development. Without this technology, stakeholders foresaw deepening economic and social need, with the attendant draw on public resources to maintain basic standards of living and/or community sustainability. Overall, their sentiments represent a powerful call to action for any rural/small town or city region that has not acted to improve high-speed internet services.

5 Lessons Learned

5.1 Lessons Learned – Project Design and Organization

At its heart, a regional broadband initiative is not a technology-driven venture. Rather, it is a way to utilize financing from public and private sources to ensure that an essential form of infrastructure and utility-like service is in place to support needs and aspirations of a region's citizens and organizations that are not being addressed through a conventional market-based approach. According to stakeholders familiar with the Eastern Ontario project, the EORN initiative offers many 'lessons learned,' all of which are noteworthy for similar future projects. In particular, stakeholders noted the importance of:

- **Recognizing that a broadband network is a different kind of infrastructure and must be structured and executed accordingly.** Such a network spans different geographic distribution patterns that do not normally align with political boundaries. It is often heavily regulated with 'public good' characteristics in mind, while simultaneously being largely private sector in both ownership and operation. The EOWC quickly understood that the ultimate success of its initiative would be dictated in significant measure, by their ability to change funders' notions of appropriate business models and agreements through which to deliver regional broadband infrastructure.
- **Seizing the moment.** In addition to developing an unconventional public-private partnership approach (typically described as a '3P'), the EOWC chose to act at a time when the importance of Information and Communications Technology (ICT) was growing rapidly, and governments were eager to invest to support their commitments to social and economic development, as well as be part of the emerging transformation to a knowledge-based economy.

At the time the Eastern Ontario initiative was conceived, it was clear that the early stages of a revolutionary societal transformation based on digitization, were under way. This transformation is now highly visible through the Internet of Things (technology embedded in machines and devices), significant data traffic shifts from desktops to mobile devices, and exponential increase in bandwidth requirements. The EOWC chose the right time to act.

- **Identification of enduring champions early and nurturing them throughout the initiative.** Broadband infrastructure is a long-term, capital-intensive proposition; municipalities and other investors need to add it into their capital asset plans, particularly in regions where it is unlikely there will be a (private) business case any time soon. In the case of Eastern Ontario, development and execution of the Eastern Ontario network was a decade-long initiative. Proponents of the regional network placed early and regular emphasis on identifying and nurturing enduring champions – those that were committed to staying the course on what promised to be a challenging, decade-long project. In contrast to other types of infrastructure (e.g. roads, water/wastewater treatment facilities etc.), regional broadband is likely to require a long-term view. Yet, with rapid ongoing advances in information and communications technology, stakeholders understand that they will need to keep an eye on the sufficiency of the regional network, and be prepared to champion and make additional investments to keep pace. Long-term engagement by champions becomes extremely important.

Eastern Ontario's ability to identify, activate and nurture regional champions with a long-term commitment, was key to navigating ever-changing public policy landscapes, turnover and transitions in both funder and regulatory organizations, and energizing those at the forefront of efforts to obtain approvals for, and launch the regional broadband initiative.

- **Capitalizing on the political support, reputation and credibility of the champions.** The Eastern Ontario regional broadband initiative was conceived by the Eastern Ontario Wardens' Caucus, an organization representing more than 100 local governments across the region. At the time the EORN project was conceived, the EOWC had already earned credibility with upper levels of government on regional issues and development of strategies/policy positions to address those issues; as a result, the EOWC's mandate and scope of influence was congruent with those of a regional broadband initiative. Therefore, the EOWC was an effective and appropriate spokesperson/advocate for a regional broadband project. Through the EOWC, EORN Inc. became a strong supporter in capturing and holding the support of elected officials and senior public servants throughout the project.

In addition to advocacy support, the EOWC – and its members – also provided vital assistance for such business functions as cash flow management, procurement, and financial services. EORN Inc. has built on the EOWC's reputation (as well as establishing its own) to advocate with the Canadian Radio-Television and Telecommunications Commission (CRTC) for spectrum allocations for municipal services, as well as for mobile broadband.

- **Deciding to create and staff a separate organization (EORN Inc.) for this initiative was the right choice for Eastern Ontario.** A separate organization allowed those working on the project to focus solely on bringing the high-profile, multi-year, large-budget network to life, rather than being expected to execute the project 'off the side of their desks'.
- **Deciding early on the appropriate role(s) and a congruent business model for a regional broadband project.** In Eastern Ontario, the decision was to take a catalytic role rather than a long-term, owner-operator model. This strategic choice set the stage for use of a business model that positioned EORN Inc. as an implementation, financial, legal, risk and accountability management organization, using specialized external resources (partners) on a time-limited, targeted basis rather than being directly responsible for all aspects of the project. In this role, EORN Inc.'s governance relationships included having a Board representative of funders as well as possessing domain expertise, and regular reporting to the EOWC, under whose auspices EORN Inc. had been created. Business model innovation is now recognized as one of the many forms of contemporary innovation [19], [20].
- **Aligning the staffing model with the governance and business models.** The Eastern Ontario project used what could be described as an 'empowered 3P' staffing model (professional, passionate, purpose-driven). These terms were used repeatedly by stakeholders to describe EORN staff and champions, and were seen as a key factor in EORN's success, matching role and outcomes that the EOWC and other funders anticipated.

Definition of Best Practice:

A method or technique that has consistently shown results superior to those achieved with other means, and that is used as a benchmark.

<http://www.businessdictionary.com/definition/best-practice.html>

5.2 Lessons Learned – Project Execution

- **Building the dedicated organization’s (EORN Inc.) operating style** based on a firm commitment to achieving the project’s original objectives combined with a constructive problem-solving attitude, creativity, flexibility and nimbleness to respond to in-project challenges, all on a solid administrative foundation that ensured accountability to partners and investors. The operating style was one that aligned with the ‘empowered 3P’ staffing model.
- **Creating and implementing a project plan with built-in flexibility**, conferred by the regional nature of the project (allowing different approaches in different parts of the region). A phased approach allowed in-project learning – for EORN Inc. and internet service providers – and recalibration for future work in response to unexpected challenges and opportunities. This approach to project design and implementation was consistent with the governance and business model, and the operating style adopted for EORN Inc.
- The **diversity of landscapes, population situations, and appropriate technologies** to deliver broadband services varied significantly across the Eastern Ontario region. This created a demand for customized solutions in particular areas.
- **Designing the network for maximum accessibility**, both in terms of geographic coverage and end user pricing, even if that means a mix of technology solutions (which was the case in Eastern Ontario).
- **Structuring implementation based on multiple competitive bidding processes** that provided an opportunity for firms of all sizes to participate in the network’s construction, operation and utilization.
- **Making significant investments in relationship management (stakeholders and subscribers) and communications**, despite the challenges of working indirectly (e.g. through/with ISPs on behalf of subscribers) and seeking customized solutions. While it would be expected that any infrastructure investment project would include an ongoing program of partner and stakeholder engagement, as well as communication from the project’s inception through to completion, the Eastern Ontario project found expectations management to be especially challenging.

- **More project emphasis on the elusive nature of 'enough' broadband** would have been useful given that the project unfolded in an era of **exponentially increasing demand for bandwidth**. This phenomenon has not abated and appears to be accelerating. Despite having set what was at the time, a relatively high speed target (10Mbps down; 1Mbps up), and building in significant capacity to scale up the backbone as demand increased, the available bandwidth is being taken up faster than anticipated. As a result, there has been network congestion between the backbone and the end user, in some parts of the region.

For EORN, the lesson is that the quest for more bandwidth will likely be a long-term challenge; as a result, a broadband project is unlikely to ever be 'finished.' Broadband proponents, particularly for initiatives in rural areas, are well-advised to convey to subscribers the elusive nature of "enough" bandwidth. Whether for personal use (such as Netflix which was just emerging as the Eastern Ontario project got underway), for public services (such as education or healthcare), or business purposes (videoconferencing, training, product installation guidance, or a host of other applications), video streaming is placing ever increasing demand on available bandwidth generating network congestion, usage-based overage charges, and/or throttling of download speeds. While understandable (and, in fact, a sign of strong utilization of the network), these issues require finely-tuned attention to expectations management. Without it, as EORN has found, some subscribers can end up feeling as though the network's promise has not been fulfilled.

- **Knowing that success is only attained if the completed network is used** by those for whom it was created. As a result, EORN Inc.'s plan for a second phase to the project, in which the emphasis shifts from the 'build' phase of the network to encouraging adoption is important to the network's long-term success.

6 Best Practices

A review of the Eastern Ontario project and the operation of EORN Inc. suggests the following best practices (grouped by categories identified in best practices literature – see Appendix B). Within each best practice description, key words/phrases are highlighted to link the insights to a particular best practice category.

6.1 Best Practice Actor(s)

1. **Help champions, funders and other stakeholders recognize from the outset that broadband is a different kind of infrastructure** than is normally an investment target for **public authorities**. A network operates across political boundaries, and has historically been owned and operated by the private sector. These factors introduce new policy and contractual considerations beyond those found in the types of infrastructure typically funded or managed by **governments** (example: water and waste water treatment facilities, recreational facilities or libraries, roads and bridges). For that reason, they can be perplexing and challenging for those working in traditional governance structures. **Project leaders** need to be prepared to listen and develop creative solutions so that a broadband project will move forward. In these situations, avoidance of project ‘mission drift’ will be dependent on the degree to which stakeholders can maintain a focus on the desired outcomes associated with the project.

The useful life of technology that forms a broadband network is significantly shorter than for traditional infrastructure assets, and in most jurisdictions, is owned and operated by (regulated) **private firms**. A broadband network is also a distributed asset, typically covering a large geographic area rather than being sited on a specific parcel of land in a single jurisdiction. As a result, **proponents, funders, suppliers and end users** must apply policies and rules differently (or develop new ones specific to the sector), negotiate with a multitude of actors, and be prepared to acknowledge the diverse circumstances (from terrain and existing technology assets to socioeconomic characteristics and other factors that may influence project costs and costs of access). Stakeholder interviews made it clear that the EORN project did not fit the provincial or federal infrastructure funding programs, resulting in rethinking of broadband-related policies at upper levels of government.

- 2. Understand your region thoroughly** – this knowledge is key to network design, structuring budgets and financing, creating effective procurement processes and contract negotiations, and the ability to work with **existing service providers**, and stakeholders to deliver intended outcomes.

Do your homework in terms of the scale of the challenges before you and the assets you have to work with in scoping and executing a project. The challenges and assets may be related to **political champions, early financial backers**, technology, the state of broadband and other telecommunications technologies across the region, the number of **technology providers** and **internet service providers**, and the state of competition among them, geography/terrain, **available expertise/people**, and even timing. This knowledge is key to being able to structure a project that can attract and retain stakeholder engagement, to developing project budgets and to securing the financial support that will stand the test of time, and ultimately being able to achieve project goals.

While a gap analysis is almost certainly a cornerstone of your regional analysis, understanding your region goes beyond current availability of broadband service. It is also important to understand the number and types of technologies in use, and internet service providers currently in the region or potentially available to be part of your project. Take note of **existing business relationships** and the changing business landscape in your region. Your business case – and ultimately your project plan – will be heavily influenced by this information.

- 3. Identify **champions** who will lead the charge and stay the course** – regional broadband projects are a long-term venture. Champions must understand that their contributions will be needed for years not months.
- 4. Get political support early and often** – in part because of the long-term nature of the project, and because the scale of public investment for a regional project will be larger than for those focused on **individual communities**. In addition, inter-governmental participation can raise multiple sets of expectations that must be negotiated. Regular communication and re-engagement can build consensus and willingness to compromise in order to see the project move forward.

Many stakeholders commenting on the EORN experience noted that any regional broadband project will need **champions** across the targeted region – at the **local/community** level, at the **regional** level, and within **financial or funding organizations**. Make sure you pay attention to building awareness support and active champions in securing political approval with upper levels of government. The EORN team and many stakeholders emphasized the value of having maintained ongoing awareness-building, communications and advocacy programs throughout their project, both with **elected officials** and **public servants** responsible for funding program implementation, oversight and evaluation.

Upfront political buy-in is extremely important, whether that is from *municipal councils* and their ratepayers, or from senior members of *upper levels of government* who will be asked to help underwrite at least some of the costs of these projects. Furthermore, that buy-in must be maintained throughout a resulting project, accompanied by careful attention to accountability and transparency. Proponents ought not to underestimate the length of time it can take to bring stakeholders from independent organizations together in support of a regional initiative. In EORN's case, that process took several years but the result was a regional collaboration at a political level that endured through the entire project, and was acknowledged by virtually all stakeholders as having been a very important contributor to the project's success.

6.2 Best Practice Characteristics

5. **Consider the wisdom of *technology agnosticism*** – because potential partners may want to propose different technology solutions for different applications within the larger regional project, and because technologies that were not mainstream at the project's inception may be so by the time you finalize the network design and begin to build. Early commitment to relatively few, specific technologies (such as specifying them in an *RFP*) can lead some potential suppliers and partners to decline participation if they believe they will be at a disadvantage without the identified technologies.

Technology can change rapidly although that does not mean recently installed equipment is useless. It does suggest though that proponents would be wise to remain technologically agnostic if possible. In competitive bidding situations, this allows bidders to recommend the technology options that best meet the request for proposal or request for information (RFP or RFS) and potentially differentiate their bid in ways that best serve a particular project. Taken together, this suggests that the project will hear about the best the industry has to offer.

6. **Consider your *business model* carefully** – it affects investor/funder, partner and stakeholder perceptions of the project, their willingness to work with you, and invest their own resources in the initiative. It also affects the *risk profile* of the venture since there are different types of risks – and opportunities – associated with different business models. While most stakeholders associated with the Eastern Ontario project believe EORN Inc. was the right business model and might well work in other jurisdictions, there was a cautionary note that any business model needs to be assessed against a region's particular circumstances and needs. Similarly, a business model that works well for one ICT project may be inappropriate for another one (for instance, cellular or mobile broadband).

In EORN Inc.'s case, the hallmarks of the business model were:

- A separate organization created by the sponsoring organization (Eastern Ontario Wardens' Caucus)
- Self-managed rather than contracting with a specialized project management team. In EORN's case, the team was a mix of permanent and seconded employees along with consulting support in specific areas.
- Catalytic in its actions rather than aspiring to long-term ownership of the network. In EORN's case, this meant aggregation of demand for high-speed services across the region; acting as the region's negotiator on the project's legal, financial and project scheduling matters; and taking on the responsibility for ensuring accountability for use of funds as well as the project's ability to deliver on the intended outcomes.
- A unique form of public-private partnership with EORN contracting with the private sector on behalf of funders, according to terms specified in contribution agreements.

Virtually all stakeholders interviewed strongly endorsed this business model and recommended it to others seeking to undertake a regional broadband initiative. The caveats to this endorsement would be that a) the sponsoring organization must contribute to the project, especially in terms of building early buy-in among stakeholders including funders, and b) great emphasis must be placed on hiring staff/retaining consultants who have a passion for the project, are truly experts in their respective fields, can function well as a team, and never lose track of the main objective(s) of the project.

- 7. Invest in *risk management* and *top-notch talent*** – the scale and complexity of a regional broadband network, and the comfort level of funders, argue for significant attention to risk management. To support their accountability requirements, the Province of Ontario emphasized EORN's participation in provincial risk management training and incorporation of these principles into project execution. The EORN team repeatedly noted the value of the training and having paid attention to risk management throughout the project.

Since a significant share of the risk is either 'baked in' or avoided in the project's initial stages project, securing top-notch talent for such assignments as legal work, procurement and contract negotiations, technology and engineering, governance oversight and project management, communications, and customer relations will pay dividends in avoiding costly or damaging mistakes and in cost-effective project delivery. Remember that these costs are a small proportion of

total project costs (in EORN Inc.'s case, 5.7 per cent per cent of total operating expenses). Scrimping on these expenditures will not free up significant resources to cover implementation costs. Finally, funders, partners and other stakeholders will have greater confidence in a team that demonstrates exceptional professionalism and expertise, and may be more willing to consider changes in strategy or reallocation of resources to deliver better results.

The EORN experience suggests that investing in top-notch talent means more than just finding people with good technical/professional/domain expertise; the degree to which a large, multi-year initiative achieves its original outcomes correlates with the degree of **passion and commitment** that staff have to finding solutions that address the inevitable challenges and opportunities that emerge during a project supplementation. In turn, finding those solutions means being willing to be **open and transparent** about those challenges, and what a project team can or cannot do to address them.

- 8. Project design and rollout can accomplish *objectives beyond getting a network built and subscribers online*.** The scale of a regional broadband network can have a significant short-term direct economic impact within the region, as well as sparking longer-term impacts during the network's operating phase. Based on the EORN experience, project design and rollout can help to achieve objectives beyond the obvious digital goal (putting a network in place). Sometimes there will be **market objectives** (e.g. stimulating competition in service provision), or **business objectives** (e.g. providing opportunities for many companies to bid on aspects of the project that are their strengths, or **avoiding direct head-to-head competition** with established private sector organizations; **enhancing the brand or reputation** of the region and participating stakeholder organizations), or **socioeconomic objectives** (e.g. negotiating pricing that is roughly comparable between urban and rural areas, supporting community development aspirations). The aforementioned examples are all drawn from the EORN experience and were achieved, primarily by designing and implementing the project in ways that supported those objectives. Proponents for other projects may well have different objectives depending on their particular situation. In this case, the best practice is identifying those objectives up front and designing the project to support their fulfilment.

6.3 Best Practice Implementation

9. **Choose intended *project outcomes* carefully** – agreements with funders will almost certainly contain specific outcomes you will be expected to deliver. Make sure you choose outcomes that are relevant for your region, that you can deliver, and that you can afford. For jurisdictions striving to close a broadband gap or significantly improve broadband services in a region, project results may be defined (as they were in the EORN project) in terms of *accessibility* (the percentage of your region that actually can access high-speed internet at any price), *network bandwidth* (the amount of data that can be sent across the network at the same time), *latency* (the time taken to move data from point A to point B), the *speed* available to subscribers (download or upload speeds, determined in part by bandwidth and latency), and *pricing* (the impact of regional broadband projects on pricing for subscribers through ISPs, sometimes compared to subscribers in nearby areas that are not subject to conditions of market failure). There are *project cost implications* for all of these project outcomes, many of them are *interconnected*, and many of them will have to be *negotiated* with partners and funders. Choose your intended project results carefully, and be prepared to be flexible and creative.

10. **Hand the implementation assignment to an *organization or team that is focused on one mission***. An expectation that a regional broadband network project can be executed by an organization or team with multiple priorities is ill-founded. Such a project is too large, complex and fraught with risk to be undertaken as part of a suite of projects or responsibilities.

11. **Structure the project to build in *flexibility*** – in part, because regional projects are often introduced in regions with significant on-the-ground variability and because the multi-year nature of a regional broadband project may generate surprises. Use the scale of a regional project to ‘average out’ variations and to be able to respond to surprises (that may be opportunities, not problems).

In building project plans, look for ways to build in flexibility so that you can adapt to changing circumstances as the project unfolds. There may also be opportunities to increase participation by external stakeholders; these may be helpful in fulfilling project objectives as well as stakeholder satisfaction. A regional broadband project is likely to be multiple years in the making and multiple years in implementation. Technologies, legal and policy environments, and the availability of financial resources can change. Different engagement strategies may be needed for different stakeholders, and opportunities to execute the project differently may present themselves.

The project's **decision-making** style should align with the flexibility mind set. In the case of all EORN, decisions were guided by an 80 per cent consensus criteria. Flexibility means being **open-minded** about new ideas and solutions, as long as they advance the initiative toward the agreed-upon outcomes. Staff must feel confident that the project's design encourages them to take on the mindset that every opinion is worth hearing; both internal and external stakeholders reported that this open-mindedness was present with the EORN initiative and contributed significantly to problem-solving and effective relationship management. For senior management, this means managing the project through a dual lens: that of internal stakeholders/staff, and that of a governance board.

Preserve the **capacity to be nimble.** With the need to continually evaluate new technologies, adapt as a project unfolds, and respond to unexpected circumstances, proponents are wise to remain technology neutral if possible, focusing on the end goal, which is likely to be related to some combination of extending access to unserved areas and perhaps improving existing services (e.g. speed, pricing). Adopting a mindset of nimbleness, being willing to change direction (without compromising the end goal) will be important to overall project success. In EORN's case, nimbleness was built into the project in multiple ways:

- By defining the desired project outcomes in ways that would encourage a change in direction if doing so would solve a problem or capitalize on an opportunity directly related to project outcomes.
- By negotiating specific provisions into contracts to engage private sector partners in meeting the project objectives.
- By taking a regional approach, allowing the project team to use the region's diversity to advantage, adjusting plans and reallocating resources across the region to ensure that the articulated needs of each area could be met. Although strongly recommended by virtually all stakeholders, some proponents may not be able to undertake a regional project. In these cases, alternative means of staying nimble should be sought (see preceding comments).

"You've got to be creative... flexible enough to look at the possibilities... Our investment helped a lot of families and businesses... improvement (to broadband services) would have been slow otherwise."

Municipal representative

"EORN needed to be able to turn on a dime."

Municipal representative

12. *Managing expectations is key to perceptions of success* – especially in an era of rapidly advancing technologies and applications. For instance, it is now clear that demand for broadband services (faster speeds, more data requirements due to intensifying downloads and streaming services, use across multiple devices) will continue to **grow dramatically** (some say exponentially) calling into question whether a project like EORN is ever really finished. If internet use (and network capacity utilization) climbs faster than a **proponent forecasts**, the degree to which scalability is built into the network design – as well as service providers’ ability and willingness to respond – becomes extremely important.

Service providers’ **ability to respond** by adding more capacity may be faster if the network was built to scale from the beginning (rather than having to go back and add to/extend the original backbone build.) The EORN network is **scalable** however, **capacity utilization** is ramping up faster than EORN (or perhaps service providers) projected so network congestion (slowdowns) can lead to subscribers feeling that they did not get the promised service... until network and ISP capacity can be increased. Make sure you can deliver on the expectations you are setting with **partners, stakeholders, end users, citizens and funders**.

13. *Communications – early and often – is a vital tool* in managing user expectations in the fast-paced world of Information and Communications Technology (ICT). In EORN’s case, the expectations challenges were two-fold:

- Helping some **potential subscribers** understand that **variable terrain** can make it impossible to **cost-effectively** deliver high-speed internet/broadband to a specific home or business, other than by satellite. Although satellite services have improved dramatically over the past decade, some users thought of it as a second-best solution and interpreted EORN to have failed them. For those relatively few subscribers who could not get improved broadband access through the EORN project, it is possible that early intensive, targeted communications in ‘high risk’ areas might have dampened the disappointment somewhat.
- Helping some subscribers understand that despite the network’s scalability, there may be **congestion** (and slower speeds) in a specific geographic location if the ISP’s available tower equipment (for wireless) or fibre from the node/Point of Presence (for fibre to the home) is being heavily used. Congestion can become a bottleneck leaving subscribers disenchanted; they do not differentiate between the backbone and the service provided to the subscriber by the ISPs (who may be challenged to keep up with demand).

- Communications is also deeply intertwined with **governance practices and accountability**. The EORN team provided regular reports to, and sought approvals from, both their own EORN Inc. Board and the EOWC Inc. In addition to providing updates on implementation progress and ensuring transparency on contractual, financial, and legal matters, these reports provided champions with vital information about the impact of the broadband project on both a regional and local basis. This approach provided reassurance, particularly to EOWC members, the project would deliver benefits across the entire region (not just the easy-to-serve areas).
- In addition to Board reports and in-project communications, EORN Inc. made more than a dozen presentations to the region's stakeholders, providing information on the overall success of the project, as well as **Return on Investment (ROI)** at both the local and regional level.
- EORN Inc. and EOWC Inc. have been active on **advocacy to make spectrum available** for rural/less densely-populated areas, including but not limited to direct representations to the CRTC. These representations have been designed to protect both public and private sector investments in the expansion of broadband services across the region; while not a direct responsibility of either stakeholder, spectrum is a 'gate-keeping' asset with enormous influence over the success of any regional network.

Given the relative paucity of evaluations and best practice derivations for regional broadband initiatives, the preceding 'lessons learned' and best practice considerations are presented as an early contribution to this field of analysis. By virtually all measures, the EORN initiative has been deemed successful – a conclusion borne out by this review (for which evidence has been presented). For that reason, the conclusions of this report warrant more than passing interest for anyone considering a regional broadband project or having best practice interest in the ICT sector.

7 Would Additional Research be Useful?

As additional investments in large-scale broadband are made, there is merit in additional research in the regional broadband sector to:

- Test the approaches and methodologies deployed in this Review, and suggest improvements.
- Validate, refine or supplement the factors identified in this Review, and suggest any limitations to their use, or describe the circumstances in which particular factors are likely to be most potent.
- Quantify the short and long-term impacts that should be expected from regional broadband investments, the timeframe over which these impacts should be expected, and the degree to which these impacts can be attributed to broadband investments as opposed to other developments or changes in the target region.
- Develop a list of Critical Success Factors that would allow a region, funders or stakeholders to assess its state of readiness for a major broadband investment, and continue to add to best practices research.
- Return to the EORN project in five (5) years' time, to make a longer-term assessment of the project's impact on the region's economy and communities.
- Assess the degree to which broadband investments, themselves, can be expected to change the trajectory of the region's economic and social development, or whether there are concomitant actions required to extract value from these investments.

8 Where to from Here for EORN?

In the interview introduction, the consultant noted that the results of this best practices review would be taken into account by EORN Inc. as it defined its future roles (if any) related to ICT. Interviews with stakeholders revealed two different perspectives on what should happen to EORN Inc. once the current project is complete. One group believes there is opportunity for EORN Inc. to use its project development and implementation capacity, and expertise to help other jurisdictions or to transfer organizational know-how to other similar projects. Another group of interview subjects believes that having achieved its stated objectives, EORN Inc. should wind up its operations, allowing the long-term transitional plan (network assets transfer to private sector in 2017) to unfold as agreed by all parties. Some members of both groups cautioned EORN Inc. to check any assumptions about whether the same business model would apply to other ventures, even if in a field closely related to broadband (e.g. mobile broadband/cellular services).

As more and more aspects of daily life become digitized, and society moves further into the era of the Internet of Things (IoT), EORN Inc. has an opportunity to share what it is learned about broadband infrastructure project business models, financing, resource deployment, and project implementation with other jurisdictions seeking to undertake such projects. However, given that technology continues to race forward, it is likely that the availability of quality internet service within the region will require continuing attention. Examples of the issues that remain on EORN's plate, each of which has an embedded risk, are shown below.

Issue	Risk to EORN and EOWC
Exponential increases in demand for bandwidth	<ul style="list-style-type: none"> - Persistent network congestion - Erosion of end user satisfaction
Continuing traffic shift to mobile applications	<ul style="list-style-type: none"> - Inability to address gaps in mobile broadband/cellular coverage, and/or growth in associated backhaul utilization
Service providers' responsibility to 'refresh' network technology	<ul style="list-style-type: none"> - Inability to ensure network technology 'refresh' erodes support for business model
Service providers' packages and associated pricing	<ul style="list-style-type: none"> - Significant price increases to subscribers - Erosion of comparable rural-urban pricing
Utilization/uptake by potential new subscribers	<ul style="list-style-type: none"> - Limited uptake/utilization by potential new subscribers
Continued economic and social impact of digitization	<ul style="list-style-type: none"> - Job destruction from technology utilization considered EORN/EOWC's responsibility
Future ICT challenges less regionally pervasive than broadband	<ul style="list-style-type: none"> - Fractures in regional partnerships
Ability to retain/attract/'grow' 'professional, passionate, purpose-driven' team	<ul style="list-style-type: none"> - Changing mandate/mission, retirements, natural career progression limits EORN's ability to execute

Because EORN Inc. has contractual commitments with funders and technology providers until 2024, the organization will continue to function at least until that time. The commitments are related to contracts which require technology providers to maintain broadband network assets at their own expense from 2018 to 2024 inclusive; full ownership of the assets transfers to private sector partners as of 2017. At the same time, EORN is likely to maintain a 'standing watch' for technology opportunities to bring broadband to the relatively few hard-to-serve communities in the region. Through its digital strategy, EORN will continue to encourage and provide regional leadership on the application of software utilizing broadband technologies for public and private service provision (e.g. emergency services and Public Safety, infrastructure monitoring, civic engagement, creation of local business clusters and innovation networks, marketing and communications, healthcare diagnostics, education and training, logistics and transportation, cyber-security etc.)

In addition, EORN Inc. will continue to undertake advocacy related to broadband, funding for mobile broadband/cellular infrastructure, and related public policy issues. EORN is also testing out the flexibility, adaptability and fit of its approach to regional broadband with other jurisdictions such as the Province of Nova Scotia, for which EORN has recently provided support for the development of the province's 'middle mile' strategy.

9 Conclusions

This Best Practices Review finds that the Eastern Ontario regional broadband network project was a major success on the following fronts:

1. EORN Inc. fulfilled or exceeded its commitments under the Contribution Agreements signed with provincial and federal funders, and its original champion: the Eastern Ontario Wardens' Caucus.
2. EORN Inc. pioneered the use of a new form of public-private partnership – one that tested prevailing models in use by provincial and federal funders, and prompted contemplation of new approaches by upper levels of government. This model is considered by most stakeholders to be transferable.
3. The project demonstrated the willingness of municipal champions, particularly the Eastern Ontario Wardens' Caucus, to provide leadership on addressing regional issues, and taking an inclusive approach to project involvement with separated cities and towns, and First Nations communities.
4. The project demonstrated strong technical and project management, financial and governance accountability, with acknowledged attentiveness to stakeholder relations and willingness to adapt plans as the project moved forward.
5. EORN Inc. remained focused on project objectives throughout the project, and demonstrated willingness to listen to the region's stakeholders, rethink implementation plans and adapt quickly to maximize regional benefits and partners' needs and expectations.
6. The Eastern Ontario project has identified many potential best practices – in the design and implementation stages – for use in other similar projects.
7. While EORN Inc.'s work is not done (the organization has commitments in the region until at least 2024), there are many follow-on opportunities to deliver valuable service to the Eastern Ontario region and beyond.

10 Appendices

Appendix A: Glossary of Terms

Backbone – a principal data route between large, strategically interconnected networks and core routers on the internet. Backbones require high-speed bandwidth connections and higher-performance servers/routers to handle the data traffic associated with modern internet utilization.

Backhaul – the intermediate links between the backbone and the smaller networks at the edge of the entire network. In some cases, the backhaul uses out-of-the-way routes to get data to its destination sooner or to contain costs.

Broadband – refers to high-speed internet access that is always on and faster than dial-up access.

Business Model – the means by which an organization captures value from its business. It describes how the organization is going to earn revenue, how it will work with internal players (employees and managers) and external players (customers, suppliers, investors/financiers, regulators etc.) The business model describes how the organization adds value. [Based on definition from Financial Times]. In the internet era, a new business model has emerged (as an alternative to the traditional pipe: the platform).

Cybersecurity – the protection of systems and information they contain from theft, damage, and disruption.

Digital Subscriber Line – the way a computer connects to the internet at high speeds, using telephone lines. DSL is a communications medium used to transfer digital signals over standard telephone lines and along with cable internet, is one of the most popular ways that ISPs provide broadband internet access. [Based on definitions from yourdictionary.com and techterms.com]

Economies of Scale – the cost advantages that enterprises obtain due to size, output, or scale of operation, with cost per unit of output generally decreasing with increasing scale, as fixed costs are spread out over more units of output.

Firewalls – a network security system that monitors and controls the incoming and outgoing network traffic based on predetermined security rules.

Gigabit – a unit of information equal to one billion (10⁹) bits.

Hardware – the physical elements of technology that makeup a computer and/or network system.

Information and Communication Technology (ICT) – the application of computers to store, retrieve, transmit and manipulate data, often in the context of a business or other enterprise.

Internet of Things (IoT) – the network of physical devices, vehicles, buildings and other items; embedded with electronics, software, sensors, actuators, and network connectivity that enable these objects to collect and exchange data.

Internet Protocol (IP) – a set of rules governing the format of data sent over the internet or other networks.

Interoperability – the capacity of one system, application, or resource to function with others.

Legacy – an old method, technology, computer system, or application program that has been in use, which might be becoming outdated.

Open source – refers to software that can be used, shared or changed freely.

Personal Information Protection and Electronic Documents Act (PIPEDA) – a Canadian law relating to data privacy. It governs how private sector organizations collect, use and disclose personal information in the course of commercial business.

Point of Presence – a demarcation or interface point connecting one point on a network to the rest of the network, for the purposes of increasing accessibility to the network. Hardware typically found at a POP includes optical switching equipment, routers, digital/analog call aggregators, servers.

Request for Proposal (RFP) – is a formal request for a business proposal to potential suppliers.

Spectrum – refers to the radio frequencies allocated for communication over the airwaves. The allocation of radio frequencies to various users determines who can use those frequencies for what purposes. If spectrum is auctioned to the highest bidder, major companies can control access to the airwaves and effectively exclude smaller organizations with local applications such as emergency services. EORN Inc. has advocated for designation of at least some spectrum (frequencies) for such purposes.

Web 2.0 – the transition from static web pages to a dynamic web presence including advanced applications.

Appendix B:

Summary of Best Practices Design Template

The following summary was drawn and adapted from "*Applying a Template for Best Practice Documentation*" by Meshari Alwazae, Erik Perjons, and Paul Johannesson, Department of Computer and System Sciences, Stockholm University, Stockholm, Sweden, presentation to Third Information Systems International Conference, 2015; Published by Elsevier B.V. Open access article via [creativecommons.org](https://creativecommons.org/licenses/by/4.0/) license. Adaptation undertaken to allow use of IT-focused template for a regional broadband initiative.

Summary

- Title
- Summary/short description of contents

Best Practice Description

- Statement of problem, solution and context
- Author contact information
- Revision information

Requirements for Application of Best Practice(s)

- Goal: intended effect of application of best practice(s)
- Means: what is needed to apply the best practice(s), including people and technology
- Skills: skills and competence required of end user for application of best practice(s)
- Cost: estimation of costs for application of best practice(s)
- Barriers: obstacles and/or problems that may occur before, during, and after application of best practice(s)
- Barrier Management: procedures to follow if obstacles or problems are encountered

Best Practice Actor(s)

- Community of practice with interest in best practice(s)
- Champion: need/role of champion re: best practice(s)
- Owner of best practice(s)
- Training Needs: degree to which training is required to use the best practice(s)
- Acceptability: degree of best practice(s) acceptance by domain experts

Best Practice Characteristics

- Usability (ease-of-use)
- Comprehensiveness of best practice(s) in addressing problem/solution
- Relevance (significance of problem addressed by best practices)
- Justification (degree of evidence that best practices solve the problem)
- Prescriptive (degree to which best practices offer concrete proposals to solve problem)
- Coherence: degree to which best practice(s) are related
- Consistency with existing knowledge and vocabulary used in target industry sector or knowledge domain
- Granularity: appropriate level of detail
- Adaptability: degree to which best practice(s) can be modified and adapted to other situations
- Activity: identification of tasks to be carried out for best practice(s) application
- Integration: degree of integration with other best practices and/or knowledge management components

Best Practice Implementation

- Demonstration of Success: a case where best practice(s) have been successfully demonstrated
- Installation Time: time required to introduce and implement best practice(s) in an organization
- Application Time: time required to apply best practice(s) in an organization
- Experiences and Feedback: users' opinions, advice and experience(s) with the best practice(s)
- Measurement: indicators for measuring quality and performance of best practice(s)

Appendix C: Documentation Review

(also serves as references as cited in the Review)

References Cited in the Review:

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- 2 Multiple analyses can be found at: www.eowc.org/en/mediareleases/2013-2014.asp
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- 4 Final Report on the Eastern Ontario Regional Broadband Network (EORN) Proposal, an initiative of the Eastern Ontario Wardens Caucus Inc. under the Major Infrastructure Component of the Building Canada Fund (EORN Inc.), March, 2010
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- 6 EORN Project, Funding and Contract Negotiations Highlights (D. Fell, EORN) – June, 2016
- 7 EORN Project, Procurement Process (S. Graham, EORN) – June, 2016
- 8 EORN Project, Project Management and Document Management (C. Menendez, EORN) – June, 2016
- 9 EORN Project, Satellite and XCI (D. Fell, EORN) – June, 2016
- 10 Evaluation of the Eastern Ontario Development Program – FedDev Ontario; http://www.feddevontario.gc.ca/eic/site/723.nsf/eng/h_00553.html. "In 2006, EODP funded a broadband gap analysis in Eastern Ontario, particularly with respect to high speed/broadband internet access, which concluded that 65 per cent of the study area was un-serviced or under-serviced. EODP further supported an implementation study, which identified cost considerations to close the service gap. While these studies were completed outside of the study period, EODP, along with other partners, funded further work in this area in 2009 to update both the implementation study and the gap analysis. This support contributed to securing government financing to create the Eastern Ontario Regional Network (EORN). The goal of the network is to achieve 95 per cent coverage in Eastern Ontario by 2013."
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- 13 "Applying a Template for Best Practice Documentation" by Meshari Alwazae, Erik Perjons, and Paul Johannesson, Department of Computer and System Sciences, Stockholm University, Stockholm, Sweden, presentation to *Third Information Systems International Conference*, 2015; Published by Elsevier B.V. Open access article via creativecommons.org license.
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- 16 **List of Identified High Speed Broadband Good Practices**, ENGAGE, High Speed Broadband for Rural Europe, INTERREG IVC, Innovation and Environment, Regions of Europe Sharing Solutions, European Union Regional Development Fund (Undated but post 2005)
- 17 EORN Rural Broadband Strategic Research and Impact Analysis: Development of a Partnership and Evaluation Framework for assessing the Social and Economic Impacts of Provincial Broadband Investments (Y. Chan, Queen's University at Kingston, Ontario) – August, 2011
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- 19 The 12 Different Ways for Companies to Innovate, Mohanbir Sawhney, Robert C. Wolcott, and Inigo, Arroniz, MIT Sloan Management Review, Vol. 47, No. 3 Spring 2006, <http://mitsmr.com/1qY1iJg>
- 20 Why Business Models Fail: Pipes vs. Platforms, Sangeet Paul Choudary, 2013 <https://www.wired.com/insights/2013/10/why-business-models-fail-pipes-vs-platforms/>

Eastern Ontario or EORN-Specific:

- 21 Broadband – Critical Infrastructure for Rural Vitality (C. Cope, City of Ottawa) – May, 2008
- 22 Revitalizing Rural Economies, A Guide for Practitioners (Y. Chan, J. Dixon, C. Dukelow, McGill-Queen's University Press) – November, 2013
- 23 Public Opinion Research: Eastern Ontario Poll (Innovative Research Group, Toronto, Calgary, Vancouver) – June 2014
- 24 Digital Strategy, A Road Map to Digital Leadership (Eastern Ontario Regional Network) – 2015
- 25 EORN Finance Highlights Presentation to EOWC – April 24, 2015
- 26 Investment in EORN by County (spreadsheet, EORN) – June, 2015
- 27 Telecom Notice of Consultation CRTC (EOWC/EORN) – July, 2015
- 28 EOWC/EORN Responses to requests for information/interrogatories addressed to EOWC/EORN from CRTC and Rogers Communications (EOWC/EORN) – September, 2015
- 29 Mapping the Innovation Ecosystem in Eastern Ontario, Towards an Inclusive Canadian Innovation Strategy, (W. Cukier, K. Stolarik, O. Ngwenyama, M. Elmi, Ryerson University), – March, 2016
- 30 Municipal Public Wifi, A Sound Investment? (EORN Inc.) – Summer, 2016
- 31 eBusiness Toolkit for Small and Medium-Sized Business (EORN Inc.) – October, 2016
- 32 News release – December 22, 2016: EOWC and EORN applaud CRTC ruling on broadband

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- 33 Best Practices in Broadband: Lessons from Canada, Japan, Korea and the United States (R. Frieden, Penn State University, USA) – 2006
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- 35 Evaluation of the Eastern Ontario Development Program (FedDev Ontario) – 2011
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- 37 Google Fiber Huntsville Deal Could Remake the Broadband Market – (Brookings Institution at www.broadbandcommunities.com) – March 2016
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- 47 The Future of New Product Development, Learn how to develop innovative new products for increasingly global and digital markets (MIT Sloan Management Review) – Spring 2017

Appendix D:

List of Individuals Consulted

Andrew Clemens

(Former Marketing) Product Manager,
Xplornet/XCI

Barry Hohol

Customer Care/Sales Cogeco

Bill MacDonald

Vice-President – Relationship Manager for Build,
Xplornet/XCI

Campbell Paterson

Technical Specialist, Utilities Kingston,
City of Kingston

David Henderson

Mayor of City of Brockville

Deryk Trehearne

former Director General,
Infrastructure Canada,
Government of Canada

Gary King

Chief Administrative Officer,
City of Peterborough; Co-Lead EORN

Gerard Hunt

Chief Administrative Officer,
City of Kingston

Jason St. Pierre

Project Technical Manager,
Bell Canada

Jeff Dixon

Associate Director, Monieson Centre,
Smith School of Business,
Queen's University

Jim Hutton

Chief Administrative Officer,
County of Renfrew

Jim Keech

President, Utilities Kingston,
City of Kingston

John Downs

Owner, Nexicom

John Swantee

Senior Project Manager,
Bell Canada

Joseph Cillis

Claims Processing,
Ontario Ministry of Agriculture,
Food and Rural Affairs

Kathy Kennedy

(Former) Claims Processing,
Ontario Ministry of Agriculture,
Food and Rural Affairs

Kurt Greaves

Chief Administrative Officer,
Lanark County

Larry Keech

Chief Administrative Officer,
County of Lennox and Addington

Lisa Hirvi

former Chief Financial Officer,
Eastern Ontario Regional Network Inc.

Lisa LeClerc

Aboriginal Consultation Specialist,
Ontario Ministry of Agriculture,
Food and Rural Affairs

Mike Marcalongo

Technical Specialist,
Ontario Ministry of Agriculture,
Food and Rural Affairs

Paul McCarthy

Infrastructure Canada,
Government of Canada

Peter Emon

Chair, Eastern Ontario Wardens Caucus;
Warden, County of Renfrew

Ronda Fraser

former Claims Processing,
Ontario Ministry of Agriculture,
Food and Rural Affairs

Yolande Chan

Professor, School of Business,
(former) Director, Monieson Centre,
Smith School of Business,
Queen's University

**Participating in Group Consultation
with EORN Inc. Board:**

Bob Sweet

EORN Board Member;
Mayor of the Town of Petawawa

David Burton

Chair EORN Inc. Board of Directors

Dick Shannon

EORN Board Member and
former Chief Administrative Officer,
Prince Edward County

Erika Demchuk

EORN Board Member;
Mayor of the Town of Gananoque

Jim Pine

Chief Administrative Officer,
Hastings County and co-chair, EORN

Joanne Albert

EORN Board Member;
Mayor of Tweed

J. Murray Jones

EORN Board Member;
Warden of Peterborough County

Sheridan Graham

County of Peterborough/Procurement Specialist
- EORN

Warren Arsenault

EORN Board Member

Also in attendance:

Anita Prosser

CSRO support, EORN

Claudio Menendez

Project Management Specialist, EORN

David Fell

Chief Executive Officer, EORN Inc.

Linda Little

Finance Department, County of Hastings;
Financial Administration – EORN

Lisa Severson

Customer Service Representative (CSRO?),
EORN

Paula Preston

Technical Engineer, EORN;
private firm: Actionable Intelligence.

Appendix E:

Consultation Discussion Guide

Discussion Guide – Eastern Ontario Regional Network Best Practices Review

September 2016

Discussion with Kathryn Wood 613-376-6006 or kwood@ncronline.ca

- From your perspective, when did you first hear about or get involved in the initiative we now know of as EORN (improvement of access to high-speed internet across rural Eastern Ontario)?

What specific roles/responsibilities and/or interests did you have related to the project?

- Based on your understanding of the EORN objective(s), how would you assess the success of the initiative to date? If it helps, think of rating the success on a 1 to 10 scale where 1 is not very successful at all and 10 is wildly successful. [see page 3 for short description of objectives]
- From your knowledge of EORN, what aspects of the project have been most successful? Least successful?

What do you think lies behind the success or lack of it? Think of the two or three most important factors....

- Looking at the list below, are there any aspects of the EORN initiative that you consider important to flag for others who might want to undertake an initiative similar to EORN (regional broadband)?

Are there any where you think EORN got it right'?

Are there any where you think EORN 'got it wrong'?

- Scoping the project regionally rather than in a single or handful of communities
- Early and continuing support of an established organization
- Public-private partnership model
- Creation of a special-purpose organization to focus on the project
- Self-management of implementation (rather than contracting out)
- Managing expectations in an era of exponentially increasing demand
- Bringing in people with technology/technical knowledge while remaining neutral
- Engaging industry and avoiding competition with private sector using public funds
- Negotiations with private companies to meet project and end user expectations
- Using 'market failure' as a guiding principle in design and negotiations
- Choosing to be a catalyst rather than owning & managing the network long-term
- Customer relations on behalf of end users in interactions with ISPs

- Incorporating First Nations into the initiative from its earliest formulation
 - Including comparable pricing for services into negotiations with Internet Service Providers
 - Anything else?
 - Looking back, do you think that the EORN initiative has been good value for money? How would you personally evaluate value for money on broadband projects?
 - How important (if at all) do you think broadband is for the long-term health of rural and small town economies?
 - Based on our conversation today, what would you say are the top two or three 'best practices' that should be shared with others undertaking similar projects?
- What cautions would you have for others considering an EORN-type approach to addressing broadband connectivity?

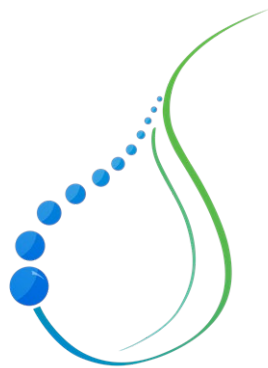
Original Expectations:

Short-term:

- Address market failure that left many in rural areas with little or no access to a vital form of infrastructure
 - 85 per cent penetration of homes and businesses
 - Up to 10Mb service
 - Raise \$50M in private capital
- Bridge the urban-rural pricing gap
- Improve customer choice (give them options) through greater competition; be technology neutral
- Provide opportunities for large and small organizations to participate
- Ensure open access to network use
- Build in scalability
- Be sensitive to competitive issues in an already hotly contested sector
- Ultimately, transfer the network to the private sector
- Get 5,500 kilometres of fibre in the ground with 60 POPs... with satellite option available

Long-term:

- Advance innovation and economic development opportunities
- Improve delivery of government and public sector services
- Enhance public access to government services and information
- Expand use of e-Health technology, such as remote diagnostics
- Improve education and training opportunities for youth (expanding access to e-learning)
- Support green technology, reduce energy consumption and protect the environment
- Sustain previous investments in internet access
- Contribute to economic progress across the region



imagine. transform. sustain.
Natural Capital Resources Inc.



MINUTES

MEMBERS PRESENT

Bruce Joy (Vice Chair)
Vince Klimkosz (Chair)
Daina Makinson
June Williams
Councillor Jessica Goyda

TOWNSHIP STAFF

Nina Lecic, Deputy Clerk
Karen Landry, CAO/Clerk
Mike Fowler, Supervisor, Public Works

OTHERS PRESENT

Mayor James Seeley

1. CALL TO ORDER

Nina Lecic, Deputy Clerk called the meeting to order at 7:02 p.m.

2. ELECTION OF CHAIR AND VICE CHAIR

By unanimous consent, the Committee appointed Vince Klimkosz as the Chair and Bruce Joy as the Vice Chair.

Vince resumed the Chair position.

3. DISCLOSURE OF PECUNIARY INTEREST

None

4. APPROVAL OF MINUTES

5. DELEGATIONS/PRESENTATIONS

6. REGULAR BUSINESS

1. Puslinch Community Newsletter update

- a. At the January 30, 2019 Council Meeting, Council directed staff to obtain feedback from the Recreation Committee on the value of the monthly production of the Puslinch Community Newsletter.
- b. Social media

The Committee discussed the Puslinch Community newsletter and noted that they see value in its monthly production as it is a good resource for new people, provides exposure for groups and their events, and assists with increased fundraising. The Committee recommended keeping the production of the Newsletter as the Township does not have a social media policy in place.

Vince Klimkosz was selected as a back-up for Daina Makinson for the production of the Newsletter.

The Committee inquired as to whether notice could be included in the tax bills about the newsletter. Staff were to follow up.



2. Notice of Public Meeting- Puslinch Community Centre Park Master Plan – Phase 1 and Phase 2
3. Fox Run Park (upcoming Public Meeting, date to be determined)

The Committee discussed the upcoming Fox Run Public Meeting and recommended that information about it be placed in the Community Newsletter, when the date has been set.

4. REC-2019-001 - Puslinch Community Centre Park - Back Soccer Fields – Update and associated Council Minutes

The Committee expressed concern with the proposed orientation of the baseball diamond as it is facing west. This is a concern due to sunset impacting visibility and resulting in games having to be scheduled half an hour later.

5. Promotion of Facility rentals (Daina)

The Committee discussed the feasibility of volunteer led promotional videos and photos of facilities.

The Committee requested additional information with respect to the following:

- Reports on gym rentals
- Summary of ice rentals for the previous season
- Use of the ice rink during PD days
- Summer rated for the rink

7. **CLOSED MEETING**

None

8. **ADJOURNMENT**

The Committee adjourned at 8:25 p.m.



MINUTES

MEMBERS PRESENT

Councillor John Sepulis, Chair
Deep Basi
Dan Kennedy
Dennis O'Connor
Paul Sadhra

MEMBERS ABSENT

None

OTHERS IN ATTENDANCE

Lynne Banks, Development and Legislative Coordinator
Curtis Marshall, Planner, County of Wellington
Meagan Ferris, Sr. Planner, County of Wellington
Hugh Handy, GSP Group
Hailey Keast, Van Harten Surveying
Karl, Brigitte & Mercedes Strachan
Beth Reade & Dave Wright

1. OPENING REMARKS

The meeting was called to order at 7:00 pm. The Chair welcomed the gallery to the Committee of Adjustment meeting and informed the gallery that Minor Variance Application D13/WRI – 161 Hume Road would be deferred until the July 9, 2019 meeting due to a resident not being advised of the meeting and that the Committee has an obligation to advise everyone that wishes to be notified with respect to the Minor Variance Application. The Chair then advised the gallery that Township Staff would present the application, then the applicant would have the opportunity to present the purpose and details of the application and provide any further relevant information. Following this, the public can obtain clarification, ask questions and express their views on the proposal. The members of the Committee can then obtain clarification, ask questions and express their views on the proposal. All application decisions are subject to a 20 day appeal period.

2. DISCLOSURE OF PECUNIARY INTEREST

- None

3. APPROVAL OF MINUTES

Moved by: Dennis O'Connor

Seconded by: Dan Kennedy

That the Minutes of the Committee of Adjustment meetings held Tuesday, May 14, 2019 be adopted.

CARRIED

4. APPLICATIONS FOR MINOR VARIANCE OR PERMISSION under section 45 of the Planning Act to be heard by the Committee this date:

4a.) Minor Variance Application D13/WRI – David Wright/Elizabeth Reade – Property described as Part of Lot 11, Concession 10, 161 Hume Road, Township of Puslinch.

Requesting relief from provisions of Zoning By-Law #19/85, as amended, requesting a reduced lot area of the severed parcel to be 10.0 metres instead of 24.3 metres as required.

Moved by: Dan Kennedy

Seconded by: Dennis O'Connor

That Application D13/WRI, providing relief from provisions of Zoning By-Law #19/85, as amended, requesting a reduced lot area for the severed parcel to be 10.0 metres instead of 24.3 metres, is hereby **deferred** until the July 9, 2019 Committee of Adjustment meeting.



CARRIED

4(b) Minor Variance Application D13/DRY – Barrie Drysdale – Property described as Concession 9, Part Lot 25, Township of Puslinch, County of Wellington

Requesting that the proposed accessory building be located in the front yard.

- Lynne Banks outlined the application and advised that the notice requirements for the application had been met and that no objections were received from the circulated agencies or public, and further advised that the applicant has already received approval from the GRCA for the location of the accessory building.
- The owner provided an overview of the application.
- There were no public comments or questions.
- Deep Basi inquired if the applicant has already received an entrance permit
- The owner advised that he had received a farm access permit several years ago.
- Dan Kennedy asked why the accessory building was being placed on angle on the property.
- The owner advised that there is a spring running under the road and across the property and that location was the best option.
- an Kennedy inquired if the building department is satisfied with the application
- The owner advised that the building permit was submitted and the required fees have been paid.

The Committee voted on the motion with all in favour.

1. That Application D13/DRY, providing relief from provisions of Zoning By-Law #19/85, as amended, requesting that the proposed accessory building be located in the front yard
2. The request is hereby **Approved** with the following condition:
 - That the accessory building be located a **minimum distance** of 34 metres from the edge of the road allowance.

CARRIED

5. OTHER MATTERS

- None.

6. ADJOURNMENT

Moved by: Deep Basi

Seconded by: Paul Sadhra

The Committee of Adjustment meeting adjourned at 7:11 p.m.

CARRIED



MINUTES

MEMBERS PRESENT

Councillor John Sepulis, Chair
Deep Basi
Dan Kennedy
Dennis O'Connor
Paul Sadhra

MEMBERS ABSENT

None

OTHERS IN ATTENDANCE

Lynne Banks, Development and Legislative Coordinator
Curtis Marshall, Planner, County of Wellington
Meagan Ferris, Sr. Planner, County of Wellington
Hailey Keast, Van Harten Surveying

1 - 5. COMMITTEE OF ADJUSTMENT

- See May 14, 2019 Committee of Adjustment minutes.

6. OPENING REMARKS

The meeting was called to order at 7:12 p.m. The Chair advised that the following portion of the Committee meeting will be reviewing and commenting on development planning applications.

7. DISCLOSURE OF PECUNIARY INTEREST

- John Sepulis declared a conflict of interest with respect to Item 11(a) Severance Application B22/19 (D10/VEN) – Angelo and Marcella Venerus, Part Lot 20, Concession 3, 4508 Sideroad 20, Township of Puslinch because he has an unsold lot near the property and the Committee's decision may be perceived as affecting the selling price of the lot, and refrained from discussions on the matter.
- John Sepulis declared a conflict of interest with respect to Item 11(b) Severance Application B26/19 (D10/FOR) – Daniel Forestell, Part Lot 20, Concession 3, 6948 Wellington Road 34, Township of Puslinch because he has an unsold lot near the property and the Committee's decision may be perceived as affecting the selling price of the lot and refrained from discussions on the matter.

Dennis O'Connor, Vice Chair, continued with that portion of the meeting with respect to the Consent Applications.

8. APPROVAL OF MINUTES

Moved by: Deep Basi

Seconded by: Dan Kennedy

That the Minutes of the Planning & Development Advisory Committee Meeting held Tuesday, May 14, 2019, be adopted.

CARRIED

9. APPLICATION FOR SITE PLAN URBAN DESIGN REVIEW

- None

10. ZONING BY-LAW AMENDMENT

- None

11. LAND DIVISION

11(a) Severance Application B22-19 (D10/VEN) – Angelo & Marcella Venerus, Part Lot 20, Concession 3, 4508 Sideroad 20 N, Puslinch

Proposed severance is 7.61 hectares with 243.8m frontage, existing and proposed rural residential use with existing shed. Note: Re-submission of denied application B20-18.

Retained parcel is 0.48 hectares with 47m frontage, existing and proposed rural residential use with existing dwelling.

- Curtis Marshall provided a brief explanation as to why both of the severance applications on tonight's agenda were denied by the County of Wellington Land Division Committee. He stated that due to changes from the province at the time of application the new provincial mapping had not been released but had come into effect at the time of the Land Division Committee meeting and therefore both applications were denied and appeals by both applicants were unsuccessful. He further stated that on May 16, 2019 the Provincial government made changes to the mapping and removed the previous zoning designation and the zoning is now changed back to secondary agricultural and further stated that the greenbelt area so if land is designated prime agriculture it will keep that designation.
- Paul Sadhra asked for confirmation that the properties are not in the greenbelt.
- Curtis Marshall confirmed that both properties are outside of the greenbelt.
- Dennis O'Connor advised that the conditions from the previous application were circulated to committee members and advised that the same conditions as the previous application.

The committee supports the application with the **following conditions** imposed:

1. That the Owner satisfy all the requirements of the Township of Puslinch, financial and otherwise (including taxes paid in full and Consent Review/Condition Clearance fee) which the Township may deem to be necessary at the time of issuance of the Certificate of Consent for the property and orderly development of the subject lands; and further that the Township of Puslinch file with the Secretary-Treasurer of the Planning and Land Division Committee a letter of clearance of this condition..
2. That the Owner obtain an approved Entrance Permit verifying safe access and site lines on the severed parcel from the Township of Puslinch; and further that the Township file with the Secretary-Treasurer of the Planning and Land Division Committee a letter of clearance of this condition.
3. That the Owner apply for, and obtain, a Building Permit from the Township of Puslinch for the septic system to be installed on the retained lands; and that the septic system permit be closed to the satisfaction of the Township's Chief Building Official.
4. That the Owner decommission the septic system on the lands to be severed to the satisfaction of the Township's Chief Building Official.

11(b) Severance Application B26-19 (D10/FOR) – Daniel Forestell, Part Lot 20, Concession 3, 6948 Wellington Road 34, Puslinch

Proposed severance is 0.4 hectares with 60m frontage, existing agricultural use for proposed rural residential use. Note: Re-submission of denied application B181-17.

Retained parcel is 29 hectares with 500m frontage, existing and proposed agricultural use with proposed agricultural use with existing dwelling without plumbing and barn.

- Hailey Keast of Van Harten Surveying provided an overview of the application and advised that the previous application was denied due to the mapping that was in effect at the time the application was heard at the County of Wellington Land Division Committee.

The committee supports the application with the standard conditions imposed.

Moved by: Deep Basi

Seconded by: Dan Kennedy

CARRIED

12. OTHER MATTERS

- Curtis Marshall provided an update on consent application file D10/REE, Lot Line Adjustment Application B129/18 that was presented at the January 8, 2019 meeting and advised that he checked the County plan and there are wetlands in front on the property and the zoning requirements state that a building must be located at least 30 metres from the wetlands. He further explained that the existing parcel has potential for severance because it is over a hectare in size and is zoned secondary agricultural and that adding land doesn't change the potential of severance.
- John Sepulis asked if the County would accept multiple applications for severances on a single property.
- Curtis Marshall stated that only 1 severance would be permitted per lot and that the first severance of the property was in 2005 so the second severance would be permitted in 2015. He further advised that 3 lots would not be permitted.

13. CLOSED MEETING

- None

14. NEXT MEETING

- Next Regular Meeting Tuesday, July 9, 2019 @ 7:00 p.m.

15. ADJOURNMENT

Moved by: Paul Sadhra

Seconded by: Dan Kennedy

That the Planning & Development Advisory Committee is adjourned at 7:27 p.m.

CARRIED

THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

BY-LAW NUMBER 043-2019

Being a by-law to delegate authority to the Chief Administrative Officer (CAO) to approve the temporary use of the Puslinch Community Centre and Township Municipal Office parking lot lands.

WHEREAS the *Municipal Act*, S.O. 2001, c.25 authorizes a municipality to delegate its powers and duties;

AND WHEREAS Council deems it expedient to delegate authority to the Chief Administrative Officer (CAO) to approve the temporary use of the Puslinch Community Centre and Township Municipal Office parking lot lands.

NOW THEREFORE the Corporation of the Township of Puslinch hereby enacts as follows:

1. That the CAO is hereby authorized to approve the temporary use of the Puslinch Community Centre and Township Municipal Office parking lot lands.

READ A FIRST, SECOND AND THIRD TIME AND FINALLY PASSED THIS 17th DAY OF JULY 2019.

James Seeley, Mayor

Nina Lecic, Deputy Clerk

THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

BY-LAW 044-2019

A by-law to establish development charges for the Corporation of the Township of Puslinch

WHEREAS the Township of Puslinch will experience growth through development and re-development; and

WHEREAS development and re-development requires the provision of physical and social services by the Township of Puslinch; and

WHEREAS Council desires to ensure that the capital cost of meeting growth-related demands for or burden on municipal services does not place an excessive financial burden on the Township of Puslinch or its existing taxpayers while at the same time ensuring new taxpayers contribute no more than the net capital cost attributable to providing the current level of municipal services; and

WHEREAS the Development Charges Act, 1997 (the "Act") provides that the council of a municipality may by by-law impose development charges against land to pay for increased capital costs required because of increased needs for services; and

WHEREAS a development charge background study has been completed in accordance with the Act; and

WHEREAS the Council of The Corporation of the Township of Puslinch has given notice of and held a public meeting on the 19th day of June, 2019 in accordance with the Act and the regulations thereto;

NOW THEREFORE the Council of the Corporation of the Township of Puslinch enacts as follows:

1. **INTERPRETATION**

1.1 In this by-law the following items shall have the corresponding meanings:

"Act" means the *Development Charges Act*, as amended, or any successor thereof;

"accessory use" means where used to describe a use naturally and normally incidental to, subordinate to or exclusively devoted to a principal use and located on the same lot;

"agricultural use" means the use of land and **buildings** for the growing of crops, including nursery, biomass, and horticultural crops; raising of livestock; raising of other animals for food, fur or fibre, including: horses (including the accessory training and/or riding of boarded horses) to a maximum of 20 horses; poultry and fish; aquaculture; apiaries; agro-forestry; maple syrup production; and associated **on-farm buildings** and structures and **accessory uses, buildings,** and structures, including an accessory outdoor storage area;

"apartment unit" means any residential unit within a **building** containing three or more **dwelling units** where access to each residential unit is obtained through a

common entrance or entrances from the street level and the residential units are connected by an interior corridor;

"bedroom" means a habitable room larger than seven square metres, including a den, study or other similar area, but does not include a bathroom, living room, dining room or kitchen;

"board of education" has the same meaning as set out in the *Education Act*, R.S.O. 1990, Chap. E.2, as amended, or any successor thereof;

"Building" means a permanent enclosed structure occupying an area greater than ten square metres (10 m²) and, notwithstanding the generality of the foregoing, includes, but is not limited to:

- (a) An above-grade storage tank;
- (b) An air-supported structure or canopy;
- (c) An industrial tent;
- (d) A roof-like structure over a gas-bar or service station; and
- (e) An area attached to and ancillary to a retail **development** delineated by one or more walls or part walls, a roof-like structure, or any one or more of them.

"Building Code Act" means the *Building Code Act*, S.O. 1992, as amended, or any successor thereof;

"canopy" means a canopy as defined O.Reg. 332/12 under the **Building Code Act** and includes a roof-like structure over a gas bar or service station;

"capital cost" means costs incurred or proposed to be incurred by the **Township** or a **local board** thereof directly or by others on behalf of and as authorized by the **Township** or **local board**,

- (a) to acquire land or an interest in land, including a leasehold interest,
- (b) to improve land,
- (c) to acquire, lease, construct or improve **buildings** and structures,
- (d) to acquire, construct or improve facilities including,
 - (i) furniture and equipment other than computer equipment, and
 - (ii) material acquired for circulation, reference or information purposes by a library board as defined in the Public Libraries Act, R.S.O. 1990, Chap. P.44, as amended, or any successor thereof; and
 - (iii) rolling stock with an estimated useful life of seven years or more, and
- (e) to undertake studies in connection with any matter under the **Act** and any of the matters in clauses (a) to (d) above, including the development charge background study

required for the provision of **services** designated in this by-law within or outside the **Township**, including interest on borrowing for those expenditures under clauses (a) to (e) above that are growth-related;

"commercial" means a building, structure, lot, use or activity pertaining to the buying or selling of commodities or the supplying of services for remuneration, but does not include industrial or agricultural uses, but does include hotels, motels, motor inns and boarding, lodging and rooming houses;

"Council" means the Council of the **Township**;

"development" means the construction, erection or placing of one or more **buildings** or structures on land or the making of an addition or alteration to a **building** or structure that has the effect of increasing the size or usability thereof, and includes redevelopment;

"development charge" means a charge imposed with respect to this by-law;

"dwelling unit" means any part of a **building** or structure used, designed or intended to be used as a housekeeping unit, used, or capable of being used by one or more persons, and containing cooking, living, sleeping and sanitary facilities;

"existing" means the number, use and size that existed as of the date this by-law was passed;

"Existing Industrial Building" means a **building** or **buildings** with a valid building permit existing on a site on the day this by-law is passed, or the first **building** or **buildings** constructed on a vacant site pursuant to site plan approval, under Section 41 of the *Planning Act*, subsequent to the passage of this by-law for which full **development charges** were paid, that is used for or in conjunction with:

- (a) the production, compounding, processing, packaging, crating, bottling, packing or assembly of raw or semi-processed goods or materials in not less than seventy five percent of the total **gross floor area** of the **building** or **buildings** on a site ("manufacturing") or warehousing related to the manufacturing use carried on in the **building** or **buildings**;
- (b) research or development activities in connection with manufacturing in not less than seventy five percent of the total **gross floor area** of the **building** or **buildings** on the site;
- (c) retail sales by a manufacturer, if retail sales are at the site where manufacturing is carried out; such retail sales are restricted to goods manufactured at the site, and the **building** or part of a **building** where such retail sales are carried out does not constitute greater than twenty five percent of the total **gross floor area** of the **building** or **buildings** on the site; or
- (d) office or administration purposes if they are:
 - (i) carried out as an **accessory use** to the manufacturing or warehousing, and
 - (ii) in or attached to the **building** or structure used for such manufacturing or warehousing.

"farm Building" means a **building** or structure associated with and located on land devoted to the practice of farming and that is used essentially for the housing of farm equipment or livestock or the growing, harvesting, or storage of agricultural and horticultural produce or feeds and as part of or in connection with a bona fide farming operation and includes barns, silos and other **buildings** or structures ancillary to that farming operation, including greenhouses, but excludes:

- (a) a **residential use**, with the exception of a secondary modular dwelling for seasonal farm workers required for that farm operation; and
- (b) any **building** or portion thereof used or intended to be used for any other **non-residential use**, including **commercial** and **industrial**.

"gross floor area" means: the sum total of the total areas of the floors in a **building** or structure, whether at, above, or below grade, measured between the exterior faces of the exterior walls of the **building** or structure or from the centre line of a common wall separating two uses, or from the outside edge of a floor where the outside edge of the floor does not meet an exterior or common wall, and:

- (a) includes the floor area of a mezzanine and air -supported structure and the space occupied by interior walls partitions; and
- (b) in the case of **non-residential uses**, excludes any parts of the **building** or structure used for mechanical equipment related to the operation or maintenance of the **building** or structure, stairwells, elevators, washrooms, and the parking and loading of vehicles, and;
- (c) where a **building** does not have any walls, the **gross floor area** shall be the sum total of the area of land directly beneath the roof of the **building** and the total areas of the floors in the **building** or structure.

"industrial" means lands, **buildings** or structures used or designed or intended for use for the processing of goods and materials; the assembly of manufactured goods; the manufacturing of goods; the repair and servicing of goods and similar uses; including any permanent storage facilities or accessory equipment that is in conjunction with the use and includes office uses and the sale of commodities to the general public where such uses are accessory to an industrial use, but does not include a motor vehicle service establishment, motor vehicle body shop, or the sale of commodities to the general public through a warehouse club;

"institutional" means land, **buildings**, structures or any part thereof used by any organization, group or association for promotion of religious, charitable, educational, welfare purposes, and includes churches, places of worship, public or private schools and nursery schools, or benevolent objectives and not for profit or gain;

"local board" means a local board as defined in section 1 of the Municipal Affairs Act other than a board as defined in subsection 1 (1) of the Education Act.

"multiple dwellings" means all dwellings other than single-detached, **semi-detached** and **apartment unit** dwellings;

"non-residential use" means a **building** or structure of any kind whatsoever used, designed or intended to be used for other than a **residential use**;

"Official Plan" means the Official Plan adopted by the County of Wellington for the **Township**, as amended and approved;

"owner" means the owner of land or a person who has made application for an approval for the **development** of land upon which a **development charge** is imposed'

"regulation" means any regulation made pursuant to the **Act**;

"residential dwelling" means a **building**, occupied or capable of being occupied as a home, residence or sleeping place by one or more persons, containing one or more **dwelling units** including modular homes but not including motels, hotels, tents, truck campers, tourist trailers, mobile camper trailers or boarding, lodging or rooming houses;

"residential use" means the use of a **building** or structure or portion thereof for one or more **dwelling units**. This also includes a **dwelling unit** on land that is used for an **agricultural use**;

"row dwelling" means a **building** containing three or more attached **dwelling units** in a single row, each of which **dwelling units** has an independent entrance from the outside and is vertically separated from any abutting **dwelling unit**;

"semi-detached dwelling" means a **dwelling unit** in a residential **building** consisting of two **dwelling units** having one vertical wall or one horizontal wall, but not other parts, attached or another **dwelling unit** where the residential unit are not connected by an interior corridor;

"service" means a service designed in Schedule "A" to this by-law, and "services" shall have a corresponding meaning;

"single detached dwelling unit" means a residential **building** consisting of one **dwelling unit** and not attached to another structure;

"Township" means the corporation of the Township of Puslinch and/or the land within the geographic limits of the Township of Puslinch; and

"Zoning by-law" means the Zoning By-Law of the **Township** or any successor thereof passed pursuant to Section 34 of the Planning Act, S.O. 1998.

2. DESIGNATION OF SERVICES

2.1 The categories of **services** for which **development charges** are imposed under this by-law are as follows:

- (a) Roads and Related;
- (b) Fire Protection Services;

(c) Parks and Recreation Services; and

(d) Administration Services

2.2 The components of the **services** designated in section 2.1 are described in Schedule A.

3. **APPLICATION OF BY-LAW RULES**

3.1 **Development charges** shall be payable in the amounts set out in this by-law where:

(a) the lands are located in the area described in section 3.2; and

(b) the **development** of the lands requires any of the approvals set out in subsection 3.4(a)

Area to Which by-law Applies

3.2 Subject to section 3.3, this by-law applies to all lands in the **Township** whether or not the land or use thereof is exempt from taxation under s. 13 of the Assessment Act.

3.3. Notwithstanding clause 3.2 above, this by-law shall not apply to lands that are owned by and used for the purposes of:

(a) the **Township** or a **local board** thereof;

(b) a **board of education**; or

(c) the County of Wellington or any **local board** thereof;

Approvals for Development

3.4 (a) **Development charges** shall be imposed on all lands, **buildings** or structures that are developed for **residential uses** or **non-residential uses** if the **development** requires one or more of the following:

(i) the passing of a **zoning by-law** or of an amendment to a **zoning by-law** under section 34 of the Planning Act;

(ii) the approval of a minor variance under section 45 of the Planning Act;

(iii) a conveyance of land to which a by-law passed under subsection 50(7) of the Planning Act applies;

(iv) the approval of a plan of subdivision under section 51 of the Planning Act;

(v) a consent under section 53 of the Planning Act;

(vi) the approval of a description under section 50 of the Condominium Act, R.S.O. 1990, Chap. C.26, as amended, or any successor thereof; or

(vii) the issuing of a building permit under the **Building Code Act** in relation to a **building** or structure.

(b) No more than one **development charge** for each **service** designated in subsection 2.1 shall be imposed upon any lands, **buildings** or structures to which this by-law applies even though two or more of the actions described in subsection 3.4(a) are required before the lands, **buildings** or structures can be developed. shall be imposed if the subsequent action has the effect of increasing the need for **services**.

(c) Despite subsection 3.4(b), if two or more of the actions described in subsection 3.4(a) occur at different times, additional **development charges** shall be imposed if the subsequent action has the effect of increasing the need for **services**.

Exemptions

3.5 Notwithstanding the provisions of this by-law, **development charges** shall not be imposed with respect to:

(a) an enlargement to an **existing dwelling unit**;

(b) one or two additional **dwelling units** in an **existing single detached dwelling**; or

(c) one additional **dwelling unit** in any other **existing residential building**;

3.6 Notwithstanding section 3.5(b), **development charges** shall be imposed if the total **gross floor area** of the additional one or two **dwelling units** exceeds the **gross floor area** of the **existing dwelling unit**.

3.7 Notwithstanding section 3.5, **development charges** shall be imposed if the additional **dwelling unit** has a **gross floor area** greater than

(i) in the case of a **semi-detached dwelling** or **row dwelling**, the **gross floor area** of the **existing dwelling unit**; and

(ii) in the case of any other residential **building**, the **gross floor area** of the smallest **dwelling unit** contained in the residential **building**.

3.8 Exemption for Industrial Development:

3.8.1 Notwithstanding any other provision of this by-law, no **development charge** is payable with respect to an enlargement of the **gross floor area** of an **existing industrial building** where the **gross floor area** is enlarged by 50 percent or less.

3.8.2 If the **gross floor area** of an **existing industrial building** is enlarged by greater than 50 percent, the amount of the **development charge** payable in respect of the enlargement is the amount of the **development charge** that would otherwise be payable multiplied by the fraction determined as follows:

1) determine the amount by which the enlargement exceeds 50 percent of the **gross floor area** before the enlargement;

2) divide the amount determined under subsection 1) by the amount of the enlargement

3.9 For the purpose of section 3.8 herein, "**existing industrial building**" is used as defined in the **regulation** made pursuant to the **Act**.

3.10 Other Exemptions:

Notwithstanding the provision of this by-law, **development charges** shall not be imposed with respect to:

- (a) Temporary use permitted under a **zoning by-law** under Section 39 of the Planning Act;
- (b) **Accessory use**;
- (c) A home occupation;
- (d) Non-residential **farm buildings** used for agricultural purposes; and
- (e) **Institutional** use.

Amount of Charges

Residential

3.11 The **development charges** described in Schedule B to this by-law shall be imposed on **residential uses** of lands, **buildings** or structures, including a **dwelling unit** accessory to a **non-residential use** and, in the case of a mixed use **building** or structure, on the **residential uses** in the mixed use **building** or structure, according to the type of residential unit, and calculated with respect to each of the **services** according to the type of **residential use**.

Non-Residential

3.12 The **development charges** described in Schedule B to this by-law shall be imposed on **non-residential uses** of lands, **buildings** or structures, and, in the case of a mixed use **building** or structure, on the **non-residential uses** in the mixed use **building** or structure, and calculated with respect to each of the **services** according to the total floor area of the **non-residential use**.

Reduction of **Development Charges** for Redevelopment

3.13 Despite any other provisions of this by-law, where, as a result of the redevelopment of land, a **building** or structure **existing** on the same land within 60 months prior to the date of payment of **development charges** in regard to such redevelopment was, or is to be demolished, in whole or in part, or converted from one principal use to another principal use on the same land, in order to facilitate the redevelopment, the **development charges** otherwise payable with respect to such redevelopment shall be reduced by the following amounts:

- (a) in the case of a residential **building** or structure, or in the case of a mixed-use **building** or structure, the **residential uses** in the mixed-use **building** or structure, an amount calculated by multiplying the applicable **development charge** under subsection 3.11 by the number, according to

type, of **dwelling units** that have been or will be demolished or converted to another principal use; and

- (b) in the case of a non-residential **building** or structure or, in the case of mixed-use **building** or structure, the **non-residential uses** in the mixed-use **building** or structure, an amount calculated by multiplying the applicable **development charges** under subsection 3.12, by the **gross floor area** that has been or will be demolished or converted to another principal use;

provided that such amounts shall not exceed, in total, the amount of the **development charges** otherwise payable with respect to the redevelopment.

Time of Payment of **Development Charges**

3.14 **Development charges** imposed under this by-law are calculated, payable, and collected upon issuance of a building permit for the **development**, except for roads and related **services** where at the discretion of **Council** shall be payable immediately upon the **owner** entering into subdivision agreement or consent agreement.

3.15 Despite section 3.14, **Council** from time to time, and at any time, may enter into agreements providing for all or any part of a **development charge** to be paid before or after it would otherwise be payable, in accordance with section 27 of the **Act**.

4. **PAYMENT BY SERVICES**

4.1 Despite the payment required under subsections 3.11 and 3.12, **Council** may, by agreement, give a credit towards a **development charge** in exchange for work that relates to a **service** to which a **development charge** relates under this by-law.

5. **INDEXING**

5.1 **Development charges** imposed pursuant to this by-law shall be adjusted annually, without amendment to this by-law, on January 1st of each year, in accordance with the prescribed index in the **Act**.

6. **SCHEDULES**

6.1 The following schedules shall form part of this by-law:

Schedule A - Components of **Services** Designated in subsection 2.1

Schedule B - Residential and Non-Residential Schedule of **Development Charges**

7. **CONFLICTS**

7.1 Where the **Township** and an **owner** or former **owner** have entered into an agreement with respect to land within the area to which this by-law applies, and a conflict exists between the provisions of this by-law and such agreement, the provisions of the agreement shall prevail to the extent that there is a conflict.

7.2 Notwithstanding section 7.1, where a **development** which is the subject of an agreement to which section 7.1 applies, is subsequently the subject of one or **more** of the actions described in subsection 3.4(a), an additional **development charge** in respect of the **development** permitted by the action shall be calculated, payable and collected in accordance with the provisions of this by-law if the **development** has the effect of increasing the need for **services**, unless such agreement provides otherwise.

8. SEVERABILITY

8.1 If, for any reason, any provision of this by-law is held to be invalid, it is hereby declared to be the intention of **Council** that all of the remainder of this by-law shall continue in full force and effect until repealed, re-enacted, amended or modified.

9. DATE BY-LAW IN FORCE

9.1 This by-law shall come into effect at 12:01 AM on September 3, 2019.

10. DATE BY-LAW EXPIRES

10.1 This by-law will expire at 12:01 AM on September 3, 2024 unless it is repealed by **Council** at an earlier date.

10. EXISTING BY-LAW REPEALED

11.1 By-law 054/14 is hereby repealed as of the date and time of this by-law coming into effect.

READ A FIRST, SECOND AND THIRD TIME AND FINALLY PASSED THIS 17th DAY OF JULY, 2019.

James Seeley, Mayor

Nina Lecic, Deputy Clerk

SCHEDULE "A" TO BY-LAW No. 044-2019

COMPONENTS OF SERVICES DESIGNATED IN SUBSECTION 2.1

100% Eligible Services

Roads and Related

Roads

Bridges and Culverts

Public Works Facilities

Vehicles and Equipment

Fire Protection Services

Fire Facilities

Fire Vehicles

Fire Fighter Equipment

90% Eligible Services

Administration Services

Growth Related Studies

Parks and Recreation

Parkland Development

Recreation Facilities

Parks and Recreation Vehicles and Equipment

SCHEDULE "B"

BY-LAW NO. 044-19

SCHEDULE OF DEVELOPMENT CHARGES

Service	RESIDENTIAL				NON-RESIDENTIAL
	Single and Semi-Detached Dwelling	Apartments - 2 Bedrooms +	Apartments - Bachelor and 1 Bedroom	Other Multiples	(per sq.ft. of Gross Floor Area)
Municipal Wide Services:					
Roads and Related	\$ 2,834	\$ 1,541	\$ 1,310	\$ 2,120	\$ 0.98
Fire Protection Services	\$ 1,378	\$ 749	\$ 637	\$ 1,031	\$ 0.47
Parks and Recreation Services	\$ 667	\$ 363	\$ 308	\$ 499	\$ 0.04
Administration - Studies	\$ 329	\$ 179	\$ 152	\$ 246	\$ 0.11
Total Municipal Wide Services	\$ 5,208	\$ 2,832	\$ 2,407	\$ 3,896	\$ 1.60

THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

BY-LAW NUMBER 045-2019

BEING A BY-LAW TO APPOINT NINA LECIC AS MUNICIPAL CLERK

WHEREAS the *Municipal Act, S.O. 2001, c. 25*, as amended provides that Council of a municipality shall appoint a Clerk;

AND WHEREAS it is deemed expedient to appoint a Municipal Clerk;

NOW THEREFORE the Council of the Corporation of the Township of Puslinch enacts as follows:

1. That Nina Lecic be and is hereby appointed Clerk for the Township of Puslinch.
2. That this By-law shall come into effect on July 17, 2019.

READ A FIRST, SECOND AND THIRD TIME AND FINALLY PASSED THIS 17th DAY OF JULY 2019.

James Seeley, Mayor

Nina Lecic, Deputy Clerk

THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

BY-LAW NUMBER 046-2019

**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 Sections 34, 39 and 39.1 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 By-law 19/85 is hereby amended by rezoning Part of Lot 32, Concession 8, municipally referred to as 4188 Victoria Road South, from a site specific AGRICULTURAL (A-42) ZONE to an amended, site specific **AGRICULTURAL (A-42) ZONE**, as shown on schedule "A" of this By-law.
2. That subsection 5(4) SPECIAL PROVISIONS of the Agricultural Zone is amended by repealing site specific provisions A-42 and replacing it with the following, amended site specific provision:

"(pp) A-42 (Temporary Use – Garden Suite)

Notwithstanding any provisions of this By-law to the contrary and in addition to the uses permitted under subsection 5(2), the land zone A-42 on Schedule "A" may also be permitted a garden suite subject to the following special provisions:

(i) Zone Requirements

The applicable regulations of Sections 3 and 5 shall apply to the subject land.

(ii) Expiration of Garden Suite Use

This garden suite is a temporary use, established by By-law No. ___/2019 and shall be in effect for a maximum of 10 years from the date of passage of this By-law (to July 17th, 2029). Upon the expiry of this time period, unless extended by further amendment(s) to this By-law, the subject land shall revert to the original Agricultural (A) Zone whereby a garden suite is not a permitted use."

3. That the subject land as shown on Schedule "A" to this By-Law shall be subject to all applicable regulations of Zoning By-Law 19/85, as amended.
4. 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 17th DAY OF JULY, 2019.

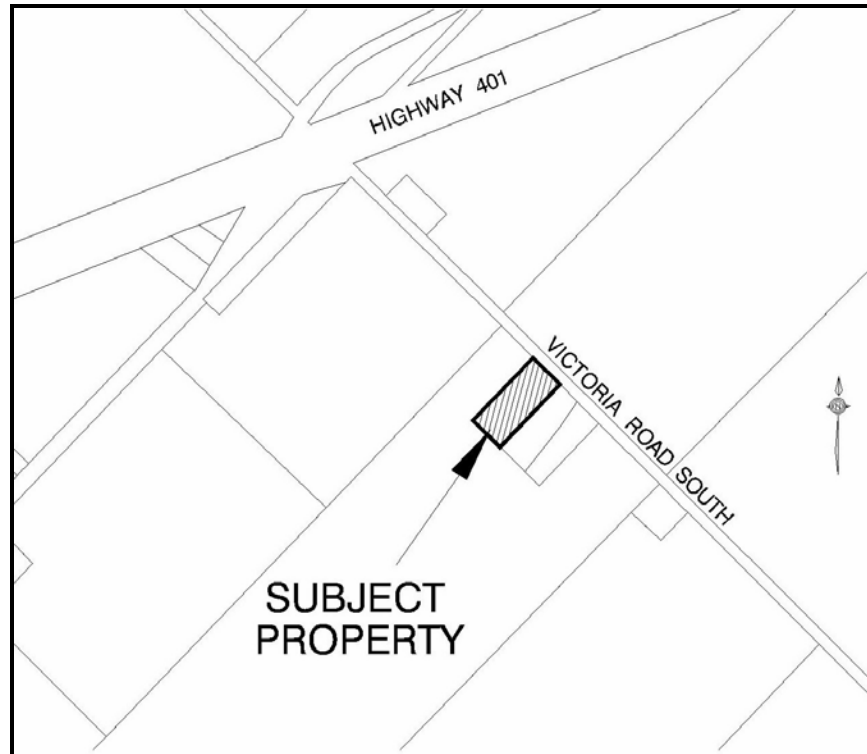
James Seeley, Mayor

Nina Lecic, Deputy Clerk

THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

BY-LAW NUMBER 046-2019

Schedule "A"



Highlighted area to be rezoned from "A-42" Zone to an amended "A-42" Zone

This is Schedule "A" to By-law No. 046-2019
Passed this 17th day of July, 2019

James Seeley, Mayor

Nina Lecic, Deputy Clerk

THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

BY-LAW NUMBER 047-2019

**A BY-LAW TO AMEND BY-LAW NUMBER 023/18, 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 023/18 pursuant to Sections 34, 39 and 39.1 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 By-law 023/18 is hereby amended by rezoning Part of Lot 32, Concession 8, municipally referred to as 4188 Victoria Road South, from a temporary use provision AGRICULTURAL (A-t¹) ZONE to an amended, temporary use provision **AGRICULTURAL (A-t¹) ZONE**, as shown on schedule "A" of this By-law.
2. That Section 16 Temporary Use Provisions of the Agricultural Zone is amended by repealing temporary use provision **AGRICULTURAL (A-t¹) ZONE** and replacing it with the following, amended temporary use provision:

No.	Zone Designation	Temporary Uses	Date Enacted	Date Expired
1	A	Garden suite with a max. floor area of 110 m²	July 17, 2019	July 17, 2029

3. That the subject land as shown on Schedule "A" to this By-Law shall be subject to all applicable regulations of Zoning By-Law 023/18, as amended.
4. 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 17th DAY OF JULY, 2019.

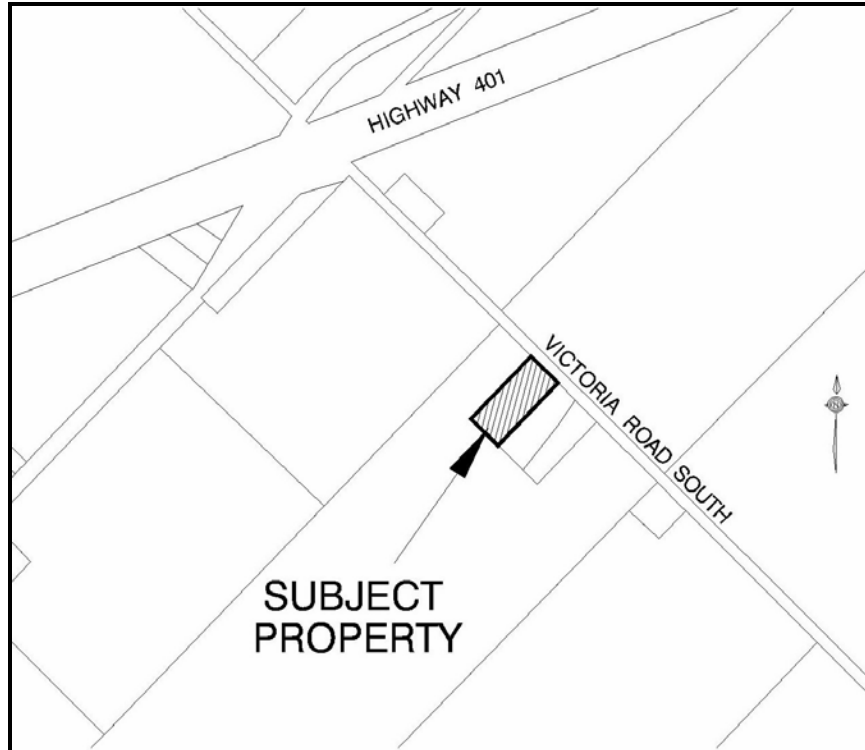
James Seeley, Mayor

Nina Lecic, Deputy Clerk

THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

BY-LAW NUMBER 047-2019

Schedule "A"



Highlighted area to be rezoned from "A-t¹" Zone to and amended "A-t¹" Zone

This is Schedule "A" to By-law No. 047-2019
Passed this 17th day of July, 2019.

James Seeley, Mayor

Nina Lecic, Deputy Clerk

THE CORPORATION OF THE TOWNSHIP OF PUSLINCH

BY-LAW NUMBER 048-2019

Being a by-law to confirm the proceedings of the Council of the Corporation of the Township of Puslinch at its Regular Council meeting held on July 17, 2019.

WHEREAS by Section 5 of the *Municipal Act, 2001, S.O. 2001, c.25* the powers of a municipal corporation are to be exercised by its Council;

AND WHEREAS by Section 5, Subsection (3) of the *Municipal Act*, a municipal power including a municipality's capacity, rights, powers and privileges under section 8, shall be exercised by by-law unless the municipality is specifically authorized to do otherwise;

AND WHEREAS it is deemed expedient that the proceedings of the Council of the Corporation of the Township of Puslinch at its Regular Council meeting held on July 17, 2019 be confirmed and adopted by By-law;

NOW THEREFORE the Council of the Corporation of the Township of Puslinch hereby enacts as follows:

- 1) The action of the Council of the Corporation of the Township of Puslinch, in respect of each recommendation contained in the reports of the Committees and each motion and resolution passed and other action taken by the Council at said meeting are hereby adopted and confirmed.
- 2) The Head of Council and proper official of the Corporation are hereby authorized and directed to do all things necessary to give effect to the said action of the Council.
- 3) The Head of Council and the Clerk are hereby authorized and directed to execute all documents required by statute to be executed by them, as may be necessary in that behalf and the Clerk authorized and directed to affix the seal of the said Corporation to all such documents.

READ A FIRST, SECOND AND THIRD TIME AND FINALLY PASSED THIS 17th DAY OF JULY, 2019.

James Seeley, Mayor

Nina Lecic, Deputy Clerk