



Regular Council Meeting Agenda

May 19, 2020, 6:00 pm

Location: <https://www.youtube.com/user/EssexOntario>

Accessible formats or communication supports are available upon request. Please contact the Clerk's Office at clerks@essex.ca or 519-776-7336 extension 1100 or 1101.

Pages

1. Call to Order

2. Closed Meeting Report

3. Declarations of Conflict of Interest

4. Adoption of Published Agenda

4.1 Regular Council Meeting Agenda for May 19, 2020

Moved by _____

Seconded by _____

That the published agenda for the May 19, 2020 Regular Council Meeting, be adopted as presented / amended.

5. Adoption of Minutes

5.1 Regular Council Meeting Minutes for May 4, 2020

1

Moved by _____

Seconded by _____

That the minutes of the Regular Council Meeting held May 4, 2020, be adopted as circulated.

5.2 Special Council Meeting Minutes for May 1, 2019

8

Moved by _____

Seconded by _____

That the minutes of the Special Council Meeting held May 1, 2019, to review the Town of Essex 2019 Development Charges Study, be adopted as circulated.

6. Public Presentations

6.1 E.L.K. Energy Inc.

10

Mark Danelon, Director, Finance & Regulatory Affairs

Presentation of E.L.K. Energy Inc. 2019 Financial Statements

- Resolutions of the Sole Shareholder of E.L.K. Energy Inc.

Moved by _____

Seconded by _____

That the presentation by E.L.K. Energy Inc. Director, Finance and Regulatory Affairs, Mark Danelon, of the 2019 Financial Statements for E.L.K. Energy Inc. for the year ending December 31, 2019, be received; and

That Council supports the signing of the annual resolutions of E.L.K. Energy Inc. appointing the Directors and KPMG LLP as Auditor; and

That the Mayor be thereby authorized to sign the documents on behalf of The Corporation of the Town of Essex.

7. Unfinished Business

8. Reports from Administration

8.1 Chief Administrative Officer (CAO) Verbal Report

RE: COVID-19 Town's Response Updates

8.2 Economic Development Report 2020-05

46

- April 2020 Building Report
- Development Overview

Moved by _____

Seconded by _____

That Economic Development Report 2020-05, entitled "Building Report and Development Overview April 2020", prepared by Nelson Silveira, Economic Development Officer, dated May 19, 2020, be received.

8.3 Drainage Report 2020-04

54

RE: Adoption of Section 77(3) Engineer's Letter of Opinion for the Essex Outlet Drain

- Letter of Opinion - Essex Outlet
- Appendix A - Essex Outlet Drain - Recommended Plan
- Appendix B - Final Hwy 3 Culvert Hydrology and Condition Report
- **By-Law 1913**
Being a by-law to adopt the Section 77(3) Engineer's Letter of Opinion to relocate the Essex Outlet Drain within the Ministry of Transportation Corridor

Moved by _____

Seconded by _____

That Drainage Report 2020-04, entitled "Adoption of Section 77(3) Engineer's Letter of Opinion for the Essex Outlet Drain", prepared by Norm Nussio, Manager Operations Drainage, dated May 19, 2020, be received and supported; and

That By-Law 1913 being a by-law to adopt Section 77(3) Engineer's Letter of Opinion to relocate the Essex Outlet Drain within the Ministry of Transportation (MTO) corridor, be read a first, a second and third time and finally passed on May 4, 2020.

8.4 Parks and Facilities Report 2020-02

213

RE: Results of Request for Tender - Remove, Supply and Install Four Condensing Boilers

Moved by _____

Seconded by _____

That Parks and Facilities Report 2020-02, entitled "Results of Request

for Tender - Remove, Supply and Install Four Condensing Boilers", prepared by Jackson Tang, Assistant Manager, Business Services, dated May 19, 2020, be received; and

That Council awards the Request for Tender - Remove, Supply and Install Four Condensing Boilers to Lekter Industrial Services Inc. in the amount of \$68,992.27 including non-refundable HST; and

That Council approves the addition of a third domestic hot water boiler at the Essex Centre Sports Complex and the funding of this new capital asset in the amount of \$15,820.00 including non-refundable HST be purchased by re-allocating \$10,000.00 from project CS-20-0047 (new Mural) and that the remaining \$5,820.00 to be funded through a forecasted under expenditure in the Essex Centre Sports Complex 's 2020 operating budget account "Building and Repairs - Other (52900)".

8.5 Parks and Facilities Report 2020-05

218

RE: Results of Request for Tender for Colchester Harbour Dock B Replacement

Moved by _____

Seconded by _____

That Parks and Facilities Report 2020-05, entitled "Results of Request for Tender for Colchester Harbour Dock B Replacement", prepared by Jackson Tang, Assistant Manager, Business Services dated May 19, 2020, be received; and

That Council awards the Request for Tender for Colchester Harbour Dock B Replacement to Kropf Instrustrial Inc. in the amount of \$160,180.42 including non-refundable HST.

8.6 Operations Report 2020-02

222

RE: Results of Request for Tender - Supply and Application of Maintenance Stone 2020

Moved by _____

Seconded by _____

That Operations Report 2020-02, entitled "Results of Request for Tender - Supply and Application of Maintenance Stone 2020", prepared by Jackson Tang, Assistant Manager, Business Services, dated May 19, 2020, be received; and

That Council awards the Request for Tender - Supply and Application of Maintenance Stone 2020 to Southwestern Sales Corporation Limited in the amount of \$160,000.00 including non-refundable HST.

8.7 Planning Report 2020-09

226

RE: Repeal of Subdivision Agreement (Parts 1 & 2 on 12R27717)

- By-Law 1915
Being a by-law to release the Subdivision Agreement over Parts 1 and 2 on 12R27717

Moved by _____

Seconded by _____

That Planning Report 2020-09, entitled "Repeal of Subdivision Agreement (Parts 1 and 2 on 12R27717)", prepared by Rita Jabbour, Manager, Planning Services, dated May 19, 2020, be received; and

That By-Law 1915, being a by-law to release the Subdivision Agreement over Parts 1 and 2 on 12R27717, be read a first, a second and a third time and finally passed on May 19, 2020; and

That the Town's Solicitor/Clerk be directed to execute all documents necessary to give effect to the actions taken by this Council as described in By-Law 1915.

8.8

Operations Report 2020-03

232

RE: Results of Request for Tender - Supply of Winter Control Equipment for a Tandem Plow Truck and Supply of a Tandem Plow Truck Cab and Chassis 2020

Moved by _____

Seconded by _____

That Operations Report 2020-03, entitled "Results of Request for Tender - Supply of Winter Control Equipment for a Tandem Plow Truck and Supply of a Tandem Plow Truck Cab and Chassis 2020, prepared by Jackson Tang, Assistant Manager, Business Services, be received; and

That Council awards the Request for Tenders as follows:

1. Supply of Winter Control Equipment for a Tandem Plow Truck with Stainless Steel Dump Body to Viking Chives Ltd. in the amount of \$144,888.94 including non-refundable HST.
2. Supply of Tandem Plow Truck Cab and Chassis 2020 to Team Truck Centres Ltd. in the amount of \$160,148.80 including non-refundable HST; and

That Council approves the additional funding of \$25,037.74 above the approved 2020 Capital Budget of \$280,000.00 for the Supply of Winter Control Equipment for a Tandem Plow Truck and Supply of a Tandem Plow Truck Cab and Chassis (project PW-20-0001) from the Town's Asset Management Lifecycle Reserve.

9. Reports from Youth Members

10. County Council Update

11. Correspondence

11.1 Correspondence to be received

Moved by _____

Seconded by _____

That the correspondence listed in Agenda Item 11.1 be received and, where indicated, to further share such information with the community using suitable methods of communication.

11.1.1 COVID-19 Virus Correspondence

11.1.1.1 Media Release - Town of Essex237

RE: Fun Fest and spring programs cancelled, limit on

11.1.1.2	Office of the Premier - NEWS	239
	RE: Declaration of Emergency Extended While Ontario Gradually Reopens the Economy	
11.1.2	Town of Grimsby	241
	RE: Support for Commerical Rent Assistance Programs	
	Correspondence dated May 6, 2020 advising of the Town of Grimsby Council supports Commercial Rent Assistance Programs	
11.1.3	AMO Releases OPP Detachment Boards Discussion Papers	244
	<ul style="list-style-type: none"> New Ontario Provincial Police Detachment Boards: Building a Framework for Better Policing Governance Discussion Paper (May 1, 2020) 	
11.1.4	Essex-Windsor Solid Waste Authority Landfill Liaison Committee Meeting	262
	May 20, 2020 Agenda	
	<ul style="list-style-type: none"> Dialing In Instructions 	
11.1.5	Windsor-Essex County Health Unit	383
	RE: Proposed Cannabis Retailer in the Town of Essex, located at 6 King Street East, Harrow	
	Correspondence, dated May 13, 2020 providing Council with their response to the pending approval of the Cannabis Retail Store Authorization application of 6 King Street East, Harrow.	
11.2	Correspondence to be considered for receipt and support	
11.2.1	Township of Armour	387
	RE: Support Resolution - High Speed Internet Connectivity in Rural Ontario	
	Correspondence from the Township of Armour, dated April 29, 2020 to the Honourable Doug Ford supporting the need to make substantial investments in high-speed internet connectivity in the rural areas of Ontario.	
	Moved by _____	
	Seconded by _____	
	That correspondence from the Township of Armour, dated April 29, 2020 to the Premier of Ontario, supporting the need to make substantial investments in high-speed internet connectivity in the rural areas of Ontario, be (received/received and supported); and	
	If Council choses to support their resolution a letter of support be sent to The Honourable Doug Ford, Premier of Ontario and that a copy of the letter of support be sent to Taras Natyshak, MPP, Essex, Chris Lewis, MP, Essex and the Township of Armour.	

RE: Applications Undergoing Public Notice

- Cannabis Application in Harrow - 6 King Street East

Moved by _____

Seconded by _____

That correspondence from the Alcohol and Gaming Commission of Ontario notifying Council of a application for a Cannabis Retail Store at 6 King Street in Harrow, be (received/received and supported); and

If Council choses to file an objection to the application, a letter be sent to the Alcohol and Gaming Commission of Ontario stating the reasons for the objection.

12. Committee Meeting Minutes

12.1 Essex Police Services Board - May 7, 2020

394

(EPSB-20-05-18) That the March 3, 2020 correspondence from Mayor Snively advising of a leave of absence as a member of the Police Services Board, be received and accepted;

That Essex Town Council be requested to appoint another Council member to service on the Police Services Board during the Mayor's leave of absence period; and

That Vice Chair Verbeek serve as Chair of the Police Services Board in place of the Mayor during the Mayor's leave of absence.

Moved by _____

Seconded by _____

That the Police Services Board Meeting minutes dated May 7, 2020, be received and adopted as circulated; and

That the Town of Essex Council appoints _____, to serve on the Police Services Board for the duration of the Mayor's leave of absence.

13. Financial

14. New Business

15. Notices of Motion

15.1 The following Notice of Motion was presented at the May 4, 2020 Regular Council Meeting, and is being brought forward for consideration this evening:

15.1.1 Councillor Bondy - Mayor's List of Round Table Items "Shoreline Protection of Public Property"

399

Moved by Councillor Bondy

Seconded by _____

That Council bring forward the item listed as "shoreline protection of public property" from the Mayor's list of round table items, in order to discuss and give direction to Administration as it relates to potential liability, budget

considerations, shoreline protection of public property policy, timelines and fallen trees policy during this time of historic high water levels.

16. Reports and Announcements from Council Members

17. By-Laws

17.1 By-Laws that require a third and final reading

17.1.1 By-Law 1911 400

Being a by-law to confirm the proceedings of the May 4, 2020 Regular Meeting of the Council of The Corporation of Town of Essex

Moved by _____

Seconded by _____

That By-Law 1911 being a by-law to confirm the proceedings of the May 4, 2020 Regular Meeting of the Council of The Corporation of the Town of Essex, be read a third time and finally passed on May 19, 2020.

17.2 By-Laws that require a first, second, third and final reading

17.2.1 By-Law 1912 402

Being a by-law to amend By-Law Number 1037 The Comprehensive Zoning By-Law for the Town of Essex

- At the March 2, 2020 Regular Council Meeting, Council passed the following resolution:
Planning Report 2020-04
Re: 183043 Ontario Limited Rezoning Application
Moved by Councillor Bowman
Seconded by Councillor Garon
(R20-03-066) That Planning Report 2020-04, entitled "183043 Ontario Limited Rezoning Application" prepared by Jeff Watson, Policy Planner, dated March 2, 2020, be received; and
That Council authorize the submission of a rezoning by-law for approval by Council to permit multiple unit dwellings within the lands identified as the Gianni Estates subdivision located east of Gosfield Townline and west of Fairview Avenue, in accordance with the recommendations of Development Services Department as set out in Appendix "A" to Planning Department Report 2020-04.

Moved by _____

Seconded by _____

That By-Law 1912 being a by-law to amend By-Law 1037 The Comprehensive Zoning By-Law for the Town of Essex, be read a first, a second and a third time and finally passed on May 19, 2020.

17.2.2 By-Law 1914 413

Being a by-law to authorize an agreement between: Her

Majesty the Queen in Right of Ontario as represented by the Minister of Municipal Affairs & Housing (the "Province") and The Corporation of the Town of Essex (the "Recipient") (Municipal Modernization Program - Ontario Transfer Payment Agreement)

Moved by _____

Seconded by _____

That By-Law 1914 being a by-law to authorize an agreement between: Her Majesty the Queen in Right of Ontario as represented by the Minister of Municipal Affairs & Housing (the "Province") and The Corporation of the Town of Essex (the "Recipient"), be read a first, a second and a third time and finally passed on May 19, 2020.

17.3 By-Laws that require a first and second reading

17.3.1 By-Law 1916 437

Being a by-law to confirm the proceedings of the May 19, 2020, Regular Meeting of the Council of The Corporation of the Town of Essex

Moved by _____

Seconded by _____

That By-Law 1916 being a by-law to confirm the proceedings of the May 19, 2020, Regular Meeting of The Corporation of the Town of Essex, be read a first and a second time and provisionally adopted of May 19, 2020.

18. Adjournment

Moved by _____

Seconded by _____

That the meeting be adjourned at [TIME].

19. Future Meetings

19.1 Monday, June 1, 2020 - 6:00 - 9:00 pm - Regular Council Meeting

Location: TBD

19.2 Monday, June 15, 2020 - 6:00 - 9:00 PM - Regular Council Meeting

Location: TBD



The Corporation of the Town of Essex
Regular Council Meeting Minutes

May 4, 2020 6:00 PM

This meeting was held electronically during a time of Declared Emergency,
pursuant to Town of Essex By-Law 1902.

Location: <https://www.youtube.com/user/EssexOntario>

Present: Mayor Larry Snively
Deputy Mayor Richard Meloche
Councillor Joe Garon
Councillor Morley Bowman
Councillor Kim Verbeek
Councillor Steve Bjorkman
Councillor Chris Vander Doelen
Councillor Sherry Bondy

Also Present: Robert Auger, Town Solicitor, Legal and Legislative
Services/Clerk
Chris Nepszy, Chief Administrative Officer
Doug Sweet, Director, Community Services/Deputy CAO
Jeffrey Morrison, Director, Corporate Services/Treasurer
Lori Chadwick, Director, Development Services
Kevin Girard, Director, Infrastructure Services
Alex Denonville, Manager, Strategic Communications
Regrets: Ehva Hoffman, Youth Council Member
Cameron Soucie, Youth Council Member

1. Call to Order

The Mayor called the meeting to order at 6:00 PM.

2. Closed Meeting Report

Robert Auger, Town Solicitor/Clerk, Legal and Legislative Services provided a verbal report on the Closed Meeting held electronically prior to tonight's Regular Council Meeting. He reported that Council met electronically in a Closed Session, as permitted during a time of Declared Emergency by Section 238/239 2 (d) of the Municipal Act.

At this meeting Council received an update on labour negotiations as it relates to Town of Essex unionized staff and CUPE 702.3. Council gave direction to present a by-law for Council's consideration in the open session tonight, at which time the by-law would be considered for approval for a new 2020 Collective Agreement between the Town and the Town's employees and CUPE 702.3.

3. Declarations of Conflict of Interest

There were no declarations of conflict of interest noted at this time.

4. Adoption of Published Agenda

4.1 Regular Council Meeting Agenda for May 4, 2020

Moved By Councillor Verbeek
Seconded By Councillor Bowman

(R20-05-137) That the published agenda for the May 4, 2020 Regular Council Meeting be adopted as amended with the addition of a Notice of Motion from Councillor Bondy, to be included as agenda item 15.2.1.

Carried

5. Adoption of Minutes

5.1 Regular Council Meeting Minutes for April 20, 2020

Moved By Councillor Bowman
Seconded By Deputy Mayor Meloche

(R20-05-138) That the minutes of the Regular Council Meeting held April 20, 2020, be adopted as circulated.

Carried

5.2 Special Council Meeting Minutes for March 16, 2020

Moved By Councillor Bowman
Seconded By Councillor Garon

(R20-05-139) That the minutes of the Special Council Meeting held March 16, 2020, for the purpose of updating Council on the Town of Essex's continuing response to measures related to the COVID-19 (Coronavirus) pandemic, be adopted as circulated.

Carried

6. Public Presentations

There were no delegations for the May 4, 2020 Regular Council Meeting.

7. Unfinished Business

8. Reports from Administration

8.1 Chief Administrative Officer (CAO) Verbal Report

RE: COVID-19 Town's Response Updates

- Province's first stage in reopening and how it impacts our municipality
- Essential construction projects
- Facilities
- Staffing

Moved By Councillor Bjorkman
Seconded By Councillor Bowman

(R20-05-140) That the verbal report provided by the Town's Chief Administrative Officer (CAO), Chris Nepszy, relating to the Town's latest updates on the Town's responses to the COVID-19 emergency, be received.

Carried

8.2 Community Services Report 2020-04

RE: Essex Fun Fest Update

Moved By Councillor Vander Doelen
Seconded By Councillor Bowman

(R20-05-141) That Community Services Report 2020-04, entitled "2020 Essex Fun Fest Update", be received; and

That Council approves and supports the Essex Fun Fest Committee's recommendation to cancel the 2020 Essex Fun Fest, scheduled for July 2-5, 2020, due to the COVID-19 pandemic.

Carried

9. Reports from Youth Members

10. County Council Update

No updates given.

11. Correspondence

11.1 Correspondence to be received

Moved By Councillor Bowman
Seconded By Councillor Vander Doelen

(R20-05-142) That the correspondence listed in agenda item 11.1 be received and, where indicated, to further share such information with the community using suitable methods of communication.

Carried

11.1.1 COVID-19 Virus Correspondence

11.1.1.1 Association of Municipalities of Ontario (AMO)

RE: Staff Reassignment Flexibility Provided (dated April 17, 2020)

11.1.1.2 Office of the Solicitor General

RE: Police Services Act (PSA) - Community Safety and Well-Being (CSWB) Plan

Correspondence, dated April 24, 2020 advising that due to COVID-19 outbreak, the deadline for the preparation and adoption of a Community Safety and Well-Being (CSWB) Plan is extended and a new deadline will be announced at a later date (original deadline was January 1, 2021).

11.1.1.3 Media Release - Town of Essex

RE: No new non-essential building permits, facility closure extended, committees go digital (April 21, 2020)

11.1.1.4 Media Release - Town of Essex

RE: Support local with new Open for Business Map
(April 27, 2020)

11.1.2 Union Water Supply System (UWSS) Joint Board of Management

February 19, 2020 Meeting Minutes

11.1.3 Town of Amherstburg

The following letters received from the Town of Amherstburg advising Council of resolutions passed at their recent Council Meetings:

- Town of Amherstburg supports AMO's submission to the Attorney General regarding "Addressing Growing Municipality Liability and Insurance Costs" (dated March 19, 2020)
- Active Transportation in the Town of Amherstburg - The Cozmic Queen (dated April 24, 2020)
- Town of Amherstburg supports the Premier's recommendation to "Suspend Time-of-Use" Electricity Billing" (dated April 24, 2020)
- Town of Amherstburg supports Grey County's resolution "100% Canadian Wines Excise Exemptions" (dated April 24, 2020)
- Town of Amherstburg supports Norfolk County's resolution "Issues Regarding the Mapping of Provincially Significant Wetlands (PSW's)" (dated April 24, 2020)

Moved By Councillor Verbeek

Seconded By Councillor Vander Doelen

(R20-05-143) That Administration be directed to send a letter in support of Grey County's resolution regarding 100% Canadian Wines Excise Exemptions to The Honourable Justin Trudeau Prime Minister of Canada, and that a copy of the letter of support be sent to the Leader of the Official Opposition, Leader of the Bloc Quebecois, Leader of the New Democratic Party of Canada, Interim Leader of the Green Party of Canada, Minister of Small Business, Export Promotion and International Trade, Taras Natyshak, MPP, Essex, Chris Lewis, MP, Essex, Federation of Canadian Municipalities (FCM), Association of Municipalities of Ontario (AMO), Vintner's Quality Alliance, Ontario Craft Wineries, Ontario Craft Cider Association, and to Grey County.

Carried

11.2 Correspondence to be considered for receipt and support

11.2.1 Ministry of Transportation

RE: Council Resolution to close or modify roadways RE: Highway 3 expansion, City of Essex

Ministry's request to pass a by-law to close South Talbot Road at County Road 8 and modify access on Victoria Avenue/North Malden Road at Highway 3 to allow for through traffic only via a grade separation.

Director, Infrastructure Services, Kevin Girard explained to Council that at this time the Ministry needed a commitment from Council to the commit to the closure of the roadway in order to move forward with the already planned and approved expansion. He also told Council that modified access will be required on Pinkerton Sideroad at County Road 8.

Moved By Councillor Verbeek
Seconded By Councillor Vander Doelen

(R20-05-144) That correspondence from the Ministry of Transportation, dated April 17, 2020 requesting that Council pass a by-law to close South Talbot Road at County Road 8, modify access on Victoria Avenue/North Malden Road at Highway 3 and modify access on Pinkerton Sideroad at County Road 8, all for the Highway 3 expansion in accordance with the plans attached to the agenda, be received and supported; and

That Council supports a by-law to close and modify access at the intersections, upon completion of the two months' notice from the Ministry of Transportation.

Carried

12. Committee Meeting Minutes

Moved By Councillor Bowman
Seconded By Councillor Bjorkman

(R20-05-145) That the minutes of the Fun Fest Committee Meeting of April 22, 2020, together with the recommendations noted therein be received and adopted as circulated.

Carried

12.1 Fun Fest Committee Meeting - April 22, 2020

13. Financial

14. New Business

15. Notices of Motion

15.1 The following Notice of Motion was presented at the April 20, 2020 Regular Council Meeting, and is being brought forward for consideration this evening:

15.1.1 Councillor Bondy

RE: Online Satisfaction Survey

Moved by Councillor Bondy
Seconded by Deputy Mayor Meloche

(R20-05-146) That the Town of Essex conduct a satisfaction survey similar to the one recently completed by the Town of Tecumseh to look at the quality of life, core services and to see if the Town is going in the right direction and that the survey be considered as part of the 2021 Budget approval process.

Carried

15.2 The following Notice of Motion was presented at this evening's Council Meeting for Council's consideration at the May 19, 2020 Regular Council Meeting:

Moved by Councillor Bondy
Seconded by

That Council bring forward the item listed as "shoreline protection of public property" from the Mayor's list of round table items in order to discuss and give direction to Administration as it relates to potential liability, budget considerations, shoreline protection of public property policy, timelines and fallen trees policy during this time of historic high water levels.

16. Reports and Announcements from Council Members

Each Council member was provided an opportunity to discuss their latest news, and activities in the municipality.

On behalf of the Town's Youth Members, Ehva Hoffman and Cameron Soucie, Council Verbeek provided Council with a brief update on their activities.

17. By-Laws

17.1 By-Laws that require a third and final reading

17.1.1 By-Law 1909

Being a by-law to confirm the proceedings of the April 20, 2020 Regular Meeting of the Council of The Corporation of the Town of Essex

Moved By Councillor Bjorkman
Seconded By Councillor Bowman

(R20-05-147) That By-Law 1909, being a by-law to confirm the proceedings of the April 20, 2020 Regular Meeting of the Council of The Corporation of the Town of Essex, be read a third time and finally passed on May 4, 2020.

Carried

17.2 By-Laws that require a first, second, third and final reading

17.2.1 By-Law 1891

Being a by-law to enter into a Collective Agreement between The Corporation of the Town of Essex and The Canadian Union of Public Employees and its Local 702.3

Moved By Deputy Mayor Meloche
Seconded By Councillor Bjorkman

(R20-05-148) That By-Law 1891 being a by-law to enter into a Collective Agreement between The Corporation of the Town of Essex and The Canadian Union of Public Employees and its Local 702.3, be read a first, a second and a third time and finally passed on May 4, 2020.

Carried

17.2.2 By-Law 1910

Being a by-law to establish tax rates and additional charges for Municipal, County and Education purposes for the year 2020

Moved By Councillor Garon

Seconded By Councillor Bowman

(R20-05-149) That By-Law 1910 being a by-law to establish tax rates and additional charges for Municipal, County and Education purposes for the year 2020, be read a first, a second time and a third time and finally passed on May 4, 2020.

Carried

17.3 By-Laws that require a first and second reading

17.3.1 By-Law 1911

Being a by-law to confirm the proceedings of the May 4, 2020 Regular Meeting of the Council of The Corporation of the Town of Essex

Moved By Councillor Verbeek

Seconded By Councillor Vander Doelen

(R20-05-150) That By-Law 1911 being a by-law to confirm the proceedings of the May 4, 2020 Regular Meeting of the Council of The Corporation of the Town of Essex, be read a first and a second time and provisionally adopted on May 4, 2020.

Carried

18. Adjournment

Moved By Deputy Mayor Meloche

Seconded By Councillor Vander Doelen

(R20-05-151) That the meeting be adjourned at 7:10 PM.

Carried

Mayor

Clerk



**The Corporation of the Town of Essex
Special Council Meeting Minutes**

May 1, 2019 4:30 PM

Location: Essex Municipal Building,
Large Meeting Room, 33 Talbot Street South, Essex, On

1. Roll Call

Present: Mayor Larry Snively
Deputy Mayor Richard Meloche
Councillor Joe Garon
Councillor Morley Bowman
Councillor Kim Verbeek
Councillor Steve Bjorkman
Councillor Chris Vander Doelen
Councillor Sherry Bondy

Also Present: Chris Nepszy, Chief Administrative Officer
Doug Sweet, Director, Community Services/Deputy CAO
Jeffrey Morrison, Director, Corporate Services/Treasurer
Nelson Silveira, Economic Development Officer
Alex Denonville, Manager, Strategic Communications
Kevin Carter, Chief Building Official
Paul Vlodarchyk, Building Inspector
Rita Jabbour, Planner
Robert Auger, Town Solicitor/Clerk

2. Declarations of Conflict of Interest

There were no conflict of interest noted.

3. Adoption of Published Agenda

- a) Special Council Meeting Agenda
Moved by Councillor Verbeek
Seconded by Councillor Garon

(SP19-05-01) That the published agenda for the May 1, 2019 Special Council Meeting to review the "Town of Essex 2019 D.C. " Study, prepared by Gary Scandlan, Managing Partner and Director, Municipal Finance, Watson & Associates Economists Ltd., be adopted as presented. **"Carried"**

4. Reports from Administration

- a) Gary Scandlan, Managing Partner, Director, Municipal Finance, Watson & Associates Economists Ltd.

Mr. Scandlan provided an overview of the Town of Essex 2019 D.C. (Development Charges) Study. He explained the background for the study, and how the charges were put together in relation to the new legislation.

Questions were fielded from Council and Staff, throughout the presentation.

Moved by Deputy Mayor Meloche

Seconded by Councillor Garon

(SP19-05-02) That the presentation entitled "Town of Essex 2019 D.C.", prepared by Gary Scandlan, Watson & Associates Economists Ltd. **"Carried"**

5. Adjournment

Moved by Deputy Mayor Meloche

Seconded by Councillor Garon

(SP19-05-03) That the meeting be adjourned at 7:01 PM. **"Carried"**

MAYOR

CLERK

Consolidated Financial Statements of

E.L.K. ENERGY INC.

And Independent Auditors' Report thereon

Year ended December 31, 2019



KPMG LLP
618 Greenwood Centre
3200 Deziel Drive
Windsor ON N8W 5K8
Canada
Telephone (519) 251-3500
Fax (519) 251-3530

INDEPENDENT AUDITORS' REPORT

To the Shareholder of E.L.K. Energy Inc.

Opinion

We have audited the consolidated financial statements of E.L.K. Energy Inc. (the Entity), which comprise:

- the consolidated statement of financial position as at December 31, 2019
- the consolidated statement of comprehensive income for the year then ended
- the consolidated statement of changes in equity for the year then ended
- the consolidated statement of cash flows for the year then ended
- and notes to the consolidated financial statements, including a summary of significant accounting policies

(Hereinafter referred to as the "financial statements").

In our opinion, the accompanying financial statements present fairly, in all material respects, the financial position of the Entity as at December 31, 2019, and its financial performance and its cash flows for the year then ended in accordance with International Financial Reporting Standards (IFRS).

Basis for Opinion

We conducted our audit in accordance with Canadian generally accepted auditing standards. Our responsibilities under those standards are further described in the "***Auditors' Responsibilities for the Audit of the Financial Statements***" section of our auditors' report.

We are independent of the Entity in accordance with the ethical requirements that are relevant to our audit of the financial statements in Canada and we have fulfilled our other ethical responsibilities in accordance with these requirements.

We believe that the audit evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.



Responsibilities of Management and Those Charged with Governance for the Financial Statements

Management is responsible for the preparation and fair presentation of the financial statements in accordance with International Financial Reporting Standards (IFRS), and for such internal control as management determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, management is responsible for assessing the Entity's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless management either intends to liquidate the Entity or to cease operations, or has no realistic alternative but to do so.

Those charged with governance are responsible for overseeing the Entity's financial reporting process.

Auditors' Responsibilities for the Audit of the Financial Statements

Our objectives are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditors' report that includes our opinion.

Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with International Financial Reporting Standards will always detect a material misstatement when it exists.

Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of the financial statements.

As part of an audit in accordance with International Financial Reporting Standards, we exercise professional judgment and maintain professional skepticism throughout the audit.

We also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion.

The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the Entity's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by management.



- Conclude on the appropriateness of management's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Entity's ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditors' report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditors' report. However, future events or conditions may cause the Entity to cease to continue as a going concern.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.
- Communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

A handwritten signature in black ink that reads 'KPMG LLP'. The signature is written in a cursive, stylized font. A single horizontal line is drawn underneath the signature, extending from the left side of the 'K' towards the right.

Chartered Professional Accountants, Licensed Public Accountants

Windsor, Canada
April 23, 2020

E.L.K. Energy Inc.

Consolidated Statement of Financial Position

December 31, 2019, with comparative information for 2018

	Notes	2019	2018
Assets			
Current assets			
Cash and cash equivalents	5	\$ 8,419,545	\$ 4,975,949
Accounts receivable	6	1,308,988	1,456,283
Due from related parties	21	55,556	32,712
Income taxes receivable		14,028	22,885
Unbilled revenue		5,144,364	4,339,503
Inventory	7	368,432	324,062
Prepaid expenses		160,729	90,219
Total current assets		15,471,642	11,241,613
Non-current assets			
Investments	8	87,395	66,849
Property, plant and equipment	9	10,231,649	9,817,273
Deferred tax assets	10	286,000	424,000
Total non-current assets		10,605,044	10,308,122
Total assets		26,076,686	21,549,735
Liabilities			
Current liabilities			
Accounts payable and accrued liabilities	12	\$ 4,539,842	\$ 3,770,388
Due to related parties	21	563,512	531,833
Customer deposits		1,882,945	1,418,287
Deferred revenue		794,124	396,055
Bank debt	13	3,100,000	3,600,000
Total current liabilities		10,880,423	9,716,563
Non-current liabilities			
Post-employment benefits	14	470,557	457,382
Total non-current liabilities		470,557	457,382
Total liabilities		11,350,980	10,173,945
Equity			
Share capital	15	2,000,100	2,000,100
Contributed surplus		4,402,375	4,402,375
Retained earnings		5,125,710	4,330,771
Accumulated other comprehensive income		168,442	179,299
Total equity		11,696,627	10,912,545
Total liabilities and equity		23,047,607	21,086,490
Regulatory balances	11	5,407,917	5,000,296
Commitments and contingencies	20		
Subsequent event	24		
Total liabilities, equity and regulatory balances		\$ 28,455,524	\$ 26,086,786

See accompanying notes to the consolidated financial statements.

On behalf of the Board:

Director

Director

E.L.K. Energy Inc.

Consolidated Statement of Comprehensive Income

Year ended December 31, 2019, with comparative information for 2018

	Notes	2019	2018
Revenue			
Sale of energy		\$ 30,762,009	\$ 29,935,916
Distribution revenue	23	3,679,820	3,569,682
Other	16	1,027,149	979,898
		35,468,978	34,485,496
Other expenses			
Cost of power purchased		30,796,651	29,944,308
Administration expenses	17	1,736,362	1,510,064
Distribution expenses	18	1,317,603	1,135,329
Depreciation and amortization		690,409	659,439
		34,541,025	33,249,140
Income from operating activities		927,953	1,236,356
Net finance income	19	50,888	98,093
Income before income taxes		978,841	1,334,449
Income tax expense	10	335,375	322,000
Net income for the year		643,466	1,012,449
Net movement in regulatory balances, net of tax	11	151,473	(132,120)
Net income for the year and net movement in regulatory balances		794,939	880,329
Other comprehensive income (loss)			
Items that will not be reclassified to profit or loss			
Remeasurement of post-employment benefits	14	(16,357)	54,550
Tax on remeasurement	10	5,500	(14,000)
Other comprehensive (loss) income for the year		(10,857)	40,550
Total comprehensive income for the year		\$ 784,082	\$ 920,879

See accompanying notes to the consolidated financial statements.

E.L.K. Energy Inc.

Consolidated Statement of Changes in Equity

Year ended December 31, 2019, with comparative information for 2018

		Share Capital	Contributed Surplus	Retained Earnings	Accumulated other comprehensive income	Total
Balance at January 1, 2018	\$	2,000,100	\$ 4,402,375	\$ 3,450,442	\$ 138,749	\$ 9,991,666
Net income and net movement in regulatory balances		-	-	880,329	-	880,329
Other comprehensive income		-	-	-	40,550	40,550
Balance at December 31, 2018	\$	2,000,100	\$ 4,402,375	\$ 4,330,771	\$ 179,299	\$ 10,912,545
Balance at January 1, 2019	\$	2,000,100	\$ 4,402,375	\$ 4,330,771	\$ 179,299	\$ 10,912,545
Net income and net movement in regulatory balances		-	-	794,939	-	794,939
Other comprehensive loss		-	-	-	(10,857)	(10,857)
Balance at December 31, 2019	\$	2,000,100	\$ 4,402,375	\$ 5,125,710	\$ 168,442	\$ 11,696,627

See accompanying notes to the consolidated financial statements.

E.L.K. Energy Inc.

Consolidated Statement of Cash Flows

Year ended December 31, 2019, with comparative information for 2018

	2019	2018
Operating activities		
Net income	\$ 794,939	\$ 880,329
Adjustments for:		
Depreciation and amortization	690,409	659,439
Amortization of deferred revenue	(303,439)	(285,953)
Post-employment benefits	3,182	5,970
Remeasurement of post-employment benefits	(16,357)	54,550
Unrealized (loss) gain on investments	(20,546)	9,727
Deferred tax assets	138,000	147,000
Income tax expense	197,375	175,000
	<u>1,483,563</u>	<u>1,646,062</u>
Changes in non-cash operating working capital:		
Accounts receivable	147,295	124,141
Due to/from related parties	8,835	6,064
Unbilled revenue	(804,861)	(249,157)
Inventory	(44,370)	38,614
Prepaid expenses	(70,510)	(6,578)
Accounts payable and accrued liabilities	769,454	(294,360)
Customer deposits	464,658	(91,893)
	<u>470,501</u>	<u>(473,169)</u>
Regulatory balances	2,565,834	2,714,815
Income tax paid	(173,025)	(322,326)
Net cash from operating activities	<u>4,346,873</u>	<u>3,565,382</u>
Investing activities		
Purchase of property, plant and equipment, net	(1,104,785)	(1,110,233)
Contributions received from customers	701,508	172,754
Net cash used by investing activities	<u>(403,277)</u>	<u>(937,479)</u>
Financing activities		
Repayment of bank debt	(500,000)	(500,000)
Net cash used by financing activities	<u>(500,000)</u>	<u>(500,000)</u>
Change in cash and cash equivalents	3,443,596	2,127,903
Cash and cash equivalents, beginning of year	4,975,949	2,848,046
Cash and cash equivalents, end of year	<u>\$ 8,419,545</u>	<u>\$ 4,975,949</u>

See accompanying notes to the consolidated financial statements.

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements
Year ended December 31, 2019

1. Reporting entity:

E.L.K. Energy Inc. (the "Corporation") is a rate regulated, municipally owned hydro distribution company incorporated under the laws of Ontario, Canada. The Corporation is located in the Town of Essex. The address of the Corporation's registered office is 172 Forest Avenue, Essex, Ontario.

The Corporation delivers electricity and related energy services to residential and commercial customers in Essex, Harrow, Belle River, Comber, Kingsville and Cottam. The Corporation is wholly owned by the Municipality of the Town of Essex ("the Town"). The Corporation also performs the billing function for the Town's Water Department.

These financial statements are presented on a consolidated basis and include the subsidiary E.L.K. Solutions Inc. Hereafter, for purposes of these notes, unless specifically referenced, any and all references to the "Corporation" refer to E.L.K Energy Inc. and its subsidiary. The financial statements are for the Corporation as at and for the year ended December 31, 2019.

2. Basis of preparation:

(a) Statement of compliance:

The Corporation's consolidated financial statements have been prepared in accordance with International Financial Reporting Standards ("IFRS").

(b) Approval of the consolidated financial statements:

The consolidated financial statements were approved by the Board of Directors on April 23, 2020.

(c) Basis of measurement:

These consolidated financial statements have been prepared on the historical cost basis, unless otherwise stated.

(d) Functional and presentation currency:

These consolidated financial statements are presented in Canadian dollars, which is the Corporation's functional currency. All financial information presented in Canadian dollars has been rounded to the nearest thousand.

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

2. Basis of preparation (continued):

(e) Use of estimates and judgements:

(i) Assumptions and estimation uncertainty:

The preparation of consolidated financial statements in conformity with IFRS requires management to make judgments, estimates and assumptions that affect the application of accounting policies and the reported amounts of assets, liabilities, income and expenses and disclosure of contingent assets and liabilities. Actual results may differ from those estimates.

Estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognized in the year in which the estimates are revised and in any future years affected.

Information about assumptions and estimation uncertainties that have a significant risk of resulting in material adjustment is included in the following notes:

- (i) Note 3 (b) – measurement of unbilled revenue
- (ii) Note 9 – estimation of useful lives of its property, plant and equipment
- (iii) Note 11 – recognition and measurement of regulatory balances
- (iv) Note 14 – measurement of defined benefit obligations: key actuarial assumptions
- (v) Note 20 – recognition and measurement of provisions and contingencies

(f) Rate regulation:

The Corporation is regulated by the Ontario Energy Board (“OEB”), under the authority granted by the *Ontario Energy Board Act, 1998*. Among other things, the OEB has the power and responsibility to approve or set rates for the transmission and distribution of electricity, providing continued rate protection for electricity consumers in Ontario, and ensuring that transmission and distribution companies fulfill obligations to connect and service customers. The OEB may also prescribe license requirements and conditions of service to local distribution companies (“LDCs”), such as the Corporation, which may include, and among other things, record keeping, regulatory accounting principles, separation of accounts for distinct businesses, and filing and process requirements for rate setting purposes.

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

2. Basis of preparation (continued):

(f) Rate regulation (continued):

(i) Rate Setting:

The electricity distribution rates and other regulated charges of the Corporation are determined by the OEB. This regulated rate-setting provides LDCs with the opportunity to recover the revenue requirement associated with owning and operating the LDC. The revenue requirement represents the forecasted prudent costs, including the cost of capital that will be reasonably necessary for the LDC to invest in the electricity grid, and serve customers in its licenced service area.

(ii) Rate Applications:

As set out in the OEB's Report of the Board: Renewed Regulatory Framework for Electricity Distributors: A Performance-Based Approach, dated October 18, 2012, the OEB performs its rate-setting function using a combination of incentive rate-setting and cost of service rate-setting. Both rate-setting techniques are based on applications made by LDC's to the OEB. Provided an LDC meets OEB-specified performance parameters, the LDC can select from one of three rate-setting streams: 4th Generation Incentive Rate-setting, Custom Incentive Rate-setting, or Annual Incentive Rate-setting Index. Each of these streams entails different rate-setting schedules and substantive filing requirements. For all streams, the revenue requirement is established through a cost of service rate-setting application. The selection of stream determines the number of years that cost of service rate-setting application pertains to, and the number of years thereafter that the LDC is expected to file incentive rate-setting applications.

Cost of service rate-setting applications recalculate the revenue requirement through a comprehensive review of an LDC's forecasted prudently incurred costs. Incentive rate-setting applications mechanistically adjust the revenue requirement using an OEB-prescribed formula. That formula was established on November 21, 2013, in the OEB's Report of the Board on Rate Setting Parameters and Benchmarking under the Renewed Regulatory Framework for Ontario's Electricity Distributors.

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

2. Basis of preparation (continued):

(f) Rate regulation (continued):

(ii) Rate Applications (continued):

For the distribution revenue included in sale of energy, the Corporation files a "Cost of Service" ("COS") rate application with the OEB every five years where rates are determined through a review of the forecasted annual amount of operating and capital expenditures, debt and shareholder's equity required to support the Corporation's business. The Corporation estimates electricity usage and the costs to service each customer class to determine the appropriate rates to be charged to each customer class. The COS application is reviewed by the OEB and interveners and rates are approved based upon this review, including any revisions resulting from that review.

In the intervening years an Incentive Rate Mechanism application ("IRM") is filed. An IRM application results in a formulaic adjustment to distribution rates that were set under the last COS application. The previous year's rates are adjusted for the annual change in the Gross Domestic Product Implicit Price Inflator for Final Domestic Demand ("GDP IPI-FDD") net of a productivity factor and a "stretch factor" determined by the relative efficiency of an electricity distributor.

The Corporation last filed a COS application in 2016 for rates effective November 1, 2017 to April 30, 2018. The GDP IPI-FDD for 2019 is 1.5%, the Corporation's productivity factor is 0.00% and the stretch factor is 0.60%, resulting in a net adjustment of 0.90% to the previous year's rates.

Electricity rates:

The OEB sets electricity prices for low-volume consumers twice each year based on an estimate of how much it will cost to supply the province with electricity for the next year. All remaining consumers pay the market price for electricity. The Corporation is billed for the cost of the electricity that its customers use and passes this cost on to the customer at cost without a mark-up.

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

3. Significant accounting policies:

The accounting policies set out below have been applied consistently in all years presented in these consolidated financial statements.

(a) Financial instruments:

All consolidated financial assets and liabilities of the Corporation are classified into one of the following categories: amortized cost, fair value through other comprehensive income, or fair value through profit or loss.

The Corporation has classified its financial instruments as follows:

Cash and cash equivalents	Amortized cost
Accounts receivable	Amortized cost
Due from related parties	Amortized cost
Investment	Fair value through profit or loss
Accounts payable and accruals	Amortized cost
Due to related parties	Amortized cost
Long-term borrowings	Amortized cost

The Corporation does not enter into derivative instruments.

Hedge accounting has not been used in the preparation of these consolidated financial statements.

Cash equivalents include short-term investments with maturities of three months or less when purchased.

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

3. Significant accounting policies (continued):

(b) Revenue recognition:

The performance obligations for the sale and distribution of electricity are recognized over time using an output method to measure the satisfaction of the performance obligation. The value of the electricity services transferred to the customer is determined on the basis of cyclical meter readings plus estimated customer usage since the last meter reading date to the end of the year and represents the amount that the Corporation has the right to bill. Revenue includes the cost of electricity supplied, distribution, and any other regulatory charges. The related cost of power is recorded on the basis of power used.

For customer billings related to electricity generated by third parties and the related costs of providing electricity service, such as transmission services and other services provided by third parties, the Corporation has determined that it is acting as a principal for these electricity charges and, therefore, has presented electricity revenue on a gross basis.

Revenue for the Corporation is recognized when the Corporation satisfies the performance obligations within the contract(s) for conditions of service, which is when the distribution and delivery of electricity is achieved or specific services are performed.

Revenue includes an estimate of unbilled revenue. Unbilled revenue represents an estimate of electricity consumed by customers since the date of each customer's last meter reading. Actual electricity usage could differ from those estimates.

Revenue is measured at the fair value of the consideration received or receivable, net of any taxes which may be applicable.

Other income for work orders is recorded on a net basis as the Corporation is acting as an agent for this revenue stream. All other amounts in other income are recorded on a gross basis and are recognized when services are rendered.

Certain customers and developers are required to contribute towards the capital cost of construction of distribution assets in order to provide ongoing service. Cash contributions are recorded as deferred revenue. When an asset other than cash is received as a capital contribution, the asset is initially recognized at its fair value, with a corresponding amount recognized as deferred revenue. The deferred revenue, which represents the Corporation's obligation to continue to provide the customers access to the supply of electricity, is amortized to income on a straight-line basis over the useful life of the related asset.

Government grants and the related performance incentive payments under CDM programs are recognized as revenue in the year when there is reasonable assurance that the program conditions have been satisfied and the payment will be received.

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

3. Significant accounting policies (continued):

(c) Materials and supplies:

Materials and supplies, the majority of which is consumed by the Corporation in the provision of its services, is valued at the lower of cost and net realizable value, with cost being determined on a first-in, first-out cost basis, and includes expenditures incurred in acquiring the materials and supplies and other costs incurred in bringing them to their existing location and condition.

(d) Property, plant and equipment:

Items of property, plant and equipment ("PP&E") used in rate-regulated activities and acquired prior to January 1, 2014 are measured at deemed cost established on the transition date, less accumulated depreciation. All other items of PP&E are measured at cost, or, where the item is contributed by customers, its fair value, less accumulated depreciation.

Cost includes expenditures that are directly attributable to the acquisition of the asset. The cost of self-constructed assets includes contracted services, materials and transportation costs, direct labour, overhead costs, borrowing costs and any other costs directly attributable to bringing the asset to a working condition for its intended use.

Borrowing costs on qualifying assets are capitalized as part of the cost of the asset based upon the weighted average cost of debt incurred on the Corporation's borrowings. Qualifying assets are considered to be those that take in excess of nine months to construct.

When parts of an item of PP&E have different useful lives, they are accounted for as separate items (major components) of PP&E.

When items of PP&E are retired or otherwise disposed of, a gain or loss on disposal is determined by comparing the proceeds from disposal, if any, with the carrying amount of the item and is included in profit or loss.

Major spare parts and standby equipment are recognized as items of PP&E.

The cost of replacing a part of an item of PP&E is recognized in the net book value of the item if it is probable that the future economic benefits embodied within the part will flow to the Corporation and its cost can be measured reliably. In this event, the replaced part of PP&E is written off, and the related gain or loss is included in profit or loss. The costs of the day-to-day servicing of PP&E are recognized in profit or loss as incurred.

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

3. Significant accounting policies (continued):

(d) Property, plant and equipment (continued):

The need to estimate the decommissioning costs at the end of the useful lives of certain assets is reviewed periodically. The Corporation has concluded it does not have any legal or constructive obligation to remove PP&E.

Depreciation is calculated to write off the cost of items of PP&E using the straight-line method over their estimated useful lives, and is generally recognized in profit or loss. Depreciation methods, useful lives, and residual values are reviewed at each reporting date and adjusted prospectively if appropriate. Land is not depreciated. Construction-in-progress assets are not depreciated until the project is complete and the asset is available for use.

The estimated useful lives are as follows:

	Years
Buildings	50
Distribution and metering equipment	10 - 60
Other assets	5 - 15

(e) Impairment:

(i) Financial assets measured at amortized cost:

A financial asset is assessed at each reporting date to determine whether there is any objective evidence that it is impaired. A financial asset is considered to be impaired if objective evidence indicates that one or more events have had a negative effect on the estimated future cash flows of that asset.

An impairment loss is calculated as the difference between an asset's carrying amount and the present value of the estimated future cash flows discounted at the original effective interest rate. Interest on the impaired assets continues to be recognized through the unwinding of the discount. Losses are recognized in profit or loss. An impairment loss is reversed through profit or loss if the reversal can be related objectively to an event occurring after the impairment loss was recognized.

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

3. Significant accounting policies (continued):

(e) Impairment (continued):

(ii) Non-financial assets:

The carrying amounts of the Corporation's non-financial assets, other than materials and supplies and deferred tax assets, are reviewed at each reporting date to determine whether there is any indication of impairment. If any such indication exists, then the asset's recoverable amount is estimated.

For the purpose of impairment testing, assets are grouped together into the smallest group of assets that generates cash inflows from continuing use that are largely independent of the cash inflows of other assets or groups of assets (the "cash-generating unit" or "CGU"). The recoverable amount of an asset or CGU is the greater of its value in use and its fair value less costs to sell. In assessing value in use, the estimated future cash flows are discounted to their present value using a pre-tax discount rate that reflects current market assessments of the time value of money and the risks specific to the asset.

An impairment loss is recognized if the carrying amount of an asset or its CGU exceeds its estimated recoverable amount. Impairment losses are recognized in profit or loss.

For other assets, an impairment loss is reversed only to the extent that the asset's carrying amount does not exceed the carrying amount that would have been determined, net of depreciation or amortization, if no impairment loss had been recognized.

(f) Customer deposits:

Customer deposits represent cash deposits from electricity distribution customers and retailers to guarantee the payment of energy bills. Interest is paid on customer deposits.

Deposits are refundable to customers who demonstrate an acceptable level of credit risk as determined by the Corporation in accordance with policies set out by the OEB or upon termination of their electricity distribution service.

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

3. Significant accounting policies (continued):

(g) Provisions:

A provision is recognized if, as a result of a past event, the Corporation has a present legal or constructive obligation that can be estimated reliably, and it is probable that an outflow of economic benefits will be required to settle the obligation. Provisions are determined by discounting the expected future cash flows at a pre-tax rate that reflects current market assessments of the time value of money and the risks specific to the liability.

(h) Regulatory balances:

Regulatory deferral account debit balances represent costs incurred in excess of amounts billed to the customer at OEB approved rates. Regulatory deferral account credit balances represent amounts billed to the customer at OEB approved rates in excess of costs incurred by the Corporation.

Regulatory deferral account debit balances are recognized if it is probable that future billings in an amount at least equal to the deferred cost will result from inclusion of that cost in allowable costs for rate-making purposes. The offsetting amount is recognized in net movement in regulatory balances in profit or loss or OCI. When the customer is billed at rates approved by the OEB for the recovery of the deferred costs, the customer billings are recognized in revenue. The regulatory debit balance is reduced by the amount of these customer billings with the offset to net movement in regulatory balances in profit or loss or OCI.

The probability of recovery of the regulatory deferral account debit balances is assessed annually based upon the likelihood that the OEB will approve the change in rates to recover the balance. The assessment of likelihood of recovery is based upon previous decisions made by the OEB for similar circumstances, policies or guidelines issued by the OEB, etc. Any resulting impairment loss is recognized in profit or loss in the year incurred.

When the Corporation is required to refund amounts to ratepayers in the future, the Corporation recognizes a regulatory deferral account credit balance. The offsetting amount is recognized in net movement in regulatory balances in profit or loss or OCI. The amounts returned to the customers are recognized as a reduction of revenue. The credit balance is reduced by the amount of these customer repayments with the offset to net movement in regulatory balances in profit or loss or OCI.

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

3. Significant accounting policies (continued):

(i) Post-employment benefits:

(i) Pension plan:

The Corporation provides a pension plan for all of its full-time employees through Ontario Municipal Employees Retirement System ("OMERS"). OMERS is a multi-employer pension plan which operates as the Ontario Municipal Employees Retirement Fund ("the Fund"), and provides pensions for employees of Ontario municipalities, local boards and public utilities. The Fund is a contributory defined benefit pension plan, which is financed by equal contributions from participating employers and employees, and by the investment earnings of the Fund. To the extent that the Fund finds itself in an under-funded position, additional contribution rates may be assessed to participating employers and members.

OMERS is a defined benefit plan. However, as OMERS does not segregate its pension asset and liability information by individual employers, there is insufficient information available to enable the Corporation to directly account for the plan. Consequently, the plan has been accounted for as a defined contribution plan. The Corporation is not responsible for any other contractual obligations other than the contributions. Obligations for contributions to defined contribution pension plans are recognized as an employee benefit expense in profit or loss when they are due.

(ii) Post-employment benefits, other than pension:

The Corporation provides its retired employees with life insurance and medical benefits.

The obligations for these post-employment benefit plans are actuarially determined by applying the projected unit credit method and reflect management's best estimate of certain underlying assumptions. Remeasurements of the net defined benefit obligations, including actuarial gains and losses and the return on plan assets (excluding interest), are recognized immediately in other comprehensive income. When the benefits of a plan are improved, the portion of the increased benefit relating to past service by employees is recognized immediately in profit or loss.

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

3. Significant accounting policies (continued):

(j) Finance income and finance costs:

Finance income is recognized as it accrues in profit or loss, using the effective interest method. Finance income comprises interest earned on cash and cash equivalents and dividend income.

Finance costs comprise interest expense on borrowings, unwinding of the discount on provisions, net interest expense on post-employment benefits and impairment losses on financial assets. Finance costs are recognized in profit or loss unless they are capitalized as part of the cost of qualifying assets.

(k) Income taxes:

The income tax expense comprises current and deferred tax. Income tax expense is recognized in profit or loss except to the extent that it relates to items recognized directly in equity, in which case, it is recognized in equity.

The Corporation is currently exempt from taxes under the Income Tax Act (Canada) and the Ontario Corporations Tax Act (collectively the "Tax Acts"). Under the *Electricity Act*, 1998, the Corporation makes payments in lieu of corporate taxes to the Ontario Electricity Financial Corporation ("OEFC"). These payments are calculated in accordance with the rules for computing taxable income and taxable capital and other relevant amounts contained in the Tax Acts as modified by the *Electricity Act*, 1998, and related regulations. Prior to October 1, 2001, the Corporation was not subject to income or capital taxes. Payments in lieu of taxes are referred to as income taxes.

Current tax comprises the expected tax payable or receivable on the taxable income or loss for the year, using tax rates enacted or substantively enacted at the reporting date, and any adjustment to tax payable in respect of previous years.

Deferred tax is recognized in respect of temporary differences between the tax basis of assets and liabilities and their carrying amounts for accounting purposes. Deferred tax assets are recognized for unused tax losses, unused tax credits and deductible temporary differences to the extent that it is probable that future taxable profits will be available against which they can be used. Deferred tax is measured at the tax rates that are expected to be applied to temporary differences when they reverse, using tax rates enacted or substantively enacted, at the reporting date.

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

3. Significant accounting policies (continued):

(l) Investments:

The Corporation has designated its investment in the common shares of Sun Life Financial as fair value through profit and loss and these instruments are recorded at market value as determined by quoted market prices. Realized and unrealized gains and losses as a result of disposition of shares and changes in fair value are recorded in the consolidated statement of comprehensive income as an unrealized gain or loss on investments in net finance income.

The investment in Gosfield North Communications is measured at cost.

4. Standards issued but not yet adopted:

The following standards, which are not yet effective for the year ended December 31, 2019, have not been applied in preparing these consolidated financial statements.

Amendments to References to the Conceptual Framework in IFRS Standards

On March 29, 2018, the IASB issued a revised version of its Conceptual Framework for Financial Reporting (the "Framework"), that underpins IFRS Standards. The IASB also issued Amendments to References to the Conceptual Framework in IFRS Standards to update references in IFRS Standards to previous versions of the Conceptual Framework.

Both documents are effective from January 1, 2020 with earlier application permitted.

Some Standards include references to the 1989 and 2010 versions of the Framework. The IASB has published a separate document which contains consequential amendments to affected Standards so that they refer to the new Framework, with the exception of IFRS 3 *Business Combinations* which continues to refer to both the 1989 and 2010 Frameworks.

Definition of Material (Amendments to IAS 1 and IAS 8)

On October 31, 2018, the IASB refined its definition of material and removed the definition of material omissions or misstatements from IAS 8.

The amendments are effective for annual periods beginning on or after January 1, 2020. Early adoption is permitted.

The definition of material has been aligned across IFRS Standards and the Framework. The amendments provide a definition and explanatory paragraphs in one place.

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

4. Standards issued but not yet adopted (continued):

Pursuant to the amendments, information is material if omitting, misstating or obscuring it could reasonably be expected to influence decisions that the primary users of general purpose financial statements make on the basis of those financial statements, which provide financial information about a specific reporting entity.

The Corporation has assessed the potential impacts on its consolidated financial statements, and determined that the future pronouncements will not have a material impact on the Corporation.

5. Cash and cash equivalents:

	2019	2018
Bank balances - unrestricted	\$ 7,108,004	\$ 4,265,568
Bank balance - restricted	1,311,541	710,381
Cash and cash equivalents in the statements of cash flows	\$ 8,419,545	\$ 4,975,949

Restricted cash relates to contractor security deposits.

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

6. Accounts receivable:

	2019	2018
Trade receivables	\$ 1,611,750	\$ 1,718,638
Other trade receivables	349,608	407,629
Allowance for doubtful accounts	(652,370)	(669,984)
	\$ 1,308,988	\$ 1,456,283

7. Inventory:

Inventory consists of parts and supplies acquired for capital, internal construction, maintenance or recoverable work.

The amount of inventory consumed by the Corporation during 2019 was \$257,703 (2018 - \$233,933).

Amount written down due to obsolescence in 2019 was \$1,922 (2018 - \$nil).

8. Investments:

	2019	2018
Investment in Gosfield North Communications, at cost	\$ 1	\$ 1
Investment in the common shares of Sun Life Financial, at market	87,394	66,848
	\$ 87,395	\$ 66,849

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

9. Property, plant and equipment:

	Land and buildings	Distribution equipment	Other fixed assets	Total
<i>Cost or deemed cost</i>				
Balance at January 1, 2019	\$ 152,782	\$ 11,970,798	\$ 698,443	\$ 12,822,023
Additions	6,478	920,439	177,868	1,104,785
Balance at December 31, 2019	\$ 159,260	\$ 12,891,237	\$ 876,311	\$ 13,926,808
Balance at January 1, 2018	\$ 142,661	\$ 10,899,610	\$ 669,519	\$ 11,711,790
Additions	10,121	1,071,188	28,924	1,110,233
Balance at December 31, 2018	\$ 152,782	\$ 11,970,798	\$ 698,443	\$ 12,822,023
<i>Accumulated depreciation</i>				
Balance at January 1, 2019	\$ 23,025	\$ 2,559,000	\$ 422,725	\$ 3,004,750
Depreciation	11,729	601,422	77,258	690,409
Balance at December 31, 2019	\$ 34,754	\$ 3,160,422	\$ 499,983	\$ 3,695,159
Balance at January 1, 2018	\$ 11,462	\$ 1,987,637	\$ 346,212	\$ 2,345,311
Depreciation	11,563	571,363	76,513	659,439
Balance at December 31, 2018	\$ 23,025	\$ 2,559,000	\$ 422,725	\$ 3,004,750
<i>Carrying amounts</i>				
At December 31, 2019	\$ 124,506	\$ 9,730,815	\$ 376,328	\$ 10,231,649
At December 31, 2018	129,757	9,411,798	275,718	9,817,273

10. Income tax expense:

Current tax expense:

	2019	2018
Current year	\$ 335,375	\$ 322,000
	\$ 335,375	\$ 322,000

Significant components of the Corporation's deferred tax balances

	2019	2018
Deferred tax assets (liabilities):		
Property, plant and equipment	\$ (193,000)	\$ 73,000
Cumulative eligible capital	73,000	78,000
Post-employment benefits	157,000	152,000
Deferred revenue	265,000	131,000
Other	(16,000)	(10,000)
	\$ 286,000	\$ 424,000

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

11. Regulatory balances:

Reconciliation of the carrying amount for each class of regulatory balances

Regulatory deferral account debit balances	January 1, 2019	Additions	Recovery/ reversal	December 31, 2019
Group 1 deferred accounts	\$ 1,203,168	\$ 4,077,964	\$ (4,563,642)	\$ 717,490
Regulatory settlement account	221,798	47	(78)	221,767
Regulatory transition to IFRS	21,601	-	-	21,601
Regulatory settlement account	3,090,484	276,556	(1,949,060)	1,417,980
	\$ 4,537,051	\$ 4,354,567	\$ (6,512,780)	\$ 2,378,838

Regulatory deferral account debit balances	January 1, 2018	Additions	Recovery/ reversal	December 31, 2018
Group 1 deferred accounts	\$ 2,063,757	\$ 3,903,249	\$ (4,763,838)	\$ 1,203,168
Regulatory settlement account	221,829	44	(75)	221,798
Regulatory transition to IFRS	21,601	-	-	21,601
Regulatory settlement account	4,074,442	292,666	(1,276,624)	3,090,484
	\$ 6,381,629	\$ 4,195,959	\$ (6,040,537)	\$ 4,537,051

Regulatory deferral account credit balances	January 1, 2019	Additions	Recovery/ reversal	December 31, 2019
Group 1 deferred accounts	\$ 4,655,014	\$29,028,295	\$ (28,482,087)	\$ 5,201,222
Regulatory transition to IFRS	(17,986)	-	-	(17,986)
Other regulatory account	156,975	15,859	(10,946)	161,888
Income tax	206,293	-	(143,500)	62,793
	\$ 5,000,296	\$29,044,154	\$ (28,636,533)	\$ 5,407,917

Regulatory deferral account credit balances	January 1, 2018	Additions	Recovery/ reversal	December 31, 2018
Group 1 deferred accounts	\$ 3,635,759	\$27,107,212	\$ (26,087,957)	\$ 4,655,014
Regulatory transition to IFRS	(17,986)	-	-	(17,986)
Other regulatory account	156,472	10,969	(10,466)	156,975
Income tax	355,814	-	(149,521)	206,293
	\$ 4,130,059	\$27,118,181	\$ (26,247,944)	\$ 5,000,296

The regulatory balances are recovered or settled through rates approved by the OEB which are determined using estimates of future consumption of electricity by its customers. Future consumption is impacted by various factors including the economy and weather. The Corporation has received approval from the OEB to establish its regulatory balances.

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

11. Regulatory balances (continued):

Settlement of the Group 1 deferral accounts is done on an annual basis through application to the OEB. An application was made to the OEB to dispose \$591,162 of the Group 1 deferral accounts and approval was obtained. The account balance was moved to the regulatory settlement account. The OEB requires the Corporation to estimate its income taxes when it files a COS application to set its rates. As a result, the Corporation has recognized a regulatory deferral account for the amount of deferred taxes that will ultimately be recovered from/paid back to its customers. This balance will fluctuate as the Corporation's deferred tax balance fluctuates.

Regulatory balances attract interest at OEB prescribed rates, which are based on Bankers' Acceptances three-month rate plus a spread of 25 basis points. In 2019, the rate was 2.45% in the first quarter, and 2.18% in the second through fourth quarters.

12. Accounts payable and accrued liabilities:

	2019	2018
Trade payables	\$ 3,708,392	\$ 3,033,073
Accrued expenses	831,450	737,315
	<u>\$ 4,539,842</u>	<u>\$ 3,770,388</u>

13. Bank debt:

(a) Bank debt consists of:

	2019	2018
One year term loan with interest rate of 2.48% (2018 – 2.66%) repayable in full on or before maturity of July 2020, secured by a general security agreement	<u>\$ 3,100,000</u>	<u>\$ 3,600,000</u>

(b) Reconciliation of movements of liabilities to cash flows arising from financing activities:

	2019	2018
Bank debt, balance at January 1	\$ 3,600,000	\$ 4,100,000
Repayment of borrowings	500,000	500,000
Balance, December 31	<u>\$ 3,100,000</u>	<u>\$ 3,600,000</u>

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

14. Post-employment benefits:

(a) OMERS pension plan:

The Corporation provides a pension plan for its employees through OMERS. The plan is a multi-employer, contributory defined pension plan with equal contributions by the employer and its employees. In 2019, the Corporation made employer contributions of \$173,858 to OMERS (2018 - \$169,015). The Corporation estimates that a contribution of \$179,000 to OMERS will be made during the next fiscal year.

As at December 31, 2019, OMERS had approximately 500,000 members, of whom 18 are current employees of the Corporation. The most recently available OMERS annual report is for the year ended December 31, 2019, which reported that the plan was 97% funded.

(b) Post-employment benefits other than pension:

The Corporation pays certain medical and life insurance benefits on behalf of some of its retired employees. The Corporation recognizes these post-employment benefits in the year in which employees' services were rendered. The Corporation is recovering its post-employment benefits in rates based on the expense and measurements recognized for post-employment benefit plans.

Reconciliation of the obligation	2019	2018
Defined benefit obligation, beginning of year	\$ 457,382	\$ 517,902
Included in profit or loss		
Current service cost	7,140	10,211
Interest cost	15,678	15,219
	22,818	25,430
Included in OCI		
Actuarial loss (gain) arising from: changes in demographic and financial assumptions	16,357	(54,550)
	16,357	(54,550)
Benefits paid	(26,000)	(31,400)
Defined benefit obligation, end of year	\$ 470,557	\$ 457,382

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

14. Post-employment benefits (continued):

(b) Post-employment benefits other than pension (continued):

Actuarial assumptions	2019	2018
General inflation	2.25%	2.25%
Discount (interest) rate	3.00%	3.50%
Medical Costs	6.50%	6.50%
Dental Costs	4.00%	4.00%

A 1% increase in the assumed medical trend rate would result in the defined benefit obligation increasing by \$30,000. A 1% decrease in the assumed medical trend rate would result in the defined benefits obligation decreasing by \$35,000.

15. Share capital:

	2019	2018
Authorized:		
Unlimited number of common shares		
Issued:		
30,000 common shares	\$ 2,000,100	\$ 2,000,100

16. Other revenue:

	2019	2018
Rendering of services	\$ 311,518	\$ 743,157
Contributions received from customers	701,508	172,754
Government grants & incentives under CDM programs	(51,782)	14,242
Rental income	65,905	49,745
	\$ 1,027,149	\$ 979,898

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)

Year ended December 31, 2019

17. Employee salaries and benefits:

	2019	2018
Salaries, wages and benefits	\$ 1,710,164	\$ 1,667,426
CPP and EI remittances	66,118	63,680
Contributions to OMERS	173,858	169,015
Post-employment benefit plans	22,818	25,430
	<u>\$ 1,972,958</u>	<u>\$ 1,925,551</u>

18. Distribution expenses:

	2019	2018
Labour	\$ 255,265	\$ 202,646
Materials, supplies, maintenance	965,600	876,294
Other	96,738	56,389
	<u>\$ 1,317,603</u>	<u>\$ 1,135,329</u>

19. Finance income and costs:

	2019	2018
Finance income		
Late payment charges	\$ 93,143	\$ 97,310
Unrealized gain on investments	20,546	-
Interest income on bank deposits	122,938	136,883
	<u>236,627</u>	<u>234,193</u>
Finance cost		
Interest expense on bank debt	99,776	81,803
Unrealized loss on investments	-	9,727
Other	85,963	44,570
	<u>185,739</u>	<u>136,100</u>
Net finance income recognized in profit or loss	<u>\$ 50,888</u>	<u>\$ 98,093</u>

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

20. Commitments and contingencies:

General:

From time to time, the Corporation is involved in various litigation matters arising in the ordinary course of its business. The Corporation has no reason to believe that the disposition of any such current matter could reasonably be expected to have a materially adverse impact on the Corporation's financial position, results of operations or its ability to carry on any of its business activities.

General Liability Insurance:

The Corporation is a member of the Municipal Electric Association Reciprocal Insurance Exchange (MEARIE). MEARIE is a pooling of public liability insurance risks of many of the LDCs in Ontario. All members of the pool are subjected to assessment for losses experienced by the pool for the years in which they were members, on a pro-rata basis based on the total of their respective service revenues. As at December 31, 2019, no assessments have been made.

21. Related party transactions:

(a) Parent and ultimate controlling party:

The sole shareholder of the Corporation is the Municipality of the Town of Essex. The Town produces consolidated financial statements that are available for public use.

(b) Outstanding balances due from (due to) related parties:

	2019	2018
Due from parent company	\$ 55,556	\$ 32,712
Parent company, included in accounts payable	\$ (563,512)	\$ (531,833)

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

21. Related party transactions (continued):

(c) Transactions with parent:

During the year the Corporation paid provision of services fees to its parent in the amount of \$563,512 (2018 - \$531,833).

The Corporation delivers electricity to the Town throughout the year for the electricity needs of the Town and its related organizations. Electricity delivery charges are at prices and under terms approved by the OEB. The Corporation also provides additional services to the Town, including streetlight maintenance services, sentinel lights and water and waste water billing and customer care services.

(d) Transactions with entity with significant influence:

In the ordinary course of business, the Corporation delivers electricity to the Town. Electricity is billed to the Town at prices and under terms approved by the OEB, if applicable.

(e) Key management personnel:

The key management personnel of the Corporation have been defined as members of its board of directors and executive management team members. The compensation paid or payable is as follows:

	2019	2018
Directors' fees	\$ 22,831	\$ 26,139
Salaries and other short-term benefits	395,994	388,860
Post-employment benefits	5,409	4,623
	<u>\$ 424,234</u>	<u>\$ 419,622</u>

22. Financial instruments and risk management:

Fair value disclosure:

The carrying values of cash and cash equivalents, accounts receivable, unbilled revenue, due from/to related parties and accounts payable and accrued liabilities approximate fair value because of the short maturity of these instruments. The carrying value of the customer deposits and bank loan approximates fair value because the amounts are payable on demand.

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

22. Financial instruments and risk management (continued):

Financial risks:

The Corporation understands the risks inherent in its business and defines them broadly as anything that could impact its ability to achieve its strategic objectives. The Corporation's exposure to a variety of risks such as credit risk, interest rate risk, and liquidity risk, as well as related mitigation strategies are discussed below.

(a) Credit risk:

Financial assets carry credit risk that a counterparty will fail to discharge an obligation which could result in a financial loss. Financial assets held by the Corporation, such as accounts receivable, expose it to credit risk. The Corporation earns its revenue from a broad base of customers located in the Town of Essex, Lakeshore and Kingsville. No single customer accounts for a balance in excess of 1% of total accounts receivable.

The carrying amount of accounts receivable is reduced through the use of an allowance for impairment and the amount of the related impairment loss is recognized in profit or loss. Subsequent recoveries of receivables previously provisioned are credited to profit or loss. The balance of the allowance for impairment at December 31, 2019 is \$652,370 (2018 - \$669,984). An impairment reversal of \$17,614 (2018 - loss of \$16,477) was recognized during the year.

The Corporation's credit risk associated with accounts receivable is primarily related to payments from distribution customers. At December 31, 2019, approximately \$945,708 (2018 - \$1,059,449) is considered 60 days past due. The Corporation has over 12,200 customers, the majority of whom are residential. Credit risk is managed through collection of security deposits from customers in accordance with directions provided by the OEB. As at December 31, 2019, the Corporation holds security deposits in the amount of \$1,882,945 (2018 - \$1,418,287).

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

22. Financial instruments and risk management (continued):

(b) Market risk:

Market risks primarily refer to the risk of loss resulting from changes in commodity prices, foreign exchange rates, and interest rates. The Corporation currently does not have any material commodity or foreign exchange risk. The Corporation is exposed to fluctuations in interest rates as the regulated rate of return for the Corporation's distribution business is derived using a complex formulaic approach which is in part based on the forecast for long-term Government of Canada bond yields. This rate of return is approved by the OEB as part of the approval of distribution rates.

A 1% increase in the interest rate at December 31, 2019 would have increased interest expense on the long-term debt by \$31,000 (2018 - \$36,000), assuming all other variables remain constant. A 1% decrease in the interest rate would have an equal but opposite effect.

(c) Liquidity risk:

The Corporation monitors its liquidity risk to ensure access to sufficient funds to meet operational and investing requirements. The Corporation's objective is to ensure that sufficient liquidity is on hand to meet obligations as they fall due while minimizing interest exposure. The Corporation has access to a \$3.1 million credit facility and monitors cash balances daily to ensure that a sufficient level of liquidity is on hand to meet financial commitments as they become due.

The majority of accounts payable, as reported on the statement of financial position, are due within 30 – 60 days.

(d) Capital disclosures:

The main objectives of the Corporation, when managing capital, are to ensure ongoing access to funding to maintain and improve the electricity distribution system, compliance with covenants related to its credit facilities, prudent management of its capital structure with regard for recoveries of financing charges permitted by the OEB on its regulated electricity distribution business, and to deliver the appropriate financial returns.

The Corporation's definition of capital includes shareholder's equity. As at December 31, 2019, shareholder's equity amounts to \$11,696,627 (2018 - \$10,912,545).

E.L.K. ENERGY INC.

Notes to Consolidated Financial Statements (continued)
Year ended December 31, 2019

23. Distribution revenue:

The Corporation generates revenue primarily from the sale and distribution of electricity to its customers. Other revenue consists of services provided to related parties and other income. Additional information is provided in Note 16 with the components of other income.

In the following table, distribution revenue is disaggregated by type of customer:

	2019	2018
Residential	\$ 2,380,088	\$ 2,310,877
Commercial	415,807	413,004
Large users	768,110	719,212
Other	115,815	126,589
Total distribution revenue	\$ 3,679,820	\$ 3,569,682

24. Subsequent event:

Subsequent to December 31, 2019 the COVID-19 outbreak was declared a pandemic by the World Health Organization. The situation is dynamic and the ultimate duration and magnitude of the impact on the economy and the financial effect on our business is not known at this time. These impacts could include impairments in the value of long-lived assets, or potential future decreases in revenue, cash flows or the profitability of our ongoing operations.

**RESOLUTIONS OF THE SOLE SHAREHOLDER
OF
E.L.K. ENERGY INC.
(the "Corporation")**

RECITAL:

- A. The Corporation wishes to attend to the annual matters of the Corporation.

NOW THEREFORE BE IT RESOLVED THAT:

Appointment of Auditor

1. KPMG LLP is appointed the auditor of the Corporation until the next annual meeting of shareholders or until a successor is appointed, at a remuneration to be fixed at the sole discretion of the directors.

Election of Directors

2. The following individuals, who have consented to act as directors of the Corporation, are elected as directors of the Corporation for a term expiring upon the next annual election of directors or when successors have been elected or appointed:

Ron McDermott
Tracey Bailey
Morley Bowman
Joe Garon
Richard Meloche
Lydia Miljan
Larry Snively
Peter Timmins
Chris Vander Doelen

The undersigned, being the sole shareholder of the Corporation signs the foregoing resolutions in accordance with the provisions of the *Business Corporations Act* (Ontario).

DATED as of the ____ day of _____, 2020.

**THE CORPORATION OF THE TOWN
OF ESSEX**

Per: _____

Name: Larry Snively

Title: Mayor

ACKNOWLEDGEMENT AND WAIVER

TO: E.L.K. ENERGY INC.
(the "Corporation")

The undersigned shareholder of the Corporation acknowledges receipt of a copy of the financial statements of the Corporation for the financial year ended December 31, 2019 including the report of the auditor thereon, if any, for such period and any further information respecting the financial position of the Corporation and the results of its operations required by the articles, the by-laws or any unanimous shareholder agreement for such period. The undersigned waives the applicable time period within which the Corporation is required by the *Business Corporations Act* (Ontario) to send such financial statements and related material.

DATED as of the ____ day of _____, 2020.

**THE CORPORATION OF THE TOWN
OF ESSEX**

Per: _____

Name: Larry Snively

Title: Mayor



Report to Council

Department: Development Services
Division: Economic Development
Date: May 19, 2020
Prepared by: Nelson Silveira, Economic Development Officer
Report Number: Economic Development-2020-05
Subject: Building Report and Development Overview April 2020
Number of Pages: 2, plus attachments

Recommendation(s)

That Economic Development -2020-05 entitled Building Report and Development Overview April 2020 prepared by Nelson Silveira, Economic Development Officer dated May 19, 2020 be received for information.

Purpose

To provide council with a monthly update on total construction values and real estate data in the Town of Essex.

Background and Discussion

Please refer to attached Building Report and Development Overview.

Link to Strategic Priorities

- ☐ Manage, invest and plan for sustainable municipal infrastructure which meets current and future needs of the municipality and its citizens.
- ☐ Create a safe, friendly and inclusive community which encourages healthy, active living for people of all ages and abilities.
- ☐ Provide a fiscal stewardship and value for tax dollars to ensure long-term financial health to the municipality.
- ☒ Manage responsible and viable growth while preserving and enhancing the unique rural and small town character of the community.
- ☐ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

Report Approval Details

Document Title:	Building Report and Development Overview April 2020 - Economic Development-2020-05.docx
Attachments:	<ul style="list-style-type: none">- Building 2020-04.pdf- Development Overview - April 2020 (1).pdf
Final Approval Date:	May 8, 2020

This report and all of its attachments were approved and signed as outlined below:



Lori Chadwick, Director, Development Services - May 7, 2020 - 11:27 AM



Chris Nepszy, Chief Administrative Officer - May 8, 2020 - 10:42 AM

Report Number: Building 2020-04
Date: Apr 30, 2020
Subject: April 2020 Building Report

Number of Permits and Construction Value

Permit Type	Permits Issued	Prior Months	Year Total	Cancelled Permits	Monthly Construction Value	Prior Months Construction Value	Less Cancelled Construction Values	Jan-Apr 2020 Construction Values	Jan-Apr 2019 Construction Values
Single Family Residence								\$ -	\$ -
Ward 1	5	26	31	\$	2,634,000.00	\$ 12,936,000.00	\$ -	\$ 15,570,000.00	\$ 3,675,250.00
Ward 2	0	0	0	\$	-	\$ -	\$ -	\$ -	\$ 1,586,000.00
Ward 3	1	2	3	\$	1,650,000.00	\$ 1,410,000.00	\$ -	\$ 3,060,000.00	\$ 1,585,975.00
Ward 4	0	0	0	\$	-	\$ -	\$ -	\$ -	\$ -
Multiple Residential	0	0	0	\$	-	\$ -	\$ -	\$ -	\$ -
Addition/Sunrooms	1	4	5	\$	650.00	\$ 297,000.00	\$ -	\$ 297,650.00	\$ 375,000.00
Garages/Carports	1	6	7	\$	28,000.00	\$ 160,102.00	\$ -	\$ 188,102.00	\$ 322,500.00
Decks/Porches	0	0	0	\$	-	\$ -	\$ -	\$ -	\$ -
Fences/Pool	1	7	8	\$	35,000.00	\$ 162,000.00	\$ -	\$ 197,000.00	\$ 200,500.00
Demolition	0	4	4	\$	-	\$ 35,000.00	\$ -	\$ 35,000.00	\$ 35,000.00
House Raising	0	0	0	\$	-	\$ -	\$ -	\$ -	\$ 45,000.00
Pole Barns	5	4	9	\$	744,000.00	\$ 577,000.00	\$ -	\$ 1,321,000.00	\$ 173,000.00
Commercial/Industrial	0	1	1	\$	-	\$ 1,302,400.00	\$ -	\$ 1,302,400.00	\$ 1,160,000.00
Miscellaneous	1	0	1	\$	15,000.00	\$ -	\$ -	\$ 15,000.00	\$ 414,200.00
Shed	0	1	1	\$	-	\$ 35,000.00	\$ -	\$ 35,000.00	\$ 15,000.00
Roof	0	1	1	\$	-	\$ 10,000.00	\$ -	\$ 10,000.00	\$ 50,000.00
Septic System	1	2	3	\$	25,000.00	\$ 60,000.00	\$ -	\$ 85,000.00	\$ -
Sign	0	1	1	\$	-	\$ 2,500.00	\$ -	\$ 2,500.00	\$ 86,500.00
Green Houses/Winery	0	0	0	\$	-	\$ -	\$ -	\$ -	\$ -
Renovations	1	0	1	\$	100,000.00	\$ -	\$ -	\$ 100,000.00	\$ 194,500.00
Additions/Renovation-Commercial/Industrial/Inst	0	8	8	\$	-	\$ 4,447,000.00	\$ -	\$ 4,447,000.00	\$ 25,000.00
Plumbing only	0	2	2	\$	-	\$ 30,000.00	\$ -	\$ 30,000.00	\$ -
Demolition Out Buildings	0	1	1	\$	-	\$ 5,000.00	\$ -	\$ 5,000.00	\$ -
Total Permits/Construction Value	17	70	87	0 \$	5,231,650.00	\$ 21,469,002.00	\$ -	\$ 26,700,652.00	\$ 9,943,425.00

Permit Fee Totals	
Monthly Total	\$ 35,445.43
Yearly Total	\$ 159,327.46
Previous Year Total	\$ 72,444.70

Monthly Building Permit Totals

Permit Categories	January	February	March	April	May	June	July	August	September	October	November	December	Total	Cancelled	Year Total	
														Permits		
Single Family Residence																
Ward 1	9	12	5	5									0	31	31	
Ward 2	0	0	0	0										0	0	
Ward 3	0	0	2	1										3	3	
Ward 4	0	0	0	0										0	0	
Multiple Residential	0	0	0	0										0	0	
Addition/Sunrooms	2	0	2	1										5	5	
Garages/Carports	2	1	3	1										7	7	
Decks/Porches	0	0	0	0										0	0	
Fences/Pools	0	1	6	1										8	8	
Demolition	2	1	1	0										4	4	
House Raising	0	0	0	0										0	0	
Pole Barns	0	0	4	5										9	9	
Commercial/Industrial	0	0	1	0										1	1	
Miscellaneous	0	0	0	1										1	1	
Shed	1	0	0	0										1	1	
Roof	0	0	1	0										1	1	
Septic System	0	1	1	1										3	3	
Sign	0	0	1	0										1	1	
Green Houses/Winery	0	0	0	0										0	0	
Renovations	0	0	0	1										1	1	
Additions/Renovation-Commercial/Industrial/Institutional	4	0	4	0										8	8	
Plumbing only	1	1	0	0										2	2	
Demolition Out Buildings	0	1	0	0										1	1	
Total	21	18	31	17	0	0	0	0	0	0	0	0	0	87	0	87

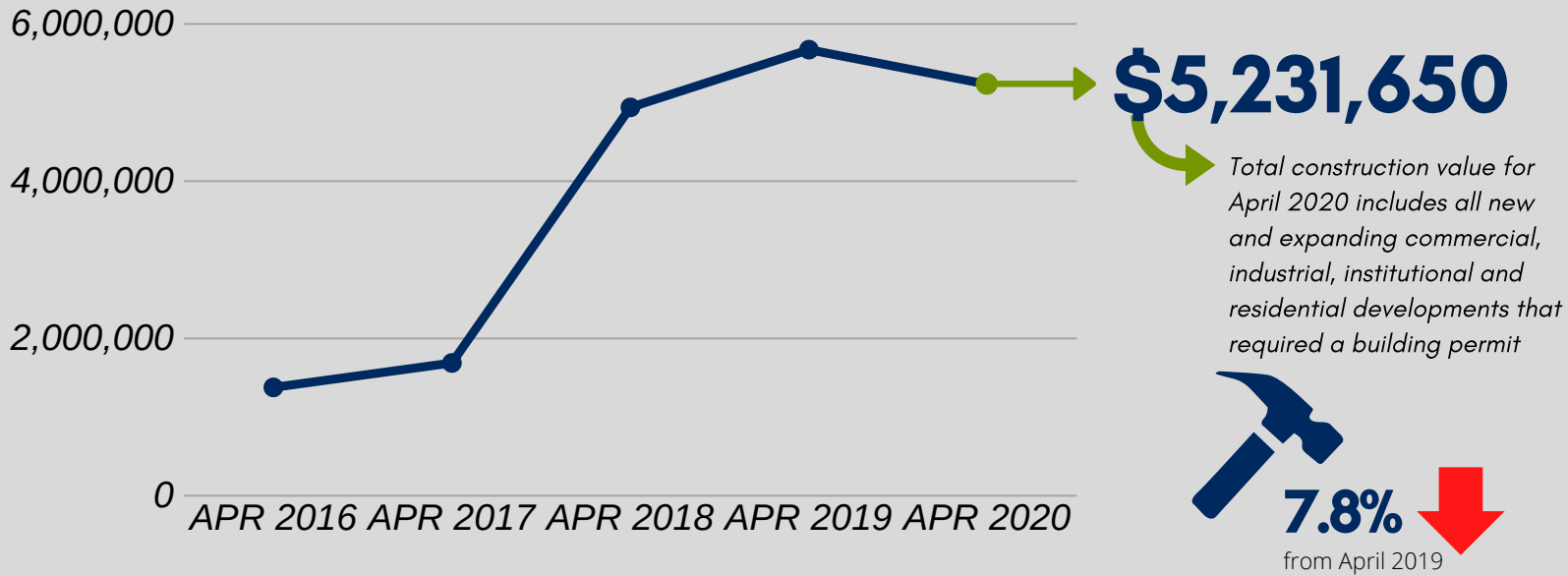
Monthly Permit Fee Totals

Permit Categories	January	February	March	April	May	June	July	August	September	October	November	December	Total	Cancelled	Year Total
														Permits	
Single Family Residence	\$ 25,213.15	\$ 33,093.30	\$ 20,452.06	\$ 22,147.55									\$ 100,906.06	\$ -	\$ 100,906.06
Single Family Residence-Plumbing	\$ 5,400.00	\$ 7,200.00	\$ 4,200.00	\$ 3,600.00									\$ 20,400.00	\$ -	\$ 20,400.00
Single Family Residence-Septic	\$ -	\$ -	\$ 700.00	\$ 700.00									\$ 1,400.00	\$ -	\$ 1,400.00
Multiple Residential	\$ -	\$ -	\$ -	\$ -									\$ -	\$ -	\$ -
Additions/Sunrooms	\$ 1,770.00	\$ 100.00	\$ 576.80	\$ 4,224.00									\$ 6,670.80	\$ -	\$ 6,670.80
Garages/Carports	\$ 304.00	\$ 247.50	\$ 414.40	\$ 135.00									\$ 1,100.90	\$ -	\$ 1,100.90
Decks/Porches	\$ -	\$ -	\$ -	\$ -									\$ -	\$ -	\$ -
Fences/Pools	\$ -	\$ 60.00	\$ 360.00	\$ 60.00									\$ 480.00	\$ -	\$ 480.00
Demolition	\$ 200.00	\$ 100.00	\$ 100.00	\$ -									\$ 400.00	\$ -	\$ 400.00
House Raising	\$ -	\$ -	\$ -	\$ -									\$ -	\$ -	\$ -
Pole Barns	\$ -	\$ -	\$ 2,333.60	\$ 2,866.60									\$ 5,200.20	\$ -	\$ 5,200.20
Commercial/Industrial	\$ -	\$ -	\$ 3,976.00	\$ -									\$ 3,976.00	\$ -	\$ 3,976.00
Miscellaneous	\$ -	\$ -	\$ -	\$ 100.00									\$ 100.00	\$ -	\$ 100.00
Shed	\$ 100.00	\$ -	\$ -	\$ -									\$ 100.00	\$ -	\$ 100.00
Roof	\$ -	\$ -	\$ 100.00	\$ -									\$ 100.00	\$ -	\$ 100.00
Septic System	\$ -	\$ 700.00	\$ 700.00	\$ 700.00									\$ 2,100.00	\$ -	\$ 2,100.00
Sign	\$ -	\$ -	\$ 100.00	\$ -									\$ 100.00	\$ -	\$ 100.00
Green Houses/Winery	\$ -	\$ -	\$ -	\$ -									\$ -	\$ -	\$ -
Renovations	\$ -	\$ -	\$ -	\$ 912.28									\$ 912.28	\$ -	\$ 912.28
Additions/Renovation-Commercial/Industrial/Institutional	\$ 11,591.60	\$ -	\$ 3,439.62	\$ -									\$ 15,031.22	\$ -	\$ 15,031.22
Plumbing only	\$ 150.00	\$ 100.00	\$ -	\$ -									\$ 250.00	\$ -	\$ 250.00
Demolition Out Buildings	\$ -	\$ 100.00	\$ -	\$ -									\$ 100.00	\$ -	\$ 100.00
Total	\$ 44,728.75	\$ 41,700.80	\$ 37,452.48	\$ 35,445.43	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 159,327.46	\$ -	\$ 159,327.46

Monthly Construction Value Total

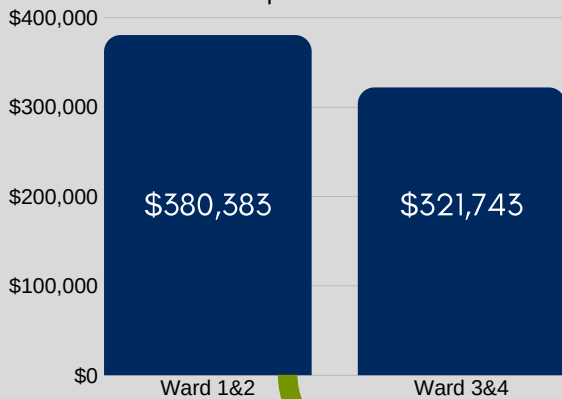
Permit Categories	January	February	March	April	May	June	July	August	September	October	November	December	Total	Cancelled Permits	Year Total
Single Family Residence															
Ward 1	\$ 4,459,000.00	\$ 5,771,000.00	\$ 2,706,000.00	\$ 2,634,000.00									\$ 15,570,000.00	\$ -	\$ 15,570,000.00
Ward 2	\$ -	\$ -	\$ -	\$ -									\$ -	\$ -	\$ -
Ward 3	\$ -	\$ -	\$ 1,410,000.00	\$ 1,650,000.00									\$ 3,060,000.00	\$ -	\$ 3,060,000.00
Ward 4	\$ -	\$ -	\$ -	\$ -									\$ -	\$ -	\$ -
Multiple Residential	\$ -	\$ -	\$ -	\$ -									\$ -	\$ -	\$ -
Additions/Sunrooms	\$ 145,000.00	\$ 12,000.00	\$ 140,000.00	\$ 650.00									\$ 297,650.00	\$ -	\$ 297,650.00
Garages/Carports	\$ 100,000.00	\$ 60,000.00	\$ 102.00	\$ 28,000.00									\$ 188,102.00	\$ -	\$ 188,102.00
Decks/Porches	\$ -	\$ -	\$ -	\$ -									\$ -	\$ -	\$ -
Fences/Pool	\$ -	\$ 1,000.00	\$ 161,000.00	\$ 35,000.00									\$ 197,000.00	\$ -	\$ 197,000.00
Demolition	\$ 25,000.00	\$ 5,000.00	\$ 5,000.00	\$ -									\$ 35,000.00	\$ -	\$ 35,000.00
House Raising	\$ -	\$ -	\$ -	\$ -									\$ -	\$ -	\$ -
Pole Barns	\$ -	\$ -	\$ 577,000.00	\$ 744,000.00									\$ 1,321,000.00	\$ -	\$ 1,321,000.00
Commercial/Industrial	\$ -	\$ -	\$ 1,302,400.00	\$ -									\$ 1,302,400.00	\$ -	\$ 1,302,400.00
Miscellaneous	\$ -	\$ -	\$ -	\$ 15,000.00									\$ 15,000.00	\$ -	\$ 15,000.00
Shed	\$ 35,000.00	\$ -	\$ -	\$ -									\$ 35,000.00	\$ -	\$ 35,000.00
Roof	\$ -	\$ -	\$ 10,000.00	\$ -									\$ 10,000.00	\$ -	\$ 10,000.00
Septic System	\$ -	\$ 25,000.00	\$ 35,000.00	\$ 25,000.00									\$ 85,000.00	\$ -	\$ 85,000.00
Sign	\$ -	\$ -	\$ 2,500.00	\$ -									\$ 2,500.00	\$ -	\$ 2,500.00
Green Houses/Winery	\$ -	\$ -	\$ -	\$ -									\$ -	\$ -	\$ -
Renovations	\$ -	\$ -	\$ -	\$ 100,000.00									\$ 100,000.00	\$ -	\$ 100,000.00
Additions/Renovation-Commercial/Industrial/Institutional	\$ 3,570,000.00	\$ -	\$ 877,000.00	\$ -									\$ 4,447,000.00	\$ -	\$ 4,447,000.00
Plumbing only	\$ 15,000.00	\$ 15,000.00	\$ -	\$ -									\$ 30,000.00	\$ -	\$ 30,000.00
Demolition Out Buildings	\$ -	\$ 5,000.00	\$ -	\$ -									\$ 5,000.00	\$ -	\$ 5,000.00
Total	\$ 8,349,000.00	\$ 5,894,000.00	\$ 7,226,002.00	\$ 5,231,650.00	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 26,700,652.00	\$ -	\$ 26,700,652.00

Total Monthly Construction Value

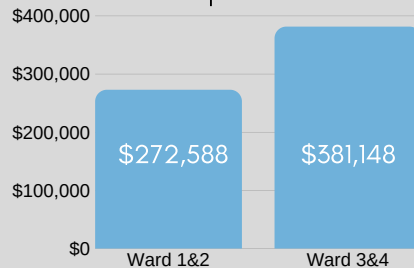


Real Estate

Average Sale Price April 2020



Average Sale Price April 2019



Total Single Family Dwellings Sold April 2020



Total Homes Sold 2020





Report to Council

Department: Infrastructure Services

Division: Drainage

Date: May 19, 2020

Prepared by: Norm Nussio, Manager Operations Drainage

Report Number: Drainage-2020-04

Subject: Adoption of Section 77(3) Engineer Letter of Opinion for the Essex Outlet Drain

Number of Pages: 3

Recommendation(s)

That Drainage Report -2020-04 entitled "Adoption of Section 77(3) letter of opinion for the Essex Outlet Drain" as prepared by Norm Nussio, Manager, Operations and Drainage, dated May 4th, 2020 be received and supported; and

That By-Law 1913, being a by-law to adopt the Section 77(3) Engineers Letter of Opinion to relocate the Essex Outlet Drain within the MTO corridor, be read a first, a second and a third time, and finally passed on May 4, 2020.

Purpose

The Ministry of Transportation (MTO), in moving forward with the expansion of Highway #3 King's Highway within the boundaries of the Town of Essex. The MTO has identified the need to relocate the Essex Outlet Drain in order to accommodate flows from the Town of Essex and avoid conflict with the proposed overpass structure at the Highway #3 and Victoria intersection. Currently the Essex Outlet Drain crosses under Highway #3 in a concrete box

culvert and outlets into the open drain on the west side of Highway #3 in front of the Pollution Control Plant on North Malden Road. The Ministry is proposing to route the drain around the new overpass structure and tie the storm water system back into the Essex Outlet Drain on the east side of Highway #3, in front of Pollution Control Plant on North Malden Road (refer to the attached appendix for design).

Background and Discussion

Section 77(2) of the Drainage Act (the "Act") re: Moving Drainage Works off Road

Where any road authority desires to relocate a drainage works or part thereof that is on or adjacent to a road under its jurisdiction, then upon the report of an engineer appointed by the municipality that recommends or identifies that the drainage works or part thereof can be moved to a specified new location without impairing the capacity or efficiency of such drainage works or adversely affecting any person or property, the council of a local municipality may authorize such relocation within the boundaries of the municipality at the expense of the road authority.

Section 77(3) of the Act re: Written Opinion in Lieu of Report

However, where the relocation of a drainage works or part thereof referred to in subsection 77 (2) is to be affected within the lands under the jurisdiction of the road authority, the engineer has the option to prepare a written opinion instead of a report. Further Section 25(2) of the *Public Transportation and Highway Improvements Act ("PTHIA")* provides that the MTO can designate one or more engineers of the Ministry to be the engineer authorized to carry out the provisions of any Act for the purpose of drainage for the King's Highway and has all the same powers and shall perform all the duties required of an engineer appointed by a municipality.

Accordingly, since the project will affect the drain only within lands under the jurisdiction of the MTO, Administration deems it acceptable that a Letter of Opinion by the MTO engineer can be provided in lieu of an engineer's report. Further that, pursuant to Section 25 (2) of the

PTHIA, there is no need for the Town to additionally retain an engineer to be appointed by the Town, as the MTO may serve as the appointed engineer under the Drainage Act for the relocation of the Essex Outlet Drain within the MTO's corridor.

Finally, since the Essex Outlet Drain relocation is within the jurisdiction of the MTO Road Authority and the capacity of the drain will remain unchanged, the costs to relocate the drain would be borne solely by the Ministry.

Financial Impact

There will be no financial impact to the Town of Essex for the relocation of the drain.

Link to Strategic Priorities

- ☒ Manage, invest and plan for sustainable municipal infrastructure which meets current and future needs of the municipality and its citizens.
- ☐ Create a safe, friendly and inclusive community which encourages healthy, active living for people of all ages and abilities.
- ☐ Provide a fiscal stewardship and value for tax dollars to ensure long-term financial health to the municipality.
- ☐ Manage responsible and viable growth while preserving and enhancing the unique rural and small town character of the community.
- ☐ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

Report Approval Details

Document Title:	Section 77 Essex outlet Drain.docx
Attachments:	<ul style="list-style-type: none">- Letter of Opinion - Essex Outlet.pdf- Appendix B - Final Hwy 3 Culvert Hydrology and Condition Report.pdf- Appendix A - Essex Outet Drain - Recommended Plan.pdf
Final Approval Date:	May 8, 2020

This report and all of its attachments were approved and signed as outlined below:



Kevin Girard, Director, Infrastructure Services - May 4, 2020 - 1:22 PM



Chris Nepszy, Chief Administrative Officer - May 8, 2020 - 10:44 AM

Ministry of Transportation
Engineering Office
Planning and Design Section
West Region

659 Exeter Road
London, Ontario N6E 1L3
Telephone: (519) 873-4561
Facsimile: (519) 873-4600

Ministère des Transports
Bureau du génie
Section de planification et de conception
Région de l'Ouest

659, chemin Exeter
London (Ontario) N6E 1L3
Téléphone : (519) 873-4561
Télécopieur : (519) 873-4600



March 20, 2020

Norman Nussio, C.E.T., CRS
Manager of Operations & Drainage
Town of Essex
nnussio@essex.ca
519-776-7336 ext. 1405

Drainage Improvements to the Essex Outlet Drain
Highway 3
City of Essex

Dear Mr. Nussio:

Instruction

The Ministry proposes a drainage realignment, contained within the Highway 3 property limits, for the Essex Outlet Drain. Specifics regarding the realignment can be found in Appendix A, Essex Outlet Drain – Recommended Plan.

The Ministry-proposed work, as it affects the Essex Outlet Drain, will not adversely affect the hydraulic capacity of the system as shown in the Appendix B, Final Highway 3 Culvert Hydrology and Condition Report. All of the works recommended (see Appendix B) shall be at the cost of the Ministry (Road Authority) and the entirety of the proposed work is on lands solely under the jurisdiction of the Ministry.

We hereby recommend that the realignment, as described in this letter, may proceed as set out in our written opinion in accordance with Section 77(3) of the Drainage Act. As such, a formal report under the Drainage Act is not required.

Watershed Description

The existing Highway 3 crossing of the Essex Outlet Drain serves as an outlet for a large urban storm drainage system within the Town of Essex. The Essex Outlet Drain is a regulated municipal drain and lies within the Canard River Subwatershed.

The Essex Outlet Drain is under the jurisdiction of Essex River Conservation Authority (ERCA) with respect to hydraulic performance and floodplain management, and the Ministry of Natural Resources and Forestry (MNRF) with respect to species at risk (SAR). Watershed characteristics for the Essex Outlet Drain sub-watershed were

../2

determined using information obtained from the previously completed Preliminary Design drainage study, official Municipal Drain mapping obtained from the local municipalities and County of Essex, and topographic mapping from MNR.

Existing Conditions

The Essex Outlet Drain, from its upstream limit to Highway 3, is an intermittent flowing, urbanized closed stormwater drainage system, and is not considered sensitive to fish habitat. The Drain is classified from its upstream limit to Essex Outlet Creek as a Class F drain, based on Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) mapping.

There is currently one crossing of the Essex Outlet Drain within Ministry property, approximately 30 m west of the intersection of Victoria Road and Highway 3. The Essex Outlet Drain, within Ministry property limits, has a linear trapezoidal conveyance feature with relatively uniform geometry.

Rationale and Design Considerations

The drain realignment is required to accommodate the future Victoria Avenue underpass structure and embankment.

Proposed drainage conditions have been reviewed and hydrodynamic modeling has determined that there are no adverse impacts on upstream properties in terms of water surface elevations. Additionally, the report demonstrates that there are no adverse impacts on downstream properties in terms of peak flows during the design events.

Recommendations

We recommend that the drainage realignment to the existing Essex Outlet Drain be constructed. The following provides a brief description of the realignment work on the Essex Outlet Drain (see Appendix B for full details):

- A new crossing culvert under Highway 3 at approximately Station 14+485 (300 m west of Victoria Avenue). To facilitate this crossing, a 4.26 m span, 2.44 m rise and a 97.84 m long concrete box culvert will be installed. The culvert length can be shortened by 27 m after the existing Highway 3 embankment is removed during construction.
- Realignment of the existing open channel drain with a 3.0 m flat bottom within Ministry property and tie into existing drain configuration both north and south of Highway 3.

All of the above works and costs recommended shall be entirely on lands solely under the jurisdiction of the Ministry. Therefore, a detailed summary of the items for construction and costs are not included as part of this letter.

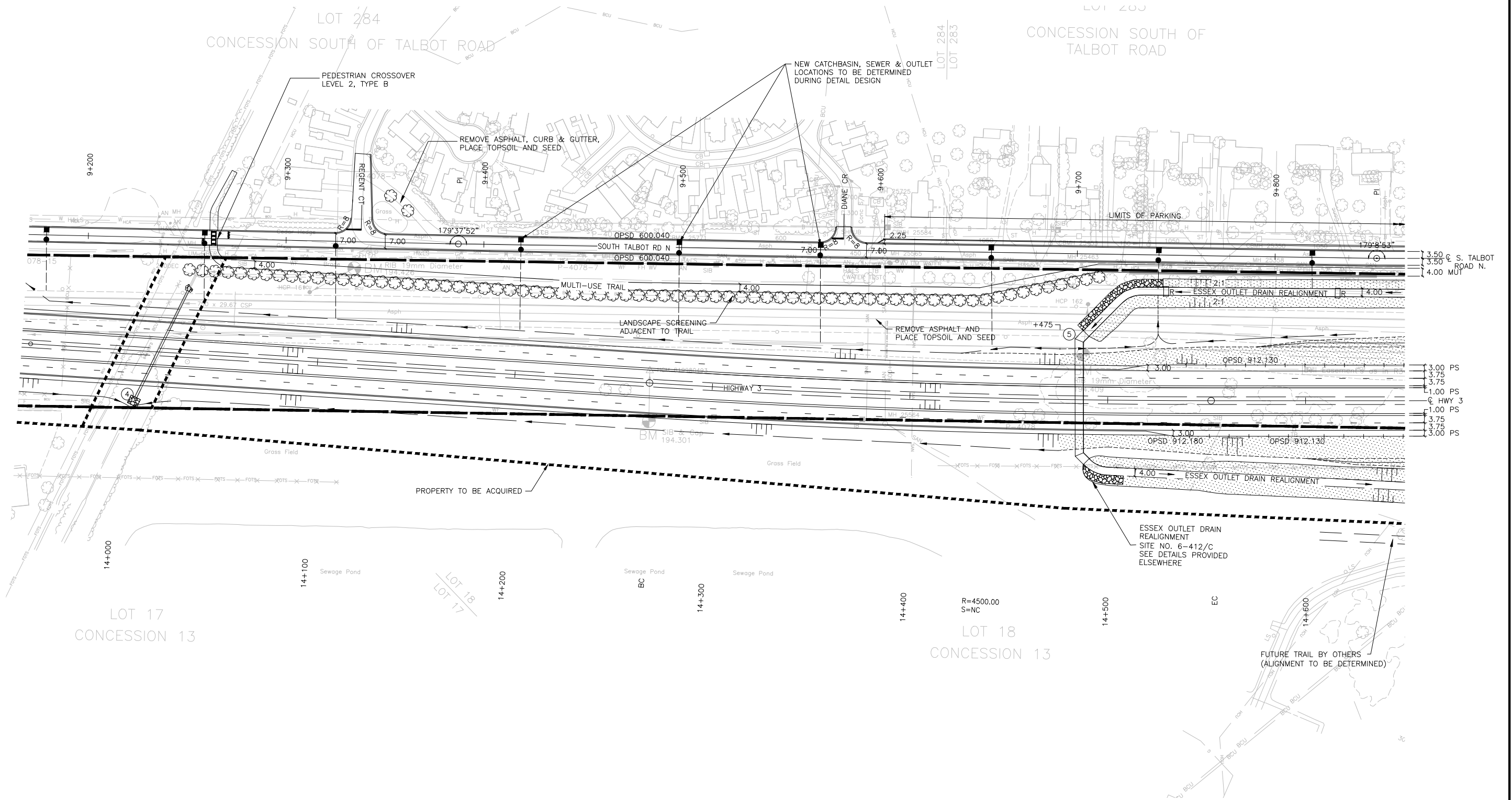
The portions of the Essex Outlet Drain and associated structures within Ministry property limits will be maintained by the Ministry.

Sincerely

A handwritten signature in grey ink, appearing to read 'A. Naylor'.

Amanda Naylor, P.Eng.
Project Engineer
Planning and Design
Ministry of Transportation
Amanda.Naylor@ontario.ca
519-852-2975

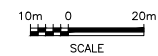
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MINISTRY OF TRANSPORTATION
HIGHWAY 3 IMPROVEMENTS
TOWN OF ESSEX
GWP 317-98-00



THE DETAILS SHOWN ON THIS
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PROVIDED FOR INFORMATION ONLY

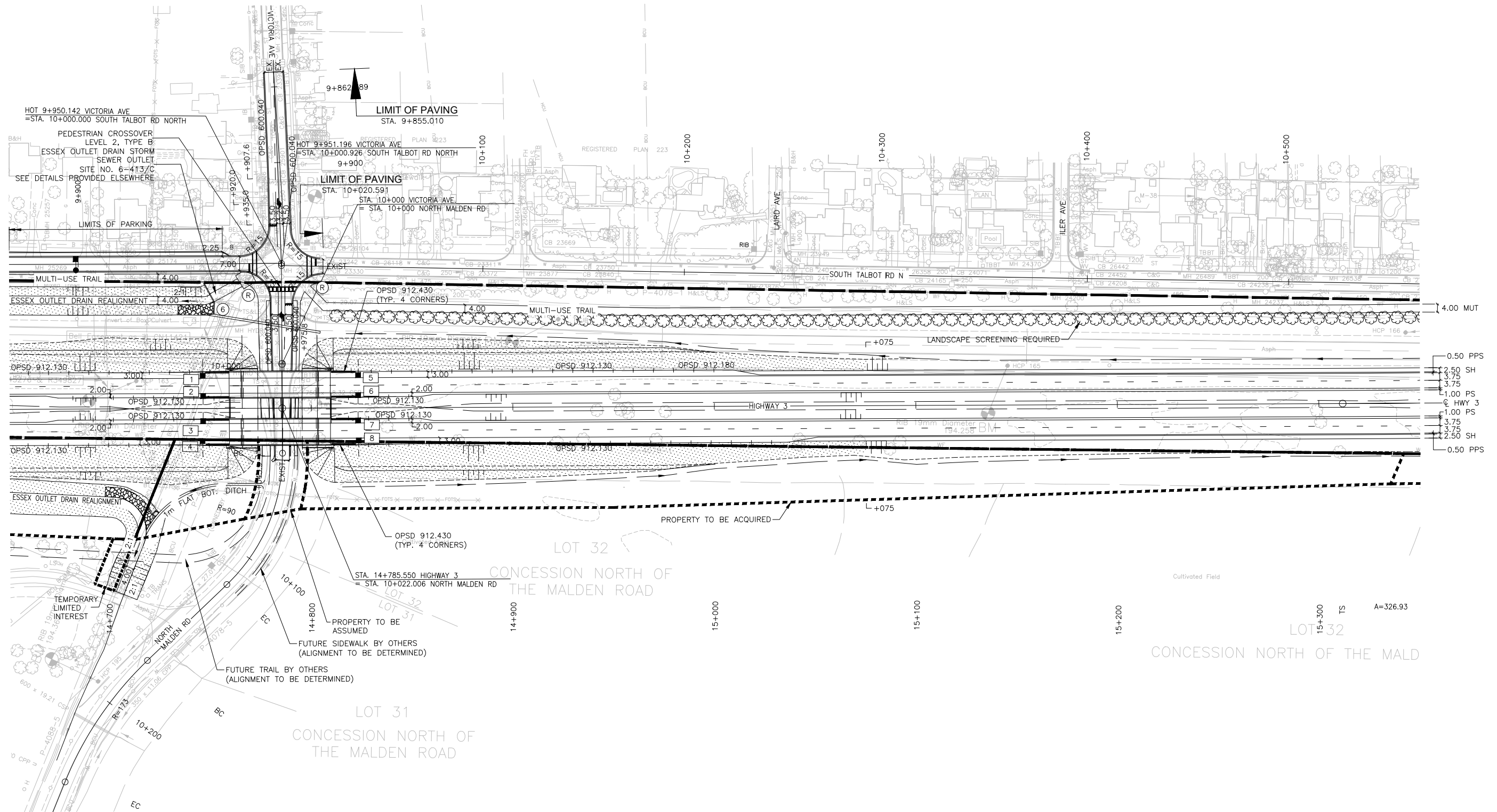


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PROJECT No. 12-6452
DATE: MARCH 2020



NEW CONSTRUCTION
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NC-4

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MINISTRY OF TRANSPORTATION
HIGHWAY 3 IMPROVEMENTS
TOWN OF ESSEX
GWP 317-98-00



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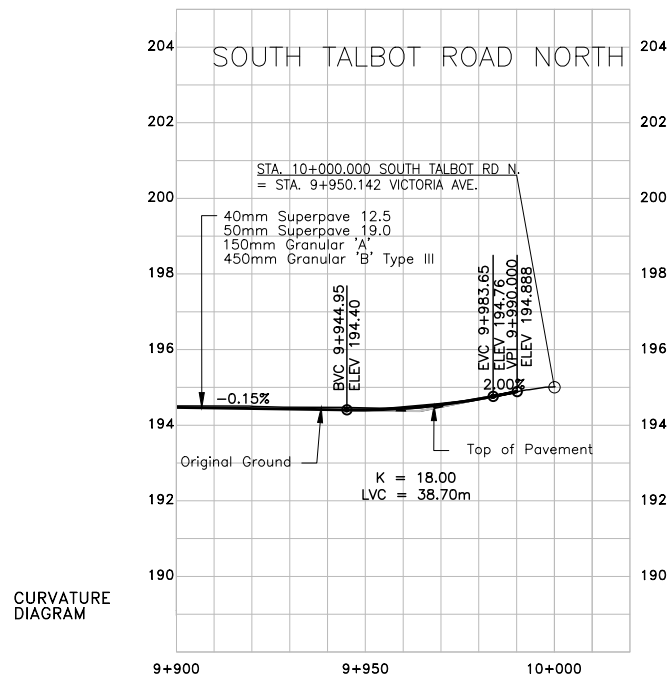
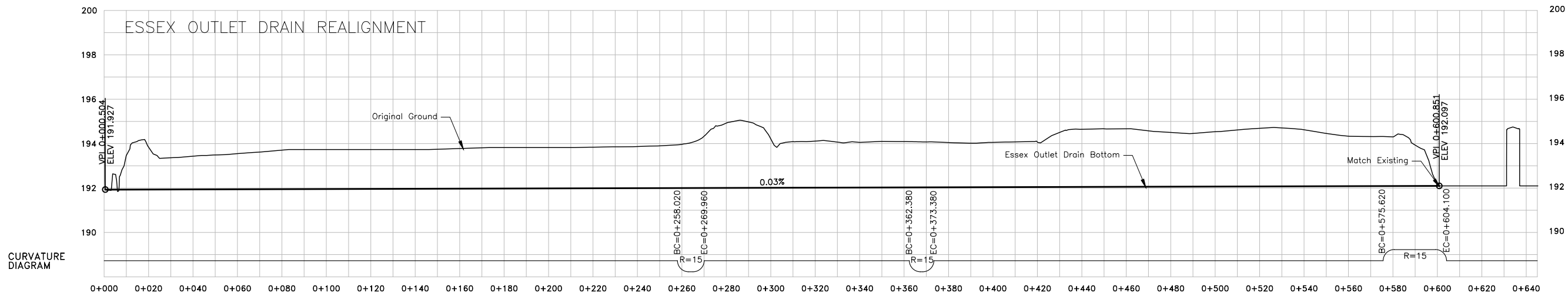


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NEW CONSTRUCTION
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NC-5

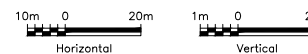
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MINISTRY OF TRANSPORTATION
HIGHWAY 3 IMPROVEMENTS
TOWN OF ESSEX
GWP 317-98-00



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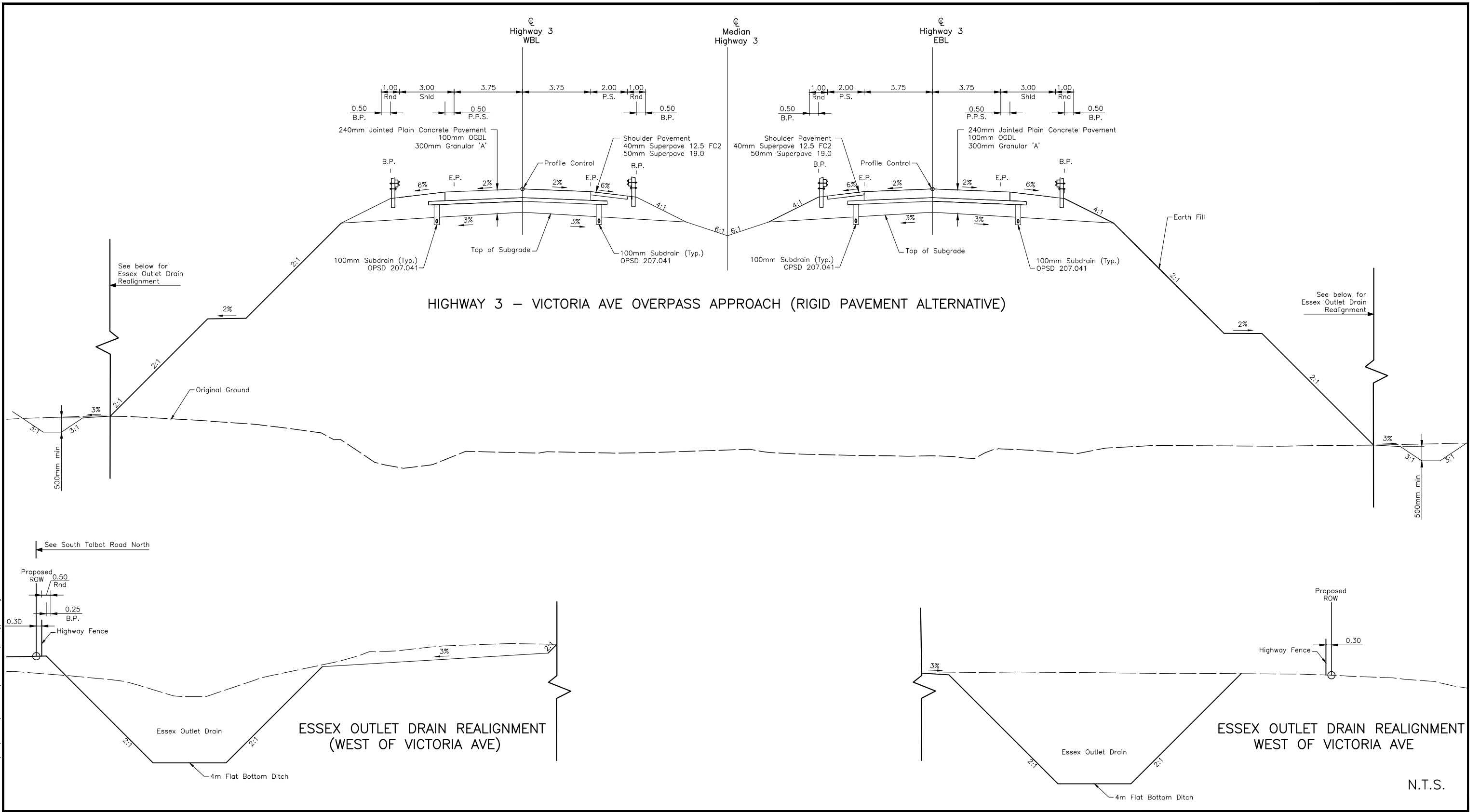


PROFILES

SOUTH TALBOT ROAD NORTH
STA. 9+900 TO STA 10+600

P-13

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MINISTRY OF TRANSPORTATION
HIGHWAY 3 IMPROVEMENTS
TOWN OF ESSEX
GWP 317-98-00



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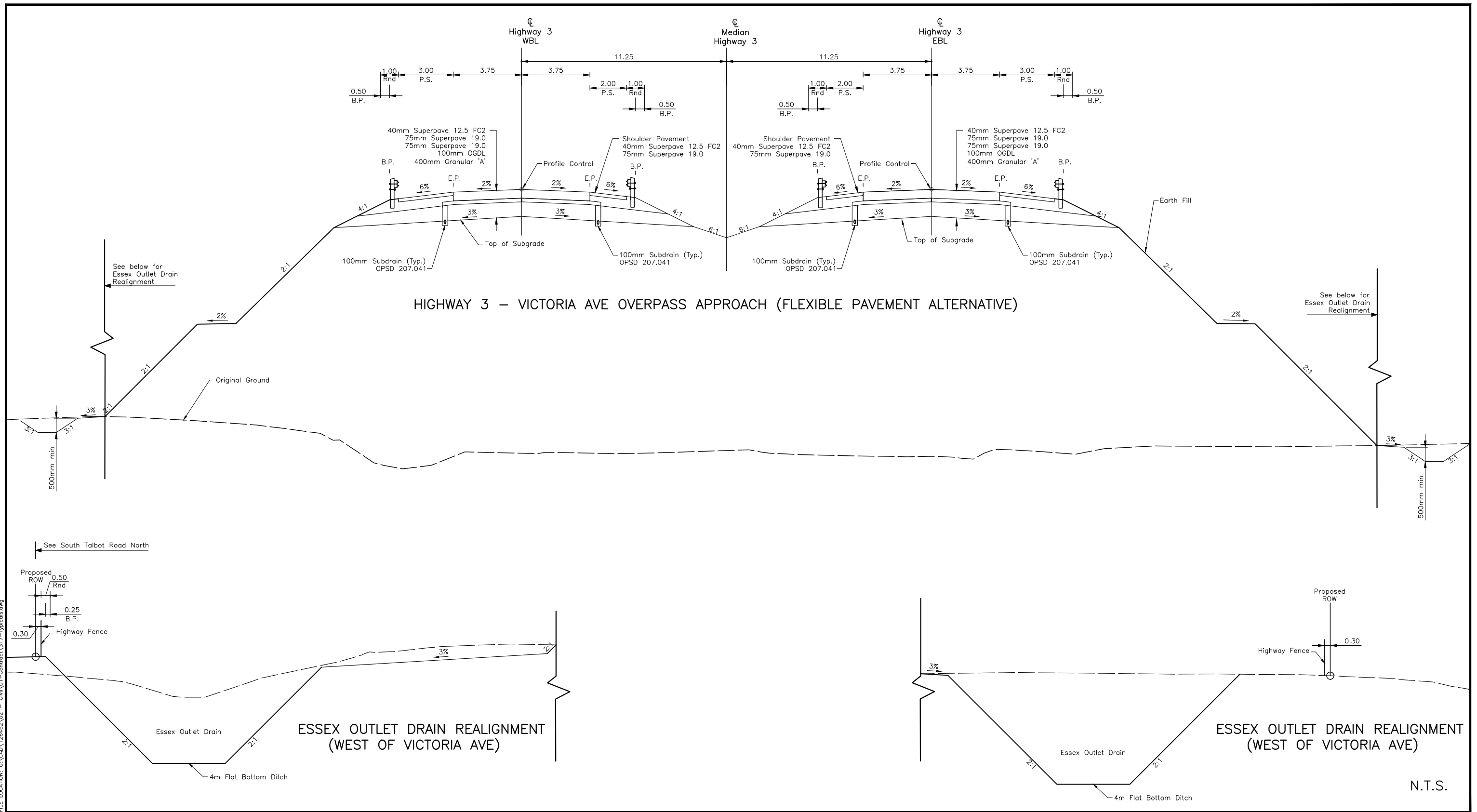
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DATE: MARCH 2020



TYPICALS
HIGHWAY 3

T-3

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MINISTRY OF TRANSPORTATION
HIGHWAY 3 IMPROVEMENTS
TOWN OF ESSEX
GWP 317-98-00



THE DETAILS SHOWN ON THIS
DRAWING ARE PRELIMINARY AND ARE
PROVIDED FOR INFORMATION ONLY

CREATED BY: ACR
CHECKED BY: SJG
PROJECT No. 12-6452
DATE: MARCH 2020



TYPICALS
HIGHWAY 3

T-4



HIGHWAY 3 Improvements

GWP 317-98-00

Culvert Hydrology and Condition Report



December 21, 2018



Ministry of Transportation
Planning and Design Office
659 Exeter Road
London, Ontario
N6E 1L3

Attention: Mr. Anthony Saraceni
Project Engineer

***Ministry of Transportation, Ontario
Highway 3 Improvements – Town of Essex (GWP 317-98-00)
Culvert Hydrology and Condition Report***

Dear Mr. Saraceni:

Enclosed for your records are three hard copies of the Final Culvert Hydrology and Condition Report for the above referenced project.

Sincerely,

DILLON CONSULTING LIMITED

Sarah Grady, P.Eng.
Project Manager

SJG:lpt
Enclosures

Our file: 12-6452

130 Dufferin Avenue
London, Ontario
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N6A 5R2
Mail: Box 426
London, Ontario
Canada
N6A 4W7
Telephone
519.438.6192
Fax
519.672.8209

**Dillon Consulting
Limited**

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1. BACKGROUND INFORMATION SUMMARY

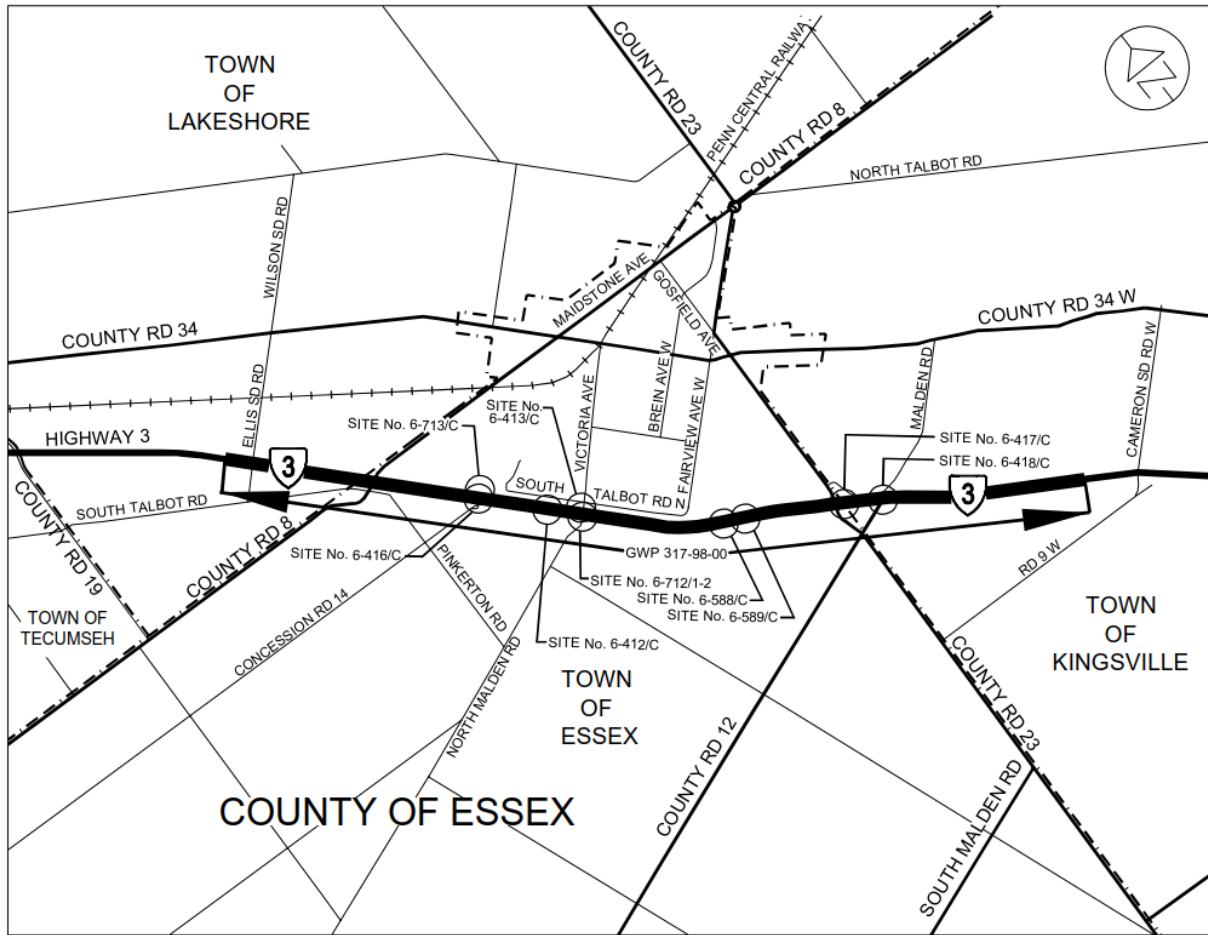
In January 2006, the Ministry of Transportation, Ontario (MTO) completed the Highway 3 Planning and Preliminary Design Study from Outer Drive in Windsor easterly 33.5 km to the east junction of Essex County Road 34 in Leamington (GWP 315-98-00). The Transportation Environmental Study Report (TESR) prepared for the project recommended widening the highway to four lanes with a 15 m grassed median and improving all at-grade intersections. It also recommended that a more comprehensive study be undertaken to address safety, traffic and operational issues through the Town of Essex.

The more detailed study recommended by the TERS was completed in 2010 and is documented in a Transportation Needs Assessment Report, Town of Essex Transportation Study, covering Highway 3 from 3.1 km west of Essex County Road 8 (Maidstone Avenue) to 1.3 km east of Essex County Road 23 (GWP 3008-06-00). To address future safety, traffic and operations issues, the 2010 study recommended a southerly shift of the highway alignment through the Town of Essex and modifications to highway intersections and the local municipal road network. The 2010 study was not completed as an environmental assessment (EA).

Some of the improvements included in the 2006 TERS, such as the widening of Highway 3 to four lanes from Windsor to Leamington, received environmental clearance under the *Environmental Assessment Act* in August 2006. The purpose of the current Class EA, Preliminary Design and initial Detailed Design Study is to revisit the alternatives developed in the 2010 study, building on the preferred alternatives identified in the 2006 TERS and 2010 study, and to assess the alternatives according to the requirements of MTO's Class EA for Provincial Transportation Facilities (2006). The TERS Addendum documents the decision-making process leading to the selection of the updated preferred Preliminary Design of improvements to Highway 3 through the Town of Essex.

The Study Area for the project extends along Highway 3 for 7.4 km from 0.5 km west of Ellis Sideroad easterly to 2 km east of Essex County Road 23. The location of the Highway 3 Improvement project is illustrated on **Figure 1**.

Figure 1: Highway 3 Project Limits



1.1 Previous Drainage Studies

In 2006, Earth Tech completed the Preliminary Design and Environmental Assessment of Highway 3 from Outer Drive 33.5 km easterly to the junction of County Road 34 under GWP 315-98-00. As part of the Preliminary Design, Earth Tech prepared a Drainage Report with recommendations for replacement and sizing of existing and proposed drainage infrastructure. In general, the report recommended that all existing CSP culverts be replaced based on the observed conditions of the culverts and the installation dates of the drainage infrastructure. A hydraulic analysis completed for the structural culverts concluded that several have deficient capacity. The condition of the existing drainage infrastructure and the hydraulic capacity of the key structural and non-structural culverts have been evaluated as part of this study.

1.2 Project Scope and Data Collection

The 2006 TESR recommended that Highway 3, through the project limits, be widened to four lanes with a 15 m wide grassed median. Improved at-grade intersections with turning lanes were recommended at all intersections. The recommended widening of Highway 3 requires the extension of structural and non-structural culverts that convey municipal drain system flows from the north side of Highway 3, through the corridor, to the south. The proposed grade separation at Victoria Avenue also requires the construction of a new culvert through the Highway 3 corridor to convey stormwater discharge from the Essex Outlet Drain to the downstream receiving watercourse. Specifically, the highway improvements recommended as part of the current Preliminary Design study include:

- Southerly shift of the Highway 3 alignment through the Town of Essex
- Partial closure of Highway 3/Ellis Sideroad intersection and construction of a cul-de-sac on the south side of the Highway corridor
- Realignment of South Talbot Road, Essex County Road 8 and Pinkerton Sideroad
- Overpass grade separation at Highway 3 and Victoria Avenue, combined with a multi-use trail constructed north of the proposed overpass embankment
- Municipal improvements at various intersections throughout the Study Area.

The primary purpose of Dillon's Culvert Hydrology and Condition Report is to document the drainage and hydrology engineering component of the Preliminary Design process. Specifically, this report covers:

- Physical condition of the existing structural and non-structural culvert impacted by the highway improvements
- Field investigations and background review of historic flooding or erosion issues at the existing culvert locations
- Hydraulic performance of the existing culverts impacted by the proposed highway improvements compared to MTO Drainage Design Standards
- Hydraulic performance of the proposed culvert configurations compared to MTO Drainage Design Standards
- Summary of recommended mitigation/improvement works for the proposed culvert configurations. These will be included in the Detailed Design of the structural and non-structural culverts.

To complete the condition assessment and hydraulic performance evaluation, several field investigations were completed by the drainage and structural design teams. The structural design team focused on the structural culvert condition assessments, while members of the drainage team undertook the non-structural culvert condition assessment, making note of any signs of flooding and erosion/scour in the watercourses. To complete the required hydrologic and hydraulic assessment of the existing and proposed culvert configurations, the following mapping and data sources were used:

- GIS base mapping from Ministry of Natural Resources and Forestry (MNRF), MTO and the County of Essex
- Ground survey data produced as part of the Preliminary Design
- Municipal Drain reports obtained from the local municipalities and County of Essex
- 2006 Earth Tech Preliminary Design/TESR Drainage Report.

1.3 Existing Condition Summary

As shown on **Figure 2**, six structural and three non-structural culverts cross Highway 3 within the project limits. The structural culverts consist of a group of five open-footing concrete non-rigid frame culverts and one horizontal elliptical corrugated steel structural plate culvert. The non-structural culverts consist of a group of two small diameter corrugated steel pipe culverts and one 2.44 m span open-footing concrete non-rigid frame culvert. In addition, there are several non-structural culverts located within the Study Area at Pinkerton Sideroad and an existing storm sewer outfall structure at the intersection of Victoria Avenue and South Talbot Road that form key components of the surface water drainage system within the Highway 3 corridor. Several other non-structural small diameter corrugated steel pipe culverts that also facilitate highway drainage will be eliminated or reconfigured as part of the Highway 3 improvements.

Figure 2: Structural and Non-Structural Culvert Locations within Project Limits











2. CONDITION ASSESSMENT

As indicated in the 2006 Preliminary Design study completed by Earth Tech, the general condition of all corrugated steel pipe (CSP) culverts within the project limits were found to be moderate to poor. Due to the proposed widening of Highway 3 and reconfiguration of side-roads, most of the non-structural CSP culverts will be eliminated or significantly impacted, therefore necessitating replacement. The non-structural CSP culverts impacted by the proposed improvements were not assessed in detail as part of the Preliminary Design update. The final location, configuration and size of the drainage ditch, side-road and entrance culverts (if necessary) will be determined during Detailed Design.

2.1 Non-Structural CSP and Concrete Culverts

There are two non-structural CSP culverts and one non-structural open-footing non-rigid-frame concrete culverts crossing the existing lanes of Highway 3 within the project limits. **Table 1** summarizes the physical configuration and condition of the existing non-structural culverts.

Table 1: Condition Assessment of Non-Structural Culverts Crossing Highway 3

Drain Name/ Classification	Existing Size	Location (Station)	Inlet	Outlet	Barrel	Condition Assessment
Unnamed Drain	750 mm x 29.67 m	14+018 Hwy 3				General condition – Poor, rusted spring line, damaged inlet/outlet Less than minimum acceptable (800 mm) size
Talbot Road South Drain A	750 mm x 22.31 m	15+489 Hwy 3				General condition – Poor, rusted spring line, damaged inlet/outlet Less than minimum acceptable (800 mm) size
Barlow Drain	2400 mm x 1830 mm x 28.58 m	11+623 Hwy 3			Not available	General Condition – Good, some minor surface scaling and leaking construction joints - Well vegetated channel and minimal channel degradation due to erosion and scour - No signs of capacity related deficiencies, including flooding or local erosion

The two CSP culverts crossing the existing lanes of Highway 3 are in poor condition and have reached the end of their useful lifespan. Both 750 mm CSP culverts require replacement and upsizing to meet current MTO Design Criteria for minimum size. The Barlow Drain culvert, a 2400 mm x 1830 mm concrete culvert, is in generally good condition and will provide an opportunity for an interim extension to the south to accommodate the proposed lane transitions at the easterly end of the project, as well as the ultimate culvert extension required for the twinning of Highway 3 to the east. Several other roadside ditch drainage culverts located within the project limits require replacement or modification due to the proposed local municipal road improvements. The final configuration and sizing of these roadside ditch culverts will be addressed during Detailed Design of Structural Culverts.

Six additional structural culverts cross the existing lanes of Highway 3 within the project limits. The condition assessment of these culverts was completed as part of the preparation of the Structural Design Reports (SDRs). **Table 2** summarizes the condition assessment, including the condition of the channel embankment and watercourse within the culvert barrels.

Table 2: Condition Assessment of Structural Culverts Crossing Highway 3

Drain Name/ Classification	Existing Size (Width x Height x Length)	Site Number	Location (Highway 3 Station)	Inlet/Outlet	Culvert Barrel	Embankment and Watercourse
14 th Concession East Drain	3050 mm x 1524 mm x 26.95 m	6-416/C	13+892	No existing headwalls	Inside of culvert in good condition. Minor surface scaling and narrow and medium width shrinkage cracks. Efflorescence and rust staining at crack locations.	Approximately 350 mm of silt and sediment measured over top of footings. Embankments are in good condition.
Essex Outlet Drain	3600 mm x 1830 mm x 36.79 m and 1830 mm x 1220 mm x 40.16 m	6-412/C	14+750	Grouted natural stone retaining walls in fair to poor condition	Inside of culvert is in good condition. Isolated transverse shrinkage cracking and small areas of spalling and delamination. Area of delamination of the soffit with exposed corroded reinforcing steel in soffit. CSP overflow culvert in generally good condition.	Silt aggradation along east side of stream inside culvert. Some accumulated sediments and standing water within culvert. Embankment slopes are steep and irregular at inlet and outlet of culvert. No significant erosion observed.
Canaan Drain	3350 mm x 2070 mm x 26.28 m	6-588/C	15+954	Concrete end walls in good condition with isolated narrow to wide cracking	Inside of culvert in good condition, with widespread loss of galvanization and light corrosion along the spring line.	Approximately 400 mm to 460 mm of standing water inside culvert limiting visual inspection below spring line. No signs of settlement or defects in streambed or embankment.

Drain Name/ Classification	Existing Size (Width x Height x Length)	Site Number	Location (Highway 3 Station)	Inlet/Outlet	Culvert Barrel	Embankment and Watercourse
Talbot Road South Drain B	3050 mm x 1220 mm x 22.76 m	6-589/C	16+137	Concrete wingwalls in good condition but isolated severe spalling near culvert side walls. Appears to be some movement of walls causing stresses and spalling at joints.	Inside of culvert in good condition but shrinkage cracks in side wall and soffit. Cracks at side wall drain locations. A wide crack was noted near inlet with an area of delamination.	Approximately 150 mm of silt and sediment measured over tops of footings. No standing water or flow within culvert at time of inspection. Embankments in good condition with cinder blocks stacked at southwest wingwall indicating a historical erosion problem.
East Townline/ West Townline Drain	3660 mm x 2100 mm x 41.63 m	6-417/C	10+017	Concrete wingwalls at south end of culvert are in good condition.	Inside of culvert in good condition but several shrinkage cracks in side walls and soffit ranging from narrow to wide. A narrow crack in the soffit was noted near the inlet with an area of soffit delamination.	Approximately 300 mm of silt and sediment measured over top of footings. No standing water or flow within culvert at time of inspection. Existing rip-rap protection appears to be functioning but appears excessively steep in northwest corner.
Russell Drain	3050 mm x 1650 mm x 25.66 m	6-419/C	10+331	Concrete wingwalls at north end are in generally good condition.	Inside of culvert is in very good condition with minor transverse shrinkage cracking.	Approximately 300 mm of silt and sediment measured over top of footings. No standing water or flow within culvert at time of inspection. No embankment or erosion issues noted.

In general, all of the structural culverts are in good condition. All of the culverts, with exception of the Canaan Drain, will require minor concrete repairs and rehabilitation. A number of crossings with wingwalls at the inlet/outlet require rehabilitation. These culverts will be considered for extension to eliminate the need for costly wingwall repairs and the need to install guardrail systems along Highway 3 to protect motorists from roadside hazards.

2.2 Design Criteria for Watercourse Crossing

This section includes the required hydrologic and hydraulic design criteria for use in the design and rehabilitation of highway drainage infrastructure under MTO's jurisdiction. The MTO 2008 Drainage Design Standard was used to define the relevant design criteria for each crossing and represents a consolidation of hydraulic performance indicators considered as part of the evaluation of the culverts impacted by the proposed highway improvements.

Table 3 contains design criteria for the group of structural and non-structural culverts crossing Highway 3 that are directly impacted by the highway widening from two lanes undivided to a four lane divided configuration. The table also presents the relevant design criteria for a new culvert required to accommodate the extension of South Talbot Road over 14th Concession Drain, west of Victoria Avenue.

Since Talbot Road South Drain crosses the Highway 3 corridor in two separate locations, the two branches have been designated as Branch 'A' and Branch 'B'. This designation applies to this culvert hydrology study only and should not be misinterpreted as part of the official Municipal Drain designation.

Table 3: Culvert Design Criteria

Drain Name/Classification	Location	Classification and Type	Design Flow Return Period	Check Flow Return Period	Freeboard Requirement	Clearance Requirement	Max Headwater/Depth Ratio or 1.5 Max Depth
Hyland Drain (CR8) – <i>New Culvert</i>	Regional Road 8 at Realigned Pinkerton Road	Non-Structural Closed-Footing	25-Year	115% of 100-Year	1.0 m	n/a	1.5
14 th Concession Drain	13+892 Highway 3	Structural – Open-Footing	50-Year	130% of 100-Year	1.0 m	0.3 m	n/a
14 th Concession Drain – South Talbot Road Extension	9+108 South Talbot Road	Structural – Open-Footing	25-Year	115% of 100-Year	1.0 m	0.3 m	n/a
Unnamed Drain	14+018 Highway 3	Non-Structural Closed Footing	50-Year	130% of 100-Year	1.0 m	n/a	1.5
Essex Outlet Drain	14+742 Highway 3	Structural – Open-Footing	50-Year	130% of 100-Year	1.0 m	0.3 m	n/a
Talbot Road South Drain A	15+489 Highway 3	Non-Structural Closed Footing	50-Year	130% of 100-Year	1.0 m	n/a	1.5
Canaan Drain	15+954 Highway 3	Structural – Closed Footing	50-Year	130% of 100-Year	1.0 m	n/a	4.5 m
Talbot Road South Drain B	16+138 Highway 3	Structural – Open-Footing	50-Year	130% of 100-Year	1.0 m	0.3 m	n/a
East Townline/West Townline Drain	10+016 Highway 3	Structural – Open-Footing	50-Year	130% of 100-Year	1.0 m	0.3 m	n/a
Russell Drain	10+331 Highway 3	Structural – Open-Footing	50-Year	130% of 100-Year	1.0 m	0.3 m	n/a
Barlow Drain	11+623 Highway 3	Non-Structural Open-Footing	50-Year	130% of 100-Year	1.0 m	0.3 m	n/a

3. HYDROLOGIC/HYDRAULIC PERFORMANCE ASSESSMENT

3.1 Hydrologic Analysis

The hydrologic analysis was completed in accordance with accepted methods outlined in the MTO Drainage Design Manual. The hydrologic drainage area characteristics presented in the following sections were obtained from the previously completed Preliminary Design drainage study, official Municipal Drain mapping obtained from the local municipalities and County of Essex, and topographic mapping from MNR.

Figure 3 illustrates the individual drainage areas consolidated from all sources of municipal drain information available for the Study Area. The Municipal Drains fall within the Canard River subwatershed area and generally flow in a north to south direction through the study area and an east to west direction downstream of the Highway 3 corridor. The Canard River is a significant tributary to the Detroit River, terminating in the Town of Amherstburg. The drainage areas associated with this section of Highway 3 are comprised of a combination of rural agricultural and low density rural residential land use. The Essex Outlet Drain drainage area comprises primarily urbanized lands within the Town of Essex.

All of the municipal drains within the Study Area are artificially created watercourses that convey characteristically peaky flows from frequent low-intensity rainfall events based on the configuration of the conveyance system, lack of definable floodplain area and minimal detention storage within the subcatchment areas. Infrequent high-intensity rainfall events (25-Year Return Period and above) characteristically use up available storage within the conveyance systems and result in the municipal drains overtopping their natural banks and spilling out into adjacent low-lying areas or the agricultural fields that they drain. Due to the surrounding topography, once the conveyance systems spill to adjacent lands, runoff is stored and attenuated to a high degree, controlling peak flows through the system and generally significantly reducing peak flows discharged to the lower reaches of the drainage systems. For the purpose of the assessment and design of the proposed highway improvement works, a conservative approach was taken to applying peak flow reductions due to storage and attenuation. In general, only minor storage reduction factors were incorporated into the hydrologic modeling of the drainage areas.

Figure 3: Study Area Municipal Drain Drainage Boundaries



Table 4 summarizes hydrologic characteristic data based on existing land use mapping, topographic mapping and aerial photo interpretation. The hydrologic characteristics reflect the existing land use characteristics within the drainage area and do not consider future urbanization of the lands north of the Highway 3 corridor. Future development north and south of the Highway 3 corridor will require site stormwater management plans based on the objective of maintaining existing flows to each municipal drain system or re-evaluation of the existing/proposed Highway 3 infrastructure.

Table 4: Drainage Area Hydrologic Characteristics Summary

Crossing Location	Watershed Area (ha)	Watershed Length (m)	Watershed Slope (%)	Estimated Runoff Coefficient
Hyland Drain (CR8)	104.56	2450	0.07	0.35
14 th Concession Drain	99.03	1200	0.07	0.35
14 th Concession Drain – South Talbot Road Extension	99.03	1200	0.07	0.35
Unnamed Drain	11.09	1600	0.01	0.35
Essex Outlet Drain	186.85	1800	0.12	0.60
Talbot Road South Drain A	24.84	600	0.10	0.35
Canaan Drain	129.56	1300	0.15	0.40
Talbot Road South Drain B	27.63	600	0.10	0.35
East Townline/West Townline Drain	97.77	1400	0.11	0.35
Russell Drain	54.82	1350	0.06	0.35
Barlow Drain	284.79	2250	0.04	0.35

Tables 5 and **6** summarize the calculated peak flow data determined by the hydrologic analysis completed for this assignment. The MTO Modified Rational Method and peak flows generated by a Visual Otthymo model of the drainage area are presented in the summary tables. Typically, the peak flow data generated by the MTO Modified Rational Method is suitable for small watershed areas up to a maximum of 50 ha to 75 ha. The Modified Rational Method tends to over-estimate peak runoff flow rates for drainage areas exceeding this size. **Table 7** summarizes the consolidated design flows applicable to each crossing location based on watershed characteristics and size. Annual maximum rainfall intensities for each return period design storm were obtained from the MTO IDF curve lookup web-based application. The detailed Visual Otthymo hydrologic modeling output summaries are included in **Appendix A**.

Table 5: MTO Modified Rational Method Peak Flow Summary

Crossing Location	2-Year Design Flow (cms)	5-Year Design Flow (cms)	10-Year Design Flow (cms)	25-Year Design Flow (cms)	50-Year Design Flow (cms)	100-Year Design Flow (cms)
Hyland Drain (CR8)	0.8	1.0	1.3	1.5	1.7	1.9
14 th Concession Drain	1.0	1.3	1.7	2.1	2.6	3.3
14 th Concession Drain – South Talbot Road Extension	1.0	1.3	1.7	2.1	2.6	3.3
Unnamed Drain	0.1	0.1	0.1	0.1	0.2	0.2
Essex Outlet Drain	6.1	7.8	10.0	12.2	15.3	19.9
Talbot Road South Drain A	0.4	0.5	0.6	0.7	0.9	1.2
Canaan Drain	1.9	2.4	3.1	3.8	4.8	6.3
Talbot Road South Drain B	0.4	0.5	0.7	0.8	1.0	1.3
East Townline/West Townline Drain	1.1	1.3	1.8	2.1	2.7	3.5
Russell Drain	0.5	0.6	0.9	1.0	1.3	1.7
Barlow Drain	1.6	1.9	2.6	3.9	4.9	6.4

Table 6: Visual Otthymo Peak Flow Summary

Crossing Location	2-Year Design Flow (cms)	5-Year Design Flow (cms)	10-Year Design Flow (cms)	25-Year Design Flow (cms)	50-Year Design Flow (cms)	100-Year Design Flow (cms)
Hyland Drain (CR8)	0.6	0.9	1.5	2.0	2.4	2.8
14 th Concession Drain	0.8	1.2	1.8	2.5	3.0	3.5
14 th Concession Drain – South Talbot Road Extension	0.8	1.2	1.8	2.5	3.0	3.5
Unnamed Drain	0.1	0.1	0.1	0.1	0.2	0.2
Essex Outlet Drain	3.1	4.6	6.9	9.2	11.0	12.7
Talbot Road South Drain A	0.3	0.4	0.7	0.9	1.1	1.3
Canaan Drain	1.3	1.9	3.0	4.1	4.9	5.7
Talbot Road South Drain B	0.3	0.5	0.7	1.0	1.2	1.4
East Townline/West Townline Drain	0.8	1.2	1.9	2.6	3.1	3.7
Russell Drain	0.4	0.6	0.9	1.3	1.5	1.8
Barlow Drain	1.2	1.8	2.8	3.8	4.5	5.2

Table 7: Consolidated Design Flows

Crossing Location	Return Period of Design Flow	Design Flow – Freeboard and Clearance Assessment (cms)	Check Flow – Erosion Potential Assessment (cms)
Hyland Drain (CR8)	25-Year	2.0	3.2
14 th Concession Drain	50-Year	3.0	4.5
14 th Concession Drain – South Talbot Road Extension	25-Year	2.5	4.0
Unnamed Drain	50-Year	0.2	0.3
Essex Outlet Drain	50-Year	11.0	16.5
Talbot Road South Drain A	50-Year	1.1	1.7
Canaan Drain	50-Year	4.9	7.4
Talbot Road South Drain B	50-Year	1.2	1.8
East Townline/West Townline Drain	50-Year	3.1	4.8
Russell Drain	50-Year	1.5	2.3
Barlow Drain	50-Year	4.5	6.8

Following the completion of this study the Town of Essex initiated a large scale urban drainage study that includes several of the noted municipal drain watershed areas. The Town’s drainage master plan study includes detailed hydraulic/hydrologic modeling of the storm sewer collection system. Upon completion of that study design flows from the Town’s hydrologic model should be used to re-evaluate existing and proposed Highway 3 infrastructure. It is noted that hydrologic input used in the Essex Outlet Drain hydraulic evaluation are flows generated by a simplified ‘lumped’ upstream drainage area Visual Otthymo model.

3.2 Hydraulic Performance Assessment

The following sections summarize the hydraulic performance assessment completed on the existing structural and non-structural culverts directly impacted by the proposed highway widening and side-road realignments. The purpose of the existing conditions performance assessment was to provide a baseline condition to assess the performance of the proposed culverts required to accommodate the improvements. **Section 3.2.1** summarizes the hydraulic assessment completed for the existing culvert configurations, **Section 3.2.2** summarizes the hydraulic assessment completed for the proposed culvert arrangements and **Section 3.2.3** compares existing versus proposed hydraulic conditions.

3.2.1 Existing Conditions Hydraulic Performance Assessment

The existing municipal drain culverts were evaluated to assess the hydraulic performance of the structures and establish the baseline conditions against which the new culvert arrangements required to accommodate the proposed highway improvements will be compared. The hydraulic performance of the existing culverts was also evaluated against the required design criteria for each culvert location, as shown in **Table 3**.

Table 8 summarizes the hydraulic performance indicators resulting from applying the design and check flows to the existing culvert geometry.

Table 8: Existing Culvert Hydraulic Performance Assessment Summary

Crossing Location	Existing Culvert Configuration (Width x Height x Length)	Design Storm Computed Headwater Elevation	Headwater Depth/ Height Ratio	Flow Regime	Check Storm Outlet Velocity (m/s)	Resultant Freeboard (m)	Resultant Clearance (m)
14 th Concession East Drain	3050 mm x 1524 mm x 26.95 m	192.920	73%	Subcritical	1.18	1.04	0.41
Unnamed Drain	750 mm x 29.67 m	193.790	63%	Subcritical	1.51	1.12	n/a
Essex Outlet Drain	3600 mm x 1830 mm x 36.79 m and 1830 mm x 1220 mm x 40.16 m	193.670	113%	Surcharged	2.08	1.26	-0.24
Talbot Road South Drain A	750 mm x 22.31 m	195.150	252%	Surcharged	3.68	0.10	n/a
Canaan Drain	3350 mm x 2070 mm x 26.28 m	192.700	71%	Subcritical	1.57	2.56	n/a
Talbot Road South Drain B	3050 mm x 1220 mm x 22.76 m	193.700	34%	Subcritical	1.81	1.58	0.80
East Townline/ West Townline Drain	3660 mm x 2100 mm x 41.63 m	193.340	66%	Subcritical	1.06	2.12	0.71
Russell Drain	3050 mm x 1650 mm x 25.66 m	192.960	36%	Subcritical	1.61	2.49	1.06
Barlow Drain	2400 mm x 1830 mm x 28.58 m	194.210	105%	Surcharged	1.52	1.24	-0.10

In existing condition, 14th Concession East, Unnamed Drain, Canaan Drain, Talbot Road South Drain B, East Townline/West Townline and Russell Drain all meet or exceed the required performance targets based on the existing culvert configuration, type and location within the Highway 3 corridor. Currently, Essex Outlet Drain, Talbot Road South Drain A and Barlow Drain are all operating below the expected level of service based on the existing culvert configuration, type and location. Notably, the Branch 'A' crossing of the Talbot Road South Drain, an existing 750 mm CSP culvert, is operating with a project headwater depth to diameter ratio of 252%. Typically, surcharging of a small diameter CSP of this configuration would be limited to approximately 150%. The projected design flow freeboard depth is also deficient at this location, leading to the possibility of overtopping of Highway 3 during extreme precipitation events. Essex Outlet Drain and Barlow Drain are both operating below ideal levels of service and experience minor surcharging for the design storm flows at each crossing location. At both locations, the structures are submerged and the required clearance between the projected headwater elevation and the underside of the culvert soffit are not achieved. However, both locations have sufficient freeboard depths based on the required design criteria for the structures. Based on the existing hydraulic performance of the Essex Outlet Drain, Talbot Road South Branch 'A' Drain, and Barlow Drain, consideration should be given to upsizing the structures to compensate for excessive headwater to depth ratios, lack of freeboard or deficient clearance at the structure inlets.

For all locations, the calculated freeboard depth for the existing culvert, referenced from the lowest edge of pavement elevation at the culvert crossing location, was established based on the existing profile of Highway 3. The projected downstream channel velocities for the check storm flows are projected to exceed the scour protection qualities of natural vegetation at Essex Outlet and Talbot Road South Branch 'A' Drain. Additional erosion protection or channel hardening should be considered at these locations to guard against future erosion and scour at the culvert inlet and outlet locations.

The detailed CulvertMaster Hydraulic output data for the existing condition assessment is included in **Appendix B**.

3.2.2 Proposed Conditions Hydraulic Performance Assessment

The proposed municipal drain culverts were assessed to evaluate the resultant hydraulic performance of the culvert arrangements required to accommodate the proposed highway

improvements. The hydraulic performance of the proposed culvert arrangements were also evaluated against the required design criteria summarized in **Table 3** for each crossing location.

Table 9 summarizes the proposed modifications to the existing municipal drain culvert arrangements that are required to accommodate the proposed highway improvements.

Table 9: Proposed Culvert Configurations

Crossing Location (New Construction Culvert #)	Summary of Proposed Highway 3 Improvement Works	Site/Culvert Design Considerations	Proposed Culvert Configuration
New Hyland Drain at Pinkerton Road/County Road 8 (Culvert #17)	<ul style="list-style-type: none"> Realignment of Pinkerton Road and new intersection at CR8 requires a new crossing of Hyland Drain along the north side of the RR8 right-of-way. 	<ul style="list-style-type: none"> 28.95 m long culvert required to convey flow along north side of RR8 right-of-way to the west side of the new Pinkerton Road intersection. 	Determine based on Hydraulic Assessment
Extended 14 th Concession East Drain (Culvert #3)	<ul style="list-style-type: none"> Widening of Highway 3 from 2-lane undivided to 4-lane divided. 	<ul style="list-style-type: none"> 33.34 m right extension required to accommodate new EBL of Highway 3 and proposed 15 m open-ditch median. 	3050 mm x 1524 mm x 60.29 m
New Proposed 14 th Concession East Drain (South Talbot Road Extension) (Culvert #2)	<ul style="list-style-type: none"> Construction of South Talbot Road Extension. 	<ul style="list-style-type: none"> The South Talbot Road Extension creates the need for a new crossing of 14th Concession East Drain approximately 8 m upstream of the existing Highway 3, 14th Concession East Drain culvert Establish culvert sizing based on freeboard and clearance requirements of future South Talbot Road Extension profile. 	Determine based on Hydraulic Assessment
Unnamed Drain (Culvert #4)	<ul style="list-style-type: none"> Widening of Highway 3 from 2-lane undivided to 4-lane divided. 	<ul style="list-style-type: none"> Existing CSP culvert is in poor condition requiring replacement Existing CSP culvert does not meet MTO minimum diameter requirements based on location within Highway 3 corridor Establish culvert sizing based on 800 mm minimum diameter and required headwater/freeboard. 	Determine based on Hydraulic Assessment
Proposed Essex Outlet Drain (Victoria Avenue) (Culvert #6)	<ul style="list-style-type: none"> Intersection improvements at South Talbot Road and Victoria Avenue Pavement and radii improvements in southwest quadrant and proposed multi-use trail system require a modified outlet to be constructed. 	<ul style="list-style-type: none"> Existing outlet consists of two drainage enclosures that join together in one common headwall arrangement Existing drainage enclosures are non-structural modified box sections. 	Determine based on Hydraulic Assessment

Crossing Location (New Construction Culvert #)	Summary of Proposed Highway 3 Improvement Works	Site/Culvert Design Considerations	Proposed Culvert Configuration
Proposed Essex Outlet Drain (Culvert #5)	<ul style="list-style-type: none"> Widening of Highway 3 from 2-lane undivided to 4-lane divided configuration Construction of Victoria Avenue overpass structure Addition of a multi-use trail system within Highway 3 corridor Minor reconfiguration of intersection of Victoria Avenue and South Talbot Road. 	<ul style="list-style-type: none"> Existing culvert arrangement to be replaced with single span culvert crossing proposed (shifted) lanes of Highway 3 and overpass embankment Consider construction staging and geotechnical requirements for placement of final culvert crossing Highway 3 Establish culvert sizing based on existing headwater elevation, freeboard and clearance requirements. 	Determine based on Hydraulic Assessment
Talbot Road South Drain A (Culvert # 8)	<ul style="list-style-type: none"> Widening of Highway 3 from 2-lane undivided to 4-lane divided. 	<ul style="list-style-type: none"> Existing CSP culvert is in poor condition requiring replacement Existing CSP culvert does not meet MTO minimum diameter requirements based on location within the Highway 3 corridor Establish culvert sizing based on 800 mm minimum diameter and required headwater/freeboard. 	Determine based on Hydraulic Assessment
Canaan Drain (Culvert #9 and 10)	<ul style="list-style-type: none"> Widening of Highway 3 from 2-lane undivided to 4-lane divided. 	<ul style="list-style-type: none"> 34.00 m right extension required to accommodate new EBL of Highway 3 and proposed 15 m open-ditch median 8.14 m left extension required to accommodate 4:1 side-slopes, grading detail, and no guiderail for WBL. 	3350 mm x 2070 mm x 68.45 m
Talbot Road South Drain B (Culvert #11)	<ul style="list-style-type: none"> Widening of Highway 3 from 2-lane undivided to 4-lane divided. 	<ul style="list-style-type: none"> 29.21 m right extension required to accommodate new EBL of Highway 3 and proposed 15 m open-ditch median. 	3050 mm x 1220 mm x 51.99 m

Crossing Location (New Construction Culvert #)	Summary of Proposed Highway 3 Improvement Works	Site/Culvert Design Considerations	Proposed Culvert Configuration
East Townline/West Townline Drain (Culvert #12)	<ul style="list-style-type: none"> Widening of Highway 3 from 2-lane undivided to 4-lane divided. 	<ul style="list-style-type: none"> 32.79 m right extension required to accommodate new EBL of Highway 3 and proposed 15 m open-ditch median. 	
Russell Drain (Culvert #13 and 14)	<ul style="list-style-type: none"> Widening of Highway 3 from 2-lane undivided to 4-lane divided. 	<ul style="list-style-type: none"> 29.52 m right extension required to accommodate new EBL of Highway 3 and proposed 15 m open-ditch median 7.45 m left extension required to accommodate 4:1 side-slopes, grading detail, and no guiderail for WBL. 	3050 mm x 1650 mm x 55.18 m
Barlow Drain (Culvert #15 and 16)	<ul style="list-style-type: none"> Construction of a 4-lane divided to 2-lane undivided cross-over lane transition. 	<ul style="list-style-type: none"> 36.87 m right extension required to accommodate new EBL of Highway 3 and proposed 15 m open-ditch median 16.38 m right interim extension required to accommodate proposed 4-lane to 2-lane transition at the east end of the project 8.86 m left extension required to accommodate 4:1 side-slopes, grading detail, and no guiderail for WBL. 	2400 mm x 1830 mm x 71.39 m (Ultimate 4-Lane Divided Highway) 2400 mm x 1830 mm x 50.90 m (Interim Lane Transition to 2-Lane Undivided)

Table 10 summarizes the hydraulic performance indicators resulting from applying the design and check flows to the proposed culvert geometry at each culvert site. The hydraulic sizing of the 14th Concession East Drain at South Talbot Road Extension, the unnamed drain at Sta. 14+018, Essex Outlet Drain, and Talbot Road South Drain Branch ‘A’ were established based on the design criteria in **Table 3**. Key design considerations included achieving the required clearance and/or freeboard depths and maintaining existing headwater elevations at the crossing to avoid impacts on drainage infrastructure upstream of the Highway 3 corridor, notably at Essex Outlet Drain. **Table 10** summarizes the final hydraulic sizing based on an iterative design process for each of the four ‘new’ culvert locations.

The proposed new culvert crossing 14th Concession Drain has been sized based on the future profile of South Talbot Road. Currently, the existing profile of the service road located west of the crossing results in deficient freeboard for the new culvert. Under future conditions, it is expected that the existing service road profile will be improved and required freeboard depths are achieved. The proposed culvert configuration has been established based on freeboard and minimum cover for the structure at the proposed 14th Concession East Drain crossing location.

Complex geotechnical and construction staging requirements for the proposed Highway 3/Victoria Avenue overpass structure/embankment required that culvert options be developed for Essex Outlet Drain. The following describes the layout characteristics of three crossing options:

Option 1 – On-line Culvert Replacement

Option 1 includes the construction of a new ‘on-line’ culvert oriented along the existing Essex Outlet Drain channel. With this option, the existing Essex Outlet Drain culverts crossing existing Highway 3 would be replaced within a single span structure to convey flow from the north side of the proposed overpass embankment to the south side of the right-of-way. The location and skew of the proposed culvert would result in an overall required length of approximately 95 m from north toe of slope to south toe of slope. There will be a net 60 m reduction in the length of open-channel resulting from the removal of the existing multi-cell culvert arrangement and construction of the proposed on-line culvert.

The on-line replacement strategy for the Essex Outlet Drain would require that the culvert be constructed prior to the construction of the Highway 3 overpass embankment. The use of light-weight fill will, therefore, likely be required to minimize the negative impacts of settlement

on the newly constructed culvert. The on-line requirement of the Essex Outlet Drain culvert will minimize the length of open channel required to be maintained in the future but would introduce a lengthy culvert that would be both complicated and costly to maintain. To maintain a consistent configuration with the downstream channel, the Essex Outlet Drain channel will have a trapezoidal cross-section with a 3 m to 4 m bottom width. Erosion and scour protection for the culvert and channel will be minimal due to the aligned nature of the crossing. Inlet and outlet erosion protection will include a rip-rap apron protecting the side slopes of the channel to the top of banks. Rip-rap protection will consist of Type I rock protection with geotextile. Based on the hydraulic characteristics of the existing drain (a wide flat bottom and low gradient profile), it is expected that future maintenance will primarily involve removal of accumulated sediments discharged from the enclosed portion of the municipal drain within the Town of Essex.

In addition to the main Essex Outlet Drain culvert under Highway 3, an additional culvert or modified storm sewer outlet arrangement is required to accommodate the proposed municipal road improvements at the intersection of South Talbot Road and Victoria Avenue. The proposed improvements include 2.0 m wide on-street parking bays, the use of 15 m radius curves at all four quadrants of the intersection and the addition of a multi-use trail paralleling the roadway. For the on-line replacement strategy, the additional culvert or modified storm sewer outlet system will be aligned with the existing Essex Outlet Drain and have to include a headwall arrangement to accommodate the adjacent fill slopes from South Talbot Road and Victoria Avenue. The proposed outlet arrangement will extend approximately 20 m in a southerly direction. The downstream end of the outlet arrangement will be located close to the inlet of the Essex Outlet Drain Highway 3 culvert, further complicating future maintenance of both the outlet arrangement and municipal drain culvert.

Option 2 – Municipal Drain Diversion to westerly crossing outside of Highway 3/Victoria Avenue Overpass Embankment

Option 2 includes the construction of a new ‘off-line’ municipal drain diversion to relocate the Essex Outlet Drain culvert under Highway 3, approximately 300 m west of its current location. This location would require the construction of approximately 600 m of municipal drain channel along the north and south side of the Highway 3 right-of-way and a 94.6 m long culvert to convey flows through the proposed overpass embankment. The location and configuration of the proposed culvert requires an overall length of approximately 95 m from the north side of the existing Highway 3 highway embankment to the toe of slope of the new embankment. There will be a net 540 m increase in the length of open-channel resulting from the removal of the

existing multi-cell culvert arrangement and construction of the proposed culvert and a 55 m increase in the length of culvert compared to existing conditions.

The drain diversion replacement strategy for the Essex Outlet Drain will allow the culvert to be constructed prior to the construction of the Highway 3 overpass embankment in an area of low fill height. The low fill height will minimize the negative effects of settlement on the newly constructed culvert and allow a standard pre-cast concrete box culvert section to be used. To construct the drain diversion while maintaining the existing Highway 3 roadway configuration, the drain will have to be temporarily realigned between existing Highway 3 and South Talbot Road. The temporary alignment of the channel requires the use of a trapezoidal channel with a 4.0 m bottom width and 2:1 side slopes to fit between the existing Highway 3 and South Talbot Road alignments. After existing Highway 3 is decommissioned, drainage channel enhancements, including modification of the alignment and integration with the proposed multi-use trail system, could be completed.

In addition to the main Essex Outlet Drain culvert under Highway 3, an additional culvert or modified storm sewer outlet arrangement is required to accommodate the proposed municipal road improvements at the intersection of South Talbot Road and Victoria Avenue. The proposed improvements include 2.0 m wide on-street parking bays, the use of 15 m radius curves at all four quadrants of the intersection and a new multi-use trail paralleling the roadway. For the municipal drain diversion strategy, the additional culvert or modified storm sewer outlet system will be aligned to direct flows in a westerly direction along the north side of existing Highway 3. The proposed outlet arrangement will extend approximately 25 m in a westerly direction.

The hydraulic performance assessments of the remaining culverts to be extended as part of the Highway 3 improvements are also summarized in **Table 10**. With the exception of the Barlow Drain, all of the proposed culvert modifications result in acceptable levels of performance when compared to existing conditions and required design criteria for the crossing locations. As mentioned, although the existing Barlow Drain culvert surcharges under design flow conditions and does not provide the required 0.3 m of clearance from the calculated headwater elevation to the underside of soffit, it does achieve the required freeboard depth at the crossing location. Under proposed conditions, the Barlow Drain culvert continues to operate with deficient clearance, surcharging to a depth of approximately 0.3 m above the soffit of the culvert inlet, but does achieve the required freeboard depth of 1.0 m measured from the projected headwater elevation to the Highway 3 low edge of pavement near the culvert. The structure's hydraulic

performance is only marginally reduced, compared to existing conditions, for the interim 50.9 m length required to accommodate the Highway 3 4-lane divided to 2-lane undivided lane transition at the east project limit. Since there is no history of flooding at this location and the existing open-footing concrete culvert is in good condition, it is recommended that this culvert not be replaced because it has insufficient clearance. Consideration should be given to future municipal drain maintenance to improve the gradient of the existing channel, improve the cross-sectional area of the channel and lower tail-water conditions at the culvert outlet. Municipal Drain improvements to lower the existing channel by approximately 0.3 m will result in approximately 0.2 m of clearance at the inlet of the culvert.

Table 10 includes a range of hydraulic performance indicators, such as headwater depth to height ratio, flow regime, outlet velocities and freeboard/clearance values, for each of the culvert sites impacted by improvements to the Highway 3 corridor.

Table 10: Proposed Culvert Hydraulic Performance Assessment Summary

Crossing Location	Proposed Culvert Configuration (Width x Height x Length)	Design Storm Computed Headwater Elevation	Headwater Depth/ Height Ratio	Flow Regime	Check Storm Outlet Velocity (m/s)	Resultant Freeboard (m)	Resultant Clearance (m)
Hyland Drain (CR8)	1830 mm x 1520 mm x 28.55 m	192.810	77%	Subcritical	1.92	1.05	n/a
Extended 14 th Concession East Drain	3050 mm x 1524 mm x 60.29 m	192.940	75%	Subcritical	1.13	1.13	0.37
New Proposed 14 th Concession East Drain (South Talbot Road Extension)	3050 mm x 1524 mm x 29.74 m	192.930	66%	Subcritical	1.13	0.47 (Reference from Existing Service Road Profile Sag)	0.51
Proposed Unnamed Drain	825 mm x 54.84 m	193.560	48%	Subcritical	1.47	1.35	n/a
Proposed Essex Outlet Drain	4260 mm x 2440 mm x 97.95 m	193.650	88%	Subcritical	1.59	1.28	0.30
Proposed Talbot Road South Drain A	1200 mm x 50.15 m	194.230	66%	Subcritical	2.38	1.02	n/a

Crossing Location	Proposed Culvert Configuration (Width x Height x Length)	Design Storm Computed Headwater Elevation	Headwater Depth/Height Ratio	Flow Regime	Check Storm Outlet Velocity (m/s)	Resultant Freeboard (m)	Resultant Clearance (m)
Canaan Drain	3350 mm x 2070 mm x 68.45 m	192.750	73%	Subcritical	1.59	2.51	n/a
Talbot Road South Drain B	3050 mm x 1220 mm x 51.99 m	193.700	34%	Subcritical	1.81	1.58	0.80
East Townline/West Townline Drain	3660 mm x 2100 mm x 74.42 m	193.350	67%	Subcritical	1.06	2.11	0.70
Russell Drain	3050 mm x 1650 mm x 55.18 m	193.000	38%	Subcritical	1.61	2.45	1.02
Barlow Drain (Interim 4-Lane to 2-Lane Transition Length)	2400 mm x 1830 mm x 50.9 m	194.250	108%	Surcharged	1.52	1.20	-0.14

The detailed CulvertMaster Hydraulic output data for the proposed condition assessment is included in **Appendix C**.

3.2.3 Site Specific Impact Summary and Mitigation Strategy

Hyland Drain – County Road 8/Pinkerton Road Intersection

The realignment of Pinkerton Road and the addition of an intersection along the County Road 8 corridor results in the need for an additional crossing of the Hyland Municipal Drain. The proposed culvert is 28.55 m in length and is oriented parallel to the County Road 8 centerline on the northerly side of the road corridor. The existing Hyland Drain channel is very flat with projected flow velocities below 2.0 m/s. The projected flow velocities will be mitigated by using standard R50 rip-rap apron at the inlet and outlet of the proposed culvert. The rip-rap apron will extend from the bottom of ditch to an elevation of 192.810 or to the top of bank of the channel immediately up and downstream of the crossing. The low projected velocities will allow the bottom of the drain channel to remain natural and allow for vegetation to re-establish following the completion of construction. In total, 28.55 m of existing open-channel will be replaced with concrete box culvert. The configuration of the erosion protection system is illustrated on Sheet NC12 of the preliminary new construction drawings.

14th Concession East Drain – Highway 3

The proposed 33.34 m culvert extension will be oriented parallel to the existing culvert. The existing 14th Concession East Drain channel is aligned with the existing culvert and will not require alignment modifications beyond the right-of-way. The proposed culvert extension results in a small decrease in outlet velocities and a small decrease in resultant clearance. The projected flow velocities will be mitigated by using standard R50 rip-rap apron at the inlet and outlet of the proposed culvert. The rip-rap apron will extend from the bottom of ditch to an elevation of 192.930 or to the top of bank of the channel immediately up and downstream of the crossing. The low projected velocities will allow the bottom of the drain channel to remain natural and allow for vegetation to re-establish following the completion of construction. In total, 33.34 m of existing open-channel will be replaced with concrete box culvert. The configuration of the erosion protection system is illustrated on Sheet NC6 of the preliminary new construction drawings.

14th Concession East Drain – South Talbot Road Extension

The new proposed 29.74 m long culvert will be oriented perpendicular to the proposed extension of South Talbot Road. The existing 14th Concession East Drain, referred to as Rush Drain north of the Highway 3 corridor, will enter the proposed culvert by making a 90 degree turn immediately upstream of the new culvert. The dramatic change in the alignment will require the addition of erosion/scour protection on the outside of the bend in the channel. The close proximity of the bend to the inlet of the culvert will result in a 10 m section of the outside of the drain channel being lined with rip-rap to an elevation of 192.940 or the top of bank. Based on the configuration of channel and culvert inlet, it is recommended that Type I rock protection be used on the outside of the channel bend immediately upstream of the proposed new culvert crossing South Talbot Road. A standard R50 rip-rap apron will be used at the culvert to mitigate potential erosion of the channel side slopes at the culvert outlet. The configuration of the erosion protection system is illustrated on Sheet NC6 of the preliminary new construction drawings.

Unnamed Drain

The existing Unnamed Drain 750 mm CSP culvert crossing Highway 3 at Sta. 14+019 will be replaced with a 825 mm concrete pipe or a circular culvert of an equivalent material to meet the MTO's required 75-year Design Service Life. The proposed culvert hydraulics result in moderate to low projected inlet and outlet velocities requiring a standard R50 rip-rap apron to control potential scour and erosion. The configuration of the erosion protection system is illustrated on Sheet NC7 of the preliminary new construction drawings.

Essex Outlet Drain

The proposed location of the Essex Outlet Drain crossing of Highway 3 requires the construction of approximately 600 m of municipal drain channel along the north and south side of the highway right-of-way and a 94.6 m long culvert to convey flows through the proposed overpass embankment. It is anticipated that the drainage works will be constructed in the following sequence:

- Construction of the permanent Essex Outlet Drain culvert approximately 300 m west of Victoria Avenue (Sta. 14+485) will be completed off-line from the existing drainage system. Installation of the culvert crossing existing Highway 3 will require construction staging with temporary lane restrictions to facilitate installation of the northerly portion of the new culvert
- Following completion of the culvert, the diversion channel along the north and south side of the Highway 3 right-of-way will be constructed off-line from the existing drainage system. Flows will be maintained through the existing culvert until grading works are completed and erosion protection measures have been constructed
- When the municipal drain diversion works are completed, flows from the existing drain will be directed to the new diversion channel and culvert. At this time, the existing culvert and channel crossing the highway right-of-way can be abandoned and construction of the preload/overpass embankment can begin
- Following the preloading/consolidation stage of the Highway 3 overpass embankment construction, traffic will be shifted to the eastbound lanes of new Highway 3 and existing Highway 3 will be removed, including the existing Essex Outlet Drain culverts.

Since the existing Essex Outlet Drain culverts and channel will be maintained during construction of Highway 3 and the new Essex Outlet Drain diversion, a temporary flow passage system at Essex Outlet Drain will not be required. Following the decommissioning and removal of the existing Highway 3 roadway embankment, the 300 m channel along the north side of the right-of-way could be modified to include additional environmental enhancements, such as a widened floodplain, benched side-slopes for enhanced landscaping and a meandering low-flow channel. A widened floodplain and benched side-slopes would dramatically improve the conveyance capacity of the channel and provide enhanced storage of runoff volume and subsequent attenuation/reduction of flows conveyed to the downstream municipal drain channel. Following removal of the existing Highway 3 roadway embankment, there will be an opportunity to shorten the Essex Outlet Drain culvert by removing the northerly section of the culvert (27 m)

that was installed to accommodate existing Highway 3. These enhancements are over and above the basic design requirements for the crossing but would serve to enhance the natural system within the right-of-way and downstream of the Highway 3 corridor.

The proposed Essex Outlet Drain alignment utilizes a curvilinear alignment with smooth transitions in the open-channel portion of the drain to minimize long-term erosion potential. To avoid dramatic bends in the open-channel at the inlet and outlet of the Essex Outlet Drain culvert, 45 degree bends have been incorporated into the up and downstream ends of the culvert. Erosion potential resulting from the bends will be mitigated by using a closed footing pre-cast culvert arrangement and 1.2 m cut-off walls at the inlet and outlet of the proposed culvert. Erosion protection measures, in the form of rip-rap channel lining, have been incorporated into the Essex Outlet Drain channel design at critical locations, such as bends along the channel alignment and transitions at the inlets and outlets of critical culvert locations. The channel lining will consist of 300 mm thick Type I rock protection with geotextile and include a 600 mm key at the toe of slope to mitigate potential degradation of the channel side-slopes. The channel lining will be extended from the toe of slope to an elevation of 193.650. The channel itself will incorporate a 4 m bottom width and 2:1 side-slopes. Side-slopes not protected with rip-rap or rock protection will incorporate the use of erosion control blanket to protect slopes prior to the re-establishment of vegetation within the channel. Erosion control blanket will extend from the toe to the top of channel bank along the entire length of the Essex Outlet Drain realignment.

Essex Outlet Drain represents the ultimate outlet for a large urban storm drainage system within the Town of Essex. An additional culvert or modified storm sewer outlet arrangement is required to accommodate the proposed municipal road improvements at the intersection of South Talbot Road and Victoria Avenue. As previously described, the proposed improvements include 2.0 m wide on-street parking bays, the use of 15 m radius curves at all four quadrants of the intersection and a new multi-use trail paralleling the roadway. The proposed outlet arrangement, consisting of a pre-cast or cast-in-place junction maintenance hole will consolidate the three existing storm sewer systems into one outlet. The outlet section, proposed to be a 4260 mm x 2440 mm box section similar in size to the main Essex Drain crossing of Highway 3, will extend approximately 25 m in a westerly direction. The preliminary design sizing for the outlet structure has been completed assuming that the storm sewer systems connected to the Victoria Street outlet are capable of conveying the 50-Year design storm. As previously described, the Town's Drainage Master Plan Study currently under way will further refine the design flows at

this outlet location and therefore confirmation of the size of the outlet structure will be required during detailed design.

In existing conditions, the urban storm drainage system delivers a significant amount of sediment from road maintenance activities within the upstream drainage area. Much of the urban drainage system consists of small diameter storm sewers and drainage tiles connected to front and rear yard catch basins. Surface drainage is facilitated by shallow grass swales which effectively reduce the volume of sediments conveyed to the main drainage system. As urban intensification occurs within the upstream drainage area, it is anticipated that the existing grass swales will be replaced by traditional curb and gutter and more formal storm drainage systems which will inherently deliver increased amounts of sediment from paved surfaces within the drainage area. Total suspended solids (TSS) originating from the urban portion of the drainage area are a concern for two reasons. First, TSS carries with it pollutants, heavy metals and hydrocarbons and is often the cause of degraded water quality within municipal drain systems. Second, TSS is generally the source of most of the sediment within a municipal drain system. Deposition of TSS by way of sedimentation often leads to channel and culvert infilling and a reduction in hydraulic conveyance capacity.

To mitigate water quality and future maintenance (sediment removal) issues for the urban drainage system, the Essex Outlet Drain channel incorporates the following features to promote sedimentation prior to surface flow reaching the proposed Essex Outlet Drain culvert:

- The curvilinear design of the channel alignment maximizes the overall length of open channel prior to flow entering the proposed culvert under Highway 3
- The channel gradient and bottom width have been widened and flattened to further promote TSS settlement and the additional surface area maximizes potential for vegetative uptake
- Incorporation of two OPSD 219.211 permanent rock flow check dams into the northerly portion of the channel, further promoting TSS settlement in an area that can be easily accessed for future maintenance (by the municipality) via the multi-use trail system. Sediment removal in the area upstream of the proposed Highway 3 culvert will reduce future maintenance requirements for MTO's drainage infrastructure at the crossing and within the southerly portion of the drain channel.

The proposed Essex Outlet Drain alignment, culvert and channel enhancements are illustrated on Sheets NC8 and NC9 of the preliminary new construction drawings. The preliminary configuration of the Essex Outlet Drain at Victoria Road is described in more detail in the Dillon prepared Structural Design Report for Storm Sewer Outlet Site No. 6-413/C.

Talbot Road South Drain Branch 'A'

The existing Talbot Road South Drain Branch 'A' consists of a 750 mm CSP culvert crossing Highway 3 at Sta. 15+490 which will be replaced with a 1200 mm concrete pipe or a circular culvert of an equivalent material to meet MTO's required 75-year Design Service Life. The proposed culvert hydraulics result in moderate projected inlet and outlet velocities that will require a standard R50 rip-rap apron to control potential scour and erosion. To minimize the length of the culvert, a 25 m channel realignment is required at the downstream end of the culvert. To protect against future erosion, the portion of the channel within the Highway 3 right-of-way will be lined with standard R50 rip-rap. The configuration of the erosion protection system is illustrated on Sheet NC11 of the preliminary new construction drawings.

Canaan Drain

The existing Canaan Drain culvert will be extended to the north and south 42.14 m. The proposed culvert extension will be oriented parallel to the existing culvert and eliminate the need for the existing concrete retaining wall system at the inlet and outlet of the culvert. At the downstream end of the culvert, the Canaan Drain will require a 32 m realignment to direct flows from the extended culvert to the existing drain channel south of the Highway 3 right-of-way. The proposed culvert extension results in a small increase in outlet velocities and a small decrease in resultant clearance. The existing culvert inlet is protected by an extensive rip-rap apron which will be modified to suit the upstream culvert extension. The projected flow velocities will be mitigated by the use of a standard R50 rip-rap apron at the outlet of the proposed culvert and extended to include the bend in the channel near the south right-of-way limit. The rip-rap apron will extend from the bottom of ditch to an elevation of 192.750. The low projected velocities will allow the bottom of the drain channel to remain natural and for vegetation to re-establish following the completion of construction. The configuration of the erosion protection system is illustrated on Sheet NC12 of the preliminary new construction drawings.

Talbot Road South Drain Branch 'B'

The existing Talbot Road South Drain culvert will be extended to the south 32.79 m. The proposed culvert extension will be oriented parallel to the existing culvert. There is no formal drain channel south of the Highway 3 right-of-way so the existing roadside ditches that intercept overland flow from the drainage area to the south will be reconstructed along the new eastbound lanes. Flow from the roadside ditches will be directed to the upstream (south) end of the culvert extension. The proposed culvert extension results in a negligible change in outlet velocities and resultant clearance. The projected flow velocities will be mitigated by standard R50 rip-rap apron at the inlet and outlet of the proposed culvert. The rip-rap apron will extend from the bottom of ditch to an elevation of 193.700. The low projected velocities will allow the bottom of the drain channel on the north side of the right-of-way to remain natural and for vegetation to re-establish following the completion of construction. A continuous rip-rap apron will be used on the upstream end of the culvert since there is no formal channel to protect from erosion and scour. The configuration of the erosion protection system is illustrated on Sheet NC13 of the preliminary new construction drawings.

East Townline/West Townline Drain

The existing East Townline/West Townline Drain culvert will be extended to the south 32.79 m. The proposed culvert extension will be oriented parallel to the existing culvert. The existing drain channel extends parallel with the existing culvert in the northerly and southerly direction outside the Highway 3 corridor. No additional channelization or channel improvements are necessary at the inlet and outlet of the proposed culvert. The proposed culvert extension results in a negligible change in outlet velocities and resultant clearance. The projected flow velocities will be mitigated by standard R50 rip-rap apron at the inlet and outlet of the proposed culvert. The rip-rap apron will extend from the bottom of ditch to an elevation of 193.350. The low projected velocities will allow the bottom of the drain channel on the north side of the right-of-way to remain natural and for vegetation to re-establish following the completion of construction. The configuration of the erosion protection system is illustrated on Sheet NC15 of the preliminary new construction drawings.

Russell Drain

The existing Russell Drain culvert will be extended to the north and south 29.52 m. The proposed culvert extension will be oriented parallel to the existing culvert and eliminate the need for the existing concrete retaining wall system at the inlet and outlet of the culvert. At the downstream end of the culvert, the Russell Drain will require a 20 m realignment to direct flows

from the extended culvert to the existing drain channel south of the Highway 3 right-of-way. The proposed culvert extension results in a small increase in outlet velocities and a small decrease in resultant clearance. The projected flow velocities will be mitigated by the use of a standard R50 rip-rap apron at the outlet of the proposed culvert and extended to include the bend in the proposed channel near the south right-of-way limit. The upstream end of the proposed culvert extension requires an irregularly shaped rip-rap apron based on the configuration of the ditches. The rip-rap apron will extend from the bottom of ditch to an elevation of 193.000. The low projected velocities will allow the bottom of the drain channel to remain natural and for vegetation to re-establish following the completion of construction. The configuration of the erosion protection system is illustrated on Sheet NC16 of the preliminary new construction drawings.

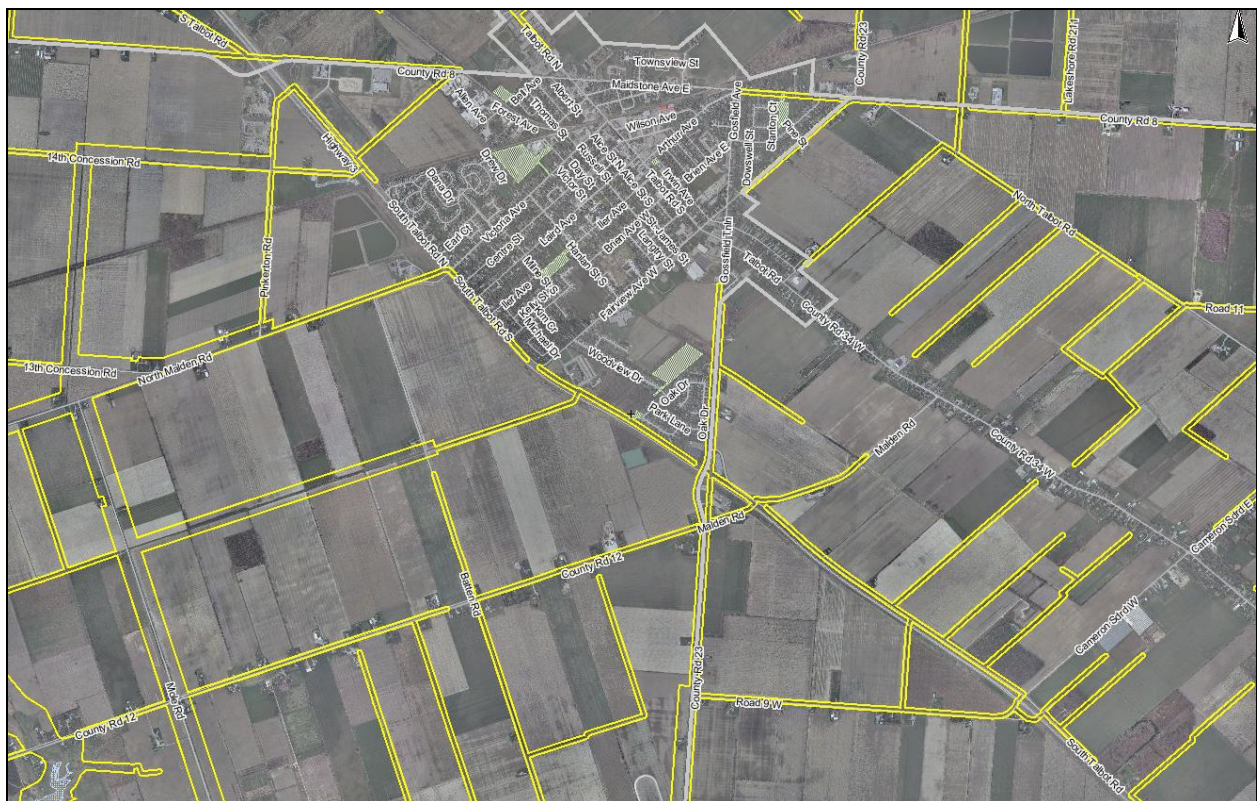
Barlow Drain

The existing Barlow Drain culvert will be extended to the north and south 22.32 m. The required culvert extension at the Barlow Drain accommodates the proposed 4-lane to 2-lane transition back to the existing highway cross-section. In the future, the Barlow Drain culvert will require an additional extension to the south to accommodate the ultimate 4-lane divided highway configuration. Based on the hydraulic assessment completed for the drain, additional downstream improvements to the municipal drain will be required when the ultimate highway configuration is constructed. The proposed culvert extension will be oriented parallel to the existing culvert and eliminate the need for the existing concrete retaining wall system at the inlet of the culvert. At the upstream end of the culvert, the Barlow Drain will require a 10 m realignment to direct flows from the existing drain channel north of the Highway 3 right-of-way to the extended culvert inlet. The proposed culvert extension results in a small increase in outlet velocities and a small decrease in resultant clearance for the interim Highway 3 configuration. The projected flow velocities will be mitigated by the use of a standard R50 rip-rap apron at the outlet of the proposed culvert. The proposed rip-rap apron at the upstream end of the proposed culvert extension will tie into rip-rap protection located downstream of the culvert crossing South Talbot Road immediately north of the Highway 3 corridor. The rip-rap apron will extend from the bottom of ditch to an elevation of 194.250. The low projected velocities will allow the bottom of the drain channel to remain natural and for vegetation to re-establish following the completion of construction. The configuration of the erosion protection system is illustrated on Sheet NC20 of the preliminary new construction drawings.

3.3 Design Considerations for Regulatory Storm and Floodplain Mapping Elevations

The results of the hydraulic analysis of the existing and proposed culvert hydraulic performance were also compared against Essex Region Conservation Authority (ERCA) Regulatory Floodplain mapping for the area impacted by highway improvements within the Highway 3 corridor. **Figure 4** illustrates the regulated watercourses within the Highway 3 corridor. The regulatory limits shown in **Figure 4** were established based on generic regulations and standard watercourse/drain offsets. None of the watercourses/drains within the study limits have been hydraulically modeled to establish floodwater elevations.

Figure 4: ERCA Regulatory Mapping along Highway 3 Corridor



To assess the impacts that the proposed culvert modifications will have on the regulated areas associated with each of the municipal drains crossing the Highway 3 right-of-way, the 100-year (Regulatory Event) design flows were applied to the existing and proposed culvert configurations. The headwater elevations resulting from the proposed culvert geometry at each of the crossing locations were compared with the headwater elevations generated in existing condition. **Table 11** summarizes the existing and proposed condition headwater elevations resulting from the 100-year design flows at each culvert crossing location. All existing non-rigid

frame culverts shall be extended with box culverts, and the horizontal elliptical corrugated structural pipe culvert (Site No. 6-588/C – Canaan Drain Culvert) shall be extended with a horizontal elliptical structural plate corrugated steel pipe. In the locations that the crossing culvert is being replaced, the proposed headwater elevations have either been maintained or improved. The extensions required to accommodate improvements to Highway 3 result in headwater increases between 0.02 m and 0.06 m for the 100-year design flows. Mitigation for the noted increase in headwater elevations at 14th Concession East, Canaan, Talbot Road South, East/West Townline, Russell and Barlow Drain is not anticipated at this time. Confirmation of the final culvert geometry and hydraulic impacts on the regulated lands will be assessed during the final detailed design of the crossings.

Table 11: Summary of Impacts for the Regulatory (100-Year) Storm Event

Crossing Location	Existing Culvert Configuration (Width x Height x Length)	Existing Design Storm Computed Headwater Elevation	Proposed Culvert Configuration (Width x Height x Length)	Proposed Design Storm Computed Headwater Elevation	Change in Projected Headwater Elevation (m)
Proposed Hyland Drain (CR8)	NEW	NEW	1830 mm x 1520 mm x 28.55 m	192.920	N/A
Extended 14 th Concession East Drain	3050 mm x 1524 mm x 26.95 m	192.990	3050 mm x 1524 mm x 60.29 m	193.020	+0.030
New Proposed 14 th Concession East Drain (South Talbot Road Extension)	NEW	NEW	3050 mm x 1524 mm x 29.74 m	193.080	N/A
Proposed Unnamed Drain	750 mm x 29.67 m	193.830	825 mm x 54.84 m	193.600	-0.230
Proposed Essex Outlet Drain	3600 mm x 1830 mm x 36.79 m and 1830 mm x 1220 mm x 40.16 m	193.880	4260 mm x 2440 mm x 97.95 m	193.810	-0.070
Proposed Talbot Road South Drain A	750 mm x 22.31 m	195.690	1200 mm x 50.15 m	194.330	-1.360
Canaan Drain	3350 mm x 2070 mm x 26.28 m	192.830	3350 mm x 2070 mm x 68.45 m	192.890	+0.060
Talbot Road South Drain B	3050 mm x 1220 mm x 22.76 m	193.740	3050 mm x 1220 mm x 51.99 m	193.760	+0.020

Crossing Location	Existing Culvert Configuration (Width x Height x Length)	Existing Design Storm Computed Headwater Elevation	Proposed Culvert Configuration (Width x Height x Length)	Proposed Design Storm Computed Headwater Elevation	Change in Projected Headwater Elevation (m)
East Townline/West Townline Drain	3660 mm x 2100 mm x 41.63 m	193.430	3660 mm x 2100 mm x 74.42 m	193.450	+0.020
Russell Drain	3050 mm x 1650 mm x 25.66 m	193.000	3050 mm x 1650 mm x 55.18 m	193.050	+0.050
Barlow Drain (Interim 4-Lane to 2-Lane Transition Length)	2400 mm x 1830 mm x 28.58 m	194.210	2400 mm x 1830 mm x 50.9 m	194.250	+0.040

4. IMPACT MITIGATION

4.1 General Erosion and Scour Protection

As described in the previous sections of this report, it is anticipated that standard erosion and scour protection systems will be adequate to protect receiving water systems within the project limits. To guard against future channel down-cutting and potential undermining of the proposed new culverts and culvert extensions, it is recommended that cut-off walls with a standard depth of 1.2 m be integrated into the proposed culvert arrangements.

In general, disturbance of existing well-vegetated roadway embankment and channel slopes should be avoided where possible. Where disturbance of vegetative slopes is unavoidable and point-discharge from spillways and storm sewers will be directed along slopes and ditches, it is recommended that standard R50 rip-rap aprons be installed with underlying geotextile to control the migration of fine-grained soils from under the rip-rap. Rip-rap protection should be installed to an elevation matching the proposed/existing ditch grades to avoid creating barriers for surface water runoff.

For newly graded roadway embankment slopes, erosion control blanket should be placed on all slopes exceeding 3:1, particularly those slopes located directly adjacent to the Essex Outlet Drain. Standard silt fence should be placed at the base of disturbed slopes parallel with the drain channel to guard against sediment entering the drain channel during construction. For newly graded “v” and flat-bottom ditches, temporary straw bale flow checks should be placed at critical

junctions with undisturbed ditches, in locations of grade changes, and immediately upstream of receiving watercourses. The proposed permanent sediment and erosion control systems are illustrated on Sheets NC1 to NC24 of the preliminary new construction drawings.

4.2 Fisheries Mitigation

Although the municipal drain culverts within the study area do not present sensitive fish habitat, where feasible a low flow channel will be constructed within the base of the drain throughout the length of the proposed culvert extensions. With exception to the Canaan Drain culvert the proposed culvert configurations provide approximately 300 mm of embedment depth to accommodate the low flow channel design and to facilitate fish passage through the culvert. For all major drains, erosion protection in the form of rip-rap or rock-protection channel lining has been limited to the side slopes of the channels. Continuous rip-rap aprons have only been used where fisheries resources will not be compromised. The proposed Essex Outlet Drain channel represents a significant increase in fish habitat within the Highway 3 right-of-way. Approximately 600 m of new open channel will be introduced within the right-of-way. The channel will consist of a trapezoidal section with a 4 m bottom width and 2:1 side slopes. Critical bends in the channel alignment will be protected from local erosion with rip-rap. The full length of the channel will also be protected with erosion control blanket on all 2:1 channel side slopes. OPSD 219.211 rock flow check dams will also be incorporated into the Essex Outlet Drain channel along the north side of the Highway 3 right-of-way to promote sedimentation and improve water quality in an area of the drain that can easily be maintained in the future.

4.3 Preliminary Temporary Flow Passage System Design

The new and proposed culvert extensions included as part of the Highway 3 improvements will require a temporary flow passage system to provide a dry work area for material, equipment and personnel involved with the improvement works. The return period for the design of drainage measures during construction was assessed based on site specific information including the length of anticipated construction, construction methodology, public safety, worker safety, flooding potential and environmental impacts. Based on the requirements of TW-1 Section 1.2, the minimum return period for temporary drainage work at the municipal drain culverts within the project limits is the 2-Year return period storm. **Table 12** summarizes the relevant flow data for the full range of design storms and highlights the 2-Year flows for the structural and non-structural culverts.

Table 12: Temporary Flow Passage Requirements

Return Period (years)	2-Year	5-Year	10-Year	25-Year	50-Year	100-Year
Hyland Drain (CR8)	0.8	1.0	1.3	1.5	1.7	1.9
14 th Concession Drain	1.0	1.3	1.7	2.1	2.6	3.3
14 th Concession Drain – South Talbot Road Extension	1.0	1.3	1.7	2.1	2.6	3.3
Unnamed Drain	0.1	0.1	0.1	0.1	0.2	0.2
Essex Outlet Drain	6.1	7.8	10.0	12.2	15.3	19.9
Talbot Road South Drain A	0.4	0.5	0.6	0.7	0.9	1.2
Canaan Drain	1.9	2.4	3.1	3.8	4.8	6.3
Talbot Road South Drain B	0.4	0.5	0.7	0.8	1.0	1.3
East Townline/West Townline Drain	1.1	1.3	1.8	2.1	2.7	3.5
Russell Drain	0.5	0.6	0.9	1.0	1.3	1.7
Barlow Drain	1.6	1.9	2.6	3.9	4.9	6.4

Based on the unique characteristics of the municipal drain crossing locations, the following temporary flow passage methods are considered feasible:

- Dam and divert
- Dam and pump.

The feasibility of the dam and divert or dam and pump system depends on the volume of water flow at the site. These options involve damming the waterway upstream and redirecting the water either across the roadway, through the existing culvert or through a temporary culvert installed adjacent to the existing culvert. The diversion through the existing culvert or through a temporary culvert could be accomplished using by-pass pipe(s), sandbags to separate flows or using small diameter discharge pipe(s) from a pumping operation. The dam and divert or dam and pump system can provide feasible solutions for providing a dry working space for short duration works but the expectation is the critical work which is to be completed in the dry is completed during periods of low-flows.

For the municipal drain culverts within the study limits, both systems are considered feasible. The dam and divert method is best suited for the cast-in-place culvert option where excavation adjacent to the existing culvert, installation of a temporary pipe, and backfilling in order to accommodate construction staging is possible. The dam and pump method is being considered for the pre-cast concrete box culvert option in order to facilitate installation of the new culvert

with minimal impact on the roadway above. For both systems, the waterway upstream of the culvert would be dammed and the water redirected through the pipe. The diversion pipe would be a gravity pipe (small diameter HDPE pipe) or a small diameter discharge pipe constituent of the pumping operation. The site specific temporary flow passage system design for each crossing location is detailed in the individual Culvert Structural Design Reports.

DILLON CONSULTING LIMITED
LONDON, ONTARIO



Nicholas Krygsman, P.Eng.
Water Resource Engineer

APPENDIX A

Visual Otthymo Hydrologic Modeling Output

Existing Conditions Flows

```

=====
=====
V   V   I   SSSSS U   U   A   L
V   V   I   SS   U   U   A A   L
V   V   I   SS   U   U   AAAAA L
V   V   I   SS   U   U   A   A   L
VV      I   SSSSS UUUUU A   A   LLLLL

000   TTTTT TTTTT H   H   Y   Y   M   M   000   TM
O   O   T       T   H   H   Y Y   MM MM   O   O
O   O   T       T   H   H       Y   M   M   O   O

000       T       T   H   H       Y   M   M   000

```

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***** D E T A I L E D O U T P U T *****

Input filename: C:\Program Files\Visual OTTHYMO 2.2.4\voin.dat

Output filename: j:\PROJECTS\DRAFT\126452 Highway 3 Widening\Drainage & Hydrology\Hwy3CulvertHydrology\Existing Conditions Flows.out

Summary filename: j:\PROJECTS\DRAFT\126452 Highway 3 Widening\Drainage & Hydrology\Hwy3CulvertHydrology\Existing Conditions Flows.sum

DATE: 15/04/2014

TIME: 12:08:45 PM

USER:

COMMENTS: _____

```

-----
*****
** SIMULATION NUMBER: 1 **
*****
-----

```

		Existing Conditions Flows	
CHICAGO STORM		IDF curve parameters: A= 823.084	
Ptotal= 40.55 mm		B= 7.500	
-----		C= .813	
		used in: INTENSITY = A / (t + B)^C	
		Duration of storm = 6.00 hrs	
		Storm time step = 10.00 min	
		Time to peak ratio = .33	

The CORRELATION coefficient is = 1.0000

TIME (min)	INPUT INT. (mm/hr)	TAB. INT. (mm/hr)
5.	108.10	105.60
10.	78.60	80.33
15.	65.20	65.48
30.	43.20	43.23
60.	26.60	26.81
120.	16.00	15.98
360.	6.80	6.76
720.	3.90	3.88
1440.	2.20	2.22

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.17	1.51	1.67	8.34	3.17	4.18	4.67	1.96
.33	1.64	1.83	20.77	3.33	3.69	4.83	1.85
.50	1.80	2.00	80.33	3.50	3.30	5.00	1.76
.67	2.01	2.17	27.39	3.67	3.00	5.17	1.68
.83	2.28	2.33	14.19	3.83	2.74	5.33	1.61
1.00	2.64	2.50	9.52	4.00	2.53	5.50	1.54
1.17	3.14	2.67	7.17	4.17	2.36	5.67	1.48
1.33	3.93	2.83	5.77	4.33	2.20	5.83	1.42
1.50	5.30	3.00	4.84	4.50	2.07	6.00	1.37

CALIB			
NASHYD (0001)		Area (ha)= 99.03	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min		Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
-----		U.H. Tp(hrs)= 2.26	

Unit Hyd Qpeak (cms)= 1.674

PEAK FLOW (cms)= .798 (i)

TIME TO PEAK (hrs)= 4.833

Existing Conditions Flows

RUNOFF VOLUME (mm)= 15.057
TOTAL RAINFALL (mm)= 40.549
RUNOFF COEFFICIENT = .371

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB                                     |
| NASHYD (0002) | Area (ha)= 11.09 Curve Number (CN)= 84.0
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 4.96

```

Unit Hyd Qpeak (cms)= .085

PEAK FLOW (cms)= .048 (i)
TIME TO PEAK (hrs)= 7.833
RUNOFF VOLUME (mm)= 15.056
TOTAL RAINFALL (mm)= 40.549
RUNOFF COEFFICIENT = .371

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB                                     |
| NASHYD (0003) | Area (ha)= 186.85 Curve Number (CN)= 84.0
| ID= 1 DT=10.0 min | Ia (mm)= 2.00 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 1.03

```

Unit Hyd Qpeak (cms)= 6.929

PEAK FLOW (cms)= 3.119 (i)
TIME TO PEAK (hrs)= 3.167
RUNOFF VOLUME (mm)= 17.094
TOTAL RAINFALL (mm)= 40.549
RUNOFF COEFFICIENT = .422

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB                                     |
| NASHYD (0004) | Area (ha)= 24.84 Curve Number (CN)= 84.0
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 1.42

```

Unit Hyd Qpeak (cms)= .668

Existing Conditions Flows

PEAK FLOW (cms)= .282 (i)
 TIME TO PEAK (hrs)= 3.833
 RUNOFF VOLUME (mm)= 15.057
 TOTAL RAINFALL (mm)= 40.549
 RUNOFF COEFFICIENT = .371

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB |
| NASHYD (0005) | Area (ha)= 129.56 Curve Number (CN)= 84.0
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 1.71
```

Unit Hyd Qpeak (cms)= 2.894

PEAK FLOW (cms)= 1.283 (i)
 TIME TO PEAK (hrs)= 4.167
 RUNOFF VOLUME (mm)= 15.057
 TOTAL RAINFALL (mm)= 40.549
 RUNOFF COEFFICIENT = .371

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB |
| NASHYD (0006) | Area (ha)= 27.63 Curve Number (CN)= 84.0
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 1.42
```

Unit Hyd Qpeak (cms)= .743

PEAK FLOW (cms)= .313 (i)
 TIME TO PEAK (hrs)= 3.833
 RUNOFF VOLUME (mm)= 15.057
 TOTAL RAINFALL (mm)= 40.549
 RUNOFF COEFFICIENT = .371

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB |
| NASHYD (0007) | Area (ha)= 97.77 Curve Number (CN)= 84.0
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
```

Existing Conditions Flows

----- U.H. Tp(hrs)= 2.10

Unit Hyd Qpeak (cms)= 1.778

PEAK FLOW (cms)= .832 (i)

TIME TO PEAK (hrs)= 4.667

RUNOFF VOLUME (mm)= 15.057

TOTAL RAINFALL (mm)= 40.549

RUNOFF COEFFICIENT = .371

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0008)	Area (ha)= 54.82	Curve Number (CN)= 84.0	
ID= 1 DT=10.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 2.52		

Unit Hyd Qpeak (cms)= .831

PEAK FLOW (cms)= .407 (i)

TIME TO PEAK (hrs)= 5.167

RUNOFF VOLUME (mm)= 15.057

TOTAL RAINFALL (mm)= 40.549

RUNOFF COEFFICIENT = .371

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0009)	Area (ha)= 284.79	Curve Number (CN)= 84.0	
ID= 1 DT=10.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 4.93		

Unit Hyd Qpeak (cms)= 2.206

PEAK FLOW (cms)= 1.238 (i)

TIME TO PEAK (hrs)= 7.833

RUNOFF VOLUME (mm)= 15.057

TOTAL RAINFALL (mm)= 40.549

RUNOFF COEFFICIENT = .371

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

Existing Conditions Flows

CALIB			
NASHYD (0010)	Area (ha)=	88.96	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)=	2.94	

Unit Hyd Qpeak (cms)= 1.156

PEAK FLOW (cms)= .588 (i)

TIME TO PEAK (hrs)= 5.667

RUNOFF VOLUME (mm)= 15.057

TOTAL RAINFALL (mm)= 40.549

RUNOFF COEFFICIENT = .371

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0011)	Area (ha)=	104.56	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)=	3.23	

Unit Hyd Qpeak (cms)= 1.236

PEAK FLOW (cms)= .644 (i)

TIME TO PEAK (hrs)= 6.167

RUNOFF VOLUME (mm)= 15.057

TOTAL RAINFALL (mm)= 40.549

RUNOFF COEFFICIENT = .371

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

 ** SIMULATION NUMBER: 2 **

CHICAGO STORM	IDF curve parameters: A=1347.917
Ptotal= 49.25 mm	B= 9.023
-----	C= .863
	used in: INTENSITY = $A / (t + B)^C$
	Duration of storm = 6.00 hrs
	Storm time step = 10.00 min
	Time to peak ratio = .33

The CORRELATION coefficient is = .9999

Existing Conditions Flows

TIME (min)	INPUT INT. (mm/hr)	TAB. INT. (mm/hr)
5.	141.60	138.02
10.	102.60	106.08
15.	86.40	86.73
30.	57.40	57.06
60.	35.30	34.88
120.	20.30	20.33
360.	8.30	8.21
720.	4.60	4.56
1440.	2.50	2.52

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.17	1.43	1.67	9.93	3.17	4.54	4.67	1.92
.33	1.58	1.83	27.11	3.33	3.93	4.83	1.81
.50	1.76	2.00	106.08	3.50	3.47	5.00	1.71
.67	1.98	2.17	36.34	3.67	3.11	5.17	1.62
.83	2.28	2.33	17.93	3.83	2.81	5.33	1.54
1.00	2.69	2.50	11.51	4.00	2.57	5.50	1.47
1.17	3.28	2.67	8.37	4.17	2.37	5.67	1.40
1.33	4.23	2.83	6.54	4.33	2.20	5.83	1.34
1.50	5.94	3.00	5.36	4.50	2.05	6.00	1.29

CALIB		
NASHYD (0001)	Area (ha)= 99.03	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 2.26	

Unit Hyd Qpeak (cms)= 1.674

PEAK FLOW (cms)= 1.166 (i)

TIME TO PEAK (hrs)= 4.667

RUNOFF VOLUME (mm)= 21.137

TOTAL RAINFALL (mm)= 49.249

RUNOFF COEFFICIENT = .429

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB		
NASHYD (0002)	Area (ha)= 11.09	Curve Number (CN)= 84.0

		Existing Conditions Flows	
ID= 1 DT=10.0 min	Ia	(mm)= 5.00	# of Linear Res.(N)= 3.00
-----	U.H.	Tp(hrs)= 4.96	

Unit Hyd Qpeak (cms)= .085

PEAK FLOW (cms)= .068 (i)
 TIME TO PEAK (hrs)= 7.667
 RUNOFF VOLUME (mm)= 21.137
 TOTAL RAINFALL (mm)= 49.249
 RUNOFF COEFFICIENT = .429

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0003)	Area	(ha)= 186.85	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia	(mm)= 2.00	# of Linear Res.(N)= 3.00
-----	U.H.	Tp(hrs)= 1.03	

Unit Hyd Qpeak (cms)= 6.929

PEAK FLOW (cms)= 4.580 (i)
 TIME TO PEAK (hrs)= 3.167
 RUNOFF VOLUME (mm)= 23.344
 TOTAL RAINFALL (mm)= 49.249
 RUNOFF COEFFICIENT = .474

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0004)	Area	(ha)= 24.84	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia	(mm)= 5.00	# of Linear Res.(N)= 3.00
-----	U.H.	Tp(hrs)= 1.42	

Unit Hyd Qpeak (cms)= .668

PEAK FLOW (cms)= .423 (i)
 TIME TO PEAK (hrs)= 3.667
 RUNOFF VOLUME (mm)= 21.137
 TOTAL RAINFALL (mm)= 49.249
 RUNOFF COEFFICIENT = .429

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

Existing Conditions Flows

CALIB			
NASHYD (0005)	Area (ha)=	129.56	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	1.71	

Unit Hyd Qpeak (cms)= 2.894

PEAK FLOW (cms)= 1.906 (i)

TIME TO PEAK (hrs)= 4.000

RUNOFF VOLUME (mm)= 21.137

TOTAL RAINFALL (mm)= 49.249

RUNOFF COEFFICIENT = .429

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0006)	Area (ha)=	27.63	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	1.42	

Unit Hyd Qpeak (cms)= .743

PEAK FLOW (cms)= .471 (i)

TIME TO PEAK (hrs)= 3.667

RUNOFF VOLUME (mm)= 21.137

TOTAL RAINFALL (mm)= 49.249

RUNOFF COEFFICIENT = .429

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0007)	Area (ha)=	97.77	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	2.10	

Unit Hyd Qpeak (cms)= 1.778

PEAK FLOW (cms)= 1.221 (i)

TIME TO PEAK (hrs)= 4.500

RUNOFF VOLUME (mm)= 21.137

TOTAL RAINFALL (mm)= 49.249

RUNOFF COEFFICIENT = .429

Existing Conditions Flows

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB                      |
| NASHYD    (0008)          | Area    (ha)= 54.82   Curve Number  (CN)= 84.0
| ID= 1 DT=10.0 min         | Ia      (mm)= 5.00    # of Linear Res.(N)= 3.00
|                           | U.H. Tp(hrs)= 2.52
-----

```

Unit Hyd Qpeak (cms)= .831

```

PEAK FLOW      (cms)= .592 (i)
TIME TO PEAK   (hrs)= 5.000
RUNOFF VOLUME  (mm)= 21.137
TOTAL RAINFALL (mm)= 49.249
RUNOFF COEFFICIENT = .429

```

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB                      |
| NASHYD    (0009)          | Area    (ha)= 284.79  Curve Number  (CN)= 84.0
| ID= 1 DT=10.0 min         | Ia      (mm)= 5.00    # of Linear Res.(N)= 3.00
|                           | U.H. Tp(hrs)= 4.93
-----

```

Unit Hyd Qpeak (cms)= 2.206

```

PEAK FLOW      (cms)= 1.751 (i)
TIME TO PEAK   (hrs)= 7.667
RUNOFF VOLUME  (mm)= 21.137
TOTAL RAINFALL (mm)= 49.249
RUNOFF COEFFICIENT = .429

```

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB                      |
| NASHYD    (0010)          | Area    (ha)= 88.96   Curve Number  (CN)= 84.0
| ID= 1 DT=10.0 min         | Ia      (mm)= 5.00    # of Linear Res.(N)= 3.00
|                           | U.H. Tp(hrs)= 2.94
-----

```

Unit Hyd Qpeak (cms)= 1.156

```

PEAK FLOW      (cms)= .847 (i)
TIME TO PEAK   (hrs)= 5.500
RUNOFF VOLUME  (mm)= 21.137

```

Existing Conditions Flows
TOTAL RAINFALL (mm)= 49.249
RUNOFF COEFFICIENT = .429

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB |
| NASHYD (0011) | Area (ha)= 104.56 Curve Number (CN)= 84.0
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 3.23

```

Unit Hyd Qpeak (cms)= 1.236

PEAK FLOW (cms)= .923 (i)
TIME TO PEAK (hrs)= 5.833
RUNOFF VOLUME (mm)= 21.137
TOTAL RAINFALL (mm)= 49.249
RUNOFF COEFFICIENT = .429

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
*****
** SIMULATION NUMBER: 3 **
*****

```

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-----
| CHICAGO STORM | IDF curve parameters: A=1502.215
| Ptotal= 66.09 mm | B= 10.559
-----
C= .831
used in: INTENSITY = A / (t + B)^C

Duration of storm = 6.00 hrs
Storm time step = 10.00 min
Time to peak ratio = .33

```

The CORRELATION coefficient is = .9997

TIME (min)	INPUT INT. (mm/hr)	TAB. INT. (mm/hr)
5.	160.80	153.53
10.	117.00	121.79
15.	98.40	101.64
30.	68.80	69.25
60.	43.90	43.71
120.	26.50	26.21
360.	11.30	11.02

Existing Conditions Flows

720.	6.40	6.27
1440.	3.40	3.54

TIME	RAIN	TIME	RAIN	TIME	RAIN	TIME	RAIN
hrs	mm/hr	hrs	mm/hr	hrs	mm/hr	hrs	mm/hr
.17	2.33	1.67	14.46	3.17	6.95	4.67	3.08
.33	2.56	1.83	36.27	3.33	6.07	4.83	2.91
.50	2.83	2.00	121.79	3.50	5.40	5.00	2.76
.67	3.18	2.17	47.56	3.67	4.86	5.17	2.62
.83	3.63	2.33	25.02	3.83	4.43	5.33	2.50
1.00	4.24	2.50	16.61	4.00	4.07	5.50	2.39
1.17	5.12	2.67	12.35	4.17	3.76	5.67	2.29
1.33	6.50	2.83	9.81	4.33	3.50	5.83	2.19
1.50	8.96	3.00	8.13	4.50	3.28	6.00	2.11

CALIB			
NASHYD (0001)	Area (ha)=	99.03	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	2.26	

Unit Hyd Qpeak (cms)= 1.674

PEAK FLOW (cms)= 1.849 (i)

TIME TO PEAK (hrs)= 4.667

RUNOFF VOLUME (mm)= 34.087

TOTAL RAINFALL (mm)= 66.085

RUNOFF COEFFICIENT = .516

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0002)	Area (ha)=	11.09	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	4.96	

Unit Hyd Qpeak (cms)= .085

PEAK FLOW (cms)= .109 (i)

TIME TO PEAK (hrs)= 7.667

RUNOFF VOLUME (mm)= 34.086

TOTAL RAINFALL (mm)= 66.085

RUNOFF COEFFICIENT = .516

Existing Conditions Flows

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB		
NASHYD (0003)	Area (ha)= 186.85	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)= 2.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 1.03	

Unit Hyd Qpeak (cms)= 6.929

PEAK FLOW (cms)= 6.885 (i)

TIME TO PEAK (hrs)= 3.167

RUNOFF VOLUME (mm)= 36.515

TOTAL RAINFALL (mm)= 66.085

RUNOFF COEFFICIENT = .553

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB		
NASHYD (0004)	Area (ha)= 24.84	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 1.42	

Unit Hyd Qpeak (cms)= .668

PEAK FLOW (cms)= .664 (i)

TIME TO PEAK (hrs)= 3.667

RUNOFF VOLUME (mm)= 34.087

TOTAL RAINFALL (mm)= 66.085

RUNOFF COEFFICIENT = .516

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB		
NASHYD (0005)	Area (ha)= 129.56	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 1.71	

Unit Hyd Qpeak (cms)= 2.894

PEAK FLOW (cms)= 3.003 (i)

TIME TO PEAK (hrs)= 4.000

Existing Conditions Flows
 RUNOFF VOLUME (mm)= 34.087
 TOTAL RAINFALL (mm)= 66.085
 RUNOFF COEFFICIENT = .516

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB |
| NASHYD (0006) | Area (ha)= 27.63 Curve Number (CN)= 84.0
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 1.42
  
```

Unit Hyd Qpeak (cms)= .743

PEAK FLOW (cms)= .739 (i)
 TIME TO PEAK (hrs)= 3.667
 RUNOFF VOLUME (mm)= 34.087
 TOTAL RAINFALL (mm)= 66.085
 RUNOFF COEFFICIENT = .516

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB |
| NASHYD (0007) | Area (ha)= 97.77 Curve Number (CN)= 84.0
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 2.10
  
```

Unit Hyd Qpeak (cms)= 1.778

PEAK FLOW (cms)= 1.934 (i)
 TIME TO PEAK (hrs)= 4.500
 RUNOFF VOLUME (mm)= 34.087
 TOTAL RAINFALL (mm)= 66.085
 RUNOFF COEFFICIENT = .516

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB |
| NASHYD (0008) | Area (ha)= 54.82 Curve Number (CN)= 84.0
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
|-----| U.H. Tp(hrs)= 2.52
  
```

Unit Hyd Qpeak (cms)= .831

Existing Conditions Flows

PEAK FLOW (cms)= .940 (i)
 TIME TO PEAK (hrs)= 5.000
 RUNOFF VOLUME (mm)= 34.087
 TOTAL RAINFALL (mm)= 66.085
 RUNOFF COEFFICIENT = .516

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB |
| NASHYD (0009) | Area (ha)= 284.79 Curve Number (CN)= 84.0
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 4.93
  
```

Unit Hyd Qpeak (cms)= 2.206

PEAK FLOW (cms)= 2.814 (i)
 TIME TO PEAK (hrs)= 7.667
 RUNOFF VOLUME (mm)= 34.087
 TOTAL RAINFALL (mm)= 66.085
 RUNOFF COEFFICIENT = .516

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB |
| NASHYD (0010) | Area (ha)= 88.96 Curve Number (CN)= 84.0
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
-----
| U.H. Tp(hrs)= 2.94
  
```

Unit Hyd Qpeak (cms)= 1.156

PEAK FLOW (cms)= 1.351 (i)
 TIME TO PEAK (hrs)= 5.667
 RUNOFF VOLUME (mm)= 34.087
 TOTAL RAINFALL (mm)= 66.085
 RUNOFF COEFFICIENT = .516

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB |
| NASHYD (0011) | Area (ha)= 104.56 Curve Number (CN)= 84.0
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
  
```


Existing Conditions Flows

----- U.H. Tp(hrs)= 3.23

Unit Hyd Qpeak (cms)= 1.236

PEAK FLOW (cms)= 1.475 (i)

TIME TO PEAK (hrs)= 6.000

RUNOFF VOLUME (mm)= 34.087

TOTAL RAINFALL (mm)= 66.085

RUNOFF COEFFICIENT = .516

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

** SIMULATION NUMBER: 4 **

| CHICAGO STORM |
Ptotal= 80.01 mm

IDF curve parameters: A=2143.714

B= 15.188

C= .857

used in: INTENSITY = $A / (t + B)^C$

Duration of storm = 6.00 hrs

Storm time step = 10.00 min

Time to peak ratio = .33

The CORRELATION coefficient is = .9997

TIME (min)	INPUT INT. (mm/hr)	TAB. INT. (mm/hr)
5.	174.00	163.19
10.	129.00	135.00
15.	110.80	115.60
30.	82.60	81.81
60.	53.20	52.88
120.	32.40	31.99
360.	13.60	13.34
720.	7.60	7.49
1440.	4.10	4.17

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.17	2.63	1.67	18.95	3.17	8.68	4.67	3.56
.33	2.90	1.83	46.88	3.33	7.49	4.83	3.35
.50	3.25	2.00	135.00	3.50	6.59	5.00	3.15
.67	3.68	2.17	60.77	3.67	5.88	5.17	2.98

Existing Conditions Flows							
.83	4.26	2.33	33.06	3.83	5.30	5.33	2.83
1.00	5.06	2.50	21.88	4.00	4.83	5.50	2.69
1.17	6.22	2.67	16.07	4.17	4.43	5.67	2.57
1.33	8.07	2.83	12.58	4.33	4.10	5.83	2.46
1.50	11.42	3.00	10.29	4.50	3.81	6.00	2.35

```

-----
| CALIB                                     |
| NASHYD      (0001) | Area      (ha)= 99.03  Curve Number  (CN)= 84.0
| ID= 1 DT=10.0 min | Ia      (mm)= 5.00   # of Linear Res.(N)= 3.00
-----
|                                     |
|                                     | U.H. Tp(hrs)= 2.26
|                                     |

```

Unit Hyd Qpeak (cms)= 1.674

PEAK FLOW (cms)= 2.509 (i)
 TIME TO PEAK (hrs)= 4.667
 RUNOFF VOLUME (mm)= 45.596
 TOTAL RAINFALL (mm)= 80.007
 RUNOFF COEFFICIENT = .570

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB                                     |
| NASHYD      (0002) | Area      (ha)= 11.09  Curve Number  (CN)= 84.0
| ID= 1 DT=10.0 min | Ia      (mm)= 5.00   # of Linear Res.(N)= 3.00
-----
|                                     |
|                                     | U.H. Tp(hrs)= 4.96
|                                     |

```

Unit Hyd Qpeak (cms)= .085

PEAK FLOW (cms)= .146 (i)
 TIME TO PEAK (hrs)= 7.667
 RUNOFF VOLUME (mm)= 45.595
 TOTAL RAINFALL (mm)= 80.007
 RUNOFF COEFFICIENT = .570

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```

-----
| CALIB                                     |
| NASHYD      (0003) | Area      (ha)= 186.85  Curve Number  (CN)= 84.0
| ID= 1 DT=10.0 min | Ia      (mm)= 2.00   # of Linear Res.(N)= 3.00
-----
|                                     |
|                                     | U.H. Tp(hrs)= 1.03
|                                     |

```

Existing Conditions Flows

Unit Hyd Qpeak (cms)= 6.929

PEAK FLOW (cms)= 9.211 (i)

TIME TO PEAK (hrs)= 3.167

RUNOFF VOLUME (mm)= 48.144

TOTAL RAINFALL (mm)= 80.007

RUNOFF COEFFICIENT = .602

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0004)	Area (ha)= 24.84	Curve Number (CN)= 84.0	
ID= 1 DT=10.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 1.42		

Unit Hyd Qpeak (cms)= .668

PEAK FLOW (cms)= .905 (i)

TIME TO PEAK (hrs)= 3.667

RUNOFF VOLUME (mm)= 45.596

TOTAL RAINFALL (mm)= 80.007

RUNOFF COEFFICIENT = .570

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0005)	Area (ha)= 129.56	Curve Number (CN)= 84.0	
ID= 1 DT=10.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 1.71		

Unit Hyd Qpeak (cms)= 2.894

PEAK FLOW (cms)= 4.087 (i)

TIME TO PEAK (hrs)= 4.000

RUNOFF VOLUME (mm)= 45.596

TOTAL RAINFALL (mm)= 80.007

RUNOFF COEFFICIENT = .570

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0006)	Area (ha)= 27.63	Curve Number (CN)= 84.0	

		Existing Conditions Flows	
ID= 1 DT=10.0 min	Ia	(mm)= 5.00	# of Linear Res.(N)= 3.00
-----	U.H.	Tp(hrs)= 1.42	

Unit Hyd Qpeak (cms)= .743

PEAK FLOW (cms)= 1.007 (i)
 TIME TO PEAK (hrs)= 3.667
 RUNOFF VOLUME (mm)= 45.596
 TOTAL RAINFALL (mm)= 80.007
 RUNOFF COEFFICIENT = .570

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0007)	Area	(ha)= 97.77	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia	(mm)= 5.00	# of Linear Res.(N)= 3.00
-----	U.H.	Tp(hrs)= 2.10	

Unit Hyd Qpeak (cms)= 1.778

PEAK FLOW (cms)= 2.626 (i)
 TIME TO PEAK (hrs)= 4.500
 RUNOFF VOLUME (mm)= 45.596
 TOTAL RAINFALL (mm)= 80.007
 RUNOFF COEFFICIENT = .570

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0008)	Area	(ha)= 54.82	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia	(mm)= 5.00	# of Linear Res.(N)= 3.00
-----	U.H.	Tp(hrs)= 2.52	

Unit Hyd Qpeak (cms)= .831

PEAK FLOW (cms)= 1.274 (i)
 TIME TO PEAK (hrs)= 5.000
 RUNOFF VOLUME (mm)= 45.596
 TOTAL RAINFALL (mm)= 80.007
 RUNOFF COEFFICIENT = .570

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

Existing Conditions Flows

CALIB			
NASHYD (0009)	Area (ha)= 284.79	Curve Number (CN)= 84.0	
ID= 1 DT=10.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 4.93		

Unit Hyd Qpeak (cms)= 2.206

PEAK FLOW (cms)= 3.776 (i)

TIME TO PEAK (hrs)= 7.667

RUNOFF VOLUME (mm)= 45.596

TOTAL RAINFALL (mm)= 80.007

RUNOFF COEFFICIENT = .570

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0010)	Area (ha)= 88.96	Curve Number (CN)= 84.0	
ID= 1 DT=10.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 2.94		

Unit Hyd Qpeak (cms)= 1.156

PEAK FLOW (cms)= 1.826 (i)

TIME TO PEAK (hrs)= 5.500

RUNOFF VOLUME (mm)= 45.596

TOTAL RAINFALL (mm)= 80.007

RUNOFF COEFFICIENT = .570

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0011)	Area (ha)= 104.56	Curve Number (CN)= 84.0	
ID= 1 DT=10.0 min	Ia (mm)= 5.00	# of Linear Res.(N)= 3.00	
	U.H. Tp(hrs)= 3.23		

Unit Hyd Qpeak (cms)= 1.236

PEAK FLOW (cms)= 1.988 (i)

TIME TO PEAK (hrs)= 5.833

RUNOFF VOLUME (mm)= 45.596

TOTAL RAINFALL (mm)= 80.007

RUNOFF COEFFICIENT = .570

Existing Conditions Flows
(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

** SIMULATION NUMBER: 5 **

CHICAGO STORM
Ptotal= 89.66 mm

IDF curve parameters: A=2684.564
B= 17.063
C= .875

used in: INTENSITY = $A / (t + B)^C$

Duration of storm = 6.00 hrs
Storm time step = 10.00 min
Time to peak ratio = .33

The CORRELATION coefficient is = .9996

TIME (min)	INPUT INT. (mm/hr)	TAB. INT. (mm/hr)
5.	192.00	179.13
10.	142.80	149.81
15.	122.80	129.16
30.	92.60	92.32
60.	60.10	59.96
120.	36.60	36.23
360.	15.20	14.95
720.	8.60	8.31
1440.	4.40	4.58

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.17	2.74	1.67	21.73	3.17	9.67	4.67	3.79
.33	3.05	1.83	54.03	3.33	8.29	4.83	3.54
.50	3.43	2.00	149.81	3.50	7.24	5.00	3.33
.67	3.92	2.17	69.89	3.67	6.42	5.17	3.14
.83	4.57	2.33	38.25	3.83	5.76	5.33	2.97
1.00	5.48	2.50	25.18	4.00	5.22	5.50	2.82
1.17	6.82	2.67	18.35	4.17	4.77	5.67	2.68
1.33	8.97	2.83	14.24	4.33	4.39	5.83	2.56
1.50	12.88	3.00	11.55	4.50	4.07	6.00	2.44

CALIB

		Existing Conditions Flows	
NASHYD (0001)	Area (ha)=	99.03	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)=	2.26	

Unit Hyd Qpeak (cms)= 1.674

PEAK FLOW (cms)= 2.997 (i)
 TIME TO PEAK (hrs)= 4.667
 RUNOFF VOLUME (mm)= 53.874
 TOTAL RAINFALL (mm)= 89.661
 RUNOFF COEFFICIENT = .601

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

		Existing Conditions Flows	
CALIB			
NASHYD (0002)	Area (ha)=	11.09	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)=	4.96	

Unit Hyd Qpeak (cms)= .085

PEAK FLOW (cms)= .173 (i)
 TIME TO PEAK (hrs)= 7.667
 RUNOFF VOLUME (mm)= 53.873
 TOTAL RAINFALL (mm)= 89.661
 RUNOFF COEFFICIENT = .601

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

		Existing Conditions Flows	
CALIB			
NASHYD (0003)	Area (ha)=	186.85	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	2.00	# of Linear Res.(N)= 3.00
-----	U.H. Tp(hrs)=	1.03	

Unit Hyd Qpeak (cms)= 6.929

PEAK FLOW (cms)= 10.983 (i)
 TIME TO PEAK (hrs)= 3.167
 RUNOFF VOLUME (mm)= 56.484
 TOTAL RAINFALL (mm)= 89.661
 RUNOFF COEFFICIENT = .630

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

Existing Conditions Flows

CALIB			
NASHYD (0004)	Area (ha)=	24.84	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	1.42	

Unit Hyd Qpeak (cms)= .668

PEAK FLOW (cms)= 1.086 (i)

TIME TO PEAK (hrs)= 3.667

RUNOFF VOLUME (mm)= 53.873

TOTAL RAINFALL (mm)= 89.661

RUNOFF COEFFICIENT = .601

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0005)	Area (ha)=	129.56	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	1.71	

Unit Hyd Qpeak (cms)= 2.894

PEAK FLOW (cms)= 4.898 (i)

TIME TO PEAK (hrs)= 4.000

RUNOFF VOLUME (mm)= 53.874

TOTAL RAINFALL (mm)= 89.661

RUNOFF COEFFICIENT = .601

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0006)	Area (ha)=	27.63	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	1.42	

Unit Hyd Qpeak (cms)= .743

PEAK FLOW (cms)= 1.208 (i)

TIME TO PEAK (hrs)= 3.667

RUNOFF VOLUME (mm)= 53.873

TOTAL RAINFALL (mm)= 89.661

RUNOFF COEFFICIENT = .601

Existing Conditions Flows

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0007)	Area (ha)=	97.77	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	2.10	

Unit Hyd Qpeak (cms)= 1.778

PEAK FLOW (cms)= 3.139 (i)

TIME TO PEAK (hrs)= 4.500

RUNOFF VOLUME (mm)= 53.874

TOTAL RAINFALL (mm)= 89.661

RUNOFF COEFFICIENT = .601

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0008)	Area (ha)=	54.82	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	2.52	

Unit Hyd Qpeak (cms)= .831

PEAK FLOW (cms)= 1.519 (i)

TIME TO PEAK (hrs)= 5.000

RUNOFF VOLUME (mm)= 53.874

TOTAL RAINFALL (mm)= 89.661

RUNOFF COEFFICIENT = .601

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0009)	Area (ha)=	284.79	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	4.93	

Unit Hyd Qpeak (cms)= 2.206

PEAK FLOW (cms)= 4.472 (i)

TIME TO PEAK (hrs)= 7.500

Existing Conditions Flows
RUNOFF VOLUME (mm)= 53.874
TOTAL RAINFALL (mm)= 89.661
RUNOFF COEFFICIENT = .601

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
-----  
| CALIB |  
| NASHYD (0010) | Area (ha)= 88.96 Curve Number (CN)= 84.0  
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00  
-----  
U.H. Tp(hrs)= 2.94
```

Unit Hyd Qpeak (cms)= 1.156

PEAK FLOW (cms)= 2.173 (i)
TIME TO PEAK (hrs)= 5.500
RUNOFF VOLUME (mm)= 53.874
TOTAL RAINFALL (mm)= 89.661
RUNOFF COEFFICIENT = .601

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
-----  
| CALIB |  
| NASHYD (0011) | Area (ha)= 104.56 Curve Number (CN)= 84.0  
| ID= 1 DT=10.0 min | Ia (mm)= 5.00 # of Linear Res.(N)= 3.00  
-----  
U.H. Tp(hrs)= 3.23
```

Unit Hyd Qpeak (cms)= 1.236

PEAK FLOW (cms)= 2.364 (i)
TIME TO PEAK (hrs)= 5.833
RUNOFF VOLUME (mm)= 53.874
TOTAL RAINFALL (mm)= 89.661
RUNOFF COEFFICIENT = .601

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

```
-----  
*****  
** SIMULATION NUMBER: 6 **  
*****
```

```
-----  
| CHICAGO STORM | IDF curve parameters: A=2954.369  
| Ptotal= 99.77 mm | B= 17.403
```

Existing Conditions Flows

C= .873

used in: INTENSITY = $A / (t + B)^C$

Duration of storm = 6.00 hrs

Storm time step = 10.00 min

Time to peak ratio = .33

The CORRELATION coefficient is = .9996

TIME (min)	INPUT INT. (mm/hr)	TAB. INT. (mm/hr)
5.	210.00	195.73
10.	156.60	164.16
15.	135.20	141.82
30.	102.60	101.74
60.	66.70	66.31
120.	40.70	40.18
360.	16.80	16.63
720.	9.50	9.27
1440.	5.00	5.11

TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr	TIME hrs	RAIN mm/hr
.17	3.10	1.67	24.35	3.17	10.89	4.67	4.28
.33	3.44	1.83	60.03	3.33	9.34	4.83	4.00
.50	3.87	2.00	164.16	3.50	8.16	5.00	3.76
.67	4.43	2.17	77.47	3.67	7.24	5.17	3.55
.83	5.16	2.33	42.67	3.83	6.49	5.33	3.35
1.00	6.18	2.50	28.19	4.00	5.89	5.50	3.18
1.17	7.69	2.67	20.58	4.17	5.38	5.67	3.03
1.33	10.10	2.83	16.00	4.33	4.95	5.83	2.89
1.50	14.48	3.00	12.99	4.50	4.59	6.00	2.76

CALIB	
NASHYD (0001)	Area (ha)= 99.03 Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)= 5.00 # of Linear Res.(N)= 3.00
	U.H. Tp(hrs)= 2.26

Unit Hyd Qpeak (cms)= 1.674

PEAK FLOW (cms)= 3.492 (i)

TIME TO PEAK (hrs)= 4.667

RUNOFF VOLUME (mm)= 62.742

TOTAL RAINFALL (mm)= 99.771

Existing Conditions Flows
RUNOFF COEFFICIENT = .629

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0002)	Area (ha)=	11.09	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	4.96	

Unit Hyd Qpeak (cms)= .085

PEAK FLOW (cms)= .202 (i)
TIME TO PEAK (hrs)= 7.667
RUNOFF VOLUME (mm)= 62.741
TOTAL RAINFALL (mm)= 99.771
RUNOFF COEFFICIENT = .629

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0003)	Area (ha)=	186.85	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	2.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	1.03	

Unit Hyd Qpeak (cms)= 6.929

PEAK FLOW (cms)= 12.713 (i)
TIME TO PEAK (hrs)= 3.167
RUNOFF VOLUME (mm)= 65.403
TOTAL RAINFALL (mm)= 99.771
RUNOFF COEFFICIENT = .656

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0004)	Area (ha)=	24.84	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	1.42	

Unit Hyd Qpeak (cms)= .668

PEAK FLOW (cms)= 1.266 (i)

Existing Conditions Flows

TIME TO PEAK	(hrs)=	3.667
RUNOFF VOLUME	(mm)=	62.741
TOTAL RAINFALL	(mm)=	99.771
RUNOFF COEFFICIENT	=	.629

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0005)	Area (ha)=	129.56	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	1.71	

Unit Hyd Qpeak (cms)= 2.894

PEAK FLOW	(cms)=	5.708 (i)
TIME TO PEAK	(hrs)=	4.000
RUNOFF VOLUME	(mm)=	62.741
TOTAL RAINFALL	(mm)=	99.771
RUNOFF COEFFICIENT	=	.629

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0006)	Area (ha)=	27.63	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	1.42	

Unit Hyd Qpeak (cms)= .743

PEAK FLOW	(cms)=	1.408 (i)
TIME TO PEAK	(hrs)=	3.667
RUNOFF VOLUME	(mm)=	62.741
TOTAL RAINFALL	(mm)=	99.771
RUNOFF COEFFICIENT	=	.629

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0007)	Area (ha)=	97.77	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	2.10	

Existing Conditions Flows

Unit Hyd Qpeak (cms)= 1.778

PEAK FLOW (cms)= 3.657 (i)

TIME TO PEAK (hrs)= 4.500

RUNOFF VOLUME (mm)= 62.741

TOTAL RAINFALL (mm)= 99.771

RUNOFF COEFFICIENT = .629

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0008)	Area (ha)=	54.82	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	2.52	

Unit Hyd Qpeak (cms)= .831

PEAK FLOW (cms)= 1.770 (i)

TIME TO PEAK (hrs)= 5.000

RUNOFF VOLUME (mm)= 62.742

TOTAL RAINFALL (mm)= 99.771

RUNOFF COEFFICIENT = .629

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0009)	Area (ha)=	284.79	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia (mm)=	5.00	# of Linear Res.(N)= 3.00
	U.H. Tp(hrs)=	4.93	

Unit Hyd Qpeak (cms)= 2.206

PEAK FLOW (cms)= 5.208 (i)

TIME TO PEAK (hrs)= 7.500

RUNOFF VOLUME (mm)= 62.742

TOTAL RAINFALL (mm)= 99.771

RUNOFF COEFFICIENT = .629

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0010)	Area (ha)=	88.96	Curve Number (CN)= 84.0

	Existing Conditions Flows		
ID= 1 DT=10.0 min	Ia	(mm)= 5.00	# of Linear Res.(N)= 3.00
-----	U.H.	Tp(hrs)= 2.94	

Unit Hyd Qpeak (cms)= 1.156

PEAK FLOW (cms)= 2.531 (i)
 TIME TO PEAK (hrs)= 5.500
 RUNOFF VOLUME (mm)= 62.742
 TOTAL RAINFALL (mm)= 99.771
 RUNOFF COEFFICIENT = .629

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

CALIB			
NASHYD (0011)	Area	(ha)= 104.56	Curve Number (CN)= 84.0
ID= 1 DT=10.0 min	Ia	(mm)= 5.00	# of Linear Res.(N)= 3.00
-----	U.H.	Tp(hrs)= 3.23	

Unit Hyd Qpeak (cms)= 1.236

PEAK FLOW (cms)= 2.754 (i)
 TIME TO PEAK (hrs)= 5.833
 RUNOFF VOLUME (mm)= 62.742
 TOTAL RAINFALL (mm)= 99.771
 RUNOFF COEFFICIENT = .629

(i) PEAK FLOW DOES NOT INCLUDE BASEFLOW IF ANY.

FINISH

=====

=====

Existing Conditions Flows

```

=====
=====

V   V   I   SSSSS U   U   A   L
V   V   I   SS   U   U   A A  L
V   V   I   SS   U   U   AAAAA L
V   V   I   SS   U   U   A   A  L
  VV   I   SSSSS UUUUU A   A  LLLLL

000   TTTTT TTTTT H   H   Y   Y   M   M   000   TM
O   O   T   T   H   H   Y   Y   MM MM  O   O
O   O   T   T   H   H   Y   M   M   O   O

000   T   T   H   H   Y   M   M   000

```

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***** S U M M A R Y O U T P U T *****

Input filename: C:\Program Files\Visual OTTHYMO 2.2.4\voin.dat

Output filename: j:\PROJECTS\DRAFT\126452 Highway 3 Widening\Drainage &
 Hydrology\Hwy3CulvertHydrology\Existing Conditions Flows.out

Summary filename: j:\PROJECTS\DRAFT\126452 Highway 3 Widening\Drainage &
 Hydrology\Hwy3CulvertHydrology\Existing Conditions Flows.sum

DATE: 15/04/2014

TIME: 12:08:45 PM

USER:

COMMENTS: _____

```

*****
** SIMULATION NUMBER: 1 **
*****

```

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
-------------	--------	-----------	------------	--------------	--------------	------------	------	--------------

Existing Conditions Flows

START @ .00 hrs

CHIC STORM 10.0

[Ptot= 40.55 mm]

*	**	CALIB NASHYD	0001	1	10.0	99.03	.80	4.83	15.06	.37	.000
		[CN=84.0									
		[N = 3.0:Tp 2.26]									
*	**	CALIB NASHYD	0002	1	10.0	11.09	.05	7.83	15.06	.37	.000
		[CN=84.0									
		[N = 3.0:Tp 4.96]									
*	**	CALIB NASHYD	0003	1	10.0	186.85	3.12	3.17	17.09	.42	.000
		[CN=84.0									
		[N = 3.0:Tp 1.03]									
*	**	CALIB NASHYD	0004	1	10.0	24.84	.28	3.83	15.06	.37	.000
		[CN=84.0									
		[N = 3.0:Tp 1.42]									
*	**	CALIB NASHYD	0005	1	10.0	129.56	1.28	4.17	15.06	.37	.000
		[CN=84.0									
		[N = 3.0:Tp 1.71]									
*	**	CALIB NASHYD	0006	1	10.0	27.63	.31	3.83	15.06	.37	.000
		[CN=84.0									
		[N = 3.0:Tp 1.42]									
*	**	CALIB NASHYD	0007	1	10.0	97.77	.83	4.67	15.06	.37	.000
		[CN=84.0									
		[N = 3.0:Tp 2.10]									
*	**	CALIB NASHYD	0008	1	10.0	54.82	.41	5.17	15.06	.37	.000
		[CN=84.0									
		[N = 3.0:Tp 2.52]									
*	**	CALIB NASHYD	0009	1	10.0	284.79	1.24	7.83	15.06	.37	.000
		[CN=84.0									
		[N = 3.0:Tp 4.93]									
*	**	CALIB NASHYD	0010	1	10.0	88.96	.59	5.67	15.06	.37	.000
		[CN=84.0									
		[N = 3.0:Tp 2.94]									
*	**	CALIB NASHYD	0011	1	10.0	104.56	.64	6.17	15.06	.37	.000
		[CN=84.0									
		[N = 3.0:Tp 3.23]									

Existing Conditions Flows

*

** SIMULATION NUMBER: 2 **

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
START @ .00 hrs								

CHIC STORM		10.0						
[Ptot= 49.25 mm]								
** CALIB NASHYD	0001	1 10.0	99.03	1.17	4.67	21.14	.43	.000
[CN=84.0]								
[N = 3.0:Tp 2.26]								
** CALIB NASHYD	0002	1 10.0	11.09	.07	7.67	21.14	.43	.000
[CN=84.0]								
[N = 3.0:Tp 4.96]								
** CALIB NASHYD	0003	1 10.0	186.85	4.58	3.17	23.34	.47	.000
[CN=84.0]								
[N = 3.0:Tp 1.03]								
** CALIB NASHYD	0004	1 10.0	24.84	.42	3.67	21.14	.43	.000
[CN=84.0]								
[N = 3.0:Tp 1.42]								
** CALIB NASHYD	0005	1 10.0	129.56	1.91	4.00	21.14	.43	.000
[CN=84.0]								
[N = 3.0:Tp 1.71]								
** CALIB NASHYD	0006	1 10.0	27.63	.47	3.67	21.14	.43	.000
[CN=84.0]								
[N = 3.0:Tp 1.42]								
** CALIB NASHYD	0007	1 10.0	97.77	1.22	4.50	21.14	.43	.000
[CN=84.0]								
[N = 3.0:Tp 2.10]								
** CALIB NASHYD	0008	1 10.0	54.82	.59	5.00	21.14	.43	.000
[CN=84.0]								
[N = 3.0:Tp 2.52]								
** CALIB NASHYD	0009	1 10.0	284.79	1.75	7.67	21.14	.43	.000
[CN=84.0]								
[N = 3.0:Tp 4.93]								

Existing Conditions Flows

```

*
** CALIB NASHYD      0010  1 10.0   88.96   .85  5.50  21.14  .43   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 2.94]
*
** CALIB NASHYD      0011  1 10.0  104.56   .92  5.83  21.14  .43   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 3.23]
*
*****
** SIMULATION NUMBER:   3 **
*****

W/E COMMAND          HYD ID   DT      AREA   Qpeak  Tpeak   R.V.  R.C.   Qbase
                      min      ha      cms    hrs    mm
START @   .00 hrs
-----
CHIC STORM           10.0
[ Ptot= 66.09 mm ]
*
** CALIB NASHYD      0001  1 10.0   99.03   1.85  4.67  34.09  .52   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 2.26]
*
** CALIB NASHYD      0002  1 10.0   11.09   .11  7.67  34.09  .52   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 4.96]
*
** CALIB NASHYD      0003  1 10.0  186.85   6.89  3.17  36.52  .55   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 1.03]
*
** CALIB NASHYD      0004  1 10.0   24.84   .66  3.67  34.09  .52   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 1.42]
*
** CALIB NASHYD      0005  1 10.0  129.56   3.00  4.00  34.09  .52   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 1.71]
*
** CALIB NASHYD      0006  1 10.0   27.63   .74  3.67  34.09  .52   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 1.42]
*
** CALIB NASHYD      0007  1 10.0   97.77   1.93  4.50  34.09  .52   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 2.10]

```

Existing Conditions Flows

```

*
** CALIB NASHYD      0008  1 10.0   54.82    .94  5.00  34.09  .52   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 2.52]
*
** CALIB NASHYD      0009  1 10.0  284.79    2.81  7.67  34.09  .52   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 4.93]
*
** CALIB NASHYD      0010  1 10.0   88.96    1.35  5.67  34.09  .52   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 2.94]
*
** CALIB NASHYD      0011  1 10.0  104.56    1.47  6.00  34.09  .52   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 3.23]
*
*****
** SIMULATION NUMBER:   4 **
*****

```

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
START @ .00 hrs								

CHIC STORM		10.0						
[Ptot= 80.01 mm]								
** CALIB NASHYD	0001	1 10.0	99.03	2.51	4.67	45.60	.57	.000
[CN=84.0]								
[N = 3.0:Tp 2.26]								
** CALIB NASHYD	0002	1 10.0	11.09	.15	7.67	45.60	.57	.000
[CN=84.0]								
[N = 3.0:Tp 4.96]								
** CALIB NASHYD	0003	1 10.0	186.85	9.21	3.17	48.14	.60	.000
[CN=84.0]								
[N = 3.0:Tp 1.03]								
** CALIB NASHYD	0004	1 10.0	24.84	.90	3.67	45.60	.57	.000
[CN=84.0]								
[N = 3.0:Tp 1.42]								
** CALIB NASHYD	0005	1 10.0	129.56	4.09	4.00	45.60	.57	.000
[CN=84.0]								
[N = 3.0:Tp 1.71]								

Existing Conditions Flows

```

*
** CALIB NASHYD      0006  1 10.0   27.63   1.01  3.67  45.60  .57   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 1.42]
*
** CALIB NASHYD      0007  1 10.0   97.77   2.63  4.50  45.60  .57   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 2.10]
*
** CALIB NASHYD      0008  1 10.0   54.82   1.27  5.00  45.60  .57   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 2.52]
*
** CALIB NASHYD      0009  1 10.0  284.79   3.78  7.67  45.60  .57   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 4.93]
*
** CALIB NASHYD      0010  1 10.0   88.96   1.83  5.50  45.60  .57   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 2.94]
*
** CALIB NASHYD      0011  1 10.0  104.56   1.99  5.83  45.60  .57   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 3.23]
*
*****
** SIMULATION NUMBER:   5 **
*****

```

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
START @ .00 hrs								

CHIC STORM		10.0						
[Ptot= 89.66 mm]								
** CALIB NASHYD	0001	1 10.0	99.03	3.00	4.67	53.87	.60	.000
[CN=84.0								
[N = 3.0:Tp 2.26]								
** CALIB NASHYD	0002	1 10.0	11.09	.17	7.67	53.87	.60	.000
[CN=84.0								
[N = 3.0:Tp 4.96]								
** CALIB NASHYD	0003	1 10.0	186.85	10.98	3.17	56.48	.63	.000
[CN=84.0								
[N = 3.0:Tp 1.03]								

Existing Conditions Flows

```

*
** CALIB NASHYD      0004  1 10.0   24.84   1.09  3.67  53.87  .60   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 1.42]
*
** CALIB NASHYD      0005  1 10.0  129.56   4.90  4.00  53.87  .60   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 1.71]
*
** CALIB NASHYD      0006  1 10.0   27.63   1.21  3.67  53.87  .60   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 1.42]
*
** CALIB NASHYD      0007  1 10.0   97.77   3.14  4.50  53.87  .60   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 2.10]
*
** CALIB NASHYD      0008  1 10.0   54.82   1.52  5.00  53.87  .60   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 2.52]
*
** CALIB NASHYD      0009  1 10.0  284.79   4.47  7.50  53.87  .60   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 4.93]
*
** CALIB NASHYD      0010  1 10.0   88.96   2.17  5.50  53.87  .60   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 2.94]
*
** CALIB NASHYD      0011  1 10.0  104.56   2.36  5.83  53.87  .60   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 3.23]
*
*****
** SIMULATION NUMBER:   6 **
*****

```

W/E COMMAND	HYD ID	DT min	AREA ha	Qpeak cms	Tpeak hrs	R.V. mm	R.C.	Qbase cms
START @ .00 hrs								

CHIC STORM		10.0						
[Ptot= 99.77 mm]								
* ** CALIB NASHYD 0001 1 10.0 99.03 3.49 4.67 62.74 .63 .000 [CN=84.0] [N = 3.0:Tp 2.26]								

Existing Conditions Flows

```

*
** CALIB NASHYD      0002  1 10.0   11.09    .20  7.67  62.74  .63   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 4.96]
*
** CALIB NASHYD      0003  1 10.0  186.85   12.71  3.17  65.40  .66   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 1.03]
*
** CALIB NASHYD      0004  1 10.0   24.84    1.27  3.67  62.74  .63   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 1.42]
*
** CALIB NASHYD      0005  1 10.0  129.56    5.71  4.00  62.74  .63   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 1.71]
*
** CALIB NASHYD      0006  1 10.0   27.63    1.41  3.67  62.74  .63   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 1.42]
*
** CALIB NASHYD      0007  1 10.0   97.77    3.66  4.50  62.74  .63   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 2.10]
*
** CALIB NASHYD      0008  1 10.0   54.82    1.77  5.00  62.74  .63   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 2.52]
*
** CALIB NASHYD      0009  1 10.0  284.79    5.21  7.50  62.74  .63   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 4.93]
*
** CALIB NASHYD      0010  1 10.0   88.96    2.53  5.50  62.74  .63   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 2.94]
*
** CALIB NASHYD      0011  1 10.0  104.56    2.75  5.83  62.74  .63   .000
   [CN=84.0          ]
   [ N = 3.0:Tp 3.23]

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FINISH

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APPENDIX B

CulvertMaster Existing Conditions Hydraulic Assessment

Culvert Designer/Analyzer Report

14th Concession East Drain

Analysis Component				
Storm Event		Check	Discharge	4.5400 m³/s
Peak Discharge Method: User-Specified				
Design Discharge		3.0000 m³/s	Check Discharge	4.5400 m³/s
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Check Storm.				
Discharge		4.5400 m³/s	Bottom Elevation	192.14 m
Depth		0.88 m	Velocity	1.09 m/s
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3050 x 1520 mm Box	4.5400 m³/s	193.14 m	1.18 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

14th Concession East Drain

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	193.14 m	Discharge	4.5400 m³/s
Inlet Control HW Elev.	193.02 m	Tailwater Elevation	193.02 m
Outlet Control HW Elev.	193.14 m	Control Type	Outlet Control
Headwater Depth/Height	0.88		
Grades			
Upstream Invert	191.79 m	Downstream Invert	191.75 m
Length	26.95 m	Constructed Slope	0.001484 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	1.27 m
Slope Type	Mild	Normal Depth	1.21 m
Flow Regime	Subcritical	Critical Depth	0.61 m
Velocity Downstream	1.18 m/s	Critical Slope	0.010433 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.024
Section Material	Concrete	Span	3.05 m
Section Size	3050 x 1520 mm	Rise	1.52 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	193.14 m	Upstream Velocity Head	0.07 m
Ke	0.20	Entrance Loss	0.01 m
Inlet Control Properties			
Inlet Control HW Elev.	193.02 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.6 m²
K	0.51500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Designer/Analyzer Report

Unnamed Drain

Analysis Component			
Storm Event	Check	Discharge	0.2600 m³/s
Peak Discharge Method: User-Specified			
Design Discharge	0.1700 m³/s	Check Discharge	0.2600 m³/s
Tailwater Conditions: Constant Tailwater			
Tailwater Elevation	N/A m		

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-750 mm Circular	0.2600 m³/s	193.90 m	1.51 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

Unnamed Drain

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	193.90 m	Discharge	0.2600 m³/s
Inlet Control HW Elev.	193.78 m	Tailwater Elevation	N/A m
Outlet Control HW Elev.	193.90 m	Control Type	Outlet Control
Headwater Depth/Height	0.77		
Grades			
Upstream Invert	193.32 m	Downstream Invert	193.16 m
Length	29.67 m	Constructed Slope	0.000000 m/m
Hydraulic Profile			
Profile	H2	Depth, Downstream	0.31 m
Slope Type	Horizontal	Normal Depth	N/A m
Flow Regime	Subcritical	Critical Depth	0.31 m
Velocity Downstream	1.51 m/s	Critical Slope	0.014474 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.76 m
Section Size	750 mm	Rise	0.76 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	193.90 m	Upstream Velocity Head	0.03 m
Ke	0.90	Entrance Loss	0.03 m
Inlet Control Properties			
Inlet Control HW Elev.	193.78 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.5 m²
K	0.03400	HDS 5 Chart	2
M	1.50000	HDS 5 Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Designer/Analyzer Report

Essex Outlet Drain

Analysis Component			
Storm Event	Check	Discharge	16.5300 m³/s
Peak Discharge Method: User-Specified			
Design Discharge	10.9800 m³/s	Check Discharge	16.5300 m³/s
Tailwater properties: Trapezoidal Channel			
Tailwater conditions for Check Storm.			
Discharge	16.5300 m³/s	Bottom Elevation	191.58 m
Depth	2.31 m	Velocity	0.88 m/s

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3660 x 1830 mm Box	13.9241 m³/s	194.33 m	2.08 m/s
Culvert-2	1-1230 x 1920 mm Horiz Ellipse	2.6036 m³/s	194.33 m	1.37 m/s
Weir	Not Considered	N/A	N/A	N/A
Total	-----	16.5277 m³/s	194.33 m	N/A

Culvert Designer/Analyzer Report

Essex Outlet Drain

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	194.33 m	Discharge	13.9241 m³/s
Inlet Control HW Elev.	193.89 m	Tailwater Elevation	193.89 m
Outlet Control HW Elev.	194.33 m	Control Type	Outlet Control
Headwater Depth/Height	1.49		
Grades			
Upstream Invert	191.60 m	Downstream Invert	191.54 m
Length	36.79 m	Constructed Slope	0.001631 m/m
Hydraulic Profile			
Profile	Pressure Profile	Depth, Downstream	2.35 m
Slope Type	N/A	Normal Depth	N/A m
Flow Regime	N/A	Critical Depth	1.14 m
Velocity Downstream	2.08 m/s	Critical Slope	0.010315 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.024
Section Material	Concrete	Span	3.66 m
Section Size	3660 x 1830 mm	Rise	1.83 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	194.33 m	Upstream Velocity Head	0.22 m
Ke	0.20	Entrance Loss	0.04 m
Inlet Control Properties			
Inlet Control HW Elev.	193.89 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	6.7 m²
K	0.51500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Designer/Analyzer Report

Essex Outlet Drain

Component: Culvert-2

Culvert Summary			
Computed Headwater Elev:	194.33 m	Discharge	2.6036 m ³ /s
Inlet Control HW Elev.	193.89 m	Tailwater Elevation	193.89 m
Outlet Control HW Elev.	194.33 m	Control Type	Outlet Control
Headwater Depth/Height	1.81		

Grades			
Upstream Invert	192.11 m	Downstream Invert	191.82 m
Length	40.16 m	Constructed Slope	0.007221 m/m

Hydraulic Profile			
Profile	Pressure Profile	Depth, Downstream	2.07 m
Slope Type	N/A	Normal Depth	1.06 m
Flow Regime	N/A	Critical Depth	0.67 m
Velocity Downstream	1.37 m/s	Critical Slope	0.021843 m/m

Section			
Section Shape	Horizontal Ellipse	Mannings Coefficient	0.035
Section Material	Concrete	Span	1.92 m
Section Size	1230 x 1920 mm	Rise	1.23 m
Number Sections	1		

Outlet Control Properties			
Outlet Control HW Elev.	194.33 m	Upstream Velocity Head	0.10 m
Ke	0.50	Entrance Loss	0.05 m

Inlet Control Properties			
Inlet Control HW Elev.	193.89 m	Flow Control	N/A
Inlet Type	Headwall (horizontal ellipse)	Area Full	1.9 m ²
Square edge with headwall (horizontal ellipse)		HDS 5 Chart	29
K	0.01000	HDS 5 Scale	1
M	2.00000	Equation Form	1
C	0.03980		
Y	0.67000		

Culvert Designer/Analyzer Report

Talbot Road South Drain A

Analysis Component				
Storm Event	Check	Discharge	0.0000 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	1.0900 m³/s	Check Discharge	1.6500 m³/s	
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Check Storm.				
Discharge	1.6500 m³/s	Bottom Elevation	193.29 m	
Depth	0.61 m	Velocity	1.22 m/s	
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-750 mm Circular	1.6500 m³/s	196.77 m	3.68 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

Talbot Road South Drain A

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	196.77 m	Discharge	1.6500 m³/s
Inlet Control HW Elev.	196.05 m	Tailwater Elevation	193.90 m
Outlet Control HW Elev.	196.77 m	Control Type	Outlet Control
Headwater Depth/Height	4.61		
Grades			
Upstream Invert	193.26 m	Downstream Invert	193.22 m
Length	22.31 m	Constructed Slope	0.001793 m/m
Hydraulic Profile			
Profile	CompositeM2PressureProfile	Depth, Downstream	0.73 m
Slope Type	Mild	Normal Depth	N/A m
Flow Regime	Subcritical	Critical Depth	0.73 m
Velocity Downstream	3.68 m/s	Critical Slope	0.059645 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.76 m
Section Size	750 mm	Rise	0.76 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	196.77 m	Upstream Velocity Head	0.67 m
Ke	0.90	Entrance Loss	0.60 m
Inlet Control Properties			
Inlet Control HW Elev.	196.05 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.5 m²
K	0.03400	HDS 5 Chart	2
M	1.50000	HDS 5 Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Designer/Analyzer Report

Canaan Drain

Analysis Component				
Storm Event	Check	Discharge	0.0000 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	4.9000 m³/s	Check Discharge	7.4200 m³/s	
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Check Storm.				
Discharge	7.4200 m³/s	Bottom Elevation	191.21 m	
Depth	1.64 m	Velocity	0.72 m/s	
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2080 x 3250 mm Horiz Ellipse	7.4200 m³/s	193.08 m	1.57 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

Canaan Drain

Component: Culvert-1

Culvert Summary

Computed Headwater Elev:	193.08 m	Discharge	7.4200 m ³ /s
Inlet Control HW Elev.	192.85 m	Tailwater Elevation	192.85 m
Outlet Control HW Elev.	193.08 m	Control Type	Outlet Control
Headwater Depth/Height	0.90		

Grades

Upstream Invert	191.22 m	Downstream Invert	191.19 m
Length	26.28 m	Constructed Slope	0.001142 m/m

Hydraulic Profile

Profile	M2	Depth, Downstream	1.66 m
Slope Type	Mild	Normal Depth	N/A m
Flow Regime	Subcritical	Critical Depth	1.03 m
Velocity Downstream	1.57 m/s	Critical Slope	0.008598 m/m

Section

Section Shape	Horizontal Ellipse	Mannings Coefficient	0.024
Section Material	Concrete	Span	3.25 m
Section Size	2080 x 3250 mm	Rise	2.08 m
Number Sections	1		

Outlet Control Properties

Outlet Control HW Elev.	193.08 m	Upstream Velocity Head	0.12 m
Ke	0.50	Entrance Loss	0.06 m

Inlet Control Properties

Inlet Control HW Elev.	192.85 m	Flow Control	N/A
Inlet Type	Headwall (horizontal ellipse)	Area Full	5.5 m ²
K	0.01000	HDS 5 Chart	29
M	2.00000	HDS 5 Scale	1
C	0.03980	Equation Form	1
Y	0.67000		

Square edge with

Culvert Designer/Analyzer Report

Talbot Road South Drain B

Analysis Component				
Storm Event		Check	Discharge	1.8300 m³/s
Peak Discharge Method: User-Specified				
Design Discharge		1.2100 m³/s	Check Discharge	1.8300 m³/s
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Check Storm.				
Discharge		1.8300 m³/s	Bottom Elevation	193.36 m
Depth		0.00 m	Velocity	0.00 m/s
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3050 x 1220 mm Box	1.8300 m³/s	193.83 m	1.81 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

Talbot Road South Drain B

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	193.83 m	Discharge	1.8300 m³/s
Inlet Control HW Elev.	193.82 m	Tailwater Elevation	193.36 m
Outlet Control HW Elev.	193.83 m	Control Type	Outlet Control
Headwater Depth/Height	0.45		
Grades			
Upstream Invert	193.28 m	Downstream Invert	193.27 m
Length	22.76 m	Constructed Slope	0.000439 m/m
Hydraulic Profile			
Profile	M2	Depth, Downstream	0.33 m
Slope Type	Mild	Normal Depth	0.64 m
Flow Regime	Subcritical	Critical Depth	0.33 m
Velocity Downstream	1.81 m/s	Critical Slope	0.003112 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.05 m
Section Size	3050 x 1220 mm	Rise	1.22 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	193.83 m	Upstream Velocity Head	0.10 m
Ke	0.20	Entrance Loss	0.02 m
Inlet Control Properties			
Inlet Control HW Elev.	193.82 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	3.7 m²
K	0.51500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Designer/Analyzer Report

East/West Townline Drain

Analysis Component				
Storm Event	Check	Discharge	4.7500 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	3.1400 m³/s	Check Discharge	4.7500 m³/s	
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Check Storm.				
Discharge	4.7500 m³/s	Bottom Elevation	192.57 m	
Depth	0.89 m	Velocity	1.12 m/s	
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3660 x 2130 mm Box	4.7500 m³/s	193.60 m	1.06 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

East/West Townline Drain

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	193.60 m	Discharge	4.7500 m³/s
Inlet Control HW Elev.	193.46 m	Tailwater Elevation	193.46 m
Outlet Control HW Elev.	193.60 m	Control Type	Outlet Control
Headwater Depth/Height	1.34		
Grades			
Upstream Invert	191.95 m	Downstream Invert	191.93 m
Length	41.63 m	Constructed Slope	0.000480 m/m
Hydraulic Profile			
Profile	Pressure Profile	Depth, Downstream	1.53 m
Slope Type	N/A	Normal Depth	N/A m
Flow Regime	N/A	Critical Depth	0.56 m
Velocity Downstream	1.06 m/s	Critical Slope	0.009787 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.024
Section Material	Concrete	Span	3.66 m
Section Size	3660 x 2130 mm	Rise	1.23 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	193.60 m	Upstream Velocity Head	0.06 m
Ke	0.20	Entrance Loss	0.01 m
Inlet Control Properties			
Inlet Control HW Elev.	193.46 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.5 m²
K	0.51500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Designer/Analyzer Report

Russell Drain

Analysis Component				
Storm Event	Check	Discharge	2.3000 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	1.5200 m³/s	Check Discharge	2.3000 m³/s	
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Check Storm.				
Discharge	2.3000 m³/s	Bottom Elevation	192.84 m	
Depth	0.00 m	Velocity	0.00 m/s	
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-610 x 610 mm Box	2.3000 m³/s	193.08 m	8.03 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

Russell Drain

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev.	193.08 m	Discharge	2.3000 m³/s
Inlet Control HW Elev.	193.00 m	Tailwater Elevation	192.84 m
Outlet Control HW Elev.	193.08 m	Control Type	Outlet Control
Headwater Depth/Height	1.17		
Grades			
Upstream Invert	192.37 m	Downstream Invert	192.37 m
Length	25.66 m	Constructed Slope	0.000000 m/m
Hydraulic Profile			
Profile	Pressure Profile	Depth, Downstream	0.47 m
Slope Type	N/A	Normal Depth	N/A m
Flow Regime	N/A	Critical Depth	0.61 m
Velocity Downstream	8.03 m/s	Critical Slope	0.271051 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.024
Section Material	Concrete	Span	0.61 m
Section Size	610 x 610 mm	Rise	0.61 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	193.08 m	Upstream Velocity Head	0.08 m
Ke	0.20	Entrance Loss	0.02 m
Inlet Control Properties			
Inlet Control HW Elev.	193.00 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	0.4 m²
K	0.51500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Designer/Analyzer Report

Barlow Drain

Analysis Component				
Storm Event	Check	Discharge	6.7700 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	5.2100 m³/s	Check Discharge	6.7700 m³/s	
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Check Storm.				
Discharge	6.7700 m³/s	Bottom Elevation	192.70 m	
Depth	1.56 m	Velocity	0.77 m/s	
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2440 x 1830 mm Box	6.7700 m³/s	194.49 m	1.52 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

Barlow Drain

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev.	194.49 m	Discharge	6.7700 m³/s
Inlet Control HW Elev.	194.26 m	Tailwater Elevation	194.26 m
Outlet Control HW Elev.	194.49 m	Control Type	Outlet Control
Headwater Depth/Height	1.21		
Grades			
Upstream Invert	192.28 m	Downstream Invert	192.19 m
Length	28.58 m	Constructed Slope	0.003149 m/m
Hydraulic Profile			
Profile	Pressure Profile	Depth, Downstream	2.07 m
Slope Type	N/A	Normal Depth	N/A m
Flow Regime	N/A	Critical Depth	0.92 m
Velocity Downstream	1.52 m/s	Critical Slope	0.012300 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.024
Section Material	Concrete	Span	2.44 m
Section Size	2440 x 1830 mm	Rise	1.83 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	194.49 m	Upstream Velocity Head	0.12 m
Ke	0.20	Entrance Loss	0.02 m
Inlet Control Properties			
Inlet Control HW Elev.	194.26 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.5 m²
K	0.51500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

APPENDIX C

CulvertMaster Proposed Conditions Hydraulic Assessment

Culvert Designer/Analyzer Report

Hyland Drain RR8

Analysis Component				
Storm Event		Design	Discharge	2.0000 m³/s
Peak Discharge Method: User-Specified				
Design Discharge		2.0000 m³/s	Check Discharge	3.2000 m³/s
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Design Storm.				
Discharge		2.0000 m³/s	Bottom Elevation	191.85 m
Depth		0.73 m	Velocity	0.66 m/s
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-1830 x 1220 mm Box	2.0000 m³/s	192.81 m	1.50 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

Hyland Drain RR8

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	192.81 m	Discharge	2.0000 m³/s
Inlet Control HW Elev.	192.68 m	Tailwater Elevation	192.58 m
Outlet Control HW Elev.	192.81 m	Control Type	Outlet Control
Headwater Depth/Height	0.77		
Grades			
Upstream Invert	191.87 m	Downstream Invert	191.85 m
Length	28.55 m	Constructed Slope	0.000701 m/m
Hydraulic Profile			
Profile	M2	Depth, Downstream	0.73 m
Slope Type	Mild	Normal Depth	N/A m
Flow Regime	Subcritical	Critical Depth	0.50 m
Velocity Downstream	1.50 m/s	Critical Slope	0.012717 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.024
Section Material	Concrete	Span	1.83 m
Section Size	1830 x 1220 mm	Rise	1.22 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	192.81 m	Upstream Velocity Head	0.09 m
Ke	0.20	Entrance Loss	0.02 m
Inlet Control Properties			
Inlet Control HW Elev.	192.68 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	2.2 m²
K	0.51500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Designer/Analyzer Report

14th Concession East Drain <proposed>

Analysis Component				
Storm Event		Check	Discharge	4.5400 m³/s
Peak Discharge Method: User-Specified				
Design Discharge		3.0000 m³/s	Check Discharge	4.5400 m³/s
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Check Storm.				
Discharge		4.5400 m³/s	Bottom Elevation	192.14 m
Depth		0.88 m	Velocity	1.09 m/s
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3050 x 1520 mm Box	4.5400 m³/s	193.17 m	1.13 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

14th Concession East Drain <proposed>

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	193.17 m	Discharge	4.5400 m³/s
Inlet Control HW Elev.	193.02 m	Tailwater Elevation	193.02 m
Outlet Control HW Elev.	193.17 m	Control Type	Outlet Control
Headwater Depth/Height	0.90		
Grades			
Upstream Invert	191.79 m	Downstream Invert	191.70 m
Length	60.29 m	Constructed Slope	0.001493 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	1.32 m
Slope Type	Mild	Normal Depth	1.20 m
Flow Regime	Subcritical	Critical Depth	0.61 m
Velocity Downstream	1.13 m/s	Critical Slope	0.010433 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.024
Section Material	Concrete	Span	3.05 m
Section Size	3050 x 1520 mm	Rise	1.52 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	193.17 m	Upstream Velocity Head	0.07 m
Ke	0.20	Entrance Loss	0.01 m
Inlet Control Properties			
Inlet Control HW Elev.	193.02 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.6 m²
K	0.51500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Designer/Analyzer Report

14th Concession East Drain <proposed> <SouthTalbotExt>

Analysis Component				
Storm Event	Check	Discharge	4.0100 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	2.5100 m³/s	Check Discharge	4.0100 m³/s	
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Check Storm.				
Discharge	4.0100 m³/s	Bottom Elevation	192.22 m	
Depth	0.82 m	Velocity	1.05 m/s	
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3050 x 1520 mm Box	4.0100 m³/s	193.16 m	1.13 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

14th Concession East Drain <proposed> <SouthTalbotExt>

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	193.16 m	Discharge	4.0100 m³/s
Inlet Control HW Elev.	193.04 m	Tailwater Elevation	193.04 m
Outlet Control HW Elev.	193.16 m	Control Type	Outlet Control
Headwater Depth/Height	0.81		
Grades			
Upstream Invert	191.92 m	Downstream Invert	191.88 m
Length	29.74 m	Constructed Slope	0.001345 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	1.16 m
Slope Type	Mild	Normal Depth	1.14 m
Flow Regime	Subcritical	Critical Depth	0.56 m
Velocity Downstream	1.13 m/s	Critical Slope	0.010402 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.024
Section Material	Concrete	Span	3.05 m
Section Size	3050 x 1520 mm	Rise	1.52 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	193.16 m	Upstream Velocity Head	0.07 m
Ke	0.20	Entrance Loss	0.01 m
Inlet Control Properties			
Inlet Control HW Elev.	193.04 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.6 m²
K	0.51500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Designer/Analyzer Report

Unnamed Drain <proposed>

Analysis Component			
Storm Event	Check	Discharge	0.2600 m³/s
Peak Discharge Method: User-Specified			
Design Discharge	0.1700 m³/s	Check Discharge	0.2600 m³/s
Tailwater Conditions: Constant Tailwater			
Tailwater Elevation	N/A m		

Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-825 mm Circular	0.2600 m³/s	193.67 m	1.47 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

Unnamed Drain <proposed>

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	193.67 m	Discharge	0.2600 m³/s
Inlet Control HW Elev.	193.59 m	Tailwater Elevation	N/A m
Outlet Control HW Elev.	193.67 m	Control Type	Outlet Control
Headwater Depth/Height	0.60		
Grades			
Upstream Invert	193.16 m	Downstream Invert	192.94 m
Length	54.84 m	Constructed Slope	0.004012 m/m
Hydraulic Profile			
Profile	M2	Depth, Downstream	0.30 m
Slope Type	Mild	Normal Depth	0.42 m
Flow Regime	Subcritical	Critical Depth	0.30 m
Velocity Downstream	1.47 m/s	Critical Slope	0.013774 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	0.84 m
Section Size	825 mm	Rise	0.84 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	193.67 m	Upstream Velocity Head	0.04 m
Ke	0.90	Entrance Loss	0.04 m
Inlet Control Properties			
Inlet Control HW Elev.	193.59 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	0.6 m²
K	0.03400	HDS 5 Chart	2
M	1.50000	HDS 5 Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Designer/Analyzer Report

Essex Outlet Drain <proposed>

Analysis Component				
Storm Event		Check	Discharge	16.5300 m³/s
Peak Discharge Method: User-Specified				
Design Discharge		10.9800 m³/s	Check Discharge	16.5300 m³/s
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Check Storm.				
Discharge		16.5300 m³/s	Bottom Elevation	191.58 m
Depth		2.31 m	Velocity	0.88 m/s
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-610 x 610 mm Box	16.5300 m³/s	194.24 m	44.48 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

Essex Outlet Drain <proposed>

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	194.24 m	Discharge	16.5300 m³/s
Inlet Control HW Elev.	193.89 m	Tailwater Elevation	193.89 m
Outlet Control HW Elev.	194.24 m	Control Type	Outlet Control
Headwater Depth/Height	4.48		
Grades			
Upstream Invert	191.51 m	Downstream Invert	191.35 m
Length	97.95 m	Constructed Slope	0.001633 m/m
Hydraulic Profile			
Profile	Pressure Profile	Depth, Downstream	2.54 m
Slope Type	N/A	Normal Depth	N/A m
Flow Regime	N/A	Critical Depth	0.61 m
Velocity Downstream	44.48 m/s	Critical Slope	14.000434 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.024
Section Material	Concrete	Span	0.61 m
Section Size	610 x 610 mm	Rise	0.61 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	194.24 m	Upstream Velocity Head	0.13 m
Ke	0.20	Entrance Loss	0.03 m
Inlet Control Properties			
Inlet Control HW Elev.	193.89 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	0.4 m²
K	0.51500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Designer/Analyzer Report

Talbot Road South Drain A <proposed>

Analysis Component				
Storm Event	Check	Discharge	1.6500 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	1.0900 m³/s	Check Discharge	1.6500 m³/s	
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Check Storm.				
Discharge	1.6500 m³/s	Bottom Elevation	193.29 m	
Depth	0.53 m	Velocity	1.20 m/s	
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-1200 mm Circular	1.6500 m³/s	194.50 m	2.38 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

Talbot Road South Drain A <proposed>

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	194.50 m	Discharge	1.6500 m³/s
Inlet Control HW Elev.	194.39 m	Tailwater Elevation	193.82 m
Outlet Control HW Elev.	194.50 m	Control Type	Outlet Control
Headwater Depth/Height	1.02		
Grades			
Upstream Invert	193.26 m	Downstream Invert	193.22 m
Length	22.31 m	Constructed Slope	0.001793 m/m
Hydraulic Profile			
Profile	M2	Depth, Downstream	0.70 m
Slope Type	Mild	Normal Depth	N/A m
Flow Regime	Subcritical	Critical Depth	0.70 m
Velocity Downstream	2.38 m/s	Critical Slope	0.014207 m/m
Section			
Section Shape	Circular	Mannings Coefficient	0.024
Section Material	CMP	Span	1.22 m
Section Size	1200 mm	Rise	1.22 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	194.50 m	Upstream Velocity Head	0.14 m
Ke	0.90	Entrance Loss	0.12 m
Inlet Control Properties			
Inlet Control HW Elev.	194.39 m	Flow Control	N/A
Inlet Type	Projecting	Area Full	1.2 m²
K	0.03400	HDS 5 Chart	2
M	1.50000	HDS 5 Scale	3
C	0.05530	Equation Form	1
Y	0.54000		

Culvert Designer/Analyzer Report

Canaan Drain <proposed>

Analysis Component				
Storm Event	Check	Discharge	7.4200 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	4.9000 m³/s	Check Discharge	7.4200 m³/s	
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Check Storm.				
Discharge	7.4200 m³/s	Bottom Elevation	191.21 m	
Depth	1.64 m	Velocity	0.72 m/s	
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2080 x 3250 mm Horiz Ellipse	7.4200 m³/s	193.16 m	1.59 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

Canaan Drain <proposed>

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	193.16 m	Discharge	7.4200 m³/s
Inlet Control HW Elev.	192.85 m	Tailwater Elevation	192.85 m
Outlet Control HW Elev.	193.16 m	Control Type	Outlet Control
Headwater Depth/Height	0.92		
Grades			
Upstream Invert	191.23 m	Downstream Invert	191.21 m
Length	68.45 m	Constructed Slope	0.000292 m/m
Hydraulic Profile			
Profile	M2	Depth, Downstream	1.64 m
Slope Type	Mild	Normal Depth	N/A m
Flow Regime	Subcritical	Critical Depth	1.03 m
Velocity Downstream	1.59 m/s	Critical Slope	0.008598 m/m
Section			
Section Shape	Horizontal Ellipse	Mannings Coefficient	0.024
Section Material	Concrete	Span	3.25 m
Section Size	2080 x 3250 mm	Rise	2.08 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	193.16 m	Upstream Velocity Head	0.11 m
Ke	0.50	Entrance Loss	0.06 m
Inlet Control Properties			
Inlet Control HW Elev.	192.85 m	Flow Control	N/A
Inlet Type	Headwall (horizontal ellipse)	Area Full	5.5 m²
Square edge with headwall (horizontal ellipse)		HDS 5 Chart	29
K	0.01000	HDS 5 Scale	1
M	2.00000	Equation Form	1
C	0.03980		
Y	0.67000		

Culvert Designer/Analyzer Report

Talbot Road South Drain B <proposed>

Analysis Component				
Storm Event	Check	Discharge	1.8300 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	1.2100 m³/s	Check Discharge	1.8300 m³/s	
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Check Storm.				
Discharge	1.8300 m³/s	Bottom Elevation	193.36 m	
Depth	0.00 m	Velocity	0.00 m/s	
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3050 x 1220 mm Box	1.8300 m³/s	193.85 m	1.81 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

Talbot Road South Drain B <proposed>

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	193.85 m	Discharge	1.8300 m³/s
Inlet Control HW Elev.	193.82 m	Tailwater Elevation	193.36 m
Outlet Control HW Elev.	193.85 m	Control Type	Outlet Control
Headwater Depth/Height	0.47		
Grades			
Upstream Invert	193.28 m	Downstream Invert	193.27 m
Length	51.99 m	Constructed Slope	0.000439 m/m
Hydraulic Profile			
Profile	M2	Depth, Downstream	0.33 m
Slope Type	Mild	Normal Depth	0.64 m
Flow Regime	Subcritical	Critical Depth	0.33 m
Velocity Downstream	1.81 m/s	Critical Slope	0.003112 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.013
Section Material	Concrete	Span	3.05 m
Section Size	3050 x 1220 mm	Rise	1.22 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	193.85 m	Upstream Velocity Head	0.08 m
Ke	0.20	Entrance Loss	0.02 m
Inlet Control Properties			
Inlet Control HW Elev.	193.82 m	Flow Control	N/A
Inlet Type: headwall w 3/4 inch chamfers		Area Full	3.7 m²
K	0.51500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Designer/Analyzer Report

East/West Townline Drain <proposed>

Analysis Component				
Storm Event	Check	Discharge	4.7500 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	3.1400 m³/s	Check Discharge	4.7500 m³/s	
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Check Storm.				
Discharge	4.7500 m³/s	Bottom Elevation	192.57 m	
Depth	0.89 m	Velocity	1.12 m/s	
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-3660 x 2130 mm Box	4.7500 m³/s	193.64 m	1.06 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

East/West Townline Drain <proposed>

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	193.64 m	Discharge	4.7500 m³/s
Inlet Control HW Elev.	193.46 m	Tailwater Elevation	193.46 m
Outlet Control HW Elev.	193.64 m	Control Type	Outlet Control
Headwater Depth/Height	1.37		
Grades			
Upstream Invert	191.95 m	Downstream Invert	191.92 m
Length	74.42 m	Constructed Slope	0.000721 m/m
Hydraulic Profile			
Profile	Pressure Profile	Depth, Downstream	1.54 m
Slope Type	N/A	Normal Depth	N/A m
Flow Regime	N/A	Critical Depth	0.56 m
Velocity Downstream	1.06 m/s	Critical Slope	0.009787 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.024
Section Material	Concrete	Span	3.66 m
Section Size	3660 x 2130 mm	Rise	1.23 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	193.64 m	Upstream Velocity Head	0.06 m
Ke	0.20	Entrance Loss	0.01 m
Inlet Control Properties			
Inlet Control HW Elev.	193.46 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.5 m²
K	0.51500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Designer/Analyzer Report

Russell Drain <proposed>

Analysis Component				
Storm Event	Check	Discharge	2.3000 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	1.5200 m³/s	Check Discharge	2.3000 m³/s	
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Check Storm.				
Discharge	2.3000 m³/s	Bottom Elevation	192.84 m	
Depth	0.00 m	Velocity	0.00 m/s	
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-610 x 610 mm Box	2.3000 m³/s	193.17 m	8.03 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

Russell Drain <proposed>

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	193.17 m	Discharge	2.3000 m³/s
Inlet Control HW Elev.	193.00 m	Tailwater Elevation	192.84 m
Outlet Control HW Elev.	193.17 m	Control Type	Outlet Control
Headwater Depth/Height	1.30		
Grades			
Upstream Invert	192.37 m	Downstream Invert	192.37 m
Length	55.18 m	Constructed Slope	0.000000 m/m
Hydraulic Profile			
Profile	Pressure Profile	Depth, Downstream	0.47 m
Slope Type	N/A	Normal Depth	N/A m
Flow Regime	N/A	Critical Depth	0.61 m
Velocity Downstream	8.03 m/s	Critical Slope	0.271051 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.024
Section Material	Concrete	Span	0.61 m
Section Size	610 x 610 mm	Rise	0.61 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	193.17 m	Upstream Velocity Head	0.05 m
Ke	0.20	Entrance Loss	0.01 m
Inlet Control Properties			
Inlet Control HW Elev.	193.00 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	0.4 m²
K	0.51500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Designer/Analyzer Report

Barlow Drain <proposed>

Analysis Component				
Storm Event		Design	Discharge	5.2100 m³/s
Peak Discharge Method: User-Specified				
Design Discharge		5.2100 m³/s	Check Discharge	6.7700 m³/s
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Design Storm.				
Discharge		5.2100 m³/s	Bottom Elevation	192.70 m
Depth		1.37 m	Velocity	0.72 m/s
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2440 x 1830 mm Box	5.2100 m³/s	194.42 m	1.17 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

Barlow Drain <proposed>

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	194.42 m	Discharge	5.2100 m³/s
Inlet Control HW Elev.	194.07 m	Tailwater Elevation	194.07 m
Outlet Control HW Elev.	194.42 m	Control Type	Outlet Control
Headwater Depth/Height	1.17		
Grades			
Upstream Invert	192.28 m	Downstream Invert	192.06 m
Length	71.39 m	Constructed Slope	0.001261 m/m
Hydraulic Profile			
Profile	Pressure Profile	Depth, Downstream	2.01 m
Slope Type	N/A	Normal Depth	N/A m
Flow Regime	N/A	Critical Depth	0.78 m
Velocity Downstream	1.17 m/s	Critical Slope	0.011851 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.024
Section Material	Concrete	Span	2.44 m
Section Size	2440 x 1830 mm	Rise	1.83 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	194.42 m	Upstream Velocity Head	0.07 m
Ke	0.20	Entrance Loss	0.01 m
Inlet Control Properties			
Inlet Control HW Elev.	194.07 m	Flow Control	Unsubmerged
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.5 m²
K	0.51500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Designer/Analyzer Report

Barlow Drain <proposed> <improved> <interim>

Analysis Component				
Storm Event	Design	Discharge	5.2100 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	5.2100 m³/s	Check Discharge	6.7700 m³/s	
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Design Storm.				
Discharge	5.2100 m³/s	Bottom Elevation	192.36 m	
Depth	1.37 m	Velocity	0.72 m/s	
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2440 x 1830 mm Box	5.2100 m³/s	193.93 m	1.32 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

Barlow Drain <proposed> <improved> <interim>

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	193.93 m	Discharge	5.2100 m³/s
Inlet Control HW Elev.	193.73 m	Tailwater Elevation	193.73 m
Outlet Control HW Elev.	193.93 m	Control Type	Outlet Control
Headwater Depth/Height	0.90		
Grades			
Upstream Invert	192.28 m	Downstream Invert	192.12 m
Length	50.90 m	Constructed Slope	0.003143 m/m
Hydraulic Profile			
Profile	M1	Depth, Downstream	1.61 m
Slope Type	Mild	Normal Depth	1.26 m
Flow Regime	Subcritical	Critical Depth	0.78 m
Velocity Downstream	1.32 m/s	Critical Slope	0.011851 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.024
Section Material	Concrete	Span	2.44 m
Section Size	2440 x 1830 mm	Rise	1.83 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	193.93 m	Upstream Velocity Head	0.10 m
Ke	0.20	Entrance Loss	0.02 m
Inlet Control Properties			
Inlet Control HW Elev.	193.73 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.5 m²
K	0.51500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Designer/Analyzer Report

Barlow Drain <proposed> <improved>

Analysis Component				
Storm Event		Design	Discharge	5.2100 m³/s
Peak Discharge Method: User-Specified				
Design Discharge		5.2100 m³/s	Check Discharge	6.7700 m³/s
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Design Storm.				
Discharge		5.2100 m³/s	Bottom Elevation	192.36 m
Depth		1.37 m	Velocity	0.72 m/s
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2440 x 1830 mm Box	5.2100 m³/s	194.07 m	1.28 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

Barlow Drain <proposed> <improved>

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	194.07 m	Discharge	5.2100 m³/s
Inlet Control HW Elev.	193.73 m	Tailwater Elevation	193.73 m
Outlet Control HW Elev.	194.07 m	Control Type	Outlet Control
Headwater Depth/Height	0.98		
Grades			
Upstream Invert	192.28 m	Downstream Invert	192.06 m
Length	71.39 m	Constructed Slope	0.001261 m/m
Hydraulic Profile			
Profile	M2	Depth, Downstream	1.67 m
Slope Type	Mild	Normal Depth	N/A m
Flow Regime	Subcritical	Critical Depth	0.78 m
Velocity Downstream	1.28 m/s	Critical Slope	0.011851 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.024
Section Material	Concrete	Span	2.44 m
Section Size	2440 x 1830 mm	Rise	1.83 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	194.07 m	Upstream Velocity Head	0.08 m
Ke	0.20	Entrance Loss	0.02 m
Inlet Control Properties			
Inlet Control HW Elev.	193.73 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.5 m²
K	0.51500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

Culvert Designer/Analyzer Report

Barlow Drain <proposed> <interim>

Analysis Component				
Storm Event	Check	Discharge	6.7700 m³/s	
Peak Discharge Method: User-Specified				
Design Discharge	5.2100 m³/s	Check Discharge	6.7700 m³/s	
Tailwater properties: Trapezoidal Channel				
Tailwater conditions for Check Storm.				
Discharge	6.7700 m³/s	Bottom Elevation	192.70 m	
Depth	1.56 m	Velocity	0.77 m/s	
Name	Description	Discharge	HW Elev.	Velocity
Culvert-1	1-2440 x 1830 mm Box	6.7700 m³/s	194.56 m	1.52 m/s
Weir	Not Considered	N/A	N/A	N/A

Culvert Designer/Analyzer Report

Barlow Drain <proposed> <interim>

Component: Culvert-1

Culvert Summary			
Computed Headwater Elev:	194.56 m	Discharge	6.7700 m³/s
Inlet Control HW Elev.	194.26 m	Tailwater Elevation	194.26 m
Outlet Control HW Elev.	194.56 m	Control Type	Outlet Control
Headwater Depth/Height	1.25		
Grades			
Upstream Invert	192.28 m	Downstream Invert	192.12 m
Length	50.90 m	Constructed Slope	0.003143 m/m
Hydraulic Profile			
Profile	Pressure Profile	Depth, Downstream	2.14 m
Slope Type	N/A	Normal Depth	N/A m
Flow Regime	N/A	Critical Depth	0.92 m
Velocity Downstream	1.52 m/s	Critical Slope	0.012300 m/m
Section			
Section Shape	Box	Mannings Coefficient	0.024
Section Material	Concrete	Span	2.44 m
Section Size	2440 x 1830 mm	Rise	1.83 m
Number Sections	1		
Outlet Control Properties			
Outlet Control HW Elev.	194.56 m	Upstream Velocity Head	0.12 m
Ke	0.20	Entrance Loss	0.02 m
Inlet Control Properties			
Inlet Control HW Elev.	194.26 m	Flow Control	N/A
Inlet Type	90° headwall w 3/4 inch chamfers	Area Full	4.5 m²
K	0.51500	HDS 5 Chart	10
M	0.66700	HDS 5 Scale	1
C	0.03750	Equation Form	2
Y	0.79000		

The Corporation of the Town of Essex

By-Law Number 1913

Being a by-law to authorize the relocation of Drainage Works pursuant to Sections 77(2) and 77(3) of the Drainage Act, R.S.O. 1990, c.

D. 17

Whereas Council of The Corporation of the Town of Essex at its May 19 2020 regular meeting received and supported Drainage Report 2020-04 which Report recommends the adoption of a Engineers Letter of Opinion in reference to the recommended relocation of the Essex Outlet Drain so as to avoid conflict with a proposed overpass structure at King's Highway Number 3 and Victoria Avenue.

And Whereas, Section 25(2) of the Public Transportation and Highway Improvements Act, Ontario, R.S.O. 1990 c. P. 50 , provides that the Ministry of Transportation of Ontario can designate one or more engineers of the Ministry to be the engineer authorized to carry out the provisions of any Act for the purpose of drainage for the King's Highway and has all the same powers and shall perform all the duties required of an engineer appointed by a municipality;

And Whereas Section 77(3) of the Ontario Drainage Act, R.S.O. 1990, c. D. 17 (the "Act") provides that where the relocation of a Drainage works or part thereof referred to in subsection 77(2) of the Act is to be effected within the lands under the jurisdiction of the Road Authority, the engineer has the option to prepare a written opinion instead of a report.

Now therefore be it resolved that the Council of The Corporation of the Town of Essex enacts as follows:

1. That the Engineer's Letter of Opinion to relocate the Essex Outlet Drain as attached hereto as Schedule "A" to this by-law be approved and adopted and that the relocation of Drainage Works referenced therein be hereby authorized;
2. That the Mayor and Clerk be hereby authorized to sign such documents and give such assurances as may be necessary to give effect to this By-law.
3. That this by-law shall come into force and effect upon its final passing thereof.

Read a first, a second and a third time and finally passed on May 19, 2020.

Mayor

Clerk

Ministry of Transportation
Engineering Office
Planning and Design Section
West Region

659 Exeter Road
London, Ontario N6E 1L3
Telephone: (519) 873-4561
Facsimile: (519) 873-4600

Ministère des Transports
Bureau du génie
Section de planification et de conception
Région de l'Ouest

659, chemin Exeter
London (Ontario) N6E 1L3
Téléphone : (519) 873-4561
Télécopieur : (519) 873-4600



March 20, 2020

Norman Nussio, C.E.T., CRS
Manager of Operations & Drainage
Town of Essex
nnussio@essex.ca
519-776-7336 ext. 1405

Drainage Improvements to the Essex Outlet Drain
Highway 3
City of Essex

Dear Mr. Nussio:

Instruction

The Ministry proposes a drainage realignment, contained within the Highway 3 property limits, for the Essex Outlet Drain. Specifics regarding the realignment can be found in Appendix A, Essex Outlet Drain – Recommended Plan.

The Ministry-proposed work, as it affects the Essex Outlet Drain, will not adversely affect the hydraulic capacity of the system as shown in the Appendix B, Final Highway 3 Culvert Hydrology and Condition Report. All of the works recommended (see Appendix B) shall be at the cost of the Ministry (Road Authority) and the entirety of the proposed work is on lands solely under the jurisdiction of the Ministry.

We hereby recommend that the realignment, as described in this letter, may proceed as set out in our written opinion in accordance with Section 77(3) of the Drainage Act. As such, a formal report under the Drainage Act is not required.

Watershed Description

The existing Highway 3 crossing of the Essex Outlet Drain serves as an outlet for a large urban storm drainage system within the Town of Essex. The Essex Outlet Drain is a regulated municipal drain and lies within the Canard River Subwatershed.

The Essex Outlet Drain is under the jurisdiction of Essex River Conservation Authority (ERCA) with respect to hydraulic performance and floodplain management, and the Ministry of Natural Resources and Forestry (MNRF) with respect to species at risk (SAR). Watershed characteristics for the Essex Outlet Drain sub-watershed were

../2

determined using information obtained from the previously completed Preliminary Design drainage study, official Municipal Drain mapping obtained from the local municipalities and County of Essex, and topographic mapping from MNR.

Existing Conditions

The Essex Outlet Drain, from its upstream limit to Highway 3, is an intermittent flowing, urbanized closed stormwater drainage system, and is not considered sensitive to fish habitat. The Drain is classified from its upstream limit to Essex Outlet Creek as a Class F drain, based on Ontario Ministry of Agriculture, Food and Rural Affairs (OMAFRA) mapping.

There is currently one crossing of the Essex Outlet Drain within Ministry property, approximately 30 m west of the intersection of Victoria Road and Highway 3. The Essex Outlet Drain, within Ministry property limits, has a linear trapezoidal conveyance feature with relatively uniform geometry.

Rationale and Design Considerations

The drain realignment is required to accommodate the future Victoria Avenue underpass structure and embankment.

Proposed drainage conditions have been reviewed and hydrodynamic modeling has determined that there are no adverse impacts on upstream properties in terms of water surface elevations. Additionally, the report demonstrates that there are no adverse impacts on downstream properties in terms of peak flows during the design events.

Recommendations

We recommend that the drainage realignment to the existing Essex Outlet Drain be constructed. The following provides a brief description of the realignment work on the Essex Outlet Drain (see Appendix B for full details):

- A new crossing culvert under Highway 3 at approximately Station 14+485 (300 m west of Victoria Avenue). To facilitate this crossing, a 4.26 m span, 2.44 m rise and a 97.84 m long concrete box culvert will be installed. The culvert length can be shortened by 27 m after the existing Highway 3 embankment is removed during construction.
- Realignment of the existing open channel drain with a 3.0 m flat bottom within Ministry property and tie into existing drain configuration both north and south of Highway 3.

All of the above works and costs recommended shall be entirely on lands solely under the jurisdiction of the Ministry. Therefore, a detailed summary of the items for construction and costs are not included as part of this letter.

The portions of the Essex Outlet Drain and associated structures within Ministry property limits will be maintained by the Ministry.

Sincerely

A handwritten signature in grey ink, appearing to read 'A. Naylor'.

Amanda Naylor, P.Eng.
Project Engineer
Planning and Design
Ministry of Transportation
Amanda.Naylor@ontario.ca
519-852-2975



Report to Council

Department: Community Services
Division: Parks and Facilities
Date: May 19, 2020
Prepared by: Jackson Tang, Assistant Manager, Business Services
Report Number: Parks and Facilities-2020-02
Subject: Results of Request for Tender – Remove, Supply and Install Four Condensing Boilers
Number of Pages: 4

Recommendation(s)

That Parks and Facilities 2020-02 entitled Results of Request for Tender – Remove, Supply and Install Four Condensing Boilers prepared by Jackson Tang, Assistant Manager, Business Services dated May 19, 2020 be received; and

That Council award the Request for Tender – Remove, Supply and Install Four Condensing Boilers to Lekter Industrial Services Inc. in the amount of \$68,992.27 including non-refundable harmonized sales tax; and

That Council approve the addition of a 3rd domestic hot water boiler at the Essex Centre Sports Complex and the funding for this new capital asset in the amount of \$15,820.00 including the non-refundable tax be purchased by re-allocating \$10,000.00 from project CS-20-0047 (new Mural) and that the remaining \$5,820.00 to be funded through a forecasted under expenditure in the Essex Centre Sports Complex's 2020 operating budget account 'Building and Repairs – Other (52900)'.

Purpose

Council approval is required to award the Request for Tender – Remove, Supply and Install Four Condensing Boilers at Essex Centre Sports Complex to Lekter Industrial Services Inc. and that the additional funds for the project be approved as per the recommendation above.

Background and Discussion

In 2020, Council approved in the Capital Budget for the replacement of four condensing boilers at Essex Centre Sports Complex amounting to \$63,200.00. The original scope of work was to replace 2 of the domestic hot water boilers and 2 of the ice resurfacing boilers as they were beginning to deteriorate from the inside and were at the end of their normal life cycle. During the 2019/20 hockey season, Administration was receiving an increase in complaints from user groups on the water temperature in the showers and washrooms at the complex. To troubleshoot the issue, the Manager of Parks and Facilities had an engineering consultant review the domestic hot water system and they recommended that adding one additional boiler is required so that the current domestic hot water system can accommodate the current needs of hot water usage at the Essex Centre Sports Complex. The consultant reported that at peak time the facility uses approximately 388 gallons of water per minute when the showers (up to 12), hand basins in the washrooms, and canteen are being utilized. The current system can only supply approximately 200 gallons, and therefore to resolve the hot water issue in the domestic hot water system the consultant recommended a third boiler be added to this system.

The Manager of Parks and Facilities worked with the Assistant Manager of Business Services to prepare an amendment to the Request for Tender, and removed the 2 ice resurfacing boilers but kept the replacement of the 2 domestic hot water boilers and added a third domestic hot water boiler. This amendment would allow the facility to address the user group hot water issues, but would defer the replacement of the 2 ice resurfacing boilers to the 2021 capital budget.

A Request for Tender following the guidelines as set out in the Town's Procurement By-Law Number 1043 to replace four condensing boilers with the amendment to only replace 2 domestic hot water boilers and add a third was posted both on the Town's website and Merx, and closed on April 15, 2020 at 3:00:00 PM.

Administration reviewed the Tender submissions for specification compliance and found it to be complete. The results of the submitted tender prices are noted in Table below:

Name of Tenderer	Total Tender price including non-refundable Harmonized Sales Tax (1.76%)
Munger Plumbing and Electrical	\$70,721.17
Haller Mechanical Contractors Inc.	\$117,807.56
Lekter Industrial Services Inc.	\$68,992.27

Based on the pricing provided in the submissions, it is recommended that the lowest tender submitted by Lekter Industrial Services Inc. be accepted.

Financial Impact

As per the 2020 Capital budget, \$63,200.00 (Project Code: CS-20-0116) was approved for the replacement of four condensing boilers. To address the current hot water issue at the Essex Centre Sports Complex and following the engineering consultant's recommendation the tender was amended to replace only 2 domestic hot water boilers and add a new third domestic hot water boiler. The cost to replace the two current domestic hot water boilers is \$53,172.27 including the non-refundable tax which falls within the 2020 capital budget for this project of \$63,200.00 with the funding coming from the asset management plan reserve. The addition of a 3rd domestic hot water boiler is considered a new capital asset, and therefore the asset management lifecycle reserve cannot be used to fund this new boiler. The cost for the installation of a 3rd boiler is \$15, 820.00 including the non-refundable tax and Administration is recommending re-allocating \$10,000.00 from project CS-20-0047 (new Mural) and that the

remaining \$5,820.00 be funded through a forecasted under expenditure in the Essex Centre Sports Complex's 2020 operating budget account 'Building and Repairs – Other (52900)'.

Consultations

Finance Department was consulted in the preparation of this Report.

Link to Strategic Priorities

- ☐ Manage, invest and plan for sustainable municipal infrastructure which meets current and future needs of the municipality and its citizens.
- ☒ Create a safe, friendly and inclusive community which encourages healthy, active living for people of all ages and abilities.
- ☒ Provide a fiscal stewardship and value for tax dollars to ensure long-term financial health to the municipality.
- ☐ Manage responsible and viable growth while preserving and enhancing the unique rural and small town character of the community.
- ☐ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

Report Approval Details

Document Title:	Results of Request for Tender - Remove, Supply and Install Condensing Boilers.docx
Attachments:	
Final Approval Date:	May 13, 2020

This report and all of its attachments were approved and signed as outlined below:

John Olsen, Manager, Parks and Facilities - May 12, 2020 - 8:56 AM

A handwritten signature in black ink, appearing to read 'John Olsen', with a stylized flourish extending to the right.

Doug Sweet, Director, Community Services/Deputy CAO - May 12, 2020 - 9:01 AM

No Signature - Task assigned to Chris Nepszy, Chief Administrative Officer was completed by workflow administrator Robert Auger, Town Solicitor, Legal and Legislative Services/Clerk

Chris Nepszy, Chief Administrative Officer - May 13, 2020 - 8:51 AM



Report to Council

Department: Community Services
Division: Parks and Facilities
Date: May 19, 2020
Prepared by: Jackson Tang, Assistant Manager, Business Services
Report Number: Parks and Facilities-2020-05
Subject: Results of Request for Tender for Colchester Harbour Dock B Replacement
Number of Pages: 3

Recommendation(s)

That Parks and Facilities-2020-05 entitled Results of Request for Tender for Colchester Harbour Dock B Replacement prepared by Jackson Tang, Assistant Manager, Business dated May 19, 2020 be received, and

That Council award the Request for Tender for Colchester Harbour Dock B Replacement to Kropf Industrial Inc. in the amount of \$160,180.42 including non-refundable Harmonized Sales Tax.

Purpose

In accordance with the Town Procurement By-Law Number 1043, Council approval is required for purchases in excess of \$100,000. This report is to seek Council's approval to appoint a qualified supplier to provide all necessary equipment, labour and materials for the replacement of Dock B located at the Colchester Harbour of the Town of Essex.

Background and Discussion

In 2020, Council approved in the Capital Budget for the replacement of Dock B at Colchester Harbour at the amount of \$178,059.00.

A Request for Tender following the guidelines as set out in the Town's Procurement By-Law Number 1043 for Colchester Harbour Dock B Replacement was posted both on the Town's website and Merx, and closed on April 29, 2020 at 3:00:00 PM.

Administration reviewed the Tender submissions for specification compliance and found it to be complete. The results of the submitted tender prices are noted in Table below:

Name of Tenderer	Total Tender price including non-refundable Harmonized Sales Tax (1.76%)
Kehoe Marine Construction Ltd.	\$237,539.28
Kropf Industrial Inc.	\$160,180.42

Based on the pricing provided in the submissions, it is recommended that the lower tender submitted by Kropf Industrial Inc. be accepted.

Financial Impact

As per the 2020 Capital budget, \$178,059.00 (Project Code: CS-20-0007) was approved for the replacement of Colchester Harbour Dock B. This Request for Tender result (\$160,180.42) including the non-refundable Harmonized Sales Tax is within our budgeted funds.

Link to Strategic Priorities

- ☐ Manage, invest and plan for sustainable municipal infrastructure which meets current and future needs of the municipality and its citizens.
- ☒ Create a safe, friendly and inclusive community which encourages healthy, active living for people of all ages and abilities.
- ☐ Provide a fiscal stewardship and value for tax dollars to ensure long-term financial health to the municipality.
- ☐ Manage responsible and viable growth while preserving and enhancing the unique rural and small town character of the community.
- ☐ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

Report Approval Details

Document Title:	Results of Request for Tender Colchester Harbour Dock B Replacement - Parks and Facilities-2020-05.docx
Attachments:	
Final Approval Date:	May 13, 2020

This report and all of its attachments were approved and signed as outlined below:

John Olsen, Manager, Parks and Facilities - May 13, 2020 - 7:31 AM

A handwritten signature in black ink, appearing to read 'John Olsen', with a stylized flourish extending from the end.

Doug Sweet, Director, Community Services/Deputy CAO - May 13, 2020 - 8:33 AM

No Signature - Task assigned to Chris Nepszy, Chief Administrative Officer was completed by workflow administrator Robert Auger, Town Solicitor, Legal and Legislative Services/Clerk

Chris Nepszy, Chief Administrative Officer - May 13, 2020 - 9:26 AM



Report to Council

Department: Infrastructure Services
Division: Operations
Date: May 19, 2020
Prepared by: Jackson Tang, Assistant Manager, Business Services
Report Number: Operations-2020-02
Subject: Results of Request for Tender -Supply and Application of Maintenance Stone 2020
Number of Pages: 3

Recommendation(s)

That Operations-2020-02 entitled Results of Request for Tender -Supply and Application of Maintenance Stone 2020 prepared by Jackson Tang, Assistant Manager, Business Services dated May 19, 2020 be received, and

That Council award the Request for Tender – Supply and Application of Maintenance Stone 2020 to Southwestern Sales Corporation Limited in the amount of \$160,000.00 including non-refundable Harmonized Sales Tax.

Purpose

In accordance with the Town Procurement By-Law Number 1043, Council approval is required for purchases in excess of \$100,000.00. This report is to seek Council's approval to appoint a qualified contractor to provide the Town with Maintenance Stone for 2020.

Background and Discussion

The Town of Essex is required to carry out regular maintenance of the roads to ensure their safe condition. As part of the maintenance program, the Town has to seek a qualified contractor for the supply and application of 100% crushed dolomite stone, and the material shall meet the requirements of the Ontario Provincial Standard Specification(OPSS) 1010, material specifications for Granular "M" material and shall have a minimum bulk relative density of 2.7.

A Request for Tender, following the guidelines as set out in the Town's Procurement By-Law Number 1043 was posted both on the Town's website and Merx, and closed on April 08, 2020 at 3:00:00 pm.

The Tenders were reviewed for arithmetic errors, completeness, legibility, revisions and irregularities. In addition, there were no apparent unbalanced prices in the Schedule of Items and Prices. The results of the submitted tender prices are noted in Table below:

Name of Tenderer	Total Price based on 9,000 tons Maintenance Stone including non-refundable Harmonized Sales Tax (1.76%)
Jeff Shepley Excavating Limited	\$232,165.44
Southwestern Sales Corporation Limited	\$207,437.76

Southwestern Sales Corporation Limited submitted the lowest bid and they are the previous supplier for the same maintenance stone with satisfactory services.

Financial Impact

As per the 2020 Operating Budget, \$160,000.00 (GL Account 1-3-31-315-51700) was approved for the supply and application of maintenance stone. The quantities as set out in the Form of Tender (9,000 tons) are approximate only, and are given as a basis for estimating and comparing tenders. Administration will utilize the unit prices provided by the successful tenderer to supply a quantity of maintenance stone which does not exceed the \$160,000.00 approved budget allotment.

Link to Strategic Priorities

- ☒ Manage, invest and plan for sustainable municipal infrastructure which meets current and future needs of the municipality and its citizens.
- ☐ Create a safe, friendly and inclusive community which encourages healthy, active living for people of all ages and abilities.
- ☐ Provide a fiscal stewardship and value for tax dollars to ensure long-term financial health to the municipality.
- ☐ Manage responsible and viable growth while preserving and enhancing the unique rural and small town character of the community.
- ☐ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

Report Approval Details

Document Title:	Results of Request for Tender -Supply and Application of Maintenance Stone 2020 - Operations-2020-02.docx
Attachments:	
Final Approval Date:	May 12, 2020

This report and all of its attachments were approved and signed as outlined below:

Norm Nussio, Manager Operations and Drainage - May 11, 2020 - 1:17 PM

A handwritten signature in black ink, appearing to read 'Norm Nussio', written over a light blue horizontal line.

Kevin Girard, Director, Infrastructure Services - May 12, 2020 - 3:40 PM

A handwritten signature in black ink, appearing to read 'Chris Nepszy', written over a light blue horizontal line.

Chris Nepszy, Chief Administrative Officer - May 12, 2020 - 3:56 PM



Report to Council

Department: Development Services
Division: Planning
Date: May 19, 2020
Prepared by: Rita Jabbour, Manager, Planning Services
Report Number: Planning2020-09
Subject: Repeal of Subdivision Agreement (Parts 1 and 2 on 12R27717)
Number of Pages: 3

Recommendation(s)

That Planning report Planning2020-09 entitled Repeal of Subdivision Agreement prepared by Rita Jabbour, Manager, Planning Services, dated May 19, 2020 be received, and

That Council approve Bylaw 1915 to release the Subdivision Agreement registered on May 5, 2004 against the lands described as Parts 1 and 2 on 12R-27717, and

That the Town's Solicitor/Clerk be directed to execute all documents necessary to give effect to the actions taken by this Council as described in Bylaw 1915.

Purpose

Council's approval of Bylaw 1915 is required in order to remove the registered subdivision agreement between the Corporation of the Town of Essex and Essex 143 Joint Venture LTD, over the lands described as Parts 1 and 2 on 12R-27717 to facilitate the sale of Parts 1 and 2 to the Ministry of Transportation (MTO).

Background and Discussion

A request was received at the Planning department on May 7, 2020, from the solicitor representing the owners of the vacant lands located at the northeast corner of South Talbot Road.

The location of the subject parcel is indicated below:



In his letter, the solicitor notes that the owners of the subject lands have entered into an agreement to convey a portion of their lands to her Majesty, the Queen in right of the Province of Ontario, as represented by the Minister of Transportation (MTO) for the Province of Ontario. These lands are being conveyed to the MTO in order to facilitate the reconfiguration of South Talbot Road. This is necessary to accommodate heavier traffic volumes when South Talbot Road and South Talbot Road North are connected to form an arterial road connecting Victoria Avenue to Maidstone Avenue to compensate for the elimination of the intersection at Victoria and Highway 3.

As a condition of the sale, the MTO has requested a clean title to Parts 1 and 2. A subdivision agreement dated October 6, 2003 and registered on March 5, 2004 between the Corporation of the Town of Essex and Essex Joint Venture LTD exists over title of the subject property including Parts 1 and 2. The MTO is requesting that the subdivision agreement be removed against Part 1 and 2 on 12R27717 only in order to facilitate the sale of the lands.

The lands to be conveyed are identified as Parts 1 and 2 on the attached reference plan, 12R-27717 (southwest corner of the subject lands).

Financial Impact

There is no financial impact on the municipality.

Consultations

Lori M. Chadwick, RPP, MCIP, Director, Development Services

Link to Strategic Priorities

- ☒ Manage, invest and plan for sustainable municipal infrastructure which meets current and future needs of the municipality and its citizens.
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- ☐ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

Report Approval Details

Document Title:	Repeal of Subdivision Agreement (Parts 1 and 2 on 12R27717).docx
Attachments:	- 12R_27717.jpg - By-Law No 1915- Release of Subdivison Agreement for Parts 1 and 2 on 12R27717.docx
Final Approval Date:	May 12, 2020

This report and all of its attachments were approved and signed as outlined below:



Lori Chadwick, Director, Development Services - May 12, 2020 - 8:50 AM



Chris Nepszy, Chief Administrative Officer - May 12, 2020 - 3:57 PM

Report Approval Details

Document Title:	Repeal of Subdivision Agreement (Parts 1 and 2 on 12R27717).docx
Attachments:	- 12R_27717.jpg - By-Law No 1915- Release of Subdivison Agreement for Parts 1 and 2 on 12R27717.docx
Final Approval Date:	May 13, 2020

This report and all of its attachments were approved and signed as outlined below:

No Signature - Task assigned to Rita Jabbour, Manager, Planning Services was completed by workflow administrator Robert Auger, Town Solicitor, Legal and Legislative Services/Clerk

Rita Jabbour, Manager, Planning Services - May 13, 2020 - 10:14 AM

No Signature - Task assigned to Lori Chadwick, Director, Development Services was completed by workflow administrator Robert Auger, Town Solicitor, Legal and Legislative Services/Clerk

Lori Chadwick, Director, Development Services - May 13, 2020 - 10:15 AM

No Signature - Task assigned to Chris Nepszy, Chief Administrative Officer was completed by workflow administrator Robert Auger, Town Solicitor, Legal and Legislative Services/Clerk

Chris Nepszy, Chief Administrative Officer - May 13, 2020 - 10:15 AM

The Corporation of the Town of Essex

By-Law Number 1915

**Being a By-Law to release the Subdivision
Agreement over Parts 1 and 2 on 12R27717**

Whereas, pursuant to the terms of the Acknowledgement and Direction Agreement between Covey Investments INC and the Minister of Transportation for the Province of Ontario regarding the discharge of the Subdivision Agreement registered against the parcels legally described as Parts 1 and 2 on 12R27717;

And whereas it is desirable that the Town discharge the Subdivision Agreement registered upon Part 1 and 2 on 12R27717;

Now therefore be it resolved that the Council of the Corporation of the Town of Essex enacts as follows:

1. The Corporation of the Town of Essex hereby releases the Subdivision Agreement executed on May 5, 2004, as it applies to the parcels known as Parts 1 and 2 on 12R27717; and
2. That the Mayor and the Clerk are hereby authorized and directed to execute all documents necessary to give effect to the actions taken by this Council as described in this by-law; and
3. This by-law shall come into full force and effect upon the final passing thereof.

Read a first, a second and a third time and finally passed on May 19, 2020.

Mayor

Clerk



Report to Council

Department: Infrastructure Services

Division: Operations

Date: May 19, 2020

Prepared by: Jackson Tang, Assistant Manager, Business Services

Report Number: Operations-2020-03

Subject: Results of Request for Tender – Supply of Winter Control Equipment for a Tandem Plow Truck and Supply of a Tandem Plow Truck Cab and Chassis 2020

Number of Pages: 4

Recommendation(s)

That Operations-2020-03 entitled Results of Request for Tender – Supply of Winter Control Equipment for a Tandem Plow Truck and Supply of a Tandem Plow Truck Cab and Chassis 2020 prepared by Jackson Tang, Assistant Manager, Business Services be received, and

That Council award the Request for Tenders as follows:

- a. Supply of Winter Control Equipment for a Tandem Plow Truck with Stainless Steel Dump Body to Viking-Cives Ltd. in the amount of \$144,888.94 including non-refundable Harmonized Sales Tax.
- b. Supply of Tandem Plow Truck Cab and Chassis 2020 to Team Truck Centres Ltd. in the amount of \$160,148.80 including non-refundable Harmonized Sales taxes. , and

That Council approve the additional funding of \$25,037.74 above the approved 2020 Capital Budget of \$280,000.00 for the Supply of Winter Control Equipment for a Tandem Plow Truck

and Supply of a Tandem Plow Truck Cab and Chassis (project PW-20-0001) from the Town's Asset Management Lifecycle Reserve.

Purpose

In accordance with the Town Procurement By-Law Number 1043, Council approval is required for purchases in excess of \$100,000.00. This report is to seek Council's approval to appoint qualified suppliers to provide the Town with the Winter Control Equipment for Tandem Plow Truck and the Tandem Plow Truck Cab and Chassis.

Background and Discussion

The purchase of one tandem plow truck cab and chassis with winter control equipment was approved in the 2020 Capital Budget as project PW-20--0001.

Two separate Tenders (one for the cab and chassis and one for the winter control equipment), following the guidelines as set out in the Town's Procurement By-Law Number 1043 were posted both on the Town's website and Merx, and closed on April 08, 2020 at 3:00:00 pm.

The Tenders were reviewed for arithmetic errors, completeness, legibility, revisions and irregularities. In addition, there were no apparent unbalanced prices in the Schedule of Items and Prices. The results of the submitted tender prices for two different Tenders are noted in the Tables below:

Supply of Winter Control Equipment for a Tandem Plow Truck with Stainless Steel Dump Body

Name of Proponent	Total Amount including non-refundable Harmonized Sales Tax (1.76%)
Viking-Cives Ltd.	\$144,888.94

Viking-Cives Ltd., submitted the compliant bid which satisfied all of the tender specifications and requirements. They have provided the Town of Essex similar equipment with satisfactory services.

Supply of a Tandem Plow Truck Cab and Chassis 2020

Name of Tenderer	Total Amount including non-refundable Harmonized Sales Tax (1.76%)
Team Truck Centres Ltd.	\$160,148.80
401 TruckSource Inc.	\$183,676.80
Carrier Centers	\$166,130.33

The low bid from Team Truck Centres Ltd. met all the tender specifications. They have also successfully provided the Town of Essex with various equipment over the years.

The overall total amount from the recommended suppliers is (\$144,888.94 + \$160,148.80) \$305,037.74 including non-refundable Harmonized Sales Tax.

Financial Impact

The 2020 Capital Budget had an approved amount of \$280,000.00 (Project PW-20-0001) for the purchase of one tandem plow truck cab and chassis with winter control equipment.

The 2020 Capital Budget for PW-20-0001 was estimated by taking the actual cost of a truck containing the same specifications that was purchased in 2018 (\$251,203) and inflated by an approximate 5.5% per year. The inflationary increase was included to account for any potential material, tariff, and exchange rate increases.

A budget is created at a point in time based on best estimates; due to this and the uncertainty surrounding labor and material costs, tariffs and exchange rates, the tender closed \$25,037.74 higher than the project budget.

Therefore, the 2020 approved budgeted amount for PW-20-0001 is not sufficient to cover the overall total cost of \$305,037.74. Additional funds in the amount of \$25,037.74 are required to be transferred from the Town's Asset Management Lifecycle Reserve to cover this shortage.

Consultations

The finance department was consulted on the financial impacts and recommended solutions.

Link to Strategic Priorities

- ☒ Manage, invest and plan for sustainable municipal infrastructure which meets current and future needs of the municipality and its citizens.
- ☐ Create a safe, friendly and inclusive community which encourages healthy, active living for people of all ages and abilities.
- ☐ Provide a fiscal stewardship and value for tax dollars to ensure long-term financial health to the municipality.
- ☐ Manage responsible and viable growth while preserving and enhancing the unique rural and small town character of the community.
- ☐ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

Report Approval Details

Document Title:	Results of Request for Tender - Supply of Winter Control Equipment and Plow Truck Cab and Chassis 2020 - Operations-2020-03.docx
Attachments:	
Final Approval Date:	May 13, 2020

This report and all of its attachments were approved and signed as outlined below:

Norm Nussio, Manager Operations and Drainage - May 11, 2020 - 11:11 AM

A handwritten signature in black ink, appearing to read "Norm Nussio". The signature is written in a cursive style with a large loop at the end.

Kevin Girard, Director, Infrastructure Services - May 12, 2020 - 3:43 PM

A handwritten signature in black ink, appearing to read "Kevin Girard". The signature is written in a cursive style with a large loop at the end.

Chris Nepszy, Chief Administrative Officer - May 13, 2020 - 2:55 PM



Media Release

May 6, 2020

Community Update on COVID-19 Response

Fun Fest and spring programs cancelled, limit on gatherings continues

In light of the evolving response to the COVID-19 pandemic, the Town of Essex has taken additional measures to protect the community while maintaining essential services for residents.

- During the Regular Meeting on Monday, May 4, Council agreed to approve the Essex Fun Fest Committee's recommendation to cancel the 2020 Essex Fun Fest.
- The Colchester Harbour and boat launch remain closed. However, staff may be working at the harbour to prepare for reopening. Members of the public are asked to avoid the area until further notice.
- All spring recreation programs have been cancelled. Individuals who have already registered for a program will receive a credit on their EssexConnect account.
- Residents are reminded that provincially-mandated social distancing and limitations on group sizes still apply to local cemeteries. Cemetery visitors must limit gatherings to five or less individuals while maintaining two meters of physical distance.

"All of us want to get things back to normal and we, as a Town, understand the many sacrifices that our citizens have made throughout this difficult period," said Mayor Larry Snively. "However, now is not the time to let up and I'm urging all of our residents to stay vigilant."

While the Town has closed all other facilities to non-essential visitors, a number of online services can be found online at www.essex.ca/OnlineServices. Customer service representatives and departmental staff are also available by phone during regular business at 519-776-7336. A summary of changes due to COVID-19 can be found online at www.essex.ca/COVID

For guidance on what individuals can do to reduce their risk of contracting the virus, or what to do if they display symptoms, please visit the [Ontario Ministry of Health's COVID-19 resource page](#). For local updates, please visit [Windsor Essex County Health Unit's Novel Coronavirus page](#).

Media Contact

Alex Denonville

Manager, Communications

adenonville@essex.ca

519-990-7546

Declaration of Emergency Extended While Ontario Gradually Reopens the Economy

New legislation will allow for more virtual or remote transactions during COVID-19

May 12, 2020 2:30 P.M.

TORONTO — The Ontario government is extending the Declaration of Emergency under the *Emergency Management and Civil Protection Act*. This additional time will ensure the province has the necessary tools and health care capacity to contain COVID-19, while gradually reopening businesses, services, and amenities safely.

Passed during a special sitting of the Ontario Legislature today, the Declaration of Emergency has been extended until June 2. The declaration will allow Ontario to continue to enforce current emergency orders, such as restricting retirement and long-term care home employees from working in more than one facility and prohibiting events and gatherings of more than five people. Since the emergency was first declared on March 17, the government has taken over 150 actions to help protect individuals, families, and businesses from the impacts of COVID-19.

A full list of emergency orders can be found on [the e-Laws website](#), under the *Emergency Management and Civil Protection Act*.

"We are making steady progress to flatten the curve and get more people back to work safely, including our legislators, but we still have far to go in defeating COVID-19," said Premier Ford.

"Extending the declaration of emergency will allow us to continue to take action to protect Ontarians, while carefully and cautiously reopening more parts of our economy."

The House also passed the *COVID-19 Response and Reforms to Modernize Ontario Act, 2020*, which will help people conduct business while practising physical distancing by:

- Providing authority to address in-person attendance rules for school board trustees' meetings in regulation. This would provide the flexibility in certain emergency situations to allow trustees to meet virtually during school closures;
- Enabling corporations to call and hold meetings virtually, as applicable, and extending the time period in which annual meetings must be held in specific circumstances;
- Allowing designations of a beneficiary to be provided electronically for Retirement Savings Plans, Retirement Income Funds, Locked-in Retirement Accounts, Life Income Funds and Tax-Free Savings Accounts;
- Allowing electronic filing of business registration documents, and the Ministry of Government and Consumer Services to accept copies of business registration documents and e-signatures;
- Allowing for regulations to set out the parameters for remotely commissioning or notarizing a document;

- Extending, on a one-time basis for 2020, the legislated four-year period during which a Métis Nation of Ontario (MNO) election is mandated to be held to give more time to support remote voting.

The Expenditure Estimates for the 2020-21 fiscal year were also tabled in the Legislature. This includes program spending to support the \$17 billion announced as part of *Ontario's Action Plan 2020: Responding to COVID-19* to ensure the province's health care system, communities, and economy are better positioned to weather challenges posed by the pandemic.

"Today's legislation is just one step further in the fight against COVID-19," said Government House Leader Paul Calandra. "We are all eager to reopen the economy and return to work, while physical distancing remains an important reality. Today's legislation helps to modernize some of our economic and community activity and make many necessary interactions that much easier and safer."

LEARN MORE

- Learn more about [A Framework for Reopening our Province](#).
- See how [your organization can help fight COVID-19](#).
- Information and advice to [help your business navigate the economy during COVID-19](#).
- Visit [Ontario's website](#) to learn more about how the province continues to protect Ontarians from COVID-19.

Ivana Yelich Premier's Office
Ivana.Yelich@ontario.ca

[Available Online](#)
[Disponible en Français](#)



**The Corporation of the Town of Grimsby
Administration**

Office of the Town Clerk

160 Livingston Avenue, P.O. Box 159, Grimsby, ON L3M 4G3

Phone: 905-945-9634 Ext. 2015 | **Fax:** 905-945-5010

Email: skim@grimsby.ca

May 6, 2020

SENT VIA EMAIL

The Honourable Justin Trudeau
Prime Minister of Canada
80 Wellington Street
Ottawa, ON K1A 0A2

The Honourable William Francis Morneau
Minister of Finance
90 Elgin Street
Ottawa, ON K1A 0G5

The Honourable Doug Ford
Premier of Ontario
Legislative Building
Queen's Park
Toronto, ON M7A 1A1

Dear Prime Minister Trudeau, Minister of Finance Morneau and Premier Ford:

Re: Support for Commercial Rent Assistance Program

At its meeting of May 4, 2020, the Town of Grimsby Council passed the following resolution:

Moved by Councillor Ritchie; Seconded by Councillor Vaine;

*Whereas these are unprecedented times that have not been seen in generations;
and,*

*Whereas on April 16, 2020 the Canadian Federal Government announced a new
program called the Canada Emergency Commercial Rent Assistance; and,*

*Whereas this program is to be developed in unison with the Provincial and
Territorial counterparts; and,*



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*Whereas this program is to provide relief to small business (in Grimsby and throughout Canada) with their rent for the months of April, May, and June; and,
Whereas many Provincial programs have been announced to date but have generally aimed at the residential, rather than the commercial, rent markets; and,
Whereas many small businesses in the Town of Grimsby have been affected financially due to COVID-19, thus making rent payments difficult;*

Therefore be it resolved that the Town of Grimsby endorse this program whole heartedly, and request the Federal Government of Canada to work with its Provincial and Territorial Partners to expedite this program and offer this program as soon as possible; and,

Be it further resolved that the Town of Grimsby ask the Federal Government, and Provincial and Territorial Partners look at the possibility of extending this program if the impacts of COVID-19 continue past the month of June; and,

Be it further resolved that the Town of Grimsby ask the Federal Government and its Provincial, and Territorial Partners to make this program 100 percent forgiving to the small businesses effected; and,

Be it further resolved that this motion be distributed to the Right Honourable Prime Minister of Canada, the Honourable Minister of Finance, the Honourable Premier of Ontario, and all municipalities in Ontario

Regards,

Sarah Kim
Town Clerk

SK/dk

Cc: Ontario Municipalities



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May 1, 2020

AMO releases OPP Detachment Boards Discussion Paper

The AMO Board recently approved a [discussion paper](#) on the establishment of new OPP detachment boards. The paper is designed to help municipal officials assess key issues, lead informed conversations, and lay the foundation for successful governance in the future.

The paper recognises the importance of municipal self-determination and cooperation in re-establishing OPP boards. The paper asserts twelve guiding principles to inform that discussion. Of note, AMO recommends the provincial government relinquish its authority to make appointments to OPP detachment boards.

Canadian precedence for fully municipally appointed boards exists in Alberta, Quebec, and Saskatchewan. Municipal employees may be appointed to a board in Manitoba and Alberta.

AMO sees merit in municipally selected board members being composed of local elected officials, community representatives (ie. not holding elected office), and a municipal staff member to support the policy drafting functions of a board.

While the exact composition of each board will vary, AMO believes all municipalities should have the opportunity to select a representative on an OPP detachment board. Municipalities in a detachment (or a portion of a detachment) should be provided every opportunity to develop and propose locally developed board composition ideas to the province.

Regulatory discussions regarding the establishment of new detachment boards are not expected to resume until the public health emergency is over. As local circumstances and priorities permit, the OPP Detachment Board paper is submitted for municipal discussion. This is an opportunity for municipalities to consider what the future of police governance should look like once that conversation restarts.

AMO Contact:

Matthew Wilson, Senior Advisor, mwilson@amo.on.ca, 416-971-9856 extension 323.

*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.

New Ontario Provincial Police Detachment Boards: Building a Framework for Better Policing Governance

Discussion Paper

May 1, 2020

Introduction

Police service boards are the vital link between the police and democratic governance.

This is just as true for municipalities who contract with the Ontario Provincial Police for public safety services.

The government has launched a consultation with municipalities on re-constituting OPP Detachment Boards. With all governments now seized with COVID-19 emergency response, all consultations on new policing regulations have now ceased. The immediate public health crisis is the first priority of the provincial and municipal governments. Consideration of the issues raised in this paper must not distract from that priority. However, policing regulation discussions will resume at some point in the months ahead. It remains valuable for municipalities to consider what the future of police governance should look like once that conversation restarts.

At present, OPP boards are aligned within existing municipal boundaries. In the future, the government is aiming to create regional or detachment-based boundaries for boards (with some exceptions). However, the details of these new boards have not been determined. This is an opportunity for municipalities to provide input to the government on board boundaries, the size and composition of those boards, and whether provincial appointees continue to be made.

The government has not made any decisions on these issues. If any municipal council or a group of councils has suggestions on how these boards should be established, this is an opportunity to put those ideas forward.

This paper is not an exhaustive list of issues presented by the establishment of new OPP detachment boards. Rather it is intended to help guide municipal input to the Ministry and lay the groundwork for a successful transition to new boards. It asserts a number of key principles to inform the discussion and attempts to lay the framework for the future of successful OPP governance at a local or regional level.

Background

Policing is a vital local service. Out of fiscal necessity, the Association of Municipalities of Ontario (AMO) has put forward comprehensive recommendations during the provincial government's lengthy review of policing legislation in recent years. The need to modernize the delivery of this service is well-documented in the many submissions AMO has made to the government on behalf of our municipal members. Here are three examples:

In 2014, AMO's OPP Billing Steering Committee put forward a [report](#) which researched options to equitably allocate policing costs for municipalities which use the Ontario Provincial Police. The Committee conducted a review of the government's proposed billing model and examined other model options so implications could be understood. It also underscored the need for efficiency and effectiveness improvements for policing in general.

In 2015, AMO's Policing Modernization Task Force issued its [report](#) which included 34 recommendations on how to modernize policing for the future. The task force interviewed experts, reviewed the best academic research available, sent representatives to the 2015 Summit on the Economics of Policing and Community Safety in Ottawa, and had thorough and lengthy discussions

on specific issues about the future of policing. These recommendations were divided into four key themes: Partnership, Productivity, Performance, and Personnel.

In 2016, AMO issued a *Municipal Guide to Police Services Act Consultations*. The [guide](#) highlighted municipal issues associated with community safety and well-being planning; modernizing what police do; the education and training of officers; and accountability to the public and governance.

In particular, the Policing Modernization Report prioritized three key recommendations above all else:

1. Make changes to the interest arbitration system.
2. Improve the quality of the existing governance and civilian oversight system.
3. Make legislative changes to permit the greater transfer of specific functions to civilians or other security providers where appropriate.

In 2019, the Ontario Legislature passed Bill 68 the *Comprehensive Ontario Police Services Act, 2019*. While the Act did not address interest arbitration, it did make some significant changes to the second two priorities – improving governance and providing some allowance for the role that civilians play in delivering public safety and security.

With the legislation passed, the focus of this paper is on the regulations needed to support priority recommendation #2 as it pertains to OPP detachment boards.

Guiding Principles

Key principles and objectives which guide AMO on the issue of establishing new OPP local governance boards include the following:

1. Policing governance is a valuable means of ensuring community expectations are reflected in how a community is policed.
2. Good governance of policing matters to municipalities of all sizes, contract or not.
3. Municipalities should be provided every opportunity to develop and propose locally developed board composition ideas to the province.
4. Successful governance includes provincial support and funding for training new board members in alignment with the municipal electoral cycle.
5. All municipalities should have the opportunity to select a representative on an OPP detachment board.
6. Community or municipal staff representatives (i.e. municipally selected, non-elected officials) should serve on OPP detachment boards wherever possible.
7. To achieve municipal representation, detachment-based boards (or portions of a detachment) will need to be larger than they have been in the past.
8. If municipalities are to be adequately represented on consolidated OPP detachment boards, the province should relinquish responsibility for provincial appointments to OPP detachment boards.
9. Detachment boundaries should change in cases where it would support good governance and municipal representation.

10. Explore the potential use of DSSABs as OPP detachment boards in the north through discussions with FONOM, NOMA, DSSABs, and northern municipalities on a case by case basis. This could be a potential opportunity to align social services with policing in ways that have been provincially mandated through municipal community safety and well-being planning and which minimize administrative duplication. (See below for specific considerations and exemptions.)
11. OPP detachment board operation costs should, 1) be provincially supported through training and grants and 2) equitably distributed between municipalities.
12. Memoranda of Understanding with the Ministry of the Attorney General or transfer agreements between municipalities which govern *Provincial Offences Act* administration and fine revenue distribution may need to be updated depending on local circumstance.

Government Consultations to date - Regional Roundtables – OPP Detachment Boards

The government recently held seven discussion meetings across the province in February 2020 focusing on OPP detachment boards and the new policing legislation. The province did not lead discussions that provided specific details on how boards would be reconstituted. No plans have been announced.

Key municipal considerations included:

Structure of Boards and Local Say

- There shall be one OPP detachment board per detachment (with flexibility for unique circumstances/geography). A board's composition, terms of office, and remuneration will be provided for in regulations and has yet to be determined.
- In effect, these changes extend police governance to about 200 municipalities (which do not have a board, i.e. Section 5.1) but will consolidate multiple existing boards within a detachment.

Activity of Boards

- Boards shall determine local objectives, priorities, and policies in consultation with the Detachment Commander, consistent with the Solicitor General's strategic plan for the OPP.
- The Commissioner of the OPP shall consult with a Board regarding the selection of the Detachment Commander.
- The Detachment Commander shall prepare and adopt a local action plan in consultation with the board.
- Training for board members will become mandatory (Ministry support and funding is needed).

Financial Considerations

- There will be no distinction between contract and non-contract in the future. Effectively all policing will become contract.
- The focus of the billing-related regulations will be to address transition matters and to account for service differences between municipalities as well as existing contracts expiring at the end of 2020.

- It should be noted, billing model changes will not lower the overall cost of policing for the municipal sector.

AMO has impressed upon the Ministry of the need for:

- Open and transparent discussions;
- A recognition that policing is fundamentally local (i.e. it is important to maintain the close proximity of a community to its board and the police);
- Locally workable governance arrangements; and
- The representation of every municipal council.

Considerations for municipalities without existing detachment boards

Boards are an opportunity to expand the democratic oversight and governance of policing. In the words of Sir Robert Peel, the father of modern policing, “the police are the public and the public are the police.”

A detachment board helps to align policing objectives, priorities, and policies with community expectations. If your municipality is unaccustomed to having a board, the establishment of a board is an opportunity for a municipality of any size to have a greater say and establish a relationship with your Detachment Commander and the officers who police your community. It is also an opportunity to align municipal public safety expectations with those of neighbouring communities and clearly express those views in a coordinated manner with the Detachment Commander.

There is also the simple fact that policing is all the better for it. Good governance includes police officers who know their work matters to people who care. Good governance includes Chiefs and Detachment Commanders who are supported. Boards legitimize the work of the police. Municipal elected officials ask the public to pay for all of it and therefore municipalities need a say in policing on behalf of the community, through a board. It should not be viewed as an imposition but rather a democratic opportunity.

Financially and administratively, transfer agreements between municipalities regarding *Provincial Offences Act* fine revenue may need to be updated. This might include the need to review the Memoranda of Understanding with the Ministry of the Attorney General depending on local circumstance.

For communities with existing OPP boards

The legislation aims to consolidate existing municipal board boundaries with OPP detachment board boundaries (thus potentially including multiple neighbouring municipalities in the same detachment). However, the legislation provides for flexibility to address unique geographic circumstances. If you feel your area’s needs are unique, help the Ministry understand that uniqueness in a province-wide context.

In addition, attendees to roundtable meetings were told the Ministry is open to considering board composition suggestions from municipalities within regions or detachments. This is an opportunity to potentially shape the composition of a board in your area and develop a local solution.

While legislation dictates the size and composition of municipal police service boards (non-OPP), no such restriction exists for OPP detachment boards at present. Also undetermined at this point is

which bodies (provincial or municipal or both) will appoint board members. Municipal police service boards (non-OPP) have municipally and provincially appointed representatives. Future OPP detachment boards could be composed entirely of municipal appointees. Please see below for more information regarding provincial appointees.

Provincial Appointees

AMO values the importance of all police service/OPP detachment board members regardless of which authority has made the appointment. AMO's commentary on provincial appointees is not intended to detract from the contributions these individuals have made to good governance.

However, one of the issues which has historically plagued policing governance are delays associated with the provincial government making its appointments in a timely way.

Unfilled provincial appointees make good governance more difficult. AMO sought legislative change to improve the provincial appointment process for all boards (OPP and municipal) but that change did not occur in legislation. The need remains and it can still be addressed in regulations for OPP policed municipalities.

Unfilled or delayed provincial appointments are an impediment to diversity, representativeness and good governance practice. According to the Ontario Association of Police Service Boards, in March 2017 over 90 of 250 provincial board positions were unfilled and vacant. Challenges with timely provincial appointments are a long-standing historical issue which is not confined to 2017.

To be clear, the province already has a significant role to play with the OPP. The provincial government hires the Commissioner and negotiates the collective agreement with the Ontario Provincial Police Association. Municipalities pay the contracts for the services of the OPP to deliver local public safety. Communities need local representatives who can be diligently selected and, on the job, without the delays and extended vacancies associated with the provincial OPP detachment board appointment process. Diligent selection of appointees is now enshrined in law. Now is the time to let municipalities meet those legal expectations without the red tape of appointments from Queen's Park.

Given the above issues, and if municipalities are to be adequately represented on consolidated boards, it is the time to dispense with provincial appointees to OPP detachment boards. There is plenty of Canadian precedence for fully municipally appointed police service boards:

In **Alberta**, police boards (called policed commissions or committees) are composed entirely of municipal council appointees which include municipal staff and community representatives.

Similarly in **Quebec**, Surete du Quebec (SQ) policed municipalities have public security committees composed of 4-7 members of a municipal council.

In **Saskatchewan**, police commissions are composed of all municipally appointed representatives, including the mayor, councillors, and community representatives (members at large).

Manitoba permits the appointment of municipal employees to boards.

Therefore, while some municipalities might like to keep existing boards as they are, there is also an opportunity for fully municipally appointed boards, subject to provincial regulation. This would be a step in the right direction.

Other Appointees

There is precedence in Canada for municipal staff members to be appointed to police service boards (i.e. Manitoba and Alberta). Municipal staff representation on OPP detachment boards in Ontario could help to better support, for example, the policy drafting functions of a board.

Community representatives (as selected by a municipal council, but not elected officials) have also played an important role in reflecting community expectations and policing governance. That should continue in the future provided all municipalities are represented.

Northern District Social Services Administration Boards (DSSAB)

Existing board structures between multiple municipalities currently exist in Northern Ontario through District Social Services Administration Boards. These existing structures and board representation frameworks could be used to function as an OPP detachment board. Thus, a DSSAB could fulfill a dual role – existing social service responsibilities and a new mandate of policing.

Individual municipal governments would continue to be billed separately for OPP services. Therefore, existing rules regarding DSSAB apportionment of costs would NOT apply.

Given the provincial desire for a greater alignment of community safety and well-being objectives with policing, DSSABs could be an effective vehicle for such alignment. This is especially the case when considering the new municipal mandate of required community safety and well-being plan development.

Of course, there would need to be some specific carve outs for a DSSAB functioning as an OPP detachment board. First, northern cities with their own police services would need to be excluded from OPP detachment board composition. Second, representation from unincorporated areas on boards would need to be restricted given that municipal property taxes are not paid in these areas. Third, the expense of an OPP detachment board would need to be divided only among those using the OPP.

The appropriateness of DSSABs fulfilling this added function is best assessed on a case by case basis. Some DSSABs have multiple OPP detachments within them. What works in one catchment area (or district) might not work in another.

This idea is subject to the review, consideration, and input of FONOM, NOMA, DSSABs, and northern municipalities. AMO emphasizes municipal self-determination and cooperation in re-establishing OPP Boards. The idea is best assessed at a local level.

OPP Advisory Council

The establishment of this Council is to provide advice to the Solicitor General with respect to the use of the Solicitor General's powers related to the OPP. More generally, this change will enhance civilian governance of the OPP.

The AMO Board has recently adopted a position regarding the Council's composition. With over 300 municipalities using the services of the OPP, AMO seeks the authority to recommend municipal appointees to the Council. AMO's position is that half of Council's composition should be designated municipal appointees.

In addition, given the purpose of the Council, no member should be a former or current member of an Ontario police service or police association. This emphasizes the distinction between employee and employer and the civilian role in the function of advising the Solicitor General.

Conclusion and Next Steps

This paper aimed to summarise some key issues and assert principles to guide the new OPP detachment board framework. AMO encourages municipalities to share their thoughts, questions and board proposals. Together, and with provincial leadership, we can build a successful local governance framework for policing in over 300 municipalities.

The twelve principles are designed to establish a framework for successful governance which emphasizes municipal self-determination and cooperation in re-establishing OPP boards. While the government's regulatory development is on hold, this is an opportunity to discuss with neighbouring municipalities, locally workable options regarding board representation to present to the Ministry.

For additional questions, please contact:

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Key municipal considerations included:

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- The representation of every municipal council.

Considerations for municipalities without existing detachment boards

Boards are an opportunity to expand the democratic oversight and governance of policing. In the words of Sir Robert Peel, the father of modern policing, “the police are the public and the public are the police.”

A detachment board helps to align policing objectives, priorities, and policies with community expectations. If your municipality is unaccustomed to having a board, the establishment of a board is an opportunity for a municipality of any size to have a greater say and establish a relationship with your Detachment Commander and the officers who police your community. It is also an opportunity to align municipal public safety expectations with those of neighbouring communities and clearly express those views in a coordinated manner with the Detachment Commander.

There is also the simple fact that policing is all the better for it. Good governance includes police officers who know their work matters to people who care. Good governance includes Chiefs and Detachment Commanders who are supported. Boards legitimize the work of the police. Municipal elected officials ask the public to pay for all of it and therefore municipalities need a say in policing on behalf of the community, through a board. It should not be viewed as an imposition but rather a democratic opportunity.

Financially and administratively, transfer agreements between municipalities regarding *Provincial Offences Act* fine revenue may need to be updated. This might include the need to review the Memoranda of Understanding with the Ministry of the Attorney General depending on local circumstance.

For communities with existing OPP boards

The legislation aims to consolidate existing municipal board boundaries with OPP detachment board boundaries (thus potentially including multiple neighbouring municipalities in the same detachment). However, the legislation provides for flexibility to address unique geographic circumstances. If you feel your area’s needs are unique, help the Ministry understand that uniqueness in a province-wide context.

In addition, attendees to roundtable meetings were told the Ministry is open to considering board composition suggestions from municipalities within regions or detachments. This is an opportunity to potentially shape the composition of a board in your area and develop a local solution.

While legislation dictates the size and composition of municipal police service boards (non-OPP), no such restriction exists for OPP detachment boards at present. Also undetermined at this point is

which bodies (provincial or municipal or both) will appoint board members. Municipal police service boards (non-OPP) have municipally and provincially appointed representatives. Future OPP detachment boards could be composed entirely of municipal appointees. Please see below for more information regarding provincial appointees.

Provincial Appointees

AMO values the importance of all police service/OPP detachment board members regardless of which authority has made the appointment. AMO's commentary on provincial appointees is not intended to detract from the contributions these individuals have made to good governance.

However, one of the issues which has historically plagued policing governance are delays associated with the provincial government making its appointments in a timely way.

Unfilled provincial appointees make good governance more difficult. AMO sought legislative change to improve the provincial appointment process for all boards (OPP and municipal) but that change did not occur in legislation. The need remains and it can still be addressed in regulations for OPP policed municipalities.

Unfilled or delayed provincial appointments are an impediment to diversity, representativeness and good governance practice. According to the Ontario Association of Police Service Boards, in March 2017 over 90 of 250 provincial board positions were unfilled and vacant. Challenges with timely provincial appointments are a long-standing historical issue which is not confined to 2017.

To be clear, the province already has a significant role to play with the OPP. The provincial government hires the Commissioner and negotiates the collective agreement with the Ontario Provincial Police Association. Municipalities pay the contracts for the services of the OPP to deliver local public safety. Communities need local representatives who can be diligently selected and, on the job, without the delays and extended vacancies associated with the provincial OPP detachment board appointment process. Diligent selection of appointees is now enshrined in law. Now is the time to let municipalities meet those legal expectations without the red tape of appointments from Queen's Park.

Given the above issues, and if municipalities are to be adequately represented on consolidated boards, it is the time to dispense with provincial appointees to OPP detachment boards. There is plenty of Canadian precedence for fully municipally appointed police service boards:

In **Alberta**, police boards (called policed commissions or committees) are composed entirely of municipal council appointees which include municipal staff and community representatives.

Similarly in **Quebec**, Surete du Quebec (SQ) policed municipalities have public security committees composed of 4-7 members of a municipal council.

In **Saskatchewan**, police commissions are composed of all municipally appointed representatives, including the mayor, councillors, and community representatives (members at large).

Manitoba permits the appointment of municipal employees to boards.

Therefore, while some municipalities might like to keep existing boards as they are, there is also an opportunity for fully municipally appointed boards, subject to provincial regulation. This would be a step in the right direction.

Other Appointees

There is precedence in Canada for municipal staff members to be appointed to police service boards (i.e. Manitoba and Alberta). Municipal staff representation on OPP detachment boards in Ontario could help to better support, for example, the policy drafting functions of a board.

Community representatives (as selected by a municipal council, but not elected officials) have also played an important role in reflecting community expectations and policing governance. That should continue in the future provided all municipalities are represented.

Northern District Social Services Administration Boards (DSSAB)

Existing board structures between multiple municipalities currently exist in Northern Ontario through District Social Services Administration Boards. These existing structures and board representation frameworks could be used to function as an OPP detachment board. Thus, a DSSAB could fulfill a dual role – existing social service responsibilities and a new mandate of policing.

Individual municipal governments would continue to be billed separately for OPP services. Therefore, existing rules regarding DSSAB apportionment of costs would NOT apply.

Given the provincial desire for a greater alignment of community safety and well-being objectives with policing, DSSABs could be an effective vehicle for such alignment. This is especially the case when considering the new municipal mandate of required community safety and well-being plan development.

Of course, there would need to be some specific carve outs for a DSSAB functioning as an OPP detachment board. First, northern cities with their own police services would need to be excluded from OPP detachment board composition. Second, representation from unincorporated areas on boards would need to be restricted given that municipal property taxes are not paid in these areas. Third, the expense of an OPP detachment board would need to be divided only among those using the OPP.

The appropriateness of DSSABs fulfilling this added function is best assessed on a case by case basis. Some DSSABs have multiple OPP detachments within them. What works in one catchment area (or district) might not work in another.

This idea is subject to the review, consideration, and input of FONOM, NOMA, DSSABs, and northern municipalities. AMO emphasizes municipal self-determination and cooperation in re-establishing OPP Boards. The idea is best assessed at a local level.

OPP Advisory Council

The establishment of this Council is to provide advice to the Solicitor General with respect to the use of the Solicitor General's powers related to the OPP. More generally, this change will enhance civilian governance of the OPP.

The AMO Board has recently adopted a position regarding the Council's composition. With over 300 municipalities using the services of the OPP, AMO seeks the authority to recommend municipal appointees to the Council. AMO's position is that half of Council's composition should be designated municipal appointees.

In addition, given the purpose of the Council, no member should be a former or current member of an Ontario police service or police association. This emphasizes the distinction between employee and employer and the civilian role in the function of advising the Solicitor General.

Conclusion and Next Steps

This paper aimed to summarise some key issues and assert principles to guide the new OPP detachment board framework. AMO encourages municipalities to share their thoughts, questions and board proposals. Together, and with provincial leadership, we can build a successful local governance framework for policing in over 300 municipalities.

The twelve principles are designed to establish a framework for successful governance which emphasizes municipal self-determination and cooperation in re-establishing OPP boards. While the government's regulatory development is on hold, this is an opportunity to discuss with neighbouring municipalities, locally workable options regarding board representation to present to the Ministry.

For additional questions, please contact:
Matthew Wilson, Senior Advisor, mwilson@amo.on.ca or 416-971-9856 extension 323.



Essex-Windsor Solid Waste Authority Landfill Liaison Committee Meeting Meeting Notice & Agenda

Meeting Date: Wednesday, May 20, 2020 (Meeting date subject to change)
Time: 4:30 PM
Location: Meeting to take place via teleconference (no video)
Landfill Liaison Committee Members and Staff will receive e-mail notification which will include telephone dialing instructions

Residents wishing to be able to listen in to the meeting are required to send an e-mail request to the Authority's Waste Disposal Manager Tom Marentette at tommarentette@ewswa.org by noon of the meeting date. Telephone dialing instructions will be provided. Residents will be able to listen to the meeting but will not be allowed to participate in the discussions.

List of Business

Page Numbers

1. Call to Order
2. Roll Call of Landfill Liaison Committee Members Present
Marc Bondy
Richard Colenutt
Joel Gagnon
Louise Masse
Richard Meloche
Susan Morand
Cara Salustro
Kim Verbeek
3. Amendment to Order and Proceedings Policy EW-001 re: Electronic Meetings during a Declaration of Emergency
4. Introductions
5. Elections of a Chair and Vice Chair for 2020
 - Term: January 1, 2020 to December 31, 2020

6. Declaration of Pecuniary Interest**7. Delegations****8. Approval of the Minutes**

- A) November 13, 2019 Meeting Minutes 1-6

9. Reports

- A) 2019 Annual Waste Diversion Report (EWSWA) 7-34
- B) Precipitation Event Monitoring Memo – Q4 2019 (WSP) 35-38
- C) Regional Landfill Composting Report 2019 (EWSWA) 39-53
- D) Regional Landfill – Fall 2019 Compliance Monitoring and Leachate Management Program Monitoring Tasks 54-59
- E) Regional Landfill Quarterly Operations Report – Q3 2019 60-83
- F) Regional Landfill Quarterly Operations Report – Q4 2019 84-104
- G) Regional Landfill – December 12, 2019 Waste Disposal Site Inspection Report 105-112
- H) Extension of Operating Hours re: ECA Condition 4.7 and Condition 4.8 113-117

10. Other Items

- A) Covid-19 (Verbal Report)
- B) Bird wires (Verbal Report)
- C) **2020 Meeting Schedule:**
July 15, 2020
September 16, 2020
November 18, 2020

11. Next Meeting

The next Committee Meeting is scheduled for July 15, 2020.

12. Adjournment



Essex-Windsor Solid Waste Authority

Landfill Liaison Committee

MINUTES

Meeting Date: Wednesday, November 13, 2019
Time: 4:30 PM
Location: Essex County Civic and Education Centre
360 Fairview Avenue West Essex – Meeting Room D

Attendance:

Committee Members:	Kim Verbeek - Chair	Town of Essex Representative
	Jack Albert	Resident Representative 2017-2019
	Susan Morand	Resident Representative 2019-2021
	Louise Masse	Resident Representative 2019-2021
EWSWA Staff:	Tom Marentette	Manager of Waste Disposal
	Teresa Policella	Executive Secretary
Absent:	Richard Meloche	Town of Essex Representative
	Marc Bondy	EWSWA Board Representative
	Joel Gagnon – Vice Chair	Resident Representative 2018-2020
	Cara Salustro	Ministry of the Environment Representative
	Dan VanHorn	Waste Disposal Supervisor

1. Call to Order.

The Chair called the meeting to order at 4:32 p.m.

2. Declaration of Pecuniary Interest

The Chair called for any declarations of pecuniary interest and none were noted. She further expressed that should a conflict of a pecuniary nature or other arise at any time during the course of the meeting that it would be noted at that time.

3. Election of Members to the Landfill Liaison Committee

A. One (1) Position (Full Term January 1, 2020 – December 31, 2022 – 3 years)

The Manager of Waste Disposal stated that Mr. Albert's term will end December 31, 2019.

One three-year position is available for the term January 1, 2020 to December 31, 2022.

Two applications were submitted for the vacancy. The applicants were Mr. James Levy and Mr. Richard Colenutt.

The Committee reviewed the applications and discussions took place.

Ballots were distributed to committee members for a vote. Four votes were received for Mr. Richard Colenutt.

Moved by Louise Masse

Seconded by Susan Morand

THAT Richard Colenutt be appointed to the Landfill Liaison Committee for the 3-year term commencing January 1, 2020 to December 31, 2022.

**-Carried Unanimously
24-2019**

4. Delegations

There were no delegations present.

5. Approval of the August 7, 2019 Regular Meeting Minutes

Moved by Susan Morand

Seconded by Jack Albert

THAT the Minutes from the Essex-Windsor Solid Waste Authority Landfill Liaison Committee Meeting dated August 7, 2019 be approved and adopted.

**-Carried Unanimously
25-2019**

6. Reports

A. WSP Report Q3 2019 – Precipitation Event Monitoring Memo dated October 1, 2019

The Manager of Waste Disposal referred to pages 11 through 14 of the agenda package. The report is a summary of surface monitoring data that was prepared by WSP for the 3rd quarter of 2019.

The Manager of Waste Disposal stated that a sampling event was completed for the 3rd quarter of 2019.

The Manager of Waste Disposal stated the memo refers to surface water samples collected from monitoring stations around the site. The analytical results and historical ranges are also provided in the memo. The memo refers to the Provincial Water Quality Objectives being exceeded, but the concentrations were generally similar to the results of previous sampling events. The concentrations were within historical ranges with some minor exceptions for select parameters at some of the monitoring stations. These concentrations are likely naturally occurring and/or are attributed to sediment loading from the surrounding agricultural lands within the drainage ditches.

The Manager also stated that surface runoff from the Landfill property directly to the White Drain is limited to the perimeter berm adjacent to the Drain. There is no discharge to the drain from within the Landfill.

The Waste Disposal Manager noted that the site map included in the report indicates where the surface water monitoring stations are located. A list of historical ranges are provided in the agenda package.

The Waste Disposal Manager asked if there were any questions. None were noted.

Moved by Jack Albert

Seconded by Susan Morand

THAT the WSP Report Q3 2019 – Precipitation Event Monitoring Memo dated October 1, 2019 be received as information.

**-Carried Unanimously
26-2019**

B. Essex-Windsor Regional Landfill Quarterly Operations Report – Q2 2019

The Manager of Waste Disposal referred to page 18 of the agenda package. He noted that there were no incidents of non-compliance during the second quarter of 2019.

Ms. Masse noted that there was an error in Table 1B on page 18 of the agenda package. The table should compare 2018 and 2019 instead of 2017 and 2018.

The Manager of Waste Disposal referred to page 21 and 22 of the agenda package. He noted that contaminated soil is still a large contributor of the total waste stream.

Ms. Masse asked if fees are charged for bringing in contaminated soil. The Manager of Waste Disposal replied yes.

Ms. Masse asked what the soil was contaminated with? The Manager of Waste Disposal stated that the soil could be impacted by low levels of metals such as arsenic and lead or petroleum hydrocarbons. He stated that a significant portion of the petroleum hydrocarbons dissipate during the landfill process. These parameters or considered non-hazardous materials. All soils for disposal require testing prior to being accepted at the landfill.

Ms. Masse asked if the contaminated soil can be used as cover. The Manager of Waste Disposal stated that the material is used as interim or daily cover only. He noted the native, clean blue/gray clay is also used as interim and final cover material.

Ms. Masse asked if the workers wear masks. The Manager of Waste Disposal stated that masks are available for staff if requested.

The Manager referred to Table 6 on page 22 of the agenda package. The approval issued by the Ministry mandates a minimum compaction rate of 600 kg/m³. The Authority is exceeding the minimum compaction at an approximate rate of 800 kg/m³.

The Manager of Waste Disposal stated that the Authority did not receive any complaints in the second quarter of 2019.

The Manager stated that disposal operations were conducted in Cell 4 North in this quarter.

The Manager stated that composting volumes have increased.

He also noted that the leachate system is functioning as designed.

The Manager of Waste Disposal asked if there were any questions. None were noted.

Moved by Jack Albert

Seconded by Susan Morand

THAT the Essex-Windsor Regional Landfill Quarterly Operations Report Q2-2019 be received as information.

**-Carried Unanimously
27-2019**

7. Other Items

A. Regional Landfill Tour – Verbal Report

The Manager of Waste Disposal stated a tour of the Regional Landfill was held on September 19, 2019. He stated that a tour was not conducted last year due to on-site cell construction. The tour was conducted during regular operating hours and 27 people attended the tour.

The bus tour was conducted around the perimeter of the site and paused at various points of interest and to answer questions from the attendees. The tour highlighted landfill gas collection and flare, the composting operation, the new construction of Cell 3 South, the litter control fences, monitoring wells, cover materials, odour control and the process of collecting and treating leachate. There were opportunities to smell different areas of the landfill. He stated the overall feedback was positive from everyone in

attendance. It was also noted that an anniversary celebration was held at the recycling centre in Windsor.

Moved by Jack Albert

Seconded by Susan Morand

That the Regional Landfill Tour – Verbal Report be received as information.

**-Carried Unanimously
28-2019**

B. Current Landfill Operations Update & Information – Verbal Report

The Manager of Waste Disposal stated that Cell 3 South is currently being landfilled. The Cell is split into 4 zones. Zones 1 and 2 are currently being landfilled and are filling up quickly. He explained that there is a lot of capacity still left for the next 2-3 years.

Ms. Masse asked if top cover is being done for Cell 2. The Manager of Waste Disposal stated that a portion of Cell 2 has been “top covered” and the balance will be completed landfilling progresses.

Ms. Verbeek asked if Cell 3 North is full. The Manager of Waste Disposal replied no.

Moved by Jack Albert

Seconded by Susan Morand

That the Current Landfill Operations Update & Information – Verbal Report be received as information.

**-Carried Unanimously
29-2019**

C. 2020 Meeting Schedule

The 2020 schedule will be distributed with the May 20, 2020 agenda.

Moved by Louise Masse

Seconded by Jack Albert

**-Carried Unanimously
30-2019**

8. Next Meeting

The next meeting is scheduled for May 20, 2020.

9. Adjournment

The Manager of Waste Disposal thanked Mr. Albert for being a member of the LLC Committee.

Moved by Louise Masse

Seconded by Jack Albert

THAT the Committee stand adjourned at 5:07 PM.

**-Carried Unanimously
31-2019**

All of which is respectfully submitted.

**Kim Verbeek
Chair**

**Tom Marentette
Manager of Waste Disposal**



Essex-Windsor Residential Waste Diversion 2019

Report Date: March 31, 2020

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This document is formatted for accessibility and available in other formats upon request.

Essex-Windsor Residential Waste Diversion

Annual Report for January – December 2019

1 Introduction

The Annual Waste Diversion Report provides information on the waste diversion activities carried out by the Essex-Windsor Solid Waste Authority during 2019 in compliance with Condition 5.2 of the Environmental Assessment Approval for the Essex-Windsor Regional Landfill.

1.1 Residential Waste Diversion Rate 2019

This report also provides the Authority with the ability to track any changes in the percentage of waste diverted through its waste diversion initiatives from year to year.

In 2019, the seven County of Essex municipalities and the City of Windsor delivered 102,452 tonnes of residential waste to the Regional Landfill. During the same time period, 56,047 tonnes of residential waste were diverted from the landfill via the blue and red box recycling program, municipal hazardous or special waste program, composting, and other waste diversion programs. These waste diversion initiatives resulted in a 2019 residential diversion rate of 34.4%. The 2018 diversion rate was 36.3%.

2019 Residential Diversion Rate is calculated as follows:

$$\frac{56,047 \text{ Tonnes Diverted (see Table 18, Page 23)}}{102,452 \text{ Tonnes of Residential Refuse Collected Curbside} + 4,513 \text{ Residuals} + 56,047 \text{ Diverted Tonnes}} = \frac{56,047}{163,012} \times 100 = 34.4\%$$

2018 Residential Diversion Rate is calculated as follows:

$$\frac{58,750 \text{ Tonnes Diverted (see Table 18, Page 23)}}{100,565 \text{ Tonnes of Residential Refuse Collected Curbside} + 2,440 \text{ Residuals} + 58,750 \text{ Diverted Tonnes}} = \frac{58,750}{161,755} \times 100 = 36.3\%$$

2 Programs

2.1 Residential Recycling Blue Box Program

The tonnes of residential recyclable materials collected curbside during 2019 totaled 25,426 tonnes. The overall tonnes of recyclables collected in 2019 were slightly lower compared to the 26,011 tonnes collected in 2018.

A monthly summary and comparison of the tonnes collected curbside from the City and the County in 2018 and 2019 is shown in Table 1. Collection of recyclables in the County was carried out under contract in 2019 by Windsor Disposal Services Ltd. Collection of recyclables in Windsor was carried out by Green For Life Environmental Inc.

All materials were processed at the Authority owned Essex-Windsor Material Recovery Facility (MRF), located at E.C. Row and Central Avenue in Windsor where Windsor Disposal Services via contract process delivered materials.

In addition to the residential recyclables collected curbside, 495 tonnes of recyclables were delivered to the Authority's Public Drop Off Depots in 2019. This is down 33% from 2018 where 735 tonnes were delivered.

**Table 1: Residential Recycling Blue Box Collection Tonnes by Month
Comparison: 2018 with 2019**

Month	2019 County of Essex Tonnes	2019 City of Windsor Tonnes	2019 Combined Tonnes	2018 Comparable Tonnes
January	1,099.61	1,075.24	2,174.85	2,343.65
February	972.63	917.59	1,890.22	1,955.57
March	945.63	932.95	1,878.58	2,090.20
April	1,063.56	1,119.42	2,182.98	2,038.99
May	1,287.05	1,283.19	2,570.24	2,521.74
June	1,007.06	1,031.30	2,038.36	2,146.27
July	1,086.20	1,110.90	2,197.10	1,980.10
August	1,025.06	1,053.24	2,078.30	2,210.14
September	998.25	1,030.87	2,029.12	2,039.40
October	1,127.57	1,097.80	2,225.37	2,231.67
November	1,040.92	1,032.53	2,073.45	2,296.10
December	1,075.17	1,012.20	2,087.37	2,156.72
Column Totals:	12,728.71	12,697.23	25,425.94	26,010.55

Notes: The County of Essex includes the Town of Amherstburg, the Town of Essex, the Town of Kingsville, the Town of Lakeshore, the Town of LaSalle, the Municipality of Leamington and the Town of Tecumseh.

2.2 Recycling Residual Disposal

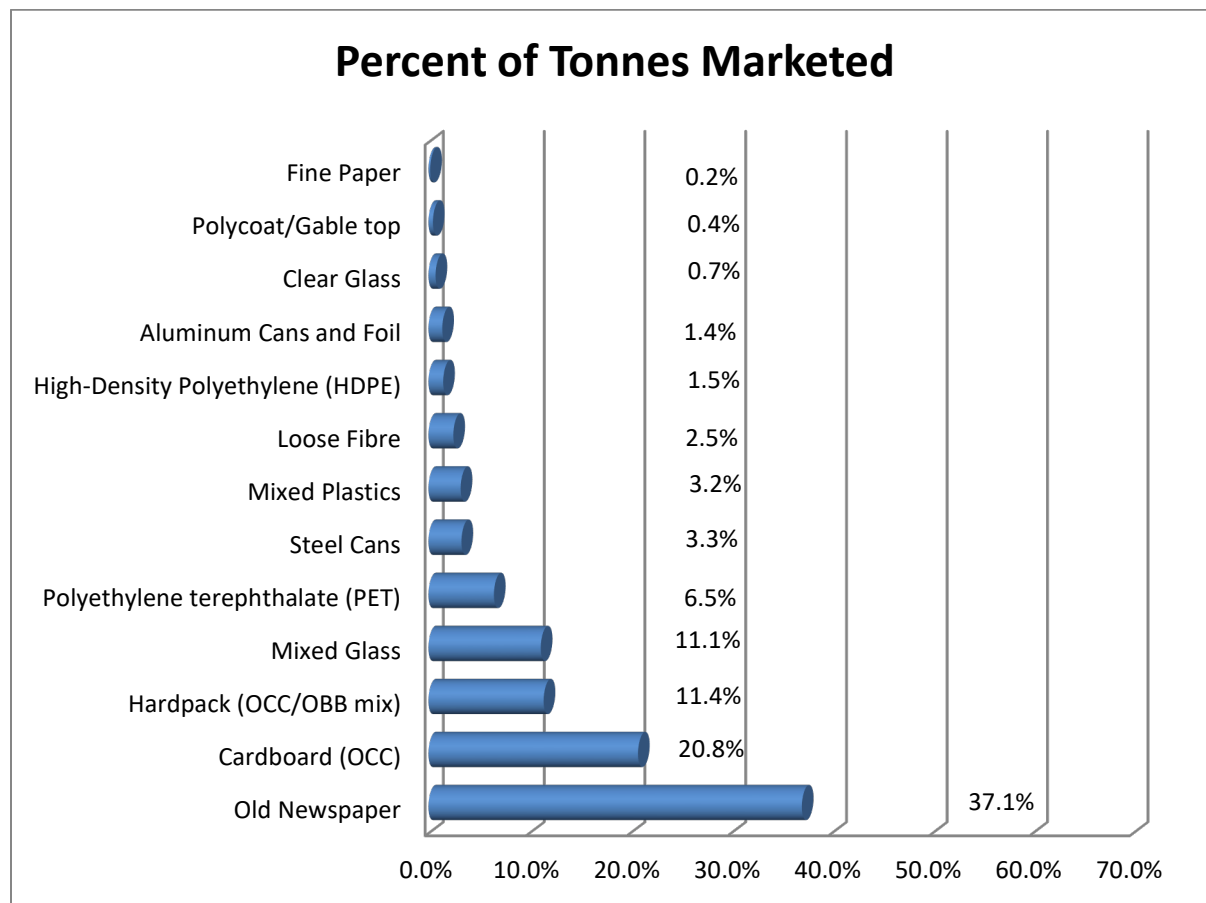
Recycling Residual is the material that is left over after the processing of the recyclable materials are collected and delivered to the MRF. The residuals consist of contaminated materials, non-recyclable materials, and packaging materials used to secure recyclables placed in the recycle box. A total of 4,513.29 tonnes of recycling residuals was disposed of in 2019.

3 Tonnes Marketed

For the purposes of waste diversion calculations, tonnes marketed are used instead of the tonnes collected curbside. The tonnes marketed by material type are shown in Table 2, 3 and 4. The Essex-Windsor Solid Waste Authority markets all materials processed through the MRF, and retains 100% of the revenue from the sale of materials. Revenue from the sale of

material in 2019 was approximately \$2,070,666 (see Table 5) representing a basket-of-goods revenue of approximately \$101/tonne compared to a basket-of-goods revenue of \$134/tonne in 2018. A brief discussion on market conditions and prices for each of the materials follows.

Figure 1: Percent of Tonnes for 2019 Marketed Recyclables



Note: Due to rounding total tonnes marketed does not total 100%.

3.1 Fibres

Old Newspaper (ONP)

Ontario market price trends are published annually by the Continuous Improvement Fund's (CIFs) Price Sheet (January 2020). For 2019, ONP prices started the year at a high of \$61 per tonne in January and then declined gradually to finally close out the year at \$33 per tonne in December. The EWSWA average price for 2019 was \$55 per tonne which is

higher than this provincially published CIF average of \$44 per tonne. The EWSWA 2018 average price for ONP was \$75 per tonne.

Old Corrugated Cardboard (OCC)

The EWSWA price for old corrugated cardboard again started the year high at \$122 per tonne and dropped due to global market conditions to a low of \$60 per tonne by the end of 2019. The 2019 EWSWA average price per tonne was \$81 compared to \$126 in 2018. The Authority's average price of \$81 per tonne was just short of the provincial average of \$84 per tonne per the CIF Price Sheet- January 2020.

Hardpack (OBB)

(Example: cereal boxes, cardboard)

EWSWA's prices for this cardboard/boxboard mix ranged from a high of \$88 to a low of \$1 per tonne in 2019. The 2019 EWSWA average price was \$17 compared to \$89 per tonne in 2018, again as a result of global market conditions. Even though market prices dropped severely in 2019, the Authority's average price of \$17 per tonne was slightly lower than the provincial average (\$19 per tonne) per the CIF Price Sheet- January 2020.

Fine Paper

Fine paper was sold in 2019 with an average price of \$207 per tonne. This is a decrease compared to the \$279 per tonne received in 2018 again as a result of the fibre market crisis.

Loose Fibre

As a result of a major equipment changeover in the Fibre MRF in 2019, the Fibre MRF was unable to process incoming delivered materials for a few days. Therefore, all incoming materials during this timeframe to the Fibre MRF were shipped loose to a fibre recycling processor with no charge to the Authority due to fibre market conditions.

3.2 Containers

Steel Cans

The pricing for steel cans ranged from a high of \$333 per tonne to a low of \$155 per tonne during 2019. The 2019 average price was \$248 per tonne compared to \$304 per tonne in 2018.

Aluminum Cans and Foil

The pricing for aluminium cans ranged from a high of \$1,615 per tonne to a low of \$1,338 per tonne. The 2019 average price was \$1,477 per tonne compared to \$1,761 in 2018. Aluminum foil was sold at an average price of \$374 during 2019.

Glass

The average price for clear glass, marketed for new containers, in 2019 was \$32 per tonne. This is slightly lower than the 2018 average price of \$36 per tonne. Clear glass is the only product that is not marketed FOB (Freight On Board) at the Essex-Windsor MRF. Mixed coloured glass was delivered to the Regional Landfill for use as road base.

Polyethylene terephthalate (PET)

(Example: Plastic Water Bottles)

PET prices ranged from a high of \$493 per tonne to a low of \$168 per tonne in 2019. The average price was \$363 per tonne in 2019 which is lower than the 2018 average price of \$438 per tonne.

High-Density Polyethylene (HDPE)

(Example: Laundry Soap Bottles)

HDPE prices ranged from a high of \$562 per tonne to a low of \$315 per tonne in 2019. The average price was \$431 per tonne in 2019 compared to the 2018 average price of \$497 per tonne.

Polycoat and Gable Top

(Example: Milk Cartons)

Five loads of polycoat were shipped out in 2019 at an average price of \$32 per tonne compared to the average price of \$76 per tonne in 2018.

Mixed Plastics

(Example: tubs & lids, clamshells, trays, cups, plastic bottles, excludes polystyrene and plastic film bags)

In 2019, mixed plastic prices ranged from a high of \$117 per tonne to a low of \$80 per tonne. The average price was \$110 per tonne in 2019 compared to the average price of \$72 per tonne in 2018.

Table 2: Marketed Fibres Summary Comparison: 2018 versus 2019

Fibre Material	2019 Tonnes	2018 Tonnes	% Change
Old Newspaper (ONP)	7,608	11,472	-33.7%
Cardboard (OCC)	4,269	4,062	5.1%
Hardpack (OCC/OBB mix)	2,346	1,647	42.4%
Fine Paper	36	81	-55.6%
Loose Fibre	507	237	113.9%
Totals:	14,766	17,499	-15.6%

Table 3: Marketed Containers Summary Comparison: 2018 versus 2019

Container Material	2019 Tonnes	2018 Tonnes	% Change
Clear Glass	145	207	-30.0%
Mixed Glass	2,288	2,446	-6.5%
Steel Cans	672	773	-13.1%
Aluminum Cans and Foil	281	298	-5.7%
Polyethylene terephthalate (PET)	1,334	1,554	-14.2%
High-Density Polyethylene (HDPE)	300	312	-3.8%
Polycoat/Gable top	91	97	-6.2%
Mixed Plastics	656	718	-8.6%
Totals:	5,767	6,405	-10.0%

Table 4: Residential Recyclables Marketed Comparison: 2018 versus 2019

Tonnes Marketed	2019 Tonnes	2018 Tonnes
a) Total Tonnes Marketed	20,533	23,904
b) ICI Tonnes	(435)	(746)
Net Marketed Residential Recyclables	20,098	23,158

Notes: a) Total Tonnes Marketed less b) ICI Delivered Tonnes = Net Marketed Residential Recyclables.

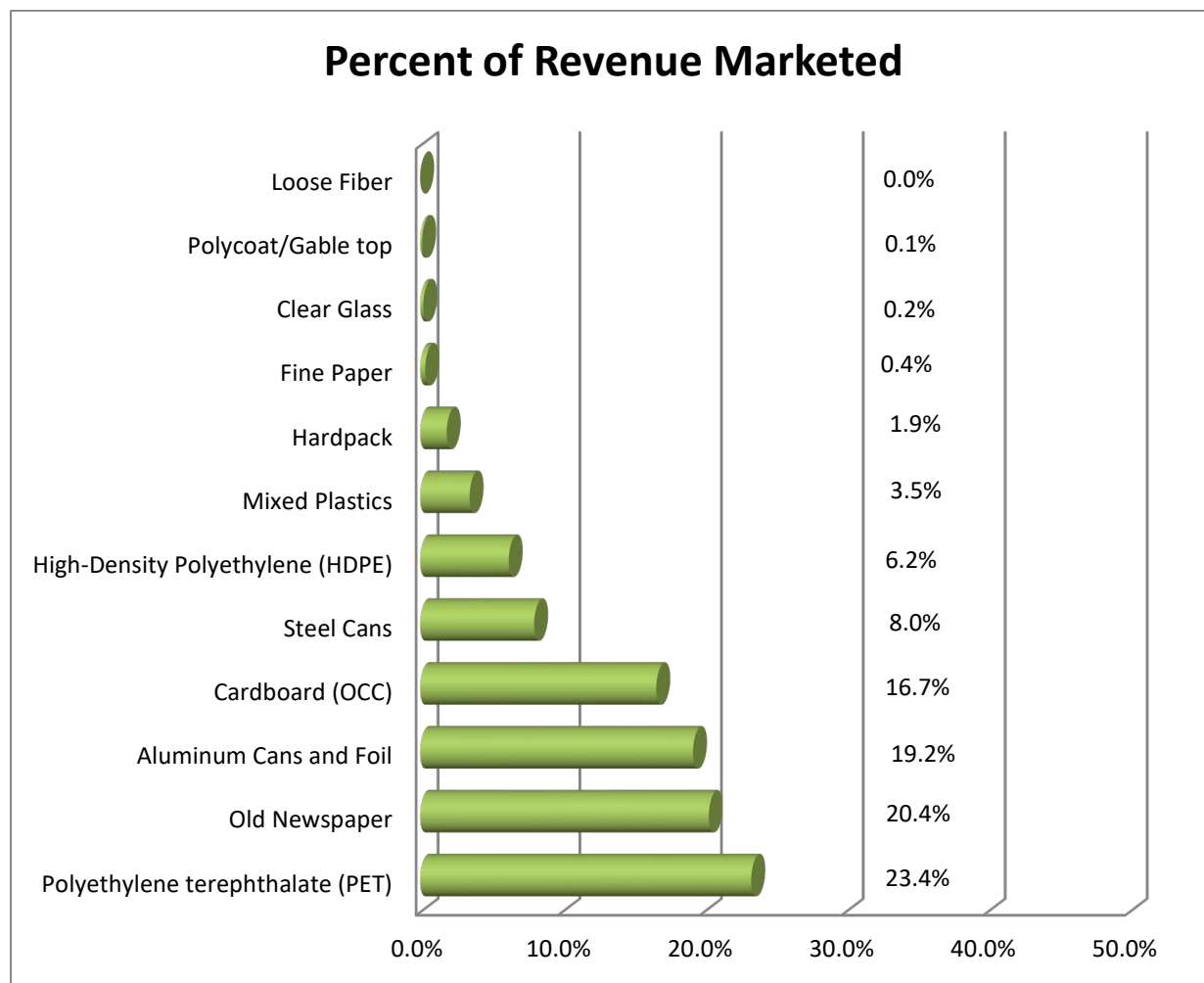
Table 5: Revenue Comparison: 2018 versus 2019

Recyclable Material	2019 Revenue	2018 Revenue
Old Newspaper (ONP#8)	\$421,670	\$858,637
Cardboard (OCC)	\$344,893	\$513,125
Hardpack	\$38,712	\$146,834
Fine Paper	\$7,416	\$22,470
Loose Fibre	\$0	\$1,182
Clear Glass	\$4,668	\$7,407
Steel Cans	\$166,520	\$235,222
Aluminum Cans and Foil	\$398,545	\$525,109
Polyethylene terephthalate (PET)	\$483,675	\$680,412
High-Density Polyethylene (HDPE)	\$129,411	\$155,100
Polycoat/Gable top	\$2,932	\$7,330
Mixed Plastics	\$72,224	\$51,916
Total Revenue	\$2,070,666	\$3,204,744

Table 6: Annual Revenue Comparison

Year	Revenue
2014	\$3,306,026
2015	\$3,101,234
2016	\$3,414,055
2017	\$4,241,411
2018	\$3,204,744
2019	\$2,070,666

Figure 2: Percent of Revenue Marketed in 2019



Note: Due to rounding total revenue marketed does not total 100%.

3.3 Markets

While delivered tonnages for 2019 were similar to 2018, there was a significant reduction in revenue generated in 2019 from the recycling markets. Due to import regulations changing in China, the North American recycling markets in 2019 finally hit an all-time low. This impacted domestic markets in 2019 as witnessed by oversaturation with recycling materials and thereby imposing greater demands (e.g., quality specifications enforced, dropping prices) to domestic sellers like EWSWA.

As a result, early in 2019, the fibre markets were hit hardest, as prices fell to an all-time low and eventually stabilized at this new low market price by the end of the year. Container market prices didn't start their decline until late summer. It is important to note that while prices for containers dropped, this decrease was nowhere near the significance of the hardship experienced in the fibre markets in 2019. These significant market changes are reflected in Table 5 on page 9 of this report. More importantly, due to many EWSWA strategies like: pre-establishment in the domestic market, efforts of Waste Diversion staff to produce higher quality materials through continuous improvement efforts and capital investment, and ongoing successful work with buyers and contractors, EWSWA was able to move all materials in 2019.

4 Other Residential Recycling Programs

4.1 White Goods

Since 1991, white goods, such as fridges, stoves, air conditioners, washers, dryers, freezers dishwashers, etc. have been restricted from landfill disposal. In 2019, curbside collection of white goods from County municipalities captured 1,738 white good units (approximately 156 tonnes).

While the City of Windsor did not operate a white goods collection program during 2019 there were also 193 tonnes of white goods delivered to the Public Drop Off Depots for a combined total of approximately 349 tonnes. Using the Resource Productivity & Recovery Authority (RPPRA) Municipal Datacall residual percentage of 20%, approximately 279 tonnes of white goods were recycled and diverted. Table 8 details the white goods collection program for each of the municipalities in the County of Essex by month during 2019.

Table 7: Summary of White Goods Diversion for 2019

White Goods Summary	2019 Tonnes
Curbside Collection Converted to Tonnes	156.42
Drop Off Depots	192.92
Total White Goods Tonnes	349.34
Less 20% Residual Calculation Amount	(69.87)
Total Tonnes Recycled and Diverted	279.47

Table 8: 2019 White Goods Collected by Month in Municipalities across Essex County

Month	Tecumseh	Essex	LaSalle	Amherstburg	Leamington	Kingsville	Total for Month
January	7	13	22	21	11	24	98
February	8	18	20	29	16	20	111
March	12	15	19	24	14	17	101
April	11	18	32	29	17	20	127
May	18	9	34	29	34	27	151
June	17	25	39	43	24	29	177
July	16	20	32	44	22	28	162
August	22	21	20	32	25	33	153
September	20	30	30	35	26	12	153
October	14	22	42	34	35	28	175
November	28	31	37	42	30	30	198
December	15	26	20	22	17	32	132
Total Units	188	248	347	384	271	300	1,738

Notes: 1,738 units with the average weight of 90 kilograms per unit results in diversion of approximately 156.42 tonnes; there was no Tonnes reported for Lakeshore in 2019.

4.2 Tires

In 2019, EWSWA like all other municipalities transitioned their tire recycling program early in the year from the Ontario Tire Stewardship Used Tires Program to the Used Tire program under Resource Productivity and Recovery Authority (RPRA). RPRA's goal is to support a waste-free Ontario, where all resources are reused and recycled through the new Individual Producer Responsibility (IPR) framework. This is due to the Tires Regulation under the Resource Recovery and Circular Economy Act, 2016 (RRCEA) that designated tires as the first material under Ontario's IPR framework to transition.

While automotive tire recycling is now offered at many locations across Essex-Windsor, EWSWA does still collect and recycle used tires through the new RPRA program. In 2019, RPRA Datacall resulted in diversion of approximately 2,830.90 tonnes of used tires in the Essex-Windsor area.

4.3 Scrap Metal

There are 40-yard roll off bins located at the Public Drop-off Depot for collection of ferrous and non-ferrous scrap metal material. The metals are sold through a competitive bid process to local scrap dealers. In 2019, approximately 588.08 tonnes of metals were collected and recycled. While the Authority does not advertise that it accepts other metal household objects besides steel cans in the blue box program, the Authority does receive and does try to capture any metal objects which are called "mixed metal". An additional 71.86 tonnes of mixed metals were received in 2019 for a total of 660 tonnes of scrap metal.

4.4 Electronics Recycling

Under contract to the Authority, Greentec supplies roll off bins for the collection of electronics at the Authority's Public Drop-off Depots. EWSWA staff place the electronic items from the public in these bins. In 2019, a total of 316.61 tonnes of computers, televisions, audio visual equipment, and various electronic items were collected through the Waste Electrical and Electronics Equipment (WEEE) stewardship program. Based on a residual portion of 20%, the total electronics recycled was approximately 253.29 tonnes.

4.5 Deposit/Return Program

The Authority implemented a capture program at its Material Recovery Facility for deposit/return containers (i.e. aluminum beer cans; glass, wine and spirit bottles) that were placed curbside for blue box collection and continued to be successful in 2019. During 2019, approximately 39 tonnes of deposit/return containers were received at the MRF and are included as part of the 2,196.94 tonnes that were diverted throughout Essex-Windsor as part of the Deposit/Return & Stewardship Program. The 2,197 diversion tonnes figure is calculated as part of the 2019 Resource Productivity and Recovery Authority Datacall and is based on the Essex-Windsor population as determined by the latest Statistics Canada Census data.

Table 9: Other Recyclables Comparison: 2018 versus 2019

Recyclable Material	2019 Tonnes	2018 Tonnes	% Change
White Goods (all sites)	279	227	42.73%
Used Tire Program	2,831	2,831	0.00%
Scrap & Mixed Metal	660	644	2.48%
Electronics	253	270	-6.30%
Deposit/Return & Stewardship Program	2,197	2,197	0.00%
Total Other Recyclables	6,220	6,169	1.56%

Note: RPRA Datacall calculation is based on population for Used Tire Program and Deposit/Return & Stewardship Program in the Essex-Windsor area as reported by the Statistics Canada Census. .

5 Residential Organics

5.1 Yard Waste

Grass, leaves, tree trimmings and brush are restricted from disposal at the Essex-Windsor Regional Landfill Site. As a result many local municipalities have established separate collection systems for yard waste, including special collections in January for Christmas trees. Furthermore, individual residents and grounds maintenance contractors also brought yard waste to one of the three yard waste depots operated by the Essex-Windsor Solid Waste Authority in 2019.

The Essex-Windsor area accepts the use of paper bags, wheeled carts, garbage bins and cardboard boxes for the collection of yard waste. Plastic

bags are not accepted. Approximately 30,293 tonnes of yard waste was received in 2019, which a decrease of 12% compared to the 34,435 tonnes delivered in 2018.

Table 10: 2019 Yard Waste Summary for all sites

Material Type	Windsor Public Drop Off	Kingsville Transfer Station 2	Regional Landfill
Municipal Delivered	11,315	1,736	4,374
Residential Delivered	4,969	1,150	163
Total Res. Organics	16,284	2,886	4,537
ICI Organics and Pallets	492	341	5,753
Grand Total (Tonnes)	16,776	3,227	10,290

Note: ICI is Industrial, Commercial and Institutional delivered material type.

Table 11: Yard Waste Tonnes Comparison: 2018 versus 2019

Material Type	2019 Tonnes	2018 Tonnes
Municipal Delivered	17,425	15,959
Residential Delivered	6,282	7,462
Total Res. Organics	23,707	23,421
ICI Organics and Pallets	6,586	11,014
Grand TOTAL (Tonnes)	30,293	34,435

Note: ICI is Industrial, Commercial and Institutional delivered material type.

5.2 Screened Compost Sales

The Authority undertakes an in depth process to the organics and yard waste it receives to turn it into saleable, quality compost. The composting process involves grinding up yard waste and placing it in long rows called 'windrows'. The material is turned frequently and the temperature is maintained above 55 degrees Celsius in order to kill any pathogens or weed seeds. Once the compost has matured it is tested, screened, and then sold for use in landscaping, as well as flower and vegetable gardens.

In 2019 compost was sold as bulk (delivered or pick-up), bag your own, and prepackaged items as listed in Table 12.

Table 12: Compost Sales 2019 Summary

Compost Material	Quantity Sold	Tonnes
Delivered	750 cubic yards	441
Bulk Sales	25,251 cubic yards	14,848
Bag Your Own Compost	1,488 bags	40
Prepackaged Garden Gold Compost	11,998 bags	228
		Total: 15,557

Notes: Prepackaged bag weights are based on approximately 19 kg/bag; bag your own compost is approximately 27 kg/bag and bulk compost is approximately 588 kg/cubic yard.

Under contract to the Authority, Frank Dupuis Landscaping and Trucking provided delivery services for the sale of 441 tonnes of bulk compost to local residents. Also 14,848 tonnes in bulk sales were sold to residents and businesses at EWSWA Depots. Additionally, about 11,998 prepackaged bags of compost were sold at the Depots. Many residents also bagged their own compost at one of the depots. The combined total weight of compost sold was approximately 15,557 tonnes. In 2019, compost sales totaled \$227,185.

5.3 Backyard Composting

Backyard composters (BYC) with the brand name “The Earth Machine” and “The Green Cone” were sold to Essex-Windsor residents in 2019. The Earth Machine was sold through local Home Hardware stores year-round. Both units were sold during the Truckload Sale held in the City of Windsor. Approximately 37 Earth Machine units were sold through the Home Hardware stores and 217 units were sold during the truckload and miscellaneous sales for a total of 254 units sold in 2019. There were 94 Green Cones sold in 2019. This brings the cumulative total to 752 Green Cones distributed since 2010, which is when they were first introduced to the area. The combined BYC distributed in 2019 was 348 units bringing the total number of units sold since 1988 to 39,881 units.

Current research has indicated that approximately 100 kg/year/BYC is diverted as a result of the backyard composting program. This translates into 3,988 tonnes of organic waste diverted from the landfill through this program. This does not consider homemade composters or composting done independent of the Authority’s backyard composting program.

Table 13: Residential Organic Waste Reduction Comparison: 2017 — 2019

Residential Organic Programs	2019 Tonnes	2018 Tonnes	2017 Tonnes
BYC Program	3,988	3,953	3,912
Mulching Blades	1,343	1,343	1,343
Yard Waste (Residential)	23,707	23,421	19,099
Total Residential Organics	29,038	28,717	24,354

Notes: The mulching blade program was no longer directly offered through EWSWA after 2001. Even though mulching blades and mowers are used by residents in the area, it can't be measured for the purposes of this report; therefore, no increase in diversion is indicated.

6 Promotion and Education

6.1 School and Community Presentations

In 2019, Authority staff conducted 24 presentations at various locations where 2,544 people from community groups, events, open houses, schools etc. attended. The emphasis in 2019 presentations was placed on how to reduce, reuse and recycle plastic.

6.2 Special Community Events

Authority staff organized displays and talked to area residents at various special events scheduled at the Horticultural Show, Earth Day Celebrations and the Truckload Sale. There were 65 special events serviced with recycling in 2019. Many special event venues have implemented their own sustainable recycling program throughout the season (April through September) and do not require the per event service offered by EWSWA.

6.3 On-going Public Education Activities

The Authority maintains a Waste Reduction Hotline (1-800-563-3377), a website (www.ewswa.org), and an annual newsletter called EnviroTips which is delivered to each household and is available online.

E-newsletters are also part of the program as they are low cost and reach residents quickly and effectively. The Authority has 2,964 e-newsletter subscribers. Industry standards indicate that a decent open rate is anything between 20-33%. Open rates for e-newsletters are as follows: Truckload Sale 63%; Gold Box, 87%; Waste Reduction Week, 63%.

The EWSWA website (www.ewswa.org) is updated on a regular basis to provide detailed information and public education to residents. Topics covered range from waste management and reduction, to details about waste diversion activities. Residents have access to instructions, tenders, reports, calendars, acceptable recycle box materials, incentives, etc. In 2019 there were approximately 38,000 hits on the website bringing the total hits to 281,077 hits since the launch of the new website in 2012; the monthly average hits in 2019 had a duration of approximately 1.47 minutes. The 'What Goes Where' material search database resulted in 8,598 searches; municipal calendar searches were at 13,396 and PDO, Windsor at 8,164 searches in 2019. In 2019, method of access by device was 53.6% mobile; 39.5% desktop computer and 6.9% tablets.

Recycle Coach is an app which makes recycling and collection schedule information easy to find. The app is continuously developing new programs that combat complacency and gets people re-engaged in recycling. It promotes best practices ideas on better waste management to improve outcomes such as increasing the amount recycled, proper disposal and diversion of solid waste, etc. In 2019, EWSWA made it a priority to promote this app and get local residents onboard with accessing information around solid waste through this app. As a result, increased metrics listed below were noted for Recycle Coach in 2019:

- 9,619 total subscribers
- 130,743 resident interactions in 2019
- 10,895 average monthly resident interactions

EWSWA also continues to maintain a presence in social media sites such as Facebook and Twitter. EWSWA started with 30 Twitter followers in January 2015 and had 755 followers by December 2019. EWSWA has 1,130 followers on Facebook with the highest reach of 17,200 on the "What is the Oops Sticker?" in a 2019 post.

6.4 Gold Star Program

In 2016, the Authority launched a new recycling incentive program aimed at increasing public awareness regarding the red and blue box recycling program. Residents were encouraged to apply for a new "Gold Recycling Box" through a program that evaluated their curbside recycling, provided feedback and rewarded successful recyclers with a gold box. The program's

ultimate objective is to decrease the amount of contamination being put out by residents and thereby decrease the amount of contamination at the MRFs. The program was renewed in 2017 and 2,050 residents registered for the "Gold Star" program. In 2017, 1,000 households were inspected and 604 gold boxes were awarded. In 2018, the fourth round of inspections were undertaken to complete the inspections of all 2,050 residents who registered in 2017. During 2018, 613 gold boxes were awarded. The program continued in 2019 being offered to the first 300 online applicants; 284 gold boxes were awarded in 2019 to keep offering this positive brand to the public.

7 Municipal Hazardous or Special Wastes (MHSW) Program

7.1 MHSW Depots

The Essex-Windsor Solid Waste Authority opened its Windsor MHSW Depot in October 1995. In addition to the Windsor facility, the Authority opened a second MHSW Depot at Transfer Station No. 2 in the Town of Kingsville in 1997. A third depot was opened at the Essex-Windsor Regional Landfill Site in October 2013. The Depots replaced the annual Household Chemical Waste Days held in Essex-Windsor. All facilities were operated year-round in 2019. A total of 596,936 litres and 112,741 kg of MHSW materials were delivered to the sites in 2019. See Table 14 and 15 for details.

Reuse Centre

A Reuse Centre has been operational at the Windsor MHSW facility since 1995.

Paint is distributed in both 1-gallon and 5-gallon pails for reuse. According to the records, 2,785 residents accessed the Reuse Centre and took 57,908 products or approximately 83,516 kg of paint and miscellaneous materials in 2019 compared to 54,555 products or 77,853 kg of reusable materials in 2018.

Demand for the Reuse Centre remains high, however quantities available depend largely on how good the products are that are delivered by households to the facility.

Mercury Roundup Program

In June 2019, the Essex-Windsor Solid Waste Authority launched Mercury Roundup: an initiative designed to divert a toxic chemical—liquid mercury—from the waste stream. In partnership with Scout Environmental, and with funding from the Ontario Trillium Foundation, Essex-Windsor has become one of the first environmentally conscious municipalities to launch the Mercury Roundup program that will expand to six other Ontario municipalities by 2021. Residents who dropped off a product containing mercury received a free digital thermometer. Since June 2019, 118 products were received equalling about 0.6443 kilograms of mercury.

Table 14: Municipal Hazardous or Special Waste for 2019 in Litres

Material	MHSW from Facilities	Reuse Centre Quantities	Total Litres
Adhesives/Flammable Liquids	62,704	20,077	82,781
Aerosols	10,068	1,390	11,458
Antifreeze (Glycol)	9,447	0	9,447
Corrosive Liquid	6,162	343	6,505
Inorganic Acids	1,022	0	1,022
Paints & Coatings	222,554	52,927	275,481
Pesticides	6,600	692	7,292
Waste Oils (hydraulic fluid)	19,500	0	19,500
Recyclable Waste Oil	183,450	0	183,450
Total MHSW Litres	521,507	75,429	596,936

Table 15: Municipal Hazardous or Special Waste for 2019 in Kilograms

Material	MHSW from Facilities	Reuse Centre Quantities	Total Kgs
Car Batteries	30,350	0	30,350
Dry Cell Batteries	3,026	0	3,026
Fire Extinguishers	2,241	0	2,241
Fluorescents/Misc. Lamps/Ballasts	23,635	0	23,635
Inorganic Oxidizers	2,641	8,087	10,728
Mercury (HG items)/Lead	513	0	513
Pharmaceuticals	1,226	0	1,226
Plastic Used Oil Containers	16,991	0	16,991
Propane Cylinders	4,577	0	4,577
Propane Tanks/Misc. Tanks	18,093	0	18,093
Rechargeable & Mixed Batteries	1	0	1
Corrosive Solids (e.g. cement)	471	0	471
Waste Oil Filters	889	0	889
Total MHSW Kilograms	104,654	8,087	112,741

Table 16: MHSW Diversion Comparison: 2018 versus 2019

	2019 Tonnes	2018 Tonnes
MHSW Recycled or Reused	709	723
MHSW not Recycled	(18)	(19)
Total MHSW Diverted	691	704

7.2 Waste Motor Oil

Waste motor oil is collected curbside with the residential recycling program. As well, residents are able to deliver oil to the MHSW facilities. The quantity of waste motor oil collected during 2019 was 183,450 litres, which is down by 0.8% compared to the 184,950 litres collected in 2018. The quantity of oil collected by month is shown in Table 17 with historical data over four years.

Table 17: Motor Oil Collected (Litres) 2016 through 2019

Month	2019 Litres	2018 Litres	2017 Litres	2016 Litres
January	8,875	10,225	14,680	9,390
February	6,025	4,950	8,700	12,480
March	11,025	13,100	7,311	10,160
April	20,850	20,800	20,320	20,771
May	17,950	22,750	21,600	22,683
June	20,900	16,400	18,400	21,685
July	20,075	20,150	20,575	16,310
August	18,725	16,350	17,300	18,245
September	17,950	15,325	14,450	20,401
October	15,275	18,425	14,900	16,716
November	14,275	13,425	20,200	18,840
December	11,525	13,050	7,950	8,000
Total:	183,450	184,950	186,386	195,681

8 Overall Summary of Residential Diversion Quantities

8.1 Residential Waste Diversion

Table 18 summarizes the residential waste diversion activities detailed in this report.

Table 18: Residential Waste Diversion Activity

Residential Waste Diversion Summary	2019 Tonnes	2018 Tonnes
Net Marketed Recyclables-Table 4	20,098	23,158
Other Recycling Programs-Table 9	6,220	6,169
Yard Waste, BYC & Mulching Blades-Table 13	29,038	28,719
MHSW Waste including Motor Oil-Table 16	691	704
Total Residential Tonnes Diverted	56,047	58,750

Residential Waste Diversion 2019 Report

For further information please contact the Essex-Windsor Solid Waste Authority Hotline at 1-800-563-3377.

Catherine Copot-Nepszy
Manager, Waste Diversion



Eli Maodus
General Manager



Report prepared by: **Margaret Shires**, Administrative Assistant

MEMO

TO: Mr. Tom Marentette, Waste Manager - Essex Solid Waste Authority (EWSWA)

FROM: Jenna McVitty (WSP)

SUBJECT: Summary of Surface Water Monitoring Data, 4th Quarter Precipitation Event Monitoring – 2019, Essex-Windsor Regional Landfill (RLF), EWSWA

DATE: November 20, 2019

Please find below a summary of the analytical results and field observations for the 2019 4th Quarter Precipitation Sampling Event as part of the routine compliance monitoring program at the Regional Landfill site for your file.

Regional Landfill – Precipitation Monitoring Data Review:

November 1, 2019, 4th Quarter Sampling Event:

Between approximately 9:30 am on October 30, 2019 and 11 pm on October 31, 2019, approximately 30.5 millimetres (mm) of rain was recorded at the Regional Landfill site. While the 30 mm in 24 hr precipitation event criteria was not met, samples were collected from the site surface water stations for internal review. Surface water samples were collected on November 1, 2019 from the existing designated monitoring stations. The locations of the designated monitoring stations are shown on the attached Figure 1.

The following is a summary of the analytical results for the surface water samples that were collected from the designated monitoring stations during this sampling event.

The samples were collected from existing monitoring stations SW2, SW3, SW9, SW12, and SW13. Monitoring station SW8 was dry at time of sampling. Visible flow was observed at stations SW2, SW3, SW12, and SW13. The surface water at stations SW2, SW9, SW12, and SW13 were observed to be pale brown, and station SW3 was observed to be brown.

Based on the reported analytical results and consistent with previous sampling events, several nutrients and/or metals were detected at low concentrations in the monitoring stations with some parameters slightly exceeding the applicable Provincial Water Quality Objectives (PWQO) and/or the control limits at the respective sampled stations. These parameters include total phosphorus for all sampled stations, ammonia for stations SW2 and SW12, manganese for stations SW2, SW12, and SW13, and copper and iron for station SW3. In addition, field turbidity exceeded the control limit for stations SW3 and SW13.

A summary of the reported analytical results along with the historical ranges for each laboratory tested parameter are presented in the attached Table 1.

Where the PWQO or control limits were exceeded, most reported concentrations fluctuated without a specific trend noted and were within their historical ranges, with the exception of manganese for station SW13. The manganese concentration at station SW13 slightly exceeded its control limit and was above the historical range. It should be noted that as monitoring only began in 2016 for station SW13, there is limited historical data for meaningful comparison at this time. The data will continue to be collected and evaluated.

In general, and similar to previous sampling events, the detected elevated concentrations are likely attributed to nutrient and sediment loading from the surrounding agricultural lands within the drainage ditches where the monitoring stations are located. The slight exceedances at the site may also be associated with the recent construction work of Cell 3S and related sediment loading from the recent topsoil placement and seeding activities throughout the Site.

It should be noted that phenols was previously detected in the surface water at the site. However, it was not detected during the November 1, 2019 sampling event.

The reported concentrations for the duplicate surface water sample were within the required relative percent difference (RPD) or were less than five times the reported detection limit. The lab duplicates, method blanks, reference materials, method blank spikes, and matrix spikes were within their required ranges. Therefore, the reported parameter concentrations are considered accurate as reported and do not affect the quality of the data.

Based on the reported concentrations of the primary leachate indicator parameters chloride and boron, for the onsite surface water management ponds, there was no apparent landfill leachate effect on the existing surface water courses at the site. Surface water monitoring will continue in 2019 and 2020 as part of the ongoing routine monitoring activities at the site.

Should you have any questions or require additional information, please feel free to contact us.

Attachments: - Figure 1, Site Plan
 - Table 1, Surface Water General Chemical Results

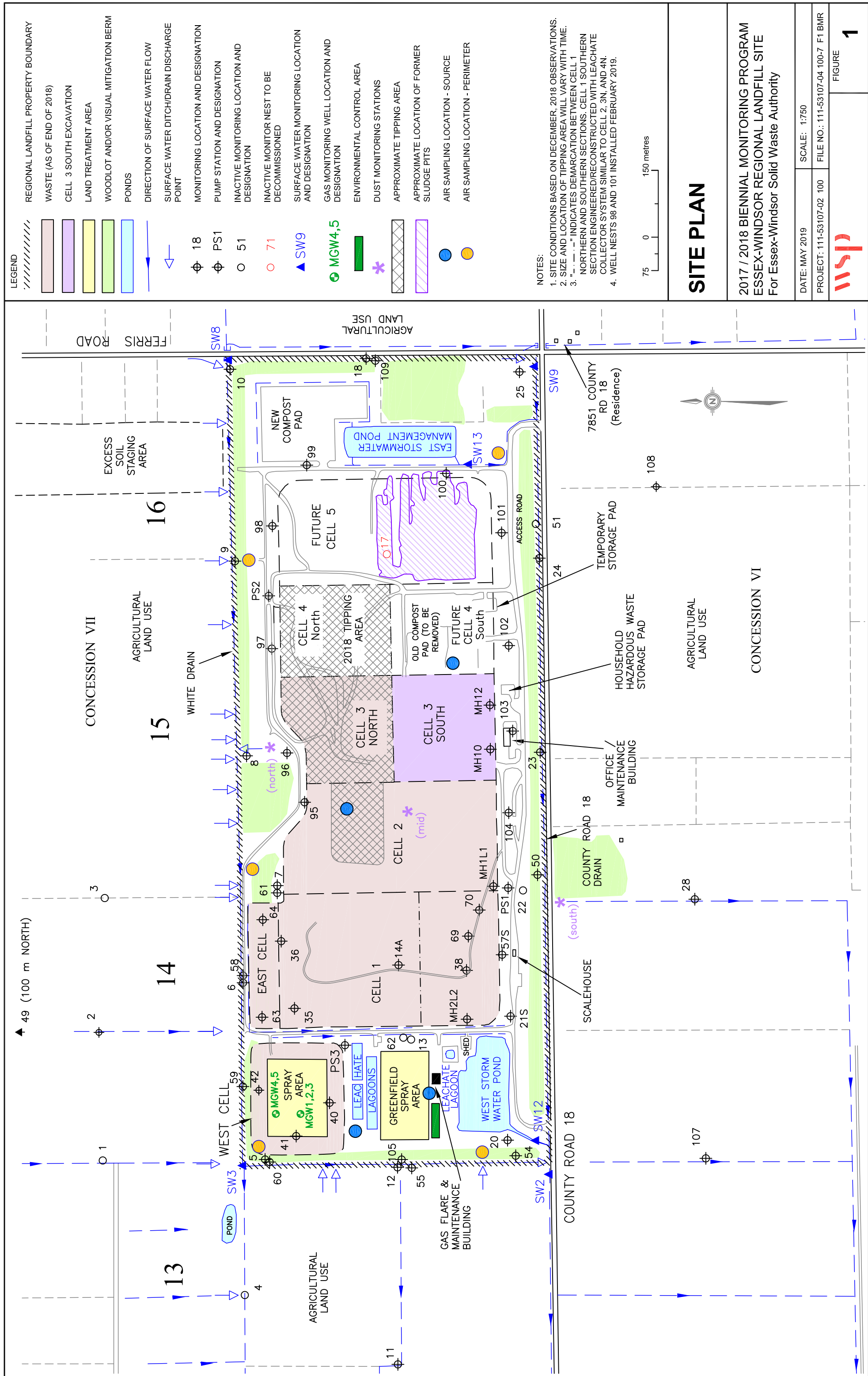


TABLE 1
FOURTH QUARTER PRECIPITATION EVENT - SURFACE WATER GENERAL CHEMICAL RESULTS
REGIONAL LANDFILL - 2019 MONITORING PROGRAM

PARAMETER	UNITS	PWQO	COUNTY ROAD 18 DRAINAGE DITCH				WHITE DRAIN WHITE DRAIN			
			ROUTE 1		ROUTE 2		SW2		SW3	
			CONTROL LIMIT	1-Nov-19	SW12	SW13	1-Nov-19	CONTROL LIMIT	1-Nov-19	SW6
FIELD RESULTS										
pH		6.5-8.5	6.5-8.5	8.09	8.12	8.37	8.00			
Conductivity	uS/cm	2297	2003	970	1030	740	400			
Temperature	°C			8.0	6.4	9.2	8.9			
Turbidity	NTU	62	62	35	28	41	254			
LABORATORY RESULTS										
BOD ₅	mg/L			<5	<5	<5	<5	<5		
Conductivity	uS/cm	2297	2003	790	1470	874	603	282		
pH		6.5-8.5	6.5-8.5	7.82	7.93	7.78	7.78	7.33		
Alkalinity (as CaCO ₃)	mg/L	152	152	246	159	121	50	50		
Chloride	mg/L	595	595	56.6	347	39.5	17.3	21.2		
Nitrate	mg/L			0.33	0.74	0.80	0.19	6.10		
Sulphate	mg/L	193	193	31.3	276	276	181	35.8		
Ammonia (total as N)	mg/L	0.15	0.15	0.27	<0.02	0.99	0.07	0.09		
Phosphorus (total)	mg/L	0.03	0.03	0.18	0.21	0.09	0.17	1.42		
Phenols	mg/L	0.001	0.001	0.001	<0.001	<0.001	0.001	0.001		
Calcium	mg/L	64.8	64.8	83.6	80.5	66.3	31.1	31.1		
Magnesium	mg/L	26.4	26.4	14.9	43.8	26.5	9.49	9.49		
Sodium	mg/L	35.4	35.4	194	33.3	97.3	5.77	5.77		
Potassium	mg/L	17.1	17.1	6.20	19.8	15.6	5.78	5.78		
Aluminum (dissolved)	mg/L	0.075	0.075	0.008	0.015	0.005	0.046	0.046		
Barium	mg/L			0.047	0.080	0.069	0.052	0.041		
Beryllium	mg/L		<0.005	<0.001	<0.001	<0.001	<0.001	<0.001		
Boron	mg/L	0.011	<0.005	0.078	0.025	0.157	0.060	0.032		
Cadmium	mg/L	0.0002	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	0.0001		
Chromium	mg/L	0.01	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003		
Cobalt	mg/L	0.0009	<0.005	<0.0005	0.0006	0.0007	0.007	0.007		
Copper	mg/L	0.005	0.003	0.003	0.002	0.003	0.04	0.007		
Iron	mg/L	0.30	0.97	0.09	<0.01	0.02	0.06	0.07		
Lead	mg/L	0.005	<0.002	<0.001	<0.001	<0.001	<0.002	0.96		
Manganese	mg/L	0.040	0.03	0.034	0.014	0.040	0.031	0.004		
Molybdenum	mg/L	0.025	0.004	0.020	0.003	0.024	0.023	0.023		
Nickel	mg/L	0.025	0.004	0.004	<0.003	0.006	0.004	0.005		
Silver	mg/L	0.0001	0.004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
Strontium	mg/L			1.15	1.98	1.10	0.789	0.154		
Tin	mg/L			<0.002	<0.002	<0.002	<0.002	<0.002		
Titanium	mg/L	0.006	0.011	0.012	0.006	0.008	0.007	0.007		
Vanadium	mg/L			<0.002	0.002	<0.002	0.003	0.003		
Zinc	mg/L	0.006	0.012	0.002	0.006	0.006	0.012	0.012		
Benzene	mg/L		0.03							
Ethylbenzene	mg/L									
Diethyl Xylenes	mg/L									

PARAMETER	UNITS	PWQO	COUNTY ROAD 18 DRAINAGE DITCH				WHITE DRAIN WHITE DRAIN			
			ROUTE 1		ROUTE 2		SW2		SW3	
			CONTROL LIMIT	1-Nov-19	SW12	SW13	1-Nov-19	CONTROL LIMIT	1-Nov-19	SW6
			FIELD RESULTS							
pH		6.5-8.5	6.5-8.5	8.09	8.12	8.37	8.00			
Conductivity	uS/cm	2297	2003	970	1030	740	400			
Temperature	°C			8.0	6.4	9.2	8.9			
Turbidity	NTU	62	62	35	28	41	254			
LABORATORY RESULTS										
BOD ₅	mg/L			<5	<5	<5	<5	<5		
Conductivity	uS/cm	2297	2003	790	1470	874	603	282		
pH		6.5-8.5	6.5-8.5	7.82	7.93	7.78	7.78	7.33		
Alkalinity (as CaCO ₃)	mg/L	152	152	246	159	121	50	50		
Chloride	mg/L	595	595	56.6	347	39.5	17.3	21.2		
Nitrate	mg/L			0.33	0.74	0.80	0.19	6.10		
Sulphate	mg/L	193	193	31.3	276	276	181	35.8		
Ammonia (total as N)	mg/L	0.15	0.15	0.27	<0.02	0.99	0.07	0.09		
Phosphorus (total)	mg/L	0.03	0.03	0.18	0.21	0.09	0.17	1.42		
Phenols	mg/L	0.001	0.001	0.001	<0.001	<0.001	0.001	0.001		
Calcium	mg/L	64.8	64.8	83.6	80.5	66.3	31.1	31.1		
Magnesium	mg/L	26.4	26.4	14.9	43.8	26.5	9.49	9.49		
Sodium	mg/L	35.4	35.4	194	33.3	97.3	5.77	5.77		
Potassium	mg/L	17.1	17.1	6.20	19.8	15.6	5.78	5.78		
Aluminum (dissolved)	mg/L	0.075	0.075	0.008	0.015	0.005	0.046	0.046		
Barium	mg/L			0.047	0.080	0.069	0.052	0.041		
Beryllium	mg/L		<0.005	<0.001	<0.001	<0.001	<0.001	<0.001		
Boron	mg/L	0.011	<0.005	0.078	0.025	0.157	0.060	0.032		
Cadmium	mg/L	0.0002	<0.005	<0.0001	<0.0001	<0.0001	<0.0001	0.0001		
Chromium	mg/L	0.01	<0.005	<0.003	<0.003	<0.003	<0.003	<0.003		
Cobalt	mg/L	0.0009	<0.005	<0.0005	0.0006	0.0007	0.007	0.007		
Copper	mg/L	0.005	0.003	0.003	0.002	0.003	0.04	0.007		
Iron	mg/L	0.30	0.97	0.09	<0.01	0.02	0.06	0.07		
Lead	mg/L	0.005	<0.002	<0.001	<0.001	<0.001	<0.002	0.96		
Manganese	mg/L	0.040	0.03	0.034	0.014	0.040	0.031	0.004		
Molybdenum	mg/L	0.025	0.004	0.020	0.003	0.024	0.023	0.023		
Nickel	mg/L	0.025	0.004	0.004	<0.003	0.006	0.004	0.005		
Silver	mg/L	0.0001	0.004	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001		
Strontium	mg/L			1.15	1.98	1.10	0.789	0.154		
Tin	mg/L			<0.002	<0.002	<0.002	<0.002	<0.002		
Titanium	mg/L	0.006	0.011	0.012	0.006	0.008	0.007	0.007		
Vanadium	mg/L			<0.002	0.002	<0.002	0.003	0.003		
Zinc	mg/L	0.006	0.012	0.002	0.006	0.006	0.012	0.012		
Benzene	mg/L		0.03							
Ethylbenzene	mg/L									
Diethyl Xylenes	mg/L									

PARAMETER	UNITS	PWQO	COUNTY ROAD 18 DRAINAGE DITCH				WHITE DRAIN WHITE DRAIN			
			ROUTE 1		ROUTE 2		SW2		SW3	
			CONTROL LIMIT	1-Nov-19	SW12	SW13	1-Nov-19	CONTROL LIMIT	1-Nov-19	SW6
			FIELD RESULTS							
pH		6.5-8.5	6.5-8.5	8.09	8.12	8.37	8.00			
Conductivity	uS/cm	2297	2003	970	1030	740	400			
Temperature	°C			8.0	6.4	9.2	8.9			
Turbidity	NTU	62	62	35	28	41	254			
LABORATORY RESULTS										
BOD ₅	mg/L			<5	<5	<5	<5	<5		
Conductivity	uS/cm	2297	2003	790	1470	874	603	282		
pH		6.5-8.5	6.5-8.5	7.82	7.93	7.78	7.78	7.33		
Alkalinity (as CaCO ₃)	mg/L	152	152	246	159	121	50	50		
Chloride	mg/L	595	595	56.6	347	39.5	17.3	21.2		
Nitrate	mg/L			0.33	0.74	0.80	0.19	6.10		
Sulphate	mg/L	193	193	31.3	276	276	181	35.8		
Ammonia (total as N)	mg/L	0.15	0.15	0.27	<0.02	0.99	0.07	0.09		
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Phenols	mg/L	0.001	0.001	0.001	<0.001	<0.001	0.001	0.001		
Calcium	mg/L	64.8	64.8	83.6	80.5	66.3	31.1	31.1		
Magnesium	mg/L	26.4	26.4	14.9	43.8	26.5	9.49	9.49		
Sodium	mg/L	35.4	35.4	194	33.3	97.3	5.77	5.77		
Potassium	mg/L	17.1	17.1	6.20	19.8	15.6	5.78	5.78		
Aluminum (dissolved)	mg/L	0.075	0.075	0.008	0.015	0.005	0.046	0.046		
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Nickel	mg/L	0.025	0.004	0.004	<0.003	0.006	0.004	0.005		
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Zinc	mg/L	0.006	0.012	0.002	0.006	0.006	0.012	0.012		
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Conductivity	uS/cm	2297	2003	790	1470	874	603	282		
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Alkalinity (as CaCO ₃)	mg/L	152	152	246	159	121	50	50		
Chloride	mg/L	595	595	56.6	347	39.5	17.3	21.2		
Nitrate	mg/L									

NOTES:
1) PWQO denotes Provincial Water Quality Objectives (1994) with updates.
2) "<" denotes the parameter was detected at a concentration less than the method reporting limit (MRL).
3) Shading denotes concentration either exceeds Control Limit or PWQO.
4) Benzene, toluene, ethylbenzene, and total xylenes analyzed during 1st recorded event per year.



ANNUAL REPORT

Essex-Windsor Regional Landfill Composting Operations Report 2019

Report Date: March 31, 2020

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Appendix A

- Map: Compost Pad Site Plan
- Map: Regional Landfill 2019 Site Plan

This document has been formatted for accessibility and is available in other formats upon request.

Regional Landfill Composting Operations Report

Annual Report for January – December 2019

1 Introduction

The Compost Pad is located on the same property as the Essex-Windsor Regional Landfill. The operation is licensed to receive 25,000 tonnes of compostable materials per year. No more than 35,000 tonnes of incoming waste, windrowed waste and finished compost shall be stored on the site at any time. The Essex-Windsor Solid Waste Authority (EWSWA) was responsible for the Compost Pad operation during the period covering this report. Staff of the EWSWA manages the site and operates the weigh scale, provides inspection services, contract administration and maintains the associated records for the site.

1.1 Environmental Compliance Approval

The composting operation is licensed under Environmental Compliance Approval (ECA) No. A 011105 dated August 18th, 1997. In September 2001, November 2004, and August 2016 subsequent amendments were approved which permitted additional quantities of yard waste on the pad to be composted and permitted the addition of a number of new feed stocks to the compost mix. On July 8, 2019 the ECA was further amended to reflect that the compost pad had been relocated to the north-east corner of the landfill site.

As a result of the Ontario Ministry of the Environment, Conservation and Parks (MECP) formerly the Ministry of Environment and Climate Change (MOECC) amendment approved in November 2004, the Compost Pad for the Essex Windsor Regional Landfill was enlarged to accommodate the additional quantities of yard waste approved for composting. In May of 2005, Amico Contracting was commissioned to carry out the Compost Pad Expansion. The work was completed by the end of the summer.

During mid to late 2018 Cell 3 South of the Regional Landfill was constructed. The westerly portion of the compost pad was situated in what was to become Cell 3 South. Similarly, the easterly portion of the compost pad is situated in what will become Cell 4 South. Considering the future construction of Cell 4 South a new pad was constructed at the north-east

corner of the landfill site directly to the east of what will become Cell 5 North. The location is depicted on a map in Appendix A.

1.2 Purpose

The purpose of this report is to fulfill amended condition 31 of the ECA No. A011105, dated September 17, 2001. Condition 31 also states that this report is to be retained on-site and does not need to be submitted to the Ministry.

1.3 Compliance

There were no noncompliance issues during 2019.

2 Inspections, Complaints and Maintenance

2.1 Complaints

A formal complaint process is in place for the Essex-Windsor Regional Landfill and Composting Pad operations. During 2019, one complaint for the site operations were received concerning odour but was not definitively attributed to compost operations.

The family of Terri Colenutt reported odour during the four days prior to their complaint notification on November 26, 2019. The odour was present around 6-7AM each morning. The landfill manager contacted the family and invited them to visit the landfill to better identify the odour but they declined.

2.2 Inspections

The Essex-Windsor Solid Waste Authority provides a full time on site supervisor at the Regional Landfill site. One of the roles of the supervisor is to oversee the compost operation and confirm that all the organics being delivered to the site is inspected as per the ECA. The Authority also employs full time inspectors who inspect all loads of incoming compostable organics for unacceptable material such as plastic bags, refuse etc.

2.3 Maintenance

Staff of the Essex-Windsor Solid Waste Authority carried out the day to day maintenance of the composting area. Some of the duties include picking up litter, snow removal as well as grass and weed cutting.

3 Yard Waste and Compost

3.1 Units of Measure

This report makes use of different units of measure to describe the amounts of the various types of yard waste and compost material. **Tonnes** are used to describe yard waste quantities received from municipalities, businesses and residents because when the material is received at various Authority facilities it is weighed on weighscales. **Cubic metres (m³)** are used to describe the quantity of compost contained within the windrows on the compost pad at the Regional Landfill because that is how the height, width and length of the windrows are measured. **Cubic yards (yd³)** are used to describe the quantity of finished compost sold to various customers because the front-end loader bucket used to measure the compost is specified by its cubic yards capacity.

3.2 Yard Waste Quantities

The quantity of decomposing organics and finished compost on the Regional Landfill Compost Pad can vary significantly depending on the time of year and annual weather patterns.

In 2019 an amount of 10,290 tonnes of yard waste was brought directly to the Regional Landfill Composting site by generators of yard waste or their haulers. An additional 16,776 tonnes was transferred to the site from the Authority's Windsor Public Drop-off Depot for a total of 27,066 tonnes of yard waste. As noted previously once the compost is finished decomposing the final product is screened and marketed.

During 2019, as each compost windrow cured, Authority staff measured the amount of compost that was ready to be screened to become the final compost product available for sale. Authority staff measured the length, width and height of the windrows and for all of 2019 it was calculated that 37,810 m³ of compost was ready to be screened. After the screening process removed the "overs", 28,674 m³ of finished compost was set aside available for sale. The overs are generally disposed of at the Regional Landfill tipping area but occasionally they are reintroduced into the existing compost rows for further composting depending on the amount of finished compost remaining in the overs.

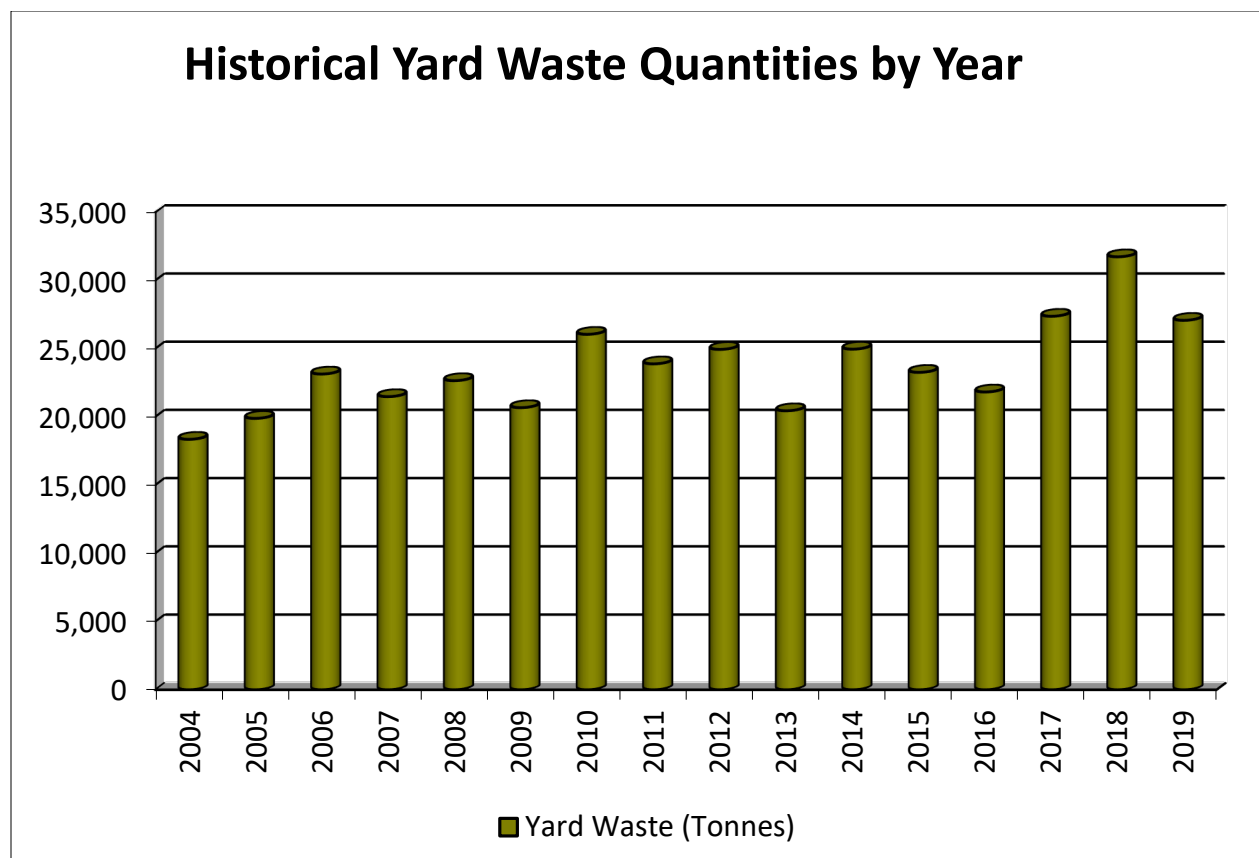


Figure 1: Historical Yard Waste Quantities

3.3 Sale of Compost

After approximately 12 months of processing the yard waste received by the Authority, it is turned into compost. Compost is a nutrient rich organic material which provides many benefits to soil and is essential for healthy plant growth. In 2019 the compost produced at the Regional Landfill was marketed to the public and private sector users in bulk, delivered, sold as “bag your own” and in pre-bagged packaging. The product was sold at the EWSWA depot in Windsor and Transfer Station 2 in Kingsville. The sales for 2019 were as follows:

Table 1: Compost Sales Summary 2019

Compost Material	Quantity	Tonnes
Delivered	750 cubic yards	441
Bulk Sales	25,251 cubic yards	14,848
Bag Your Own Compost	1,488 bags	40
Prepackaged Garden Gold Compost	11,998 bags	228
Totals:	\$227,185 Revenue	15,557

Table 1 Notes: Pre-packaged bag weights are based on approximately 18kg/bag; Bag-Your-Own is approximately 27kg/bag; Bulk compost is approximately 588kg/cubic yard.

Delivered Compost Sales

Sales of delivered compost represent, for the most part, sales of larger dump-truck sized loads of compost to residential customers. The Authority engaged Frank Dupuis Landscaping & Trucking to provide the delivery services on behalf of the Authority.

Bulk Compost Sales

Sales of bulk loads of compost represents the sale of larger amounts of compost to those residential customers who attend Authority facilities and purchase pick-up sized loads or trailer sized loads. It also represents sales of compost to larger business customers such as landscaping companies or nurseries who acquire many thousands of yards of compost under take-or-pay agreements with the Authority.

Bag Your Own Compost Sales

Sales of bag-your-own compost represent the sale of compost to those residential customers who attend Authority facilities and purchase compost that they load into one or more large paper bags.

Pre-packaged Compost Sales

Sales of pre-packaged compost represents the sale of compost to those residential customers who attend Authority facilities and purchase compost

which has been pre-packaged by the Authority in sealed smaller plastic bags which are easy to lift, carry and place in gardens at the resident's home.

3.4 Compost Quality

As per Conditions 29 and 30 of the ECA No. A011105 detailed monitoring, inspection and waste tracking logs are being retained on site for a minimum period of two years for review upon request. During 2019, 7 finished compost samples were collected and sent to an accredited lab for analysis. All the samples of finished compost were analyzed for metal concentrations, pathogens, maturity and foreign matter. In all cases the finished compost product exceeded MOECC compost quality criteria and was classified as A Compost as per Canadian Council of Minister of the Environment (CCME) Compost Quality Standards.

Tom Marentette

Manager, Waste Disposal



Eli Maodus

General Manager



Report prepared by: **Margaret Shires**, Administrative Assistant

Appendix A

- Map: Compost Site Location Plan
- Map: Regional Landfill 2019 Site Plan








ESSEX-WINDSOR SOLID WASTE AUTHORITY
360 FAIRVIEW AVE. W., ESSEX, ONTARIO, N6M 1Y6
(519) 776-6441 1-800-563-3377 FAX: (519) 776-6370



KEY:

[illegible]

Gas Collection System

 Positive flare
 Vacuum flare
 Gas well

**ESSEX - WINDSOR
SOLID WASTE AUTHORITY
REGIONAL LANDFILL
2019 SITE PLAN**

AUTOCAD FILE:
RLF_2019.dwg

DRAWN BY:

A.E.B.B.

DATE: DEC. 31, 2019

SCALE: AS SHOWN



MEMO

TO: Mr. Tom Marentette (Essex-Windsor Solid Waste Authority)

FROM: Jenna McVitty (WSP)
Radwan Tamr (WSP)

SUBJECT: **Summary of Fall 2019 Compliance Monitoring and Leachate Management Program Monitoring Tasks; Essex-Windsor Regional Landfill, EWSWA**

DATE: February 12, 2020

Please find below a summary of the analytical results and field observations for the Fall 2019 compliance sampling and monitoring event at the Regional Landfill for your file. The findings presented in this memo will also be provided in the routine monitoring reporting.

SUMMARY OF THE FALL/OCTOBER MONITORING DATA FOR REGIONAL LANDFILL

GROUNDWATER SAMPLING RESULTS

The following summary is based on the analytical results of the groundwater samples collected from the existing monitors during the October and subsequent verification 2019 events.

- Regularly scheduled groundwater sampling for the October event included monitors in the shallow flow system and upper sand groundwater system.
- It should be noted that the preliminary data analysis includes the comparison of the reported data with established Predictive Standards for each monitor and the applicable Ontario Drinking Water Quality Standards (ODWQS). Selected parameters for predictive standards include the primary leachate indicator parameters chloride and boron as well as sulphate, alkalinity, calcium, magnesium, sodium, potassium, and barium. Chloride and boron have been selected as the primary indicator parameters due to their mobility in groundwater, elevated concentrations in leachate, and representation for larger groups of parameters (chloride for inorganic chemicals and boron for metals).
- Also, and as per the conditions of approval for the Regional Landfill, an exceedance of a predictive standard includes an assessment of the other parameters (including historical data) and a concentration trend analysis to determine if the exceedance is anomalous or related to natural variability. If the exceedance appears potentially landfill related the monitor is to be resampled within 6-8 weeks.
- Monitors that were dry during the October sampling event and could not be sampled included monitors 8-III, 11-V, 28-V, 59A-III, 60-III, 95-III, 97-III, and 105. These monitors will be sampled during the April 2020 event, if possible, based on site conditions at that time.
- Monitors 9-III and 95-I had reported parameters exceeding the established Predictive Standards. for one of the primary indicator parameters, chloride and boron, for the 2019 monitoring period. These

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monitors were resampled in December 2019 for verification/internal review. The location of monitors is shown on the attached site map.

- Monitor 9-III reported a minor exceedance for boron. The monitor is screened within the Shallow Flow System and is considered a background well as it is located northeast of Cell 4 North. Based on concentration trend analysis for the two primary indicator parameters, chloride remains acceptable at this location and does not appear to be increasing with time. Boron concentrations appear to be fluctuating with time. The October 2019 boron concentration was slightly above the historical range for the monitor. However, given the monitor is a background monitor, the boron concentration is not likely a result of a potential leachate effect at this location during this sampling event.
- Monitor 95-I reported a minor exceedance for chloride. The monitor is screened within the Upper Sand Flow System, upgradient of the waste, north of Cell 2. Based on concentration trend analysis for the two primary indicator parameters, boron remains acceptable at this location and does not appear to be increasing with time. Chloride concentrations have remained fairly constant with time as well, however, the chloride concentration in October 2019 was slightly above the historical high for this monitor. The detected chloride concentration is not likely a result of a potential leachate effect.
- Multiple exceedances of the ODWQS for sulphate and sodium occurred for the sampled monitors, and alkalinity exceeded the ODWQS for monitors 99-III and 103-III. The reported sulphate, sodium, and alkalinity concentrations were within their respective historical ranges for the sampled monitors. Sulphate, sodium, and alkalinity are not health-related parameters and only affect the aesthetic quality of the water.
- Given there were no ODWQS exceedances of the primary indicator parameters, chloride and boron, the detected sulphate, sodium, and alkalinity exceedances appear to be associated with variable groundwater quality and not likely related to a potential landfill impact.
- Predictive Standards have not been established for Monitors 95-III, 97-I, 98-I/III, 99-I/III, 100-I/III, 101-I/III, 102-I/III, and 103-I/III, due to minimal data sets from recent installation. However, these monitors were compared to the ODWQS as well as concentration trends established from available data acquired since installation. The reported concentrations met the ODWQS standards with the exceptions of sulphate, sodium, and alkalinity, as discussed above. Chloride and boron concentrations for these monitors remained within their respective available limited historical ranges.
- The reported concentrations were non-detect for all monitors that were sampled for benzene, toluene, ethylbenzene, and total xylenes (BTEX), with the exception of monitoring well 98-III where toluene was detected at a concentration of 0.44 ug/L. The reported concentration is well below the ODWQS for toluene (60 ug/L). Monitor 98-III was installed in February 2019. The toluene concentration in April 2019 for Monitor 98-III was detected at a concentration of 0.87 ug/L. Toluene will continue to be monitored at this location as part of the regular compliance monitoring program.

ADDITIONAL GROUNDWATER SAMPLING RESULTS

- Monitors 9-III and 95-I were resampled on December 4, 2019. The Monitors were purged and sampled as per standard operating procedures.
- The reported boron concentration for Monitor 9-III decreased from 0.147 mg/L to 0.096 mg/L in the verification sampling event. The verification sample concentration of 0.096 mg/L meets the established Predictive Standard concentration of 0.145 mg/L for the Monitor. Further evaluation will be completed upon subsequent monitoring events.
- The reported chloride concentration for Monitor 95-I decreased from 99.9 mg/L to 73.1 mg/L in the verification sampling event. The verification sample concentration of 73.1 mg/L meets the established



Predictive Standard concentration of 89 mg/L. Further evaluation will be completed upon subsequent monitoring events.

- No other additional sampling was required.

LEACHATE SAMPLING RESULTS

- A leachate sample was collected from Pump Station PS3 (representative of the leachate produced from the West Cell) as part of the routine compliance monitoring program and leachate management program on October 29, 2019. The reported concentrations were below the laboratory method detection limits for the semi-volatile organic compound (SVOC) and volatile organic compound (VOC) analyzed parameters. The remaining parameters analyzed for the PS3 sample were within their historical ranges, with the exception of nitrate which was above the historical range. The elevated nitrate concentration is likely a result of agricultural run-off. Nitrate will continue to be monitored in the leachate as per the compliance monitoring program.

LEACHATE MANAGEMENT PLAN ECA, LTS AND LTRS OCTOBER 2019 SOIL SAMPLING RESULTS

Composite shallow soil samples from the Environmental Control Area (ECA) were collected at depths of 15 cm, 60 cm, and 125 cm below existing grade surface (bgs) on October 29, 2019 as part of the Leachate Management Program (LMP) and submitted for laboratory analytical chemical analysis.

- Where parameter concentrations exceeded the target guidelines (soil concentration indicators/MECP Standards) they were within their historical range and are considered to be naturally present within the soil at similar concentrations.

Composite shallow soil samples from the Leachate Treatment System (LTS) were collected at depths of 15 cm, 60 cm, and 125 cm bgs on October 29, 2019 as part of the LMP and submitted for analysis.

- Typical target guidelines (soil concentration indicators/MECP Standards) were exceeded within the shallow soil of the LTS for boron, EC, and sodium absorption ratio (SAR) for the 15 cm depth sample, EC, arsenic, molybdenum and nickel for the 60cm depth sample, and EC, arsenic, molybdenum, and nickel within the 125 cm depth sample. Where the exceedances were noted, the concentrations were within their historical ranges, except for EC for the 60 cm and 125 cm depth samples which were slightly above their respective historical ranges.

Composite shallow soil samples from the Land Treatment and Recirculation System (LTRS) were collected at depths of 15 cm, 60 cm and 90 cm bgs on October 29, 2019 as part of the LMP and submitted for analysis.

- Typical target guidelines (soil concentration indicators/MECP Standards) were exceeded within the shallow soil of the LTRS for EC and nickel for the three sample depths, SAR and boron for the 15 cm depth sample, SAR, boron, and molybdenum for the 60 cm depth sample, molybdenum for the 90cm depth sample. Where exceedances were noted, the concentrations were within their historical ranges, with the exceptions of SAR for the 60 cm depth sample.



LEACHATE MANAGEMENT PLAN ECA AND LTS OCTOBER 2019 VEGETATION SAMPLING RESULTS

Vegetation samples were collected on October 30, 2019 from the following areas: 1) the LTS spray area, 2) the LTS trickle area, and 3) the control area south of the LTS spray application area.

Based on the chemical analytical results, the reported concentrations varied for samples from the ECA and the two LTS treatment areas. There is no notable pattern in comparison of the spray area with the trickle area.

In general, concentrations were greater (or similar) in the leachate application areas than in the ECA. The elevated boron concentrations in the vegetation generally corresponded with the detected boron concentrations in the soil samples from each location.

Considering concentration changes with time, the constituent concentrations within the ECA were similar to historical concentrations, with the exception of the concentration of phosphorus which was slightly elevated compared to recent and historical concentration data. The increased phosphorus concentration may be associated with the decay of organic material such as plant material. The elevated TKN concentrations noted in 2018 decreased in 2017 and returned to typical concentrations as noted in previous years.

The chemical concentrations within the vegetation tissue analytical results for the two LTS treatments areas were generally similar to recent years and within their historical ranges, with the exceptions of phosphorus for the spray area and TKN for the trickle area. The reported concentrations are likely associated with the variable soil conditions at the sampled locations.

LAB QUALITY ASSURANCE/QUALITY CONTROL (QA/QC) RESULTS

The groundwater, leachate and shallow soil duplicate field samples were collected in 2019 by WSP and submitted to AGAT laboratory for chemical analysis.

Groundwater:

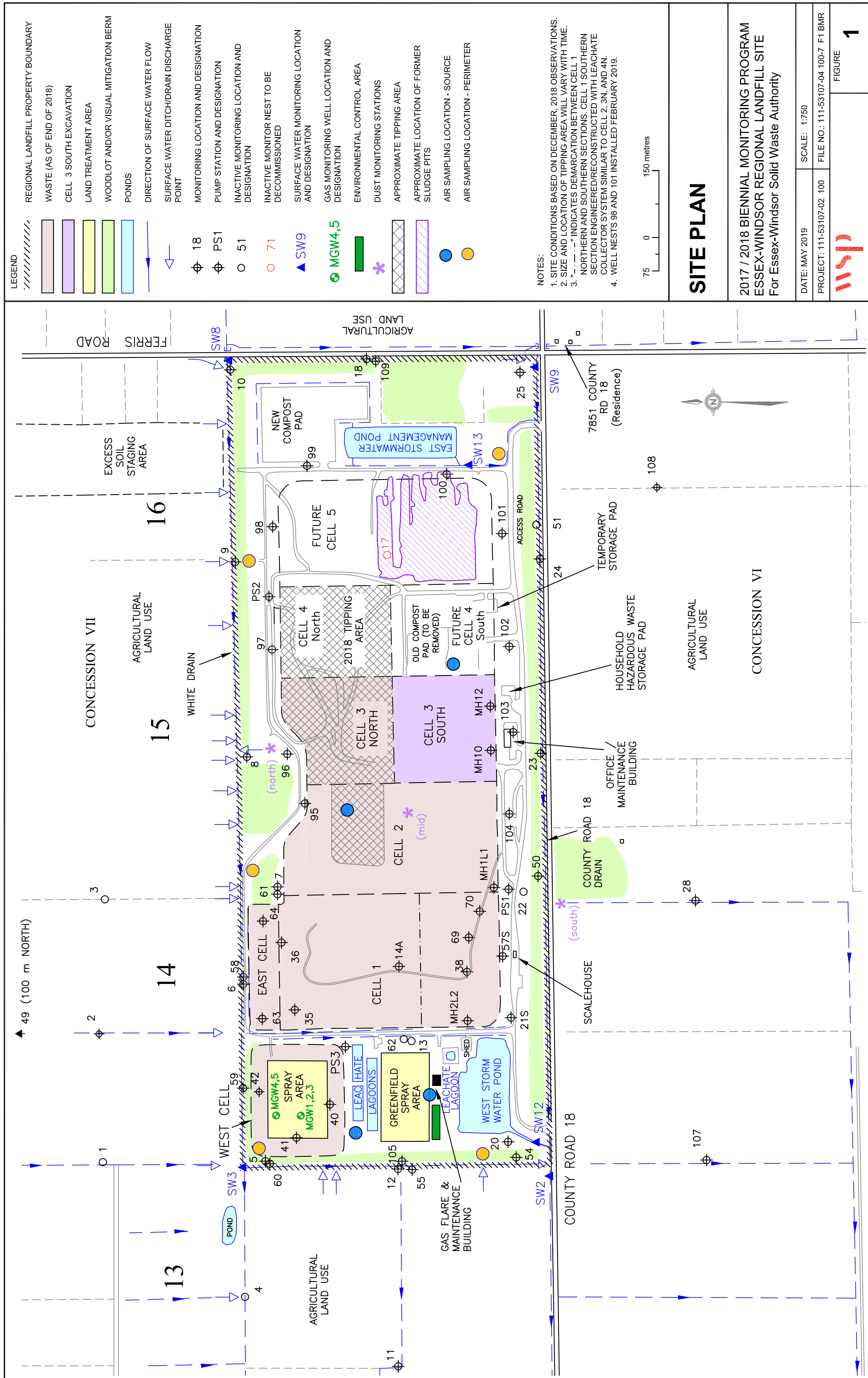
- There were no issues with the reported groundwater QA/QC laboratory analytical results.

Leachate:

- Total Organic Carbon concentration for the duplicate leachate sample differed to the original sample by greater than 20% relative percent difference. However, there were no QA/QC violations reported by the laboratory in the certificate of analysis. The lab duplicates, method blanks, reference materials, method blank spikes, and matrix spikes were within their required ranges. Therefore, the reported chemical data for the leachate samples is considered accurate as reported and does not affect the quality of the data.

Soil:

- Several parameters for the duplicate soil sample differed to the original sample by greater than 35% relative percent difference. However, there were no QA/QC violations reported by the laboratory in the certificate of analysis. The lab duplicates, method blanks, reference materials, method blank spikes, and matrix spikes were within their required ranges. Therefore, the reported chemical data for the soil samples is considered accurate as reported and does not affect the quality of the data.





Essex-Windsor Solid Waste Authority

Essex-Windsor Regional Landfill

Quarterly Operations Report

Report Date Range: July - September, 2019

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- Precipitation Charts
- Contact Form
- Report Distribution

This document is available in other formats upon request

Essex-Windsor Regional Landfill

Quarterly Operations Report for July – September, 2019

1 Introduction

The Essex-Windsor Regional Landfill Site is located in part of Lot 14, 15, and 16, Concession 7, in the Town of Essex. The Site is licensed by the Ontario Ministry of Environment under Environmental Compliance Approval No. A011101 (September 28, 1995).

2 Compliance

There were no incidents of non-compliance during the third quarter of 2019.

3 Waste Disposal Operations

3.1 Waste Quantities

The waste quantities disposed of during the third quarter of 2018 and 2019 were as follows:

Table 1A: Waste Quantities and Average Daily Waste for 2018 and 2019

Month	2018 Waste (Tonnes)	2018 Daily Waste (average)	2019 Waste (Tonnes)	2019 Daily Waste (average)
July	25,231.09	1,009	21,007.59	808
August	21,683.01	834	24,020.39	924
September	17,093.15	712	19,335.92	806

Table 1B: Waste Vehicles by Month and Daily Average for 2018 and 2019

Month	2018 Waste Vehicles	2018 Vehicles/Day (average)	2019 Waste Vehicles	2019 Vehicles/Day (average)
July	1,763	71	1,587	63
August	1,558	60	1,794	69
September	1,239	50	1,490	60

3.2 Special Waste

The special waste quantities disposed of during the third quarter of 2019 were as follows:

Table 2: Special Waste Loads for 2019

Month	Bleaching Clay Loads
July	13
August	13
September	2

Table 3A: Sewage Sludge Tonnes for 2019

Month	Essex	Amherstburg	Leamington	Kingsville	Windsor	Total Tonnes
July	0.00	127.87	0.00	116.75	8.75	253.37
Aug.	13.65	118.23	0.00	121.68	0.00	253.56
Sep.	15.20	117.72	0.00	119.63	0.00	252.55

Table 3B: Sewage Sludge Tonnes for 2018

Month	Essex	Amherstburg	Leamington	Kingsville	Windsor	Total Tonnes
July	33.41	93.25	301.72	71.33	0.00	499.71
Aug.	30.54	107.09	46.42	120.95	0.00	305.00
Sep.	36.62	69.83	0.00	120.92	0.00	227.37

The following loads of Asbestos were disposed of at the Regional Landfill during the third quarter:

July 2019

There were 14 loads of Asbestos during the month of July. WDS brought two loads, one from a residence in Amherstburg and one from Ford Motor of Canada, Windsor. Coxon Towing brought nine loads; five loads from Windsor residences, one load from Windsor Salt, one from a residence in Belle River, one from Canada Post, Belle River and one from Hotel Dieu Hospital, Windsor. Enviro Disposal brought three loads; one from DNC Insulation, Lakeshore, one from Kingsville Curling Club and one from the University of Windsor.

August 2019

There were 14 loads of Asbestos disposed of in August. WDS brought three loads; two from Lakeshore residences and one from a Harrow residence. Coxon Towing brought four loads; two from Windsor residences, one from a Kingsville residence and one from University of Windsor. Enviro Disposal brought seven loads; four from an Amherstburg residence, one from a residence in Lakeshore, one from a Windsor residence and one from a Kingsville residence.

September 2019

There were a total of 8 loads disposed of at the Landfill during September. WDS brought one load from a Lakeshore residence. Coxon Towing brought five loads; one from Assumption Church, Windsor, three from Windsor residences and one from a LaSalle residence. Enviro Disposal brought two loads; one from Paul Martin Building, Windsor and one from a Windsor residence.

3.3 Waste Diversion from Refuse

The Scale Clerk, Waste Inspectors and equipment operators are required to question waste haulers about the nature of the wastes being disposed of, and to look for suspicious, unauthorized, or banned materials present in a load. If waste of this type is brought to the site by a licensed commercial hauler the material is not landfilled. It is removed and diverted to either the MHSW area or appropriate onsite storage/collection area.

Table 4: Waste Units Diverted from the Landfill

Source of Loads	Material Type	July	August	September
County Towing	Tires	0	2	0
County Towing	Electronics	2	0	0
County Towing	MHSW	0	0	1
Transfer Station	Tires	1	2	1
Transfer Station	Electronics	1	0	0
Transfer Station	MHSW	0	0	0
Coxon Towing	Tires	2	0	0
Coxon Towing	Appliances or Electronics	0	0	0

Essex-Windsor Regional Landfill Quarterly Report: July – September 2019

Source of Loads	Material Type	July	August	September
Double Diamond	Refrigerants	1	0	0
WDS	Metal	0	0	1
WDS	Tires	5	6	3
WDS	MHSW	1	2	2
WDS	Refrigerants	0	0	1
WDS	Appliances or Electronics	4	5	6
Total Units Banned:		17	17	15

Table 5A: 2019 Waste Stream Analysis by Month (Tonnes)

Material Type	July	August	September
Municipally Delivered Refuse	2,233.65	2,090.22	2,015.37
Municipal Clean Up	0.06	20.27	3.80
Recycling Fibre Residual	156.85	339.22	296.92
Municipal Construction/Demo	0.00	0.00	0.00
Pollution Control Grit	133.46	69.43	95.83
Municipal Sewage Sludge	253.37	253.56	252.55
Residentially delivered Refuse	4.67	4.12	1.41
Residentially Construction/Demo	0.97	0.09	0.66
Residentially delivered Shingles	0.47	0.39	0.00
Charitable Organizations	5.09	18.65	5.71
Contaminated Soil	118.31	2,314.38	1,706.96
Vines-Greenhouse	4,449.01	4,736.03	2,734.94
Greenhouse - Waste	1,008.60	1,066.23	796.74
IC&I Delivered Refuse	2,058.96	2,664.30	1,738.81
IC&I Construction/Demolition	277.39	713.54	444.20
IC&I Shingles	37.09	21.95	40.27
Asbestos	40.66	57.28	19.35
Transfer Stations	10,228.98	9,650.73	9,182.40
Grand Totals:	21,007.59	24,020.39	19,335.92

Table 5A Notes: Transfer Station refuse includes Windsor Transfer Station 1 and Kingsville Transfer Station 2.

Table 5B: 2019 Waste Stream Analysis by Quarter and Percent

Material Type	Q3 Tonnes	Percent of Total Waste
Municipally Delivered Refuse	6,339.24	9.85%
Municipal Clean Up	24.13	0.04%
Recycling Fibre Residual	792.99	1.23%
Municipal Construction/Demo	0.00	0.00%
Pollution Control Grit	298.72	0.46%
Municipal Sewage Sludge	759.48	1.18%
Residential delivered refuse	10.20	0.02%
Residentially Construction/Demo	1.72	0.00%
Residentially delivered Shingles	0.86	0.00%
Charitable Organizations	29.45	0.05%
Contaminated Soil	4,139.65	6.43%
Vines-Greenhouse	11,919.98	18.52%
Greenhouse - Waste	2,871.57	4.46%
IC&I Delivered Refuse	6,462.07	10.04%
IC&I Construction/Demolition	1,435.13	2.23%
IC&I Shingles	99.31	0.15%
Asbestos	117.29	0.18%
Transfer Stations	29,062.11	45.15%
Grand Totals:	64,363.90	100%

Table 5B Notes: Transfer Station refuse includes Windsor Transfer Station 1 and Kingsville Transfer Station 2.

3.4 Compaction

The compaction rate performance criterion is 600 kg/m³. The compaction rates and relation to the performance criteria is as follows:

Table 6: Compaction Results for Third Quarter 2019

Month	Compaction kg/m3	Criteria Percentage
July	776.30	+ 29.4%
August	806.48	+34.4%
September	759.30	+26.6%

4 Complaints

There were no complaints during the third quarter of 2019. On August 8, 2019, Terri Colenutt contacted the Waste Disposal Manager to compliment the efforts taken to reduce odour issues. Though there were some slight odours noted overall, she indicated a vast improvement and nothing to complain about.

5 Site Development and Maintenance

5.1 Development of Disposal Areas

Disposal operations were conducted in Cell 4 North. Cell 3 South construction started approximately the third week of May.

5.2 Vegetation

Grass cuts of slopes and cells were completed as required during this quarter.

5.3 Drainage

There was no activity during this quarter.

5.4 Roads and Site Maintenance

The water truck and the front end loader were used as required to maintain the roads during the months of July through September.

5.5 Composting Area

There were 304 loads of compost brought in July totalling 3,392.22 tonnes, 238 loads in August totalling 2,958.01 tonnes and 210 loads in September totalling 1,830.53 tonnes.

5.6 Cover Material

The site received the following quantities to use as cover material during this quarter:

Table 7A: 2019 Cover Material Tonnage for Third Quarter

Cover Material Type	July	August	September
Auto Shredder Fluff	2,465.17	2,643.53	2,465.79
Alternate Daily Cover	312.33	1,117.80	3,069.99
Total Tonnes:	2,777.50	3,761.33	5,535.78

Table 7B: 2019 Cover Material Loads for Third Quarter

Cover Material Type	July	August	September
Auto Shredder Fluff	66	70	66
Alternate Daily Cover	22	44	107
Total Loads:	88	114	173

5.7 Other Activities

There were no other activities noted this quarter.

6 Leachate Management

6.1 Leachate Quantities

There was 12,823.34 tonnes leachate hauled off site in July, 4,166.76 tonnes in August and 3,975.95 tonnes in September.

6.2 Leachate System Maintenance

Systems were cut bi-weekly to control invasive Johnson grass and help Reed Canary Grass to spread.

6.3 Leachate Land Application

The leachate application systems operations and quantities are as follows:

West Cell Spray System

During the month of July, the system was operated for 5 days and 474 m³ was applied. In August 1,443 m³ were applied over 15 days and in September, 518 m³ were applied over 8 days. A total of 2,435 m³ was applied to the area during the third quarter.

Leachate Land Treatment System (Spray)

During the third quarter the system was not operated due to significant weather and operational breakdowns. The system is expected to be fully operational in 2020.

Leachate Land Treatment System (Trickle)

During the third quarter the system was not operated as previously stated.

7 Monitoring Programs

7.1 Ground Water and Surface Water Monitoring

There were no storm events recorded at the Regional Landfill during the third quarter sampling was completed following a combined precipitation of 26.2 mm September 11 and 12, 2019. Ground water levels were monitored August 12 and 13, 2019. Pond chemistry was collected July 31, August 13 and September 10, 2019.

7.2 Leachate Monitoring

Leachate level samples were collected on July 29, August 27 and September 10, 2019 by WSP.

7.3 Precipitation Monitoring

The precipitation quantities were as follows:

Table 8: Precipitation Comparison 2018 and 2019

Month	2018 millimetres	2019 millimetres	Percent Change
July	6.8	58.9	766.2%
August	20.5	64.0	212.2%
September	69.9	78.0	11.6%

7.4 Other Monitoring Programs

The West Cell gas monitoring was completed July 29, August 27, and September 10, 2019.

Public Relations

A landfill tour was conducted on September 19, 2019.

Bird Control Program

The Bird Control System is functioning as designed.

Tom Marentette

Manager, Waste Disposal

A handwritten signature in black ink, appearing to read 'Tom Marentette', with a large, rounded loop at the end.

Dan Van Horn

Supervisor, Waste Disposal

A handwritten signature in black ink, appearing to read 'Dan Van Horn', with a large, stylized 'D' and a horizontal line extending to the right.

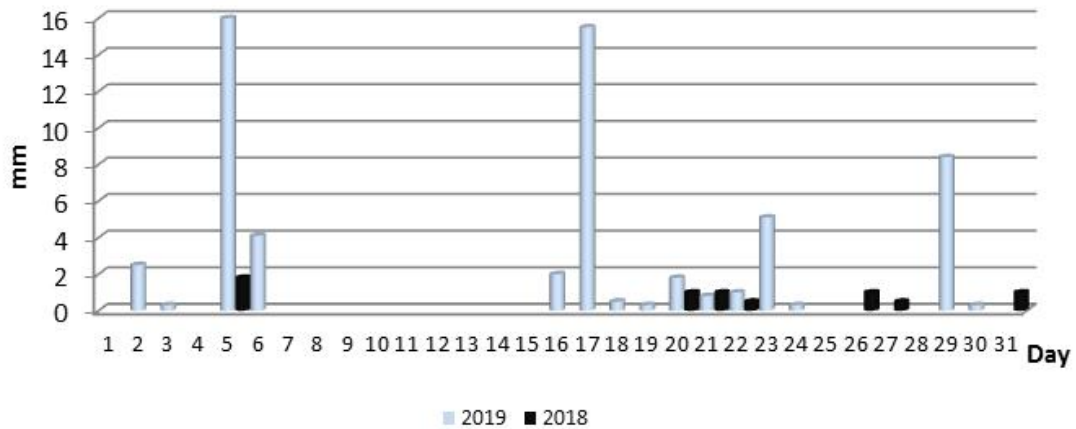
Report prepared by:

Margaret Shires, Administrative Assistant

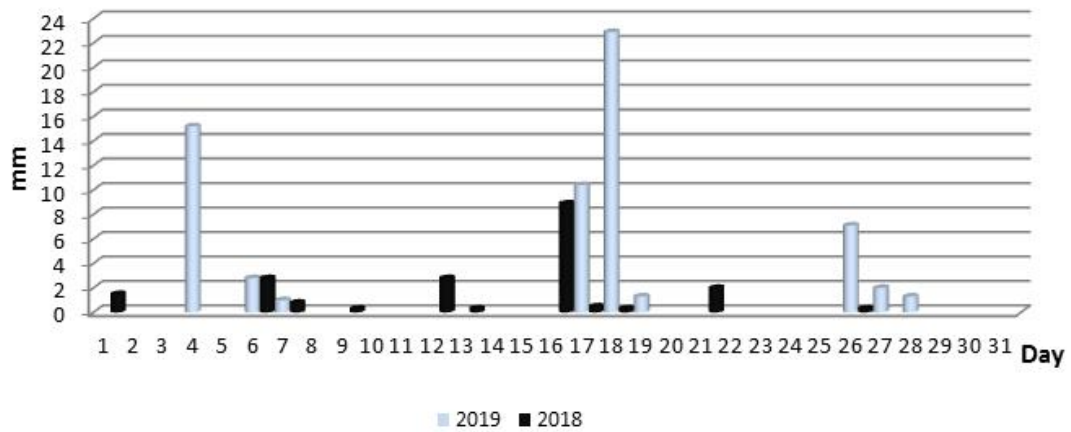
Appendix

- Precipitation Monitoring
- Contact Form
- Report Distribution

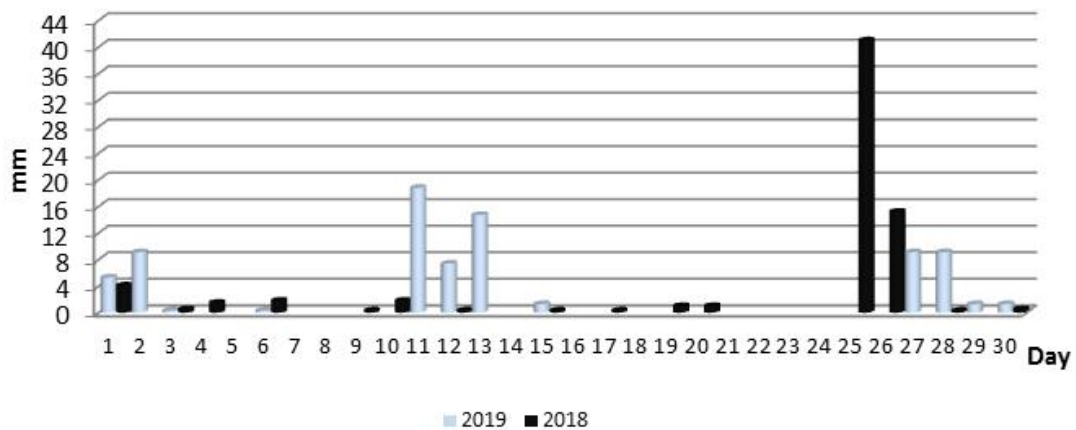
July Precipitation Comparison



August Precipitation Comparison



September Precipitation Comparison





Essex-Windsor Solid Waste Authority

360 Fairview Ave. West, Suite 211 Essex, ON N8M 3G4

ph: 519-776-6441 f: 519-776-6370

tf: 1-800-563-3377 / tty: 1-877-624-4832

email: ask@ewswa.org / web: www.ewswa.org

Complaint Form

Details of Complaint

Date of Occurrence: August 8, 2019

Time of Occurrence: 8:00 am

Complainant Name: Terri Colenutt

Address: Ferris Sideroad

Phone Number: 519-551-1737

Email: None

New Complaint: ☐ **Repeat Complaint:** ☒

Nature of Complaint: ☐ Debris, ☒ Odour, ☐ Dust, ☐ Noise, ☐ Mud on the Road,
☐ Service, ☒ Other, Compliment.

Location of Occurrence (Please Include Map where relevant): See attached

Complaint Received By: Tom Marentette

Date Complaint Received: Aug. 8, 2019

Description of Occurrence:

Hi Tom, it's Terri Colenutt calling back on the Ferris Side Road, just calling about the dump. just wanted to put a call in, I have been thinking about it for months now to thank you, we hardly have any smells at all anymore. We had slight odour this morning and one last week but nothing to complain about so I just wanted to thank you and I appreciate whatever you've done down there and have a good day, okay, thanks.

Weather Conditions at location at time of Occurrence: not applicable

Action Taken

Forwarded to: Tom Marentette

Date Forwarded: August 8, 2019

Resolution: Noted and filed.

Follow Up Required:

☐ Yes ☒ No

Complainant Contacted with Resolution:

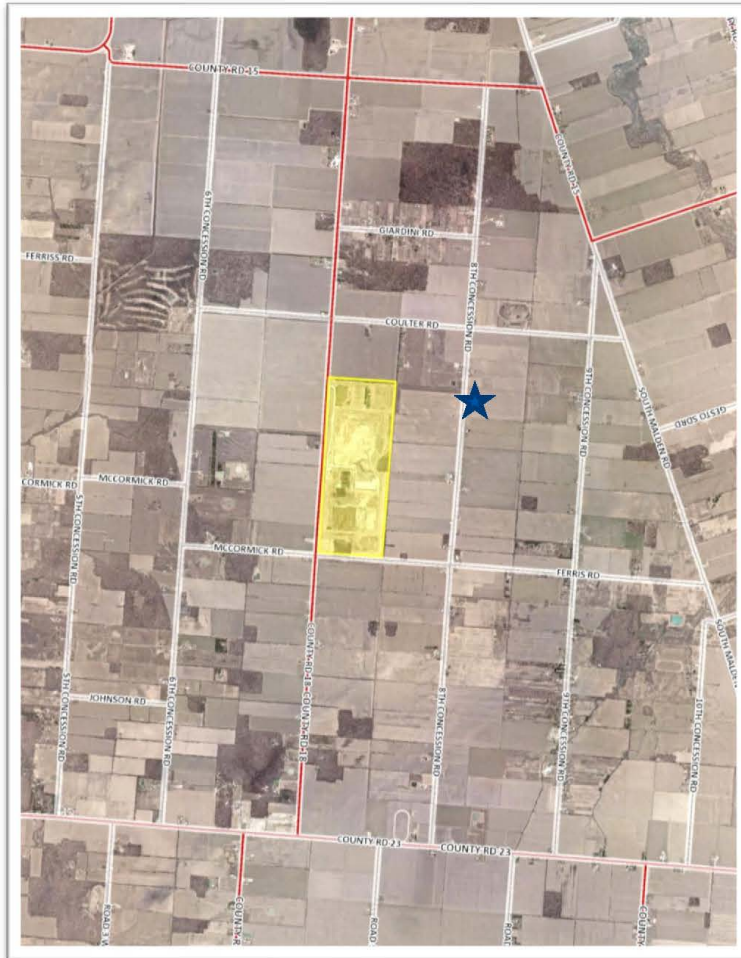
☒ Yes ☐ No

Contacted By:

Map of Regional Landfill Area

(Please indicate on the map the location related to the complaint)

Notes:



Report Distribution

- Landfill Liaison Committee Chairperson
- WSP Canada, Inc.



Essex-Windsor Solid Waste Authority

Essex-Windsor Regional Landfill

Quarterly Operations Report

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- Precipitation Charts
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Essex-Windsor Regional Landfill

Quarterly Operations Report for October - December, 2019

1 Introduction

The Essex-Windsor Regional Landfill Site is located in part of Lot 14, 15, and 16, Concession 7, in the Town of Essex. The Site is licensed by the Ontario Ministry of Environment under Environmental Compliance Approval No. A011101 (September 28, 1995).

2 Compliance

There were no incidents of non-compliance during the fourth quarter of 2019.

3 Waste Disposal Operations

3.1 Waste Quantities

The waste quantities disposed of during the fourth quarter of 2018 and 2019 were as follows:

Table 1A: Waste Quantities and Average Daily Waste for 2018 and 2019

Month	2018 Waste (Tonnes)	2018 Daily Waste (average)	2019 Waste (Tonnes)	2019 Daily Waste (average)
October	20,638.96	794	20,839.74	802
November	30,286.81	1,165	48,473.70	1,861
December	29,250.33	1,219	44,458.03	1,853

Table 1B: Waste Vehicles by Month and Daily Average for 2018 and 2019

Month	2018 Waste Vehicles	2018 Vehicles/Day (average)	2019 Waste Vehicles	2019 Vehicles/Day (average)
October	1,596	64	1,626	65
November	2,200	85	3,083	119
December	2,114	88	2,920	122

3.2 Special Waste

The special waste quantities disposed of during the fourth quarter of 2019 were as follows:

Table 2: Special Waste Loads for 2019

Month	Bleaching Clay Loads
October	8
November	5
December	9

Table 3A: Sewage Sludge Tonnes for 2019

Month	Essex	Amherstburg	Windsor	Kingsville	Total Tonnes
October	30.30	142.50	22.33	138.46	333.59
November	36.29	98.02	0.00	99.84	234.15
December	31.33	68.75	0.00	131.51	231.59

Table 3B: Sewage Sludge Tonnes for 2018

Month	Essex	Amherstburg	Windsor	Kingsville	Total Tonnes
October	37.45	90.30	0.00	106.56	234.31
November	55.28	61.40	0.00	91.40	208.08
December	23.86	91.55	0.00	125.87	241.28

The following loads of Asbestos were disposed of at the Regional Landfill during the fourth quarter:

October 2019

There were 4 loads of Asbestos during the month of October. Coxon Towing brought two loads, both from Windsor residences. Sterling Ridge Contracting brought two loads both from sewer work in Kingsville.

November 2019

There were 13 loads of Asbestos disposed of in November. Coxon Towing brought seven loads; one from a Windsor residence, one from a Lakeshore residence and five from Hotel Dieu Hospital, Windsor. WDS brought three loads; two from Windsor residences and one from a Leamington residence.

Enviro Disposal brought three loads; two from Windsor residences and one from R.C. White/multiple locations.

December 2019

There was a total of 7 loads disposed of at the Landfill during December. Coxon Towing brought three loads all from Windsor residences. WDS brought four loads; two from a Leamington residence, one from Hiram Walkers, Windsor and one from Ford Motor of Canada, Windsor.

3.3 Waste Diversion from Refuse

The Scale Clerk, Waste Inspector and the Contractor's employees are required to question waste haulers about the nature of the wastes being disposed of, and to look for suspicious, unauthorized, or banned materials present in a load. If wastes of this type are brought to the site by a licensed commercial hauler the material is not landfilled and is returned with the hauler for proper disposal or recycling.

Table 4: 2019 Waste Units Diverted from the Landfill

Source of Loads	Material Type	October	November	December
County Towing	Appliances or Electronics	0	0	1
County Towing	Tires	0	0	1
Transfer Station 1	Appliances or Electronics	2	0	0
Transfer Station 1	Tires	2	0	1
Nature Fresh	Tires	0	0	1
Nature Fresh	Appliances or Electronics	0	1	0
Dimena Construction	Appliances or Electronics	0	2	0
WDS	Car Battery	0	1	0
WDS	Tires	1	1	0
WDS	Propane Tank	1	0	0
WDS	Appliances or Electronics	6	3	4
Total Units Banned:		12	8	8

Table 5A: 2019 Waste Stream Analysis by Month (Tonnes)

Material Type	October	November	December
Municipally Delivered Refuse	2,241.45	1,961.67	1,822.86
Municipal Clean Up	0.96	3.06	1.48
Recycling Fibre Residual	225.88	120.92	281.64
Municipal Construction/Demo	0.00	0.00	0.00
Pollution Control Grit	123.31	69.05	77.09
Municipal Sewage Sludge	333.59	234.15	231.59
Residentially delivered Refuse	0.70	0.82	1.84
Res. Construction/Demolition	0.00	0.00	0.00
Res. Shingles	1.12	0.00	0.00
Charitable Organizations	11.27	7.16	8.57
Contaminated Soil	1,808.50	16,314.74	16,144.84
Vines-Greenhouse	3,015.56	17,111.23	14,668.05
Greenhouse - Waste	976.35	1,669.19	1,324.09
IC&I Delivered Refuse	1,926.67	2,231.06	1,729.76
IC&I Construction/Demolition	375.76	305.13	191.37
IC&I Shingles	20.38	8.23	1.67
Asbestos	9.09	88.82	7.31
Transfer Stations	9,769.15	8,255.47	7,965.87
Grand Totals:	20,839.74	48,380.70	44,458.03

Table 5A Notes: Transfer Station refuse includes Windsor Transfer Station 1 and Kingsville Transfer Station 2.

Table 5B: 2019 Waste Stream Analysis by Quarter and Percent

Material Type	Q4 Tonnes	Percent of Total Waste
Municipally Delivered Refuse	6,025.98	5.30%
Municipal Clean Up	5.50	0.00%
Recycling Fibre Residual	628.44	0.55%
Municipal Construction/Demo	0.00	0.00%
Pollution Control Grit	269.45	0.24%
Municipal Sewage Sludge	799.33	0.70%
Residentially delivered Refuse	3.36	0.00%
Res. Construction/Demolition	0.00	0.00%
Res. Shingles	1.12	0.00%
Charitable Organizations	27.00	0.02%
Contaminated Soil	34,268.08	30.15%
Vines-Greenhouse	34,794.84	30.61%
Greenhouse - Waste	3,969.63	3.49%
IC&I Delivered Refuse	5,887.49	5.18%
IC&I Construction/Demolition	872.26	0.77%
IC&I Shingles	30.28	0.03%
Asbestos	105.22	0.09%
Transfer Stations	25,990.49	22.86%
Grand Totals:	113,678.47	100.00%

Table 5B Notes: Transfer Station refuse includes Windsor Transfer Station 1 and Kingsville Transfer Station 2.

3.4 Compaction

The compaction rate performance criterion is 600 kg/m³. The compaction rates and relation to the performance criteria is as follows:

Table 6: Compaction Results for Third Quarter 2019

Month	Compaction kg/m3	Criteria Percentage
October	759.30	26.6%
November	791.16	31.9%
December	773.20	28.9%

4 Complaints

There was one complaint during the fourth quarter of 2019. The family of Terri Colenutt reported odour during the four days prior to their complaint notification on November 26, 2019. The odour was present around 6-7AM each morning. The landfill manager contacted the family and invited them to visit the landfill to better identify the odour but they declined.

5 Site Development and Maintenance

5.1 Development of Disposal Areas

Disposal operations were conducted in Cell 4 North.

5.2 Vegetation

Grass cuts of slopes were not required during this quarter.

5.3 Drainage

There was no unscheduled activity during this quarter.

5.4 Roads and Site Maintenance

The water truck and the front end loader were used as required to maintain the roads during the months of October through December.

5.5 Composting Area

There were 222 loads of ground yard waste from the Material Recovery Facility brought in October totalling 3,025.21 tonnes, 252 loads in November totalling 4,142.73 tonnes and 171 loads in December totalling 3,120.67 tonnes.

5.6 Cover Material

The site received the following quantities to use as cover material during this quarter:

Table 7A: 2019 Cover Material Tonnage for Fourth Quarter

Cover Material Type	October	November	December
Auto Shredder Fluff	2,687.24	2,498.61	2,652.84
Alternate Daily Cover	282.58	74.61	101.79
Clay	0.00	0.00	0.00
Total Tonnes:	2,969.82	2,573.22	2,754.63

Table 7B: 2019 Cover Material Loads for Fourth Quarter

Cover Material Type	October	November	December
Auto Shredder Fluff	72	69	73
Alternate Daily Cover	26	10	13
Clay	0	0	0
Total Loads:	98	79	86

5.7 Other Activities

There were no other activities to note for the fourth quarter.

6 Leachate Management

6.1 Leachate Quantities

There were 5,290.67 tonnes leachate hauled off site in October, 5,704.75 tonnes hauled off site during November and 3,670.47 tonnes during the month of December.

6.2 Leachate System Maintenance

There was no unscheduled system maintenance required during this quarter.

6.3 Leachate Land Application

During the 4th quarter of 2019 there was no leachate applied to the land (spray) area or to the land (trickle) application area. The West Cell land application spray system was operated for two days during the fourth quarter and 97 m³ was applied. All leachate application areas were winterized on October 21 and 22, 2019.

7 Monitoring Programs

7.1 Ground Water and Surface Water Monitoring

There was a storm event recorded at the Regional Landfill during the fourth quarter on October 30-31, 2019 totalling 30.5 mm over the two days and sampling was completed by WSP.

Ground water well sampling was completed October 9 to 17, 2019. Ground water levels and well status was completed October 8, 9, and December 19, 2019.

7.2 Leachate Monitoring

Leachate level samples were collected on October 11, November 19 and December 19, 2019 by WSP.

7.3 Precipitation Monitoring

The precipitation quantities were as follows:

Table 8: Precipitation Comparison 2018 and 2019

Month	2018 millimetres	2019 millimetres	Percent Change
October	99.5	101.7	2.2%
November	93.1	17.5	-81.2%
December	54.5	29.1	-46.6%

7.4 Other Monitoring Programs

Vegetation sampling, soil sampling, West Cell gas monitoring and pump station sampling was all done during October by WSP.

Public Relations

There were no public relations activities during the fourth quarter.

Bird Control Program

The Bird Control System is functioning as designed.

Tom Marentette

Manager, Waste Disposal

A handwritten signature in black ink, appearing to read 'Tom Marentette', with a large, rounded loop at the end.

Dan Van Horn

Supervisor, Waste Disposal

A handwritten signature in black ink, appearing to read 'Dan Van Horn', with a large, stylized 'D' and a horizontal line extending to the right.

Report prepared by:

Margaret Shires, Administrative Assistant

Appendix A

Complaint Form

Precipitation

Report Distribution



Essex-Windsor Solid Waste Authority

360 Fairview Ave. West, Suite 211 Essex, ON N8M 3G4

ph: 519-776-6441 f: 519-776-6370

tf: 1-800-563-3377 / tty: 1-877-624-4832

email: ask@ewswa.org / web: www.ewswa.org

Complaint Form

Details of Complaint

Date of Occurrence: November 26, 2019

Time of Occurrence: 8:04 am

Complainant Name: Terri Colenutt

Address: Ferris Sideroad

Phone Number: 519-551-1737

Email: None

New Complaint: ☐ **Repeat Complaint:** ☒

Nature of Complaint: ☐ Debris, ☒ Odour, ☐ Dust, ☐ Noise, ☒ Mud on the Road,
☐ Service, ☐ Other _____

Location of Occurrence (Please Include Map where relevant): See attached

Complaint Received By: Tom Marentette

Date Complaint Received: Nov 26, 2019

Description of Occurrence: Son has been saying for the past 4 days about 6-7am that it really smells around our house. Just thought I would let you know.

Weather Conditions at location at time of Occurrence: Dry, sunny, temp 45 deg F.

Action Taken

Forwarded to: Tom Marentette

Date Forwarded: Nov 26, 2019

Resolution: Returned phone call on Nov. 26, 2019 at 10:05 am

Spoke with Terri Colenutt. She will ask Son what type of smell so that we may better follow up. Invited them to the Landfill to identify smell, but declined.

Follow Up Required:

☐ Yes ☒ No

Complainant Contacted with Resolution:

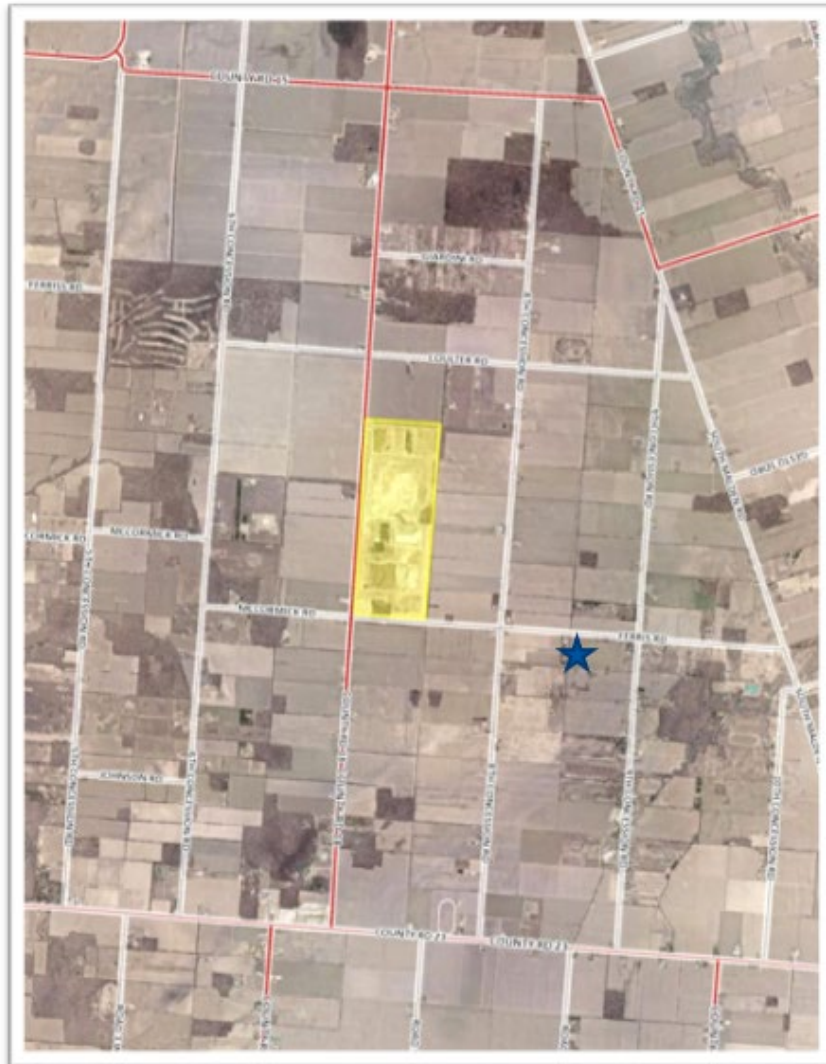
☒ Yes ☐ No

Contacted By: Tom M.

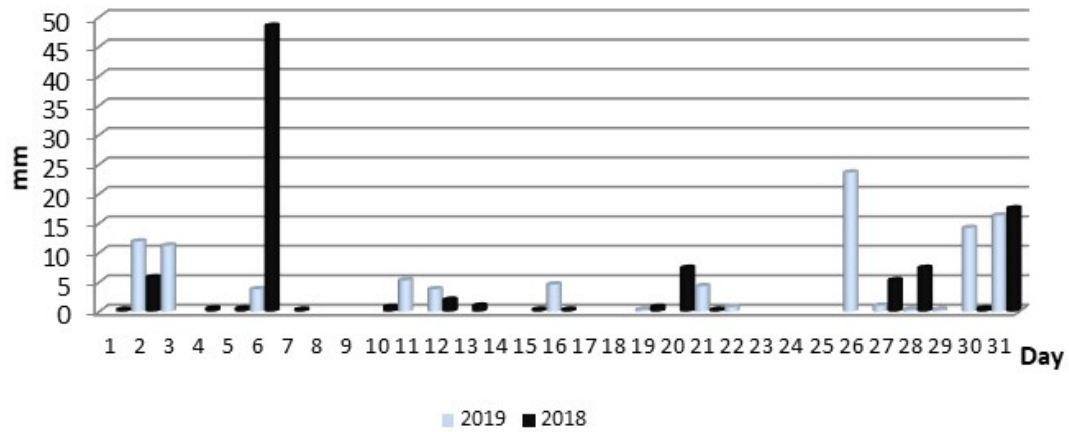
Map of Regional Landfill Area

(Please indicate on the map the location related to the complaint)

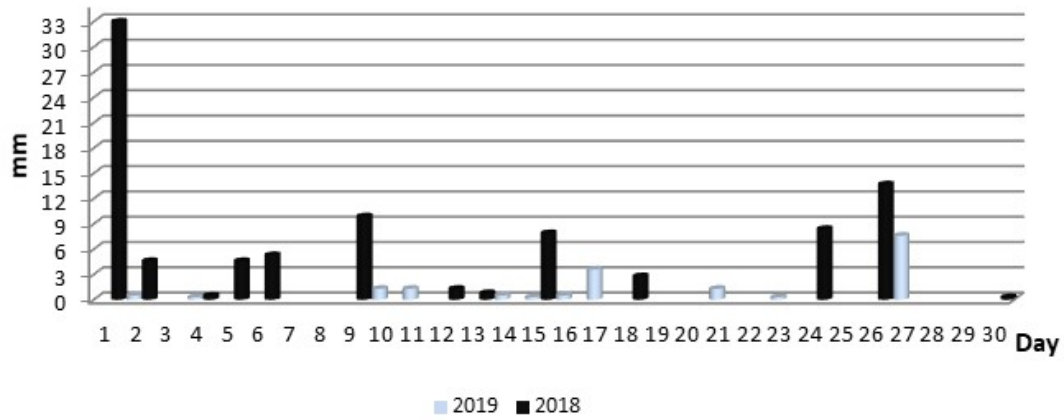
Notes:



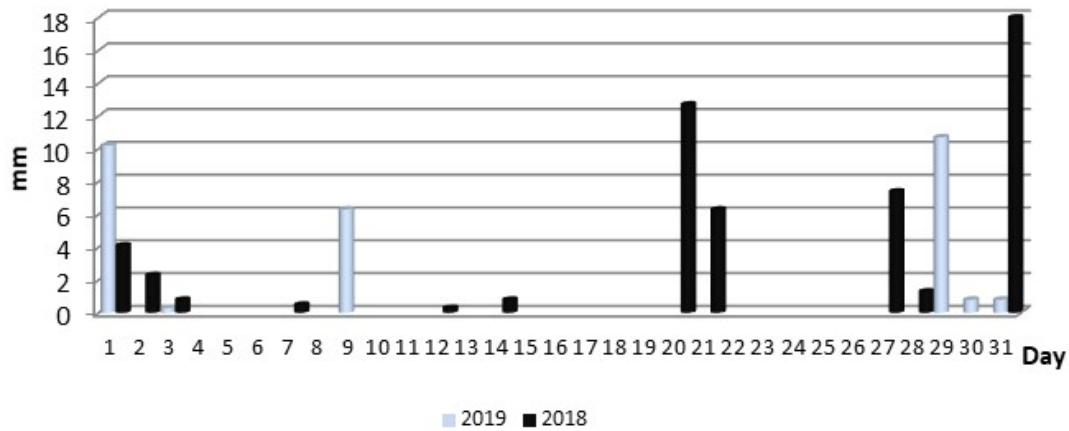
October Precipitation Comparison



November Precipitation Comparison



December Precipitation Comparison



Report Distribution

Landfill Liaison Committee Chairperson

WSP Canada, Inc.



Solid Non-Hazardous Waste Disposal Site Inspection Report

Client:	Essex-Windsor Solid Waste Authority Mailing Address: Suite 211 - 360 Fairview Ave W, Essex, Ontario, Canada, N8M 3G4 Physical Address: Suite 211 - 360 Fairview Ave W, Essex, Town, County of Essex, Ontario, Canada, N8M 3G4 Telephone: (519)776-6441, Extension: 1226, FAX: (519)776-5183, email: emaodus@ewswa.org Client #: 6232-9HRNJC, Client Type: Municipal Government		
Inspection Site Address:	Essex-Windsor Regional Landfill Site Address: 7700 Essex County Road 18 R.R. # 3 Cottam, Essex, Town, County of Essex, N0R 1B0 District Office: Windsor GeoReference: Map Datum: NAD27, Zone: 17, UTM Easting: 344806, UTM Northing: 4661156, , LIO GeoReference: Zone: 17, UTM Easting: 356598.94, UTM Northing: 4663560.5, Latitude: 42.11104, Longitude: -82.73452 Site #: 1538-4FERLF		
Contact Name:	Tom Marentette	Title:	Waste Disposal Manager
Contact Telephone:	(519)776-7941 ext1961	Contact Fax:	
Last Inspection Date:	2016/12/15		
Inspection Start Date:	2019/12/10	Inspection Finish Date:	2019/12/10
Region:	Southwestern		

1.0 INTRODUCTION

An inspection was conducted as part of a planned pro-active inspection program. This facility was assessed for compliance with Environmental Compliance Approval(s) relevant to the waste disposal site and applicable environmental legislation. The site inspection consisted of a brief overview of the operations at this facility. The focus on the inspection was limited to the sections/conditions of the Environmental Compliance Approval(s) specified in this inspection report. This site was previously inspected in 2016. This inspection period consists of the years 2016 to 2018.

The Composting Facility at this site is approved under Environmental Compliance Approval A011105. This inspection report does not include an assessment of this aspect of the site.

Landfill operational and monitoring information contained in this inspection report and referenced below was obtained from the following documents submitted by or on behalf of the Waste Authority:

- Essex-Windsor Regional Landfill Site, Operations Reports for 2016, 2017 and 2018 prepared by the Essex-Windsor Solid Waste Authority.
- Essex-Windsor Solid Waste Authority Waste Diversion Annual Report 2018, prepared by the Essex-Windsor Solid Waste Authority.
- Essex-Windsor Regional Landfill - 2015/2016 and 2017/2018 Biennial Monitoring Reports, Essex-Windsor Solid Waste Authority, prepared by WSP dated March 17, 2017 and May 31, 2019 respectively.
- Essex-Windsor Regional Landfill Annual Landfill Leachate Management Program, prepared by WSP for 2016, 2017 and 2018.

On December 10, 2019, Ministry of the Environment, Conservation and Parks (MECP) Officer Cara Salustro conducted a solid non-hazardous waste disposal site inspection at the Essex-Windsor Regional Landfill Site located at 7700 Essex County Road #18 in Essex (Site). The Site Representative(s) present during the site inspection was Tom Marentette, Waste Disposal Manager for the Essex-Windsor Solid Waste Authority (Authority).

2.0 INSPECTION OBSERVATIONS

Certificate of Approval Number(s):

A011101 - Certificate of Approval for a Waste Disposal Site issued November 5, 1982 and updated with a detailed certificate on September 28, 1995. Various Notice of amendments have been issued to this certificate.

A011105 - Certificate of Approval for a Waste Disposal Site issued September 18, 1989 and amended to a waste disposal site (processing) on August 15, 1997. This Certificate and amendments issued are for collection and composting of waste.

Amended Environmental Compliance Approval (ECA) No A011101, issued April 3, 2017 which revokes Approval No. A011101 issued on September 28, 1995. There were approximately 23 amendment notices associated with the revoked approval. The recent amended ECA consolidates all previous notices as per field alert IDS ref : 3799-A6ER9G.

Both the September 1995 and April 2017 are relevant for this inspection and will be used to access compliance for this inspection period (2016-2018) however conditions from the April 3, 2017 ECA only are referenced in this report.

2.1 FINANCIAL ASSURANCE:

Specifics:

The Essex Regional Landfill is exempt from the requirement for financial assurance as it is a municipal landfill site.

2.2 APPROVED AREA OF THE SITE:

Specifics:

The following conditions of ECA A011101 deal with **Landfill Operations** requirements applicable to the approved site area:

- 4.5. (1) The total site area shall be 123.5 hectares.
- (2) The Total waste disposal fill area shall be 64.5 hectares which includes 58 hectares of new waste disposal area.
- (5) There shall be buffer area of a minimum 100 meters between the edge of the new fill area and the property boundary for a total buffer area of 58.5 hectares. The buffer area shall not be used for the disposal of waste.
- (6) The final contours of the site are not to exceed those shown in the end use plan.

The landfill is 123 hectares with a waste footprint of 58 hectares. The disposal area is divided into five cells. Each cell has specific disposal and capacity areas.

Cell 1 has a disposal area of 1,707,000, was opened in 1997 and as of 2018 had approximately 1,418,487 tonnes of waste in-situ.

Cell 2 has a disposal area of 2,834,000, was opened in 2002 and as of 2018 had approximately 2,102,477 tonnes of waste in-situ.

Cell 3 has a disposal area of 2,675,000, was opened in 2012 and as of 2018 had approximately 496,953 tonnes of waste in-situ.

Cell 4 has a disposal area of 2,969,000, was opened to 2016, and has received 438,531 tonnes of waste to date.

Cell 4 South and Cell 5 North and South have not been developed. Cell 3 South was under construction in 2018. During the site visit it appeared that landfilling was occurring within the site approved footprint. There was no waste observed being deposited in the buffer areas. The current tipping area is occurring in Cell 3 South.

2.3 APPROVED CAPACITY:

Specifics:

The following conditions of ECA A011101 deal with **Landfill Operations** requirements applicable to the approved site capacity:

4.5 (3) *The Final waste disposal fill area footprint and site contours shall provide a capacity of 12,200,000 cubic meters of landfill volume (including waste, daily and interim cover material); and*

(4) *The total capacity as identified in Condition No. 4.5 (3) does not include the final cover.*

The total volume capacity of disposal areas (Cells 1-5) is reported to be 12,800,000 cubic meters (including cover

material), 58 hectares.

The Essex-Windsor Regional Landfill Site Operations Reports report the total waste received at the Regional Landfill as follows:

2016 - 250,698.66 tonnes

2017 - 245,440.17 tonnes

2018 - 248,040.32 tonnes

The average daily quantity delivered to the site are as follows:

2016 - 824 tonnes

2017 - 809 tonnes

2018 - 818 tonnes

The total waste landfilled was reported to be 4,456,460.38 tonnes (5,749,081 cubic meters) with a remaining volume of 6,450,919 tonnes at the end of 2018. The site is reported to be at approximately 69% of the design operation capacity.

4.6. The Site service area shall be the Province of Ontario. No waste shall be received for disposal at this Site from outside the approved service area.

In 2007 the site service area was expanded to include the Province of Ontario. The Essex-Windsor Regional Landfill Site Annual Operations Reports report the total waste received at this site was collected for the most part from Essex-Windsor and Chatham-Kent.

4.7. Waste shall only be accepted at the Site during the following time periods:

(i) Monday- Friday - 8:00 a.m. to 5:00 p.m.; and

(ii) Saturday - 8:00 am to 1:00 p.m. or such reduced hours as identified by Essex- Windsor

(iii) The Site will be closed all Sundays and Statutory holidays.

4.8. The landfill may open one hour earlier and two hours later than the waste disposal operating hours on Monday to Friday, for purposes other than disposal of waste. The landfill may open one hour earlier and one hour later than the waste disposal operating hours on Saturday for purposes of the application of daily cover only.

The Site Representative indicated that these hours of operations are not fully being complied with. The Regional Landfill accepts appointments for "special loads" (7:00 am – 7:30 am) for the disposal of asbestos from demolition projects. Additionally, the Site Representative reports that due to the increased demands they have responded to requests to process trucks at as early as approximately 7:30 am.

By no later than April 8, 2020, the Authority shall apply for an amendment to ECA No. A011101 if the hours of operations at this site are to be extended.

5.24. Quantities of dewatered sewage sludges that may be received for disposal shall be limited to no more than 2% by tonnage of the total waste received at the site.

The Essex-Windsor Regional Landfill Site Annual Operations Reports report that the amount of sludge disposed was 0.9% in 2016; 1.6% in 2017; and 1.3% in 2018 of the total waste stream.

5.11. A minimum compaction rate of 600 kilograms (0.600 tonnes) of waste per cubic meter shall be maintained.

The Essex-Windsor Regional Landfill Site Annual Operations Reports report that monthly compaction surveys of the site are carried out by staff to provide accurate volume analysis. The average compaction of waste for the Regional Landfill for 2011 was 804 kg/m³; 2017 was 810 kg/m³; and 2018 was 786 kg/m³. This is greater than the minimum acceptable compaction criterion of 600 kg/m³.

2.4 ACCESS CONTROL:

Specifics:

Access to the site is controlled by an attendant in a scale house at the entrance of the Site. The Site is enclosed by a perimeter fence and berms that surround the site. Full-time site inspectors are present at the landfill to ensure unacceptable waste is not deposited.

2.5 COVER MATERIAL:

Specifics:

The following conditions of ECA A011101 deal with **Landfill Operations** requirements applicable to cover material:

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

5.33. No lime stabilised sewage sludge shall be used as cover material. Lime stabilised sewage sludge may be used

as a top soil amendment to assist in the establishment of the vegetative layer.

5.34. The foundry sands to be used as alternative daily cover satisfy the definition of non-hazardous solid industrial waste as defined in Reg 347 of the Environmental Protection Act ; and

5.35. The foundry sands to be used as alternative daily cover material are transported to the site in accordance with Condition 4.13

The Site Representative reports that foundry sands are no longer being used as a daily cover. Shredder fluff and soil is used at this time.

5.36. Auto Shredder Fluff is permitted for use as a daily cover material at the site, all in accordance with Items 13,14, 15, and 16 of Schedule "A". Samples of the daily cover material are to be taken on a monthly basis and submitted for analysis of Ontario Regulation 558 Schedule IV Inorganics and PCBs. Auto Shredder Fluff is to confirm with the specifications of a non-hazardous waste under Ontario Regulation 558.

The Essex-Windsor Regional Landfill Site Annual Operations Reports indicate that samples of Shredder Fluff were taken on a monthly basis and submitted for analysis of Ontario Regulation 558 Schedule IV Inorganics and PCBs as required and in every case the Auto Shredder Fluff samples conformed with the specifications of a non-hazardous waste under Regulation 558. The Site Representative stated that these results will be included in future biennial reports.

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

The Site Representative reports that this requirement is being followed.

2.6 WASTE BURNING:

Specifics:

5.5. Burning of waste is not permitted at the Site.

There was no indication of burning at this site at the time of the inspection.

2.7 GROUNDWATER/SURFACEWATER IMPACT:

Specifics:

There were not obvious evidence of groundwater/surface water impacts at the time of the inspection.

Conditions 8.6 and 8.7 of ECA A011101 specifies the requirements for **surfacewater/groundwater** monitoring. Biennial Monitoring Reports are required to be submitted to the ministry.

The ground and surface water monitoring results are discussed in Annual Operations Reports, and the Essex-Windsor Regional Landfill Site Biennial Monitoring Program Reports. There were no adverse effects on groundwater or surfacewater quality reported.

2.8 LEACHATE CONTROL SYSTEM:

Specifics:

Condition 8.8 of ECA A011101 specifies the requirements for **leachate management** monitoring. Condition 9 outlines the requirements for leachate treatment.

The leachate treatment system monitoring results are discussed in Annual Operations Reports, the Essex-Windsor Regional Landfill Site Biennial Monitoring Program Reports and the Annual Leachate Management Plan Reports. There were no detectable effects reported from the current operations of the leachate treatment areas at the landfill on groundwater and surface water quality.

Leachate control consists of a perimeter collection system for the west cell and the old waste within Cell 1. An under drain system located under the southern section of Cell 1, Cell 2 and Cell 3 North and South. The entire leachate collection system is drained/pumped to one of three leachate collection ponds at the landfill site. Leachate from the landfill is currently managed through two methods including land applied into existing landfilled waste on site and/or collected by a tanker truck and taken to the Lou Romano Pollution Control Plant for treatment.

Condition 9.1(b) states that application rates of leachate are not to exceed 10 millimetres of leachate per day less daily precipitation.

The Site Representative indicated that this rate is not exceeded.

The Essex-Windsor Regional Landfill Site Annual Operations Reports report the total leachate managed at the Regional Landfill as follows:

2016 - 34,523.47 cubic meters total, with 26,102.47 cubic meters of it trucked off site

2012 - 51,441.84 cubic meters total, with 42,344.84 cubic meters of it trucked off site

2018 - 67,375.50 cubic meters total, with 61,596.50 cubic meters of it trucked off site

An increase in leachate has been noted may be attributed partially due to weather and possible attenuation effect.

The Site Representative suggested other causes could be during cell construction they had to mine the garbage and expose the face to construct the cell.

Condition 9.4 states that cleaning of the leachate collection system shall be conducted by power flushing of the system and vacuuming of the sumps at least once every two years.

The leachate systems at this site are flushed and cleaned at least once every two years.

Condition 9.12 states that by no later than December 31, 2018, a plan to phase out the Spray Irrigation system shall be submitted to the Director, Environmental Approval Branch for approval to phase out the Spray Irrigation System at the Site.

On December 18, 2018

Condition 9.13 states that by no later than December 31, 2018, an updated report for the operation and monitoring of the Drip Irrigation System shall be submitted to the Director, Environmental Approval Branch.

A letter dated December 18, 2018 prepared by WSP was submitted to the Environmental Assessment and Permissions Branch (EAPB) on behalf of the Authority. This letter was submitted pursuant to the requirements in Conditions 9.12 and 9.13. A letter dated March 28, 2019 from EAPB was sent advising the Authority that the requirements of Conditions 9.12 and 9.13 were not satisfied and an application for approval would have to be submitted to request to continue to spray irrigate. An application for approval was submitted on May 15, 2019 and Notice 2 to continue spray irrigation was issued on July 8, 2019.

2.9 METHANE GAS CONTROL SYSTEM:

Specifics:

The gas management system at the Essex-Windsor Regional Landfill consists of a vacuum flare.

The Authority continues to look at options for utilizing landfill gas. Currently landfill gas is not being harnessed for energy.

Conditions 10 of ECA A011101 specifies the requirements for **landfill gas** monitoring.

Condition 10.1 requires that a gas monitoring program to monitor the lateral subsurface migration of methane gas will be carried out at the perimeter soil monitors in February and August of each year, and in leachate monitors prior to purging for each leachate sampling event.

The landfill gas monitoring results are discussed in Annual Operations Reports, and the Essex-Windsor Regional Landfill Site Biennial Monitoring Program Reports. Combustible gas monitoring results reported indicate that combustible gas is present within the old waste of Cell 1, the former East Cell and the West Cell. The report suggested that based on these results no potential for hazards were identified to residences or structures however, access to the closed an open waste footprint is restricted to adequately trained site personnel.

Condition 8.10, 8.11, 8.12 and 8.13 of ECA A011101 specified the requirements for an **air monitoring program** at this site.

Condition 8.14 requires that the sampling program shall be carried out beginning in 2017 and every fifth year thereafter starting in 2017.

In 2017 an air monitoring program was implemented pursuant to this condition.

The air monitoring results are discussed in Annual Operations Reports, and the Essex-Windsor Regional Landfill Site Biennial Monitoring Program Reports. In summary, no exceedances of the target list of compounds were reported, and the majority of the reported parameters were below the detection limits with the exception of o and m&p Xylene. However, the total Xylenes met the ministry standard. No further exceedances were reported therefore no further actions or remedial measures were recommended by the consultant. The air monitoring program will be performed every five years as required.

2.10 OTHER WASTES:

Specifics:

*Condition 5.10 of ECA A011101 specifies the types of **waste types** to be received at the Site for disposal. These wastes include Domestic, Commercial, Institutional, non-hazardous solid industrial, agricultural (limited to miscellaneous debris from agricultural activities) and Dewatered Sewage Sludge generated within Service Area shall be accepted at the Site for landfilling.*

Agricultural waste (greenhouse waste) is accepted at the Site. The ECA includes "agricultural" waste and limits it to miscellaneous debris from agricultural activities. The Annual Operations Report reports that 22.3% of the waste accepted at the Site was vines from greenhouses in 2018 and 16.1% in 2017.

Condition 2.2 of the ECA specifies unacceptable waste types.

There was no evidence of unapproved waste being deposited at the time of the inspection. The Site Representative indicated that the waste types deposited at the landfill are limited to those that are permitted by the ECA. If wastes not permitted for disposal are brought to the Site by a hauler they are removed and relocated for proper disposal and/or recycling. The Authority employs a waste inspector to inspect waste loads for unacceptable material.

Condition 17.0 of ECA A011101 specifies the requirements of waste diversion activities for solid non-hazardous waste including electrical and electronic equipment. Condition 18 of ECA A011101 specifies the requirements for the operation of a Household Hazardous Waste (HHW) depot. Waste diversion activities include refrigerant appliances, blue box recyclable, scrap metal, tires, waste electrical and electronic equipment and household hazardous waste.

The Site Representative reports that all white goods received are tagged by a licensed technician to indicate that the equipment no longer contains refrigerants in accordance with Ontario Regulation 463/10.

Compliance with all the conditions pertaining to waste diversion activities was not evaluated as part of this inspection.

3.0 REVIEW OF PREVIOUS NON-COMPLIANCE ISSUES

A review of the Integrated Divisional System and Windsor Area Office files did not identify any known outstanding non-compliance issues related to this inspection.

4.0 SUMMARY OF INSPECTION FINDINGS (HEALTH/ENVIRONMENTAL IMPACT)

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

No

Specifics:

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

No

Specifics:

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

No

Specifics:

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

No

Specifics:

Was there any indication of minor administrative non-compliance?

Yes

Specifics:

The Authority has operated outside of the time periods permitted by ECA No. A011101, Condition 4.7.

5.0 ACTION(S) REQUIRED

The following action is required:

1. By no later than April 8, 2020, the Authority shall apply for an amendment to ECA No. A011101 if the hours of operation at this Site are to be extended.

Please see "Other Inspection Findings" in Section 6 below for other suggested actions and findings.

6.0 OTHER INSPECTION FINDINGS

Condition 5 of the Environmental Assessment Approval dated 1995 to the Essex-Windsor Solid Waste Authority states the following:

5.1 Essex-Windsor shall make every reasonable effort to divert waste from disposal to at least meet or exceed:


- a) the provincial waste diversion target of 50% by the year 2000 calculated according to the waste diversion regulations, using 1987 as the base year for calculations;
- b) the 60% diversion target by the year 2019, as established by Essex Windsor in the Waste Management Master Plan adopted in October 1993.

The "Essex-Windsor Residential Waste Diversion Report 2018 dated March 28, 2019" reports a residential diversion rate of 36.3% therefore the waste diversion target of 60% is not being met. The Authority submitted the attached "Essex-Windsor Solid Waste Authority Administrative Report, dated May 2, 2019" that speaks to the MECP's discussion paper on the proposal on reducing litter and waste in our communities. **The Authority shall continue to give consideration to an action plan as to how the waste diversion rate of 60% as detailed in the Environmental Assessment Approval dated 1995 will be met.**

Given the large quantities (22%) of greenhouse vines accepted at this Site the Authority may consider reviewing not only the existing approval but also any applications for approval or EA documents submitted as part of the approval process to determine if the waste types (ie greenhouse/agricultural) are adequately reflected and approved. **Consideration may be given for an application for amendment if necessary for any changes in the approved waste types (ie greenhouse/agricultural waste).**

The Essex-Windsor Regional Landfill Site 2017/2018 Biennial Monitoring Program Report prepared by WSP dated May 31, 2019 and the Essex-Windsor Regional Landfill Annual Landfill Leachate Management Program Report dated 2018 prepared by WSP has been sent to MECP Technical Support staff for review and comments. Any comments received will be forwarded to the Authority. The last review was completed of the 2013/2014 Biennial Report.

7.0 INCIDENT REPORT

Applicable
5487-BL4LZ4 

8.0 ATTACHMENTS

MECP RL Inspection Notes December 10 2019 - Final Response-Jan 23-2020.pdf; REPORT - Provincial Discussion Paper May 2, 2019.pdf

PREPARED BY:

Environmental Officer:

Name:

Cara Salustro

District Office:

Windsor Area Office

Date:

2020/01/30

Signature



REVIEWED BY:

District Supervisor:

Name:

Shawn Howard

District Office:

Windsor Area Office

Date:

2020/01/31

Signature:



File Storage Number:

SI ES ES Z18 - 610

Note:

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



Essex-Windsor Solid Waste Authority Administrative Report

May 1, 2020

To: The Chair and Members of the Landfill Liaison Committee
From: Tom Marentette, Manager of Waste Disposal
Meeting Date: Wednesday, May 20, 2020
RE: AMENDING OPERATING HOURS - REGIONAL LANDFILL

Purpose

The purpose of this report is to advise the Landfill Liaison Committee that the Authority intends to submit an application to the MECP to amend the Environmental Compliance Approval to amend the Monday – Friday start time at the Regional Landfill from 8:00am to 7:00am.

Background

As the Committee is aware, Condition 2.1.1. (c) of the ECA for the Regional Landfill states:

2.1.1. Purpose

The purpose of the LLC shall be to review and make comment on any activities associated with the Essex-Windsor Regional Landfill Site, and shall include, but not necessarily be limited to, the following:

(c) Compliance of EA/EPA conditions of Approval:

Since 2017, for reasons described in the Discussion section below, the Regional Landfill has begun its operating day at 7:00am but these hours have not been formally documented within the ECA.

The Authority's intention is to submit an application to the MECP to amend Condition 4.7.(i) to allow for the receipt of waste starting at 7:00am as opposed to 8:00am.

It is Authority Administration's observation that such an amendment will not serve to adversely impact the environment nor the health of neighbouring property owners.

Discussion

The following two (2) conditions of ECA A011101 dated April 3, 2017 deal with the hours of operation applicable to the Regional Landfill Site;

4.7. Waste shall only be accepted at the Site during the following time periods:

- (i) Monday- Friday - 8:00 a.m. to 5:00 p.m. ; and
- (ii) Saturday - 8:00 a.m. to 1:00 p.m. or such reduced hours as identified by Essex - Windsor
- (iii) The Site will be closed all Sundays and Statutory holidays.

4.8. The landfill may open one hour earlier and two hours later than the waste disposal operating hours on Monday to Friday, for purposes other than disposal of waste. The landfill may open one hour earlier and one hour later than the waste disposal operating hours on Saturday for purposes of the application of daily cover only.

To accommodate increasing demand for safe disposal of “special loads” such as asbestos from abatement and demolition projects, the Regional Landfill has been scheduling disposal of these loads by appointment between the hours of 7:00 am and 7:30 am. Early morning scheduling of these loads allows equipment operators time to prepare a suitable disposal area and for health and safety reasons ensures that EWSWA waste inspectors are not exposed unnecessarily to these materials. This schedule also allows for adequate time for these loads to be properly covered prior to the receipt of regular waste.

On days that no special loads are scheduled, the Regional Landfill has allowed for the receipt of waste one (1) hour earlier (7:00 am) than stated in the ECA, in order to accommodate increased volumes of waste from the City of Windsor transfer station and heavy demand from other waste haulers. On a number of occasions more recently, the Regional Landfill has experienced long delays for trucks entering the facility due to an influx in the amount of trucks disposing of contaminated soil from various large infrastructure projects. Delays at the landfill may affect municipal collection schedules.

Therefore, the Essex-Windsor Solid Waste Authority will be requesting administrative approval from the MECP to amend the current ECA to allow for a one (1) hour increase in daily operating hours at the Regional Landfill. This amendment to the operating hours will be to accommodate early morning appointments for “special loads” and/or the receipt of regular waste haulers, Monday to Friday - 7:00 a.m. to 5:00 p.m. All other operation restrictions will remain the same.

Process to Amend the Environmental Compliance Approval

The process to be undertaken to amend the ECA for the site hours is as follows:

1. At some date following the May 20, 2020 meeting of the LLC a letter will be sent to all property owners as listed in Schedule “A” of the compensation agreement for the Regional Landfill. Schedule “A” lists those owners of property which is within 0-1,609 metres (1 mile) of the Regional Landfill and those properties along County Road 18 between the Regional Landfill and County Rd. 23 (Arner Townline). The letter will serve to advise the property owners of the Authority’s intent and to further advise the property owners that if they have any comment on the Authority’s intention that they submit their comments in writing to the Ministry with a copy to the Authority.
2. Submission of an amendment application to the Ministry.
3. Authority Administration to prepare an information report to the Authority Board to advise them of the submission of the amendment application to the Ministry.

Recommendation

For the information of the Landfill Liaison Committee

SUBMITTED BY



Tom Marentette, Manager of Waste Disposal

Attachment:

Draft of Letter to be sent to Property owners listed in Schedule "A" of the compensation agreement for the Regional Landfill



Essex-Windsor Solid Waste Authority

360 Fairview Ave. West, Suite 211 Essex, ON N8M 3G4

ph: 519-776-6441 f: 519-776-6370

tf: 1-800-563-3377 / tty: 1-877-624-4832

email: ask@ewswa.org / web: www.ewswa.org

[Click here to enter a date.](#)

File
Sent By Mail

Dear Property Owner,

Subject: EWSWA requesting the Ministry of the Environment, Conservation and Parks to amend operating hour conditions of the Regional Landfill Environmental Compliance Approval (ECA)

This letter is being sent to those property owners as listed in Schedule "A" of the compensation agreement for the Regional Landfill. Schedule "A" lists those owners of property which is within 0-1,609 metres (1 mile) of the Regional Landfill and those properties along County Road 18 between the Regional Landfill and County Rd. 23 (Arner Townline).

The purpose of this letter is to advise you that the EWSWA wishes to amend the hours of operation within the Environmental Compliance Approval (ECA) for the site

The following amendment is being requested:

Site Hours

ECA CONDITION 4.7 SITE HOURS - CURRENTLY STATES:

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

- (i) Monday- Friday - **8:00 a.m.** to 5:00 p.m.; and
- (ii) Saturday - 8:00 a.m. to 1:00 p.m. or such reduced hours as identified by Essex - Windsor
- (iii) The Site will be closed all Sundays and Statutory holidays.

THE REQUEST IS TO AMEND THE HOURS TO:

- (i) Monday- Friday - **7:00 a.m.** to 5:00 p.m.

All other conditions are to remain the same

The Authority has been operating under the above hours since 2017 but these hours have not been formally documented within the ECA.

REASONS FOR REQUESTED CHANGE TO SITE HOURS:

To accommodate increasing demand for safe disposal of “special loads” such as asbestos from abatement and demolition projects, the Regional Landfill has been scheduling disposal of these loads by appointment between the hours of 7:00 am and 7:30 am. Early morning scheduling of these loads allows equipment operators time to prepare a suitable disposal area and for health and safety reasons, ensures that EWSWA waste inspectors are not exposed unnecessarily to these materials. This schedule also provides adequate time for these loads to be properly covered prior to the receipt of regular waste.

On days that no special loads are scheduled, the Regional Landfill has allowed for the receipt of waste one (1) hour earlier (7:00 am) than stated in the ECA, in order to accommodate increased volumes of waste from the City of Windsor transfer station and heavy demand from other waste haulers. On a number of occasions more recently, the Regional Landfill has experienced long delays for trucks entering the facility due to an influx in the amount of trucks disposing of contaminated soil from various large infrastructure projects. Delays at the landfill may affect municipal collection schedules.

If you wish to comment on the Authority’s amendment application you can do so in writing by _____ to:

Ministry of the Environment, Conservation and Parks
Attention Director
Environmental Approvals Access and Service Integration Branch
135 St. Clair West 1st Floor
Toronto, ON M4V 1P5

If you do send a letter to the director please send a copy of your letter by e-mail or mail to:

EWSWA
Attn: Eli Maodus, General Manager
360 Fairview Ave. West
Suite 211
Essex, ON N8M 3G4
emaodus@ewswa.org

Thank you for your attention to this letter

Ilija Maodus
General Manager



Ilija Maodus, General Manager



Essex-Windsor Solid Waste Authority

360 Fairview Ave. West, Suite 211 Essex, ON N8M 3G4

ph: 519-776-6441 f: 519-776-6370

tf: 1-800-563-3377 / tty: 1-877-624-4832

email: ask@ewswa.org / web: www.ewswa.org

May 20, 2020 Landfill Liaison Committee Meeting

Dialing in Instructions for Committee and Staff

This meeting will be conducted via **telephone only** – (NO VIDEO)
No computer or internet required

The Waste Disposal Manager and the Authority's Executive Secretary, along with the LLC Chair, will be conducting the meeting from a room at the Civic Centre.

All other meeting participants will be calling in on the phone from their own location.

If you have any problems while trying to dial in please contact Waste Disposal Manager Tom Marentette on his Cell at 226-345-2338.

Please dial in as follows:

Please start to dial in to the meeting 5-10 minutes before 4:30pm.

Since there will be others dialing in you may get a busy signal if everyone dials in at the same time.

Primary Phone Number – Allstream Conferencing (EWSWA provider)

Toll-free phone number: 1-866-365-4409

Access Code: 9351244#

Once connected please stay on the line even if you don't hear anyone else speaking.

It may occur that you get a busy signal "or unable to connect" message when dialing the number.

This may be due to too many people dialing in at the same time.

You may need to try dialing 3 or 4 times before you are able to connect.

Do not press re-dial on your phone, manually enter the full number.

We will do a roll call of Committee members once the meeting commences.

If you continue to get a busy signal or some other message after 3 or 4 attempts while trying to connect please use the following alternate number.

Be advised that long distance charges will apply when using this number

Alternate Phone Number – Allstream Conferencing (EWSWA provider)

Phone number: 1-303-248-9656 (long distance charges apply)

Access Code: 9351244# (same access code as that used when dialing the toll-free number above)

Please do not share any phone numbers or access codes with the public or media.

We appreciate your patience as we try to conduct our first LLC meeting in this manner.

Tom Marentette
Waste Disposal Manager
Essex-Windsor Solid Waste Authority
360 Fairview Ave. West
Suite 211
Essex, Ontario N8M 3G4
tommarentette@ewswa.org
www.ewswa.org
519-776-6441 x1961

May 13, 2020

Mr. Chris Nepszy
Chief Administrative Officer
Town of Essex
33 Talbot Street South
Essex, N8M 1A8

Dear Mr. Nepszy

Proposed cannabis retailer in the Town of Essex, located at 6 King Street East, Harrow

The Windsor-Essex County Health Unit (WECHU) is writing in response to the recent pending approval of the Cannabis Retail Store Authorization application for **6 King Street East, Harrow**. Should you wish to review this location and provide feedback to the Alcohol and Gaming Commission of Ontario during the public consultation period, the following considerations may assist in determining whether it poses a risk to public health and safety, and exposure/access to youth and other vulnerable populations in the Town of Essex.

At this time, the *Ontario Regulation (O. Reg) 468/18* under the *Cannabis Licence Act* does not allow for a cannabis retail store to be located within 150 metres from a school or private school as defined in the *Education Act*; however, there are no other restrictions imposed from other sensitive use lands (e.g. daycares, playgrounds, mental health and addictions facilities). Additionally, municipalities are currently prohibited from using licensing or land-use by-laws to control the placement or number of cannabis retail outlets. Having a strong Policy Statement and providing feedback to the Alcohol Gaming Commission of Ontario is one way that the Town of Essex could reduce any risk to public health and safety.

Public Health Considerations and WECHU Recommendations for Cannabis Retail

When considering a location for a cannabis retailer, special consideration needs to be given to vulnerable populations (e.g., children and youth, those already struggling with substance addictions, etc.) and the inequitable impact that a chosen site location may have on particular populations within your community. It has been well established that closer retail outlet proximity to sensitive use spaces increases normalization among vulnerable populations.^{1,2} In addition, retail outlet proximity to youth-serving facilities normalizes and increases substance use.^{3,4} By supporting a more effective minimum distance requirement from youth-serving facilities such as schools, child care centres, libraries, and community centres, municipalities can prevent the role-modeling of cannabis use and reduce youth access.^{5,6,7}

In order to minimize the potential for vulnerable populations to access cannabis and reduce public exposure to environmental cannabis smoke, the WECHU recommends the following:

- That cannabis-related businesses **be no less than 500 metres** from any school, library, park, recreational centre and any other youth-serving facility.

- That cannabis-related businesses **be no less than 500 metres** from addiction and mental health facilities, hospitals and places of worship.
- That cannabis-related businesses **be no less than 500 metres** from any alcohol, tobacco, or other cannabis-related business.

The following is a summary of the sensitive land use or areas of concern, located within either 150 metres, 250 metres, or 500 metres of the proposed store **located at 6 King Street East, Harrow**. A visual map is also attached.

Sensitive Land Use or Area of Concern	Name	Address	Distance from Retailer (metres)
Community centre	HARROW YOUTH CENTRE	18 Queen Street, Harrow, N0R 1G0	150
Tobacco & E-cigarettes	COLONIAL VARIETY	50 King West, Harrow, N0R 1G0	150
Tobacco & E-cigarettes	SANFORD & SON SUPERMARKET	77 King East, Harrow, N0R 1G0	150
Tobacco & E-cigarettes	STOP N GO VARIETY	80 King East St, Harrow, N0R 1G0	150
Alcohol	LCBO	119 King Street West, Harrow, N0R 1G0	250
Childcare centre or school	ST ANTHONY CATHOLIC SCHOOL	166 Centre St W, Harrow, N0R 1G0	500
Library	HARROW BRANCH	140 King Street West, Harrow	500
Park and playground	HARROW FAIRGROUNDS PARK	243 Mcaffee Street, Harrow, N0R 1G0	500

In addition to the abovementioned areas of concern, the proposed cannabis retailer is also located within a residential area experiencing moderate to high levels of social inequity using a validated measure of inequity.

Should the Town of Essex wish to provide feedback regarding this application to the Registrar of the Alcohol and Gaming Commission, the WECHU is able to provide additional consultation and support. If you have any questions, would like to discuss these recommendations, or if you are interested in enhancing your current policy statement, I would be happy to arrange a meeting by phone or in person at your earliest convenience.

Thank you,



Theresa Marentette, RN, MSc
Chief Executive Officer, Chief Nursing Officer
Windsor Essex County Health Unit
1005 Ouellette Avenue, Windsor, N9A 4J8
Ph. 519-258-2146 ext. 1475
Fx. 519-258-6003
tmarentette@wechu.org

Encl.

References

1. Liem, S. (2018). Alcohol policy review: Opportunities for Ontario municipalities. Retrieved from <http://opha.on.ca/getmedia/4e8f860f-6e34-4036-9fa6-a1311a35852e/Alcohol-Policy-Review-Full-Report-Final.pdf.aspx>
2. Ontario Public Health Association. (2015b). OPHA Issue Series: Alcohol Marketing & Advertising. Strategies to Reduce Alcohol-Related Harms and Costs in Ontario. Retrieved from <http://opha.on.ca/getmedia/23a643ff-6899-4846-920f-7440631c92ac/Marketing-Advertising-Alcohol-OPHA-Issue-Series-2015.pdf.aspx>
3. U.S. Department of Health and Human Services. (2016). Facing Addiction in America: The Surgeon General's Report on Alcohol, Drugs, and Health. Retrieved from <https://addiction.surgeongeneral.gov/surgeon-generals-report.pdf>
4. Canadian Paediatric Society (2016). Cannabis and Canada's children and youth. Retrieved from <https://www.cps.ca/en/documents/position/cannabis-children-and-youth>
5. Ibid
6. Government of Canada. (2016). A framework for the legalization and regulation of cannabis in Canada: The final report of the task force on cannabis legalization and regulation. Retrieved from <http://www.healthycanadians.gc.ca/task-force-marijuana-groupe-etude/framework-cadre/alt/framework-cadre-eng.pdf>
7. Association of Municipalities of Ontario (2018). Municipal Cannabis Updater – Information to Help Municipal Staff Prepare Reports for Councils. Retrieved From <https://www.amo.on.ca/AMO-PDFs/Cannabis/Draft-Template-Municipal-Cannabis-Policy-Statement.aspx>

Map of Sensitive Land Use Areas within 500m of Proposed Cannabis Retailer at 6 King Street East, Harrow





DISTRICT OF PARRY SOUND

56 ONTARIO STREET
PO BOX 533
BURK'S FALLS, ON
POA 1C0

(705) 382-3332

(705) 382-2954

Fax: (705) 382-2068

Email: info@armourtownship.ca

Website: www.armourtownship.ca

April 29, 2020

Honourable Doug Ford
Premier of Ontario
Legislative Building
Queen's Park
Toronto, ON M7A 1A1

Re: Support Resolution - High Speed Internet Connectivity in Rural Ontario

At its meeting held on April 28, 2020, the Council of the Township of Armour passed Resolution #6 supporting our Councillor Rod Ward's letter regarding the need to make substantial investments in high-speed internet connectivity in the rural areas of Ontario.

A copy of Council's Resolution #6 dated April 28, 2020 and Councillor Ward's letter is attached for your consideration.

Sincerely,

Charlene Watt
Deputy Clerk

Cc: MPP Norm Miller, MP Scott Aitchison and Ontario Municipalities

Enclosures



CORPORATION OF THE TOWNSHIP OF ARMOUR

RESOLUTION

Date: April 28, 2020

Motion # 6.

That the Council of the Township of Armour supports the letter, dated April 15, 2020 from Councillor Rod Ward, on the need to make substantial investments in high-speed internet connectivity in rural areas. Furthermore, that this resolution and the letter be circulated to Scott Aitchison, MP for Parry Sound-Muskoka, Norm Miller, MPP for Parry Sound-Muskoka and all Ontario municipalities requesting their support.

Moved by:

Blakelock, Rod	<input type="checkbox"/>
Brandt, Jerry	<input checked="" type="checkbox"/>
MacPhail, Bob	<input type="checkbox"/>
Ward, Rod	<input type="checkbox"/>
Whitwell, Wendy	<input type="checkbox"/>

Seconded by:

Blakelock, Rod	<input checked="" type="checkbox"/>
Brandt, Jerry	<input type="checkbox"/>
MacPhail, Bob	<input type="checkbox"/>
Ward, Rod	<input type="checkbox"/>
Whitwell, Wendy	<input type="checkbox"/>

Carried / Defeated

Declaration of Pecuniary Interest by:

Recorded vote requested by:

Recorded Vote:

Blakelock, Rod
Brandt, Jerry
MacPhail, Bob
Ward, Rod
Whitwell, Wendy

For

☐
☐
☐
☐
☐

Opposed

☐
☐
☐
☐
☐

April 15, 2020

To whom it may concern,

The COVID-19 pandemic in Ontario has highlighted both our positive responses to a crisis, and some definite shortcomings in infrastructure, systems and services which need to be addressed on a long-term basis. Setting priority on solving these issues will be a challenge, given the differing agendas and the strained budgets. Solving fundamental issues should focus on the most basic needs as a starting point. One of the clear needs in a rural community such as the Almaguin Highlands, highlighted further by recent events, is the need for proper high-speed internet connectivity. Healthcare and education are both going down a path where appropriate connectivity is assumed. Like many models that move outward from metropolitan areas, this assumption is lost on rural areas. For the vast majority of households in our community, true high-speed connectivity simply does not exist. For the vast majority of future strategies in healthcare and education, there is an assumption that it does exist.

Even in areas in the Almaguin Highlands which have 'high-speed' internet, the overall infrastructure is still limited. It is certainly not designed to deal with a sudden huge peak in demand. Whereas the capacity in large urban centres is built to handle the added throughput, there are clear limitations here. The best way to explain it is a comparison to hydro. Imagine if everyone went home at the same time and turned their lights on, but because there wasn't enough hydro capacity overall, all lights were 50% dimmer than normal and some appliances simply didn't work. We no longer have to imagine what happens with internet speed during peak usage. Suddenly during the COVID pandemic, people are working from home who have never worked from home. Kids are trying to do courses on-line. People who are not working are turning on-line to stay connected. Video-conferencing, which was a totally foreign concept to many, is now part of daily routine. Any idea how much internet bandwidth video uses? It's no wonder we hit a wall.

The future of healthcare sees patients being monitored and cared for in their own homes, through the use of technology. The future of education sees students doing much of their learning on-line. The future of business and commerce sees the ability to function outside the 'bricks and mortar' of an office location. Malls disappear and on-line shopping is the norm. For some, that future has already arrived. Our area has already been drastically affected by cutbacks in the area of healthcare and education through gradual decreases in budgets and services. Technology offers us the ability to level the playing field to a great extent. High-speed connectivity cannot be seen as a luxury or a nice-to-have, any more than hydro should be seen that way. In order to solve some other problems (i.e. skyrocketing budgets in healthcare and education) the wise investment is in providing connectivity for every resident in the province.

A handwritten signature in dark ink, appearing to read 'Rod Ward', with a stylized flourish at the end.

Rod Ward
Councillor
Armour Township

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.



iAGCO - Applications Undergoing Public Notice

Subscription details:

Email Address: clerks@essex.ca

Types of Applications: Liquor Sales Licence - Manufacturer's Tied House, Liquor Sales Licence, Cannabis Retail Store Authorization

Location: All of Ontario

The public notice offers the municipality and residents of the municipality in which the premises is located an opportunity to respond to the application within the time period identified on the posting and on the placard.

The following application(s) are now undergoing public notice:

Cannabis Applications

City	Premises	Deadline for Objections / Submissions	File Number	Application Type	Areas	
ORANGEVILLE	Broadway Cannabis 71 BROADWAY ORANGEVILLE, ON L9W1K1	2020-05-22	888081	New Application Cannabis Retail Store Authorization	Indoor Area	File Objection / Submission
SCARBOROUGH	SPIRITLEAF 875 MILNER AVENUE 875 MILNER AVE UNIT 114 SCARBOROUGH, ON M1B5N6	2020-05-22	921604	New Application Cannabis Retail Store Authorization	Indoor Area	File Objection / Submission
MIDLAND	Friendly Stranger Bay St. Midland 542 BAY ST MIDLAND, ON L4R1L3	2020-05-22	943789	New Application Cannabis Retail Store Authorization	Indoor Area	File Objection / Submission
HARROW	RC BUD SHOP 6 KING STREET HARROW, ON N0R1G0	2020-05-22	946672	New Application Cannabis Retail Store Authorization	Indoor Area	File Objection / Submission
ANCASTER	Cannabis Roll 11 HATTON DR ANCASTER, ON L9G2H5	2020-05-22	946701	New Application Cannabis Retail Store Authorization	Indoor Area	File Objection / Submission

BLENHEIM	Higher Limits Cannabis Company 52 CATHERINE ST UNIT 4 BLENHEIM, ON N0P1A0	2020-05-22	946844	New Application Cannabis Retail Store Authorization	Indoor Area	File Objection / Submission
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Liquor Applications

City	Premises	Deadline for Objections / Submissions	File Number	Application Type	Areas	
BARRIE	BARRIE BURGER 222 MAPLEVIEW DR W UNIT 4 BARRIE, ON L4N9E7	2020-05-21	868370	New Application Liquor Sales Licence	Indoor Area	File Objection / Submission
NEPEAN	BROWNS SOCIALHOUSE BARRHAVEN 1055 GREENBANK RD SUITE 1 NEPEAN, ON K2J6K8	2020-06-04	982527	New Application Liquor Sales Licence	Indoor and Outdoor Area	File Objection / Submission
YORK	Arsenal do Minho of Toronto Community Centre	2020-05-14	1001344	New Application Liquor Sales Licence	Indoor Area	File Objection / Submission

	3404A DUNDAS ST W YORK, ON M6S2S1					
TORONTO	DINEEN COFFEE CO 199 BAY ST TORONTO, ON M5L1A9	2020-06-04	254599	Change Application (Changes and/or Additions to Existing Licensed Areas) Liquor Sales Licence	Outdoor Area	File Objection / Submission
WELLINGTON	DRAKE DEVONSHIRE INN 24 WHARF ST WELLINGTON, ON K0K3L0	2020-06-04	810514	Change Application (Changes and/or Additions to Existing Licensed Areas) Liquor Sales Licence	Outdoor Area	File Objection / Submission

To unsubscribe, click [here](#).

Alcohol and Gaming Commission of Ontario
90 Sheppard Avenue East, Suite 200
Toronto ON M2N 0A4
Tel.: 416-326-8700
Toll free in Ontario: 1-800-522-2876
Inquiries: www.agco.ca/iagco



Essex Police Services Board (EPSB)

Regular Meeting Minutes

A regular meeting of the Essex Police Service Board was held on Thursday, May 7, 2020 - 4:30 PM the meet was an electronic meeting held via Zoom.

1. Roll Call

Present:	Councillor, Kim Verbeek, Vice-Chair Katie McGuire Blais Richard Tapping
Also Present:	Inspector Glenn Miller A/Staff Sergeant Todd Lavigne Doug Sweet, Director of Community Services / Deputy CAO Chris Nepszy, Chief Administrative Officer David Tilley, Police Services Advisor Robert Auger, Clerk Legal Legislative Services Sarah Aubin, Recording Secretary

2. Declarations of Conflict of Interest

None

3. Adoption of Published Agenda

- a) Thursday May 7th, 2020 EPSB Regular Meeting Agenda
 - Moved by Richard Tapping
 - Seconded by Katie McGuire Blais

(EPSB-20-05-12) That the published agenda for the May 7th, 2020 Regular EPSB meeting, be adopted as presented. **“Carried”**

4. Adoption of Minutes

- a) Thursday, February 6th, 2020 EPSB Regular Meeting Minutes

Moved by Katie McGuire Blais

Moved by Richard Tapping

(EPSB 20-05-13) That the minutes of the February 6th, 2020 Regular EPSB Meeting, be adopted as circulated. **“Carried”**

5. Public Presentations

None

6. Unfinished Business

None

7. Reports from Administration

1. Monthly Reports

January

- a) Police Services Board Report for Essex
- b) Police Services Board Monthly Overview January 2020
- c) OPP Detachment Board Report
- d) Windsor & Essex County Crime Stoppers Report

February

- e) Police Services Board Report for Essex
- f) Police Services Board Monthly Overview February 2020
- g) OPP Detachment Board Report
- h) Windsor & Essex County Crime Stoppers Report

March

- i) Police Services Board Report for Essex
- j) Police Services Board Monthly Overview March 2020
- k) OPP Detachment Board Report

I) Windsor & Essex County Crime Stoppers Report

As part of Reports, A/Staff Sergeant Todd Lavigne gave a verbal report on recent COVID-19 responses within the community.

Moved by Richard Tapping

Seconded by Katie McGuire Blais

(EPSB-20-05-14) That that Reports listed under item 7.1 on the Agenda together with the verbal report of A/Staff Sergeant Todd Lavigne be received **“Carried”**

2. Other Reports

a) OPP Detachment Board Report dated January 23rd, 2020

Foresight Management Consulting

- i. Correspondence from the Town of Lakeshore to the Town of Tecumseh in support of a two board system.
 - a. Town of Lakeshore, Council Approval, Report and Resolution
- ii. Correspondence from the Town of Tecumseh to the Town of Lakeshore in support of a two board system.

Moved by Katie McGuire Blais

Seconded by Richard Tapping

(EPSB-20-05-15) That the Reports listed under item 7.2 on the Agenda be received. **“Carried”**

8. Correspondence

a) Information Purposes Only

- 1. 20-006** Digital Motorized Snow Vehicle Operator Licence
 - 20-006** Memo Nosa-Ero-Brown
 - 20-006** MSVOL Images
- 2. 20-008** PAWS Act –Tele-warrants

3. **20-0012** Changes to Section 145 of the Criminal Code
 - 20-0012** Memo Susan Kyle
 - 20-0012** Section 145 Charges and Wording
4. **20-0013** Letter from Solicitor General
 - 20-0013** Human Trafficking Strategy
5. **20-0014** Ontario Licence Plates
6. **20-0017** Declaration of a Provincial Emergency
 - 20-0017** Attachment 1
 - 20-0017** Attachment 2
 - 20-0017** Attachment 3
7. **20-0018** Set Fines for EMCPA
8. **20-0024** Guide to Police Services Boards regarding Meetings
9. **20-0028** Enforcement of EMCPA Orders
 - 20-0028** Enforcement FAQ's
10. **20-0032** Social Gatherings
11. **20-0037** Quarantine Act
 - 20-0037** Attachment 1
 - 20-0037** Attachment 2
 - 20-0037** Attachment 3
12. **20-0038** Declaration of Emergency
13. **20-0050** COVID-19 Preparation & Actions to manage disease spread
14. **20-0054** Police Week 2020
15. **20-0062** Extension of Community Safety & Well-being

Moved by Katie McGuire-Blais

Seconded by Richard Tapping

(EPSB-20-05-16) That the Correspondence in Agenda item 8 a) be received. **"Carried"**

b) Information for review

i. OAPSB Section 10 Elections – May 14, 2020

i. Board of Directors Election – Zone 6

ii. 2021 Municipal Policing Billing Statement Property Count

Moved by Katie McGuire Blais

Seconded by Richard Tapping

(EPSB-20-05-17) That the Correspondence in Agenda item 8 b) be received. **“Carried”**

c) March 3, 2020 Correspondence from Mayor Snively re: Leave of absence from Police Services Board

Moved by Katie McGuire Blais

Seconded by Richard Tapping

(EPSB-20-05-18) That the March 3, 2020 Correspondence from Mayor Snively advising of a leave of absence as a member of the Police Services Board be received and accepted;

that Essex Town Council be requested to appoint another Council member to serve on the Police Services Board during the Mayors leave of absence period ; and

that Vice-Chair Verbeek serve as Chair of the Police Services Board in place of the Mayor during the Mayors leave of absence period.

9. New Business

10. Announcements / Notices of Motion

11. Adjournment

Moved by: Katie McGuire Blais

Seconded by: Richard Tapping

(EPSB-20-05-19) That the meeting be adjourned at 5:31 p.m.

Next Meeting Date TBD

The following Notice of Motion was presented at the May 4, 2020 Regular Council Meeting, and is being brought forward for consideration this evening:

Moved by Councillor Bondy

Seconded by

That Council bring forward the item listed as "shoreline protection of public property" from the Mayor's list of round table items in order to discuss and give direction to Administration as it relates to potential liability, budget considerations, shoreline protection of public property policy, timelines and fallen trees policy during this time of historic high water levels.

The Corporation of the Town of Essex

By-Law Number 1911

Being a by-law to confirm the proceedings of the May 4, 2020, Regular Meeting of Council of The Corporation of the Town of Essex

Whereas pursuant to Section 5(1) of The Municipal Act, 2001, S.O. 2001, c.25 as amended, the powers of a municipality shall be exercised by its Council;

And whereas pursuant to Section 5(3) of The Municipal Act, 2001, S.O. 2001, c.25 as amended, a municipal power, including a municipality's capacity, rights, powers and privileges under Section 8 of the Municipal Act, 2001, S.O. 2001, c.25, as amended, shall be exercised by by-law unless the municipality is specifically authorized to do otherwise;

And whereas it is deemed expedient that a by-law be passed to authorize the execution of Agreements and other documents and that the proceedings of the Council of The Corporation of the Town of Essex at its meetings be confirmed and adopted by by-law.

Now therefore be it resolved that the Council of The Corporation of the Town of Essex enacts as follows:

1. That the actions of the Council of The Corporation of the Town of Essex in respect of all recommendations in reports and minutes of committees, all motions and resolutions and all other actions passed and taken by the Council of The Corporation of the Town of Essex, documents and transactions entered into during the May 4, 2020 meeting of Council, are hereby adopted and confirmed as if the same were expressly contained in this by-law.
2. That the Mayor and proper officials of The Corporation of the Town of Essex are hereby authorized and directed to do all the things necessary to give effect to the actions of the Council of The Corporation of the Town of Essex during the said May 4, 2020 meeting referred to in paragraph 1 of this by-law.
3. That the Mayor and the Clerk are hereby authorized and directed to execute all documents necessary to the actions taken by this Council as described in Section 1 of this by-law and to affix the Corporate Seal of The Corporation of the Town of Essex to all documents referred to in said paragraph 1.

Read a first and a second time and provisionally adopted on May 4, 2020.

Mayor

Clerk

Read a third time and finally adopted on May 19, 2020.

Mayor

Clerk

The Corporation of the Town of Essex
By-Law Number 1912

Being a By-Law to Amend By-Law Number 1037

The Comprehensive Zoning By-Law for the Town of Essex

Whereas By-law Number 1037 is the Town's Comprehensive Zoning By-law regulating the use of lands and the character, location and use of buildings and structures within the Town of Essex;

And whereas the Council of the Corporation of the Town of Essex deems it expedient and in the best interest of proper planning to amend By-law Number 1037;

Now therefore the Corporation of the Town of Essex enacts as follows:

1. That Section 28, Specific Zoning Exceptions in certain Areas, subsection 1, Site Specific Zoning Provisions, is hereby amended by adding the following paragraph:

49. For the lands comprising Part Block 281, Concession South of Talbot Road, located between Gosfield Townline Road and Fairview Avenue, north of Morton Avenue, and identified as "Multi-unit Residential Block" in Schedule "A" to this by-law, multiple dwelling units and uses accessory thereto shall be additional permitted uses, subject to conformity with the provisions of Section 16, subsection 1, R3.1 District, applicable thereto, save and except that the maximum building height for a multiple dwelling shall be 6 storeys ZDM 3
2. That Schedule 'A' attached hereto be declared to form part of this by-law.
3. This By-law shall come into force and take effect on the date of its passing thereof by Council.

Read a first, second and third time and finally passed on the 19th Day of May, 2020.

Mayor

Clerk

Schedule "A" to By-law 1912

1830143 ONTARIO LIMITED

GIANNI SUBDIVISION -

TOWN OF ESSEX

HANLON STREET EXTENSION

CONCEPTUAL DEVELOPMENT PLAN

OPTION 1.0

SUBJECT AREA

(± 3.9 ac)

MULTI-UNIT

RESIDENTIAL BLOCK

FUTURE PLAN

OF SUBDIVISION

WOODLOT

BUFFER

STORM WATER

MANAGEMENT

MAP/DRAWING INFORMATION

THIS DRAWING IS FOR INFORMATION PURPOSES ONLY. ALL INFORMATION IS SUBJECT TO VERIFICATION AND SHOULD BE CHECKED BY THE USER.

DESIGNED BY: NOT

SCALE: N.T.S.

N

E

S

W

PROJECT: 19-1020

STATUS: DRAFT

DATE: 01/06/2020

Page 403 of 438



Report to Council

Department: Development Services
Division: Planning
Date: March 2, 2020
Prepared by: Jeff Watson
Report Number: Planning-2020-04
Subject: 183043 Ontario Limited Rezoning Application
Number of Pages: 7

Recommendation(s)

That Planning report "Planning 2020-04" entitled "183043 Ontario Limited Rezoning Application" prepared by "Jeff Watson" dated "March 2, 2020" be received, and

That "Council authorize the submission of a rezoning by-law for approval by Council to permit multiple unit dwellings within the lands identified as the Gianni Estates subdivision located east of Gosfield Townline and west of Fairview Avenue, in accordance with the recommendations of Development Services Department, as set out in Appendix 'A' to the Planning report "Planning 2020-04", .

Purpose

Through a rezoning application, 1830343 Ontario Limited, Peter Valente, agent, seeks to permit the construction of a multiple dwelling(s) on a portion of the future Gianni Estates subdivision situated on lands west of Gosfield Townline, east of the municipal recreational facilities on the east side of Fairview Avenue.

Rezoning to permit the proposed uses is necessary in order to accommodate the requested uses, as the current zoning permits single-detached, semi-detached and townhome dwellings, not multiple unit dwellings.

The general location of the subject property is outlined on the map below.



Approval of this incentive would help the Town achieve its mandates under the Official Plan and Provincial Policy Statement (PPS) to provide for a mix of housing types to meet the varied needs of its residents.

Approval of this incentive would help the Town to achieve its mandates under the Official Plan and Provincial Policy Statement (PPS) to provide for a mix of housing types to meet the varied needs of its residents.

Background

The applicant, 1830143 Ontario Limited, is the owner/developer of the lands shown above, comprising approximately 15 hectares (37 acres). The property, which is occupied by tilled farmland and a 2.5 ha (6.0 ac) woodlot, has a 514 meter (1690 feet) frontage on Gosfield Townline.

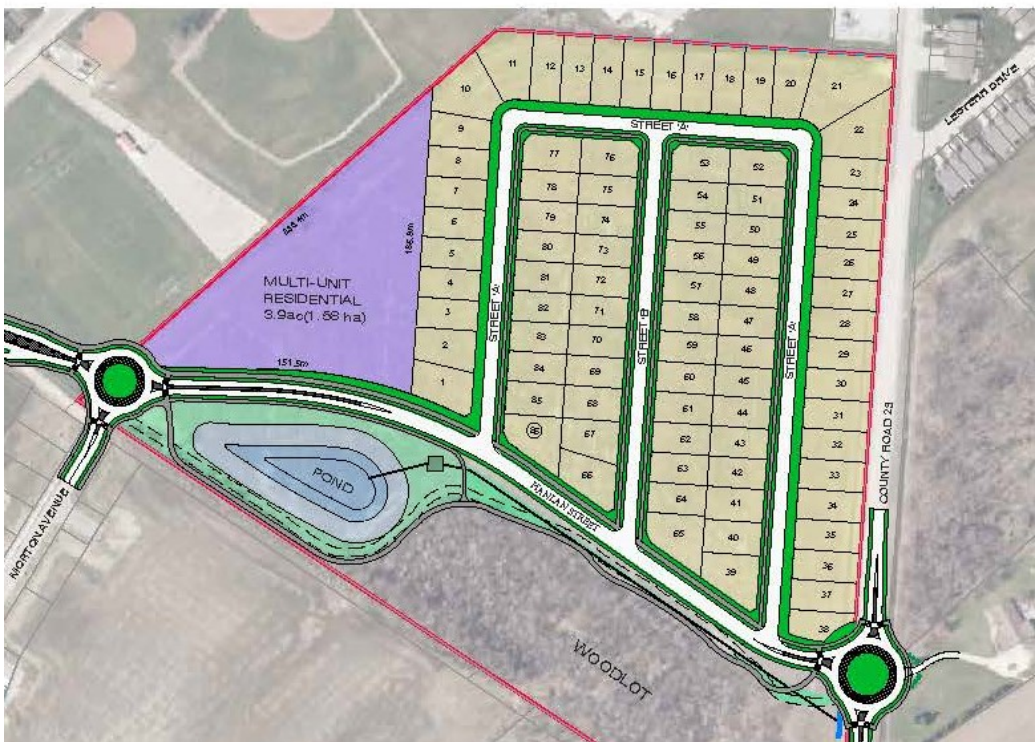
It is zoned R2.2, a residential zone permitting single-detached, semi-detached and townhome dwellings, secondary dwelling units and accessory uses. This zoning was introduced in the Town's comprehensive zoning by-law adopted by Council in 2010. It emulates the previous zoning, R3.12, of By-law 2010, the Town of Essex (pre-amalgamation) zoning by-law, which applied to the subject lands.

Discussion

The Provincial Policy Statement, which guides municipal planning policies, mandates that a planning authority,(the Town of Essex), ensure that a 3 year supply of zoned and serviced land is available for residential development, with an additional 10 year supply of lands capable of being zoned and serviced for residential development, also be made available. As well, the Town must ensure that there is a variety of housing types and levels of affordability to provide adequate housing for its residents, including residents with special needs.

Of note, no new multiple unit residential developments have been constructed in Essex Centre in over 25 years, except for the new 6 storey, 54 unit rental apartment building currently under construction on the former Weston Bakery site. Only one other property is zoned and available for multiple residential housing, that being located at the corner of Talbot Street and Fairview Avenue. While there has been prior discussion with this property owner about various development options, there has been no formal application for site plan approval to date.

The plan shown below is a concept plan only, primarily to show the proposed location of the multiple dwelling site and other basic features of the future subdivision. The lands affected by the rezoning application comprise a 1.6 hectare (3.9 acre) parcel at the west limit of the larger property. The applicants are requesting that the zoning be amended for this parcel to permit multi-unit dwellings at this location in addition to the range of residential uses presently permitted under the existing R2.2 zoning.



The proposed multiple residential site would front on the future Hanlan Street extension and border the Town’s recreational facilities associated with the Essex Centre Sports Complex. As

shown, the subject site will be separated from the current built up areas comprising Holy Names Catholic Elementary School and the newer dwellings on Morton Avenue by Hanlan Street, a future storm water management pond and the existing woodlot.

To aid Council with its review of this rezoning proposal, the proponents have submitted multiple dwelling renderings. They represent buildings constructed in other municipalities by the proponents.

3-storey conceptual design



4-storey conceptual design



6-storey conceptual design



A statutory public meeting was held by Council on February 13, 2020. Subsequent to a PowerPoint presentation and the distribution of background materials, including a draft of the requested zoning for discussion, the 12 persons in attendance were given the opportunity to ask questions and to comment on the proposed rezoning. Questions related primarily to the overall concept plan for the subdivision and no opposition to the multiple dwelling rezoning was raised.

Approval of a rezoning by-law, as recommended by Planning, would add multiple residential uses as additional permitted uses, keeping the underlying zoning which permits single-detached, semi-detached and townhome dwellings.

Attached as Appendix 'A', is the recommended zoning, which would be incorporated into the Zoning By-law under Section 28. Section 28, adds site specific provisions to the established zoning of a property. The zoning would permit building heights of up to 6 storeys and a maximum of 160 dwelling units, as requested by the proponent. The 6 storey height limit permits a reduced building footprint and accordingly greater building setbacks from adjacent existing and potential residential uses.

If approved, the multiple residential block will be the subject of site plan control approval by Council and potentially draft plan of condominium approval, if not developed as rental accommodation.

Financial Impact

Not applicable.

Consultations

Rita Jabbour, Manager of Planning Services

Lori Chadwick, Director of Development Services

Link to Strategic Priorities

- ☐ Manage, invest and plan for sustainable municipal infrastructure which meets current and future needs of the municipality and its citizens.
- ☐ Create a safe, friendly and inclusive community which encourages healthy, active living for people of all ages and abilities.
- ☐ Provide a fiscal stewardship and value for tax dollars to ensure long-term financial health to the municipality.
- ☒ Manage responsible and viable growth while preserving and enhancing the unique rural and small town character of the community.
- ☐ Improve the experiences of individuals, as both citizens and customers, in their interactions with the Town of Essex.

Appendix A – For Discussion: Proposed Multiple Residential Zoning for the Subject Lands

Special Multiple Residential Zoning	
i) Proposed main uses	Multiple Dwelling Townhome Dwelling Semi-detached Dwelling Single-detached Dwelling
iii) Accessory use	
b) Regulations	
i) Amenity area per multiple dwelling unit – Minimum	Bachelor unit – 7.5m2 (81f2); One-bedroom unit – 10m2 (108f2); Two or more bedroom unit – 15m2 (162F2);
ii) Lot Area, multiple dwelling – Minimum	555m2 (6000f2) for the first 4 dwelling units, plus 90m2 (970f2) for each additional dwelling unit to a maximum of 105uph (42upa)
iv) Building Coverage – Maximum	35% of lot area
v) Building Height – Maximum	20m (65f) for a main building 1 storey for an accessory building
vi) Front Yard Depth – Minimum	7.5m (25f)
vii) Rear Yard Depth – Minimum	7.5m (25f)
Viii) Side Yard Width – Minimum	6m (20f) where a habitable room window of any dwelling unit faces a side lot line 3m (10f) where a one-way vehicular access area (driveway) abuts the main building wall 6m where a two-way vehicular access area (driveway) abuts the main building wall Equal to 30% of the building height, if none of the provisions above apply
<div> <div> ix) Notwithstanding the provisions of this subsection in conflict herewith, a single-detached dwelling, semi-detached dwelling, duplex dwelling, townhome dwelling and any use accessory thereto shall conform to the regulations of subsection 15.2, R2.2 District, of this by-law, applicable thereto. </div> <div> x) Provisions of the following subsections shall apply in whole or in part to lands situated within any of the following restricted areas shown on the Zoning District Maps: <div> 1. Natural Heritage Overlay – see subsection 10.8. </div> </div> </div> <div> <div>c) Supplementary Regulations: See Sections</div> <div> <div> 7: Definitions 8: Supplementary Use Regulations 9: Supplementary Lot Regulations </div> <div> 10: Supplementary Building Regulations 11: Parking Space Regulations 12: Parking Area Regulations. </div> </div> </div>	

Report Approval Details

Document Title:	183043 Ontario Limited - Planning-2020-04.docx
Attachments:	
Final Approval Date:	Feb 24, 2020

This report and all of its attachments were approved and signed as outlined below:

Rita Jabbour, Manager, Planning Services - Feb 21, 2020 - 2:29 PM



Lori Chadwick, Director, Development Services - Feb 21, 2020 - 4:02 PM



Chris Nepszy, Chief Administrative Officer - Feb 24, 2020 - 5:08 PM

The Corporation of the Town of Essex
By-Law Number 1914
Being a by-law to authorize an agreement between:
Her Majesty the Queen in Right of Ontario as represented by the
Minister of Municipal Affairs & Housing (the “Province”)
-and-
The Corporation of the Town of Essex (the “Recipient”)

Whereas, Section 11(1) of the Municipal Act, 2001, S.O. 2001, c. 25 and amendments thereto, provides that a Municipality may provide any service or thing that the municipality considers necessary or desirable for the public;

And Whereas, the Town as Recipient has applied for funding to conduct a review under the Municipal Modernization Program as it relates to internal & shared service delivery for the Town of Essex and the “Municipalities” as defined in the Agreement (the “Project”).

And Whereas the Province, by way of the Municipal Modernization Program (the “Agreement”) attached hereto as Schedule “A” to this By-Law Number 1914, wishes to provide funds to assist with the Project.

Now therefore be it resolved that the Council of The Corporation of the Town of Essex enacts as follows:

1. That the Mayor and Clerk be authorized to sign the Agreement attached as Schedule “A” to this By-Law 1914.
2. That the Mayor and Clerk be hereby authorized to sign such further documents and give such further assurances as may be necessary to give effect to this By-law.
3. That this by-law shall come into full force upon the final passing thereof.

Read a first, a second and a third time and finally passed on May 19, 2020.

Mayor

Clerk

ONTARIO TRANSFER PAYMENT AGREEMENT

The Agreement is effective as of the ____ day of _____, 20____

B E T W E E N

**Her Majesty the Queen in right of Ontario
as represented by the Minister of Municipal Affairs and Housing
(the "Province")**

- and -

**The Corporation of the Town of Essex
(the "Recipient")**

CONSIDERATION

In consideration of the mutual covenants and agreements contained in this Agreement and for other good and valuable consideration, the receipt and sufficiency of which are expressly acknowledged, the Province and the Recipient agree as follows:

1.0 ENTIRE AGREEMENT

1.1 The agreement, together with:

Schedule "A" - General Terms and Conditions
Schedule "B" - Project Specific Information and Additional Provisions
Schedule "C" - Project Summary
Schedule "D" - Budget
Schedule "E" - Payment Plan
Schedule "F" - Reports

any amending agreement entered into as provided for in section 4.1

constitutes the entire agreement between the Parties with respect to the subject matter contained in the Agreement and supersedes all prior oral or written representations and agreements.

2.0 CONFLICT OR INCONSISTENCY

2.1 **Conflict or Inconsistency.** In the event of a conflict or inconsistency between the Additional Provisions and the provisions in Schedule "A", the following rules will apply:

- (a) the Parties will interpret any Additional Provisions in so far as possible, in a way that preserves the intention of the Parties as expressed in Schedule "A"; and
- (b) where it is not possible to interpret the Additional Provisions in a way that is consistent with the provisions in Schedule "A", the Additional Provisions will prevail over the provisions in Schedule "A" to the extent of the inconsistency.

3.0 COUNTERPARTS

3.1 The Agreement may be executed in any number of counterparts, each of which will be deemed an original, but all of which together will constitute one and the same instrument.

4.0 AMENDING THE AGREEMENT

4.1 The Agreement may only be amended by a written agreement duly executed by the Parties.

5.0 ACKNOWLEDGEMENT

5.1 The Recipient acknowledges that:

- (a) by receiving Funds, it may become subject to legislation applicable to organizations that receive funding from the Government of Ontario, including *the Broader Public Sector Accountability Act, 2010 (Ontario)*, *the Public Sector Salary Disclosure Act, 1996 (Ontario)*, and *the Auditor General Act (Ontario)*;
- (b) Her Majesty the Queen in right of Ontario has issued expenses, perquisites, and procurement directives and guidelines pursuant to the *Broader Public Sector Accountability Act, 2010 (Ontario)*;
- (c) the Funds are:
 - (i) to assist the Recipient to carry out the Project and not to provide goods or services to the Province;
 - (ii) funding for the purposes of the *Public Sector Salary Disclosure Act, 1996 (Ontario)*;
- (d) the Province is not responsible for carrying out the Project; and

- (e) the Province is bound by the *Freedom of Information and Protection of Privacy Act* (Ontario) and that any information provided to the Province in connection with the Project or otherwise in connection with the Agreement may be subject to disclosure in accordance with that Act.

The Parties have executed the Agreement on the dates set out below.

**HER MAJESTY THE QUEEN IN RIGHT OF ONTARIO
as represented by the Minister of Municipal Affairs
and Housing**

Date

Name: The Honourable Steve Clark
Title: Minister of Municipal Affairs and Housing

The Corporation of the Town of Essex

Date

Name:
Title:

I have authority to bind the Recipient.

Date

Name:
Title:

I have authority to bind the Recipient.

SCHEDULE "A"
GENERAL TERMS AND CONDITIONS

A1.0 INTERPRETATION AND DEFINITIONS

A1.1 Interpretation. For the purposes of interpretation:

- (a) words in the singular include the plural and vice-versa;
- (b) words in one gender include all genders;
- (c) the headings do not form part of the Agreement; they are for reference only and will not affect the interpretation of the Agreement;
- (d) any reference to dollars or currency will be in Canadian dollars and currency; and
- (e) "include", "includes" and "including" denote that the subsequent list is not exhaustive.

A1.2 Definitions. In the Agreement, the following terms will have the following meanings:

"Additional Provisions" means the terms and conditions set out in Schedule "B".

"Agreement" means this agreement entered into between the Province and the Recipient, all the schedules listed in section 1.1, and any amending agreement entered pursuant to section 4.1.

"Budget" means the budget attached to the Agreement as Schedule "D".

"Business Day" means any working day, Monday to Friday inclusive, excluding statutory and other holidays, namely: New Year's Day; Family Day; Good Friday; Easter Monday; Victoria Day; Canada Day; Civic Holiday; Labour Day; Thanksgiving Day; Remembrance Day; Christmas Day; Boxing Day and any other day on which the Province has elected to be closed for business.

"Effective Date" means the date set out at the top of the Agreement.

"Event of Default" has the meaning ascribed to it in section A13.1.

"Expiry Date" means the expiry date set out in Schedule "B".

"Funding Year" means:

- (a) in the case of the first Funding Year, the period commencing on the Effective Date and ending on the following March 31; and

- (b) in the case of Funding Years subsequent to the first Funding Year, the period commencing on April 1 following the end of the previous Funding Year and ending on the following March 31.

"Funds" means the money the Province provides to the Recipient pursuant to the Agreement.

"Indemnified Parties" means Her Majesty the Queen in right of Ontario, Her ministers, agents, appointees, and employees.

"Maximum Funds" means the maximum Funds set out in Schedule "B".

"Notice" means any communication given or required to be given pursuant to the Agreement.

"Notice Period" means the period of time within which the Recipient is required to remedy an Event of Default pursuant to section A13.3(b), and includes any such period or periods of time by which the Province extends that time in accordance with section A13.4.

"Parties" means the Province and the Recipient.

"Party" means either the Province or the Recipient.

"Project" means the undertaking described in Schedule "C".

"Reports" means the reports described in Schedule "F".

A2.0 REPRESENTATIONS, WARRANTIES, AND COVENANTS

A2.1 General. The Recipient represents, warrants, and covenants that:

- (a) it has, and will continue to have, the experience and expertise necessary to carry out the Project;
- (b) it is in compliance with, and will continue to comply with, all federal and provincial laws and regulations, all municipal by-laws, and any other orders, rules, and by-laws related to any aspect of the Project, the Funds, or both; and
- (c) unless otherwise provided for in the Agreement, any information the Recipient provided to the Province in support of its request for funds (including information relating to any eligibility requirements) was true and complete at the time the Recipient provided it and will continue to be true and complete.

A2.2 Execution of Agreement. The Recipient represents and warrants that it has:

- (a) the full power and authority to enter into the Agreement; and

- (b) taken all necessary actions to authorize the execution of the Agreement, including passing a municipal by-law authorizing the Recipient to enter into the Agreement.

A2.3 **Governance.** The Recipient represents, warrants, and covenants that it has, will maintain in writing, and will follow:

- (a) procedures to enable the Recipient to manage Funds prudently and effectively;
- (b) procedures to enable the Recipient to complete the Project successfully;
- (c) procedures to enable the Recipient to identify risks to the completion of the Project and strategies to address the identified risks, all in a timely manner;
- (d) procedures to enable the preparation and submission of all Reports required pursuant to Article A7.0; and
- (e) procedures to enable the Recipient to address such other matters as the Recipient considers necessary to enable the Recipient to carry out its obligations under the Agreement.

A2.4 **Supporting Proof.** Upon the request of the Province, the Recipient will provide the Province with proof of the matters referred to in Article A2.0.

A3.0 TERM OF THE AGREEMENT

A3.1 **Term.** The term of the Agreement will commence on the Effective Date and will expire on the Expiry Date unless terminated earlier pursuant to Article A11.0, Article A12.0, or Article A13.0.

A4.0 FUNDS AND CARRYING OUT THE PROJECT

A4.1 **Funds Provided.** The Province will:

- (a) provide the Recipient up to the Maximum Funds for the purpose of carrying out the Project;
- (b) provide the Funds to the Recipient in accordance with the payment plan attached to the Agreement as Schedule "E"; and
- (c) deposit the Funds into an account designated by the Recipient provided that the account:
 - (i) resides at a Canadian financial institution; and
 - (ii) is in the name of the Recipient.

A4.2 Limitation on Payment of Funds. Despite section A4.1:

- (a) the Province is not obligated to provide any Funds to the Recipient until the Recipient provides evidence satisfactory to the Province that the Recipient's council has authorized the execution of this Agreement by the Recipient by municipal by-law;
- (b) the Province is not obligated to provide any Funds to the Recipient until the Recipient provides the certificates of insurance or other proof as the Province may request pursuant to section A10.2;
- (c) the Province is not obligated to provide instalments of Funds until it is satisfied with the progress of the Project;
- (d) the Province may adjust the amount of Funds it provides to the Recipient in any Funding Year based upon the Province's assessment of the information the Recipient provides to the Province pursuant to section A7.1; or
- (e) if, pursuant to the *Financial Administration Act* (Ontario), the Province does not receive the necessary appropriation from the Ontario Legislature for payment under the Agreement, the Province is not obligated to make any such payment, and, as a consequence, the Province may:
 - (i) reduce the amount of Funds and, in consultation with the Recipient, change the Project; or
 - (ii) terminate the Agreement pursuant to section A12.1.

A4.3 Use of Funds and Carry Out the Project. The Recipient will do all the following:

- (a) carry out the Project in accordance with the Agreement;
- (b) use the Funds only for the purpose of carrying out the Project;
- (c) spend the Funds only in accordance with the Budget;
- (d) not use the Funds to cover any cost that has or will be funded or reimbursed by one or more of any third party, ministry, agency, or organization of the Government of Ontario.

A4.4 Interest Bearing Account. If the Province provides Funds before the Recipient's immediate need for the Funds, the Recipient will place the Funds in an interest-bearing account in the name of the Recipient at a Canadian financial institution.

A4.5 Interest. If the Recipient earns any interest on the Funds, the Province may:

- (a) deduct an amount equal to the interest from any further instalments of Funds;

or

(b) demand from the Recipient the payment of an amount equal to the interest.

A4.6 **Rebates, Credits, and Refunds.** The Ministry will calculate Funds based on the actual costs to the Recipient to carry out the Project, less any costs (including taxes) for which the Recipient has received, will receive, or is eligible to receive, a rebate, credit, or refund.

A5.0 RECIPIENT'S ACQUISITION OF GOODS OR SERVICES, AND DISPOSAL OF ASSETS

A5.1 **Acquisition.** If the Recipient acquires goods, services, or both with the Funds, it will do so through a process that promotes the best value for money.

A5.2 **Disposal.** The Recipient will not, without the Province's prior written consent, sell, lease, or otherwise dispose of any asset purchased or created with the Funds or for which Funds were provided, the cost of which exceeded the amount as provided for in Schedule "B" at the time of purchase.

A6.0 CONFLICT OF INTEREST

A6.1 **No Conflict of Interest.** The Recipient will carry out the Project and use the Funds without an actual, potential, or perceived conflict of interest.

A6.2 **Conflict of Interest Includes.** For the purposes of Article A6.0, a conflict of interest includes any circumstances where:

(a) the Recipient; or

(b) any person who has the capacity to influence the Recipient's decisions,

has outside commitments, relationships, or financial interests that could, or could be seen to, interfere with the Recipient's objective, unbiased, and impartial judgment relating to the Project, the use of the Funds, or both.

A6.3 **Disclosure to Province.** The Recipient will:

(a) disclose to the Province, without delay, any situation that a reasonable person would interpret as an actual, potential, or perceived conflict of interest; and

(b) comply with any terms and conditions that the Province may prescribe as a result of the disclosure.

A7.0 REPORTS, ACCOUNTING, AND REVIEW

A7.1 **Preparation and Submission.** The Recipient will:

- (a) submit to the Province at the address referred to in section A17.1, all Reports in accordance with the timelines and content requirements as provided for in Schedule "F", or in a form as specified by the Province from time to time;
- (b) submit to the Province at the address referred to in section A17.1, any other reports as may be requested by the Province in accordance with the timelines and content requirements specified by the Province;
- (c) ensure that all Reports and other reports are completed to the satisfaction of the Province; and
- (d) ensure that all Reports and other reports are signed on behalf of the Recipient by an authorized signing officer.

A7.2 Record Maintenance. The Recipient will keep and maintain:

- (a) all financial records (including invoices) relating to the Funds or otherwise to the Project in a manner consistent with generally accepted accounting principles; and
- (b) all non-financial documents and records relating to the Funds or otherwise to the Project.

A7.3 Inspection. The Province, any authorized representative, or any independent auditor identified by the Province may, at the Province's expense, upon twenty-four hours' Notice to the Recipient and during normal business hours, enter upon the Recipient's premises to review the progress of the Project and the Recipient's allocation and expenditure of the Funds and, for these purposes, the Province, any authorized representative, or any independent auditor identified by the Province may take one or more of the following actions:

- (a) inspect and copy the records and documents referred to in section A7.2;
- (b) remove any copies made pursuant to section A7.3(a) from the Recipient's premises; and
- (c) conduct an audit or investigation of the Recipient in respect of the expenditure of the Funds, the Project, or both.

A7.4 Disclosure. To assist in respect of the rights provided for in section A7.3, the Recipient will disclose any information requested by the Province, any authorized representatives, or any independent auditor identified by the Province, and will do so in the form requested by the Province, any authorized representative, or any independent auditor identified by the Province, as the case may be.

A7.5 No Control of Records. No provision of the Agreement will be construed so as to give the Province any control whatsoever over the Recipient's records.

A7.6 **Auditor General.** The Province's rights under Article A7.0 are in addition to any **rights** provided to the Auditor General pursuant to section 9.1 of the *Auditor General Act* (Ontario).

A8.0 COMMUNICATIONS REQUIREMENTS

A8.1 **Acknowledge Support.** Unless otherwise directed by the Province, the Recipient will:

- (a) acknowledge the support of the Province for the Project; and
- (b) ensure that the acknowledgement referred to in section A8.1(a) is in a form and manner as directed by the Province.

A8.2 **Publication.** The Recipient will indicate, in any of its Project-related publications, whether written, oral, or visual, that the views expressed in the publication are the views of the Recipient and do not necessarily reflect those of the Province.

A9.0 INDEMNITY

A9.1 **Indemnification.** The Recipient will indemnify and hold harmless the Indemnified Parties from and against any and all liability, loss, costs, damages, and expenses (including legal, expert and consultant fees), causes of action, actions, claims, demands, lawsuits, or other proceedings, by whomever made, sustained, incurred, brought, or prosecuted, in any way arising out of or in connection with the Project or otherwise in connection with the Agreement, unless solely caused by the negligence or wilful misconduct of the Indemnified Parties.

A10.0 INSURANCE

A10.1 **Recipient's Insurance.** The Recipient represents, warrants, and covenants that it has, and will maintain, at its own cost and expense, with insurers having a secure A.M. Best rating of B+ or greater, or the equivalent, all the necessary and appropriate insurance that a prudent person carrying out a project similar to the Project would maintain, including commercial general liability insurance on an occurrence basis for third party bodily injury, personal injury, and property damage, to an inclusive limit of not less than the amount provided for in Schedule "B" per occurrence. The insurance policy will include the following:

- (a) the Indemnified Parties as additional insureds with respect to liability arising in the course of performance of the Recipient's obligations under, or otherwise in connection with, the Agreement;
- (b) a cross-liability clause;
- (c) contractual liability coverage; and

(d) a 30-day written notice of cancellation.

A10.2 Proof of Insurance. The Recipient will:

(a) provide to the Province, either:

- (i) certificates of insurance that confirm the insurance coverage as provided for in section A10.1; or
- (ii) other proof that confirms the insurance coverage as provided for in section A10.1; and

(b) upon the request of the Province, provide to the Province a copy of any insurance policy.

A11.0 TERMINATION ON NOTICE

A11.1 Termination on Notice. The Province may terminate the Agreement at any time without liability, penalty, or costs upon giving at least 30 days' Notice to the Recipient.

A11.2 Consequences of Termination on Notice by the Province. If the Province terminates the Agreement pursuant to section A11.1, the Province may take one or more of the following actions:

- (a) cancel further instalments of Funds;
- (b) demand from the Recipient the payment of any Funds remaining in the possession or under the control of the Recipient; and
- (c) determine the reasonable costs for the Recipient to wind down the Project, and do either or both of the following:
 - (i) permit the Recipient to offset such costs against the amount the Recipient owes pursuant to section A11.2(b); and
 - (ii) subject to section A4.1(a), provide Funds to the Recipient to cover such costs.

A12.0 TERMINATION WHERE NO APPROPRIATION

A12.1 Termination Where No Appropriation. If, as provided for in section A4.2(d), the Province does not receive the necessary appropriation from the Ontario Legislature for any payment the Province is to make pursuant to the Agreement, the Province may terminate the Agreement immediately without liability, penalty, or costs by giving Notice to the Recipient.

A12.2 Consequences of Termination Where No Appropriation. If the Province terminates the Agreement pursuant to section A12.1, the Province may take

one or more of the following actions:

- (a) cancel further instalments of Funds;
- (b) demand from the Recipient the payment of any Funds remaining in the possession or under the control of the Recipient; and
- (c) determine the reasonable costs for the Recipient to wind down the Project and permit the Recipient to offset such costs against the amount owing pursuant to section A12.2(b).

A12.3 No Additional Funds. If, pursuant to section A12.2(c), the Province determines that the costs to wind down the Project exceed the Funds remaining in the possession or under the control of the Recipient, the Province will not provide additional Funds to the Recipient.

A13.0 EVENT OF DEFAULT, CORRECTIVE ACTION, AND TERMINATION FOR DEFAULT

A13.1 Events of Default. Each of the following events will constitute an Event of Default:

- (a) in the opinion of the Province, the Recipient breaches any representation, warranty, covenant, or other material term of the Agreement, including failing to do any of the following in accordance with the terms and conditions of the Agreement:
 - (i) carry out the Project;
 - (ii) use or spend Funds; or
 - (iii) provide, in accordance with section A7.1, Reports or such other reports as may have been requested pursuant to section A7.1(b);
- (b) the Recipient's operations, its financial condition, or its organizational structure, changes such that it no longer meets one or more of the eligibility requirements of the program under which the Province provides the Funds;
- (c) the Recipient makes an assignment, proposal, compromise, or arrangement for the benefit of creditors, or a creditor makes an application for an order adjudging the Recipient bankrupt, or applies for the appointment of a receiver; or
- (d) the Recipient ceases to operate.

A13.2 Consequences of Events of Default and Corrective Action. If an Event of Default occurs, the Province may, at any time, take one or more of the following actions:

- (a) initiate any action the Province considers necessary in order to facilitate the successful continuation or completion of the Project;
- (b) provide the Recipient with an opportunity to remedy the Event of Default;
- (c) suspend the payment of Funds for such period as the Province determines appropriate;
- (d) reduce the amount of the Funds;
- (e) cancel further instalments of Funds;
- (f) demand from the Recipient the payment of any Funds remaining in the possession or under the control of the Recipient;
- (g) demand from the Recipient the payment of an amount equal to any Funds the Recipient used, but did not use in accordance with the Agreement;
- (h) demand from the Recipient the payment of an amount equal to any Funds the Province provided to the Recipient; and
- (i) terminate the Agreement at any time, including immediately, without liability, penalty or costs to the Province upon giving Notice to the Recipient.

A13.3 Opportunity to Remedy. If, in accordance with section A13.2(b), the Province provides the Recipient with an opportunity to remedy the Event of Default, the Province will give Notice to the Recipient of:

- (a) the particulars of the Event of Default; and
- (b) the Notice Period.

A13.4 Recipient not Remediating. If the Province provided the Recipient with an opportunity to remedy the Event of Default pursuant to section A13.2(b), and:

- (a) the Recipient does not remedy the Event of Default within the Notice Period;
- (b) it becomes apparent to the Province that the Recipient cannot completely remedy the Event of Default within the Notice Period; or

the Recipient is not proceeding to remedy the Event of Default in a way that is satisfactory to the Province, the Province may extend the Notice Period, or initiate any one or more of the actions provided for in sections A13.2(a), (c), (d), (e), (f), (g), (h), and (i).

A13.5 When Termination Effective. Termination under Article will take effect as provided for in the Notice.

A14.0 FUNDS AT THE END OF A FUNDING YEAR

A14.1 **Funds at the End of a Funding Year.** Without limiting any rights of the Province under Article A13.0, if the Recipient has not spent all of the Funds allocated for the Funding Year as provided for in the Budget, the Province may take one or both of the following actions:

- (a) demand from the Recipient payment of the unspent Funds; and
- (b) adjust the amount of any further instalments of Funds accordingly.

A15.0 FUNDS UPON EXPIRY

A15.1 **Funds Upon Expiry.** The Recipient will, upon expiry of the Agreement, pay to the Province any Funds remaining in its possession or under its control.

A16.0 DEBT DUE AND PAYMENT

A16.1 **Payment of Overpayment.** If at any time the Province provides Funds in excess of the amount to which the Recipient is entitled under the Agreement, the Province may:

- (a) deduct an amount equal to the excess Funds from any further instalments of Funds; or
- (b) demand that the Recipient pay an amount equal to the excess Funds to the Province

A16.2 **Debt Due.** If, pursuant to the Agreement:

- (a) the Province demands from the Recipient the payment of any Funds or an amount equal to any Funds; or
- (b) the Recipient owes any Funds or an amount equal to any Funds to the Province, whether or not the Province has demanded their payment,

such Funds or other amount will be deemed to be a debt due and owing to the Province by the Recipient, and the Recipient will pay the amount to the Province immediately, unless the Province directs otherwise.

A16.3 **Interest Rate.** The Province may charge the Recipient interest on any money owing by the Recipient at the then current interest rate charged by the Province of Ontario on accounts receivable.

A16.4 **Payment of Money to Province.** The Recipient will pay any money owing to the Province by cheque payable to the "Ontario Minister of Finance" and delivered to the Province as provided for in Schedule "B".

A16.5 **Fails to Pay.** Without limiting the application of section 43 of the *Financial Administration Act* (Ontario), if the Recipient fails to pay any amount owing

under the Agreement, Her Majesty the Queen in right of Ontario may deduct any unpaid amount from any money payable to the Recipient by Her Majesty the Queen in right of Ontario.

A17.0 NOTICE

A17.1 Notice in Writing and Addressed. Notice will be in writing and will be delivered by email, postage-prepaid mail, personal delivery, or fax, and will be addressed to the Province and the Recipient respectively as provided for Schedule "B", or as either Party later designates to the other by Notice.

A17.2 Notice Given. Notice will be deemed to have been given:

- (a) in the case of postage-prepaid mail, five Business Days after the Notice is mailed; or
- (b) in the case of email, personal delivery, or fax, one Business Day after the Notice is delivered.

A17.3 Postal Disruption. Despite section A17.2(a), in the event of a postal disruption:

- (a) Notice by postage-prepaid mail will not be deemed to be given; and
- (b) the Party giving Notice will give Notice by email, personal delivery, or fax.

A18.0 CONSENT BY PROVINCE AND COMPLIANCE BY RECIPIENT

A18.1 Consent. When the Province provides its consent pursuant to the Agreement it may impose any terms and conditions on such consent and the Recipient will comply with such terms and conditions.

A19.0 SEVERABILITY OF PROVISIONS

A19.1 Invalidity or Unenforceability of Any Provision. The invalidity or unenforceability of any provision of the Agreement will not affect the validity or enforceability of any other provision of the Agreement. Any invalid or unenforceable provision will be deemed to be severed.

A20.0 WAIVER

A20.1 Waiver Request. Either Party may, in accordance with the Notice provision set out in Article A17.0, ask the other Party to waive an obligation under the Agreement.

A20.2 Waiver Applies. Any waiver a Party grants in response to a request made pursuant to section A20.1 will:

- (a) be valid only if the Party granting the waiver provides it in writing; and

(b) apply only to the specific obligation referred to in the waiver.

A21.0 INDEPENDENT PARTIES

A21.1 **Parties Independent.** The Recipient is not an agent, joint venturer, partner, or employee of the Province, and the Recipient will not represent itself in any way that might be taken by a reasonable person to suggest that it is, or take any actions that could establish or imply such a relationship.

A22.0 ASSIGNMENT OF AGREEMENT OR FUNDS

A22.1 **No Assignment.** The Recipient will not, without the prior written consent of the Province, assign any of its rights or obligations under the Agreement.

A22.2 **Agreement Binding.** All rights and obligations contained in the Agreement will extend to and be binding on the Parties' respective heirs, executors, administrators, successors, and permitted assigns.

A23.0 GOVERNING LAW

A23.1 **Governing Law.** The Agreement and the rights, obligations, and relations of the Parties will be governed by and construed in accordance with the laws of the Province of Ontario and the applicable federal laws of Canada. Any actions or proceedings arising in connection with the Agreement will be conducted in the courts of Ontario, which will have exclusive jurisdiction over such proceedings.

A24.0 FURTHER ASSURANCES

A24.1 **Agreement into Effect.** The Recipient will provide such further assurances as the Province may request from time to time with respect to any matter to which the Agreement pertains and will otherwise do or cause to be done all acts or things necessary to implement and carry into effect the terms and conditions of the Agreement to their full extent.

A25.0 JOINT AND SEVERAL LIABILITY

A25.1 **Joint and Several Liability.** Where the Recipient is comprised of more than one entity, all such entities will be jointly and severally liable to the Province for the fulfillment of the obligations of the Recipient under the Agreement.

A26.0 RIGHTS AND REMEDIES CUMULATIVE

A26.1 **Rights and Remedies Cumulative.** The rights and remedies of the Province under the Agreement are cumulative and are in addition to, and not in substitution for, any of its rights and remedies provided by law or in equity.

A27.0 FAILURE TO COMPLY WITH OTHER AGREEMENTS

A27.1 Other Agreements. If the Recipient:

- (a) has failed to comply with any term, condition, or obligation under any other agreement with Her Majesty the Queen in right of Ontario or one of Her agencies (a "**Failure**");
- (b) has been provided with notice of such Failure in accordance with the requirements of such other agreement;
- (c) has, if applicable, failed to rectify such Failure in accordance with the requirements of such other agreement; and
- (d) such Failure is continuing,

the Province may suspend the payment of Funds for such period as the Province determines appropriate.

A28.0 SURVIVAL

A28.1 Survival. The following Articles and sections, and all applicable cross-referenced sections and schedules, will continue in full force and effect for a period of seven years from the date of expiry or termination of the Agreement: Article 1.0, Article 3.0, Article A1.0 and any other applicable definitions, section A2.1(a), sections A4.2(e), A4.5, section A5.2, section A7.1 (to the extent that the Recipient has not provided the Reports or other reports as may have been requested to the satisfaction of the Province), sections A7.2, A7.3, A7.4, A7.5, A7.6, Article A8.0, Article A9.0, section A11.2, sections A12.2, A12.3, sections A13.1, A13.2(d), (e), (f), (g) and (h), Article A15.0, Article A16.0, Article A17.0, Article A19.0, section A22.2, Article A23.0, Article A25.0, Article A26.0, Article A27.0 and Article A28.0.

- END OF GENERAL TERMS AND CONDITIONS -

SCHEDULE "B"
PROJECT SPECIFIC INFORMATION AND ADDITIONAL PROVISIONS

Maximum Funds	\$200,000.00
Expiry Date	December 31, 2020
Amount for the purposes of section A5.2 (Disposal) of Schedule "A"	\$5,000.00
Insurance	\$2,000,000.00
Contact information for the purposes of Notice to the Province	<p>Name: Helen Collins</p> <p>Position: Manager, Municipal Programs and Outreach Unit</p> <p>Address: 777 Bay Street, Toronto, Ontario M7A 2J3, 16th Floor</p> <p>Fax: 416-585-7292</p> <p>Email: helen.collins@ontario.ca</p>
Contact information for the purposes of Notice to the Recipient	<p>Name:</p> <p>Position:</p> <p>Address:</p> <p>Fax:</p> <p>Email:</p>
Contact information for the senior financial person in the Recipient organization (e.g., CFO, CAO) – to respond as required to requests from the Province related to the Agreement	<p>Name:</p> <p>Position:</p> <p>Address:</p> <p>Fax:</p> <p>Email:</p>

Additional Provisions:

B1 Section 4.3 of Schedule "A" is amended by adding the following subsection:

(e) use the Funds only for the purpose of reimbursement for the actual amount

paid to the independent third-party reviewer in accordance with the Project;
and,

- (f) Not use the Funds for the purpose of paying the salaries of the Recipient's employees.

SCHEDULE "C"
PROJECT SUMMARY

Objectives

The objective of the Project is to review all of the Recipient's current services with the purpose of identifying efficiencies in internal processes, external service delivery and formal and informal shared services between the Recipient, the Town of Amherstburg, the County of Essex, the Town of Kingsville, the Town of Lakeshore, the Town of LaSalle, the Municipality of Leamington and the Town of Tecumseh (the Municipalities").

Description

The Recipient will retain an independent third-party reviewer to conduct a joint service delivery and modernization review of the internal and shared services of the Municipalities.

The independent third-party review will include a comprehensive evaluation of internal and external administrative processes of all five of the Recipient's departments. It will also seek to identify barriers to efficiencies, potential applications of new technology, and recommendations to update internal processes.

Independent Third-Party Reviewer's Report

The Recipient will retain the independent third-party reviewer to compile the findings and recommendations in the Independent Third-Party Reviewer's Report.

The Recipient will submit a draft of the Independent Third-Party Reviewer's Report to the Province by August 31, 2020. The draft will summarize the reviewer's preliminary findings and recommendations for cost savings and improved efficiencies.

The Recipient will submit the Independent Third-Party Reviewer's Report to the Province and publish the report on their publicly accessible website by September 18, 2020.

The report will summarize the reviewer's findings and identify specific, actionable recommendations based on the analysis and findings that aim to identify cost savings and improved efficiencies.

SCHEDULE "D"
BUDGET

ITEM	AMOUNT
Reimbursement for payments to independent third-party reviewer	Up to \$200,000.00

SCHEDULE "E"
PAYMENT PLAN

Milestone	Scheduled Payment
<ul style="list-style-type: none">• Execution of the Agreement	Initial payment of \$150,000.00 made to Recipient no more than thirty (30) days after the execution of the Agreement
<ul style="list-style-type: none">• Submission of Interim Progress Report to the Province• Submission of draft Independent Third-Party Reviewer's Report to the Province• Submission of Independent Third-Party Reviewer's Report to the Province• Publishing of Independent Third-Party Reviewer's Report on the Recipient's publicly accessible website• Submission of Final Report to the Province	Final payment of up to \$50,000.00 made to Recipient no more than thirty (30) days after the Province's approval of the Final Report

SCHEDULE "F" REPORTS

Name of Report	Reporting Due Date
1. Interim Progress Report	June 15 th , 2020
2. Final Report	September 18 th , 2020

Report Details

1. Interim Progress Report

The Recipient will submit an Interim Progress Report to the Province by June 15th, 2020 using the reporting template provided by the Province. The Interim Progress Report will include:

- An update to the estimated cost of the Project, and
- A statement indicating whether the Recipient has retained the independent third-party reviewer.

2. Final Report

The Recipient will submit a Final Report to the Province by September 18th, 2020 using the reporting template provided by the Province. The Final Report will include:

- A hyperlink to the Independent Third-Party Reviewer's Report on the Recipient's publicly accessible website,
- A 250-word abstract of the Project and its findings,
- The actual amount paid by the Recipient to the independent third-party reviewer in accordance with the Project with supporting documentation, such as invoices or receipts, showing actual costs incurred, and
- A statement indicating the percentage of the total amount of service delivery expenditures reviewed that are identified as potential cost savings in the Independent Third-Party Reviewer's Report, which will be the performance measure for the Project.

The Corporation of the Town of Essex

By-Law Number 1916

Being a by-law to confirm the proceedings of the May 19, 2020, Regular Meeting of Council of The Corporation of the Town of Essex

Whereas pursuant to Section 5(1) of The Municipal Act, 2001, S.O. 2001, c.25 as amended, the powers of a municipality shall be exercised by its Council;

And whereas pursuant to Section 5(3) of The Municipal Act, 2001, S.O. 2001, c.25 as amended, a municipal power, including a municipality's capacity, rights, powers and privileges under Section 8 of the Municipal Act, 2001, S.O. 2001, c.25, as amended, shall be exercised by by-law unless the municipality is specifically authorized to do otherwise;

And whereas it is deemed expedient that a by-law be passed to authorize the execution of Agreements and other documents and that the proceedings of the Council of The Corporation of the Town of Essex at its meetings be confirmed and adopted by by-law.

Now therefore be it resolved that the Council of The Corporation of the Town of Essex enacts as follows:

1. That the actions of the Council of The Corporation of the Town of Essex in respect of all recommendations in reports and minutes of committees, all motions and resolutions and all other actions passed and taken by the Council of The Corporation of the Town of Essex, documents and transactions entered into during the May 19, 2020 meeting of Council, are hereby adopted and confirmed as if the same were expressly contained in this by-law.
2. That the Mayor and proper officials of The Corporation of the Town of Essex are hereby authorized and directed to do all the things necessary to give effect to the actions of the Council of The Corporation of the Town of Essex during the said May 19, 2020 meeting referred to in paragraph 1 of this by-law.
3. That the Mayor and the Clerk are hereby authorized and directed to execute all documents necessary to the actions taken by this Council as described in Section 1 of this by-law and to affix the Corporate Seal of The Corporation of the Town of Essex to all documents referred to in said paragraph 1.

Read a first and a second time and provisionally adopted on May 19, 2020.

Mayor

Clerk

Read a third time and finally adopted on June 1, 2020.

Mayor

Clerk