Class Environmental Assessment Environmental Study Report, Denis St. Pierre Water Pollution Control Plant Expansion, Town of Lakeshore

Draft

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Prepared for:

Town of Lakeshore

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Executive Summary

The Town of Lakeshore is located in Essex County in the Province of Ontario. Lakeshore is bounded by Lake St. Clair to the north, the Municipality of Chatham-Kent to the east, the Town of Tecumseh to the west with the Municipalities of Leamington, Kingsville and Essex abutting the southern municipal boundary. Lakeshore was established with the amalgamation of the former Townships of Tilbury North, Tilbury West, Rochester, and Maidstone, and the former Town of Belle River.

This Environmental Study Report (ESR) is the documentation of the Class Environmental Assessment (Class EA) process of the Municipal Engineers Association (MEA) for sanitary sewage works to service the Belle River and Maidstone Communities. Figure 1.1 shows the location of these communities.

This ESR comprises Sections 1 to 8 inclusive and Appendices A to C inclusive.

SECTION 1: INTRODUCTION

This section provides background information and a description of the Class EA process. The Class EA process includes five phases. Phase 1 includes identification of the problem or opportunity and discretionary public consultation. Phase 2 includes identification and evaluation of alternative solutions to the problem, identification of environmental impacts of the alternative solutions, consultation with the public and review agencies, selection of the preferred solution and determination of the project Schedule. Projects are classified as Schedule A, B or C depending on their complexity and potential for environmental impact. Phase 3 includes identification and evaluation of alternative design concepts, identification of environmental impacts and mitigating measures with respect to the design concepts, further consultation with the public and review agencies, and selection of the preferred design. Phase 4 includes the completion of the ESR and placing it on the public record, notification to the public and review agencies of completion of the Class EA and a 30-day review period providing the opportunity to request the Minister to require a proponent to comply with Part II of the EA Act (which addresses individual EAs) before proceeding with the project. The Minister determines whether this is necessary.

The Master Plan and Update were prepared in accordance with Phases 1 and 2 of the Class EA process and identified this project as Schedule C. This Class EA has been carried out in accordance with Phases 3 and 4.

SECTION 2: EXISTING WATER POLLUTION CONTROL PLANT

This section describes the existing Denis St. Pierre Water Pollution Control Plant (WPCP) providing secondary level biological treatment for municipal wastewater from the Belle River and Maidstone areas.

The Denis St. Pierre WPCP, which is located on Rourke Line Road south of County Road 22, Town of Lakeshore, has a rated capacity of 14,500 m^3/day. The treatment process consists of fine screening, grit removal, three extended aeration tanks, two final settling tanks, and UV disinfection. Waste activated sludge is aerobically digested for stabilization and the stabilized biosolids are gravity-thickened and dewatered by centrifuges. The dewatered biosolids are hauled to an offsite storage facility and ultimately land applied.

Treated effluent is discharged into Lake St. Clair through a 900-mm-diameter plant outfall sewer. The existing outfall sewer extends approximately 600 m into Lake St. Clair. Effluent discharges through nozzles at the end of the outfall to assist in dispersing the effluent.

SECTION 3: PROBLEM STATEMENT

This section provides an overview of population projections, future wastewater flows, identifies the problem statement, and establishes the project objective.

An average treated flow of 14,228 m^3/d from the Belle River and Maidstone wastewater service areas was recorded for 2018, which is approximately 98 percent of the plant's rated capacity of 14,500 m^3/d. Thus, the existing capacity of the Denis St. Pierre WPCP is not adequate to accommodate the projected future flows from the Belle River and Maidstone wastewater service area.

There are pressures for residential and industrial development in the Belle River and Maidstone areas and because of inadequate wastewater treatment capacity, developments have been restricted. Additional treatment capacity at the Denis St. Pierre WPCP is required to support the existing services areas and the anticipated future growth.

SECTION 4: WASTEWATER TREATMENT DESIGN ALTERNATIVES

This section of the report identified and evaluated seven different treatment process leading to the selection of a preferred design for this application.

The evaluation of alternative designs includes consideration of potential environmental, social and economic impacts and recognizes the need to design the facilities in such a way that they will be as unobtrusive as possible and blend in with existing treatment plant site.

The existing Denis St. Pierre WPCP was upgraded and converted from an SBR to an extended aerated activated sludge (EAAS) system in 2008. Operating experience with the EAAS system has been good and there is some merit in utilizing the same process for the Denis St. Pierre WPCP expansion. Thus, the EAAS system is identified as the preferred treatment process for the plant expansion.

SECTION 5: BIOSOLIDS MANAGEMENT DESIGN ALTERNATIVES

This section of the report reviews various possible biosolids management approaches with the objective of selecting the preferred system for the Denis St. Pierre WPCP expansion. The EAAS treatment process produces excess solids known as waste activated sludge. Biosolids

management deals with all aspects of handling the waste sludge stream including storage, dewatering or thickening, stabilization and ultimate disposal.

A number of disposal alternatives were considered including incineration, landfilling, farmland application and re-sale of the stabilized and processed biosolids product. Alternative biosolids stabilization processes that were considered include anaerobic digestion, aerobic digestion, lime stabilization, composting and pelletization. A biosolids management system consisting of aerobic digestion, sludge dewatering, sludge cake storage and seasonal application on farmland offers several advantages. It is recommended as the preferred option for the plant expansion because it is a proven process and has been used successfully at the existing Denis St. Pierre WPCP for many years.

SECTION 6: ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

This section identifies the environmental impacts of the preferred solution and describes the recommended mitigation measures.

SECTION 7: PUBLIC PARTICIPATION

This section documents agency and public consultations that occurred during this EA process. This section includes documentation of consultation with the public and review agencies. In order to complete Phase 4 of the Class EA process, this report will be made available for review and comment by the public and review agencies as a part of the consultation process.

SECTION 8: SUMMARY

This section summarizes recommendations that are made with respect to this study, and the preferred design with respect to probable capital costs.

Abbreviations

BOD	**Biochemical Oxygen Demand**
CPR	**Canada Pacific Rail**
PDWF	**Peak Dry Weather Flow**
EA	**Environmental Assessment**
EAAS	**Extended Aerated Activated Sludge**
ECA	**Environmental Compliance Approval**
ERCA	**Essex Region Conservation Authority**
ESR	**Environmental Study Report**
HGL	**Hydraulic grade line**
I&I	**inflow and infiltration**
kg	**kilogram**
kW	**kilowatt**
L	**litres**
L/c/d	**litres per capita per day**
m	**metre**
mg	**milligrams**
MECP	**Ministry of the Environment, Conservation and Parks, formerly known as MOECC, MOE**
Mg/L	**Milligrams per litre**
MIG	**million Imperial gallons**
MIGD	**million Imperial gallons per day**
mL	**millilitres**
ML/d or MLD	**million litres or megalitres per day**
mm	**millimetre**
MOE	**Ministry of Environment, now Known as MECP**
OCWA	**Ontario Clean Water Agency**
PS	**Pumping Station**
PWWF	**Peak Wet Weather Flow**
RAS	**Return Activated Sludge**
SBR	**Sequencing Batch Reactor**
SOR	**Surface Overflow Rate**
SWD	**Side Wall Depth**
TSS	**Total Suspended Solids**
UV	**Ultraviolet**
WAS	**Waste Activated Sludge**
WPCP	**Water Pollution Control Plant**

1.0 INTRODUCTION

1.1 BACKGROUND

The Town of Lakeshore is located in Essex County in the Province of Ontario. The Town of Lakeshore is bounded by Lake St. Clair to the north, the Municipality of Chatham-Kent to the east, the Town of Tecumseh to the west with the Municipalities of Leamington, Kingsville and Essex abutting the southern municipal boundary. Lakeshore was established with the amalgamation of the former Townships of Tilbury North, Tilbury West, Rochester, and Maidstone, and the former Town of Belle River. Figure 1.1 of Appendix A shows key plan of the County of Essex.

The urbanized areas within the Town of Lakeshore which are serviced with sewage works include Belle River, Maidstone, Stoney Point, Comber and South Woodslee. Other urbanized areas that are not serviced include North Woodslee, Lighthouse Cove, Rochester Place, Belle River Road, Essex Fringe and Highway 401 Corridor. This Class EA is concerned with the Belle River and Maidstone communities, which is shown in Figure 1.2 of Appendix A.

The Town of Lakeshore adopted its first comprehensive Water and Wastewater Master Plan in November 2008, and then an update of this Master Plan was undertaken and completed in 2018 in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment (EA) process.

The Water and Wastewater Master Plan and Update identified capacity issues within the Denis St. Pierre Wastewater System. The former Belle River community and the Maidstone urban are serviced by the Denis St. Pierre Wastewater System consisting of sanitary sewers, pumping stations, the Denis St. Pierre Water Pollution Control Plant (WPCP) and an outfall discharging to Lake St. Clair.

It is outlined in the Master Plan and Update that additional treatment capacity at the Denis St. Pierre Water Pollution Control Plant (WPCP) is required to support the existing services areas and the anticipated future growth. The Master Plan and Update were prepared in accordance with Phases 1 and 2 of the Class EA process to implement the preferred solution which involves capacity expansion of the Denis St. Pierre WPCP which is located on Rourke Line.

Executive summary of the Master Plan and Update is presented in Appendix B. Further information may be obtained by viewing the Water and Wastewater Master Plan at www.lakeshore.ca.

The Town of Lakeshore is now undertaking Phases 3 and 4 of the Class EA process which will involve evaluation of alternative design concepts for the proposed Denis St. Pierre WPCP

capacity expansion, and preparation of an Environmental Study Report documenting the activities and recommendations from the Class EA process.

1.2 CLASS ENVIRONMENTAL ASSESSMENT PROCESS

1.2.1 General

The Environmental Assessment (EA) Act was passed in 1975 by the Province of Ontario to provide a mechanism for public participation in public projects.

The EA Act provides a means for the public or interest groups to receive the needed assurances that the environment is being protected from adverse effects on any significant public project. If there are necessary adverse effects on the environment, the public also needs assurances that all essential measures are being taken to minimize these impacts. The proponent is to weigh the impacts of a number of possible alternative ways to achieve the desired objective and to select the best alternative based on a thorough examination of each.

The EA Act recognized that certain municipal undertakings occur frequently, are small in scale, have a generally predictable range of effects or have relatively minor environmental significance. To ensure that a degree of standardization in the planning process is followed throughout the Province, the EA Act contemplated the use of the 'Class EA procedure for projects which require approval under the Act but which are not considered to be major environmental works. The work undertaken in this study includes Phases 3 and 4 the EA process and follows the planning and design process of the Municipal Engineers Association (MEA) Class EA, October 2000, as amended in 2007, 2011 and 2015.

The Class EA document also serves as a statement for public use in the decision making process under the EA Act. Municipal staff and consultants can use the Class EA in planning design and construction of projects to ensure that the requirements of the EA Act are met. As part of the Class EA procedure, the proponent is required to state how the project is to proceed and gain approval under this EA Act. There are three approval mechanisms available to the proponent under the Class EA.

- **Schedule A** projects are limited in scale, have minimal adverse environmental affects and include a number of normal or emergency municipal maintenance and operational objectives. These projects are pre-approved and can proceed directly to implementation without following the full Class EA planning process.
- **Schedule A+** projects include a new sub-class of activities introduced as part of the 2007 MEA Class EA amendments. Schedule A+ projects are also pre-approved similar to Schedule A, however, the public is to be advised prior to project implementation. Advising the public of the project implementation is a means to inform the public of what

is being undertaken in their local area. The manner in which the public is advised is to be determined by the proponent.

- **Schedule B** projects generally include improvements and minor expansions to existing facilities. In these cases, there is a potential for some adverse environmental impacts and therefore the proponent is required to proceed through a screening process including consultation with those who may be affected.
- **Schedule C** projects generally include the construction of new facilities and major expansions to existing facilities. These projects proceed through the environmental assessment planning process outlined in the Class EA and require preparation of an Environmental Study Report (ESR) to document the planning process.

The preferred solution has multiple activities identified under multiple Class EA schedules. Therefore, this project is being completed under the Municipal Class EA as a **Schedule C** activity, which is the highest identified schedule.

1.2.2 Phases in Class EA Process

The Class EA for municipal projects follows a five-phase planning process that can be summarized as follows:

Phase 1 - Identification of the problem

Phase 2 Identification of alternative solutions to the problem, consultation with review agencies and the public, selection of the preferred solution, and identification of the project as a Schedule A, A+, B or C activity.

Phase 3 - Identification of alternative design concepts (technical alternatives) for the preferred solution, evaluation of the alternative designs and their impacts on the environment, consultation with review agencies and the public and selection of the preferred design.

Phase 4 - Preparation of an Environmental Study Report (ESR) to document the planning, design and consultation process for the project. The ESR is placed on the public registry for scrutiny by review agencies and the public.

Phase 5 - Final design, construction and commissioning of selected technical alternative. Monitoring of construction for adherence to environmental provisions and commitments.

The steps in each phase are identified in the flow diagram shown in Figure 1.3.

2.0 EXISTING WATER POLLUTION CONTROL PLANT

2.1 DESCRIPTION OF EXISTING WASTEWATER TREATMENT PLANT

2.1.1 Overview

The Denis St. Pierre WPCP is located on Rourke Line Road south of County Road 22 and provides secondary level biological treatment. The plant was commissioned in 1976 as an extended aeration plant and was later upgraded and expanded in 1999 to a sequencing batch reactor (SBR) process. The treatment plant was rated for an average daily sewage flow of 13,640 m^3/day (3.0 MIGD) and a peak flow capacity of 35,069 m^3/d (7.7 MIGD). However, various operational problems were limiting the treatment capacity of the facility. In response to these operational issues, the Town of Lakeshore implemented the upgrade improvements including converting the SBR treatment process to an Extended Aeration process including blower facilities, new final clarifiers and a new effluent pumping station in addition to improvements to the biosolids handling process involving upgrades to existing centrifuge dewatering equipment as well as various improvements to ancillary systems. The improvements and upgrades were completed in the Winter of 2008 but had no increase in the plants rated capacity.

The main treatment process consists of fine screening, grit removal, four (4) extended aeration tanks, two (2) final clarifiers, and UV disinfection. Treated effluent is discharged into Lake St. Clair though an outfall sewer. Waste activated sludge is aerobically digested for stabilization and the stabilized biosolids are gravity thickened and dewatered by centrifuges. The dewatered biosolids are hauled to an offsite storage facility and ultimately land applied.

The existing plant site includes provisions for future expansion to accommodate the ultimate design. The existing plant site has sufficient space for expansions to accommodate an ultimate design flow, which will double the existing treatment capacity.

2.1.2 Design Wastewater Flows

The most recent upgrades of the existing Denis St. Pierre WPCP were completed in 2008. The plant was originally rated for an average daily sewage flow of 13,640 m^3/day (3.0 MIGD) and a peak flow capacity of 35,069 m^3/d (7.7 MIGD), and then re-rated for an average daily sewage flow of 14,500 m^3/day (3.2 MIGD) in January 2019.

Table 2.1 summarizes the original design flows for the existing plant. The table also includes ultimate design capacities. It shall be noted that the peak wet weather flow (PWWF) is equal to the total raw sewage pumping capacity for the current design.

Existing Water Pollution Control Plant

Table 2.1 Design Sewage Flows

Parameter	Existing Design	Ultimate Design
Average Dry Weather Flow (ADWF)	13,640 m^3/d (1)	27,280 m^3/d
Peak Dry Weather Flow (PDWF)	35,070 m^3/d	70,140 m^3/d
Peak Wet Weather Flow (PWWF)	67,855 m^3/d	102,750 m^3/d
Note (1): Re-rated for an average daily sewage flow of 14,500 m^3/day (3.2 MIGD) in January 2019		

Table 2.2 summarizes the design flows used for each unit process in evaluating plant hydraulics.

Table 2.2 Hydraulic Design Parameters

Parameter	Current Design	Ultimate Design
Inlet Channel	67,855 m^3/d	102,750 m^3/d
Preliminary Treatment (Screening & Grit)	67,855 m3/d	102,750 m3/d
Secondary Treatment	35,070 m^3/d	70,140 m^3/d
UV Disinfection	35,070 m3/d	70,140 m3/d
Storm Bypass Facility - Normal Operating Conditions	32,800 m^3/d	32,800 m^3/d
Effluent Pump Station	70, 140 m^3/d	105,210 m^3/d
Outfall Sewer	70, 140 m^3/d	105,210 m^3/d

Bypass facilities are to be designed to bypass secondary treatment at flows exceeding 35,070 m^3/d (406 L/s) in the proposed design and 70,140 m^3/d (812 L/s) in the ultimate design. These flows are to be directed to a pair of wastewater holding tanks that will release the stored contents back to the plant headworks for treatment when capacity becomes available at the plant.

2.1.3 Design Wastewater Characteristics and Loading

The raw wastewater influent to the Denis St. Pierre WPCP is primarily of domestic origin, with the exception of a few commercial sources. Table 2.3 presents a summary of the raw wastewater characteristics and loadings for the upgrades of the existing plant in 2008.

Table 2.3 Raw Wastewater Characteristics and Loadings

Parameter	Concentration[1] (mg/L)		Loading [3] (kg/d)	
	Average	Max Month[2]	Average	Max Month[2]
BOD_5	139	197	1,896	2,692
TSS	238	380	3,246	5,194
TP	4.7	6.4	64.1	85.9
TKN	20.5	25.8	280	350

Notes:
(1) Average concentration based on 2000 – September 2006 historical average.
(2) Maximum month concentration based on maximum month factors (2000 to September 2006).
(3) Loading at the plant's rated capacity of 13,640 m^3/d

2.1.4 Treatment and Compliance Requirements

The treatment plant operates under an Amended Environmental Compliance Approval (ECA) No. 1087-B7FLRU issued on January 29, 2019. A copy of the current ECA is contained in Appendix B. The current ECA outlines the effluent compliance limits and objectives for the facility, which are summarized in Table 2.4 .

Table 2.4 Effluent Objectives and Non-compliance Limits

	Non-compliance Limits		Effluent Objectives
Parameter	Monthly Average Concentration	Annual Average Loading	Concentration
$cBOD_5$	14 mg/L	203 kg/d	10 mg/L
TSS	14 mg/L	203 kg/d	10 mg/L
TP	0.8 mg/L	11.6 kg/d	0.5 mg/L
Total Ammonia			
Summer (May 1 to Nov 31)	1.4 mg/L	20.3 kg/d	1.0 mg/L
Winter(Dec 1 to April 30)	2.8 mg/L	40.6 kg/d	2.0 mg/L
E. coli[1]	200 organisms/100 mL	-	150 organisms/100 mL
pH	6.5 - 9.5 inclusive	-	6.5 - 8.5 inclusive

Notes:
(1) Monthly geometric mean density.

2.1.5 Existing Treatment Process

The Denis St. Pierre Water Pollution Control Plant provides secondary level treatment for municipal wastewater from the Belle River and Maidstone communities. The treatment plant was commissioned in 1977 as an extended aerated activated sludge (EAAS) plant, and expanded in 1999 to a Sequencing Batch Reactor (SBR) process. The plant was later upgraded back to an EAAS plant in 2008.

Major unit operations at the Denis St. Pierre WPCP include the following:

- Raw Wastewater Pumping Station
- Fine Screening
- Grit Removal
- Extended Aeration Activated Sludge with Selectors
- Final Clarification
- UV disinfection
- Effluent Pumping Station and Outfall Discharge to Lake St. Clair
- Aerobic Sludge Digestion
- Sludge Dewatering by Centrifuges

The existing plant was designed to handle a peak flow 785 L/s (67,855 m^3/d) including a peak dry weather flow of 406 L/s (35,069 m^3/d) plus a wet weather bypass flow of 379 L/s (32,786 m^3/d). Two wastewater holding tanks with a total storage volume of 1,800 m^3 were also provided to capture and store bypass flows until they can be returned to the plant inlet works after the storm event when plant capacity become available. The upgrades were also designed to easily accommodate future expansions to an ultimate plant capacity of 1,189 L/s (102,750 m^3/d).

A schematic of the existing plant is shown in the following Figure 2.1 of Appendix A.

Major unit process data are summarized in Table 2.5.

Table 2.5 Denis St. Pierre WPCP Major Unit Process Description

Unit Process	Process Description
Belle River Pumping Station No.2: Number and Type of Pumps: No. in Standby: hp each Firm Capacity: Total capacity:	 three pumps, 2-duty and 1-standby, each 80 L/s at 26 m TDH 1 50 13,820 m^3/d 20,735 m^3/d
Maidstone Pumping Station No.8: Number and Type of Pumps: No. in Standby: hp each Firm Capacity: Total capacity:	 two-stage screw pump station; each stage with two (2) screw pumps 1 per stage 50 23,560 m^3/d 47,120 m^3/d
Screening: No. of Units: Type: Peak Flow each (MLD)	 2 One automatic perforated fine screen with 6 mm opening, having a peak capacity of 67,750 m^3/d. One 12 mm bar screen, manually cleaned as standby
Grit Removal: Type: Diameter: No. of Vortex Separator Units: Vortex Tank Capacity – Treatment Vortex Tank Capacity – Hydraulic No. of Classifiers Grit Classifier Capacity	 One vortex separator, one grit classifier with cyclone 4.2 m 2 51,400 m^3/d 67,855 m^3/d 1 grit loading of 1.8 dry tons per hour
Selector: No. of Selector: No. of Chamber per Selector: Chamber Dimensions and Volume: Mixer Type Aeration Diffuser Type: Aeration Blowers:	 1 3 First Chamber A: 5.16mx2.45m by 4.7m SWD, 59 m^3 First Chamber B: 6.74mx4.45m by 4.7m SWD, 141 m^3 Second Chamber: 10.1mx3.2m by 4.7m SWD, 152 m^3 Third Chamber: 12.3mx5.25m by 4.7m SWD, 304 m^3 Submersible, operation in anoxic mode First Chamber A: 2.5 HP First Chamber B: 2.5 HP Second Chamber: 4 HP Third Chamber: 8.3 HP Fine pore, membrane disk, operation in aerobic mode One at 25 HP, PD type, rated 232 L/s at 7.5 psi discharge pressure
Aeration Tank: No. of Tanks: Cells per Tank: Tank Dimensions: Tank Volume – each Diffuser Type: Blowers:	 3 2 in parallel, divided by baffle wall 15.05 m x 43.5 m by 4.23 m SWD 2769 m^3 Fine pore, membrane disk, Sanitaire Four (3 duty, 1 standby) at 125 HP each, centrifugal type, each at 1000 L/sec at 7.5 psi discharge pressure

Table 2.5 Denis St. Pierre WPCP Major Unit Process Description

Unit Process	Process Description
Phosphorous Removal:	
Chemical:	Alum
Storage:	one tank, 46,000 L
Chemical Feed Pumps:	Two (1 duty, 1 standby), each 108 L/hr Lines to dosing point at the final clarifier distribution chamber
Final Clarifier:	
No. of Units:	2
Type:	Circular, centre drive clarifier mechanism
Total Volume m3:	3,016
Surface Area – each:	754 m^2
Dimensions - each:	30.3 m diameter by 4 m SWD
Scum Pumps:	
No. of Units:	1
Type & Size:	Wemco Hydrostal Torque Flow Pump, 3 HP
Capacity - each:	5.0 L/s at 5.9 m TDH
Return Sludge Pumps:	
No. of Units:	3
Type & Size:	Wemco Hydrostal Torque Flow Pump, 16.7 HP
Capacity - each:	160 L/sec at 6 m TDH
Waste Sludge Pumps:	
No. of Units:	2
Type:	Wemco Hydrostal Torque Flow Pump, 2.9 HP
Capacity - each (L/sec):	20 L/sec at 5.8 m TDH
UV Disinfection:	
No. of banks:	2, each can handle flow of 17,534 m^3/d
Type:	Ultra Violet, Trojan UV3000
Rated Capacity	35,069 m^3/d
Effluent Pumping Station:	
No. of Pumps:	3 (2 duty,1 standby)
Type:	Submersible centrifugal; fixed speed
hp each	45
Flow Capacity - each:	406 L/sec at 3.3 m TDH
Outfall Sewer:	
Size (mm diameter):	900
Type:	Gravity flow, surcharged when effluent pumping station is on
Aerobic Digesters:	
No. of digesters:	3
Dimensions and Volume:	1st Digester: 21.5 m x 29.9 m by 4.1 m SWD, 2,620 m^3 2nd Digester: 6.8 m x 28.5 m by 4.5 m SWD, 870 m^3 3rd Digester: 5.8 m x 29.0 m by 4.5 m SWD, 760 m^3
Aeration and Mixing Type:	1st Digester: Jet Aeration, 3 jet pumps, 20 HP each, 515 L/s air 2nd Digester: coarse bubble with 150 Flexcap Diffuser, 795 L/s air 3rd Digester: coarse bubble with 168 Flexcap Diffuser, 690 L/s air
Sludge Dewatering:	
Sludge feed pumps	One duty 6 L/s (actual 5.4 L/s), one standby 3 L/s
No. of Centrifuges:	Two dewatering centrifuges
Centrifuge Capacity - each:	2.8 L/s (maximum allowable hydraulic loading) 140 Kg/hr (maximum allowable solids loading)
Polymer Feed Pump	One with VFD, flow range 5.0 – 35 L/s

Table 2.5 Denis St. Pierre WPCP Major Unit Process Description

Unit Process	Process Description
Wastewater Holding Tanks: No. of Units: Type: Total Volume (m3):	 2 Circular, above surface 1,800
Standby Power: No. of Units and Capacity:	 Two, one 350 kW located adjacent to Selector & Blower Building, 460 KW generator in Sludge Management Building

2.2 PLANT INFLUENT AND EFFLUENT CHARACTERISTICS

2.2.1 Influent Flows

Historical annual wastewater flows to the Denis St. Pierre WPCP from 2009 to 2018 are summarized in Table 2.6. With the exception of an extremely wet weather year in 2011 with an annual precipitation of 1,568 mm, annual average daily wastewater flows were relatively constant over the period 2009 to 2013, ranging from 8,089 m^3/d to 9,766 m^3/d. However, over the period 2013 to 2018 with relatively constant annual precipitation ranging from 945 mm to 1,148 mm, annual average daily wastewater flows have shown a relatively constant on an upward trend, increasing from 9,646 m^3/d to 14,228 m^3/d.

Table 2.6 Historical Annual Wastewater Flows to Denis St. Pierre WPCP (2009-2018)

Year	Daily Average Flow (m^3/d)	Daily Max Flow (m^3/d)	Peak Factor	Annual Precipitation (mm)
2018	14,228	37,657	2.65	935
2017	13,332	35,872	2.69	1,014
2016	12,399	36,650	2.96	1,020
2015	11,887	-	-	981
2014	11,302	33,579	2.97	1,053
2013	9,646	25,677	2.66	1,148
2012	8,089	25,677	3.12	782
2011	13,819	33,966	2.46	1,568
2010	9,766	-	-	904
2009	9,586	-	-	948

According to the Certificate of Approval Number 1087-B7FLRU (January 29, 2019), the Denis St. Pierre WPCP has a rated plant capacity of 14,500 m^3/d with a peak flow capacity of 35,069 m^3/d. Average day flow (based on the 2018 data reviewed) is approximately 14,228 m^3/d, representing approximately 98 percent of the rated plant capacity (14,500 m^3/d). The most

recent three-year annual average day flow (based on 2016 to 2018 data) is 13, 320 m^3/d, representing approximately 92 percent of the rated plant capacity.

The Belle River-Maidstone collection system is a separate sanitary sewer system that was designed to carry domestic wastewater to the treatment plant. However, extraneous flows into the sewer system result in significant flow increases during storm events. Peak flows vary significantly due to the significant contribution of wet weather inflow and infiltration into the Town's aging sanitary sewers.

The plant frequently experiences periods of high flows for extended durations that are typically associated with snow melt and wet weather events. The following Figure **2.2** of Appendix A shows flow into the plant during a storm event on November 2, 2018.

Based on the 2018 average day flow of 14,228 m^3/day and maximum day flow of approximately 37,657 m^3/d, the maximum day flow factor is 2.65, suggesting a high level of extraneous flow (infiltration and/or inflow, I/I) entering the collection system. Excess flows resulting from storm events are bypassed into a wastewater holding tank. If the capacity of the wastewater holding tank is not exceeded, following the storm event, the tank contents are pumped back into the inlet facilities for treatment when treatment capacity becomes available at the plant. If the capacity of the wastewater holding tank is exceeded, then the settled overflow bypasses secondary treatment and is discharged together with plant effluent into the outfall sewer. There is no provision for disinfection of bypass flows.

In an attempt to minimize wet weather flows at the plant, the Town implemented a 10 year infiltration and inflow reduction program in 2010. The historical flow records indicate there has been no significant reduction in infiltration and inflow. This doesn't mean that I/I reduction program has not achieved some benefits but rather illustrates the overall magnitude of the I/I problem.

2.2.2 Influent and Effluent Characteristics

The influent/effluent wastewater characteristics for the review period are summarized in Table 2.7. Influent concentrations are generally consistent with typical medium-strength domestic wastewater characteristics as indicated in MECP Design Guidelines (170 mg/L BOD total, 200 mg/L SS, and 7 mg/L TP) and Metcalf & Eddy (190 mg/L BOD, 210 mg/L SS, and 7 mg/L TP).

As shown in Table 2.8, lower monthly flows generally coincide with higher influent concentrations (except TSS in 2018) in comparison to influent concentrations in maximum flow months.

Table 2.7 Summary of Influent and Effluent Characteristics (2018)

Parameter	Influent (mg/L)	Final Effluent (mg/L)	Removal Rate (%)
$cBOD_5$	107	2.3	97.9
TSS	190	3.1	98.4
TP	2.1	0.21	90.0
TAN	1.9	0.13	93.1

Table 2.8 Summary of Influent Characteristics (Min and Max Flow Months)

Influent Parameter(1)	Year					
	2018		2017		2016	
	Min Flow Month	Min Flow Month	Max Flow Month	Min Flow Month	Max Flow Month	Min Flow Month
Monthly Mean Flow (m^3/d)	17,587	11,725	16,277	10,485	17,505	9,940
$cBOD_5$ (mg/L)	42	62	25	140	46	162
TSS (mg/L)	178	85	108	250	80	543
TP (mg/L)	0.91	1.18	0.61	2.79	1.08	3.44
TKN (mg/L)	16.4	19.9	9.7	22.3	13.7	27

Notes:
(1) Influent flow and concentrations based on values reported in monthly (plant) data sheets

The Denis St. Pierre WPCP has consistently produced a high quality effluent. As shown in Table 2.9, over the 2018 period reviewed, the plant achieves its effluent compliance requirements with concentrations of 2.3 mg/L, 3.1 mg/L, 0.21 mg/L and 0.13 for $CBOD_5$, TSS, and TP, TAN respectively. The plant has continued to consistently achieve a high quality effluent and has consistently met its effluent compliance requirements.

Table 2.9 Summary of Denis St. Pierre WPCP Effluent Quality

Parameter		2011	2012	2013	2014	2015	2016	2017	2018
cBOD5 (mg/L)		2.23	2.12	2.06	2.04	2.14	2.06	2.35	2.29
TSS (mg/L)		5.38	3.47	4.13	2.83	3.18	2.86	3.66	3.10
Total Ammonia Nitrogen (mg/L)	Spring-Fall(1)	0.10	0.15	0.10	0.11	0.10	0.11	0.12	0.10
	Winter(2)	0.11	0.11	0.11	0.82	0.15	0.16	0.61	0.19
Total Phosphorous (mg/L)		0.20	0.20	0.19	0.10	0.12	0.11	0.16	0.21
E. coli (Organisms/100mL)		5.98	5.85	10.33	9.54	6.12	4.95	10.24	13.10

Note:
(1) Spring-fall period: May 1 - Nov 3
(2) Winter period: Dec 1 - April 30

2.3 REVIEW OF EXISTING UNIT PROCESS PARAMETERS

2.3.1 General Unit Process Evaluation

The objective of the existing WPCP process evaluation and performance (liquid treatment train and solids handling) was to define the status of the existing Denis St. Pierre WPCP, in terms of flows, loadings, process capacity, bottlenecks, and opportunities. Key components of the process performance evaluation include:

- review and summarize unit process parameters, including flows and loadings for the liquid treatment and sludge handling processes under current conditions and at the rated plant capacity
- review the impact of peak flow conditions on existing unit process parameters
- review of sludge accountability analysis and prediction of sludge generation at the rated plant capacity
- identification of process limitations and opportunities to maximize existing unit process capacities
- obtain a strong unit process understanding of the plant to serve as the design basis to effectively address plant unit process modifications required for a plant expansion

A review of historical operating and performance data was undertaken to establish and define the performance status of the overall plant and the individual unit processes. Historical operation records over the period January 2018 to December 2018 were compiled for analysis, including plant unit process parameters and sludge generation rates. Monthly average data values were used to simplify data compilation, although daily records were reviewed as applicable.

Process parameters are compared to MECP Design Guidelines for Sewage Works (July 2008) and other current literature values (Metcalf and Eddy, 2003). The MECP Design Guidelines are intended to facilitate the proper design of sewage works in Ontario and provide satisfactory guidance for the review and approval of sewage works by the Ministry through the Certificate of Approval (C of A) process. For the purposes of this process evaluation, the MECP Design Guidelines (2008) were used.

A detailed description of key unit process performance parameters based on the data reviewed (January 2018 to December 2018) is presented the following sections. The process parameters define the status of the existing plant and its anticipated condition at the current rated plant capacity (14,500 m^3/d). The definition of the plant process parameters will provide the basis for

subsequent determination of design loadings for the plant capacity increase and evaluation of alternatives.

2.3.2 Influent Pumping Stations

The Belle River and Maidstone areas of the Town are serviced by a gravity sewer collection system complete with a series of lift pumping stations.

The Belle River collection system conveys sewage to Pumping Station No. 2. This pumping station is equipped with 3 pumps (2 duty, 1 standby) each having a rated capacity of 80 L/s. Firm capacity rating is 13,820 m^3/d (3.0 MIGD) or 160 L/s and total pumping capacity rating is 20,735 m^3/d (4.56 MIGD) or 240 L/s.

Pumping Station No. 2 pumps sewage directly to the inlet works at the Denis St. Pierre WPCP via two 300mm diameter forcemains approximately 1,220 meters long. The forcemains change lead and lag every 6 hours to minimize the build up of H_2S entering the treatment plant inlet channel.

The Maidstone sewage collection system conveys sewage directly to Pumping Station No.8 located at the Denis St. Pierre WPCP site. Pumping Station No. 8 is a 2-stage screw pump station with two screw pumps per stage each having a capacity of 23,560 m^3/d (5.2 MIGD) or 272 L/s. The station is currently fitted with two stages with provisions for a future third stage. Firm capacity rating is 23,560 m^3/d (5.2 MIGD) or 272 L/s and total pumping capacity rating is 47,120 m^3/d (10.36 MIGD) or 545 L/s.

The pump station lifts sewage to an elevated concrete channel where it is conveyed into the inlet works of the treatment plant.

A summary of existing raw sewage pumping capacity is provided in Table 2.10.

Table 2.10 Existing Raw Sewage Pumping Capacity

Description	Current Design
Firm Raw Sewage Pumping Capacity (PS 2 and 8)	37,380 m^3/d (8.2 MIGD)
Total Raw Sewage Pumping Capacity (PS 2 and 8)	67,855 m^3/d (14.92 MIGD)

2.3.3 Preliminary Treatment

The preliminary treatment process consists of screening, screening dewatering and compaction, grit removal, grit washing and dewatering, wet weather storm water bypass and flow measurement facilities followed by distribution to the secondary treatment process.

The following sections provide a detailed description of the individual processes making up the preliminary treatment in the plant headworks.

2.3.3.1 Fine Screen

Mechanical fine screens are provided as the first stage of preliminary treatment. These screens typically remove rags, sticks and coarse debris from the incoming raw sewage flow to protect downstream plant equipment against reduced operating efficiency, blockage or physical damage. A manual fixed bar screen is also provided as an emergency standby to the mechanical fine screens.

A summary of existing raw sewage pumping capacity is provided in Table 2.11.

Table 2.11 Description of Existing Fine Screen

Screen Channels	Three, one for mechanical fine screen, one for manual screen, and one for future
Mechanical fine screen	Stainless steel perforated fine screen with 6 mm openings, Rated capacity 67,855 m^3/d
Manual Screen	Dimensions 914 mm W x 1750 mm H, 50 x 9 mm flat bars mounted vertical to flow with 12 mm openings

2.3.3.2 Grit Removal

Following the screening process, raw sewage passes through a grit removal system which removes sand and grit. Grit removal is required in advance of secondary treatment to prevent undue wear of machinery and the unwanted accumulation of solids in channels, tanks and digesters.

Screened wastewater enters and exits the grit removal chamber tangentially. Sand and grit are removed from the wastewater by the centrifugal force created inside the grit tank in one revolution as a result of the vortex flow pattern. The shape of the tank is conical to facilitate tangential movement of flow and spinning out of grit. Sand and grit settle and collect at the bottom of the tank by gravity.

Collected grit is periodically pumped out from the bottom of the tank using a recessed impeller vortex type grit slurry pump and a positive displacement air scour blower to loosen the compacted debris prior to pumping. The pumped grit is discharged into a grit classifier and cyclone where the inorganic grit and sand is washed and separated from the light organic solids. The dewatered grit and sand is discharged to the same collection bin as the screenings while the excess water and light organic solids are returned to the plant inlet via the plant sewer.

A summary of existing raw sewage pumping capacity is provided in Table 2.12.

Table 2.12 Description of Existing Grit Removal

Equipment	Description
Vortex Grit Tank	Stainless steel grit tank with an agitator drive system complete with a propeller made up of four (4) stainless steel agitating paddles. Rated treatment capacity 51,400 m^3/d
Grit Air Scour Blower	Rated capacity 62 cfm @ 6.0 psi
Grit Pump	Rated capacity 5.7 L/s @ 9 m TDH
Grit Cyclone	Rated capacity 20 m^3/hr
Grit Classifier	Rated capacity 0.859 m^3/hr

2.3.3.3 Plant Influent Flow Measurement and Wet Weather Flow Bypass

Following the grit removal process, wastewater passes through a elevated effluent channel fitted with both a flow measuring and bypass flow facility prior to entering the secondary treatment influent distribution chamber.

Primary flow measurement is provided to properly monitor plant operation and control raw sewage flows to the secondary treatment process using a bypass flow arrangement. The bypass flow facilities are also provided in the event that unusually high storm flows are received at the plant, which in combination with the raw sewage flows, exceed the plant's secondary treatment capacity to provide proper treatment.

2.3.3.4 Wastewater Holding Tanks

Wastewater from the bypass facility being provided as part of the existing preliminary treatment works is discharge into existing wastewater holding tanks. In order to mitigate the potential for partially treated sewage bypasses into the Lake, two existing wastewater holding tanks with a total storage volume of approximately 1,800 m^3 are utilized to capture and store the bypass flow from the downstream of vortex grit removal tank.

After a wet weather or overflow event when the plant secondary treatment has spare capacity, wastewater from the holding tanks is pumped to the plant headworks for treatment.

2.3.4 Secondary Biological Treatment

The existing secondary treatment process is comprised of one three compartment selector tank, three extended aeration tanks and aeration blowers, two circular secondary clarifiers, one new alum storage & feed building and one return activated sludge (RAS) and waste activated sludge (WAS) chamber and submersible pumping systems.

Space has been provided for a duplicate secondary treatment train on the east side of the plant site for the next planned future capacity expansion in the ultimate design.

2.3.4.1 Selector and Flow Distribution Chamber

Wastewater from the headworks primary effluent distribution chamber flows into a three-zone selector tank that acts as a selector against filamentous organisms to improve settleability and process efficiency. The selector is designed to allow operation in either aerobic or anoxic mode at the choice of the operator.

The selector is comprised of three chambers with the third chamber having twice the volume of chambers one and two. The selector zones have a total volume of approximately 600 m^3. The selector chambers are also baffled using concrete walls with opening to provide plug flow conditions.

Return activated sludge withdrawn from the bottom of the final settling tanks and conveyed to a return activated sludge chamber via an underground pipeline is pumped into the selector and mixed with the incoming raw sewage using a mechanical mixer.

A summary of the existing selector compartments is provided in Table 2.13.

Table 2.13 Existing Selectors

Parameters	Current (2018)	MECP Guideline (2019)
Total Volume of Selector	597 m^3	-
Volume of First Chamber B	141 m^3	-
Volume of Second Chamber	152 m^3	-
Volume of Third Chamber	304 m^3	-
MLSS	3,500 mg/L	-
Average Daily Flow	14,228 m^3/d	-
Maximum Daily Flow	37,657 m^3/d	-
HRT (Based on Q Avg.)	1.0 h	-
BOD_5 Load (1)	1892 kg/d (a)	-
F/Mv – 1st Chamber	5.1 d^{-1}	12 d^{-1} (anoxic)
F/Mv – 2nd Chamber	4.9 d^{-1}	6 d^{-1} (anoxic)
F/Mv – 3rd Chamber	2.4 d^{-1}	3 d^{-1} (anoxic)

Notes:

(1) Calculated based on influent BOD_5 of 133 mg/L (2012-2018 average), influent flow 14,228 m^3/d, and MLSS of 3,500 mg/L with 74 percent volatile solids.

2.3.4.2 Extended Aeration Tanks

A mixture of raw sewage and RAS flows from the selector effluent distribution chamber to each of the three extended aeration tanks. Each aeration tank has a baffle wall to provide a plug flow pattern. The baffle wall in each bioreactor runs along the long dimension of the tank in order to provide two passes per tank.

A summary of the existing extended aeration tanks is provided in Table 2.14.

Table 2.14 Existing Extended Aeration Tanks

Parameters	Current (2018)	MECP Guideline (2019)
Number of Tanks	3	-
Tank Dimensions	15.05 m x 43.5 m by 4.23 m SWD	-
Total Volume	Each 2,769 m^3	-
Average Daily Flow	14,228 m^3/d	-
Maximum Daily Flow	37,657 m^3/d	-
BOD_5 Load	1892 kg/d (1)	-
HRT (Based on Q Avg.)	14 h	15 h
Organic Loading Rate	0.23 kg-$BOD_5/m^3 \cdot d$ (2)	0.17 - 0.24 kg-$BOD_5/m^3 \cdot d$
MLSS Concentration (mg/L)	3500	3000-5000
Return Sludge Rate (% Q average)	100%	50-200%
F/Mv	0.088 d^{-1}	0.05 - 0.15 d^{-1}
SRT	17 d (2)	>15 d

Notes:

(1) Calculated based on influent BOD_5 of 133 mg/L (2012-2018 average) and influent flow 14,228 m^3/d.

(2) Calculated based on typical waste sludge 120 g per m^3 raw sewage treated, effluent TSS of 3.1 mg/L (2018) and influent flow of 14,228 m^3/d (2018).

The aeration basin loading and operating parameters were within the MECP Design Guidelines for an extended aeration system. Using the current average influent cBOD5 concentration (133 mg/L), the volumetric loading rate was 0.23 kg/$m^3 \cdot d$ at the influent flow of 14,228 m^3/d, which is within MECP Design Guidelines (2019). The activated sludge system was operated at an average F/Mv ratio of 0.065 d^{-1} based on an average MLSS concentration of 3,500 mg/L and 74 percent volatile solids.

The MECP Design Guidelines (2019) recommend a solids retention time (SRT) of 15 days or higher for an extended aeration treatment process. Based on the average parameters, the SRT at the Denis St. Pierre WPCP was 17 days.

The existing aeration system consists of Sanitaire fine bubble diffusers with four (4) Gardner-Denver centrifugal blowers (3 duty, 1 standby, 100 hp each). According to the design brief (Sanitaire #08-7028S, January 2009), the system was designed for an average day oxygen requirement of 11,466 kg/d (each aeration tank 3,822 kg/d). Current estimates of the average and peak month oxygen requirements for carbonaceous oxidation and nitrification are presented in Table 2.15.

The design oxygen supply (11,466 kg/d) exceeds the total oxygen requirements estimated for current peak conditions, including complete nitrification. The existing aeration system has sufficient capacity for both BOD_5 oxidation and nitrification.

Table 2.15 Oxygen Requirement Estimates at Current (2018) Flow Capacity

Oxygen Requirements	2018 Average Flow (14,220 m^3/d)	
	Average	Peak Month
BOD Oxidation(1) (kg/d)	2282	5397
Nitrification(2) (kg/d)	1099	2008
Total (kg/d)	3381	7405

Notes:
(1) BOD oxidation based on 2018 influent BOD_5 concentration of 107 mg/L and 253 mg/L for average and peak months, respectively
(2) Nitrification based on 2018 influent TKN concentration of 17 mg/L and 31 mg/L for average and peak months, respectively.

A summary of air requirements in existing extended aeration tanks is provided in Table 2.16. At the 2018 daily average flow of 14,220 m^3/d, the estimated air requirement is 3,233 L/s for a peak influent BOD_5 concentration of 253 mg/L and a peak TKN concentration of 31 mg/L. The existing aeration system consists of four (4) centrifugal blowers, each with a capacity of 1,000 L/s, to supply air to the extended aeration tanks. The existing blowers have adequate capacity to meet aeration requirements.

Table 2.16 Air Requirement Estimates at Current (2018) Flow Capacity

Air Requirements	Air Requirements to Meet Oxygen Demand (L/s) based on 2018 Average Flow (14,220 m^3/d)	
	Average Loading	Peak Loading
Extended Aeration Tanks	1476	3233

2.3.4.3 Secondary Clarification

Mixed liquor effluent from aeration tanks is directed to an influent/effluent chamber via underground piping prior to being discharged into the secondary clarifiers followed by the UV disinfection facility.

Two existing secondary clarifiers are provided to separate MLSS from the treated sewage before being disinfected and discharged to the Lake. The total surface area of the clarifiers is1,440 m^2 (720 m^2 each). The mixed liquor is split between the two clarifiers using equal fixed length weirs located along the effluent launders in each clarifier. Each secondary clarifier has a 30.3 m diameter by 4.0 m SWD and is fitted with a stainless steel sludge scraping and activated sludge return mechanism complete with skimmers, scum baffles and scum collection boxes along with effluent weirs, anti rotational baffles and launder brush cleaning system.

Floating matter is skimmed and discharged into a common scum sump or chamber. Two vortex type submersible scum pumps; one installed in the scum chamber and the other stored on the shelf for standby duty, are utilized to pump the scum to the aerobic digesters. Each scum pump has a capacity of 5.0 L/s.

Settled sludge from the bottom of the clarifier is withdrawn using a series of sludge collection piping and routed to a return sludge well within the clarifier mechanism followed by conveyance back to the RAS/WAS chamber by gravity via underground piping.

A summary of the existing final clarifier is provided in Table 2.17.

Table 2.17 Existing Final Clarifier Loading Rates

Parameters	Current (2018)	MECP Guideline (2019)
Number of Tanks	2	-
Diameter	30.3 m	-
Total Surface Area	1440 m^2, each 720 m^2	-
Side Water Depth	4.0 m	-
MLSS	3,500 mg/L	-
Average Daily Flow	14,228 m^3/d	-
Maximum Daily Flow	37,657 m^3/d	-
Surface Overflow Rate at Peak Flow	26 $m^3/(m^2 \cdot d)$ (1)	40 $m^3/(m^2 \cdot d)$
Peak Solids Loading Rate	160 $kg/(m^2 \cdot d)$ (2)	170 $kg/(m^2 \cdot d)$

Notes:

(1) Calculated based on peak influent flow 37,657 m^3/d.

(2) Calculated based on the peak daily flow 37,657 m^3/d plus the design maximum return sludge flow rate (200% average daily flow) and the design MLSS (3,500 mg/L) under aeration.

The final clarifier surface overflow rate (SOR) under peak flow conditions is within the MECP Design Guideline (2019) value of 40 $m^3/(m^2 \cdot d)$ for extended aeration system. The peak solids loading rate is 160 $kg/(m^2 \cdot d)$ just within the MECP Design Guideline (2019). A peak value of 170 $kg/(m^2 \cdot d)$ is specified in the MECP Design Guidelines for an extended aeration system.

2.3.5 Chemical Feed for Total Phosphorus Removal

The Denis St. Pierre WPCP uses alum addition to the mixed liquor for phosphorus precipitation and removal. Phosphorus removal is accomplished through chemical addition immediately following the extended aeration tanks.

The existing alum feed system consists of two metering pumps (one duty, one standby), each with an operating feed range of 20 to 108 L/hr. Alum dosage is automatically controlled by flow pacing in direct proportion to plant flow measured at the UV effluent Parshall flume. The existing fiberglass alum storage tank has a storage capacity of 46 m^3 to provide 30-day storage at the average alum feed rate. The tank is located within an reinforced concrete retention well accessible by ladder and fitted with an ultrasonic level sensor for monitoring levels and recording volumes pumped.

Table 2.18 summarizes the historical alum dosage and volumes used for phosphorus removal from January to December 2018. Based on the year 2018 data reviewed, the raw sewage has a monthly TP concentration in the range of 0.6 mg/L to 5.11 mg/L, and the amount of liquid alum added to precipitate phosphorus is in the range of 38 mg/L to 58 mg/L as liquid alum.

Table 2.18 Effluent Flow and Alum Dosage (2018)

Date	Effluent Flow (m^3/d)	Monthly Alum Usage (L/d)	Monthly Alum Usage(1)		T-P (mg/L)		Al:P weight ratio
			mL/m^3	mg/L	Influent	Effluent	
01/2018	12,766	-	-	-	3.23	0.19	
02/2018	17,176	534	31	41	5.11	0.17	0.47
03/2018	14,847	504	34	45	0.6	0.14	4.4
04/2018	16,689	503	30	40	0.71	0.12	3.2
05/2018	17,587	504	29	38	0.91	0.12	2.4
06/2018	14,560	505	35	46	1.22	0.13	2.2
07/2018	12,019	522	43	58	1.76	0.17	1.9
08/2018	12,114	470	39	52	2.46	0.26	1.2
09/2018	15,365	412	27	36	3.48	0.31	0.6
10/2018	12,869	437	34	45	2.65	0.34	1.0
11/2018	15,533	518	33	45	1.95	0.26	1.3
12/2018	11,725	475	41	54	1.18	0.28	2.6
Average	14,403	489	34	45	2.11	0.21	1.2

Notes:
(1) Usage expressed as 48% commercial grade liquid alum with density of 1,335 kg/m^3

Theoretically, aluminum precipitates soluble phosphorus at a 1:1 molar ratio, although a higher molar ratio is required in practice to ensure phosphorus precipitation. The 1:1 molar ratio is equivalent to a Al:P weight ratio of 0.87:1. Based on the literature, typical aluminum to phosphorus (Al:P) ratios to achieve an 85 percent phosphorus reduction is in the range of 1.5:1 (WEF, 2010). In 2018, the Denis St. Pierre WPCP applied alum to the aeration tank effluent at an annual average weight Al:P ratio of 1.2:1, which is slightly less than the suggested application rate, but higher than theorical weight ratio of 0.87.

With higher influent T-P concentration in February and September 2018, Al:P weight ratio is in the range of 0.6, which is less than theorical weight ratio of 0.87. It is considered that a portion of phosphorous is removed by the biological treatment process prior to the chemical precipitation process. The MECP Design Guidelines (2008) noted that, with secondary treatment plants, the chemical dosage requirements for either alum or ferric chloride have been found to be least when the addition of chemical is made to the aeration tank effluent. Dosing to the aeration tank influent requires as much as 35 percent higher dosage rates.

Table 2.19 shows design parameters for alum addition based on the theorical Al:P ratio of 0.87. A maximum monthly TP concentration of 6.6 mg/L (Feb 2016) is used to size a chemical feed system required for phosphorus removal.

Table 2.19 Description of Existing Alum Feed and Storage System

Parameter	Value
Chemical Metering Pumps	2 (1 duty, 1 standby) each with operating feed range of 20 to 108 L/hr
Theorical Al:P weight ratio	0.87:1
Required Alum Dosage[(a)]	14.9 L Alum/kg P
Required Alum Dosage (as 48% commercial grade alum) [(b)]	99 mg/L (74 mL liquid alum per m^3 wastewater flow)
Maximum Daily Flow that can be fed by one existing chemical metering pump[(b)]	34,380 m^3/d
Existing Chemical Storage Capacity	46 m^3

Notes:

a) Estimated based on 48% alum solution with density of 1,335 kg/m^3.

b) Estimated based on a maximum month raw wastewater concentration of 6.6 mg/L (Feb 2016)

c) Estimated based on maximum chemical metering pump capacity of 108 L/hr.

2.3.6 UV Disinfection

The UV system is a Trojan System UV3000 for a peak flow of 35,070 m^3/d (406 L/s). The existing UV disinfection system, which uses low pressure, low intensity lamps, was designed based on a UVT of 65%.

It is noted that the Trojan System UV3000 at the Denis St. Pierre WPCP has a design operating parameters to disinfect to the limits of <150/100 mL fecal coliform (based on a 30 day geometric mean) up to a peak flow of 35,070 m^3/d with 30 day average suspended solids less than 10 mg/L and a UV transmission of more than 65 percent.

The design parameters of the existing UV system are provided in Table 2.20.

Table 2.20 UV System Design Parameters

Parameter	Value
Design Peak Flow	35,070 m^3/d
UVT	65%
Number of Channels	one, 8.8 m L x 0.99 m W x 0.673 m D
Total Number of Banks	2
Number of Modules per Bank	13
Number of Lamps per Module	8
Total Number of UV Lamps:	208

2.3.7 Effluent Pumping Station and Outfall

Effluent from the UV disinfection facility is conveyed into the effluent pumping station prior to being discharged through the existing outfall sewer to Lake St. Clair. Under normal conditions, the effluent flows through the plant processes and outfall sewer by gravity to Lake St. Clair. The effluent pumping station operates only when the water levels in the existing chlorine contact chamber reaches the maximum allowable water level of 177.39 m during specific high lake level and high flow conditions.

The proposed effluent pumping station would be sized to accommodate both the proposed design peak wet weather flow (PWWF) of 67,855 m^3/d as well as the ultimate design PWWF of 102,750 m^3/d.

The design parameters for the effluent pumping station are presented in Table 2.21:

Table 2.21 Effluent Pumping Station Design Parameters

Parameter	Present Design
Peak Wet Weather Flow	67,855 m^3/d
Effluent Pumping Station Dimensions	10 m wide x 9.6m long x 8.33m deep
Pump Type	submersible non-clog centrifugal pumps
Pump Number	3 (2 duty, 1 standby)
Pump Capacity	35,070 m^3/d, each
Pump Firm Capacity	70,140 m^3/d

Effluent from the existing plant is discharged from the plant site to a point approximately 600 meters offshore in Lake St. Clair. Effluent discharges through nozzles in the end section of the outfall to assist in dispersing the effluent.

The details of the outfall are presented in Table 2.22 below:

Table 2.22 Existing Outfall Details

Parameter	Land Portion	Lake Portion
Diameter	900 mm	900 mm
Length	720 m	630 m
Material	Reinforced concrete pipe	Polyethylene pipe
Depth	1.8 m below grade	1.8 m below lake bottom
Diffusers	-	16 – 10” x 5” nozzles 2.1 m below low lake water level

2.3.8 Biosolids Stabilization

2.3.8.1 Biosolids Production

An estimate of sludge generation was developed as a basis for predicting unit process parameters for aerobic digestion and centrifuge dewatering. It is assumed that total sludge is comprised of suspended solids removed and biological solids produced in aeration by BOD removal, chemical solids produced by alum addition for phosphorus precipitation, and suspended solids removed in the final clarifiers. Sludge production based on current conditions was also determined to verify the accuracy of the predictive approach in comparison to reported values.

The historical sludge production, in terms of raw sewage flow and sludge hauled, is shown in Table 2.23. Based on the historical data, the average total sludge production at the Denis St.

Pierre WPCP was about 134 g TS/m^3 of treated wastewater. This is approximately 12 percent higher compared to the MECP Guideline (2019) value of 120 g TS/m^3 for an extended aeration plant with chemical addition for phosphorus removal.

Historically, the average sludge production from the plant was approximately 0.9 kg VS/kg BOD_5 loading. The sludge production in terms of BOD removal is relatively high when compared to a published value of 0.77 kg VS/kg BOD_5 for this type of treatment process operated at 15 day SRT (WEF, 1998). This published value does not include chemical solids production, which will account for some of the discrepancy between the published and historical sludge production values. The 2017 and 2018 sludge production figures are presented in Table 2.23.

Table 2.23 Historical Sludge Production

Parameter	2018	2017
Annual Daily Average Flow (m^3/day)	14,228	13,526
BOD_5 (mg/L)	107	106
Volume of sludge cake hauled (m^3/yr)	2,882	2,890
Annual average TSS in sludge cake hauled (mg/L)	168,800	160,750
Daily average TSS in sludge cake/digested sludge (dry kg/d)	1,333	1,273
Daily average TSS in WAS sludge (dry kg/d) (1)	1,905	1,819
Biosolids Production (g TSS/m^3 raw sewage)	134	134
Volatile Solids Production (g VSS/kg BOD_5)	0.9	0.9

Notes:

(1) It was assumed that waste activated sludge contains 70% volatile solids and the volatile solids are reduced by 38 percent across the conventional aerobic digestion process (Metcalf and Eddy, 2003).

2.3.8.2 Aerobic Digestion

Unthickened WAS is wasted continuously to the aerobic digesters. The existing plant has three aerobic digestors operating in series. The first stage of the digester has one digester with a volume of 2,620 m^3 and the second stage has two aerobic digesters with a volume of 810 m^3 and 935 m^3, respectively, providing a total volume of about 1,745 m^3. The digested biosolids is subsequently be conditioned with polymer and dewatered by centrifuges.

The 2018 flows and solids loading to the digester are shown in Table 2.24. Table 2.25 presents a summary of typical operating parameters for aerobic digestion and a comparison with MECP Guidelines.

Based on the total primary digester volume and the WAS flow to the digesters, the primary digester volatile solids loading rate was 509 g TVS/m^3·d. The MECP Design Guidelines (2019) recommend a volatile solids loading rate of no more than 1600 g TVS/m^3·d to the primary

digester. The Guidelines indicate a minimum sludge retention time of 45 days. Based on the total combined aeration and digester volumes, the average SRT was 54 days.

Table 2.24 Sludge Flow and Loading Parameters (2018)

Parameter	WAS	Digested Sludge
Mass (kg/day)	1,905	1,333 (1)
% Total Solids	0.60	1.2(2)
Sludge Flow (m^3/day)	318	111

Notes:
(1) It was assumed that the volatile solids are reduced by 38 percent across the conventional aerobic digestion process (Metcalf and Eddy, 2003).
(2) Based on 2004-2006 historical solids concentration achieved in the digesters. Assumed decanting capability in all digesters.

Table 2.25 Comparison of Biosolids Stabilization Assessment - WAS

Parameter	At 2018 ADWF	MECP Guidelines
Combined Sludge Age in Aeration and Digesters	54 days(1)	>45 days
Stage 1 Digester VS Loading (3)	509 g VS/m^3/d (2)	< 1,600 g VS/m^3/d

Notes:
(1) For an extended aeration plant SRT of 15 days.
(2) Based on historical average digested sludge volume and volume of first digester (new tank) and VSS/TSS = 70%.
(3) Based on the volume of Stage 1 Digester of 2,620 m^3.

2.3.9 Centrifugal Dewatering

2.3.9.1 Polymer Feed

Polymer is currently added to the digested sludge entering the centrifuges to improve liquid/solid separation. The existing polymer mixing, and feed system is used for conditioning the digested sludge prior to dewatering. Table 2.26 summarizes the polymer dosages used at the Denis St. Pierre WPCP based on the 2018 sludge production records at the plant.

Based on the sludge thickening pilot study conducted by Hydro-Logic Environmental on January 28, 2004, the estimated polymer dosage for dewatering is in the range of 70 to 110 mg/L or 8 to 12 g/kg. Based on the current operation of the polymer system, the historic active polymer dose is around 11.5 g/kg. This is higher than typical values for centrifuge sludge dewatering. The

MECP Design Guidelines (2019) recommend a polymer feed range 0 to 6.0 g/kg of dry solids for centrifuge dewatering.

According to the polymer supplier, the maximum dilution recommended is one percent. As shown in Table 2.26, The peak polymer feed rate is calculated to be 0.165 l/s. It has been assumed that the dewatering centrifuges would be operated a maximum of 24 hours per week (6 hours per day, 4 days per week) on a normal basis. The existing polymer system consists of a 2,500 L mixing tank and one polymer metering pump with a capacity range of 0.08 - 0.58 L/s. The existing polymer solution feed pump has adequate capacity to meet the required feed rate with the use of an emulsion type polymer.

Table 2.26 Sludge Flow and Polymer Dosage (2018)

Parameter	Digested Sludge	
	Average Daily	Hourly Sludge Flow
Daily Average Mass	1,333 (kg/day)	310 (kg/hr) (1)
% Total Solids	1.2%	1.2%
Sludge Flow	111 m^3/day	25.9 m^3/hr
Active Polymer Addition	-	3,580 g/hr(2)
Polymer Addition	-	7,160 g/hr(3)
Polymer solution feed to centrifuge	-	0.36 m^3/hr (0.098 L/s) at 1.0% diluted polymer

Notes:
(1) It was assumed based on operating centrifuge 24 hours per week (6 hours per day, 4 days per week)
(2) Based on polymer feed 6.0 g/kg of dry solids
(3) The polymer used is Zetag 7878 FS40. Active component of polymer emulsions is 50 percent (CIBA supplier info)

2.3.9.2 Dewatering Centrifuge

Digested sludge is conditioned with polymer and pumped to the dewatering centrifuges. The existing plant has two (2) centrifuges, each with a solids loading rate of 140 kg/h and a hydraulic loading rate of 2.8 L/s based on a sludge concentration of 1.4%.

The 2018 parameters for the dewatering centrifuges are summarized in Table 2.27. It has been assumed that the dewatering centrifuges would be operated a maximum of 24 hours per week (6 hours per day, 4 days per week) on a normal basis. As shown in Table 2.6, as 2018 plant flow (14,228 m^3/d) approach the rated flow capacity of 14,500 m^3/d, one dewatering centrifuge operated 30 hours per week if a solids concentration of 2.5% was achieved. However, if a solids concentration is 1.2%, two centrifuge need to run at longer operation time.

Table 2.27 Dewatering Centrifuge Operation Parameters (2018)

Parameter	2018 Daily Flow	
Daily Average Mass	1,333 (kg/day) (1)	1,333 (kg/day) (1)
% Total Solids	1.2%	2.5 %
Sludge Flow	7.2 L/s	2.8 L/s

Notes:

(1) Present design based on operating centrifuge 24 hours per week (6 hours per day, 4 days per week) without factoring in the solids loading limitations of the existing centrifuges

(2) Present design based on operating centrifuge 30 hours per week (6 hours per day, 5 days per week) factoring in the solids loading limitations of the existing centrifuges

2.3.10 Summary of Denis St. Pierre WPCP Process Evaluation

This review of historical operating and performance data (2011 to October 2018) has been used to define the status of the overall plant and the individual unit processes. Overall, the plant is operating at an average flow of 14,228 m^3/d, representing approximately 98 percent of the rated plant capacity.

The loading and operating parameters for each unit process are adequate in comparison to the MECP Design Guideline (2008) values.

The Denis St. Pierre WPCP has consistently produced a high quality effluent with average concentrations of 2.3 mg/L, 3.1 mg/L, 0.21 mg/L and 0.13 for $CBOD_5$, TSS, and TP, TAN, respectively, over the 2018 period reviewed.

3.0 PROBLEM STATEMENT OR OPPORTUNITY

3.1 PROBLEM STATEMENT/OPPORTUNITY

Historical sewage flows to the treatment plant from the Belle River and Maidstone wastewater service area are given in Table 2.6. The table shows that an average treated flow of 14,228 m^3/d was recorded for 2018, which is approximately 98 percent of the plant's rated capacity of 14,500 m^3/d. Thus, the existing capacity of the Denis St. Pierre WPCP is not adequate to accommodate the projected future flows from the Belle River/Maidstone wastewater service area. Additional treatment capacity at the Denis St. Pierre WPCP is required to support the existing services areas and the anticipated future growth.

There are pressures for residential and industrial development in the Belle River and Maidstone areas and because of inadequate wastewater treatment capacity, developments have been restricted.

3.2 POPULATION PROJECTIONS

The growth projections for the wastewater service area form the basis for establishing wastewater flow rate assumptions and ultimately the future servicing plans. Figure 3.1 can be found in Appendix A.

Figure 3.1 shows the growth projections for the Maidstone and Belle River area serviced by Denis St. Pierre WPCP as obtained from

- Growth Study prepared by Watson & Associates Economists Ltd. for the Town of Lakeshore, November 2005.
- Lakeshore Growth Analysis Study by Watson & Associates Economists, Ltd., November 2015
- Population projections prepared by Lapointe Consulting for the City of Windsor and County of Essex, January 2008.
- Statistics Canada, 2016

The population projections in Figure 3.1 are based on the assumption that 65% of the entire town's population is in the Maidstone and Belle River Area. As shown on Figure 3.1, Watson's 2005 projections are significantly higher than Lapointe's 2008 projections. Lapointe's projection and Watson's 2015 growth analysis is consistent with population forecast by Statics Canada and Ontario Ministry of Finance. The population forecast presented in the Water and Wastewater Master Plan was obtained from the Watson's report (November 2005).

To provide flexibility for changes in case actual growth is lower or higher than population projection, Table 3.1 shows the population projections for the Denis St. Pierre Wastewater Servicing area as provided in the Watson's 2005 Growth Study and Lapointe's 2008 population projections.

Table 3.1 Population Projections from Denis St. Pierre Wastewater Servicing Area

Population Projection Method	Existing (2019)	10-Year (2029)	20-Year (2039)
Watson's 2005 Growth Study - HIGH	32,768	39,986	48,611
Lapointe's 2008 population projections	25,067	27,719	30,111

3.3 DENIS ST. PIERRE WPCP PLANT FLOW PROJECTIONS

Sewage consists of wastewater generated by residential, commercial and industrial development in the community plus extraneous flows. Extraneous flow includes inflow and infiltration (I/I). Infiltration is water entering a sewer system and service connections from the ground through such means as defective pipes, pipe joints, connections and manholes. Inflow is water discharged into a sewer system and service connections from such sources as roof leaders, yard and area drains, foundation drains, cooling water discharges, drains from springs and swampy areas, manhole covers, cross connections from storm sewers and combined sewers, catch basins, storm water, surface run-off and street washing or drainage. In general, inflow increases with the amount of precipitation. Increases in inflow have also been observed during winter thaws that produce runoff from melting of accumulated snow cover.

The MECP Guidelines for Design of Sanitary Sewage Works (2008) recommends a design value for average daily domestic flow ranging from 315 Lpcd to 540 Lpcd including an average extraneous flow allowance of 90 Lpcd. The MECP Guidelines also recommend an allowance of 227 Lpcd for peak extraneous flow and determination of the peak domestic component of sewage flow using the Harmon Formula.

Sewage flow data from the Denis St. Pierre system for the years 2009 to 2018 were analyzed and the average, maximum and minimum total daily flows expressed as cubic meters/day (m^3/d) and the per capita daily flows expressed as Liters per capita per day (Lpcd) are shown in Table 3.2.

For the Denis St. Pierre system, the average and maximum daily per capita sewage flow including extraneous flows for the corresponding serviced population was estimated to be 489 Liters per capita per day (Lpcd) and 576 Lpcd, respectively. A projected average flow of 550 Lcpd for future development was selected in anticipation of wastewater resulting from increased inflow and extraneous flows that may result from climate changes. By applying these average

sewage flow rates to the populations projected by Lapointe's 2008 projection as well as Watson's 2015 projections, the projected average daily sewage flow in the year 2029 is 15,245 m^3/d and in the year 2039 is 16,561 m^3/d, respectively. The higher populations projected by the Watson's 2005 study projections are also used to estimate the projected average daily sewage flow in the year 2029 and 2039, which are 21,992 m^3/d and 26,736 m^3/d, respectively.

Table 3.2 Denis St. Pierre WPCP Wastewater Flows 2009-2018

	Average	Maximum	Minimum
Average Daily Flow, m^3/d	11,405	14,228 (2018)	8,089 (2012)
Maximum Daily Flow, m^3/d	32,725	37,657 (2018)	25,677 (2012)
Peaking factor	2.87	2.65	3.17
Average Daily Per Capita Flow, Lpcd	489	576	355
Maximum Daily Per Capita Flow, Lpcd	1,389	1,523	1,113

Table 3.3 shows projected lower and higher daily sewage flows based on the projected populations for each community for both high growth (Watson's 2005 study) and low growth (Lapointe's 2008 study) scenarios. The high growth scenario is approximately 20% higher than the projected average and the low growth scenario is approximately 20% lower.

Table 3.3 Denis St. Pierre WPCP Projected Wastewater Flows

Daily Flow	Year 2029	Year 2039
Lower Prediction Daily Flow, m^3/d (Lapointe)	15,245	16,561
Higher Prediction Daily Flow, m^3/d (Watson)	21,992	26,736
Average of Higher and Lower Daily Flow, m^3/d	18,619	21,649

3.4 APPROACH FOR TREATMENT CAPACTY EXPANSION

Population projections serve as a basis for determining future sewage flows. Accordingly, for design purposes, population projections are developed with a view to minimizing capital investment by designing and constructing specific facilities on the basis of shorter design periods if the facilities lend themselves to economic expansion in short term stages. The decision regarding the selected initial design period is based upon anticipated growth rates, financing costs, economies of scale and other relevant factors.

The existing Denis St. Pierre WPCP site, which is located on Rourke Line Road south of County Road 22, can physically accommodate future treatment plant expansions. The most recent upgrades of the existing treatment plant were completed in 2008. The plant was rated for an average daily sewage flow of 13,640 m^3/day (3.0 MIGD) and a peak flow capacity of 35,069 m^3/d (7.7 MIGD), and then re-rated for an average daily sewage flow of 14,500 m^3/day (3.2

MIGD) in January 2019. The existing plant site has sufficient space for expansions to accommodate an ultimate design flow, which will double the existing treatment capacity.

During the last plant upgrades in 2008, the layout and hydraulic sizing of channels and plant piping made provisions for additional treatment units to be added and potential increases in loading rates. The location of existing buildings and final settling clarifiers also allow for the location of the next stages of expansion. Within the existing screening and grit removal building, space has been provided for the addition of equipment for expansions. Provision has been made in sizing effluent pumping station to accommodate ultimate plant capacity.

To provide flexibility for process design and changes in case actual growth is lower or higher than population projection, the proposed approaches presented in Table 3.4 will be used for the design of wastewater treatment facilities servicing Maidstone and Belle River area.

- The expansion of the treatment plant for the 20 year design flow, which services the average growth requirements to the year 2040 with an average daily flow of 25,000 m^3/d and a maximum dry weather daily flow of 64,000 m^3/d.
- If high growth is experienced in the service area, the ultimate plant expansion would be required before Year 2040 to 30,000 m^3/d average and 77,000 m^3/d maximum dry weather daily flows.

Table 3.4 Phasing for Denis St. Pierre WPCP Expansions

Daily Flow	Existing	20 Years Design	Ultimate Design
Average Daily Flow, m^3/d	14,500	25,000	30,000
Maximum Dry Weather Flow, m^3/d	37,300	64,000	77,000
Maximum Wet Weather Flow, m^3/d	72,100	90,000	108,000

4.0 WASTEWATER TREATMENT DESIGN ALTERNATIVES

4.1 ALTERNATIVE TREATMENT PROCESSES

4.1.1 Introduction

The primary technical considerations when evaluating alternative treatment processes include the ability of a system to consistently meet the established discharge criteria, the feasibility of locating a suitable site for the process and of expanding the process to the ultimate capacity, the ability of the process to handle variations in hydraulic and organic loadings, requirements for sludge handling and disposal, and capital and operating costs. The following sections describe several wastewater treatment processes that might be considered for the Denis St. Pierre WPCP expansion.

4.1.1.1 Site Selection

The east side of the existing Denis St. Pierre WPCP site was originally purchased and reserved to accommodate an expansion of the plant. This site offers the following advantages for locating a common area treatment facility.

- The site is more than adequate in size to accommodate the projected footprint of a treatment system to meet the servicing needs.
- The site utilizes an existing plant site in lieu of establishing a new site.
- The property is already owned by the Town of Lakeshore.
- The site is adequately separated from existing development in accordance with MECP buffer zone requirements.

In view of the numerous and distinct advantages offered by this site, no further review of alternative sites was carried out as part of preparation of this ESR. Accordingly, it is proposed to expand the wastewater treatment facilities on the existing Denis St. Pierre WPCP site, which is shown in Figure 4.1 of Appendix A.

4.1.1.2 Discharge Requirements

The existing Denis St. Pierre WPCP operates under an Amended Environmental Compliance Approval (ECA) No. 1087-B7FLRU issued on January 29, 2019. The expanded Denis St. Pierre WPCP is to meet effluent compliance limits and objectives outlined in the current ECA.

Table 4.1 summarizes the current ECA effluent objectives and non-compliance limits for the Denis St. Pierre WPCP.

Table 4.1 Effluent Objectives and Non-compliance Limits

	Non-compliance Limits		Effluent Objectives
Parameter	**Monthly Average Concentration**	**Annual Average Loading**	**Concentration**
$cBOD_5$	14 mg/L	203 kg/d	10 mg/L
TSS	14 mg/L	203 kg/d	10 mg/L
TP	0.8 mg/L	11.6 kg/d	0.5 mg/L
Total Ammonia			
Summer (May 1 to Nov 31)	1.4 mg/L	20.3 kg/d	1.0 mg/L
Winter(Dec 1 to April 30)	2.8 mg/L	40.6 kg/d	2.0 mg/L
E. coli(1)	200 organisms/100 mL	-	150 organisms/100 mL
pH	6.5 - 9.5 inclusive	-	6.5 - 8.5 inclusive
Notes: (2) Monthly geometric mean density.			

4.1.2 Wastewater Treatment Technology Alternatives

4.1.2.1 General

Treatment technology and plant sizing should consider both current and future needs of the service area. This is to ensure that the initial capital investment in a treatment plant is not a "throw away" cost if the next expansion phase deems components of it to be either redundant or undersized.

It is imperative that treatment technology be properly evaluated. Items considered during evaluation included, but were not limited to:

- Ability for logical and cost effective plant expansion;
- Ability to meet effluent limits and objectives;
- Operational and maintenance costs;
- Life cycle costs; and
- Proven technology, proof of successful installations within Canada and Southwestern Ontario (similar climate) within the last 20 years.

A brief overview of the following technologies is provided in subsequent sections:

- Extended Aeration (EA);
- Sequencing Batch Reactor (SBR); and

- Membrane Bioreactor (MBR).

All of the treatment systems described in the following sections will require pretreatment in the form of screening and grit removal facilities to remove rags, debris, floating material, stones and grit from the raw sewage flow. These pretreatment facilities are required to protect downstream equipment and processes from pluggage and abrasion problems. Since screening and grit removal requirements are common for all of the potential treatment processes they are not a determining factor in evaluating and selecting the preferred treatment process.

4.1.2.2 Activated Sludge Treatment Systems

In the activated sludge process, an environment is created where micro-organisms (activated sludge) can oxidize organic matter in the wastewater under controlled aerobic conditions. The process normally occurs in a tank (aeration tank) in which air is introduced to mix the contents and provide a source of oxygen for the micro-organisms. The micro-organisms consume the organic matter in the wastewater and in so doing produce new cell mass. The micro-organisms and the wastewater are mixed for a period of time after which the mixture of new and old cells flows to a settling tank where the micro-organisms are settled and separated from the treated wastewater. A portion of the settled micro-organisms is re-cycled back to the aeration tank (return activated sludge) to maintain a desired concentration of micro-organisms and a portion of the settled sludge is wasted for disposal.

There are several variations of the activated sludge process described as follows;

Conventional Activated Sludge (CAS)

In the CAS process raw wastewater undergoes primary treatment through settling tanks, with or without chemical addition for phosphorous removal, prior to entering the activated sludge aeration tank. The main components in the treatment process include primary settling tanks, aeration tanks, air blowers, secondary settling tanks and activated sludge return pumps. The primary settling tanks (clarifiers) reduce organic and suspended solids loading on the activated sludge process thereby reducing aeration requirements and saving capital and operating costs. The advantages of primary treatment and the savings in aeration requirements generally apply to treatment plants with design capacities greater than 4,500 m^3/d (1.0 MIGD). For smaller plants the savings in aeration tankage and operating costs are generally more than off-set by the extra costs for construction of the primary settling tanks and for primary sludge treatment and disposal.

Extended Aeration Activated Sludge (EAAS)

The extended aeration activated sludge process is a modification of the conventional activated sludge process in which primary settling tanks are omitted. Raw wastewater is introduced directly to the aeration tank. Longer aeration times of 18 to 24 hours and lower organic loadings

are normally required to obtain acceptable effluent quality. As with the conventional activated sludge process, effluent from the aeration chamber flows to a settling tank where the suspended micro-organisms are separated from the treated wastewater. A high concentration of micro-organisms is maintained in the extended aeration process by re-circulating the majority of the solids from the settling tank back to the aeration tank.

The extended aeration process normally provides good treatment including nitrification and is well suited to small communities with primarily domestic wastewater. The EAAS process is capable of accommodating variations in hydraulic loadings that are typical for small communities and produces less sludge than a conventional activated sludge plant. The extended aeration process is often considered to be more expensive for large treatment plants both in terms of capital cost for aeration tankage and operating costs for supplying air to the system.

Sequencing Batch Reactor (SBR)

The sequencing batch reactor process is a modification of the extended aeration process in which the final settling tanks are omitted. As in the EAAS process the raw wastewater flows directly into the aeration tank. While in the aeration tank, the wastewater is aerated over a number of "air-on/air-off" cycles. The solids-liquid separation (i.e. final clarification) occurs during the air-off part of the cycle. During the latter part of the air-off cycle, treated effluent is decanted or withdrawn from the liquid surface. The SBR process can maintain a continuous wastewater inflow allowing flow equalization, biological oxidation, nitrification and final clarification to be carried out in one tank.

4.1.2.3 Attached Growth Systems

Trickling Filter/Solids Contact (TF/SC)

The trickling filter/solids contact (TF/SC) process makes use of both attached growth and suspended growth types of biological treatment. The trickling filter is an attached growth type of biological wastewater treatment system. In this process, wastewater is passed over a media to which micro-organisms attach themselves. Through aerobic cell metabolism the organic matter in the wastewater is consumed. The trickling filter consists of a bed of porous media with wastewater added at the top and allowed to cascade or trickle through its depth. A bacteriological slime attaches itself to the media and absorbs the organic matter in the wastewater. The media support system is designed in a manner which allows natural air circulation up through the filter to maintain aerobic conditions.

Effluent from the trickling filter flows to a solids contact unit. The solids contact unit consists of aeration tank facilities similar to a small activated sludge system but with only 15 to 30 minutes retention time in the aeration tank. The solids contact unit conditions the sludge to enhance settling characteristics and provides some additional nitrification and BOD_5 removal. Effluent

from the solids contact unit flows to settling tanks where solids are separated from the treated wastewater. A portion of the settled solids is returned to the solids contact unit and the remainder is wasted for further sludge processing.

Sludge production from a TF/SC process is reported to be less than that from an activated sludge process and is generally easier to settle and dewater. As well, there is an operating cost advantage with the TF/SC system since natural air circulation is used to aerate the trickling filter.

Primary sedimentation is required in advance of the TF/SC process to reduce solids and organic loading and to remove larger solids and grease. This introduces the requirement for primary sludge stabilization, handling and disposal.

To our knowledge there are currently no TF/SC systems in operation in Ontario although these systems are quite common in the mid-west and western United States.

In colder climates treatment efficiency in small TF/SC plants may suffer due to heat loss in the trickling filter during very cold weather conditions.

Rotating Biological Contactor (RBC)

The rotating biological contactor is another form of attached growth biological wastewater treatment system in which aerobic micro-organisms attached to the surface of rotating discs partially submerged in wastewater. Each RBC consists of a number of circular discs mounted on a horizontal shaft with approximately 40% of the disc diameter submerged in a contoured channel. As the discs rotate, a thin film of wastewater coats each disc and a bacteriological slim is formed. During rotation, the film is exposed to the atmosphere maintaining aerobic conditions. As with a trickling filter, excess bacteriological growth sloughs off and is carried with the effluent from the RBC treatment unit to a final settling tank where solids are separated from the treated wastewater.

Nitrification can be obtained by installing RBC units in series. The organic matter is consumed by the first set of RBC's and nitrifying bacteria form on the latter RBC's to convert ammonia to nitrate.

Primary sedimentation is required in advance of the RBC process to provide the necessary reduction in solids and organic loading together with removal of larger solids and grease. RBC's are normally installed outdoors with insulated covers and have proven to operate successfully in northern climates.

Biological Aerated Filter (BAF)

The biological aerated filter is another form of attached growth biological wastewater treatment process. The process is similar to that in a trickling filter but the media in this case is much smaller with a grain size similar to that in a sand filter. BAF units can be of the downward or upward flow type with upward flow units seeming to gain favour in recent years. Wastewater pre-treatment by primary sedimentation and very fine screening is required in advance of the BAF treatment units. The pre-treated wastewater is added to the bottom of the filter tank along with compressed air to maintain aerobic conditions throughout the tank. The wastewater and air flow up through the media in the tank with aerobic micro-organisms removing organic carbon in the lower and middle areas of the tank and nitrifying bacteria converting ammonia to nitrate in the upper reaches of the tank. In contrast to the trickling filter, excess biomass is not sloughed off but is maintained in the filter bed. Effluent from the BAF unit is very low in suspended solids and is acceptable for discharge without the need for final settling tanks. Excess biomass which accumulates within the filter must be removed by periodic backwashing of the filter units. Backwash water is usually re-circulated back to the front of the treatment works to co-settle with the raw wastewater in the primary settling tanks. Effluent water storage and backwash pumps are required for backwashing of the filter units.

The BAF treatment process has been in operation in Europe for many years and there are several installations operating in the Province of Quebec. In recent years, two large BAF treatment systems have been installed in Windsor and Thunder Bay, Ontario.

Primary sedimentation and fine screening are required ahead of the BAF process and this introduces the requirement for primary sludge handling facilities. A distinct advantage is that the BAF process does not require final clarification.

4.1.2.4 Membrane Bioreactor

Membrane bioreactor (MBR) technology is similar to the EAAS process except that solids/liquid separation is achieved through the use of immersed ultra-filtration membranes that operate under vacuum pressure. The MBR represents the current state of the art for wastewater treatment and is finding niche applications where space is limited, where stringent effluent limits must be met, and/or where retrofits of existing facilities is proving cost competitive with more traditional expansions.

As MBRs can operate at much higher mixed liquor concentrations compared to extended aeration, this leads to better degradation in a given time span or to smaller required reactor volumes. The MBR process combines the unit operations of aeration, secondary clarification and tertiary filtration into a single process.

Advantages of MBR treatment technology include:

- Achieve very high quality effluent, low in particulate;
- Smaller footprint (when compared to extended aeration); and
- Does not require a tertiary filtration system.

Disadvantages of MBR treatment technology include:

- Higher life-cycle cost due to power costs and costs associated with the replacement of membrane modules.

4.1.3 Comparison of Treatment Process Alternatives

Table 4.2 provides a comparison of the relative merits of the potential treatment processes.

Table 4.2 Comparison of Potential Treatment Processes

Process / Item	CAS	EAAS	SBR	TF/SC	RBC	BAF	MBR
Able to meet MECP effluent criteria	yes	yes	yes	yes	yes	yes	yes
Odor and environmental impacts	minimal	minimal	minimal	minimal	minimal	minimal	minimal
Land area requirements	relatively similar site requirements for all processes						
Primary settling tankage required	yes	no	no	yes	yes	yes	yes
Modular capacity expansion	yes	yes	yes	yes	yes	yes	yes
Sludge handling and disposal(1)	Primary + WBS	WBS only	WBS only	Primary + WBS	Primary + WBS	Primary + WBS	Primary + WBS
Suitability for small treatment plant	possible	yes	yes	possible	yes	possible	possible
Ability to accommodate peak hydraulic loads	good	good	fair	good	fair	good	good

Note
(1) WBS = Waste biological sludge (known as waste activated sludge "WAS" for the CAS, EAAS, and SBR processes)

All of the potential treatment processes are able to meet the effluent guidelines set out by the MECP.

All of the processes are very similar and relatively benign in terms of odor and environmental impacts.

While all of the processes could potentially be used to meet the needs of the Belle River and Maidstone area, land area requirements for the different processes vary significantly. The existing site has difficulty accommodating any of alternatives that require primary settling tanks. Given the area available at the plant site, land area requirement is a significant factor in selecting the preferred process.

The EAAS and SBR treatment systems have been commonly used in Ontario for smaller plants treating mainly domestic wastewater from residential service areas. The two treatment systems that do not require primary settling tanks are particularly well suited to the existing site.

Sludge processing and disposal considerations are a significant factor in selecting a suitable treatment process. All of the potential treatment systems produce waste biological sludge. Since handling and disposal of waste biological sludge is a common requirement for all of the treatment options it will not be a determining factor in evaluating and selecting the preferred process. The EAAS and SBR processes are the only two potential treatment systems that do not require primary settling tanks and therefore do not produce any raw sewage sludge. Eliminating the need to handle, process and dispose of raw sewage sludge is an important benefit providing both capital and operating cost savings.

It is noted that the Town of Lakeshore has experience with both the EAAS and SBR treatment processes. The Denis St. Pierre WPCP was upgraded in 2008 and, at the same time, the treatment process was converted from a SBR system to an EAAS system. To date, operating experience with the EAAS system has been good and there is definite merit in utilizing the same process for the plant expansion. By using the same treatment process at the existing plant, operator training would be confined to a single treatment process and assignment of operating staff to any one of the Town's treatment facilities would be simplified.

Based on the foregoing evaluation, the EAAS is identified as the preferred treatment process for the Denis St. Pierre WPCP expansion.

4.2 PREFERRED EAAS TREATMENT PROCESS

4.2.1 Treatment Plant Size and Staging

As noted in section 3.4 of this report, expansion of the Denis St. Pierre WPCP to an average daily flow of 25,000 m^3/d, a peak dry weather flow of 64,000 m^3/d, and a peak wet weather daily flow of 90,000 m^3/d would serve the growth requirements of the Belle River and Maidstone area to the year 2040. If the high growth is experienced in the service area, plant expansion would be required before year 2040 to 30,000 m^3/d average, 77,000 m^3/d peak dry weather and 108,000 m^3/d wet weather daily flows.

In this section tankage sizing and configurations are presented for the EAAS treatment process. The plant layouts are based on the ultimate design capacity requirement of 30,000 m^3/d with a peak wet weather flow (PWWF) capacity of 108,000 m^3/d. The components that would have to be put in place for the plant expansion and the ultimate expansion are shown as part of the larger plant layout.

4.2.2 Design Approach

The plant design and layout take into account the need for equipment and process redundancy to provide continuing treatment capability during maintenance and repair activities. The MECP publication "Design Guidelines for Sewage Works 2019" states that standby or redundant capabilities need to be provided for satisfactory operation of the sewage works during power failures, flooding, peak loads, equipment failure and maintenance shutdowns. Generally, sewage pumping stations and treatment works should be designed so that with the largest flow capacity unit out-of-service the hydraulic capacity of the remaining units can handle the design peak instantaneous flow. The design of a sewage treatment plant, since it has an effluent discharge into the environment, should be based on the premise that the failure of any single component should not prevent the sewage works from meeting the required effluent quality and quantity criteria, while operating at design flows (i.e. minimum to maximum design flows).

4.2.2.1 Pumping Station

Existing Pumping Station No. 8 is a 2-stage screw pump station with two screw pumps per stage each having a capacity of 23,560 m^3/d or 272 L/s. Pumping Station No. 8 is currently fitted with two stages with provisions for a future third stage.

As part of the plant expansion, the third screw pump set should be installed so firm and total capacities of the pumping station increase to 47,120 m^3/d or 545 L/s and 70,680 m^3/d or 817 L/s, respectively. Alternatively, a submersible pump can be installed instead of addition of the third screw pump set. These alternatives will be investigated in detail during final design in order to determine the preferred option.

4.2.2.2 Preliminary Treatment

A schematic diagram of the proposed preliminary treatment facilities including expansion phasing information is shown in Figure 4.2.

Fine Screening

Screens are provided as part of preliminary treatment to remove rags, sticks and other oversized debris from the incoming raw sewage flow. This is done to protect downstream equipment and processes from reduced operating efficiency, increased maintenance, blockage or damage.

The existing screening facility is comprised of the three inlet screening channels. The 2008 plant upgrades constructed one duty channel and one bypass channel with "knock out" provision for the addition of a third channel. The existing duty channel with a fine screen has a capacity of 70,200 m^3/d. The bypass channel is equipped with a manually cleaned bar screen to accommodate the ultimate PWWF. The mechanically cleaned screen provides "fine" screening with clear openings in the range of 7 to 10 mm whereas the manually cleaned screen consists of a bar screen with clear openings of 12 to 15 mm.

Phasing for installation of the screening facilities is proposed as follows:

20 Year Design Phase

- Add fine screen equipment in third screening channel with a capacity of 67,855 m^3/d so that the combined capacity of the two channels will exceed the ultimate peak wet weather flow (PWWF) of 108,000 m^3/d. The fine screens will include a spray wash system and screenings compactor.

Ultimate Design Phase

- No changes needed

Grit Removal

Grit removal is provided in advance of secondary treatment to remove stones, sand and other abrasive material to prevent undue wear of machinery and the unwanted accumulation of solids in channels and tanks.

The existing grit removal system is comprised of one vortex type grit removal tank and associated pump, cyclones and classifiers designed to accommodate the ultimate PDWF of 35,070 m^3/d while providing removal of grit particles as fine as 150 microns. The grit removal facilities will also be capable of accepting the ultimate PWWF of 67,855 m^3/d at a reduced removal efficiency.

Phasing for installation of the grit removal facilities is proposed as follows;

20 Year Design Phase

- Install a second grit removal system of the same size as existing

Ultimate Design Phase

- No changes needed

Flow Measurement

Flow measurement is required for compliance reporting purposes and to properly monitor and control plant operations. The existing design is comprised of a "nesting" type of Parshall Flume downstream of the screening and grit removal facilities. The flume measures total flow through the treatment plant.

The custom designed fibreglass reinforced plastic Parshall Flume is comprised of a 305 mm Parshall nested in a 610 mm flume for measuring raw sewage flows ranging from 900 m³/d to 80,000 m³/d. The inner flume is to be removed when the plant is upgraded to treat a peak flow of 64,000 m³/d and ultimate flow of 77,000 m³/d.

Flows from the individual service areas can be separately measured and recorded using existing magnetic flow meters at the pumping stations serving the individual communities.

Emergency Plant Bypass

The existing plant has an automatically controlled, downward opening stainless steel weir gate for control of bypass flows to the existing wastewater holding tanks. The gate is located immediately downstream of the screening and grit removal facilities and mounted on one side of the effluent channel.

No changes to this plant bypass are needed.

Primary Effluent Distribution

Following the bypass flow and flow measurement process, wastewater enters an elevated primary effluent distribution chamber where it is equally divided using flow splitting weirs and conveyed to the aeration selector tanks using large diameter underground piping.

Existing flow splitting weirs are to be replaced with automatic downward opening gates to control flow to the existing and new treatment plant trains.

4.2.2.3 Extended Aeration Activated Sludge (EAAS) Treatment

This section describes the facilities proposed for the EAAS treatment alternative. A schematic diagram of the proposed EAAS treatment facilities including expansion phasing information is shown in Figure 4.3 of Appendix A.

Selector Tankage

Selector tankage is commonly provided with activated sludge treatment systems to favor the growth of desirable organisms and to reduce the growth of filamentous organisms. This is done to enhance the settling characteristics of the mixed liquor suspended solids thereby improving effluent quality and waste sludge concentration.

Selector tankage is typically divided into three compartments with the first and second compartments being of equal volume and the third compartment being equal to the combined volume of the first two compartments. Selectors can be aerobic, anoxic or anaerobic and it is proposed to provide appropriate aeration and mixing equipment to give flexibility to operate the selector tankage in any of these three modes.

Selector tankage can be provided can be incorporated at the inlet end of each individual aeration tank. The use of a separate selector tank offers advantages in terms of ease of operation and operational flexibility and is therefore proposed for use at the new secondary treatment train to match existing.

Aeration Tanks

The proposed design of the new EAAS aeration tanks is in accordance with criteria contained in the MECP Design Guidelines for Sewage Works (2019). The guidelines suggest a minimum hydraulic retention time of fifteen (15) hours in the aeration tank based on design flow. The guidelines also note a longer retention time may be required to achieve year-round nitrification as is required for the plant.

The following tank sizing and staging is proposed.

20 Year Design Phase

- Install two (2) tanks at 2,770 m^3 each of the same size as existing

Ultimate Design Phase

- Install one (1) tank at 2,770 m^3

It is proposed that the tanks be fitted with fine bubble air diffusers similar to the existing system. An air supply of approximately 1,200 L/s will be provided to each tank with controls to automatically optimize air flow to meet dissolved oxygen and mixing requirement. To minimize footprint required for the plant expansion, the tankage sizing is based on an assumed liquid depth of 5 m in the aeration tanks. Exact aeration tank dimensions are to be further reviewed and determined during the final design phase.

Final Clarifiers

Mixed liquor flows from the aeration tanks to the final clarifiers where solids settle to the bottom of the clarifier and final effluent overflows from the surface of the clarifier to be disinfected prior to discharge into Lake St. Clair. Most of the solids from the bottom of the clarifier are pumped back to the selector tanks (return activated sludge) and the remainder (waste sludge) is pumped to the digestion facilities for further processing and disposal.

The proposed clarifier design is in accordance with the MECP Design Guidelines for Sewage Works 2019. In this case solids loading criteria govern for sizing of the clarifiers and the tank sizing (surface area) would be as follows.

20 Year Design Phase

- Install two (2) 30 m diameter clarifiers each of the same size as existing

Ultimate Design Phase

- no changes needed

A sludge pump station will be provided as part of the plant expansion. The new sludge pump station will be equipped with pumps to return activated sludge to the selector tankage and to pump waste sludge for further treatment and disposal. Pumping equipment will be added in stages to suit expansion of the EAAS treatment system.

The final clarifiers will be fitted with automatic cleaning equipment to control algae accumulation on the clarifier launders and weirs. This is an important feature to reduce algae plugging problems in the ultraviolet disinfection process.

4.2.2.4 Sludge Processing

Details of alternative biosolids (sludge) handling, stabilization and disposal alternatives are presented in Chapter 8.

4.2.2.5 Disinfection

A schematic layout for the proposed UV disinfection system including expansion phasing information is shown in Figure 4.4 of Appendix A.

The proposed system consists of two (2) channels each equipped with two banks of UV lights. The channels include removable side inserts to permit widening of the UV banks as required to accommodate future flows. The proposed staging for construction of the UV facilities to disinfect the treated effluent is as follows.

20 Year Design Phase

- Construct a new UV building consisting of two (2) channels, one duty and one bypass.
- Condition of Existing UV Disinfection is to be reviewed during final design. It may be more cost-effective to build a larger new UV disinfection and decommission the existing UV disinfection.

Ultimate Design Phase

- add a second bank of UV lights in the duty channel to increase total UV capacity to 77,000 m^3/d.

4.2.2.6 Phosphorus Removal

The effluent criteria set out by the MECP indicate the effluent objective and effluent limit for phosphorus is 0.5 mg/L and 0.8 mg/L respectively. It is proposed to dose alum to enhance sedimentation and achieve the required level of phosphorus removal. A new liquid alum storage and metering pump facilities will be needed for both the EAAS process.

4.3 OUTFALL TO LAKE ST. CLAIR

Plant effluent is discharged through diffusers in a 900 dia. outfall approximately 600 meters off the shore of Lake St. Clair. Effluent discharges through nozzles in the end section of the outfall to assist in dispersing the effluent. The existing outfall sewer constructed in the late 1970s have sixteen (16) 250 mm diameter outlets with 250 x 125 reducing elbow diffuser ports.

To date, there has been no periodic inspection conducted on the outfall and diffuser system to evaluate any areas of deterioration or failure within the outfall and to provide an assessment with regard to its serviceability. An inspection of the outfall pipe including diffuser ports will be undertaken to determine the condition and ongoing serviceability of the system and whether any repairs and improvements are required.

The alternative design possibilities that have been considered for the outfall are summarized as follows:

- Alternate No. 1 Construct new outfall from the plant effluent pumping station into the lake along Rourke Line Road in parallel with existing outfall sewer (Figure 4.5)

- Alternate No.2 Construct inland portion of new outfall along Rourke Line Road in parallel with existing outfall sewer (Figure 4.6)

The first alternative (Figure 4.5) is to construct a new 900 diameter outfall sewer as existing. The proposed new outfall consists of approximately 720 meters inland portion and 600 meters offshore in Lake St. Clair. The construction of the new outfall sewer in the water would be very costly and would be open cut construction or a lake bottom pipe system that is secured with an appropriate anchoring or ballast system to provide protection for the installation. This alternative is not recommended due to the cost and complexity of construction.

The second alternative (Figure 4.6) construct inland portion of a new outfall in parallel with existing outfall sewer would be more feasible. There is an existing 250 diameter sanitary sewer that would need to be relocated for the construction of the new outfall sewer along Rourke Line Road. The new outfall will need to be connected to existing outfall at MH No.5 on Rourke Line Road at Caille Avenue. This alternative avoids the construction of a new outfall in the lake. The existing diffuser ports need to be modified to hydraulically accommodate increased flows from plant expansion. This alternative is considered as the preferred option.

4.4 ELECTRICAL SUPPLY

The main power supply consists of a power transformer, incoming main service cables and service entrance equipment. The existing power transformer is rated for 1,000 KVA and its projected peak load demand is estimated to be near the full load rating of the transformer.

The existing service entrance switchboard consists of a 1200 amp frame main breaker with 1200 amp rated adjustable trips currently set at 1000 amps. The existing switchboard also consists of 1000 amp rated bus bars and the interrupting and bus bracing capacity.

For future expansions, a new electrical power supply building, which will also house a new standby generator, would be required to provide additional load capacity.

5.0 BIOSOLIDS MANAGEMENT DESIGN ALTERNATIVES

5.1 GENERAL

The biological wastewater treatment processes produce excess solids known as waste activated sludge. Biosolids management deals with all aspects of handling the waste sludge stream including stabilization, dewatering or thickening, and ultimate disposal. This section of the report reviews various possible biosolids management approaches with the objective of selecting the preferred biosolids management system for the Denis St. Pierre WPCP.

As a matter of interest, the terms sludge and biosolids are often used interchangeably, although the term biosolids is more commonly used to describe sludge that has undergone treatment to render it suitable for land application.

5.2 ESTIMATED FUTURE SLUDGE PRODUCTION

5.2.1 Predicted Sludge Production at the Denis St. Pierre WPCP

The MECP Guidelines provide information on typical sludge generation rates and characteristics for various treatment processes. Typical sludge production figures for the EAAS process with phosphorus removal are listed as follows;

- Liquid sludge – 13.3 L per cubic meter of sewage treated
- Solids concentration – range 0.4% to 1.9%
  average 0.9%
- Volatile solids content – 60%
- Dry solids – 120 grams per cubic meter of sewage treated or
  55 grams per capita per day

In addition to these typical sludge generation values, historical sludge production rates for the Denis St. Pierre WPCP have been reviewed to help predict sludge generation rates for the 20 year and ultimate design. The 2017 and 2018 historical data indicates that the average total historical sludge production at the plant was about 128 grams of dry solids per cubic meter of sewage treated. This is approximately 10% higher than the MECP guideline value of 120 grams dry solids per cubic meter of sewage treated. As the historical sludge production is higher than typical generation rates, the 2017/2018 historical data was used to estimate future sludge production. Table 5.1 summarizes the estimated future sludge production values at the rated capacity of the plant.

Based on a historic solids production rate of 128 g TS/m^3 raw sewage treated, the future average daily sludge production was estimated at 3,200 kg/d and 3,840 kg/d for the 20 year and

ultimate design, respectively. The maximum monthly sludge production values were based on the 2018 peak factors.

Table 5.1 Estimated Future Sludge Production at the Denis St. Pierre WPCP

Parameter	20 Year Design		Ultimate Design	
	Average Day(1)	Max. Month(2)	Average Day(1)	Max. Month(2)
TS Production	3,200 kg/d	4,160 kg/d	3,840 kg/d	4,992 kg/d
TS Concentration	0.6 %	0.6 %	0.6 %	0.6 %
WAS Flow	508 m^3/d	660 m^3/d	610 m^3/d	793 m^3/d

(1) Based on 128 g TS/m^3 raw sewage treated
(2) Represents a max month factor of about 1.3.

5.2.2 Predicted Sludge Production at the Stoney Point WPCP

The initial (Phase 1) construction of the Stoney Point Water Pollution Control Plant (WPCP) for an average daily flow of 3,200 m^3/d would serve the high growth requirements of Stoney Point and Comber and Lighthouse Cove. A Phase 2 plant expansion to increase the capacity by 50% to 4,800 m^3/d average daily flow would permit the construction of a sewage collection system for Rochester Place. The timing of Phase 3 and Phase 4 expansions to accommodate average daily flows of 6,400 and 8,000 m^3/d respectively will depend upon the subsequent growth in the communities.

For Phase 1, sludge produced at the Stoney Point WPCP is aerobically digested, then transported digested sludge to the Denis St. Pierre WPCP for dewatering by centrifuges. This approach would avoid a significant capital cost outlay in Phase 1, and it provides flexibility and time to gather actual operating information from the new plant. This operating data can be used in planning future Phases of construction to reassess sludge management options and make more informed decisions if changes are required.

The proposed Stoney Point WPCP is an EAAS plant treating mainly domestic wastewater and should therefore have similar sludge generation levels as the Denis St. Pierre WPCP. Table 5.2 provides the sludge generation rates at the Stoney Point WPCP, which were predicted based on the 2017/2108 historical sludge production rates at the Denis St. Pierre WPCP.

Table 5.2 Estimated Future Sludge Production at the Stoney Point WPCP

Parameter	Phase 1	Phase 2	Phase 3	Phase 4
Average digested sludge(1)	310 kg/d	451 kg/d	601 kg/d	752 kg/d
TS Concentration in Digesters	1.2 %	1.2 %	1.2 %	1.2 %
Digested Sludge Flow	24 m^3/d	36 m^3/d	48 m^3/d	60 m^3/d

(1) Based on 128 g TS/m^3 raw sewage treated, VSS/TTS ratio of 0.7, and 38% VS reduction in aerobic digesters.

For the purposes of this report, the sludge production for the Phase 3 Stoney Point WPCP has been used for preliminary design and sizing of the biosolids management system at the Denis St. Pierre WPCP. This is a conservative approach and will likely result in some oversizing especially for the Denis St. Pierre WPCP expansion.

5.2.3 Hauled Sludge

Aside from future sludge haulage from the Stoney Point WPCP, sludge from two Rotating Biological Contactor (RBC) plants in South Woodslee and the North Woodslee are presently hauled to the Denis St. Pierre WPCP for digestion. The South Woodslee sewage collection and treatment system consists of a Septic Tank Effluent Pumping (STEP) system, where raw sewage is conveyed from the house to the septic tank (or clarifier), and effluent from the septic tank is pumped into a pressurized collection system and conveyed to an RBC plant for treatment. The South Woodslee RBC plant has a rated capacity of 425 m^3/day. At the rated capacity, it is estimated that three 2,000 gallon trucks would collect the sludge from the RBC plant, every three months.

The North Woodslee RBC plant has an estimated rated capacity of 330 m^3/d. The amount of sludge produced was estimated based on typical values from the MECP Guidelines. Based on a solids production rate of 90 g/m^3 and a solids concentration of 0.9 percent (an Extended Aeration plant with no phosphorus removal), it was estimated the plant produces 3.3 m^3/d of sludge at its rated capacity.

A sludge receiving station has been installed at the Denis St. Pierre WPCP in 2019. This allows sludge from the South Woodslee plant and the North Woodslee plant to be hauled periodically to the plant for stabilization and disposal.

5.3 BIOSOLIDS MANAGEMENT TECHNOLOGIES

5.3.1 Sludge Thickening

Sludge thickening increases the solids concentration of sludge by removing a portion of the liquid content and it reduces the volume, resulting in smaller digesters and storage tanks and a lower energy requirement for mixing and aeration operations. Several sludge thickening options were analyzed based on performance, operating cost and design parameters, and applicability at the Denis St. Pierre WPCP. These options include: gravity thickening (GT), gravity belt thickeners (GBT), and rotary drum thickeners (RDT).

5.3.1.1 Gravity Thickening with Polymer Addition

Gravity thickening (GT) is similar to sedimentation in a conventional clarifier. Dilute sludge is dosed with polymer and fed to a central well in a gravity thickening tank where it is allowed to settle and compact. Supernatant is drawn off the top and thickened sludge is pumped from the bottom of the unit. Gravity thickening is capable of achieving concentrations of 2 to 4% for both raw and digested WAS. However, historically at the Denis St. Pierre WPCP, a solids concentration of less than 2% has been achieved through gravity thickening of digested WAS.

5.3.1.2 Gravity Belt Thickeners

With gravity belt thickeners (GBTs), polymer conditioned sludge is distributed evenly across the width of a moving fabric belt. Free water drains through the belt, while suspended solids are retained on the surface. Rows of plough blades ride on the belt surface and turn the sludge to release additional water, and expose clear areas on the belt for improved drainage. A high-pressure wash is used to clean polymer and suspended solids from the pores of the fabric belt. Filtrate is collected and returned to the head of the plant, or to the secondary treatment plant. A sludge concentration of 4 to 9 percent can be achieved when thickening raw WAS, and 4 to 6 percent when thickening digested WAS.

5.3.1.3 Rotating Drum Thickeners

With rotating drum thickeners (RDT), polymer conditioned sludge is fed into one end and is distributed onto the internal surface of a rotating drum screen. Flocculated sludge solids are retained on the inner surface, while free water drains through the screen. Filtrate is collected in a trough and is returned to the head of the plant, or to the secondary plant. Sludge solids are conveyed towards the outlet end of the drum by flights or an internal screw conveyor. The inside and outside drum surfaces are periodically rinsed to flush trapped solids from the screen. As with GBT, sludge concentrations of 4 to 9 percent can be achieved when thickening raw WAS, and 4 to 6 percent when thickening digested WAS.

5.3.1.4 Comparison of Sludge Thickening Options

Table 5.3 summarizes the advantages and disadvantages of the thickening processes under evaluation for the Denis St. Pierre WPCP.

Table 5.3 Advantages and Disadvantages of Sludge Thickening Processes

Process	Advantages	Disadvantages
Gravity Thickening (GT)	• Simple operation • Low power requirements	• Lower solids capture • Potential for sludge to turn septic due to long HRT • Potential for rising sludge with long retention times • Odour potential • Polymer is required for effective operation • Doesn't work well with filamentous sludge
Gravity Belt Thickener (GBT)	• Low space requirements • Low power requirements • High solids capture • High operating flexibility • Low maintenance requirement	• Polymer is required for effective operation • Odour potential • Higher operation requirements
Rotating Drum Thickener (RDT)	• Low space requirements • Low power requirements • High solids capture • High operating flexibility • Low maintenance requirement • Lower odour potential due to ease of enclosure	• Polymer is required for effective operation • Higher operation requirements

Other technologies that are used for thickening include centrifugation, dissolved air flotation, vacuum filtration, and plate press thickeners that are not considered further in this study. Reasons for not considering these options are outlined below in Table 5.4.

Table 5.4 Sludge Thickening Technologies Not Considered for Application

Thickening Technology	Reason for disregarding Option
Centrifugation	Very high capital cost relative to considered technologies. More suitable for larger facilities.
Dissolved Air Flotation	High operational requirements. Poor performance with variable sludge characteristics.
Vacuum Filtration	Not commonly used.
Plate Press Thickener	More commonly used in industrial applications than municipal applications. Not typically a cost effective alternative for smaller municipal WWTPs.

The main disadvantages of mechanical thickening prior to biosolids stabilization are that a large sludge storage tank would be required which could also be a source of odours. Odours due to septic sludge could also be a concern with the option of providing gravity thickening. The use of thickening may also reduce the capital cost of the dewatering. However, providing an increase in dewatering capacity has the advantage of being re-usable in the future plant expansion.

5.3.2 Biosolids Stabilization

There are a number of potential sludge stabilization alternatives available. Table 5.5 Alternative Methods of Biosolids Stabilization provides a summary of several alternative stabilization processes including anaerobic digestion, aerobic digestion, lime stabilization, composting and pelletization.

Table 5.5 Alternative Methods of Biosolids Stabilization

Stabilization Process	Comments
Anaerobic Digestion (ultimate disposal by landfilling or farm land application)	• high capital costs • very expensive and complex system for low design capacity • not viable for this size of application
Aerobic Digestion (ultimate disposal by landfilling or farmland application)	• well stabilized end product suitable for farmland application • simple, relatively odor free process • commonly used at small EAAS plants • low odor potential • energy intensive • significant capital cost but far less than anaerobic digestion
Lime Stabilization (ultimate disposal by landfilling or farmland application)	• low energy consumption • suitable for application on farmland • requires dewatering of unstabilized biosolids for efficient use of lime • high odor potential requiring odor control system • end product susceptible to bacterial regrowth following pH fall • storage of dewatered stabilized biosolids difficult
Composting (Disposal includes landfill, farmland application and possibly re-sale or giveaway)	• beneficial reuse • potential market for sale or giveaway • capital intensive • high odor potential • current compost guidelines very restrictive making unrestricted use unobtainable • difficult to store finished product in odor free form
Pelletization (ultimate disposal alternatives include landfill, farmlands and possibly sale as fertilizer additive)	• potential market for sale • very significant volume reduction • suitable for long term storage and easy handling • capital intensive • requires strict quality control for sale purposes • not viable for this size of application

Considering the sludge stabilization processes that are available, it is evident that anaerobic digestion, composting and pelletization are not preferred choices for this application. Anaerobic

digestion has a high capital cost and is rarely, if ever, used at small treatment plants. Pelletization is also very capital cost intensive and is best suited for large treatment plants. Composting has a number of restrictions and disadvantages as noted in the table and is not recommended for this application.

A lime stabilization process could potentially be used at the new treatment plant to condition sludge for application on farmland. Negative factors associated with lime stabilization include high odour potential and difficulties associated with storage of dewatered, lime stabilized, sludge cake.

Aerobic digestion is recommended technology because it is suitable for small municipal wastewater treatment plants and require less maintenance and operator attention than the other technologies. This offers an operational advantage since plant staff is very familiar with the operation of this technology.

5.3.3 Biosolids Dewatering

Four major technologies are available for biosolids dewatering, including belt presses, rotary presses, and screw presses, and centrifuges.

5.3.3.1 Belt Filter Presses

Belt filter presses are able to dewater solids by using two or three belts and a series of rollers. Compression and gravity drainage are both used for the separation of water from solids. Typically, biosolids or conditioned sludge enters the gravity drainage section. Most of the free water is removed by the gravity drainage section. The biosolids are then introduced into a low-pressure section where they are squeezed between two porous cloth belts. In most modern units, the low-pressure section is following by a high-pressure section where the biosolids are subjected to compression forces as belts pass through a series of rollers. The belts are continually washed. The advantages and disadvantages of dewatering belt presses are presented in Table 5.6.

Table 5.6: Dewatering Belt Filter Presses Evaluation

Advantages	Disadvantages
Low energy consumption	Significant housekeeping requirements
Straight forward operation	Higher potential for odours
Moderate capital and O&M costs	Variable efficiency
	High water consumption for belt washing, resulting in high volumes of filtrate returned for retreatment
	Produces aerosol in work area

	High operator attention

5.3.3.2 Rotary Presses

Rotary presses are relatively new technology for dewatering purposes. Their performance on solids capture rate and cake solids content are similar to centrifuges and belt presses. Rotary presses separate water from solids by gravity, friction and pressure differential. Conditioned biosolids are fed into a channel bound by screens on each side. The channel curves with the circumference of the unit, making a 180-degree turn from the inlet to the outlet of the rotary press. The solids move in a continuous, slow, concentric motion through the unit, while free water passes through the screens. The dewatered cake is continuously released through the pressure-controlled outlet. The advantages and disadvantages of the dewatering rotary press are summarized in Table 5.7.

Table 5.7 Dewatering Rotary Presses Evaluation

Advantages	Disadvantages
Totally Enclosed – Odours Contained	Screen Clogging Potential
Small Footprint	Relatively High Capital Cost
Low Noise and Vibration Levels	Limited Performance with Secondary Solids
Uses Less Energy Than Belt Presses and Centrifuges	Low Throughput Compared to Other Mechanical Dewatering Processes

5.3.3.3 Screw Presses

A screw press is a simple, slow moving device that achieves continuous dewatering. Dewatering screw presses are divided into two major categories: inclined and horizontal. The inclined screw presses are at angles 15 to 20 degrees from the horizontal. A screw press is an enclosed cylindrical unit with a rotating screw. The screw transfers the conditioned biosolids through the wedge wire screening basket while the filtrate passes through the bottom and sides of the wedge wire screen. Screw presses dewater solids first by gravity drainage at the inlet section of the screw and then by squeezing free water out of the solids as they are conveyed to the discharge end of the screw under gradually increasing pressure and friction.

The advantages and disadvantages of the dewatering rotary press are summarized in Table 5.8 Dewatering Screw Presses Evaluation.

Table 5.8 Dewatering Screw Presses Evaluation

Advantages	Disadvantages
Low Energy Consumption	Requires Continuous Wash Water (Lower Requirement Than Belt Filter Press)
Containment of Odours and Aerosols	Low Solids Content with No Primary Sludge
Simple Operation and Low Operator Attention	Low Solids Capture Rate
Low Maintenance and Noise	Larger Footprint Requirements

5.3.3.4 Dewatering Centrifuges

Centrifuges are widely used for biosolids dewatering and are relatively simple to operate. Cake dryness and centrate quality can be controlled by changing the conveyor torque and polymer dosage. Centrifuges require less operator attention and can produce sludge cake with high solids content. Summarized in Table 5.9 are the advantages and disadvantages of dewatering centrifuges.

Table 5.9 Dewatering Centrifuges Evaluation

Advantages	Disadvantages
Less operator attention	Energy intensive
Easy to automate	Major maintenance occurs off-site
Dry cake and high solids content	Support structures need to be designed to handle vibrations
Self-contained process, which minimizes housekeeping and odour potential	
operation staff familiar with equipment	
Control capability to improve process performance by adjusting equipment set points	
Widely used at large WWTPs	

The use of dewatering centrifuges is recommended because it is capable of achieving high dewatered solids concentrations and require less maintenance and operator attention than the other technologies. This offers an operational advantage since plant staff is very familiar with the operation of this equipment. In addition, using the same equipment currently in service at the plant offers an advantage from a maintenance perspective. Namely, plant staff are familiar with the maintenance issues of the equipment.

5.3.4 Biosolids Disposal

There are a number of potential biosolids disposal alternatives available. Table 5.10 provides a summary of several different biosolids disposal options including incineration, re-sale or giveaway, landfilling, and farmland application.

Table 5.10 Alternative Methods of Biosolids Disposal

Biosolids Disposal	Evaluation
Incineration	➢ no incinerators in close proximity within Essex County or Chatham Kent ➢ prohibitive cost and permitting requirements for new incinerator
Re-Sale or Giveaway	➢ beneficial reuse ➢ may generate revenue to offset operating costs ➢ requires a market demand ➢ requires extensive processing and quality control ➢ capital intensive
Landfilling	➢ requires dewatering facilities to reduce leachate forming potential and improve manageability at landfill ➢ ongoing requirement for dewatering, haulage and tipping fees ➢ may require stabilization of biosolids for pathogen reduction
Farmland Application	➢ stabilization of biosolids for pathogen reduction necessary ➢ abundance of suitable farmland ➢ haulage of biosolids required but usually no disposal charge ➢ beneficial reuse ➢ farm operations and weather dictate frequency of disposal ➢ infrequent disposal introduces requirement for extensive liquid biosolids storage or biosolids dewatering and sludge cake storage facilities

Construction of new incineration facilities is definitely not a viable option and there are no existing incineration facilities that can be used within reasonable proximity of the plant site. Resale or giveaway as a disposal method is not recommended as an alternative due to high costs associated with the need for extensive processing and strict quality control.

The two ultimate disposal options that are best suited for use at the Denis St. Pierre WPCP plant are landfill disposal or disposal by application on farmland. Dewatering of unstabilized sludge followed by sludge cake disposal by landfilling does offer the advantage of being a relatively low cost option. Negative factors associated with this alternative are odour potential, the need to meet fairly stringent cake dryness criteria, ongoing haulage and tipping fees, the potential need for sludge stabilization and the potential for changes in landfill requirements over time. Also, there is a limited landfilling site available for sludge disposal. Therefore, disposal by application on farmland is recommended because it is a proven process successfully used for biosolids disposal from the plant for many years.

5.4 PREFERRED BIOSOLIDS MANAGEMENT PROCESS

5.4.1 Overview

Based on the information in Section 5.3, the biosolids management process that appears to be most advantageous for this application is sludge stabilization by aerobic digestion followed by sludge dewatering with centrifuges and sludge cake disposal by farmland application. Aerobic digestion is a proven process commonly used for sludge stabilization at EAAS plants. This process is fairly simple to operate and produces a well stabilized end product suitable for use on agricultural land. The capital and operating costs associated with the process are significant but are comparable to or less than the other alternative processes (with the possible exception of landfill disposal of unstabilized sludge).

It is particularly relevant to this study that a biosolids management system consisting of aerobic digestion, sludge dewatering by centrifuge, sludge cake storage and seasonal application on farmland has been used successfully at the existing Denis St. Pierre WPCP for many years. The municipality has an Environmental Compliance Approval for a storage/transport site that is approximately 8 acres in size and located a short distance from the plant. During August and September of each year the stored biosolids are removed from the site and applied to farmland. The municipality is very familiar with the regulatory requirements for this process including submitting and obtaining approval for biosolids land application sites. For farmland application, a Non-Agricultural Source Material (NASM) plan is developed to comply with the Nutrient Management Act, 2002 (NMA) and its General Regulation (O. Reg. 267/03). The NASM approval is to be obtained from the Ministry of Agriculture and Rural Affairs (OMAFRA). Based on historical operational records, there does not appear to be concern with respect to obtaining ongoing approvals for land application.

Figure 5.1 of Appendix A shows phased expansion of biosolids management consisting of aerobic digestion and sludge dewatering.

5.4.2 Aerobic Digesters

The MECP Design Guidelines for design of aerobic digesters include the following criteria.

- An aerobic sludge digestion system should include provisions for digestion, supernatant separation, sludge concentration and sludge storage. These provisions may be accomplished in separate tanks or processes, or within the digestion tanks.
- Multiple digestion units capable of independent operation are desirable and should be provided in plants where the design average daily flow exceeds 380 m^3/d.
- Sizing should be designed to achieve a minimum solids retention time (SRT) of 45 days, including both digester stages and the SRT of the activated sludge treatment process.

- Two stages with a minimum of one digester in each stage should be provided. It is recommended that 2/3 of the total digester volume be in the first stage and 1/3 be in the second stage.
- If supernatant separation is performed in the digestion tank, a minimum of 25 percent additional tank volume is required.
- A loading rate of 1.6 kg/(m^3·d) volatile solids based upon first stage volume only should be provided.

These criteria have been used to develop the preliminary aerobic digester sizing information shown in Table 5.11. The digester sizing assumes that 15 days of the required 45 day SRT is provided in the EAAS process with the remaining 30 days in the aerobic digesters. The sizing further assumes a 25% increase in tank volume to account for supernatant separation in the digestion tank rather than in a separate tank. Also, sizing of the digesters is based on historic Denis St. Pierre WPCP operating data, which is higher than MECP typical sludge quantity and quality values.

Table 5.11 Aerobic Digester Sizing

Phase	Existing	20-year Design	Ultimate Design
Flow (m^3/d)	14,500	25,000	30,000
Aerobic Digester Volume m^3	4,365	7,645	9,165
Digester Tankage	3 tanks, one 2,620 m^3, one 935 m^3, and one 810 m^3	Add two tanks with a total additional volume of 4,800 m^3	No changes needed

For preliminary design purposes and recognizing the storage requirement for digested sludge from the Stoney Point WPCP, it is suggested that two digestion tanks with a total volume of 4,800 m^3 be provided in 20 year design.

Provision of 4,800 m^3 of digestion tank volume in 20 year design exceeds the calculated requirement. Provision of surplus digester volume also provides flexibility to store sludge and tailor a sludge trucking schedule to coincide with the availability of dewatering capacity at the Denis St. Pierre WPCP.

Digestion tank dimensions are to be consistent with the aeration tanks. This should give some economy in design and common wall construction. Exact dimensions and configuration of digestion tanks are to be further reviewed and be finalized in the final design stage.

5.4.3 Centrifuge Dewatering Facility

5.4.3.1 Centrifuge Dewatering Process Overview

The function of the dewatering process is to remove moisture from the biosolids produced by the EAAS process at the plant. The objective of dewatering is to reduce the volume of material and produce sludge cake suitable for ultimate disposal (land application).

The dewatering centrifuges are the main process equipment for the sludge dewatering system. The ancillary process components include digested sludge grinders and feed pumps, polymer feed system, mixers, sludge cake handling and storage system, and odour control system.

5.4.3.2 Dewatering Capacity Requirements

It is noted in Section 5.4 that the following biosolids management alternative be selected as the preferred option for expansion of the Denis St. Pierre WPCP.

- Aerobic digestion → Sludge dewatering → Sludge cake trucked to the existing biosolids storage/transfer site → Land application

This alternative also includes trucking digested biosolids from the Stoney Point WPCP to the Denis St. Pierre WPCP for dewatering as well as hauled sludge.

The design parameters for the dewatering centrifuges are summarized in Table 5.12.

Table 5.12 Dewatering Centrifuge Design Parameters

Parameter	Existing	20 Year Design	Ultimate Design
Estimated Biosolids Mass	1,337 kg/d 9,359 kg/wk	3,855 Kg/d (1) 26,985 kg/wk	3,865 Kg/d (2) 27,055 kg/wk
Number of Centrifuges & Design Capacity	Two, each 140 kg/h	Two, 1-duty and 1-standby each 900 kg/h	Same as 20-year design
Estimated % Total Solids	1.2%	1.2%	1.2%
Estimated Sludge Flow	106 m^3/d	306 m^3/hr	306 m^3/hr

Notes:
(1) Include monthly maximum of 3,054 kg/d from the Denis St. Pierre WPCP, average daily 601 kg/d trucked from the Stoney Point WPCP and RBC plants, and 200 kg/d form hauled sludge.
(2) Include monthly maximum of 3,665 kg/d from the Denis St. Pierre WPCP and 200 kg/d form hauled sludge.
(3) Design based on operating centrifuge be operated 6 hours per day, 5 days per week

The centrifuges are selected to treat the digested sludge with an anticipated solids content of 0.5% - 2.4% with a typical feed concentration of 1.2%. Centrifuge dewatering uses centrifugal force to separate solids from liquid. Solid/liquid separation in centrifuges takes place at high-

speed rotation. The rotor consists of the cylindroconical solid bowl and scroll. The solid/liquid mixture is injected to the rotor of the centrifuge and reaches the distributor, where it is subjected to centrifugal force. The dry cake is collected on the bowl wall. The scroll rakes over the centrifuged particles and conveys them to the end of the bowl, where they are discharged by gravity. The liquid, which forms a pond in the bowl, is evacuated at the other end by overflowing a weir.

The dewatering process generates two products; sludge cake and centrate. The sludge cake behaves like a solid material. The biosolids cake is hauled to an existing biosolids storage and transfer site, and then trucked to farmland sites for land application. The centrate, which contains the water removed from the cake and some residual solids, is discharged into the plant sewer and then pumped to the plant headworks.

6.0 ENVIRONMENTAL IMPACTS AND MITIGATING MEASURES

6.1 OVERVIEW

Table 6.1 provides a summary of potential environmental impacts and proposed mitigating measures for the preferred design. In general, the preferred design will have a limited effect on the environment and that effect will be mostly due to construction activities. Other than the environmental effects listed in Table 6.1, it is anticipated that the preferred work will not have a significant effect on the natural environment such as wildlife, vegetation, or the habitat characteristics of any particular species. The main impact that the alternatives for the proposed work will have on the socio-economic environment is the disruption that residents may experience during the construction. However, this inconvenience and disruption will only be temporary and should not significantly impact the environment.

With respect to other socio-economic impacts, it is anticipated that the preferred servicing alternative will not have any serious impact on existing land uses, cultural activities, heritage resources or any other community program except to the extent that it will permit the ongoing implementation of development and other activities as envisioned in planning documents which have positive impacts on the socio-economic environment.

Table 6.1 Environmental Effects and Mitigating Measures

Operation	Effect	Mitigating Measures
Cutting, digging, or trimming ground covers, shrubs and trees	Reduced terrestrial wildlife habitat quality (i.e., diversity, area, function) and increased fragmentation of habitat.	➢ This is not a concern as there is no significant existing terrestrial wildlife habitat in the proposed area of construction
	Loss of unique or otherwise valued vegetation features	➢ There are no known unique vegetation features in the area that may be disturbed by construction activities. ➢ Where possible, existing vegetation features will be restored to a preconstruction condition.
Trenching / tunnelling for outfall sewers, excavation and construction for wastewater treatment facilities at the Denis St. Pierre WPCP site	Soil erosion and sediment transport to adjacent water bodies causing sedimentation and turbidity of adjacent water bodies and drainage ditches	➢ Use of erosion control measures (i.e. sediment traps, silt fences, etc.) ➢ Collect contaminated runoff ➢ Restore vegetation growth quickly ➢ Stage construction activities to minimize potential of adverse impacts
	Reduced water quality and clarity due to increased erosion and sedimentation, and transport of debris.	➢ Apply wet weather restrictions to construction activity. ➢ Comply with any local regulations, policies and guidelines that stipulate a minimum acceptable buffer width (the allowable distance from a water body). Maximum buffer widths are desirable. ➢ If possible, direct surface drainage away from working areas and areas of exposed soils. To the maximum extent possible, promote overland sheet flow to well vegetated areas.

Operation	Effect	Mitigating Measures
		➢ Install and maintain silt curtains, sedimentation ponds, check dams, cofferdams or drainage swales, and silt fences around soil storage sites and elsewhere, as required.
	Loss of vegetation and topsoil and mixing topsoil and subsoil	➢ Restore site by replacing topsoil and reinstate vegetation to prevent erosion
	Removal and/or disturbance of trees and ground flora	➢ Avoid treed areas where possible ➢ Employ tree protection measures ➢ Replace trees and provide site landscaping
	Temporary disruption of pedestrian and vehicle traffic	➢ Provide and maintain detours ➢ Provide for safe alternate routes ➢ Select alternate routes to minimize inconvenience
	Temporary disruption and inconvenience during construction to adjacent properties, buildings and inhabitants	➢ Notify public agencies and neighbouring owners of construction activities ➢ Prepare program for reporting and resolving problems ➢ Ensure access is provided for emergency vehicles and personnel ➢ Apply noise and vibration control measures ➢ Apply dust control measures ➢ Control emissions from construction equipment and vehicles ➢ Use silencers to reduce noise ➢ Require compliance with municipal noise by-laws
	Possible need to remove petroleum contaminated excavated material.	➢ Sample material. ➢ Handle and dispose of contaminated material in an acceptable manner
	Decreased ambient air quality due to dust and other particulate matter.	➢ Avoid site preparation or construction during windy and prolonged dry periods. ➢ Cover and contain fine particulate materials during transportation to and from the site. ➢ Instruct workers and equipment operators on dust control methods. ➢ Spray water to minimize dust off paved areas or exposed soils. ➢ Stabilize high traffic areas with a clean gravel surface layer or other suitable cover material. ➢ Cover or otherwise stabilize construction materials, debris and excavated soils against wind erosion.
	Disturbance to microscopic organisms in the soil.	➢ Limit the size of stockpiles to avoid anaerobic conditions. ➢ Protect stockpiled soils from exposure to and sterilization by solar radiation (or stockpile in an uncovered shaded area).
	Reduced soil capability through compaction and rutting, and mixing of topsoil and layers below.	➢ Avoid working during wet conditions and/or confine operation to paved or gravel surfaces. ➢ Whenever possible, strip and store topsoil separately from the layers below and return to excavation in sequence.
	Removal and/or disturbances of trees and flora.	➢ Avoid treed areas ➢ Employ tree protection measures ➢ Avoid areas with significant vegetation
		➢ All driveways, roadways and field access will be restored to pre-construction condition

Operation	Effect	Mitigating Measures
	Industrial disruption of field/facility access.	➢ Staging of construction and advance notice to property owners prior to disruption of construction to minimize inconvenience
	Disruption of tile and surface drainage systems.	➢ Provide for temporary drainage systems until final restoration is accomplished. ➢ Avoid disturbing drainage systems during critical periods. ➢ All existing culverts, tiles and drainage systems to be restored to pre-construction conditions following construction.
	Reduced water quality of nearby surface waters having value as wildlife habitat.	➢ Use sediment control techniques for stockpiled materials to minimize degradation of water quality.
	Modifications or removal of aquatic habitat.	➢ Stage construction to minimize potential for adverse impacts.
	Residential impacts.	➢ Construction noise and dust impacts will be controlled through noise by-laws and dust control measures in contract specification. ➢ Inconvenience due to temporary loss of property access will be minimized through proper communication and advance notice of disruption. ➢ Pedestrian safety will be maintained through excavation barricades and construction fencing
	Traffic disruption.	➢ Construction activities will attempt to maintain a minimum of one lane of open traffic at all times with necessary detour signage and flag persons. ➢ If complete closure is required, emergency services will be advised in advance and access will be restored at the end of each working day.
	Visual aesthetics.	➢ Tunnel sewer and RTB will be buried and have no impact on aesthetics.
	Recreation.	➢ Maintain access to recreational sites during construction. ➢ Locate water and wastewater infrastructure components to minimize impact.
	Archaeological and heritage resources.	➢ The MTCS's "Criteria for Evaluating Archaeological Potential" checklist was reviewed. Proposed work is located in the disturbed areas and away from any known archaeological sites, and thus is not expected to impact heritage resources in the area. ➢ The MTCS's "Screening for Impacts to Build Heritage and Cultural Heritage Landscapes" checklist was reviewed. Proposed work is located away from any built heritage and cultural heritage landscapes, and thus is not expected to impact heritage resources in the area.
Use of construction equipment	Contamination of surface waters, drains and public roadways from spills, leaks or equipment refuelling.	➢ Use containment facilities ➢ Inspect equipment regularly for fuel and oil leaks ➢ Clean equipment before it travels off site

Operation	Effect	Mitigating Measures
	Decreased air quality due to vehicular emissions causing increased concentrations of chemical pollutants.	➢ Minimize operation and idling of vehicles and gas-powered equipment, particularly during local smog advisories. ➢ Use well-maintained equipment and machinery within operating specifications.
	Disruption to wildlife migration and movement patterns, breeding, nesting or hibernation.	➢ There are no known areas containing sensitive vegetation and wildlife. ➢ There are no known areas where migratory birds are breeding.
	Introduction of non-native vegetation, including opportunistic species.	➢ Clean heavy machinery and equipment prior to transporting to new location.
	Loss of unique or otherwise valued vegetation features	➢ Avoid or minimize trampling vegetation with equipment. ➢ Minimize physical damage to vegetation by avoiding push-outs and avoiding the placement of splash onto living vegetation.
	Reduced water quality and clarity due to increased erosion and sedimentation, and transport of debris.	➢ Operate heavy machinery on the shore above the normal water level. ➢ Where possible, conduct activities in the dry, above the actual water level and above any expected rises in water level that may occur during a rainfall or snowmelt event.
	Reduced water quality due to inputs of contaminants from surface runoff during construction and operation.	➢ Refuel equipment off slopes and well away from water bodies. ➢ Securely contain and store all oils, lubricants, fuels and chemicals. If necessary, use impermeable pads or berms.

6.2 NATURAL ENVIRONMENT IMPACTS AND MITIGATING MEASURES

6.2.1 Aquatic and Terrestrial Habitat

The proposed work area may contain natural features that may support habitat of endangered species and threatened species. As per Section 2.1.7 of the Provincial Policy Statement (PPS 2014) – “Development and site alteration shall not be permitted in habitat of endangered species and threatened species, except in accordance with provincial and federal requirements.” All issues related to the provincial Endangered Species Act and its regulations shall be addressed prior to the construction of the proposed work.

A field investigation shall be carried out to document existing conditions (terrestrial and aquatic) at the proposed work site. The field investigation shall consist of vegetation and wildlife habitat assessments. The number, location and species of Barn Swallow and other bird nests found in trees or vegetated areas that may be affected by the proposed work will be documented. Potential tree or vegetation removals is to be reviewed to identify potential species at risk, such as Butternut, and special habitat features such as bat maternity roosts. Blanding’s Turtle and

Eastern Fox Snake (both protected under the Endangered Species Act) are known to occur in this area. As such, an assessment of potential habitat provided by the proposed outfall outlet may be undertaken. The single season field investigation to document aquatic habitat can be combined with the terrestrial field visit and will document existing conditions and habitat suitability for fish and aquatic species at risk within potential in-water work areas in the lake.

A biological survey work plan is to include the following tasks:

1. Compile data from a variety of secondary sources, including the Land Information Ontario (LIO) database, Natural Heritage Information Centre (NHIC) database, the Species at Risk in Ontario List, Fisheries and Oceans Canada (DFO) Aquatic Species at Risk Maps, the Essex Region Natural Heritage System Study (ERHNSS), ERCA's study reports and mapping including mapping studies, fish assessment data, current extents of the ERCA Limit of Regulated Area, and digital mapping from the ERHNSS, various wildlife atlases, municipal Official Plans and other planning reports.
2. Conduct a one-day field investigation (May to July) to document existing conditions (terrestrial and aquatic) in the outfall site (i.e., the existing outfall, proposed outfall and the area within a 120 m radius of the outfall sewer installation).
3. If any in-water work is required, a DFO Self-Assessment will be undertaken to determine potential impacts of the project to fish and fish habitat and provide mitigation measures to reduce the risk of serious harm to fish.
4. Prepare a memo identifying environmental constraints and permit needs. The technical Memo is to be prepared to document background information, field data and constraints (i.e., one memo combining terrestrial and aquatic habitats). The memo is to describe existing conditions within 120 m of the predicted work area, recommend general mitigation measures to include during design, and identify permits that may be required prior to construction of the new storm sewer, water quality unit and outfall.

6.2.2 Floodplain Hazard Management

The proposed work site is under the jurisdiction of the Essex Region Conservation Authority (ERCA). The preferred route and location of this project was reviewed in accordance with ERCA's floodplain mapping of this area, and it has been determined that the proposed work site fall within the Limit of Regulated Area of the Lake St. Clair. The proposed excavations, construction of structures, drain crossings, and placement and grading of fill, within the regulated area will require permits from the ERCA under Ontario Regulation 158/06, (Development, Interference with Wetlands and Alteration to Shorelines and Watercourse Regulations - Section 28 of the Conservation Authorities Act).

In the final design phase, an application of flood proofing measures must be submitted to the ERCA for review and approval. The permit application shall meet the following requirements:

- Specific “Best Management Practices” regarding erosion control measures, sedimentation, and the removal of vegetation, which is provided in the MECP Stormwater Management Planning and Design Manual (2003)

- Water quality measures shall be considered to ensure no adverse impact on the downstream watercourse. The new preferred outfall sewer will run parallel to the existing outfall sewer that is located along Rourke Line Road, and outletting to the Lake St. Clair. Surface water monitoring program is to be implemented to verify no adverse impact on the downstream watercourse.

- Items listed in Table 6-1 “Environmental Effect and Mitigation Measures” described in this ESR Report

6.2.3 Source Water Protection

6.2.3.1 Source Water Protect

For the protection of local municipal drinking water sources, the Essex Region Source Protection Plan (SPP), which has been established under the Clean Water Act, 2006 (Ontario Regulation 287/07), came into effect on October 1, 2015.

The Clean Water Act (2006) refers to four types of Vulnerable Areas, which include:

- Intake Protection Zones
- Wellhead Protection Areas
- Highly Vulnerable Aquifers
- Significant Groundwater Recharge Areas

The types of Vulnerable Areas are addressed further below in relation to this project location.

6.2.3.2 Intake Protection Zones (IPZs)

There is one municipal Water Treatment Plant (WTP) in the region, the Lakeshore (Belle River) WTP, having its intake in the Lake St. Clair (refer to Map 7 of the Essex Region Source Protection Plan in Appendix B). Intake Protection Zones are areas of land and water, where run-off from streams or drainage systems, in conjunction with currents in lakes and rivers, could directly impact the source water at the municipal drinking water intakes.

An Intake Protection Zone can be described as a defined area surrounding a surface water body intake. The size and shape of each zone in an IPZ represents either a set distance around the intake pipe, or the length of time it would take water and contaminants to reach the intake:

- IPZ-1 is the area closest to the intake pipe and is a set distance which extends one kilometre upstream and 120 metres onto the shore.

- IPZ-2 includes the on and offshore areas where flowing water and any pollution would reach the intake pipe within two hours.
- IPZ-3 is an area where contaminants could reach the intake pipe during and after a large storm.

According to the Approved Source Protection Plan for the Essex region source protection area, Lake St. Clair in the study area is characterized to be an Intake Protection Zone 2 (IPZ-2). Refer to Map 7 of the Essex Region Source Protection Plan in Appendix B)

The purpose of this EA study is to investigate and report on alternative means of treating wastewater in the Belle River and Maidstone areas. The proposed project for expanding the plant treatment capacity and therefore minimizing the plant bypass during extreme storm events will have an important beneficial impact on the source of drinking water quality.

6.2.3.3 Wellhead Protection Areas

Wellhead Protection Areas are not applicable in the Essex Region, as no municipal drinking water systems are supplied by groundwater.

6.2.3.4 Highly Vulnerable Aquifers (HVAs)

Highly Vulnerable Aquifers (HVAs) are defined as aquifers on which external sources have or are likely to have a significant adverse impact, and include the land above the aquifer.

In the ERSPA these HVAs are generally located in the sandy soil areas in the southern part of the region, including most of Pelee Island (refer to Map 4 of the Essex Region Source Protection Plan). There are no HVAs located in or close to the proposed work area.

6.2.3.5 Significant Groundwater Recharge Areas

Significant Groundwater Recharge Areas (SGRAs) are defined as per Regulation 287/07 as areas within which it is desirable to regulate or monitor drinking water threats that may affect the recharge of an aquifer. Groundwater recharge occurs where rain or snowmelt percolates into the ground and flows to an aquifer. The greatest recharge usually occurs in areas which have loose or permeable soil such as sand or gravel that allows the water to seep easily into the aquifer.

Most of the SGRAs in the ERSPA are located in the sandy soil areas of the southern part of the Essex Region, in the Harrow area, parts of Leamington and Kingsville, and limited parts of the Turkey Creek and Pelee Island subwatersheds (refer to Map 5 of the Essex Region Source Protection Plan in Appendix B). There are no HVAs located in the northern part of the Essex Region including Town of Lakeshore area.

6.2.3.6 Overall Vulnerability Assessment Summary

Project activities in vulnerable areas need to be assessed to determine the risk they pose. The Clean Water Act requires that significant threats be managed to reduce the threat to a point where it is no longer significant. Action may be taken to address low and moderate threats at the discretion of the Source Protection Committee. Table 6.2 provides a summary of threats to vulnerable areas and the subsequent actions to be taken, relating to this project.

Table 6.2 Summary of Threats to Vulnerable Areas

Vulnerable Area	Threat Potential	Action Taken
Intake Protection Zone	Low	None
Wellhead Protection Areas	Not applicable	None
Highly Vulnerable Aquifer	Not applicable	None
Significant Ground Water Recharge Areas	Not applicable	None

6.2.4 Permits to Take Water

Some areas with sandy subsoils and high water tables have been identified in the outfall sewer site where well point dewatering systems will be required to facilitate the outfall sewer construction.

The use of these dewatering systems will require the acquisition of a Permit to Take Water from the MECP.

6.2.5 Active / Former Waste Sites

The existence and location of any active and/or former waste disposal sites within the study area was carefully reviewed. A listing of information about large and small landfills in Ontario that includes open/closed status, site owner, site location, and Certificate of Approval number are available from Government of Ontario ‘s website.

There is no large or small waste disposal site in the region. As the proposed work includes sewer construction within the road right-of-way and the proposed wastewater treatment facility is located far away from any active/former waste disposal sites, the proposed work is not expected to have any impact on the migration of methane and/or leachate from nearby active and/or former waste sites.

6.2.6 Climate Change

Climate encompasses all aspects of weather, including: temperature, precipitation, air pressure, humidity, wind speeds, and cloudiness. Weather and climate are not static processes and variability is often normal. Weather, for example, changes on a daily and sometimes hourly basis. Weather can also change on a monthly basis, through the changing of seasons. When climate changes on a global scale, it is referred to as Climate Change.

Since the beginning of the industrial revolution in the 18th century, excessive emission of greenhouse gases, like carbon dioxide and methane, have been released through human activities, causing an increased percentage of solar radiation to be trapped in our atmosphere. In recent decades the effect of this on climate has become clearer. As more energy is retained within the atmosphere, a general increasing trend in global temperatures has occurred.

Regardless of the cause, the average temperature in Windsor has increased by almost 1°C since 1940. As air temperatures increases, so does the capacity of the air to hold more water leading to more intense rainfall events. The Environment Canada weather station located at Windsor Airport has been monitoring and recording weather data since 1941. Since this time, an increasing trend in annual precipitation has been documented.

The effects of climate change are expected to include an increase in the number and severity of storms, leading to increased precipitation. Since 1970, there has been increasing evidence of heavier short duration (24 hours or less) rain events in southern Ontario.

Climate changes related to increasing rainfall in the region have a significant impact on municipal sewer systems. The Windsor-Essex Region recently experienced a significant rainfall event that inundated and overwhelmed the area's sanitary and storm sewer system/facilities. In the last decade alone, this region has experienced six (6) significant storm events that have surpassed current 1:100 year regulatory standards, and have resulted in urban flooding issues and sewer backups that have impacted hundreds of homes and businesses in the region. As such, historical data regarding the likelihood of major flooding events must be reconsidered. It is important that the proposed work for wastewater treatment continues to operate effectively in the future. A solution needs to be identified to provide resiliency to the impacts of climate change.

The proposed treatment plant site is located outside the periphery of lands that are designated as Lake St. Clair Floodprone Areas in the Official Plan and in the Zoning By-Law. Specific flood proofing measures are not considered to be undertaken on the site.

The proposed plant site is under the jurisdiction of the Essex Region Conservation Authority (ERCA). The ERCA was contacted to verify whether additional flood proofing measures would be required for the proposed treatment plant site, and no specific comments have been received to date.

6.3 SOCIO-ECONOMIC IMPACTS AND MITIGATING MEASURES

6.3.1 Built Heritage Resources and Cultural Heritage Landscapes

The Ministry of Tourism, Culture and Sport (MTCS)'s "Screening for Impacts to Build Heritage and Cultural Heritage Landscapes" checklist was completed for this project. The completed checklist is included in Appendix B. As shown in Appendix B, the proposed work is located away from these built heritage and cultural heritage landscapes, the proposed work is not expected to impact heritage resources in the area.

6.3.2 Archaeological Resources

The MTCS's "Criteria for Evaluating Archaeological Potential" checklist was completed for this project. The completed checklist is included in Appendix B. As shown in Appendix B, Proposed work is located in the disturbed areas and away from any known archaeological sites, and thus is not expected to impact heritage resources in the area.

6.3.3 Community

6.3.3.1 Disruption of Traffic

Construction of the proposed plant expansion and the outfall will result in temporary detours or lane restrictions that will disrupt traffic in the area and interfere with access for some residents and businesses. All emergency services will be notified of detours prior to commencement of construction. Services that may experience temporary detours or delays include school buses, mail delivery and garbage collection.

Construction of the proposed outfall sewer will result in temporary detours or lane restrictions that will disrupt traffic in the area and interfere with access for some residents and businesses. All emergency services will be notified of detours prior to commencement of construction. Services that may experience temporary detours or delays include school buses, mail delivery and garbage collection. Where the alignment for the outfall sewer follows a Town Road, approval of the alignment would be obtained from the Town of Lakeshore.

Mitigating measures are to provide and maintain detours, provide for safe alternate routes, and select alternate routes to minimize inconvenience.

6.3.3.2 Inconvenience During Outfall Sewer Construction

Construction activities will create noise and traffic from construction vehicles resulting in temporary inconvenience to residents and businesses.

The best available construction techniques shall be applied to the construction of the proposed outfall sewer to mitigate noise and vibration. The noise and vibration limits set for the project will ensure that the community, all buildings, including those with heritage features, are protected. Monitoring during construction will ensure that noise and vibration are kept below the established limit.

6.3.3.3 Proximity to Arterial Roadway

The County Road No.22 major arterial roadways that provide direct access to the local Communities and neighboring areas. It is not expected that there will be any significant traffic disruptions during the construction of the proposed work.

6.3.3.4 Crossing Railway Rights-of-Way

Rail traffic should not be disrupted by outfall sewer construction. Permits to cross railways would be obtained from the railway company. In all railway crossings, directional drilling procedures should be used to install steel casings for insertion of outfall sewer pipes.

6.3.3.5 Proximity to Existing Dwellings

The MECP has developed Guidelines with respect to recommended separation or buffer zone distances between various sizes and types of wastewater treatment facilities and nearby "sensitive" land uses. In some cases these Guidelines are applied as policy by MECP staff especially where there is a proposal for expansion of a large treatment facility and where there are concerns related to the generation of odours or noise. An application to the MECP for approval of air and noise emissions from any proposed treatment facility is required under the regulations of the Provincial Environmental Protection Act.

Separation distances between sewage works and sensitive land use are specified in MECP Guideline D-2, Compatibility between Sewage Treatment and Sensitive Land Use. The guideline indicates that:

1. Where practical, sensitive land uses should not be placed adjacent to treatment facilities.

2. When new facilities or enlargements to existing facilities are proposed, an adequate buffer area should be acquired as part of the project. Plants with a capacity of less than or equal to 500 m^3/d have a recommended separation distance of 100 metres. Plants with a capacity greater than 500 m^3/d but less than 25,000 m^3/d have a minimum separation distance of 100 metres, and plants with a capacity greater than 25,000 m^3/d have a minimum separation distance of 150 metres.

The ultimate capacity of the proposed treatment facility is 30,000 m^3/d. Therefore, the minimum separation of 150 metres would apply.

The MECP has indicated sensitive land use in the context of this Guideline can be defined as: "A use associated with residences, schools, hospitals and senior citizen homes or other land uses where humans and the natural environment may be adversely affected by emissions from the facilities".

The existing treatment plant site is located to provide a buffer zone of more than 150 m from the closest residential property line to any open tankage. This buffer zone exceeds the minimum requirements as outlined by the MECP. The buffer zone will help minimize potential impacts on adjacent lands and effectively mitigate potential impacts related to aesthetics.

7.0 PUBLIC CONSULTATION

The Municipal Class Environmental Assessment process provides a minimum of three points of contact for a Schedule C undertaking where members of the public and review agencies have the opportunity to review the project findings and submit comments for consideration in development of the project. The following sections summarize the approach that has been taken with respect to public participation during this project.

7.1 PUBLIC PARTICIPATION

A notice was originally published in the April 11, 2019 edition of the Lakeshore News and Tilbury Times, and the April 12, 2019 edition of the Shoreline News advising of the initiation of this Class EA undertaking and inviting public input. A copy of the notice is contained in **Appendix C**.

In addition to this discretionary point of contact, there are two points for mandatory public contact during this Class EA study, namely:

- Phase 3: Public Consultation and Information Centre
- Phase 4: Notice of Completion

A public Open House is to be held on September 11, 2019 to provide information regarding this undertaking and to invite input and comment from interested persons. Information on alternative concepts for the preferred design selected in Phase 3 of the Class EA process was available for review. A copy of the open house notice as published in the Windsor Star on August 24, 2019, Tilbury Times of August 27, 2019, the Lakeshore News on August 29, 2019, and the Shoreline News on August 30, 2019 is included in **Appendix C** together with a copy of the material that is to be given to all attendees.

7.2 REVIEW AGENCIES

The Class EA provides for the involvement in the project by the MECP's various branches as well as other provincial and federal ministries and outside agencies. The list of Review Agencies varies depending upon the scope of the project, its location and the potential environmental impacts.

A letter dated April 3, 2019, advising of the initiation of this project was sent to review agencies. Copies of the letter, notice and the list of review agencies are contained in **Appendix C**.

Information on the preferred design selected in Phase 3 of the Class EA process are being distributed to review agencies and mandatory contacts under cover of a letter dated September 10, 2019. A copy of the letter and distribution list is included in **Appendix C**.

Copies of this Draft ESR Report are being distributed to review agencies and mandatory contacts under cover of letters in September 2019.

7.3 RESPONSE FROM PUBLIC AND REVIEW AGENCIES

7.3.1 Notice of Project Initiation

The notice of initiation of the project did not generate any public response. The following responses (copies included in **Appendix C**) were received from review agencies and mandatory contacts.

- Ministry of the Environment, Conservation and Parks (MECP) - advised by emails on April 10, 2019 and May 31, 2019 that the MECP has comments and concerns regarding this project. Responses to the MECP's comments/concerns have been addressed.
- Ministry of Natural Resources and Forestry (MNRF), Aylmer District – advised in an email dated April 10, 2019 that the MECP has now assumed responsibility for the Endangered Species Act (ESA), including species at risk (SAR) in Ontario.
- Ministry of Tourism, Culture and Sport (MTCS) – advised in an email dated May 8, 2019 that the Class EA should identify and address potential impacts to Archaeological resources, including land-based and marine; built heritage resources, including bridges and monuments; and Cultural heritage landscapes.
- Transport Canada – advised in an email dated May 9, 2019 that Transport Canada does not require receipt of all individual or Class EA related notifications. The project proponent is requested to self-assess if the project will interact with a federal property and/or waterway, and require approval and/or authorization under any Acts administered by Transport Canada.
- Essex Region Conservation Authority (ERCA) – advised in a letter dated May 29, 2019 that ERCA is interested in providing support and comments to the Town as this study progresses.
- Indigenous Services Canada (ISC) - requested in a letter dated May 6, 2019 that ISC be kept informed of progress of this project. ISC has no comments concerning the project at this time.
- Hydro One - advised in a letter dated July 30, 2019 that there are no existing Hydro One Transmission assets in the subject area. No further consultation with Hydro One Networks Inc. is required if no changes are made to the current information.

- Also received responses from Town of Essex, ENWIN Utilities Ltd., and Meo & Associates requested to be kept on the mailing list.

7.3.2 Phase 3 Public Consultation and Information Centre

A notice was originally published in the August 24, 2019 edition of the Windsor Star and the August 27, 2019 edition of the Tilbury Times, the August 27, 2019 edition of Lakeshore News and the August 30, 2019 edition of Shoreline News advising of Phase 3 Public Consultation and Information Centre and inviting public input. A copy of the notice is contained in **Appendix C**.

A public Open House is to be held on September 11, 2019 to provide information regarding this undertaking and to invite input and comment from interested persons. A copy of display material, which is presented at the open house described the design options considered leading to selection of the recommended design, is included in **Appendix C**.

7.4 FIRST NATIONS CONSULTATION

Consultation with First Nations is ongoing in accordance with the Municipal Class EA First Nations Consultation requirements. As part of this Environmental Assessment, communications with First Nations agencies and communities is being undertaken in parallel with the other stakeholder communications and consultations. This report will be sent to the First Nations groups and organizations to solicit their interest or non-interest in the study.

First nations consultation is to be completed in accordance with the Municipal Class EA First Nations Consultation requirements. As part of this Class EA, communications with First Nations agencies and communities are being undertaken in parallel with the other stakeholder communications and consultations. Letters were sent to the following First Nations groups and organizations at study commencement and public open house to solicit their interest or non-interest in the study.

Chippewas of the Thames First Nation (COTTFN) advised in a letter dated May 8, 2019 that the proposed project is located within the Mckee Treaty area (1790) to which COTTFN is a signatory, as well as the Big Bear Creek Addition to Reserve (ATR) land selection area, and COTTFN's Traditional Territory. COTTFN has minimal concerns with the proposed project. It is requested that COTTFN be kept informed of progress of this project including distribution of a digital copy of the study report.

Documentation of consultation with First Nations communities during the Environmental Assessment Process is located in **Appendix C**.

8.0 SUMMARY

8.1 RECOMMEDATIONS

The recommended alternative designs that form the preferred solution are summarized in Figure 8.1 of Appendix A.

When capital budget funding becomes available, it is recommended that the following major work described in the ESR proceed to Phase 5 with final design and construction:

- Increase pumping capacity of the existing Maidstone Pumping Station No.8
- Add second fine screen and vortex grit tank in the existing Screening and Grit Removal Facility
- Add two new aeration tanks and final clarifiers
- Build new UV disinfection facility
- Construct new service building accommodating blowers, sludge pumps, and chemical feed and storage
- Add two new aerobic digesters
- Construct new centrifugal dewatering facility
- Construct new electrical and standby generator building
- Twinning of inland portion of outfall sewer along Rourke Line Road from the Denis St. Pierre WPCP to Caille Avenue.

8.2 OPINION OF PROBABLE COST

This section discusses an opinion of probable cost for the preferred solution. An opinion of probable cost can be prepared as an attempt to project what someone else will be willing to contract for in the future to do construction work which has not yet been defined and which is subject to changes in scope, design, and market conditions.

8.2.1 Level of Accuracy

Opinions of probable cost are typically provided throughout various stages of a project's life cycle. There are a number of classifications for estimates that identify typical minimum and maximum probable costs or levels of accuracy. These classifications vary widely by industry but all are based on the fact that the level of accuracy is directly proportional to the level of detail available at each stage of the project.

The level of accuracy increases as the project moves through the various stages from planning to preliminary design to final design. A wide range of accuracy would be expected at the planning stage of a project development because a number of details would be unknown. As the project moves closer to completion of final design, the estimate would become more accurate due to the increased level of detail available and the reduced number of unknowns.

Table 8.1 includes a summary of typical estimate classifications used throughout a project's development including a description of the project stage and range of accuracy. The opinions of probable cost in this study are estimated at the study stage (Class 2) and the corresponding level of accuracy could range from –15% to +30% from the opinion presented in the report.

Table 8.1 Classification of Cost Estimates

Class	*Description*	*Level of Accuracy*	*Stage of Project Lifecycle*
1	Conceptual Estimate	+50% to -30%	Screening of alternatives.
2	Study Estimate	+30% to -15%	Treatment system master plans.
3	Preliminary Estimate	+25% to -10%	Pre-design report.
4	Detailed Estimate	+15% to -5%	Completed plans and specifications.
5	Tender Estimate	+10% to -3%	This is the actual tender price and it can vary depending on the amount of contingency allowance consumed.

8.2.2 Opinion of Probable Cost for Preferred Solution

In addition to the level of accuracy discussed, the opinion of probable cost was prepared taking into consideration the following factors.

- All estimates are first quarter, 2019 dollars based on an Engineering News Record (ENR) Construction Cost Index of 1200 (Average in August 2019).
- It is assumed that the Contractor will have unrestricted access to the site and will complete the work during normal working hours from 7:00 am to 6:00 pm Monday to Friday. There is no allowance for premium time included.
- Labour costs are based on union labour rates for the Windsor area.
- An allowance is included for mobilization and demobilization and the Contractor's overhead and profit.
- Equipment costs are based on vendor supplied price quotations and historical pricing of similar equipment.
- Bulk material and equipment rental costs used are typical for the Windsor area.

- The estimate does not include the cost of application or permit fees.
- Taxes are not included.
- Allowances for engineering and contingency allowances (approximately 15% and 10%, respectively) are included in the estimate.
- No allowance is included for interim financing costs or legal costs.
- No allowance is included for escalation beyond the date of this report.
- It is not known whether contaminated soil conditions may be encountered in the areas proposed for the plant expansion. The potential impact cannot reasonably be determined at this point and no allowance is included in the estimate for this possible eventuality.
- Another factor that could impact the estimate is the possible presence of archaeological resources at the plant site or along the outfall sewer. The potential impact cannot reasonably be determined at this point and no allowance is included in the estimate for this eventuality.

A capital budget estimate (in 2019 dollars) is summarized in Table 8.2.

Table 8.2 Opinion of Probable Capital Cost for Preferred Solution

Description	Expansion
Inlet Works and Grit Building	$1,500,000
Extended Aeration Tanks and Blower Facility	$5,500,000
Final Settling Tanks and Alum Storage & Feed Facility	$4,800,000
UV disinfection	$1,200,000
Outfall	$4,000,000
Aerobic Digester	$1,500,000
Dewatering Building	$2,500,000
Electrical and Standby Generator Building	$1,200,000
Sub-total	$22,200,000
Contingency 10%	$2,220,000
Engineering Allowance 15%	$3,330,000
TOTAL	$27,750,000

8.3 PERMIT AND APPROVAL

Table 8.3 shows the permit and approval requirements for the preferred design. The permit requirements are based on past experience with similar projects and may change at the discretion of the regulatory authorities. The applications shall be prepared upon completion of the detailed design drawings and specifications.

Table 8.3 Permit requirements for implementing the preferred design

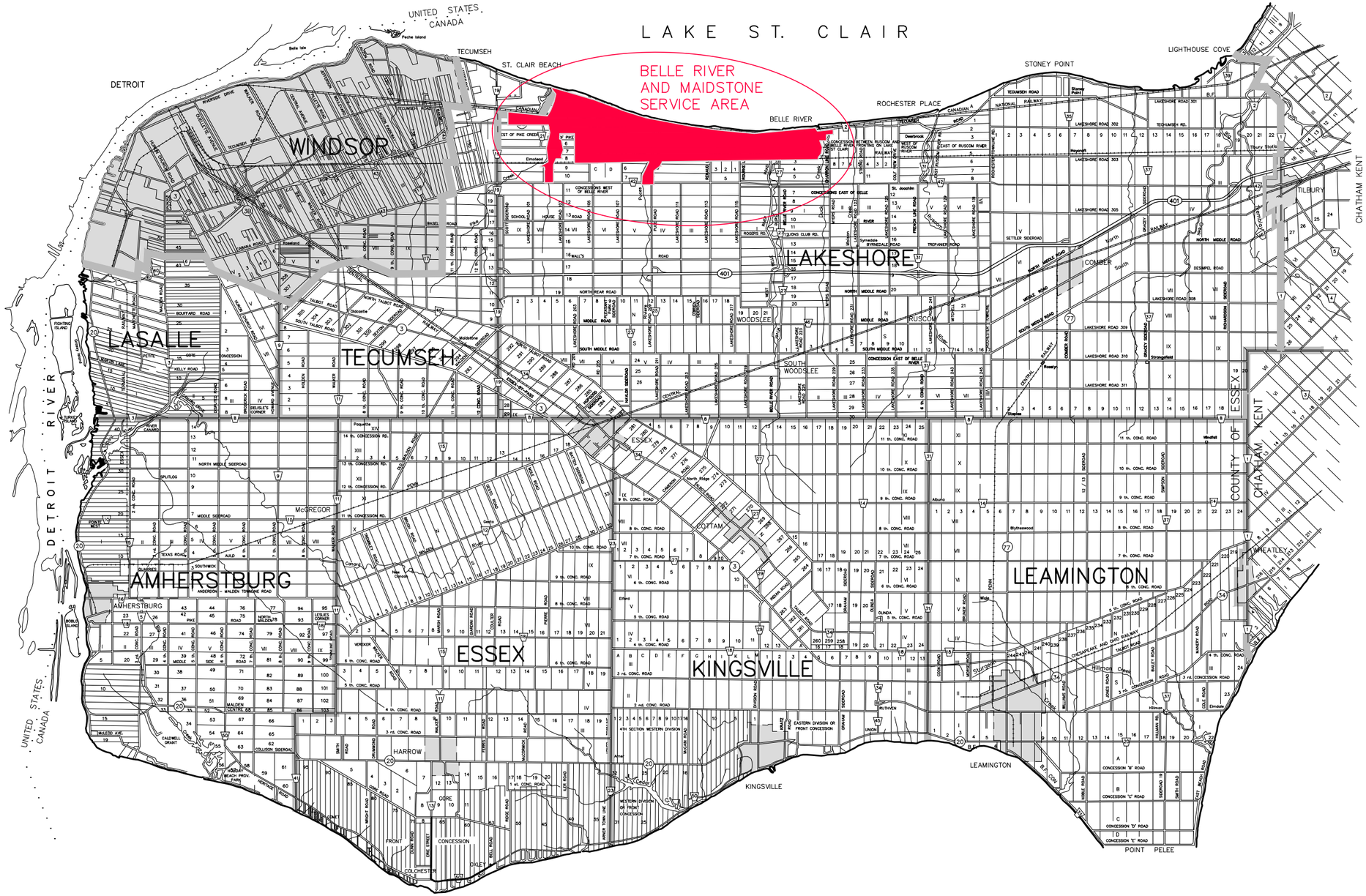
Infrastructure	Regulatory Authority or Owner	Permit
Plant Expansion	Ministry of Environment Conservation and Parks (MECP)	ECA for Plant expansion
Outfall Sewer	MECP	ECA for outfall sewer construction
	Essex Region Conservation Authority (ERCA)	Approval for outfall construction
	Canadian National Railway (CNR)	Encroachment and crossing Approval

APPENDIX A

- **Figures**

APPENDIX A

Figures



v:\01656\active\165620173\planning\ESR Report\Drawings\20173_FIGURE_1.1.dwg
2019-9-04 02:05pm BY: qkha

Lakeshore

Stantec

TOWN OF LAKESHORE
DENIS ST. PIERRE WPCP EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

KEY PLAN OF ESSEX COUNTY

PROJECT NO.	DRAWING NO.
165620173	FIGURE 1.1
DATE 2019.07.30	1:200000 (0 2 6 10km)

LAKE ST. CLAIR

SEE DETAIL 'A' BELOW

BELLE RIVER/MAIDSTONE SEWAGE SERVICE AREA

DENIS ST. PIERRE WATER POLLUTION CONTROL PLANT

N

EAST PIKE CREEK RD.

COUNTY ROAD NO. 22

CANADIAN NATIONAL RAILWAY

COUNTY ROAD NO. 19 (MANNING ROAD)

LITTLE BASELINE ROAD

CANADIAN PACIFIC RAILWAY

COUNTY ROAD NO. 42

PATILLO ROAD

WALLACE LINE RD.

TRENAUD LINE ROAD

ROUKE LINE ROAD

WEST PUCE RIVER ROAD

COUNTY ROAD NO. 25

WEST BELLE RIVER ROAD

COUNTY ROAD NO. 22 (BELLE RIVER ROAD)

COUNTY ROAD NO. 25 (PUCE ROAD)

LAKESHORE ROAD 111

LAKESHORE ROAD 113

LAKESHORE ROAD 115

WALLS ROAD

KINGS HIGHWAY NO. 401

DETAIL 'A'

SCALE= 1:12,500

WASTEWATER SERVICING AREA

Lakeshore

Stantec

TOWN OF LAKESHORE
DENIS ST. PIERRE WPCP EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

WASTEWATER SERVICING AREA

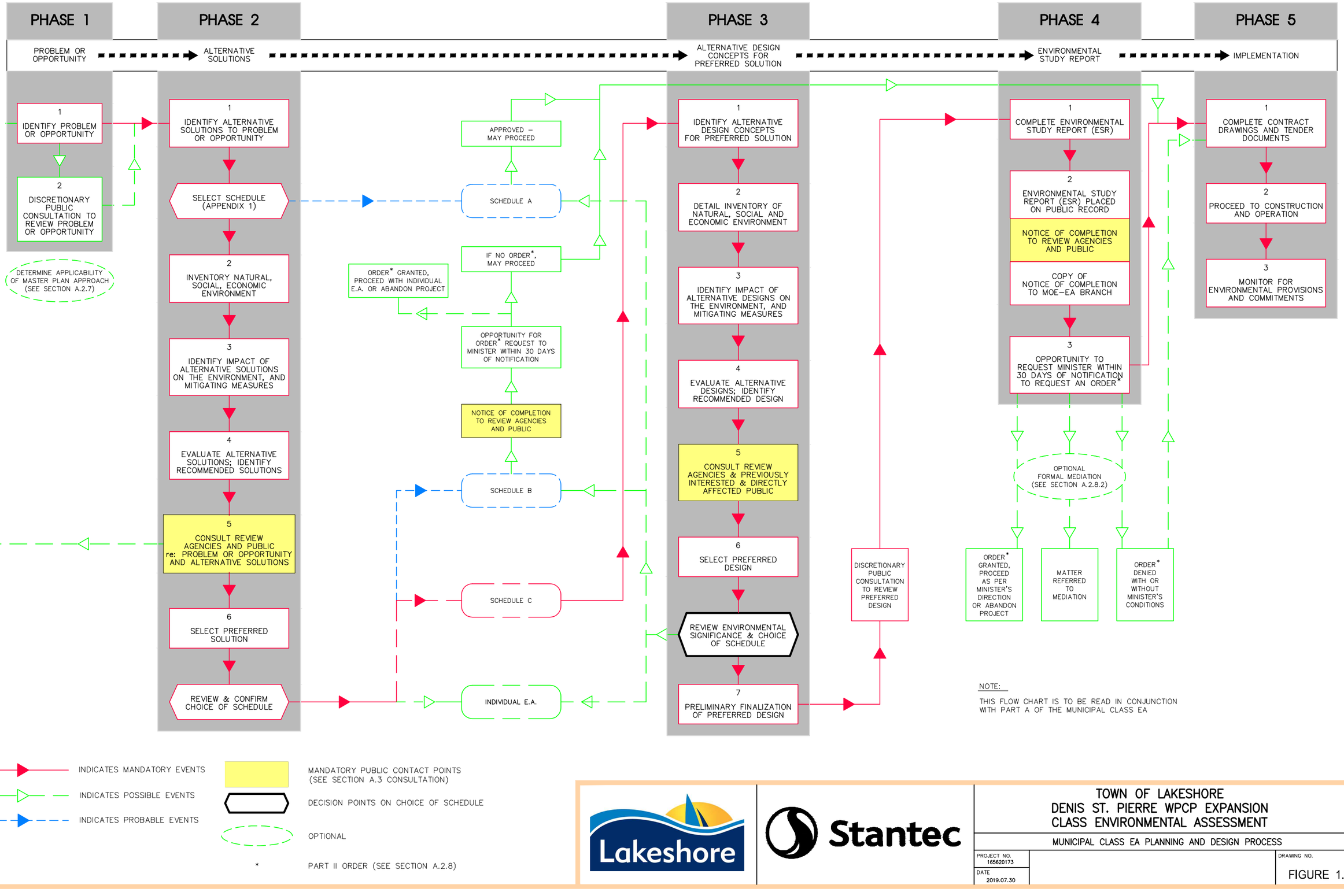
PROJECT NO. 165620173

DATE 2019.07.30

1:40000 0 400 1200 2000m

DRAWING NO. FIGURE 1.2

V:\01656\active\165620173\planning\ESR Report\Drawings\20173_FIGURE_1.2.dwg
2019-9-04 02:06pm BY: qkha



V:\01656\active\165620173\planning\ESR Report\Drawings\20173_FIGURE_1.3.dwg
2019-9-04 02:07pm BY: qkha

Lakeshore

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TOWN OF LAKESHORE
DENIS ST. PIERRE WPCP EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

MUNICIPAL CLASS EA PLANNING AND DESIGN PROCESS

PROJECT NO. 165620173
DATE 2019.07.30
DRAWING NO. FIGURE 1.3

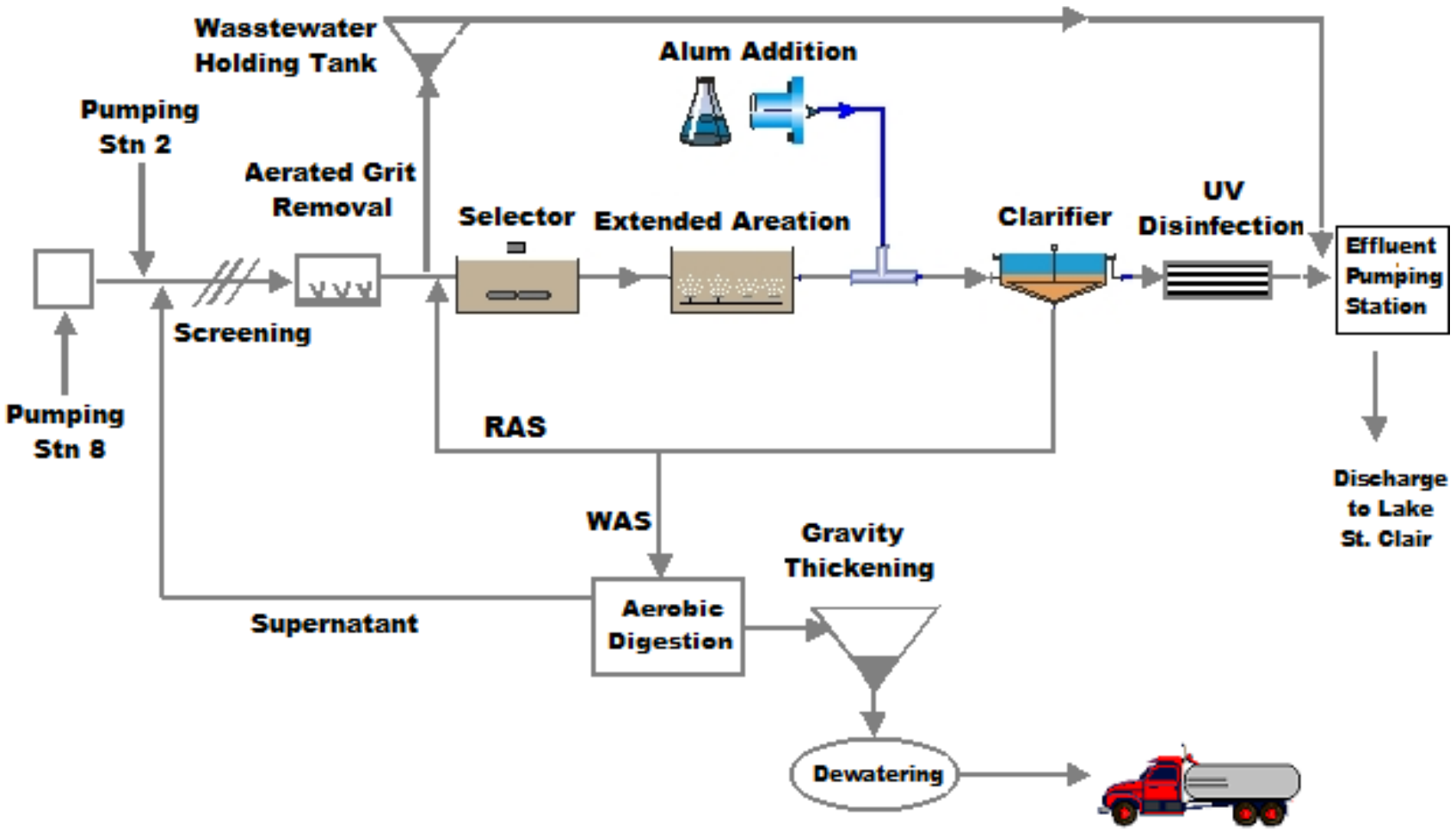

Figure 2.1: Denis St. Pierre Water Pollution Control Plant Process Schematic

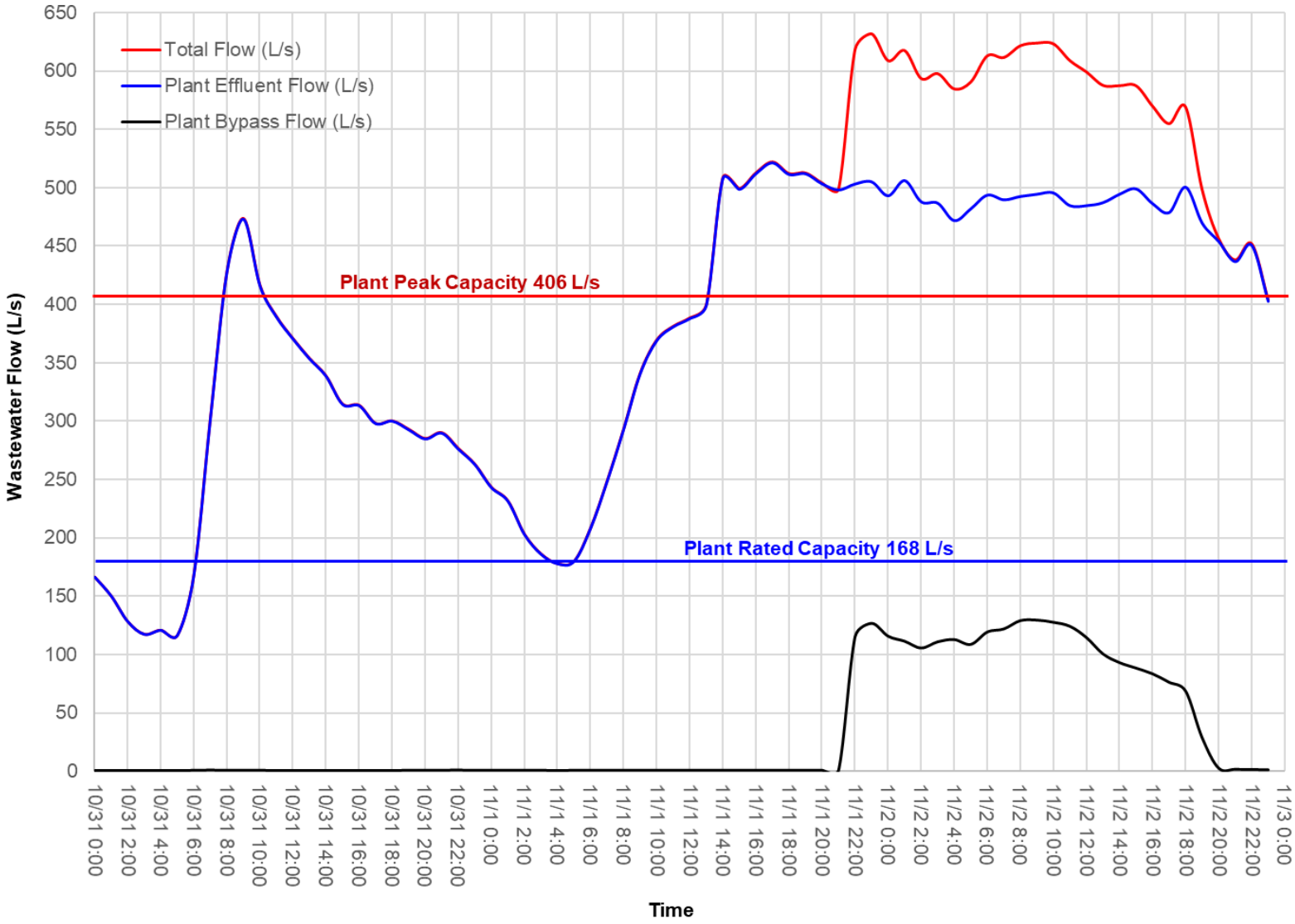

Figure 2.2: Denis St. Pierre WPCP Storm Bypass Event (Oct 31-Nov 2, 2018)

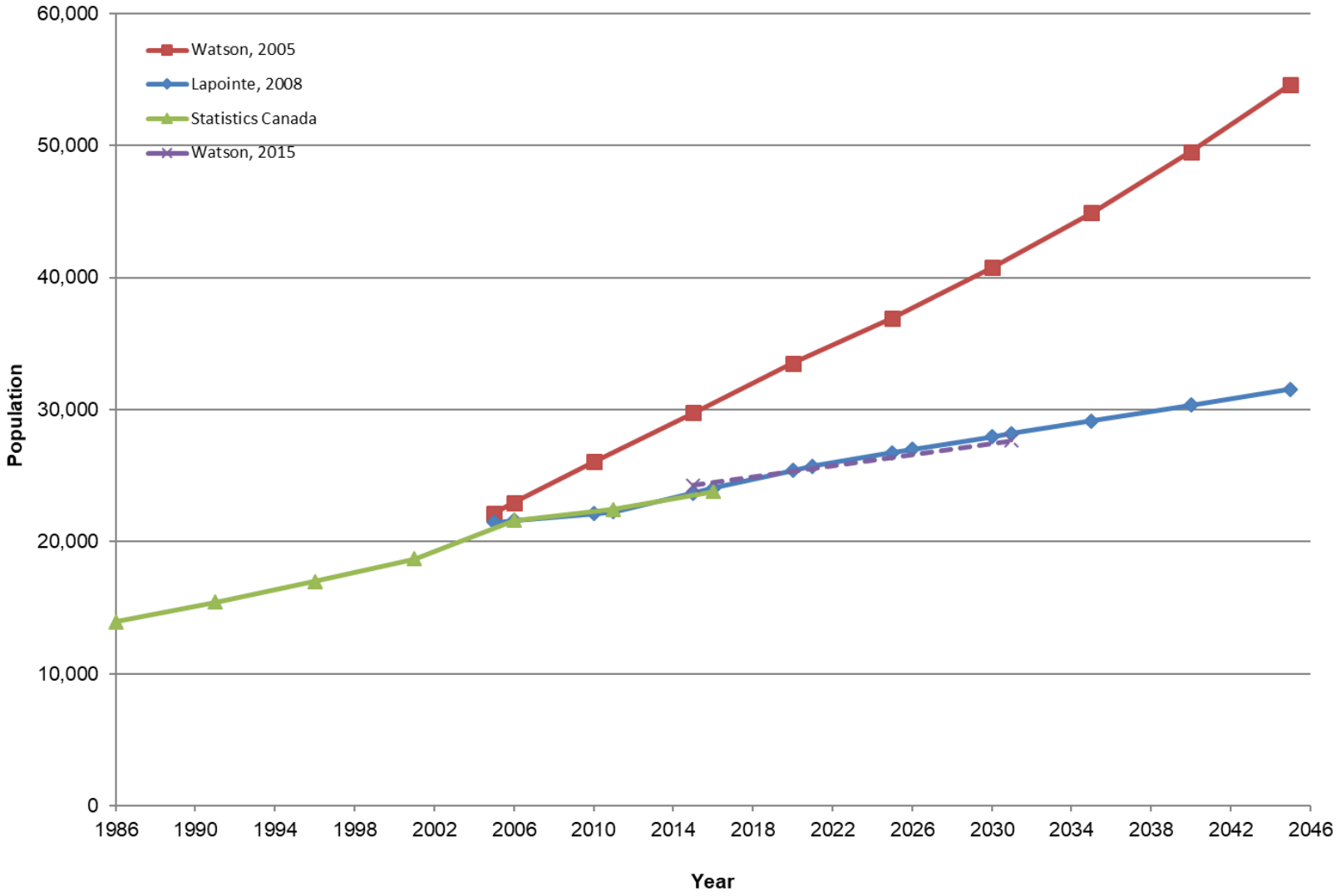

Figure 3.1: Population Growth Projections for the Maidstone and Belle River Area

V:\01656\active\165620173\planning\ESR Report\Drawings\20173_FIGURE_4.1.dwg
2019-9-04 02:19pm BY: qkha

Lakeshore

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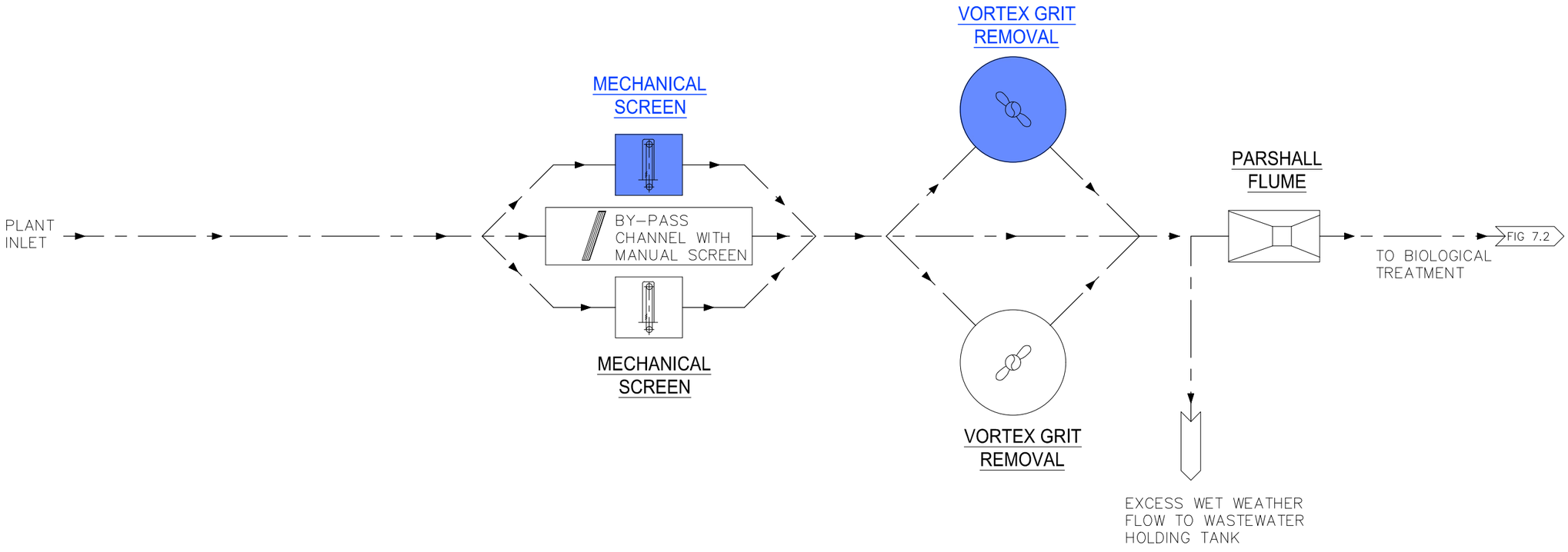
TOWN OF LAKESHORE
DENIS ST. PIERRE WPCP EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

SITE PLAN OF EXISTING DENIS ST. PIERRE WPCP

PROJECT NO.	0 10 30 50m	DRAWING NO.
165620173	1:1000	FIGURE 4.1
DATE 2019.07.30		

PHASES	DESIGN FLOW	PEAK DRY WEATHER	PEAK WET WEATHER	PROPOSED TREATMENT FACILITIES
EXISTING	14,500m^3/d	35,070m^3/d	67,855m^3/d	1 MECHANICAL CLEANED SCREEN (70,200m^3/d) 1 MANUALLY CLEANED BAR SCREEN 1 VORTEX GRIT SYSTEM (70,200m^3/d)
20 YEAR DESIGN	25,000m^3/d	64,000m^3/d	90,000m^3/d	ADD A SECOND MECHANICAL CLEANED SCREEN (70,200m^3/d) ADD A SECOND VORTEX GRIT SYSTEM (70,200m^3/d)
ULTIMATE DESIGN	30,000m^3/d	77,000m^3/d	108,000m^3/d	NO CHANGES NEEDED



LEGEND

- EXISTING
- 20 YEAR DESIGN
- ULTIMATE DESIGN

Lakeshore

Stantec

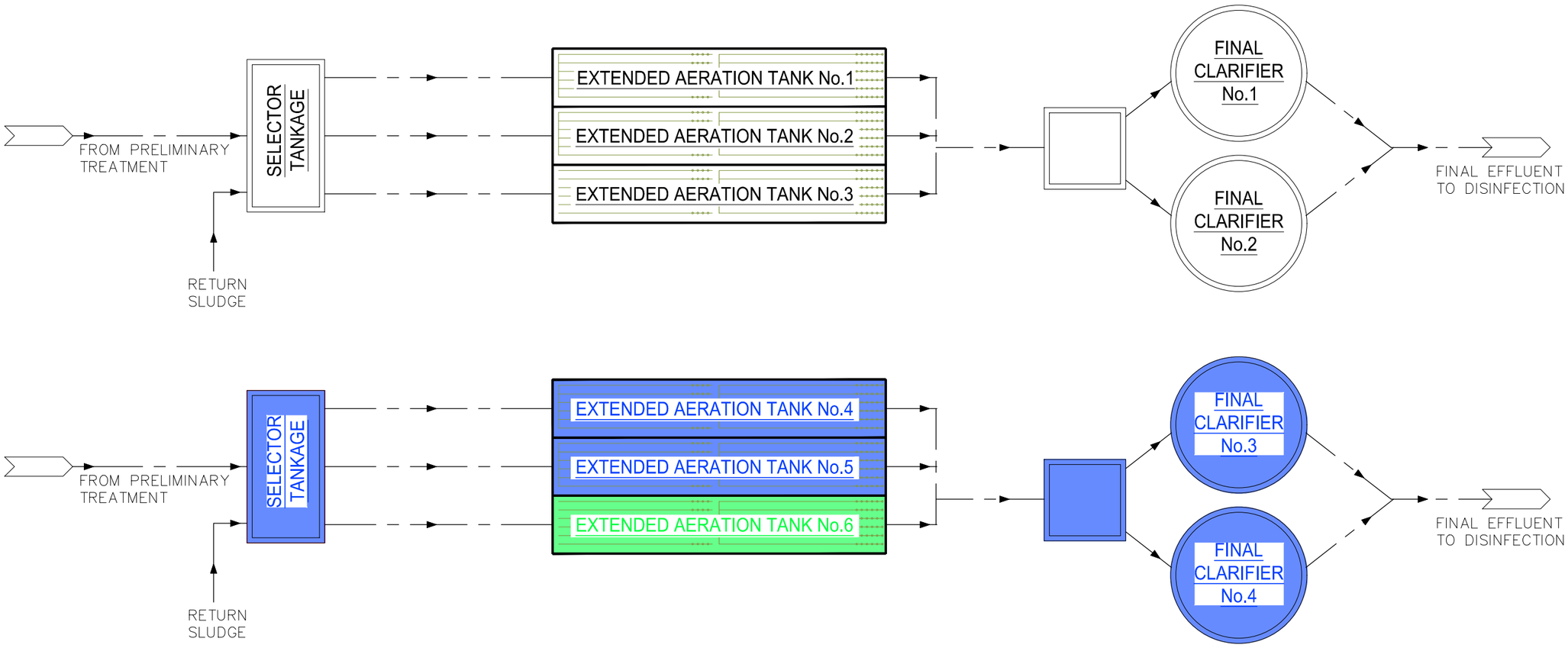
TOWN OF LAKESHORE
DENIS ST. PIERRE WPCP EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

PHASED EXPANSION OF PRELIMINARY TREATMENT

PROJECT NO. 165620173
DATE 2019.07.30
DRAWING NO. FIGURE 4.2

V:\01656\active\165620173\planning\ESR Report\Drawings\20173_FIGURE_4.2.dwg
2019-9-04 03:15pm BY: qkha

PHASES	DESIGN FLOW	PEAK FLOW	PROPOSED TREATMENT FACILITIES
EXISTING	14,500m^3/d	35,070m^3/d	3 AERATION TANKS AT 2,770m^3 EACH TWO CLARIFIERS - 30m DIAMETER
20 YEAR DESIGN	25,000m^3/d	64,000m^3/d	ADD 2 AERATION TANK EACH AT 2,770m^3 ADD 2 CLARIFIER EACH - 30m DIAMETER
ULTIMATE DESIGN	30,000m^3/d	77,000m^3/d	ADD 1 AERATION TANK No.6 AT 2,770m^3



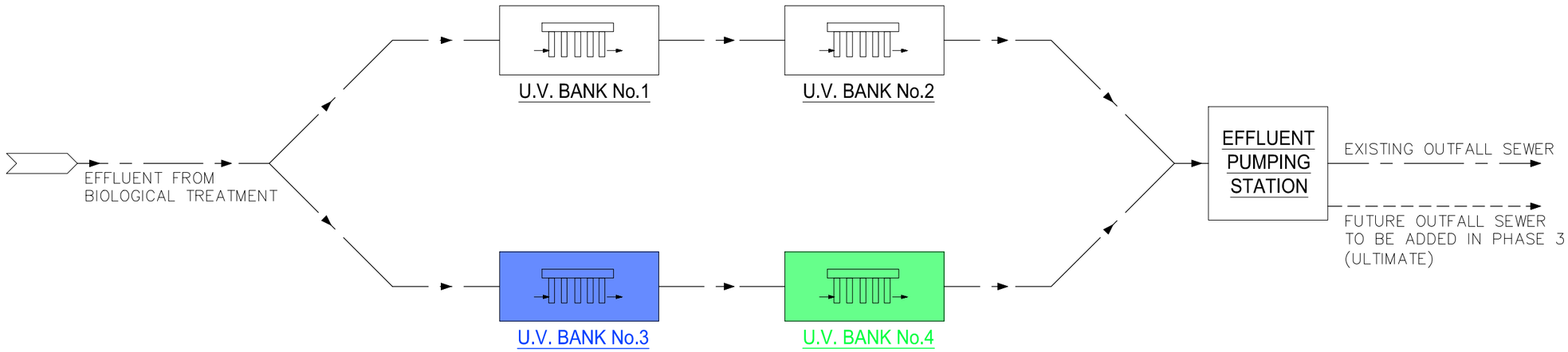
TOWN OF LAKESHORE
DENIS ST. PIERRE WPCP EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

PHASED EXPANSION OF EAAS TREATMENT

PROJECT NO. 165620173
DATE 2019.07.30
DRAWING NO. FIGURE 4.3

V:\01656\active\165620173\planning\ESR Report\Drawings\20173_FIGURE_4.3.dwg
2019-9-04 02:21pm BY: qkha

PHASES	DESIGN FLOW	PEAK FLOW	PROPOSED TREATMENT FACILITIES
EXISTING	14,500m^3/d	35,070m^3/d	2 U.V. BANK IN EXISTING U.V. FACILITY RATED AT 35,070m^3/d
20 YEAR DESIGN	21,650m^3/d	55,450m^3/d	CONSTRUCT A NEW U.V. FACILITY TO HANDLE 20 YEAR PEAK FLOW
ULTIMATE DESIGN	30,000m^3/d	77,000m^3/d	ADD U.V. BANK No.4 IN SECOND U.V. FACILITY FOR A TOTAL CAPACITY OF 77,000m^3/d



NOTE:

1. CONDITION OF EXISTING U.V. DISINFECTION TO BE REVIEWED DURING FINAL DESIGN.
2. IT MAY BUILD A NEW LARGE U.V. DISINFECTION AND DECOMMISSION THE EXISTING U.V. DISINFECTION

LEGEND

- EXISTING
- 20 YEAR DESIGN
- ULTIMATE DESIGN

Lakeshore

Stantec

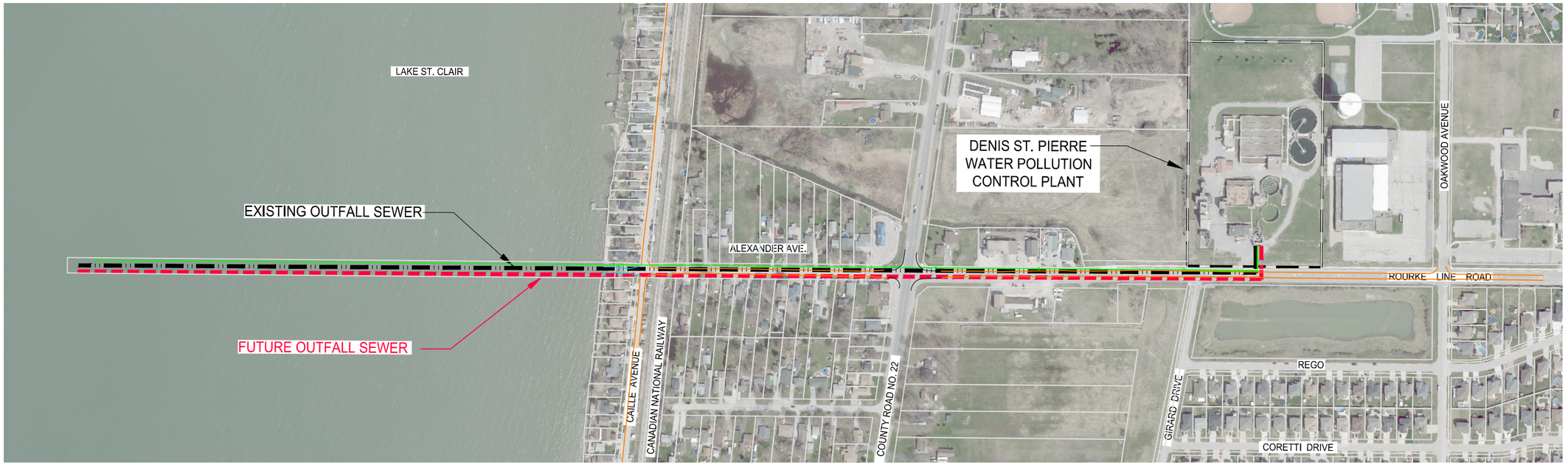
TOWN OF LAKESHORE
DENIS ST. PIERRE WPCP EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

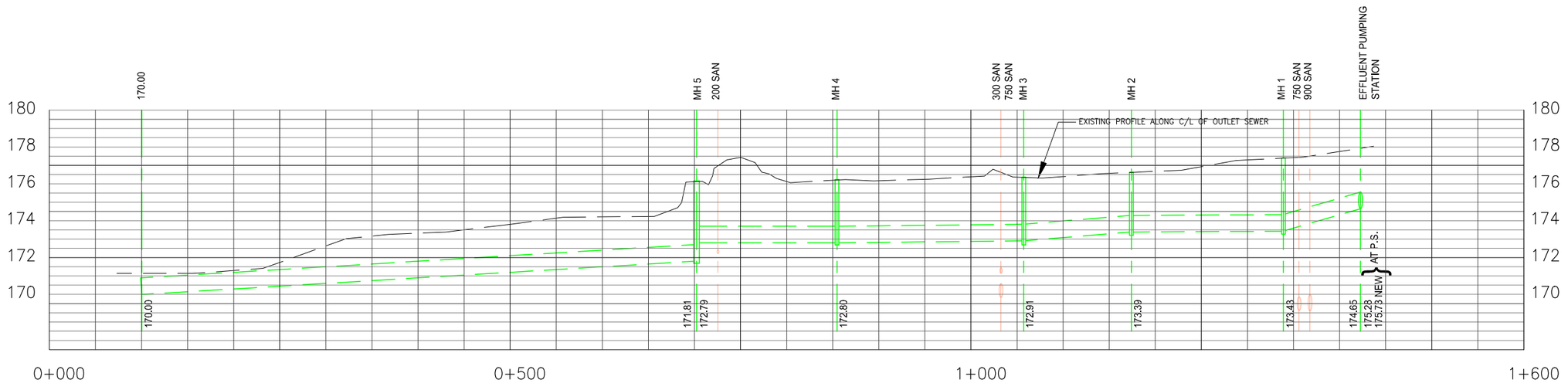
PHASED EXPANSION OF U.V. DISINFECTION

PROJECT NO. 165620173

DATE 2019.07.30

DRAWING NO. FIGURE 4.4





W:\active\165620173\planning\ESR Report\Drawings\20173_FIGURE_4.5.dwg
2019-9-10 11:50am BY: jholmes

Lakeshore

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TOWN OF LAKESHORE
DENIS ST. PIERRE WPCP EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 1 – TWINNING OF THE ENTIRE OUTFALL SEWER

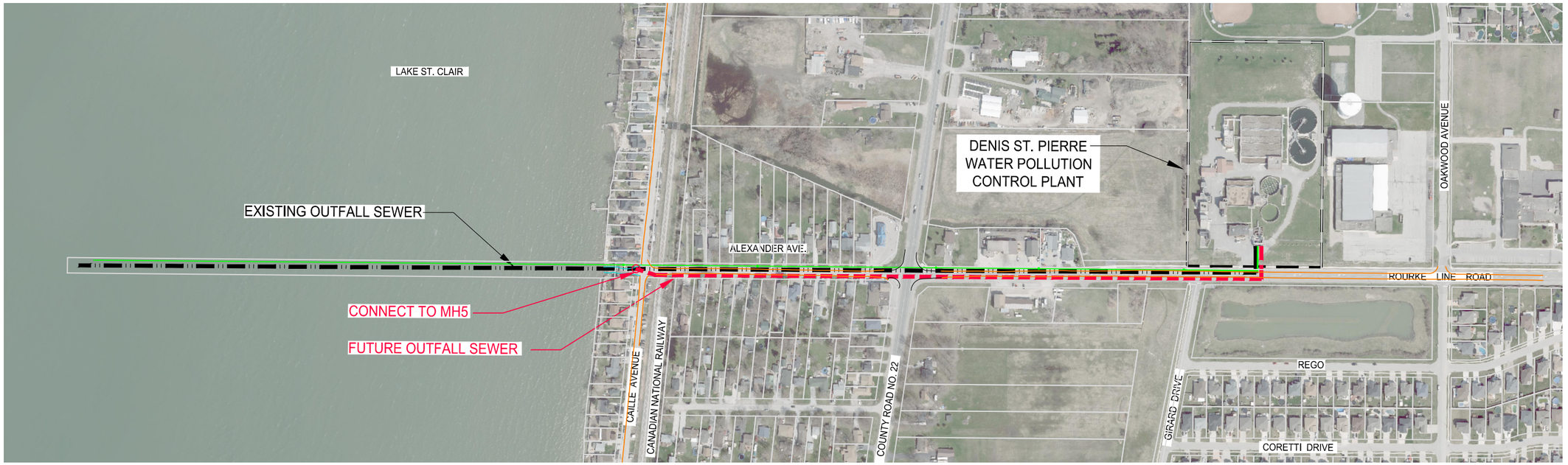
PROJECT NO. 165620173

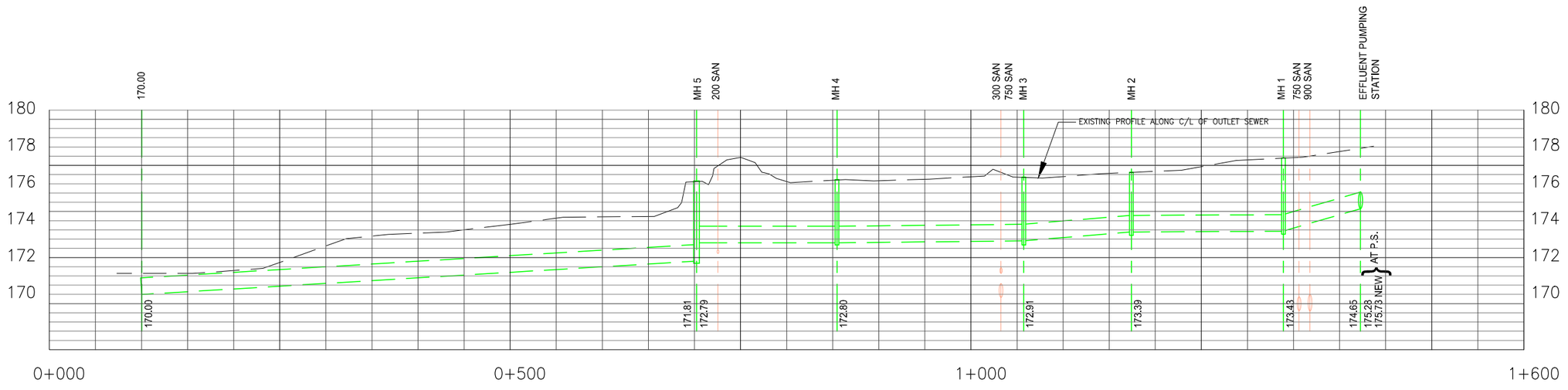
DATE 2019.8.21

0 50 150 250m

1:5000

DRAWING NO. FIGURE 4.5





NOTES:

1. NEW OUTFALL SEWER CONNECTED TO EXISTING OUTFALL AT MH No.5.
2. MODIFY OUTFALL DIFFUSER TO SUIT FUTURE FLOWS.

Lakeshore

Stantec

TOWN OF LAKESHORE
DENIS ST. PIERRE WPCP EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

ALTERNATIVE 2 – TWINNING OF THE INLAND PORTION OF THE OUTFALL SEWER

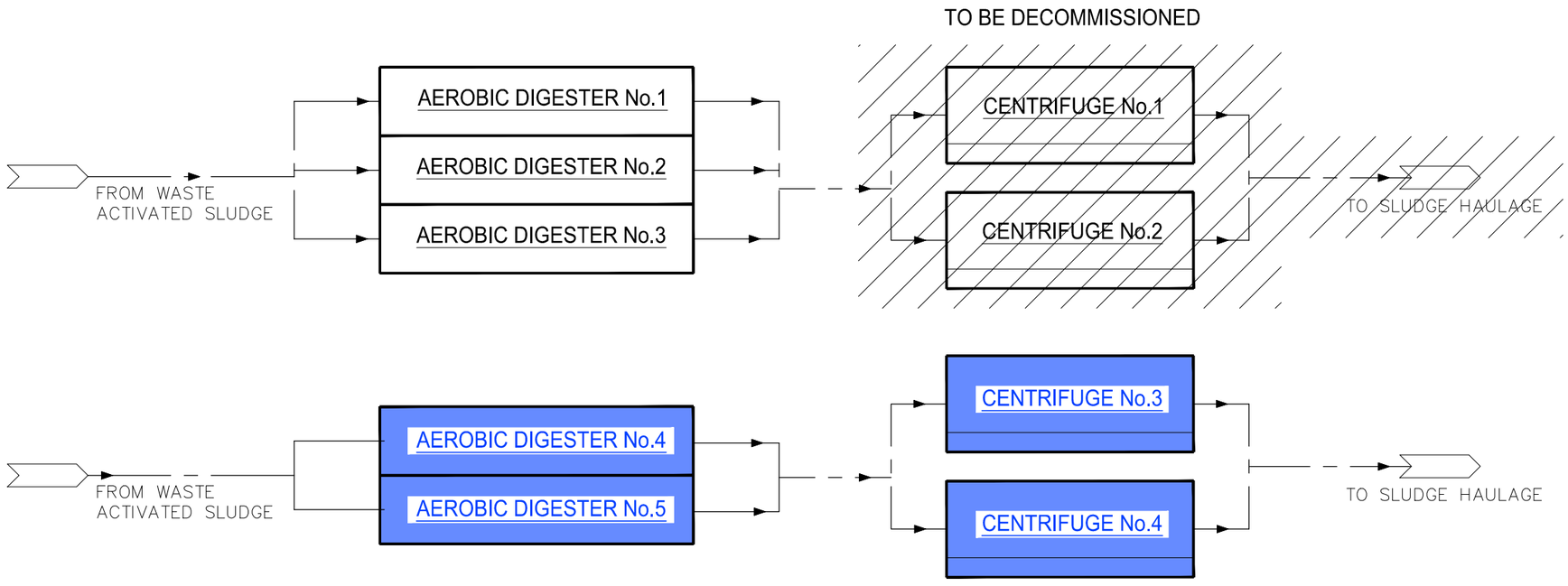
PROJECT NO. 165620173
DATE 2019.8.21

1:5000 0 50 150 250m

DRAWING NO. FIGURE 4.6

W:\active\165620173\planning\ESR Report\Drawings\20173_FIGURE_4.6.dwg
2019-9-10 11:50am BY: jholmes

PHASES	DESIGN FLOW	PEAK FLOW	PROPOSED AEROBIC DIGESTERS	PROPOSED CENTRIFUGAL DEWATERING
EXISTING	14,500m^3/d	35,070m^3/d	3 DIGESTER TANKS AT 2,770m^3 EACH	2 CENTRIFUGES, EACH 140 Kg/HR
20 YEAR DESIGN	25,000m^3/d	64,000m^3/d	ADD 2 DIGESTER TANKS AT A TOTAL VOLUME OF 4,800m^3	NEW DEWATERING BUILDING WITH TWO NEW CENTRIFUGES, EACH 900 Kg/HR
ULTIMATE DESIGN	30,000m^3/d	77,000m^3/d	NO CHANGES NEEDED	NO CHANGES NEEDED



NOTES:

1. CENTRIFUGE TO INCLUDE SLUDGE FROM STONEY POINT WPCP.
2. DECOMMISSION EXISTING CENTRIFUGES WHEN NEW CENTRIFUGES ARE IN OPERATION.

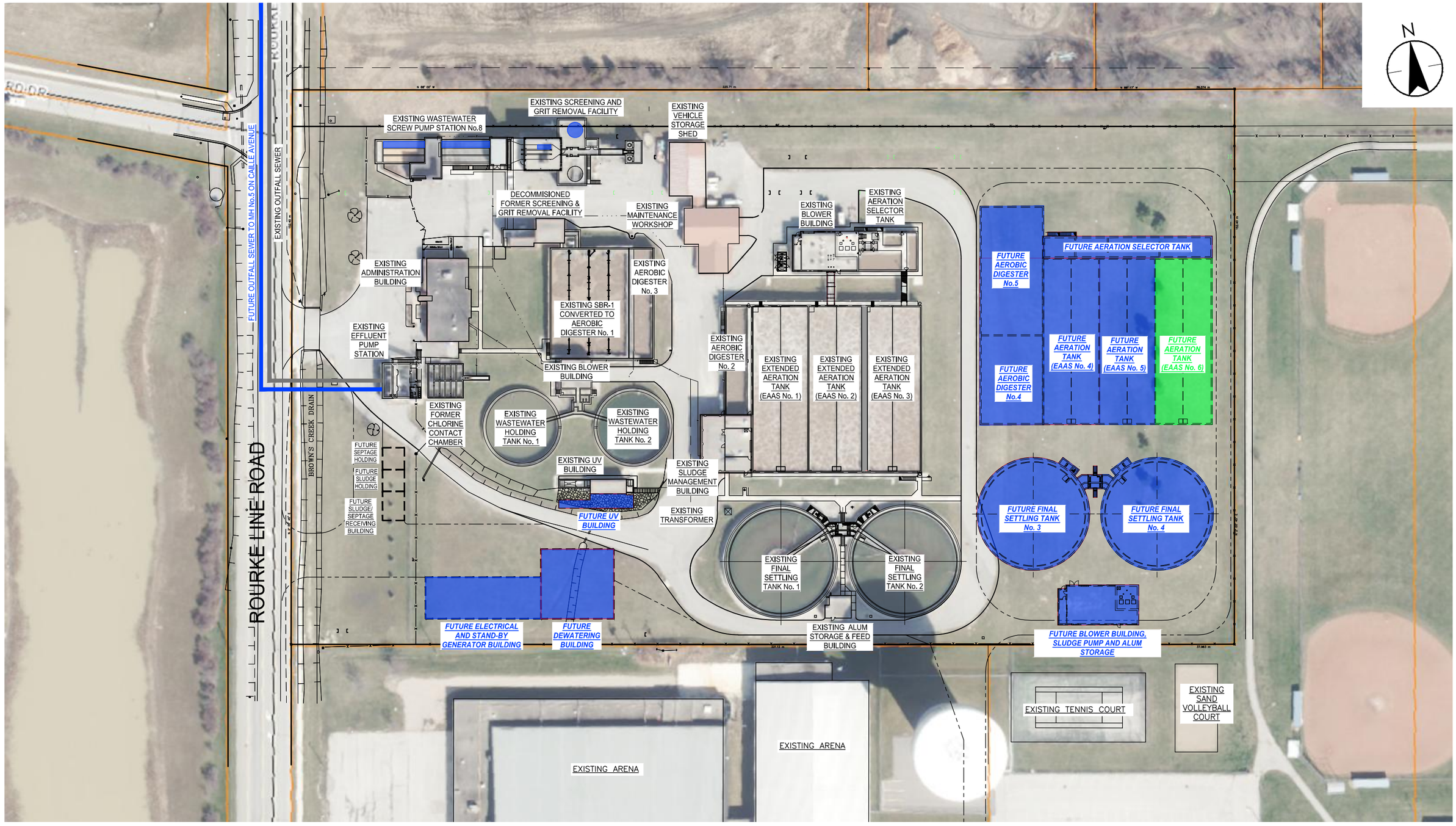
LEGEND

- EXISTING
- 20 YEAR DESIGN
- ULTIMATE DESIGN

TOWN OF LAKESHORE
DENIS ST. PIERRE WPCP EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

PHASED EXPANSION OF BIOSOLIDS MANAGEMENT

PROJECT NO. 165620173
DATE 2019.07.30
DRAWING NO. FIGURE 5.1



LEGEND

- EXISTING
- 20 YEAR DESIGN
- ULTIMATE DESIGN

Lakeshore

Stantec

TOWN OF LAKESHORE
DENIS ST. PIERRE WPCP EXPANSION
CLASS ENVIRONMENTAL ASSESSMENT

AERIAL PLAN OF PHASED PLANT EXPANSION

PROJECT NO. 165620173

DATE 2019.07.30

1:1000 (0, 10, 30, 50m)

DRAWING NO. FIGURE 8.1

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2019-9-04 03:23pm BY: qkha

APPENDIX B

- B-1 Environment Compliance Approval
- B-2 Water and Wastewater Master Plan (2008)
  - Executive Summary
- B-3 Water and Wastewater Master Plan Update (2017)
  - Executive Summary
- Appendix G of Essex Region Source Protection Plan
  - Map 4: Highly Vulnerable Aquifers
  - Map 5: Significant Groundwater Recharge Areas
  - Map 7: Lakeshore (Belle River) Water Treatment Plant IPZs and Vulnerability Scoring
- MTCS Checklists
  - Criteria for Evaluating Archaeological Potential
  - Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes

APPENDIX B-1

Environment Compliance Approval

Ontario
Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL
NUMBER 1087-B7FLRU
Issue Date: January 29, 2019

The Corporation of the Town of Lakeshore
419 Notre Dame St
Belle River, Ontario
N0R 1A0

Site Location: The Denis St. Pierre Water Pollution Control Plant
276 Rourke Line Rd Belle River
Town of Lakeshore, Ontario

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

re-rating, usage and operation of existing municipal sewage works, for the treatment of sanitary sewage and disposal of effluent to Lake St. Clair River via a Sewage Treatment Plant (the Denis St. Pierre Wastewater Treatment Plant) and Final Effluent disposal facilities as follows:

Classification of Collection System: Separate Sewer System

Classification of Sewage Treatment Plant: Secondary

Design Capacity of Sewage Treatment Plant

Design Capacity with All Treatment Trains in Operation	Prior to Completion of Re-Rating	Upon Completion of Re-Rating
Rated Capacity	13,640 m3/d	14,500 m3/d

Influent, Imported Sewage and Processed Organic Waste

Receiving Location	Types
In Collection System	Sanitary Sewage
At Sewage Treatment Plant	Holding Tank, Processed Organic Waste

Existing Works:

Sanitary Sewage Pumping Stations

Denis St. Pierre Sewage Pumping Station

- a two-stage screw pump station with two (2) screw pumps per stage each pump

having a rated capacity of 23,560 m^3/d, discharging via an elevated channel to the existing screening and grit removal facility;

Denis St. Pierre

Influent Sewers

- inlet sewers from the Maidstone sewage collection system discharging to Pumping Station No. 8 (on-site);
-
- elevated channel redirecting discharge from the existing Pumping Station No. 8 to the elevated inlet chamber of the screening and grit removal facility;
-
- two (2) 300 mm diameter forcemains from Belle River Pumping Station No. 2 to discharging to the elevated inlet chamber of the new screening and grit removal facility;

Emergency Storage Facilities - Wet Weather Overflow

- one (1) 900 m^3 capacity wastewater holding tank for wet weather overflows to be returned later to the inlet of the plant for treatment;
-
- one (1) additional 900 m^3 capacity wastewater holding tank converted from the existing sludge thickening tank for wet weather overflows to be returned later to the inlet of the plant for treatment;

Preliminary Treatment System

- Screening
  - one (1) screening channel equipped with a mechanically cleaned 6 mm fine screen with a peak flow rate of 67,855 m^3/d, complete with screw wash press
  -
  - one (1) screening channel equipped with a manually cleaned 12 mm spacing bar screen for emergency and maintenance bypass;

- Grit Removal
  - one (1) vortex type grit removal tank with a hydraulic peak flow rate of 67,855 m^3/d, complete with grit pump, grit blower, cyclone and classifier;
  -

Influent Flow Measurement and Sampling Point

- influent Parshall flume;
- automatic composite sampler in the headworks building;

Primary Treatment System

Primary Effluent Distribution

- a primary effluent distribution chamber with three compartments, one common receiving compartment for the screened and degritted effluent and two discharge compartments, one with piping to the aeration selector tank and one with only the drop portion of the piping and capped for future extension;
-

Secondary Treatment Systems

- **Aeration Selector Tank**

- an aeration selector tank with an inlet chamber and three aeration selection zones and an outlet chamber to distribute effluent to the three extended aeration tanks;
-
- one (1) mixer in the inlet chamber
-
- three (3) mixers and fine bubble diffusion systems in the aeration zones for operation in anoxic or aerated mode;
-

- Biological Treatment

- three (3) 15.0 m x 45.1 m x 4.23 m SWD extended aeration tanks converted from the existing sequencing batch reactors and upgraded with a longitudinal baffle wall to provide a plug flow pattern and retrofitted with fine bubble diffusion system;

- one (1) air blower for the aeration selector tank with a capacity of 232 L/s;

- four (4) air blowers for the extended aeration tanks (one standby), each with a capacity of 1,000 L/s;
- two (2) air blowers to supply the stage-one aerobic digester (one standby), each with a capacity of 645 L/s;
- six (6) existing air blowers to supply the stage-two aerobic digesters (two standby), four (4) with a capacity of 425 L/s each and two (2) with a capacity of 350 L/s each

- Secondary Sedimentation
  - two (2) 30.3 m diameter x 4.0 m SWD secondary clarifiers each equipped with sludge and scum collection mechanism;
  - three (3) return activated sludge pumps (one standby), each with a capacity of 13,640 m^3/d and equipped with VFD;
  - two (2) waste activated sludge pumps (one standby), each with a capacity of 1,728 m^3/d;
  - two (2) scum pumps (one installed and one shelf spare), each with a capacity of 5.0 L/s;

Supplementary Treatment Systems

- Phosphorus Removal
  - one (1) 46,000 L capacity chemical storage tank and two (2) chemical metering pumps (one standby) each having a capacity range of 20 - 108 L/h;

Disinfection System

- a UV disinfection system with a peak flow rate of 35,070 m^3/d comprising one (1) contact channel equipped with two (2) banks of UV lamps;

Final Effluent Flow Measurement and Sampling Point

- effluent Parshall flume following UV;
- automatic composite sampler at outlet of in UV disinfection channel;

Sludge Management System

- Sludge Thickening
  - one (1) sludge holding/thickening tank, equipped with coarse bubble diffuser system and two (2) sludge transfer pumps (one standby) for the centrifuges;
- Sludge Digestion

  Primary Digesters

  - a two-stage aerobic sludge digestion system comprising one (1) 935 m^3 stage-one digester and one (1) 810 m^3 stage-two digester, both equipped with coarse bubble diffuser system, sludge transfer pump, telescopic supernatant withdrawal valve;
  - one (1) 2,620 m^3 stage-one aerobic digester with additional jet aeration header;

- Digested Sludge Dewatering
  - two (2) centrifuges each with a solids loading rate of 140 kg/h and a hydraulic loading rate of 2.8 L/s;
  - a polymer system for dry/emulsion polymer, a 2,500 L mixing tank and metering pump with a capacity range of 0.08 - 0.58 L/s;

Final Effluent Disposal Facilities

- an effluent pumping station equipped with three (3) submersible pumps (one standby), each with a capacity of 35,070 m^3/d to discharge the effluent by pumping when necessary;
- approximately 1,350 m of 900 mm diameter outfall sewer with diffuser section discharging to Lake St. Clair;

including all other mechanical system, electrical system, instrumentation and control

system, standby power system, piping, pumps, valves and appurtenances essential for the proper, safe and reliable operation of the Works in accordance with this Approval, in the context of process performance and general principles of wastewater engineering only;

all in accordance with the submitted supporting documents listed in Schedule A.

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

1. "Annual Average Effluent Concentration" is the mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured during a calendar year, calculated and reported as per the methodology specified in Schedule F;

2. "Annual Average Daily Effluent Flow" means the cumulative total Final Effluent discharged during a calendar year divided by the number of days during which Final Effluent was discharged that year;

3. "Approval" means this environmental compliance approval and any schedules attached to it, and the application;

4. "BOD5" (also known as TBOD5) means five day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogenous oxygen demands;

5. "Bypass" means diversion of sewage around one or more treatment processes, excluding Preliminary Treatment System, within the Sewage Treatment Plant with the diverted sewage flows being returned to the Sewage Treatment Plant treatment train upstream of the Final Effluent sampling point(s) and discharged via the approved effluent disposal facilities;

6. "CBOD5" means five day carbonaceous (nitrification inhibited) biochemical oxygen demand measured in an unfiltered sample;

7. "Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;

8. "District Manager" means the District Manager of the appropriate local district office of the Ministry where the Works is geographically located;

9. "*E. coli*" refers to the thermally tolerant forms of Escherichia that can survive at 44.5 degrees Celsius;

10. "EPA" means the *Environmental Protection Act*, R.S.O. 1990, c.E.19, as amended;

11. "Equivalent Equipment" means alternate piece(s) of equipment that meets the design requirements and performance specifications of the piece(s) of equipment to be substituted;

12. "Event" means an action or occurrence, at a given location within the Works that causes a Bypass or Overflow. An Event ends when there is no recurrence of Bypass or Overflow in the 12-hour period following the last Bypass or Overflow. Overflows and Bypasses are separate Events even when they occur concurrently;

13. “Existing Works” means those portions of the Works included in the Approval that have been constructed previously;

14. "Final Effluent" means effluent that is discharged to the environment through the approved effluent disposal facilities, including all Bypasses, that are required to meet the compliance limits stipulated in the Approval for the Sewage Treatment Plant at the Final Effluent sampling point(s);

15. "Imported Sewage" means sewage hauled to the Sewage Treatment Plant by licensed waste management system operators of the types and quantities approved for co-treatment in the Sewage Treatment Plant, including hauled sewage and leachate within the meaning of R.R.O. 1990, Regulation 347: General – Waste Management, as amended;

16. "Influent" means flows to the Sewage Treatment Plant from the collection system;

17. "Limited Operational Flexibility” (LOF) means the conditions that the Owner shall follow in order to undertake any modification that is pre-authorized as part of this Approval;

18. "Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

19. "Monthly Average Effluent Concentration" is the mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured during a calendar month, calculated and reported as per the methodology specified in Schedule F; (use only if monthly averaging period is used in the effluent concentration requirement for a contaminant)

20. "Monthly Geometric Mean Density" is the mean of all Single Sample Results of *E.coli* measurement in the samples taken during a calendar month, calculated and

reported as per the methodology specified in Schedule F;

21. “Normal Operating Condition” means the condition when all unit process(es), excluding Preliminary Treatment System, in a treatment train is operating within its design capacity;

22. “Operating Agency” means the Owner or the entity that is authorized by the Owner for the management, operation, maintenance, or alteration of the Works in accordance with this Approval;

23. "Overflow" means a discharge to the environment from the Works at designed location(s) other than the approved effluent disposal facilities or via the effluent disposal facilities downstream of the Final Effluent sampling point;

24. "Owner" means the Corporation of the Town of Lakeshore and its successors and assignees;

25. "OWRA" means the *Ontario Water Resources Act*, R.S.O. 1990, c. O.40, as amended;

26. "Peak Daily Flow Rate" (also referred to as maximum daily flow or maximum day flow) means the largest volume of flow to be received during a one-day period for which the sewage treatment process unit or equipment is designed to handle;

27. “Preliminary Treatment System” means all facilities in the Sewage Treatment Plant associated with screening and grit removal;

28. “Primary Treatment System” means all facilities in the Sewage Treatment Plant associated with the primary sedimentation unit process and includes chemically enhanced primary treatment;

29. "Processed Organic Waste" means organic waste within the meaning of R.R.O. 1990, Regulation 347:General - Waste Management, as amended, that is hauled to the Sewage Treatment Plant of the types and quantities approved for co-processing in the sludge management system;

30. "Professional Engineer” means a person entitled to practice as a Professional Engineer in the Province of Ontario under a licence issued under the Professional Engineers Act;

31. "Rated Capacity" means the Annual Average Daily Influent Flow for which the Sewage Treatment Plant is designed to handle;

32. "Sanitary Sewers" means pipes that collect and convey wastewater from residential, commercial, institutional and industrial buildings, and some infiltration and inflow from extraneous sources such as groundwater and surface runoff through means other than stormwater catch basins;

33. “Separate Sewer Systems" means wastewater collection systems that comprised of Sanitary Sewers while runoff from precipitation and snowmelt are separately collected in Storm Sewers;

34. “Sewage Treatment Plant" means all the facilities related to sewage treatment within the sewage treatment plant site excluding the Final Effluent disposal facilities;

35. “Single Sample Result" means the test result of a parameter in the effluent discharged on any day, as measured by a probe, analyzer or in a composite or grab sample, as required;

36. "Storm Sewers" means pipes that collect and convey runoff resulting from precipitation and snowmelt (including infiltration and inflow);

37. "Works" means the approved sewage works, and includes Existing Works and modifications made under Limited Operational Flexibility.

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

TERMS AND CONDITIONS

1. **GENERAL PROVISIONS**

2. The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the terms and conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

3. The Owner shall design, construct, operate and maintain the Works in accordance with the conditions of this Approval.

4. Where there is a conflict between a provision of any document referred to in this Approval and the conditions of this Approval, the conditions in this Approval shall take precedence.

5. **CHANGE OF OWNER AND OPERATING AGENCY**

6. The Owner shall, within thirty (30) calendar days of issuance of this Approval, prepare/update and submit to the District Manager the Municipal and Local Services Board Wastewater System Profile Information Form, as amended (Schedule G) under any of the following situations:

a. the form has not been previously submitted for the Works;
b. this Approval is issued for extension, re-rating or process treatment upgrade of the Works;
c. when a notification is provided to the District Manager in compliance with requirements of change of Owner or Operating Agency under this condition.

7. The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within thirty (30) days of the change occurring:

a. change of address of Owner;
b. change of Owner, including address of new owner;
c. change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act, R.S.O. 1990, c. B.17*, as amended, shall be included in the notification;
d. change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the *Corporations Information Act, R.S.O. 1990, c. C.39*, as amended, shall be included in the notification.

8. The Owner shall notify the District Manager, in writing, of any of the following changes within thirty (30) days of the change occurring:

a. change of address of Operating Agency;
b. change of Operating Agency, including address of new Operating Agency.

9. In the event of any change in ownership of the Works, the Owner shall notify the succeeding owner in writing, of the existence of this Approval, and forward a copy of the notice to the District Manager.

10. The Owner shall ensure that all communications made pursuant to this condition refer to the environmental compliance approval number.

11. **RECORD DRAWINGS**

12. A set of record drawings of the Works shall be kept up to date through revisions undertaken from time to time and a copy shall be readily accessible for reference at the

Works.

13. **BYPASSES**

14. Any Bypass is prohibited, except:

a. an emergency Bypass when a structural, mechanical or electrical failure causes a temporary reduction in the capacity of a treatment process or when an unforeseen flow condition exceeds the design capacity of a treatment process that is likely to result in personal injury, loss of life, health hazard, basement flooding, severe property damage, equipment damage or treatment process upset, if a portion of the flow is not bypassed;

b. a planned Bypass that is a direct and unavoidable result of a planned repair and maintenance procedure or other circumstance(s), the Owner having notified the District Manager in writing at least fifteen (15) days prior to the occurrence of Bypass, including an estimated quantity and duration of the Bypass, an assessment of the impact on the quality of the Final Effluent and the mitigation measures if necessary, and the District Manager has given written consent of the Bypass;

15. Notwithstanding the exceptions given in Paragraph 1, the Operating Agency shall undertake everything practicable to maximize the flow through the downstream treatment process(es) prior to bypassing.

16. At the beginning of a Bypass Event, the Owner shall immediately notify the Spills Action Centre (SAC) and the local Medical Officer of Health. This notice shall include, at a minimum, the following information:

a. the type of the Bypass as indicated in Paragraph 1 and the reason(s) for the Bypass;

b. the date and time of the beginning of the Bypass;

c. the treatment process(es) gone through prior to the Bypass and the treatment process(es) bypassed;

d. the effort(s) done to maximize the flow through the downstream treatment process(es) and the reason(s) why the Bypass was not avoided.

17. Upon confirmation of the end of a Bypass Event, the Owner shall immediately notify the Spills Action Centre (SAC) and the local Medical Officer of Health. This notice shall include, at a minimum, the following information:

a. the date and time of the end of the Bypass;

b. the estimated or measured volume of Bypass.

18. For any Bypass Event, the Owner shall collect daily sample(s) of the Final Effluent, inclusive of the Event and analyze for all effluent parameters outlined in Compliance Limits condition, except for *E. coli* , toxicity to Rainbow Trout and Daphnia magna, total residual chlorine / bisulphite residual, dissolved oxygen, pH, temperature and unionized ammonia, following the same protocol specified in the Monitoring and Recording condition as for the regular samples. The sample(s) shall be in addition to the regular Final Effluent samples required under the monitoring and recording condition, except when the Event occurs on a scheduled monitoring day.

19. The Owner shall submit a summary report of the Bypass Event(s) to the District Manager on a quarterly basis, no later than each of the following dates for each calendar year: February 15, May 15, August 15, and November 15. The summary reports shall contain, at a minimum, the types of information set out in Paragraphs (3), (4) and (5) and either a statement of compliance or a summary of the non-compliance notifications submitted as required under Paragraph 1 of Condition 11. If there is no Bypass Event during a quarter, a statement of no occurrence of Bypass is deemed sufficient.

20. The Owner shall develop a notification procedure in consultation with the District Manager and SAC and notify the public and downstream water users that may be adversely impacted by any Bypass Event.

21. **OVERFLOWS**

22. Any Overflow is prohibited, except:

a. an emergency Overflow in an emergency situation when a structural, mechanical or electrical failure causes a temporary reduction in the capacity of the Works or when an unforeseen flow condition exceeds the design capacity of the Works that is likely to result in personal injury, loss of life, health hazard, basement flooding, severe property damage, equipment damage or treatment process upset, if a portion of the flow is not overflowed;

b. a planned Overflow that is a direct and unavoidable result of a planned repair and maintenance procedure or other circumstance(s), the Owner having notified the District Manager in writing at least fifteen (15) days prior to the occurrence of Overflow, including an estimated quantity and duration of the Overflow, an assessment of the impact on the environment and the mitigation measures if necessary, and the District Manager has given written consent of the Overflow;

23. Notwithstanding the exceptions given in Paragraph 1, the Operating Agency shall undertake everything practicable to maximize the flow through the downstream

treatment process(es) and Bypass(es) prior to overflowing.

24. At the beginning of an Overflow Event, the Owner shall immediately notify the Spills Action Centre (SAC) and the local Medical Officer of Health. This notice shall include, at a minimum, the following information:

a. the type of the Overflow as indicated in Paragraph 1 and the reason(s) for the Overflow;
b. the date and time of the beginning of the Overflow;
c. the point of the Overflow from the Works, the treatment process(es) gone through prior to the Overflow, the disinfection status of the Overflow and whether the Overflow is discharged through the effluent disposal facilities or an alternate location;
d. the effort(s) done to maximize the flow through the downstream treatment process(es) and Bypass(es) and the reason(s) why the Overflow was not avoided.

25. Upon confirmation of the end of an Overflow Event, the Owner shall immediately notify the Spills Action Centre (SAC) and the local Medical Officer of Health. This notice shall include, at a minimum, the following information:

a. the date and time of the end of the Overflow;
b. the estimated or measured volume of the Overflow.

26. For any Overflow Event

a. in the Sewage Treatment Plant, the Owner shall collect grab sample(s) of the Overflow, one near the beginning of the Event and one every eight (8) hours for the duration of the Event, and have them analyzed at least for CBOD5, total suspended solids, total phosphorus, total ammonia nitrogen, total Kjeldahl nitrogen, E. coli.except that raw sewage and primary treated effluent Overflow shall be analyzed for BOD5, total suspended solids, total phosphorus and total Kjeldahl nitrogen only.
b. at a sewage pumping station in the collection system, the Owner shall collect at least one (1) grab sample representative of the Overflow Event and have it analyzed for BOD5, total suspended solids, total phosphorus and total Kjeldahl nitrogen.

27. The Owner shall submit a summary report of the Overflow Event(s) to the District Manager on a quarterly basis, no later than each of the following dates for each calendar year: February 15, May 15, August 15, and November 15. The summary report shall contain, at a minimum, the types of information set out in Paragraphs (3), (4) and (5). If there is no Overflow Event during a quarter, a statement of no occurrence of Overflow is deemed sufficient.

28. The Owner shall develop a notification procedure in consultation with the District Manager and SAC and notify the public and downstream water users that may be adversely impacted by any Overflow Event.

29. **DESIGN OBJECTIVES**

30. The Owner shall design and undertake everything practicable to operate the Sewage Treatment Plant in accordance with the following objectives:

a. Final Effluent parameters design objectives listed in the table(s) included in Schedule B.
b. Final Effluent is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film or sheen or foam or discolouration on the receiving waters.
c. Annual Average Daily Influent Flow is within the Rated Capacity of the Sewage Treatment Plant.

31. **COMPLIANCE LIMITS**

1. The Owner shall operate and maintain the Sewage Treatment Plant such that compliance limits for the Final Effluent parameters listed in the table(s) included in Schedule C are met.

2. The Owner shall operate and maintain the Sewage Treatment Plant such that the Final Effluent is disinfected continuously year-round.

32.

OPERATION AND MAINTENANCE

1. The Owner shall ensure that, at all times, the Works and the related equipment and appurtenances used to achieve compliance with this Approval are properly operated and maintained. Proper operation and maintenance shall include effective performance, adequate funding, adequate staffing and training, including training in all procedures and other requirements of this Approval and the OWRA and regulations, adequate laboratory facilities, process controls and alarms and the use of process chemicals and other substances used in the Works.

2. The Owner shall update the operations manual for the Works within six (6) months of completion of the plant re-rating, that includes, but not necessarily limited to, the following information:

a. operating procedures for the Works under Normal Operating Conditions;

b. inspection programs, including frequency of inspection, for the Works and the methods or tests employed to detect when maintenance is necessary;

c. repair and maintenance programs, including the frequency of repair and maintenance for the Works;

d. procedures for the inspection and calibration of monitoring equipment;

e. operating procedures for the Works to handle situations outside Normal Operating Conditions and emergency situations such as a structural, mechanical or electrical failure, or an unforeseen flow condition, including procedures to minimize Bypasses and Overflows;

f. a spill prevention and contingency plan, consisting of procedures and contingency plans, including notification to the District Manager, to reduce the risk of spills of pollutants and prevent, eliminate or ameliorate any adverse effects that result or may result from spills of pollutants;

g. procedures for receiving, responding and recording public complaints, including recording any followup actions taken.

3. The Owner shall maintain the operations manual up-to-date and make the manual readily accessible for reference at the Works.

4. The Owner shall ensure that the Operating Agency fulfills the requirements under O. Reg. 129/04, as amended for the Works, including the classification of facilities, licensing of operators and operating standards.

33. **MONITORING AND RECORDING**

34. The Owner shall, upon commencement of operation of the Works, carry out a scheduled monitoring program of collecting samples at the required sampling points, at the frequency specified or higher, by means of the specified sample type and analyzed for each parameter listed in the tables under the monitoring program included in Schedule D and record all results, as follows:

a. all samples and measurements are to be taken at a time and in a location characteristic of the quality and quantity of the sewage stream over the time period being monitored.

b. a schedule of the day of the week/month for the scheduled sampling shall be created. The sampling schedule shall be revised and updated every year through rotation of the day of the week/month for the scheduled sampling program, except when the actual scheduled monitoring frequency is three (3) or more times per week.

c. definitions and preparation requirements for each sample type are included in document referenced in Paragraph 3.b.

d. definitions for frequency:
    i. Weekly means once every week; and
    ii. Monthly means once every month;

35. In addition to the scheduled monitoring program required in Paragraph 1, the Owner shall collect daily sample(s) of the Final Effluent, on any day when there is any situation outside Normal Operating Conditions, by means of the specified sample type and analyzed for each parameter listed in the tables under the monitoring program included in Schedule D, except for *E. coli* , toxicity to Rainbow Trout and Daphnia magna, total residual chlorine / bisulphite residual, dissolved oxygen, pH, temperature and unionized ammonia.

36. The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following documents and all analysis shall be conducted by a laboratory accredited to the ISO/IEC:17025 standard or as directed by the District Manager:

a. the Ministry's Procedure F-10-1, “Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only), as amended;

b. the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater Version 2.0" (January 2016), PIBS 2724e02, as amended;

c. the publication "Standard Methods for the Examination of Water and Wastewater", as amended.

37. The Owner shall monitor and record the flow rate and daily quantity using flow measuring devices or other methods of measurement as approved below calibrated to an accuracy within plus or minus 15 per cent (+/- 15%) of the actual flowrate of the following:

a. Influent flow to the Sewage Treatment Plant by continuous flow measuring devices and instrumentations/pumping rates/details of other methods (e.g. top water elevation of lagoons), or in lieu of an actual installation of equipment, adopt the flow measurements of the Final Effluent for the purpose of estimating Influent flows if the Influent and Final Effluent streams are considered not significantly different in flow rates and quantities;

b. Final Effluent discharged from the Sewage Treatment Plant by continuous flow

measuring devices and instrumentations/pumping rates/details of other methods (e.g. level of lagoons), or in lieu of an actual installation of equipment, adopt the flow measurements of the Influent for the purpose of estimating Final Effluent flows if the Influent and Final Effluent streams are considered not significantly different in flow rates and quantities;

c. each type of Imported Sewage received from co-treatment at the Sewage Treatment Plant by flow measuring devices/pumping rates/haul manifests;

d. Processed Organic Waste received for co-processing at the Sewage Treatment Plant by flow measuring devices/pumping rates/haul truck manifests;

38. The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the monitoring activities required by this Approval.

39.

LIMITED OPERATIONAL FLEXIBILITY

1. The Owner may make pre-authorized modifications to the sewage pumping stations and Sewage Treatment Plant in Works in accordance with the document “Limited Operational Flexibility - Protocol for Pre-Authorized Modifications to Municipal Sewage Works” (Schedule E), as amended, subject to the following:

a. the modifications will not involve the addition of any new treatment process or the removal of an existing treatment process, including chemical systems, from the liquid or solids treatment trains as originally designed and approved.

b. the scope and technical aspects of the modifications are in line with those delineated in Schedule E and conform with the Ministry’s publication “Design Guidelines for Sewage Works 2008”, as amended, Ministry’s regulations, policies, guidelines, and industry engineering standards;

c. the modifications shall not negatively impact on the performance of any process or equipment in the Works or result in deterioration in the Final Effluent quality;

d. where the pre-authorized modification requires notification, a "Notice of Modifications to Sewage Works" (Schedule E), as amended shall be completed with declarations from a Professional Engineer and the Owner and retained on-site prior to the scheduled implementation date. All supporting information including technical memorandum, engineering plans and specifications, as applicable and appropriate to support the declarations that the modifications conform with LOF shall remain on-site for future inspection.

2. The following modifications are not pre-authorized under Limited Operational

Flexibility:

a. Modifications that involve addition or extension of process structures, tankages or channels;
b. Modifications that involve relocation of the Final Effluent outfall or any other discharge location or that may require reassessment of the impact to the receiver or environment;
c. Modifications that involve addition of or change in technology of a treatment process or that may involve reassessment of the treatment train process design;
d. Modifications that require changes to be made to the emergency response, spill prevention and contingency plan; or
e. Modifications that are required pursuant to an order issued by the Ministry.

40. **REPORTING**

1. The Owner shall report to the District Manager orally as soon as possible any non-compliance with the compliance limits, and in writing within seven (7) days of non-compliance.

2. The Owner shall, within fifteen (15) days of occurrence of a spill within the meaning of Part X of the EPA, submit a full written report of the occurrence to the District Manager describing the cause and discovery of the spill, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation, in addition to fulfilling the requirements under the EPA and O. Reg. 675/98 "Classification and Exemption of Spills and Reporting of Discharges".

3. The Owner shall, upon request, make all manuals, plans, records, data, procedures and supporting documentation available to Ministry staff.

4. The Owner shall prepare performance reports on a calendar year basis and submit to the District Manager by March 31 of the calendar year following the period being reported upon. The reports shall contain, but shall not be limited to, the following information pertaining to the reporting period:

a. a summary and interpretation of all Influent, Imported Sewage and Processed Organic Waste monitoring data, and a review of the historical trend of the sewage characteristics and flow rates;
b. a summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in this Approval, including an overview of the success and adequacy of the Works;

c. a summary of any deviation from the monitoring schedule and reasons for the current reporting year and a schedule for the next reporting year;

d. a summary of all operating issues encountered and corrective actions taken;

e. a summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;

f. a summary of any effluent quality assurance or control measures undertaken;

g. a summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer;

h. a summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for pro-active actions if any are required under the following situations:
    i. when any of the design objectives is not achieved more than 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality;
    ii. when the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity;

i. a tabulation of the volume of sludge generated, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed;

j. a summary of any complaints received and any steps taken to address the complaints;

k. a summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events;

l. a summary of all Notice of Modifications to Sewage Works completed under Paragraph 1.d. of Condition 10, including a report on status of implementation of all modification.

m. a summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the year following that for which the report is submitted.

n.

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

1. Condition 1 regarding general provisions is imposed to ensure that the Works are constructed and operated in the manner in which they were described and upon which approval was granted.

2. Condition 2 regarding change of Owner and Operating Agency is included to ensure that the Ministry records are kept accurate and current with respect to ownership and Operating Agency of the Works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

3. Condition 3 regarding record drawings is included to ensure that the Works are constructed in accordance with the Approval and that record drawings of the Works "as constructed" are updated and maintained for future references.

4. Condition 4 regarding Bypasses is included to indicate that Bypass is prohibited, except in circumstances where the failure to Bypass could result in greater damage to the environment than the Bypass itself. The notification and documentation requirements allow the Ministry to take action in an informed manner and will ensure the Owner is aware of the extent and frequency of Bypass Events.

5. Condition 5 regarding Overflows is included to indicate that Overflow of untreated or partially treated sewage to the receiver is prohibited, except in circumstances where the failure to Overflow could result in greater damage to the environment than the Overflow itself. The notification and documentation requirements allow the Ministry to take action in an informed manner and will ensure the Owner is aware of the extent and frequency of Overflow Events.

6. Condition 6 regarding design objectives is imposed to establish non-enforceable design objectives to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs.

7. Condition 7 regarding compliance limits is imposed to ensure that the Final Effluent discharged from the Works to the environment meets the Ministry's effluent quality requirements.

8. Condition 8 regarding operation and maintenance is included to require that the Works be properly operated, maintained, funded, staffed and equipped such that the environment is protected and deterioration, loss, injury or damage to any person or property is prevented. As well, the inclusion of a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the Owner. Such a manual is an integral part of

the operation of the Works. Its compilation and use should assist the Owner in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act as a benchmark for Ministry staff when reviewing the Owner's operation of the Works.

9. Condition 9 regarding monitoring and recording is included to enable the Owner to evaluate and demonstrate the performance of the Works, on a continual basis, so that the Works are properly operated and maintained at a level which is consistent with the design objectives and compliance limits.

10. Condition 10 regarding Limited Operational Flexibility is included to ensure that the Works are constructed, maintained and operated in accordance with the Approval, and that any pre-approved modification will not negatively impact on the performance of the Works.

11. Condition 11 regarding reporting is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, and to provide a compliance record for this Approval.

Schedule A

1. Application for Environmental Compliance Approval submitted by Mr Mike Newbigging, P.Eng. of Jacobs received on September 4, 2018 for the proposed rerating of the Denis St Pierre WPCP, including design report, final plans and specifications.

Schedule B

Final Effluent Design Objectives

Concentration Objectives prior to rerating the Works

Final Effluent Parameter	**Averaging Calculator**	**Objective (milligrams per litre unless otherwise indicated)**
CBOD5	Monthly Average Effluent Concentration	10.0 mg/L
Total Suspended Solids	Monthly Average Effluent Concentration	10.0 mg/L
Total Phosphorus	Monthly Average Effluent Concentration	0.8 mg/L
Total Ammonia Nitrogen	Monthly Average Effluent Concentration	1.0 mg/L (May 1 to Nov 30) 2.0 mg/L (Dec 1 to April 30)
E. coli	Monthly Geometric Mean Density	*150 CFU/100 mL

pH	Single Sample Result	6.5 - 8.5 inclusive

*If the MPN method is utilized for *E.coli* analysis the objective shall be 150 MPN/100 mL

Concentration Objectives after rerating the Works

Final Effluent Parameter	Averaging Calculator	Objective
CBOD5	Monthly Average Effluent Concentration	10.0 mg/L
Total Suspended Solids	Monthly Average Effluent Concentration	10.0 mg/L
Total Phosphorus	Monthly Average Effluent Concentration	0.5 mg/L
Total Ammonia Nitrogen	Monthly Average Effluent Concentration	1.0 mg/L (May 1 to Nov 30) 2.0 mg/L (Dec 1 to April 30)
E. coli	Monthly Geometric Mean Density	*150 CFU/100 mL
pH	Single Sample Result	6.5 - 8.5 inclusive

*If the MPN method is utilized for *E.coli* analysis the objective shall be 150 MPN/100 mL

Schedule C

Final Effluent Compliance Limits

Concentration Limits prior to rerating the Works

Final Effluent Parameter	Averaging Calculator	Limit (maximum unless otherwise indicated)
CBOD5	Monthly Average Effluent Concentration	15.0 mg/L
Total Suspended Solids	Monthly Average Effluent Concentration	15.0 mg/L
Total Phosphorus	Monthly Average Effluent Concentration	1.0 mg/L
Total Ammonia Nitrogen	Monthly Average Effluent Concentration	1.5 mg/L (May 1 - Nov 30) 3.0 mg/L (Dec 1 - April 30)
E. coli	Monthly Geometric Mean Density	*200 CFU/100 mL

*If the MPN method is utilized for *E.coli* analysis the limit shall be 200 MPN/100 mL

Concentration Limits after rerating the Works

Final Effluent Parameter	Averaging Calculator	Limit (maximum unless otherwise indicated)

CBOD5	Monthly Average Effluent Concentration	14.0 mg/L
Total Suspended Solids	Monthly Average Effluent Concentration	14.0 mg/L
Total Phosphorus	Monthly Average Effluent Concentration	0.8 mg/L
Total Ammonia Nitrogen	Monthly Average Effluent Concentration	1.4 mg/L (May 1- Nov 30) 2.8 mg/L (Dec 1 - April 30)
E. coli	Monthly Geometric Mean Density	*200 CFU/100 mL
pH	Single Sample Result	between 6.0 - 9.5 inclusive

*If the MPN method is utilized for *E.coli* analysis the limit shall be 200 MPN/100 mL

Loading Limits prior to rerating the Works

Final Effluent Parameter	**Averaging Calculator**	**Limit (maximum unless otherwise indicated)**
CBOD5	Monthly Average Daily Effluent Loading	204.6 kg/d
Total Suspended Solids	Monthly Average Daily Effluent Loading	204.6 kg/d
Total Phosphorus	Monthly Average Daily Effluent Loading	13.6 kg/d
Total Ammonia Nitrogen	Monthly Average Daily Effluent Loading	20.5 kg/d (May 1 - Nov 30) 40.9 kg/d (Dec 1 - Apr 30)

Loading Limits after rerating the Works

Final Effluent Parameter	**Averaging Calculator**	**Limit (maximum unless otherwise indicated)**
CBOD5	Monthly Average Daily Effluent Loading	203.0 kg/d
Total Suspended Solids	Monthly Average Daily Effluent Loading	203.0 kg/d
Total Phosphorus	Monthly Average Daily Effluent Loading	11.6 kg/d
Total Ammonia Nitrogen	Monthly Average Daily Effluent Loading	20.3 kg/d (May 1- Nov 30) 40.6 kg/d (Dec 1- Apr 30)

Schedule D

Monitoring Program

Influent - Influent sampling point

Parameters	Sample Type	Minimum Frequency
BOD5	24 hour composite	Monthly
Total Suspended Solids	24 hour composite	Monthly
Total Phosphorus	24 hour composite	Monthly
Total Kjeldahl Nitrogen	24 hour composite	Monthly

Imported Sewage - Sampled from hauled sewage truck

Parameters	Sample Type	Minimum Frequency
BOD5	Grab	Monthly
Total Suspended Solids	Grab	Monthly
Total Phosphorus	Grab	Monthly
Total Kjeldahl Nitrogen	Grab	Monthly

Final Effluent - Final Effluent sampling point

Parameters	Sample Type	Minimum Frequency
CBOD5	24 hour composite	Weekly
Total Suspended Solids	24 hour composite	Weekly
Total Phosphorus	24 hour composite	Weekly
Total Ammonia Nitrogen	24 hour composite	Weekly
E. coli	Grab	Weekly
pH*	Grab/Probe/Analyzer	Weekly
Temperature*	Grab/Probe/Analyzer	Weekly

*pH and temperature of the Final Effluent shall be determined in the field at the time of sampling for Total Ammonia Nitrogen.

**The concentration of un-ionized ammonia shall be calculated using the total ammonia concentration, pH and temperature using the methodology stipulated in "Ontario's Provincial Water Quality Objectives" dated July 1994, as amended.

Sludge/Biosolids – holding tank/truck loading bay

Parameters	Sample Type	Minimum Frequency
Total Solids	Grab	Quarterly
Total Phosphorus	Grab	Quarterly
Total Ammonia Nitrogen	Grab	Quarterly
Nitrate as Nitrogen	Grab	Quarterly
Metal Scan - Arsenic - Cadmium	Grab	Quarterly

- Cobalt - Chromium - Copper - Lead - Mercury - Molybdenum - Nickel - Potassium - Selenium - Zinc		

Schedule E

Limited Operational Flexibility

Protocol for Pre-Authorized Modifications to Municipal Sewage Works

1. **General**

2. Pre-authorized modifications are permitted only where Limited Operational Flexibility has already been granted in the Approval and only permitted to be made at the pumping stations and sewage treatment plant in the Works, subject to the conditions of the Approval.

3. Where there is a conflict between the types and scope of pre-authorized modifications listed in this document, and the Approval where Limited Operational Flexibility has been granted, the Approval shall take precedence.

4. The Owner shall consult the District Manager on any proposed modifications that may fall within the scope and intention of the Limited Operational Flexibility but is not listed explicitly or included as an example in this document.

5. The Owner shall ensure that any pre-authorized modifications will not:

f. adversely affect the hydraulic profile of the Sewage Treatment Plant or the performance of any upstream or downstream processes, both in terms of hydraulics and treatment performance;

g. result in new Overflow or Bypass locations, or any potential increase in frequency or quantity of Overflow(s) or Bypass(es).

h. result in a reduction in the required Peak Flow Rate of the treatment process or

equipment as originally designed.

9. **Modifications that do not require pre-authorization:**

10. Sewage works that are exempt from Ministry approval requirements;

11. Modifications to the electrical system, instrumentation and control system.

12. **Pre-authorized modifications that do not require preparation of "Notice of Modification to Sewage Works"**

13. Normal or emergency maintenance activities, such as repairs, renovations, refurbishments and replacements with Equivalent Equipment, or other improvements to an existing approved piece of equipment of a treatment process do not require pre-authorization. Examples of these activities are:

a. Repairing a piece of equipment and putting it back into operation, including replacement of minor components such as belts, gear boxes, seals, bearings;

b. Repairing a piece of equipment by replacing a major component of the equipment such as motor, with the same make and model or another with the same or very close power rating but the capacity of the pump or blower will still be essentially the same as originally designed and approved;

c. Replacing the entire piece of equipment with Equivalent Equipment.

14. Improvements to equipment efficiency or treatment process control do not require pre-authorization. Examples of these activities are:

a. Adding variable frequency drive to pumps;

b. Adding on-line analyzer, dissolved oxygen probe, ORP probe, flow measurement or other process control device.

15. **Pre-Authorized Modifications that require preparation of "Notice of Modification to Sewage Works"**

16. Pumping Stations

q. Replacement, realignment of existing sewers including manholes, valves, gates, weirs and associated appurtenances provided that the modifications will not add new influent source(s) or result in an increase in flow from existing sources as originally approved.

r. Extension or partition of wetwell to increase retention time for emergency response and improve station maintenance and pump operation;

s. Replacement or installation of inlet screens to the wetwell;

t. Replacement or installation of flowmeters, construction of station bypass;

u. Replacement, reconfiguration or addition of pumps and modifications to pump suctions and discharge pipings including valve, gates, motors, variable frequency drives and associated appurtenances to maintain firm pumping capacity or modulate the pump rate provided that the modifications will not result in a reduction in the firm pumping capacity or discharge head or an increase in the peak pumping rate of the pumping station as originally designed;

v. Replacement, realignment of existing forcemain(s) including valves, gates, and associated appurtenances provided that the modifications will not reduce the flow capacity or increase the total dynamic head and transient in the forcemain.

23. Sewage Treatment Plant

24. Sewers and appurtenances

a. Replacement, realignment of existing sewers (including pipes and channels) or construction of new sewers, including manholes, valves, gates, weirs and associated appurtenances within the a sewage treatment plant, provided that the modifications will not add new influent source(s) or result in an increase in flow from existing sources as originally approved and that the modifications will remove hydraulic bottlenecks or improve the conveyance of sewage into and through the Works.

25. Flow Distribution Chambers/Splitters

a. Replacement or modification of existing flow distribution chamber/splitters or construction of new flow distribution chamber/splitters, including replacements or installation of sluice gates, weirs, valves for distribution of flows to the downstream process trains, provided that the modifications will not result in a change in flow distribution ratio to the downstream process trains as originally designed.

26. Imported Sewage Receiving Facility

a. Replacement, relocation or installation of loading bays, connect/disconnect hook-up systems and unloading/transferring systems;

b. Replacement, relocation or installation of screens, grit removal units and compactors;
c. Replacement, relocation or installation of pumps, such as dosing pumps and transfer pumps, valves, piping and appurtenances;
d. Replacement, relocation or installation of storage tanks/chambers and spill containment systems;
e. Replacement, relocation or installation of flow measurement and sampling equipment;
f. Changes to the source(s) or quantity from each source, provided that changes will not result in an increase in the total quantity and waste loading of each type of Imported Sewage already approved for co-treatment.

27. Preliminary Treatment System

a. Replacement of existing screens and grit removal units with equipment of the same or higher process performance technology, including where necessary replacement or upgrading of existing screenings dewatering washing compactors, hydrocyclones, grit classifiers, grit pumps, air blowers conveyor system, disposal bins and other ancillary equipment to the screening and grit removal processes.
b. Replacement or installation of channel aeration systems, including air blowers, air supply main, air headers, air laterals, air distribution grids and diffusers.

28. Primary Treatment System

a. Replacement of existing sludge removal mechanism, including sludge chamber;
b. Replacement or installation of scum removal mechanism, including scum chamber;
c. Replacement or installation of primary sludge pumps, scum pumps, provided that:the modifications will not result in a reduction in the firm pumping capacity or discharge head that the primary sludge pump(s) and scum pump(s) are originally designed to handle.

29. Secondary Treatment System

1. Biological Treatment
    a. Conversion of complete mix aeration tank to plug-flow multi-pass aeration tank, including modifications to internal structural configuration;
    b. Addition of inlet gates in multi-pass aeration tank for step-feed operation mode;

c. Partitioning of an anoxic/flip zone in the inlet of the aeration tank, including installation of submersible mixer(s);

d. Replacement of aeration system including air blowers, air supply main, air headers, air laterals, air distribution grids and diffusers, provided that the modifications will not result in a reduction in the firm capacity or discharge pressure that the blowers are originally designed to supply or in the net oxygen transferred to the wastewater required for biological treatment as originally required.

2. Secondary Sedimentation
   a. Replacement of sludge removal mechanism, including sludge chamber;
   b. Replacement or installation of scum removal mechanism, including scum chamber;
   c. Replacement or installation of return activated sludge pump(s), waste activated sludge pump(s), scum pump(s), provided that the modifications will not result in a reduction in the firm pumping capacity or discharge head that the activated sludge pump(s) and scum pump(s) are originally designed to handle.

30. Post-Secondary Treatment System

a. Replacement of filtration system with equipment of the same filtration technology, including feed pumps, backwash pumps, filter reject pumps, filtrate extract pumps, holding tanks associated with the pumping system, provided that the modifications will not result in a reduction in the capacity of the filtration system as originally designed.

31. Disinfection System

1. UV Irradiation
   a. Replacement of UV irradiation system, provided that the modifications will not result in a reduction in the design capacity of the disinfection system or the radiation level as originally designed.

2. Chlorination/Dechlorination and Ozonation Systems
   a. Extension and reconfiguration of contact tank to increase retention time for effective disinfection and reduce dead zones and minimize short-circuiting;
   b. Replacement or installation of chemical storage tanks, provided that the tanks are provided with effective spill containment.

32. Supplementary Treatment Systems

1. Chemical systems
    a. Replacement, relocation or installation of chemical storage tanks for existing chemical systems only, provided that the tanks are sited with effective spill containment;
    b. Replacement or installation of chemical dosing pumps provided that the modifications will not result in a reduction in the firm capacity that the dosing pumps are originally designed to handle.
    c. Relocation and addition of chemical dosing point(s) including chemical feed pipes and valves and controls, to improve phosphorus removal efficiency;
    d. Use of an alternate chemical provided that it is a non-proprietary product and is a commonly used alternative to the chemical approved in the Works, provided that the chemical storage tanks, chemical dosing pumps, feed pipes and controls are also upgraded, as necessary..

33. Sludge Management System

1. Sludge Holding and Thickening
    a. Replacement or installation of sludge holding tanks, sludge handling pumps, such as transfer pumps, feed pumps, recirculation pumps, provided that modifications will not result in reduction in the solids storage or handling capacities;

2. Sludge Digestion
    a. Replacement or installation of digesters, sludge handling pumps, such as transfer pumps, feed pumps, recirculation pumps, provided that modifications will not result in reduction in the solids storage or handling capacities;
    b. replacement of sludge digester covers.

3. Sludge Dewatering and Disposal
    a. Replacement of sludge dewatering equipment, sludge handling pumps, such as transfer pumps, feed pumps, cake pumps, loading pumps, provided that modifications will not result in reduction in solids storage or handling capacities.

4. Processed Organic Waste
    a. Changes to the source(s) or quantity from each source, provided that changes will not result in an increase in the total quantity already approved for co-processing.

34. Standby Power System

1. Replacement or installation of standby power system, including feed from alternate power grid, emergency power generator, fuel supply and storage systems, provided that the existing standby power generation capacity is not reduced.

35. Pilot Study

1. Small side-stream pilot study for existing or new technologies, alternative treatment process or chemical, provided:
    a. all effluent from the pilot system is hauled off-site for proper disposal or returned back to the sewage treatment plant for at a point no further than immediately downstream of the location from where the side-stream is drawn;
    b. no proprietary treatment process or propriety chemical is involved in the pilot study;
    c. the effluent from the pilot system returned to the sewage treatment plant does not significantly alter the composition/concentration of or add any new contaminant/inhibiting substances to the sewage to be treated in the downstream process;
    d. the pilot study will not have any negative impacts on the operation of the sewage treatment plant or cause a deterioration of effluent quality;
    e. the pilot study does not exceed a maximum of two years and a notification of completion shall be submitted to the District Manager within one month of completion of the pilot project.

36. Lagoons

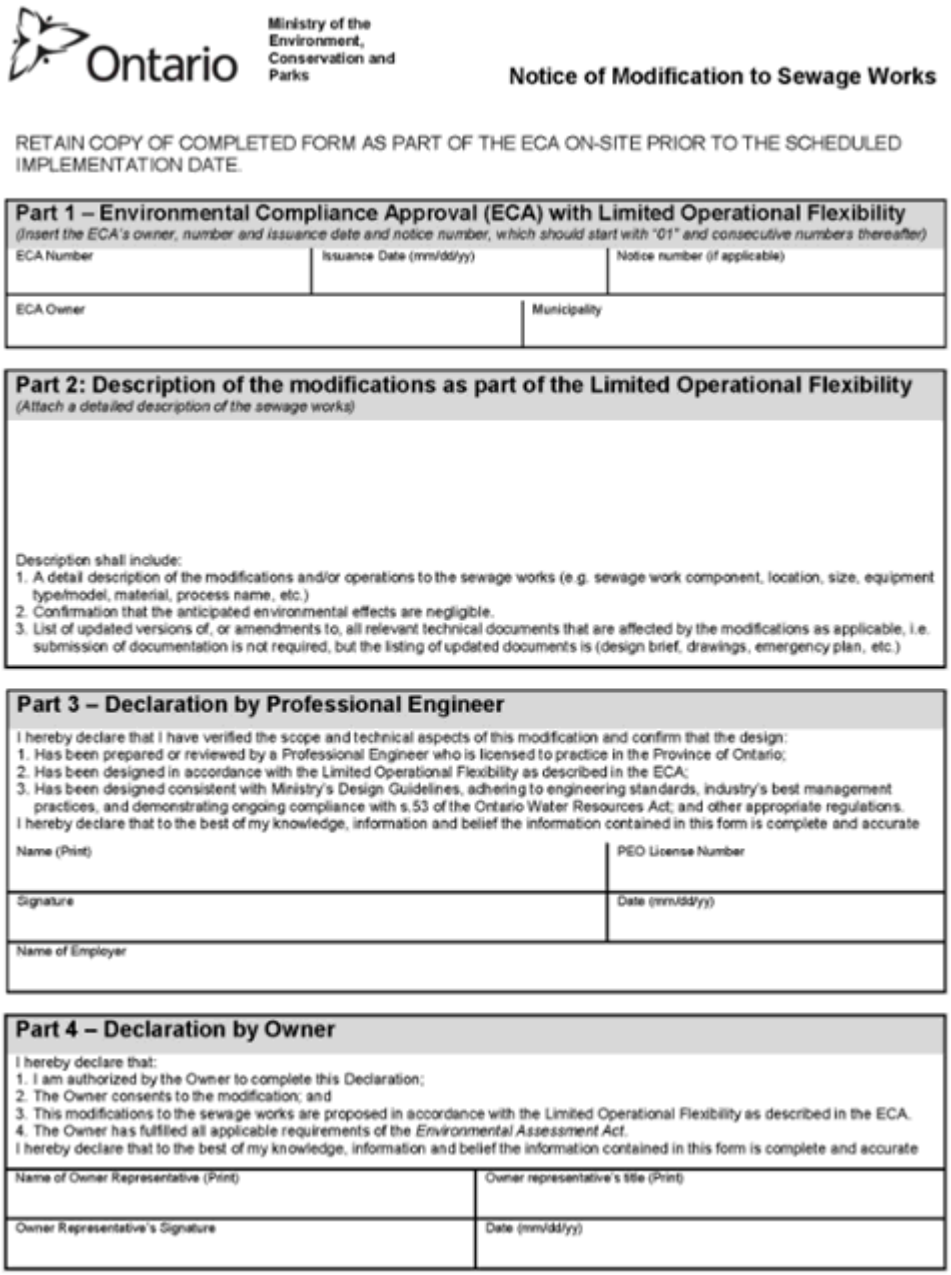
a. installing baffles in lagoon provided that the operating capacity of the lagoon system is not reduced;
b. raise top elevation of lagoon berms to increase free-board;
c. replace or install interconnecting pipes and chambers between cells, provided that the process design operating sequence is not changed;
d. replace or install mechanical aerators, or replace mechanical aerators with diffused aeration system provided that the mixing and aeration capacity are not reduced;
e. removal of accumulated sludge and disposal to an approved location offsite.

37. Final Effluent Disposal Facilities

al. Replacement or realignment of the Final Effluent channel, sewer or forcemain,

including manholes, valves and appurtenances from the end of the treatment train to the discharge outfall section, provided that the sewer conveys only effluent discharged from the Sewage Treatment Plant and that the replacement or re-aligned sewer has similar dimensions and performance criteria and is in the same or approximately the same location and that the hydraulic capacity will not be reduced.

This page contains an image of the form entitled "Notice of Modification to Sewage Works". A digital copy can be obtained from the District Manager.



Ontario

Ministry of the Environment, Conservation and Parks

Notice of Modification to Sewage Works

RETAIN COPY OF COMPLETED FORM AS PART OF THE ECA ON-SITE PRIOR TO THE SCHEDULED IMPLEMENTATION DATE.

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

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

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

ECA Owner	Municipality

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

(Attach a detailed description of the sewage works)

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

Part 3 – Declaration by Professional Engineer

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

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

Name (Print)	PEO License Number

Signature	Date (mm/dd/yy)

Name of Employer

Part 4 – Declaration by Owner

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

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

Name of Owner Representative (Print)	Owner representative's title (Print)

Owner Representative's Signature	Date (mm/dd/yy)

Schedule F

Methodology for Calculating and Reporting

Monthly Average Effluent Concentration, Annual Average

Effluent Concentration and Monthly Geometric Mean Density

1. Monthly Average Effluent Concentration

Step 1: Calculate the arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured during a calendar month and proceed as follows depending on the result of the calculation:

a. If the arithmetic mean does not exceed the compliance limit for the contaminant, then report and use this arithmetic mean as the Monthly Average Effluent Concentration for this parameter where applicable in this Approval;

b. If the arithmetic mean exceeds the compliance limit for the contaminant and there was no Bypass Event during the calendar month, then report and use this arithmetic mean as the Monthly Average Effluent Concentration for this parameter where applicable in this Approval;

c. If the arithmetic mean exceeds the compliance limit for the contaminant and there was Bypass Event(s) during the calendar month, then proceed to Step 2;

d. If the arithmetic mean does not exceed the compliance limit for the contaminant and there was Bypass Event(s) during the calendar month, the Owner may still elect to proceed to Step 2 calculation of the flow-weighted arithmetic mean.

Step 2: Calculate the flow-weighted arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured during a calendar month and proceed depending on the result of the calculation:

a. Group No Bypass Days (**NBPD**) data and Bypass Days (**BPD**) data during a calendar month separately;

b. Calculate the arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured on all NBPD during a calendar month and record it as **Monthly Average NBPD Effluent Concentration**;

c. Obtain the "**Total Monthly NBPD Flow**" which is the total amount of Final Effluent discharged on all NBPD during the calendar month;

d. Calculate the arithmetic mean of all Single Sample Results of the

concentration of a contaminant in the Final Effluent sampled or measured on all BPD during a calendar month and record it as **Monthly Average BPD Effluent Concentration**;

e. Obtain the "**Total Monthly BPD Flow**" which is the total amount of Final Effluent discharged on all BPD during the calendar month;

f. Calculate the flow-weighted arithmetic mean using the following formula:

[(Monthly Average NBPD Effluent Concentration × Total Monthly NBPD Flow) + (Monthly Average BPD Effluent Concentration × Total Monthly BPD Flow)] ÷ (Total Monthly NBPD Flow + Total Monthly BPD Flow)

It should be noted that in this method, if there are no Bypass Event for the month, the calculated result would be the same as the non-flow-weighted arithmetic mean method;

g. Report and use the lesser of the flow-weighted arithmetic mean obtained in Step 2 and the arithmetic mean obtained in Step 1 as the Monthly Average Effluent Concentration for this parameter where applicable in this Approval.

2. Annual Average Effluent Concentration

Step 1: Calculate the arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured during a calendar year and proceed as follows depending on the result of the calculation:

a. If the arithmetic mean does not exceed the compliance limit for the contaminant, then report and use this arithmetic mean as the Annual Average Effluent Concentration for this parameter where applicable in this Approval;

b. If the arithmetic mean exceeds the compliance limit for the contaminant and there was no Bypass Event during the calendar year, then report and use this arithmetic mean as the Annual Average Effluent Concentration for this parameter where applicable in this Approval;

c. If the arithmetic mean exceeds the compliance limit for the contaminant and there was Bypass Event(s) during the calendar year, then proceed to Step 2;

d. If the arithmetic mean does not exceed the compliance limit for the contaminant and there was Bypass Event(s) during the calendar year, the Owner may still elect to proceed to Step 2 calculation of the flow-weighted arithmetic mean.

Step 2: Calculate the flow-weighted arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured during a calendar year and proceed depending on the result of the calculation:

a. Group No Bypass Days (**NBPD**) data and Bypass Days (**BPD**) data during a calendar year separately;

b. Calculate the arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured on all NBPD during a calendar year and record it as **Annual Average NBPD Effluent Concentration**;

c. Obtain the "**Total Annual NBPD Flow**" which is the total amount of Final Effluent discharged on all NBPD during the calendar year;

d. Calculate the arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured on all BPD during a calendar year and record it as **Annual Average BPD Effluent Concentration**;

e. Obtain the "**Total Annual BPD Flow**" which is the total amount of Final Effluent discharged on all BPD during the calendar year;

f. Calculate the flow-weighted arithmetic mean using the following formula:

[(Annual Average NBPD Effluent Concentration × Total Annual NBPD Flow) + (Annual Average BPD Effluent Concentration × Total Annual BPD Flow)] ÷ (Total Annual NBPD Flow + Total Annual BPD Flow)

It should be noted that in this method, if there are no Bypass Event for the calendar year, the calculated result would be the same as the non-flow-weighted arithmetic mean method;

g. Report and use the lesser of the flow-weighted arithmetic mean obtained in Step 2 and the arithmetic mean obtained in Step 1 as the Annual Average Effluent Concentration for this parameter where applicable in this Approval.

3. Monthly Geometric Mean Density

Geometric mean is defined as the n^{th} root of the product of *n* numbers. In the context of calculating Monthly Geometric Mean Density for *E.coli*, the following formula shall be used:

$$\sqrt[n]{x_1 x_2 x_3 \cdots x_n}$$

in which,

"*n*" is the number of samples collected during the calendar month; and

"*x*" is the value of each Single Sample Result.

For example, four weekly grab samples were collected and tested for *E.coli* during the calendar month. The *E.coli* densities in the Final Effluent were found below:

Sample Number	***E.coli* Densities* (CFU/100 mL)**
1	10
2	100
3	300
4	50

The Geometric Mean Density for these data:

$$\sqrt[4]{10 \times 100 \times 300 \times 50} = 62$$

*If a particular result is zero (0), then a value of one (1) will be substituted into the calculation of the Monthly Geometric Mean Density. If the MPN method is utilized for E.coli analysis, values in the table shall be MPN/100 mL.

Schedule G

Municipal and Local Services Board Wastewater System

Profile Information Form

(For reference only, images of the form are attached on the next four pages. A digital copy can be obtained from the District Manger.)

Ontario

Ministry of the Environment, Conservation and Parks

Municipal and Local Services Board Wastewater System Profile Information Form

The information in this form is necessary to administer the Ministry's approvals, compliance and enforcement programs with respect to wastewater treatment and collection systems owned by municipalities and local services boards. These programs are authorized under the *Ontario Water Resources Act*, the *Environmental Protection Act*, the *Nutrient Management Act* and their respective regulations.

Email the completed form to: waterforms@ontario.ca
For any questions call 1-866-793-2588.

[A] SYSTEM PROFILE INFORMATION

Wastewater System Number *(if assigned)*

☐ New Profile
☐ Update Existing Profile

Name of System

Name of Municipality or Local Services Board

Level of Treatment (select one*)
☐ Primary
☐ Secondary
☐ Tertiary
☐ Secondary Equivalent
☐ Other (specify):
*See Terms and Concepts on page 4

Population Served	Population (Design)	Type of System
		☐ Treatment & Collection System ☐ Collection System Only

Design Rated Capacity (m^3/day)	Peak Flow Rate (m^3/day)	Current Environmental Compliance Approval (ECA) Number	Current ECA Issue Date (yyyy/mm/dd):

The treatment plant receives sewage from: (Check all that applies.* If you have checked more than one option below, indicate the approximate %)

☐ Sanitary Sewer ☐ Combined Sewer
☐ Nominally Separated Sewer ☐ Partially Separated Sewer *See Terms and Concepts on page 4

[B] OWNER INFORMATION

Legal Name of Municipality or Local Services Board

Unit No	Street No.	Street Name.	Street Type (St, Rd, etc)	Street Direction (N,S,E,W)

PO Box	City/Town	Postal Code

☐ Dr ☐ Miss ☐ Mr ☐ Mrs ☐ Ms	Owner Contact First Name	Owner Contact Last Name	Owner Contact Job Title

Tel. No.	Fax Number	Email address
( ) - ext.	( ) -	

[C] OPERATING AUTHORITY ☐ Check if same as owner

Legal Name of Operator

Unit No	Street No.	Street Name.	Street Type (St, Rd, etc)	Street Direction (N,S,E,W)

PO Box	City/Town	Postal Code

☐ Dr ☐ Miss ☐ Mr ☐ Mrs ☐ Ms	Operator Contact First Name	Operator Contact Last Name	Operator Contact Job Title

Tel. No.	Fax Number	Email address
( ) - ext.	( ) -	

[D] 24/7 CONTACT

☐ Dr ☐ Miss ☒ Mr ☐ Mrs ☐ Ms	First Name	Last Name	Job Title

Tel. No.	Fax Number	Email address
( ) - ext.	( ) -	

[E] SYSTEM CIVIC LOCATION ADDRESS (I.E. ADDRESS OF TREATMENT PLANT)

Unit No	Street No.	Street Name.	Street Type (St, Rd, etc)	Street Direction (N,S,E,W)

PO Box	City/Town	Postal Code

If the Wastewater System has no street address

Geographical Township	Lot	Concession

Geographical Referencing (if known, enter the Geographical Reference Information for this Wastewater System)

Map Datum	Geo-Referencing Method	Accuracy Estimate	Location Reference	
Latitude	**Longitude**	**Zone**	**Easting**	**Northing**

[F] TREATMENT PROCESS

Preliminary	Primary	Secondary	Secondary Equivalent	Post-Secondary	Additional Treatment
☐ Screening	☐ Settling/sedimentation/ clarification	☐ Conventional Activated Sludge (CAS)	☐ Aerated Lagoon	☐ Filtration	☐ Phosphorous Removal ☐ Biological ☐ Chemical
☐ Shredding/ grinding	☐ Scum Removal	☐ Extended Aeration	☐ Facultative Lagoon	☐ Clarification	If chemical is used, specify:
☐ Grit Removal	☐ Polymer Addition	☐ Membrane Bioreactor (MBR)	☐ Anaerobic Lagoon	☐ Intermittent Sand Filter (after lagoons)	☐ Nitrification
☐ Other(specify):	☐ Other(specify):	☐ Sequencing Batch Reactor (SBR)	☐ Aerobic Lagoon	☐ Polishing Wetlands	☐ Denitrification
		☐ Rotating Biological Contactor (RBC)	☐ Other(specify):	☐ Polishing Lagoons	☐ Other(specify):
		☐ Trickling Filter (TF)		☐ Other(specify):	
		☐ Biological Aerated Filter (BAF)			
		☐ Other(specify):			

[G] DISINFECTION

Method of Disinfection	Disinfection Period
☐ Chlorination If you chlorinate, do you practice de-chlorination? ☐ Yes ☐ No	☐ Continuous ☐ Seasonal
☐ Ultraviolet Irradiation	☐ Continuous ☐ Seasonal
☐ Other (specify):	☐ Continuous ☐ Seasonal

[H] SLUDGE

Sludge Stabilization Process	Method of Sludge Disposal/Utilization
☐ Aerobic Digestion	☐ Agricultural
☐ Anaerobic Digestion	☐ Landfill
☐ Drying & Pelletization	☐ Incineration
☐ Lime Treatment	☐ Other (specify):
☐ Composting	
☐ Other (specify):	

Available Sludge Storage Capacity (m^3):

[I] EFFLUENT

Effluent Disposal Method	Effluent Discharge Frequency
☐ Surface Water Receiving Water Body Name:	☐ Continuous ☐ Seasonal
☐ Subsurface	☐ Continuous ☐ Seasonal
☐ Other (specify):	☐ Continuous ☐ Seasonal

Is the effluent discharged in a vulnerable area identified in the local source protection assessment report approved under the Clean Water Act, 2006?
☐ Yes ☐ No

[J] INFLUENT

Does the plant receive sewage from another municipality or local services board either through an interconnected collection system or hauled sewage?
☐ Yes ☐ No
(if yes, name(s) of other municipality or local services board):

Plant receives:
☐ Leachate (approximate annual volume in m^3):
☐ Septage (approximate annual volume in m^3):
☐ Industrial input (approximate annual volume in m^3):
or (approximate volume in %):

Terms and Concepts

The following Terms and Concepts are provided to assist you when completing Wastewater System Profile Information Form.

In order to determine the level of treatment that applies to the wastewater system, the effluent quality objectives that the wastewater treatment plant was designed to meet must be considered. The process based approach often used in the past has led to confusion and is open to interpretation due to recent developments and practices in the wastewater treatment industry. For example, a plant with a high rate filter (often referred to as a tertiary filter) after its secondary treatment was considered a tertiary treatment in the past since the filter was designed and operated to produce a tertiary quality effluent. However, secondary plants are now being constructed with these filters as a safeguard against any potential secondary clarifier performance degradation and not for the purpose of ensuring tertiary treatment performance. Also, new technologies have evolved that can produce tertiary quality effluent without having these high rate filters (e.g., membrane bioreactors). Lagoons were considered in the past as being capable of providing only secondary equivalent treatment. However, with add-on treatment after the lagoons (e.g. intermittent sand filters), many lagoon treatment systems are capable of producing secondary or tertiary quality effluent.

During the establishment of sewage works, site-specific effluent limits (including averaging periods) are provided by the Ministry's Regional Technical Support Section, considering the assimilative capacity of the receivers and the minimum treatment requirements provided in Procedure F-5-1. The designer of the sewage works then selects objective values that are acceptable to the Ministry and are less (i.e. more stringent) than the effluent limits , in order to provide an adequate safety factor based on the designer's confidence/experience with the technology chosen and other site-specific conditions. The sewage works are then designed (and operated) to meet these design objectives in a reliable and consistent manner. Therefore, the values that are to be used in the determination of the level of treatment that applies to the sewage works must be based on the design objectives, and not the effluent limits.

Two common parameters used in almost all sewage works designs and performance evaluations are $CBOD_5$ (carbonaceous biochemical oxygen demand) (BOD_5 – biochemical oxygen demand - for primary sewage works) and total suspended solids (TSS). Therefore, it is logical that the **objective values** of these two parameters are used to determine the level of treatment at the sewage works.

Level of Treatment:

Primary:
Wastewater treatment plants that have only settling/sedimentation (with or without chemical addition) and providing 30% and 50% or better reduction of BOD_5 and TSS respectively are considered primary plants (MOE Procedures F-5-1 and F-5-5).

Secondary:
Wastewater treatment plants that have biological processes (e.g. activated sludge process and its variations, fixed film processes) or physical-chemical processes producing an effluent quality of $CBOD_5$ and TSS of 15 mg/L or better are considered secondary plants (MOE Design Guidelines for Sewage Works, 2008).

Secondary Equivalent:
Wastewater treatment plants producing an effluent quality of $CBOD_5$ of 25 mg/L and TSS of 30 mg/L or better are considered as secondary equivalent plants.

Note: Wastewater treatment plants that provide only primary settling of solids and the addition of chemicals to improve the removal of TSS (and phosphorus) are not considered as secondary treatment plants or secondary equivalent plants (MOE Design Guidelines for Sewage Works, 2008).

Tertiary:
Wastewater treatment plants that have biological processes (e.g. activated sludge process and its variations, fixed film processes) and/or physical-chemical processes producing an effluent quality of $CBOD_5$ and TSS of 5 mg/L or better are considered tertiary plants.

Note: Biological processes such as nitrification, denitrification and enhanced biological phosphorus removal can be part of either a secondary or tertiary treatment plant. They may be described as secondary treatment plant with nitrification, secondary treatment plant with enhanced biological phosphorus removal, tertiary treatment plant with nitrification etc.

Sewer System Type:

Sanitary Sewers:
Pipes that convey sanitary sewage flows made up of wastewater discharges from residential, commercial, institutional and industrial establishments plus extraneous flow components from such sources as groundwater and surface run off.

Combined Sewers:
Pipes that convey both sanitary sewage and stormwater runoff through a single-pipe system.

Partially Separated Sewers:
Exist when either a portion of the combined sewer area was retrofitted to separate (sanitary and storm) sewers and/or a service area with combined sewers has had a new development area with separate sewers added to the service area; whatever the case may be, the final flows will be combined sewage.

Nominally Separated Sewers:
These sewers are constructed as separate sewers, but the sanitary sewers accept stormwater from roof and foundation drains (i.e., these are separated sewers in name only).

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 9475-AP5RQG issued on July 31, 2017.

In accordance with Section 139 of the Environmental Protection Act, you may by written

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

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

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

The Notice should also include:

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

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

This Notice must be served upon:

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

AND

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

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

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

DATED AT TORONTO this 29th day of January, 2019

Fariha Pannu, P.Eng.
Director

appointed for the purposes of Part II.1 of the *Environmental Protection Act*

WS/
c: Area Manager, MECP Windsor
c: District Manager, DWECD, MECP Sarnia
Mike Newbigging, Jacobs Engineering Group, Inc.

APPENDIX B-2

Water and Wastewater Master Plan
- Executive Summary

EXECUTIVE SUMMARY

ES.1.0 INTRODUCTION

ES.1.1 PURPOSE OF THE MASTER PLAN

The Town of Lakeshore retained Stantec Consulting Ltd. in association with Watson & Associates Economists Ltd. to prepare a Water and Wastewater Master Plan Study including a Rate Review Study in accordance with the Municipal Class Environmental Assessment (EA) process. The goal was to provide a consolidated framework to guide the planning and implementation of strategic water and wastewater infrastructure improvements over the next 20 year planning horizon and beyond with integrated consideration of the natural, social and economic environments.

ES.1.2 BACKGROUND AND SERVICE AREAS

The following sections briefly describe the existing water and wastewater service areas throughout the Town and identify potential future wastewater service areas which are not presently serviced by municipal wastewater systems.

ES.1.2.1 Water Service Areas

The Town of Lakeshore is presently serviced by five separate water supply systems. They include the Belle River, Stoney Point, Union, Tecumseh and Tilbury / Wheatley water supply systems.

ES.1.2.2 Wastewater Service Areas

There are presently five existing wastewater service areas in the Town of Lakeshore. They include the Belle River / Maidstone, Stoney Point, Comber, South Woodslee and North Woodslee Sewage Works.

ES.1.2.3 Future Wastewater Service Areas

As part of this study, residentially populated areas which are not currently being serviced by municipal sanitary sewage collection and treatment systems were identified for evaluation. These areas, listed below, are serviced by individual on-site private septic systems generally consisting of septic tanks and leaching beds:

- **Lighthouse Cove Area** (including shoreline area west of Lighthouse Cove. i.e. Laforet Beach, Crystal Beach and Couture Beach Roads).

- **Rochester Place Area** (including Deerbrook, St. Joachim and shoreline areas generally between Charron Line Road and Rochester Town Line Road including along the Ruscom River).

- **Belle River Road Area** (north of North Woodslee hamlet and south of Belle River urban area)

- **Essex Fringe Area** (south-west corner of the Town along County Road 35 and including adjacent side streets)

Potential Highway 401 Employment Area - For the purposes of the Water and Wastewater Master Plan, broad assumptions have been made with respect to the water and wastewater servicing requirements of the potential Highway 401 employment lands corridor.

ES.1.3 ENVIRONMENTAL ASSESSMENT PROCESS

The work undertaken in preparation of the Lakeshore Water and Wastewater Master Plan follows the planning and design process of the Municipal Engineers Association (MEA) Class EA, October 2000, as Amended in 2007.

Typically, Master Plans are long range plans with broader scopes which integrate infrastructure requirements for existing and future land use with environmental assessment planning principles. These plans examine an infrastructure system or group of related projects in order to outline a framework for planning subsequent projects and/or developments. *Master Plans address (in part) Phases 1 and 2 of the Municipal Class EA process*.

ES.2.0 EXISTING ENVIRONMENTAL CONDITIONS

Projects identified through the Master Plan process must be evaluated on the basis of the potential impact on the existing environmental conditions of the study area. The Master Plan report provides a general description of the existing natural, social and economic environmental conditions in the Town of Lakeshore.

With respect to the natural environment, the Master Plan report includes a discussion on the local climate, geology and physiology, soils, water resources, natural vegetation, terrestrial and aquatic animal life throughout the Town of Lakeshore. As part of documenting existing environmental conditions under the Class EA process, a Benthic Invertebrate Survey was undertaken on the watercourses within the Town of Lakeshore which receive effluent discharges from an existing wastewater treatment facility. Also, a pollution survey was conducted within the main settlement areas of the Town which are not currently serviced by a municipal wastewater system.

ES.3.0 GROWTH, WATER DEMAND AND WASTEWATER FLOW PROJECTIONS

ES.3.1 COMMUNITY GROWTH PROJECTIONS

The growth projections for the Lakeshore Water and Wastewater Master Plan form the basis for establishing water demand and wastewater flow rate assumptions and ultimately the future servicing plans. Community growth projections were established for the 20 and 40 year planning horizons as well as the corresponding projected water demands and wastewater flows.

Residential and non-residential growth projections have been based on a report prepared for the Town of Lakeshore by Watson Associates Economists Ltd. (formerly C.N. Watson and Associates Ltd.) entitled "Town of Lakeshore Population, Household and Employment Forecast Final Report, April 28, 2006".

ES.3.2 EXISTING AND PROJECTED WATER DEMANDS

Prediction and planning for water demand is one of the most important elements of water supply master planning. The historical water supply and consumption records for the Belle River and Stoney Point water systems were evaluated to establish current water demands. The following tables summarize the present, 20 year and 40 year water demand projections for the Belle River and Stoney Point water supply systems:

Table 3.1: Existing and Projected Water Demands

Water Supply System	**Total Max Day Demand, m^3/day (MIGD)**		
	Existing (2005)	***20-Year (2025)***	***40-Year (2045)***
Belle River	*16,958 (3.7)*	*32,987 (7.3)*	*50,115 (11.0)*
Stoney Point	*3,548 (0.78)*	*8,030 (1.8)*	*10,047 (2.2)*

ES.3.3 EXISTING AND PROJECTED WASTEWATER FLOWS

Sanitary sewage flows are made up of waste discharges from residential, commercial, industrial and institutional establishments plus extraneous non-waste flow components from sources such as groundwater and surface runoff.

The following tables summarize the present, 20 year and 40 year wastewater flow projections for the existing and potential wastewater service areas previously identified. The average per capita sewage flow including extraneous flow has been established for each respective service

area based on a review of the historical flow records at the existing sewage treatment facilities. For areas which are not presently serviced by a municipal sewage system, an average per capita sewage flow of 455 Lpcpd has been assumed.

Table 3.2: Existing and Projected Average Daily Wastewater Flows (m^3/d)

Wastewater Service Areas	*Existing (2005)*	*20-Year (2025)*	*40-Year (2045)*
1. BELLE RIVER / MAIDSTONE	*7,730*	*15,593*	*24,532*
2. STONEY POINT	*1,092*	*2,100*	*3,108*
3. COMBER	*395*	*1,409*	*1,714*
4. SOUTH WOODSLEE	*71*	*123*	*146*
5. NORTH WOODSLEE	*0*	*320*	*381*
6. LIGHTHOUSE COVE	*0*	*1,186*	*1,795*
7. ROCHESTER PLACE	*0*	*1,302*	*1,769*
8. BELLE RIVER ROAD	*0*	*541*	*808*
9. ESSEX FRINGE	*0*	*296*	*296*
10. HIGHWAY 401 CORRIDOR	*0*	*816*	*2,992*

ES.4.0 PROBLEM STATEMENTS

ES.4.1 WATER

The primary focus of the Water component of the Master Plan is to evaluate the ability of the water treatment, storage and watermains within the Belle River and Stoney Point water supply systems to meet existing and projected water demands and identify constraints, improvements and or modifications.

The following problems have been identified for the Belle River and Stoney Point water supply systems to satisfy the needs of existing consumers and provide sufficient capacity to accommodate future growth based on projected 20 year demands.

ES.4.1.1 Belle River Water Supply System

.1 Additional clear water storage capacity of approximately 9,000 m^3 (or 2.0 MIG) is required in addition to existing available storage to meet MOE Guidelines (note: existing storage includes both the Belle River and Maidstone elevated water towers as well as the expanded Belle River WTP reservoir).

.2 Improvements to the existing water distribution system are required to augment the existing pipeline network to convey the increased flows to meet projected demand as well as improve the level of fire protection.

ES.4.1.2 Stoney Point Water Supply System

.1 Additional treatment plant capacity of approximately 3,600 m^3/d (or 0.8 MIG) is required.

.2 Additional clear water storage capacity of approximately 2,500 m^3 (or 0.6 MIG) is required in addition to the existing available system storage to meet MOE Guidelines.

.3 Improvements to the existing water distribution system are required to augment the existing pipeline network to convey the increased flows to meet projected demands as well as improve the level of fire protection.

ES.4.2 WASTEWATER

The following problems have been identified for the existing and potential wastewater service areas throughout the Town of Lakeshore to satisfy the needs of existing development and provide sufficient capacity to accommodate future growth based on projected 20 year demands.

ES.4.2.1 Belle River / Maidstone Wastewater System

1. Additional treatment plant capacity of approximately 2,000 m^3/d (or 0.5 MIGD) is required to service the existing service area and anticipated growth areas.

2. Extension of the Oakwood trunk sanitary sewer westerly to service existing development and future growth within the existing service area and anticipated growth areas including provision of a new local collection system in the Pike Creek area to address pollution concerns

3. I&I into the existing collection system is an ongoing problem.

ES.4.2.2 Stoney Point Wastewater System

1. Additional treatment plant capacity of approximately 1,200 m^3/d (or 0.25 MIGD) is required to service the existing service area.

2. I&I into the collection system is an ongoing problem.

ES.4.2.3 Comber Wastewater System

1. Additional treatment plant capacity of approximately 1,000 m^3/d (or 0.22 MIGD) is required to service the existing service area and anticipated growth areas.

2. I&I into the collection system is an ongoing problem.

ES.4.2.4 South Woodslee Wastewater System

1. Upgrades to the existing collection system are required to address on-going problems with the existing septic tank effluent pumping (S.T.E.P) systems.

ES.4.2.5 North Woodslee Wastewater System

1. Construction of a new wastewater collection system to service the areas in North Woodslee east of the Belle River.

ES.4.2.6 Un-Serviced Settlement Areas

1. The Lighthouse Cove, Rochester Place, Belle River Road Corridor and Essex Fringe study areas require sanitary sewage servicing to address pollution problems related to existing malfunctioning septic systems and to address development pressures.

2. The proposed Highway 401 Employment Lands require sanitary sewage servicing to accommodate development.

ES.5.0 DEVELOPMENT AND EVALUATION OF ALTERNATIVE SOLUTIONS

ES.5.1 PLANNING LEVEL CONCEPTUAL ALTERNATIVE SOLUTIONS

Several conceptual alternative solutions were identified to address the problems and needs of the water and wastewater systems. The following broad planning level alternative solutions were considered for providing adequate water and wastewater servicing in the Town of Lakeshore:

1. Do Nothing.
2. Restrict Community Growth.
3. Implement water use reduction and inflow / infiltration control measures.
4. Undertake projects to construct, expand or augment water and wastewater system capacity as needed to service existing and future development.

The advantages and disadvantages of each alternative together with their effects on the socio-economic and natural environment were evaluated. The results of the preliminary screening clearly indicate that the recommended alternative solutions which address the identified problems and study objectives are as follows:

- ***Expand the capacity of the existing water and wastewater system components (treatment, distribution, collection, etc.) including the provision of additional capacity at new or existing facilities to meet the existing and future servicing requirements,***

- ***Implement water efficiency and inflow and infiltration control measures.***

ES.5.2 SERVICING ALTERNATIVES

Alternative servicing solutions were identified and evaluated to address the specific problems and needs of the water and wastewater systems and the unserviced settlement areas. A detailed evaluation of the various alternative solutions is included in the full Master Plan report.

ES.6.0 PUBLIC AND REVIEW AGENCY CONSULTATION

Consultation is a key feature of a successful environmental assessment. The Municipal Class EA process identifies mandatory consultation requirements. The Master Plan has provided several opportunities for participation to date including:

- Notice of Study Commencement advertised to Public and issued to Review Agencies
- Three Public Information Sessions (under Phase 1 of the EA Master Plan Study)
- Two Town Council Information Sessions (under Phase 1 of the EA Master Plan Study)
- Consultation with local Municipalities
- Consultation with Interested Stakeholders including individual meetings with local development groups in Lighthouse Cove, Rochester Place, urban Maidstone and the Belle River Corridor areas.
- One Public Information Session (under Phase 2 of the EA Master Plan Study)

ES.7.0 RECOMMENDED SERVICING PLAN

ES.7.1 SERVICING PLAN

A servicing plan was developed which outlines the recommended water and wastewater infrastructure works required within the Town of Lakeshore to service the needs of the community over the next 20 years and beyond.

Tables 7.1 and 7.2 below summarize the identified water and wastewater projects with respect to capital budget estimates (in 2007 dollars), anticipated timing and Class EA Schedule.

ES.7.2 WATER & WASTEWATER RATE STUDY

Based on the recommendations established in the Water and Wastewater Master Plan, a separate report entitled “Town of Lakeshore – Financial Impact of the Water and Wastewater Master Plan on Consumer Rates, March 24, 2008” (Rate Study) was prepared by Watson & Associates Economists Ltd. The purpose of the study was to evaluate the financial aspects of the recommended servicing alternatives and identify the impact of water and sewer rates in the Town of Lakeshore. A copy of the report is included with the full Master Plan report. The following tables summarize the calculated water and wastewater rates identified in the Rate Study based on the current rate structures over a 10 year period:

Table ES.1: Water Rate Summary

Description	*2007 Passed*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*
Base Charge ($, monthly)	12.50	12.50	12.50	12.50	12.50	12.50	13.50	13.50	13.50	13.50	13.50
Special Levy ($, monthly)	12.00	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Volume Charge ($ /m^3)	0.83	0.92	1.40	1.41	1.46	1.63	1.67	1.77	1.78	1.78	1.82
Avg. Annual Residential Bill*	501.50	524.25	500.27	502.94	514.55	557.29	580.70	604.84	606.66	606.88	616.20

** Average annual residential bill based on 250m^3*

Table ES.1: Wastewater Rate Summary

Description	*2007 Passed*	*2008*	*2009*	*2010*	*2011*	*2012*	*2013*	*2014*	*2015*	*2016*	*2017*
Base Charge ($, monthly)	12.50	12.50	12.50	12.50	12.50	12.50	13.50	13.50	13.50	13.50	13.50
Special Levy ($, monthly)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Volume Charge ($ /m^3)	0.90	1.00	1.10	1.20	1.30	1.38	1.38	1.38	1.38	1.38	1.38
Avg. Annual Residential Bill*	375.00	401.03	425.03	449.99	475.93	495.01	507.02	507.01	507.01	507.00	506.96

** Average annual residential bill based on 250m^3*

Possible alternative rate structures were evaluated and identified in the Rate Review. The alternatives involved maintaining the current special capital levy for water and establishing a new levy for wastewater.

ES.7.3 NEXT STEPS

To complete the Lakeshore Water and Wastewater Master Plan Study process, the following activities will be undertaken:

- Conduct a Public Information Session to present recommended servicing solutions and Rate Review results and provide an opportunity for public input.
- Circulate the Water and Wastewater Master Plan report to review agencies and interested stakeholders for comments.
- Document feedback from public and review agencies and update Master Plan report identifying preferred servicing solutions.
- Issue a “Study Notice of Completion” and place the Master Plan report on public record for a 30-day review period.
- Upon completion of the 30-day review period and assuming no Part II Order requests are submitted to the Minister of Environment, the Master Plan report will be adopted by Town Council in the form of a Council Resolution.

ES.7.4 MONITORING

The scheduling of many planned projects is related to the anticipated growth in demand for water and sewer services. Accordingly, the Town should closely monitor actual growth, water demand and wastewater flows, and adjust scheduling and implementation of related infrastructure projects as needed.

Table ES.3: Summary of Identified 20-Year Water Supply Projects

WATER PROJECTS	*PROBABLE COST*	*YEAR REQUIRED*	*CLASS EA SCHEDULE*
BELLE RIVER WATER SUPPLY SYSTEM			
Watermains			
300-mm along West Pike Creek Road from County Road 42 to Whisper Creek Cir.	$565,000	Completed in 2007	A+
600-mm along West River St. from Caille Ave. to County Road 22.	$420,000	Completed in 2007	A+
600-mm along County Road 22 from West River St. to Rourke Line	$1,520,000	Completed in 2007	A+
400-mm along County Road 22 from Rourke Line to East Puce River Road	$2,720,000	Completed in 2007	A+
250-mm along South St. from Saint Charles St. to Desjardins St.	$200,000	Completed in 2007	A+
400-mm along First St. from Broadway St. to Notre Dame St.	$290,000	Completed in 2007	A+
600-mm along Lakeview Ave. from Belle River WTP to West River St. (new crossing of Belle River)	$750,000	2008	A+
400-mm along Little Baseline Road from existing 500-mm to Stonebrook St.	$500,000	2010	A+
400-mm crossing of Pike Creek along Little Baseline Road	$350,000	2010	A+

WATER PROJECTS	*PROBABLE COST*	*YEAR REQUIRED*	*CLASS EA SCHEDULE*
BELLE RIVER WATER SUPPLY SYSTEM (Watermains cont'd)			
600-mm from West Puce River Road to Patillo Road (through Wallace Woods growth area)	$1,470,000	2010	A+
600-mm along Rourke Line from County Road 22 to future Tower site	$680,000	2011	A+
600-mm feedermain to 401 Employment Lands	$3,100,000	2012	A+
600-mm crossing of Puce River along County Road 22	$460,000	2013	A+
600-mm along West Puce River Road from County Road 22 southerly to existing 600-mm river crossing.	$500,000	2014	A+
400-mm along Renaud Line from County Road 22 to St. Clair Ave.	$350,000	2015	A+
300-mm along Little Baseline Road from West Pike Creek Road westerly to existing 150-mm watermain.	$550,000	2016	A+
150-mm along 13-14 Sideroad from 9th Conc. Road to 10th Conc. Road	$190,000	2016	A+
400-mm along County Road 22 from West Puce River Road to Patillo Road	$1,780,000	2016	A+
400-mm along County Rd. 22 (Belle River crossing) from First St. to West River St.	$260,000	2017	A+
250-mm along Notre Dame St. from Ducharme St. to Saint Peter St.	$250,000	2017	A+
400-mm along Rourke Line from County Road 22 to Caille Ave.	$400,000	2017	A+

WATER PROJECTS	*PROBABLE COST*	*YEAR REQUIRED*	*CLASS EA SCHEDULE*
BELLE RIVER WATER SUPPLY SYSTEM (cont'd)			
Storage Facilities			
New 1.25 MIG elevated water storage tank to replace existing Belle River tower	$4,500,000	2011	B
New 1.25 MIG elevated water storage tank to replace existing Maidstone tower	$4,500,000	2013	B

STONEY POINT WATER SUPPLY SYSTEM			
Watermains			
300-mm along St. Clair Ave. from Comber Sideroad approx. 700m easterly	$313,000	Completed in 2007	A+
300-mm along Saint Clair Ave. from Saint Peter St. westerly approx. 700m	$319,000	2008	A+
200-mm along Gracie Sideroad from Couture Beach Road to 2nd Conc. Road	$350,000	2009	A+
150-mm along County Road 2 (Tecumseh Road) from Gracie Sideroad to existing 50-mm watermain	$115,000	2009	A+
300-mm from Couture Beach Road to Martin Drive (connection to Lighthouse Cove)	$625,000	2009	A+ / B
300-mm along Comber Sideroad from St. Clair Ave. to Tecumseh Road	$320,000	2010	A+
100-mm connections along 3rd Concession Road, County Road 37 and 5th Concession Road (includes two crossings of Highway 401).	$770,000	2013	A+

WATER PROJECTS	*PROBABLE COST*	*YEAR REQUIRED*	*CLASS EA SCHEDULE*
STONEY POINT WATER SUPPLY SYSTEM (Watermains cont'd)			
100-mm connections along Rochester Townline Road generally between County Road 2 and 5th Concession Road	$450,000	2013	A+
300-mm along County Road 35 from Tecumseh Road to Highway 401	$2,600,000	2017	A+
Storage Facilities			
New 0.7 MIG elevated water storage tank	$2,500,000	2010	B
Treatment			
1.0 MIGD expansion of Stoney Point WTP	$3,500,000	2011	C

Table ES.4 Summary of Identified 20-Year Wastewater Projects

WASTEWATER PROJECTS	*PROBABLE COST*	*YEAR REQUIRED*	*CLASS EA SCHEDULE*
BELLE RIVER / MAIDSTONE WASTEWATER SYSTEM			
Treatment			
Expand Belle River / Maidstone WPCP to 4.0 MIGD	$12,800,000	2022	C
Conveyance			
Oakwood trunk sewer extension from Puce River to Pike Creek area.	$8,500,000	2010	A+
Belle River Road corridor - sewer system including trunk sewer, pumping station and forcemain to BRMWPCP.	$9,000,000*	2015	A+
401 Employment Lands – pumping station and forcemain to Belle River / Maidstone collection system	$3,900,000	2010	A+
Local Collection			
New gravity sewer collection system to service Belle River Road Corridor	* Included in conveyance	2015	A+
New gravity sewer collection system to service North Woodslee area	$4,700,000	2015	A+
New gravity sewer collection system to service South Woodslee area	$1,200,000	2015	A+
New gravity sewer collection system to service Pike Creek Area	$3,900,000	2010	A+
New gravity sewer collection system to service 401 Employment Lands	$2,800,000	2010	A+

WASTEWATER PROJECTS	*PROBABLE COST*	*YEAR REQUIRED*	*CLASS EA SCHEDULE*
STONEY POINT WASTEWATER SYSTEM			
Treatment			
Upgrade and expand Stoney Point Wastewater Treatment Facility to 5,990 m^3/d	$12,530,000	2010	C
Conveyance			
Pumping station and forcemain from Stoney Point service area to expanded treatment facility in Stoney Point	$200,000	2010	A+ / C
Pumping station and forcemain from Comber service area to expanded treatment facility in Stoney Point	$3,500,000	2010	A+ / C
Pumping station and forcemain from Lighthouse Cove service area to expanded treatment facility in Stoney Point	$1,800,000	2010	A+ / C
Pumping station and forcemain from Rochester Place service area to expanded treatment facility in Stoney Point	$2,500,000	2010	A+ / C
Local Collection			
New gravity sewer collection system to service Lighthouse Cove area	$24,000,000	2010	A+ / C
New gravity sewer collection system to service Rochester Place area	$16,000,000	2010	A+ / C

WASTEWATER PROJECTS	*PROBABLE COST*	*YEAR REQUIRED*	*CLASS EA SCHEDULE*
ESSEX FRINGE SERVICE AREA			
Treatment			
Acquire treatment capacity at existing Town of Essex wastewater treatment facility.	$1,400,000	2017	n/a
Conveyance			
Pumping station and forcemain from Essex Fringe service area to Town of Essex treatment facility.	$2,600,000	2017	A+ / C
Local Collection			
New gravity sewer collection system to service Essex Fringe area	$2,600,000	2017	A+ / C

APPENDIX B-3

Water and Wastewater Master Plan Update
- Executive Summary

Executive Summary

Introduction

Purpose of the Master Plan

The Town of Lakeshore retained CH2M Hill Canada Limited (CH2M) and Stantec Consulting Ltd. (Stantec) to update the original Water and Wastewater Master Plan Study completed in February 2009 in accordance with the Municipal Class Environmental Assessment (EA) process. The goal is to provide an updated consolidated framework to continue guiding the planning and implementation of strategic water and wastewater infrastructure improvements over the next 20-year planning horizon with an integrated consideration of the natural, social and economic environments.

The Lakeshore Water and Wastewater Master Plan Update is intended to provide timely and cost effective solutions to better manage the increased amount of infrastructure required to service growth within the municipality utilizing sound environmental assessment planning principles.

Background and Service Areas

Water Service Areas

The Town of Lakeshore is presently serviced by five separate water supply systems. They include the Belle River, Stoney Point, Union, Tecumseh, and Tilbury-Wheatley water supply systems.

Wastewater Service Areas

There are presently five existing wastewater service area in the Town of Lakeshore. They include the Belle River/Maidstone, Stoney Point, Comber, South Woodslee and North Woodslee Sewage Works.

Future Wastewater Service Areas

As part of the study, residential areas currently not serviced with municipal sewer collection and treatment were identified for evaluation. These areas, listed below, are serviced by individual on-site private septic systems (typically a septic tank with leaching bed):

- **Lighthouse Cove Area** (Including shoreline area West of Lighthouse Cove i.e. Laforet Beach, Crystal Beach and Couture Beach Roads).
- **Rochester Place Area** (Including Deerbrook, St. Joachim and shoreline areas generally between Charron Line Road and Rochester Town Line Road including along the Ruscom River).
- **Belle River Road Area** (North of North Woodslee hamlet and south of Belle River urban area)
- **Essex Fringe Area** (South-west corner of the Town along County Road 35 including adjacent side streets)

Environmental Assessment Process

The work undertaken in preparation of the Lakeshore Water and Wastewater Master Plan Update Study follows according to the phases defined in the Municipal Engineers Association (MEA) Class EA document (MEA, 2000 amended in 2007, 2011, and 2015).

Master Plans are long range plans with broader scopes which integrate infrastructure requirements for existing and future land use with environmental assessment planning principles. These plans examine infrastructure systems or groups of related projects in order to define a framework for planning

subsequent projects and/or developments. Master Plans address Phases 1 and 2 of the Municipal Class EA process.

Existing Environmental Conditions

Projects identified through the Master Plan process must be evaluated on the basis of the potential impact on the existing environmental conditions of the study area. The Master Plan report provides a general description of the existing natural, social and economic environmental conditions in the Town of Lakeshore.

With respect to the natural environment, the Master Plan report includes a discussion on the local climate, geology and physiology, soils, water resources, natural vegetation, terrestrial and aquatic life throughout the Town of Lakeshore.

Growth, Water Demand and Wastewater Flow Projections

Community Growth Projections

The growth projections for the Lakeshore Water and Wastewater Master Plan Update Study form the basis of establishing water demand and wastewater flow rate assumptions and ultimately future servicing plans. Community growth projections were established for the 20 year (2015 – 2035) planning horizon along with corresponding projected water demands and wastewater flows.

Residential and non-residential growth projections are based on estimates prepared for the Town of Lakeshore by Watson & Associates Economists Ltd. (Watson, 2015).

Existing and Projected Water Demands

Prediction and planning for water demand is one of the most important elements of water supply master planning. Historical water supply and consumption records for the Belle River and Stoney Point water supply systems were evaluated to established current water demands. Table ES-1 summarizes the present and future water demand projections for the Belle River and Stoney Point water supply systems.

Table ES-1. Existing and Projected Water Demands

	Total Calculated Maximum Day Water Demand, m^3/day	
Water Supply System	**Existing (2015)**	**20 Year (2035)**
Belle River WSS	18,000	24,680
Stoney Point WSS	3,990	4,854

Existing and Projected Wastewater Flow

Sanitary sewage flows are made up of waste discharges from residential, commercial, industrial and institutional establishments plus extraneous non-waste flow components from sources such as groundwater and surface runoff. Existing and projected wastewater flows are presented in Table ES-2.

For areas which are not presently serviced by a municipal sewage system, an average per capita sewage flow of 455 Lpcpd has been assumed.

Table ES-2. Existing and Projected Average Daily Wastewater Flows

Service Areas	Wastewater Flow (m^3/d)	
	Existing (2015)	20-year (2035)
Denis St. Pierre (Belle River / Maidstone)	11,698	14,601
Stoney Point	1,197	1,547
Comber	334	519
South Woodslee	90	106
North Woodslee	115	133
Lighthouse Cove	273	487
Rochester Place	126	141
Highway 401 Corridor (Hamlet communities of St. Joachim, Ruscom and Staples)	228	255
Essex Fringe	118	168

Problem Statements

Water

The primary focus of the water component of the Master Plan Update is to evaluate the ability of the water treatment, storage and distribution systems within the Belle River and Stoney Point water supply systems to meet both existing and projected future water demands and identify any constraints, improvements and/or modifications.

The following problems have been identified for the Belle River and Stoney Point water supply systems to satisfy the needs of existing consumers and provide sufficient capacity to accommodate future growth based on projected 20 year demands.

Belle River Water Supply System

- Additional clear water storage capacity of approximately 1,440 m3 by Year 2030 will be required to meet MOECC Guidelines.
- Improvements to the existing water distribution system will be required to augment the existing pipeline network to convey the increased flows needed to meet projected water demand as well as improve the level of fire protection.

Stoney Point Water Supply System

- Additional treatment plant capacity of approximately 455 m3/day by Year 2026 will be required.
- Additional clear water storage capacity of approximately 540 m3 will be required today to meet MOECC Guidelines.
- Improvements to the existing water distribution system will be required to augment the existing pipeline network to convey the increased flows needed to meet projected water demand as well as improve the level of fire protection.

Wastewater

The following problems have been identified for the existing and potential wastewater service areas throughout the Town of Lakeshore to satisfy the needs of existing development and provide sufficient capacity to accommodate future growth based on projected demands. *Problem statements carried forward from the 2009 WWWMP are excerpted and italicized.*

Denis St. Pierre (Belle River / Maidstone) Wastewater System

1. *Additional treatment capacity at the Denis St. Pierre WPCP is required to support the existing services areas and the anticipated future growth through 2035.*

   The projected population growth for the Denis St. Pierre WPCP indicates the capacity of the WPCP will be met prior to 2035, around 2028, assuming linear growth. Design and construction of the upgrade needs to start prior to this date to ensure capacity is available when needed. Generally, facilities begin design of upgrades once the facility reaches 80% of its rated capacity and the Denis St. Pierre WPCP has already reached 85% of its rated capacity, more if current flow data is used (i.e. see Post-Master Plan Update Revision).

2. *Extension of the Oakwood trunk sanitary sewer westerly to service existing development and future growth within the existing service area and anticipated growth areas including provision of a new local collection system within the Pike Creek area to address pollution concerns. (Stantec, 2009)*

Peak Wet Weather Capacity Issues within the Existing Belle River / Maidstone Conveyance System

Sanitary sewer modelling conducted by CH2M in 2013 identified surcharging issues along old Tecumseh Road. The Town has implemented a long-term inflow and infiltration reduction program focusing on main line sewer repairs. In September 2016, the Town experienced a 1:100 year storm event. Surcharging and basement flooding issues were significant during this event. (CH2M, 2013)

3. *There are peak wet weather flow (WWF) capacity issues within the Denis St. Pierre system.*

Patillo Road / Advance Area Servicing Options

In 2013 CH2M HILL (CH2M) developed a sanitary system hydraulic model to assess sanitary sewer performance, specifically on the system tributary to the Denis St. Pierre WPCP. This exercise found that the system has adequate capacity during dry weather flow (DWF) conditions but surcharging occurs along the Old Tecumseh Road sewer during 2- and 5-year design rainfall wet weather flow (WWF) conditions.

Typically, sewer system analysis for new development is based on available dry weather capacity unless there are exceptional circumstances, such as chronic basement flooding. The 2013 modelling effort identified areas of this sewer which experience basement flooding, pipe surcharging, and surface flooding. Therefore, WWF should be considered when planning or approving future development in this area. This could affect the ability of the Town to approve new development requests in the area unless economical alternatives are possible to mitigate WWF concerns.

4. *Wet weather flow along the Old Tecumseh Road imposes servicing limitations within the Patillo Road / Advance areas.*

Eastern Communities

Servicing of the Eastern Communities has been explored since the 2009 WWWMP in detail in the Eastern Communities EA completed in 2012 (Stantec, 2012). Therefore, this Master Plan Update will not develop problem statements for these areas further. The problem statement developed for the Eastern Communities is excerpted below and applies to Stoney Point, Comber, and Unserviced Settlement areas (Rochester Place and Lighthouse Cove).

Additional sewage treatment capacity is required in Stoney Point and Comber to service growth in the service area. Inflow and infiltration problems exist in the Stoney Point sewer system and to a lesser degree in the Comber system. The Lighthouse Cove and Rochester Place areas require sanitary sewage servicing to address pollution problems related to existing malfunctioning septic systems and to address development pressures. (Stantec, 2012)

I&I is ongoing issue within the Comber and Stoney Point collection systems.

North Woodslee Wastewater System

The North Woodslee collection system does not currently service the eastern portion of the North Woodslee hamlet (east of the Belle River). There is sufficient capacity at the North Woodslee STF to receive additional flows.

South Woodslee Wastewater System

The South Woodslee community is serviced by a low pressurized sewage collection system with a mechanical sewage treatment plant. This system uses individual septic tanks each with an effluent grinder pump. The Town has ongoing operational issues with the individual tanks and related pumps and check valves. In addition, these tanks accumulate solids and require regular cleaning.

Essex Fringe Area

The Town of Essex (Essex) owns two lagoons, both operated by OCWA, one of which is located within the Town of Lakeshore. Essex recently built a new tertiary treatment plant. This presents the opportunity to service the surrounding residences (currently on individual private septic systems) within the Town of Lakeshore at the newly constructed Essex WWTP.

Development and Evaluation of Alternatives Solutions

Planning Level Conceptual Alternative Solutions

Several conceptual alternative solutions were identified to address the problems and needs of the water and wastewater systems. The following broad planning level alternative solutions were considered for providing adequate water and wastewater servicing in the Town of Lakeshore:

1. Do Nothing
2. Restrict Community Growth
3. Implement water use reduction and inflow/infiltration control measures.
4. Undertake projects to construct, expand or augment water and wastewater system capacity as needed to service existing and future development.

The advantages and disadvantages of each alternative together with their effects on the socio-economic and natural environment were evaluated. The results of the preliminary screening clearly indicate that the recommended alternative solutions which address the identified problems and study objectives are as follows:

- Expand the capacity of the existing water and wastewater system components (treatment, storage, distribution, collection, etc.) including the provision of additional capacity at new or existing facilities to meet existing and future servicing requirements.
- Implement water efficiency and expand inflow and infiltration mitigation programs.

Servicing Alternatives

Alternative servicing solutions were identified and evaluated to address the specific problems and needs of the water and wastewater systems and the unserviced settlement areas. A detailed evaluation of the various alternative solutions is included in the Master Plan Update Report.

Public and Review Agency Consultation

Consultation is a key feature of a successful environmental assessment. The Municipal Class EA process identifies mandatory consultation requirements. The Master Plan has provided several opportunities for participation to date including:

- Notice of Study Commencement advertised to public and issued to review agencies.
- One Public Information Session under Phase 2 of the Class EA process.
- Two Town Council Information Sessions under Phase 2 of the Class EA process.
- Notice of Completion advertised to public and review agencies.

Recommended Servicing Plan

Servicing Plan

A servicing plan was developed outlining the recommended water and wastewater infrastructure works required within the Town of Lakeshore to service the needs of the community to 2035 and beyond.

Following Tables ES-3 and ES-4 summarizes the identified water and wastewater projects and associated capital budget estimates (in 2017 dollars), anticipated timing and Class EA Schedule.

Table ES-3. Summary of Identified Water Supply Projects to 2035

Water Projects	Capital Cost[a]	Year Required	Class EA Schedule
BELLE RIVER WATER SUPPLY SYSTEM			
Storage Facilities			
Replace existing Maidstone Elevated Water Tower with a new 5,800 m^3 elevated water tower in general vicinity of the Patillo Road / Little Baseline Road corridor and connect to proposed future 600 mm diameter trunk watermain through Wallace Woods Area	$7,500.000	2030	B
Watermain Infrastructure			
Construct new 200 & 300 mm dia. trunk watermains along 11th Street from Broadway Street to St. Louis Street (200 - 225 meters ; 300 – 300 meters)	$500,000	2018	A+
Construct new 250 & 300 mm dia. trunk watermains along Notre Dame Street from 11th Street to Duck Creek Blvd (250 dia - 225 meters ; 300 dia – 300 meters)	$600,000	2018	A+
Construct new 400 mm dia. trunk watermains along Rourke Line Road from County Road 22 to Caille Avenue (290 meters)	$650,000	2018	A+
Construct new 400 mm dia. trunk watermains along Renaud Line Road from County Road 22 to Caille Avenue (230 meters)	$600,000	2018	A+
Construct new 600 mm dia. trunk watermain along West Puce River Road from County Road 22 southerly to existing 600 mm dia. trunk watermain (590 meters)	$750,000	2019	A+
Construct new 600 mm dia. trunk watermain through Wallace Woods area from West Puce River Road to Patillo Road (3,000 meters)	$3,000,000	2019 to 2030	A+

Table ES-3. Summary of Identified Water Supply Projects to 2035

Water Projects	Capital Cost[a]	Year Required	Class EA Schedule
Construct new 400 mm dia. trunk watermain along County Road 22 from West Puce River Road to Wallace Line Road (1,675 meters)	$1,250,000	2019	A+
Construct new 400 mm dia. trunk watermain along Wallace Line Road from County Road 22 southerly to proposed 600 mm dia. trunk watermain through Wallace Woods area (1,000 meters)	$650,000	2020	A+
Construct new 400 mm dia. trunk watermain along County Road 22 from Wallace Line Road to Patillo Road (1,450 meters)	$1,000,000	2020	A+
Construct new 400 mm dia. trunk watermain along County Road 22 from Patillo Road to West Pike Creek Road (County Road 21) (2,200 meters)	$1,400,000	2021	A+
Construct new 500 mm dia. trunk watermain along Little Baseline Road from existing 500 mm dia. trunk watermain west of Patillo Road to existing 400 mm dia. trunk watermain at Stonebrook Road (780 meters)	$750,000	2022	A+
Construct new 400 mm dia. trunk watermain along Little Baseline Road from West Pike Creek Road (County Road 21) westerly to existing 150 mm dia. watermain near Manning Road (County Road 19) (1,430 meters)	$1,000,000	2022 to 2035	A+
STONEY POINT WATER SUPPLY SYSTEM			
Treatment Facilities			
Monitor Stoney Point WTP capacity and initiate an Environmental Study Report (ESR) at 80% of treatment capacity to evaluate the following two alternative solutions:			
Alternative 1 - Expand Stoney Point WTP to next modular size from 4,545 m^3/day to 9,090 m^3/day on present site	$6,500,000	2026	C
Alternative 2 - Supply 9,090 m^3/day from Belle River WSS via new trunk watermains and convert Stoney Point WTP into a reservoir and booster pump station	$11,500,000	2026	B
Storage Facilities			
Construct a new 3,200 m^3 elevated water tower located in the Community of Stoney Point in the general area of Comber Sideroad (County Road 35) and Tecumseh Road (County Road 2)	$5,000,000	Today	B
Watermain Infrastructure			
Construct new 300-mm dia. trunk watermain along Comber Sideroad (County Road 35) from St. Clair Road to existing 300 mm dia. trunk watermain immediately north of Tecumseh Road (County Road 2) – 730 meters	$450,000	Today	A+
Construct new 300-mm dia. trunk watermain along Comber Sideroad (County Road 35) from Tecumseh Road (County Road 2) to existing 200 mm dia. trunk watermain immediately south of the Canadian National Railway – 210 meters	$200,000	Today	A+
Construct new 200 mm dia. watermain along Gracie Sideroad (County Road 37) from Couture Beach Road to Lakeshore Road 302 – 1,635 meters	$650,000	2018	A+
Construct new 200 mm dia. watermain along Tecumseh Road (County Road 2) from Gracie Sideroad (County Road 37) westerly – 700 meters	$350,000	2018	A+
Construct new 100 or 150 mm dia. watermain looping interconnection along Tecumseh Road (County Road 2) near Rochester Townline - 640 meters	$300,000	2019	A+

Table ES-3. Summary of Identified Water Supply Projects to 2035

Water Projects	Capital Cost[a]	Year Required	Class EA Schedule
Construct new 100 or 150 mm dia. watermain looping interconnection along Tecumseh Road (County Road 2) and Rochester Townline – 1,015 meters	$475,000	2019	A+
Construct new 100 or 150 mm dia. watermain looping interconnection and check valve facility along Rochester Townline from Lakeshore Road 302 southerly – 335 meters	$225,000	2019	A+
Construct new 100 or 150 mm dia. watermain looping interconnection along Lakeshore Road 303 from Gracie Sideroad (County Road 37) westerly plus check valve facility on Gracie Sideroad from Lakeshore Road 303 southerly – 645 meters	$350,000	2020	A+
Construct new 100 or 150 mm dia. watermain looping interconnection along Rochester Townline from County Road 42 northerly – 420 meters	$250,000	2020	A+
Construct new 100 or 150 mm dia. watermain looping interconnection along County Road 42 from Rochester Townline easterly – 2,150 meters	$700,000	2021	A+
Construct new 100 or 150 mm dia. watermain looping interconnection along Rochester Townline from Lakeshore Road 305 southerly – 550 meters	$275,000	2021	A+
Construct new 100 or 150 mm dia. watermain looping interconnection along Rochester Townline from Auction Side Road northerly across Kings Highway 401 – 435 meters	$450,000	2022	A+
Construct new 100 or 150 mm dia. watermain looping interconnection along Gracie Sideroad (County Road 37) across Kings Highway 401 – 380 meters	$500,000	2022	A+
Construct new 100 or 150 mm dia. watermain looping interconnection along Lakeshore Road 305 across Kings Highway 401 – 260 meters	$400,000	2023	A+
Construct new 100 or 150 mm dia. watermain looping interconnection along Gracie Sideroad (County Road 37) from Middle Road (County Road 46) southerly plus isolation valve facility on Middle Road (County Road 46) 650 m west of Gracie Sideroad (County Road 37) – 800 meters	$400,000	2023	A+
Construct new 100 or 150 mm dia. watermain looping interconnection along Gracie Sideroad (County Road 37) from Lakeshore Road 309 northerly – 740 meters	$325,000	2024	A+
Construct new 100 or 150 mm dia. watermain looping interconnection along Gracie Sideroad (County Road 37) from County Road 8 northerly – 740 meters	$325,000	2024	A+
Construct new 100 or 150 mm dia. watermain looping interconnection along Lakeshore Road 311 from Kings Highway 77 westerly – 1,100 meters	$475,000	2025	A+
Construct new 100 or 150 mm dia. watermain looping interconnection along South Middle Road from Rochester Townline easterly – 1,200 meters	$500,000	2025	A+
Construct new 100 or 150 mm dia. watermain looping interconnection along South Middle Road from Lakeshore Road 309 easterly – 1,100 meters	$475,000	2026	A+
Consider construction of new 400 mm dia. watermain along Comber Sideroad (County Road 35) from CN Railway southerly as conditions dictate to south of Hwy 401 in Comber to replace existing 200 mm dia. watermain – 7,200 meters	$5,000,000	2018 to 2035	A+

Notes:

[a] Capital costs represent conceptual level planning estimates and based on factors and reasoning discussed in Appendix E.

Table ES-4. Summary of Identified Wastewater Projects to 2035

Wastewater Projects	Capital Cost	Year Required	Class EA Schedule
North and South Woodslee			
Expand gravity sewers to service the Eastern portion of the North Woodslee hamlet.	$5,300,000 [a]	Far Future	A+
Continue to repair and upgrade the existing South Woodslee pressurized system.	$9,100 per system [b]	Ongoing	A+
Denis St. Pierre WPCP Wastewater Collection System			
Expand the Denis St. Pierre WPCP by one SBR treatment train (increase of approximately 1 MIGD)	$14,500,000 [a]	2020 [e]	C
Oakwood trunk sewer extension from Puce River to Pike Creek area	$9,600,000 [a]	2025	A+
New gravity sewer collection system to service Pike Creek area	$4,400,000	Far Future	A+
Belle River Road Corridor – sewer system including trunk sewer, pumping station and forcemain to Denis St. Pierre WPCP	$10,200,000 [a]	2025+	A+
Eastern Communities			
Construct a new sewage treatment facility in Stoney Point to treat sewage from both Stoney Point and Comber (Phase 1)	$15,576,000 [c]	2020	N/A [d]
Pump Station and Forcemain to transmit wastewater from Stoney Point to the new STF (Phase 1)	$500,000 [c]	2020	
Pump Station Upgrade and new Forcemain to transmit wastewater from Comber to the new STF (Phase 1)	$3,795,000 [c]	2020	
Construct gravity sewer collection system to service Lighthouse Cove (Phase 1)	$23,725,000 [c]	2020	
New Pumping Station and forcemain to transmit sewage from Lighthouse Cove to the new STF (Phase 1)	$904,000 [c]	2020	
Construct new gravity sewer collection system to service Rochester Place (Phase 2)	$30,753,000 [c]	2030	
New Pumping Station and forcemain to transmit sewage from Rochester Place to the new STF (Phase 2)	$3,135,000 [c]	2030	
Decommission the existing sewage lagoons located in Stoney Point and Comber (Phase 2)	$3,163,000 [c]	2030	
Expand Stoney Point STF to receive flows from Lighthouse Cove and Rochester Place (Phase 2)	$3,921,000 [c]	2030	
Studies			
Initiate a private source control inflow and infiltration program in addition to the ongoing public source control program. Review the existing inflow and infiltration program.	$80,000	2017	N/A
Conduct a study of the Patillo Road Package Plant to evaluate (1) the ability of the plant to relieve wet weather flows (2) ability of the plant to increase available capacity at the Denis St. Pierre WPCP and (3) assess the capital cost and feasibility of bringing this plant back online from standby.	$50,000	2017	N/A

Table ES-4. Summary of Identified Wastewater Projects to 2035

Wastewater Projects	Capital Cost	Year Required	Class EA Schedule
Explore opportunities with the Town of Essex to expand service from the Essex WWTP to the Essex Fringe Area within the Town of Lakeshore.	N/A	2017	N/A

Notes:

All costs exclude HST and represent conceptual level planning cost estimates.

[a] Original costs were developed in 2009 WWWMP. Costs presented here have been escalated to 2017 dollars using the Consumer Price Index (CPI) with details provided in Appendix E.2.
[b] Per system costs are presented here as the number of systems replaced per year may vary depending on conditions. These costs are escalated to 2017 dollars from 2009 costs presented in the 2009 WWWMP as detailed in Appendix E.2.
[c] Costs presented are from the 2012 Eastern Communities ESR (Stantec, 2012), see Appendix E.2 for details.
[d] The Eastern Communities ESR completes the planning phases of the Class EA process and its projects are approved and may proceed to detailed design and construction.
[e] Design and construction should potentially start in early 2018 based on current 2016 flows, see Post-Master Plan Update Revision

Next Steps

To complete the Lakeshore Water and Wastewater Master Plan Update Study process, the following activities will need to be undertaken:

- Advertise a “Notice of Completion” and place the Master Plan Update report on the public record for the required 30-day review period.
- Upon completion of the 30-day review period and assuming no Part II Order requests are submitted to the MOECC, the Master Plan Update report can be adopted by Lakeshore Council in the form of a Council Resolution.

Monitoring

The scheduling of planned projects is related to the anticipated growth in demand for water and sewer services.

Accordingly, the Town should closely monitor actual growth, water demand and wastewater flows and adjust the scheduling and implementation of related infrastructure projects as needed.

Specifically, the following actions are recommended:

1. Monitor actual water plant production records, wastewater treatment plan flows, and development growth annually and compare to Master Plan projections.
2. Establish and annually track the uncommitted reserve capacity of the Town’s existing water and wastewater treatment facilities in accordance with MOECC Guideline D-5-1 – Calculating and Reporting Uncommitted Reserve Capacity at Sewage and Water Treatment Plants, March 1995.
3. Collect water distribution system and wastewater collection system component attribute data on new installations as they are constructed and update the Town’s geographic information systems (GIS) database.
4. Implement a watermain and sewer rehabilitation / replacement program including water use and inflow and infiltration measures and review priorities based on data collected and results of studies.
5. The Town of Lakeshore Water and Wastewater Master Plan should be reviewed annually and updated every five (5) years to adjust to changing local conditions, new problems, and system

improvements which have been implemented and incorporated these changes into long-term planning for water and wastewater infrastructure.

Post-Master Plan Update Revision

Subsequent to the Master Plan Update review, the Denis St. Pierre WPCP flows for 2016 were reviewed (OCWA 2016 Annual Performance Report). They indicate an average treated flow of 12,292 m^3/d for 2016, which is greater than expected from the projected population forecast. If the 2016 recorded flows increase at a similar rate, the WPCP would reach capacity around 2024. If the future flows increase at a rate greater than the population forecast, the available WPCP capacity may be consumed even sooner than this.

To prevent the WPCP reaching its capacity, optimization and upgrade activities need to proceed. Currently, the plant is treating 91% of its rated capacity (based on 2016 treated flows). Generally, upgrades are initiated once a plant reaches 80% of its rated capacity. It is expected that upgrades could require two to three years to complete (to accommodate design, approvals, and construction), and therefore, even if upgrades start in 2018, the plant could reach 96% of its rated capacity prior to the completion of the new works. Simultaneous efforts to further optimize processes at the WPCP and continued pursuit of I/I reductions in the sewer system can free up some capacity at the plant, but an upgrade should be initiated in the near term.

Appendix G of Essex Region Source Protection Plan

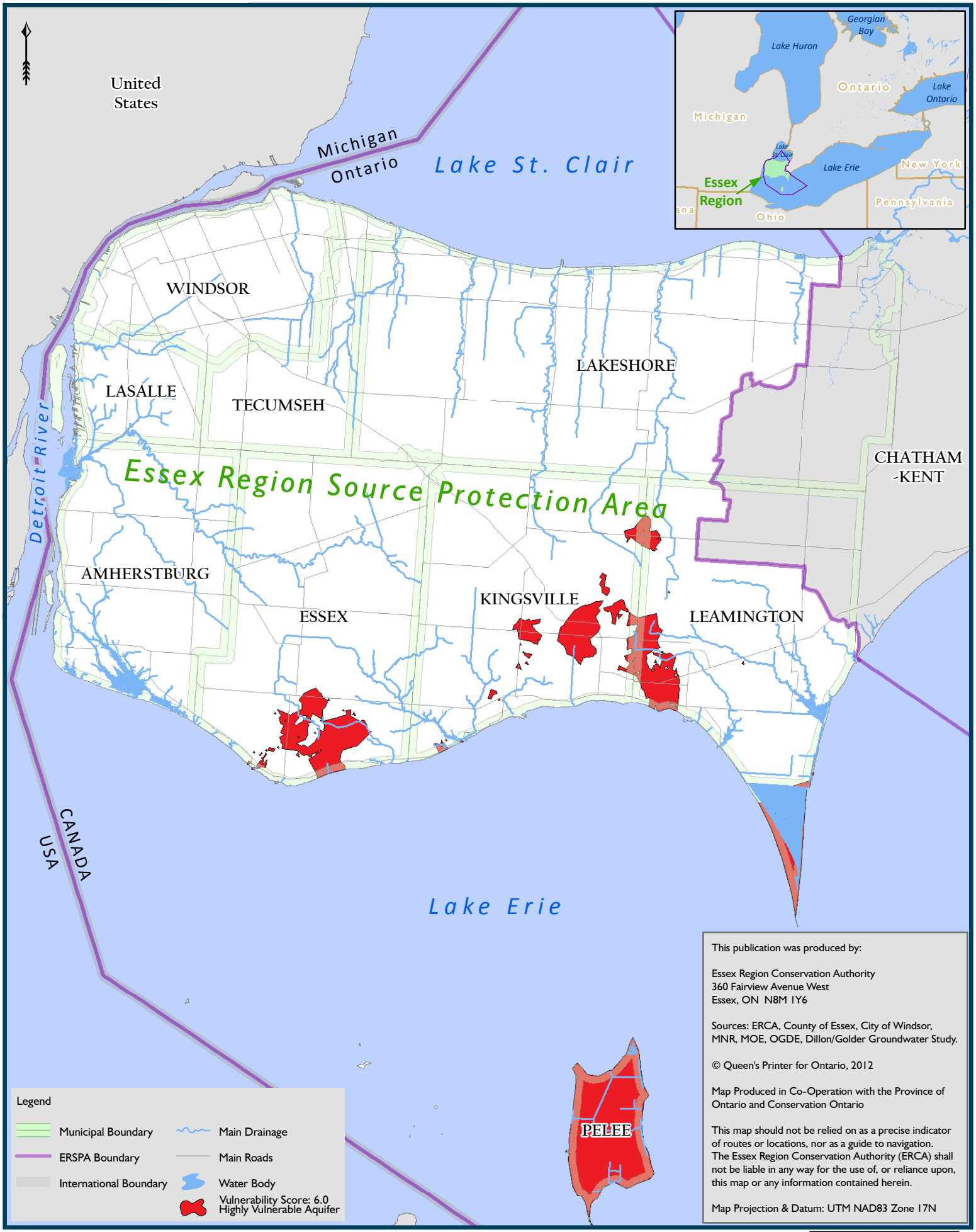
Map 4: Highly Vulnerable Aquifers

Map 5: Significant Groundwater Recharge Areas

Map 7: Lakeshore (Belle River) Water Treatment Plant IPZs and Vulnerability Scoring

Map 4: Highly Vulnerable Aquifers

Made possible by the Government of Ontario



Legend

- Municipal Boundary
- ERSPA Boundary
- International Boundary
- Main Drainage
- Main Roads
- Water Body
- Vulnerability Score: 6.0 Highly Vulnerable Aquifer

This publication was produced by:

Essex Region Conservation Authority
360 Fairview Avenue West
Essex, ON N8M 1Y6

Sources: ERCA, County of Essex, City of Windsor, MNR, MOE, OGDE, Dillon/Golder Groundwater Study.

Map Produced in Co-Operation with the Province of Ontario and Conservation Ontario

This map should not be relied on as a precise indicator of routes or locations, nor as a guide to navigation. The Essex Region Conservation Authority (ERCA) shall not be liable in any way for the use of, or reliance upon, this map or any information contained herein.

Map Projection & Datum: UTM NAD83 Zone 17N

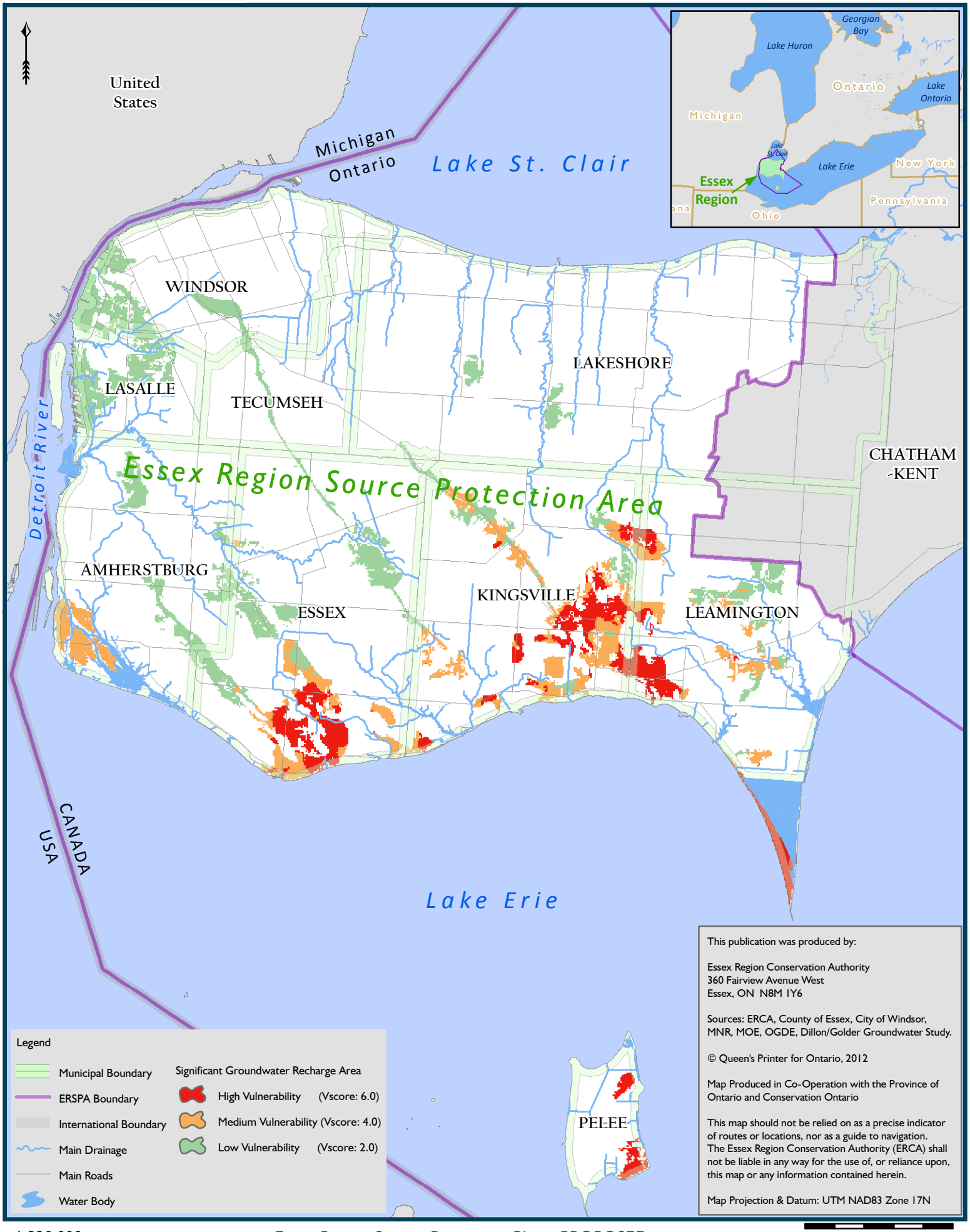
1:320,000

Essex Region Source Protection Plan - PROPOSED

0 10 Kilometers

Map 5: Significant Groundwater Recharge Areas

Made possible by the Government of Ontario



Legend

- Municipal Boundary
- ERSPA Boundary
- International Boundary
- Main Drainage
- Main Roads
- Water Body

Significant Groundwater Recharge Area

- High Vulnerability (Vscore: 6.0)
- Medium Vulnerability (Vscore: 4.0)
- Low Vulnerability (Vscore: 2.0)

This publication was produced by:

Essex Region Conservation Authority
360 Fairview Avenue West
Essex, ON N8M 1Y6

Sources: ERCA, County of Essex, City of Windsor, MNR, MOE, OGDE, Dillon/Golder Groundwater Study.

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Map Projection & Datum: UTM NAD83 Zone 17N

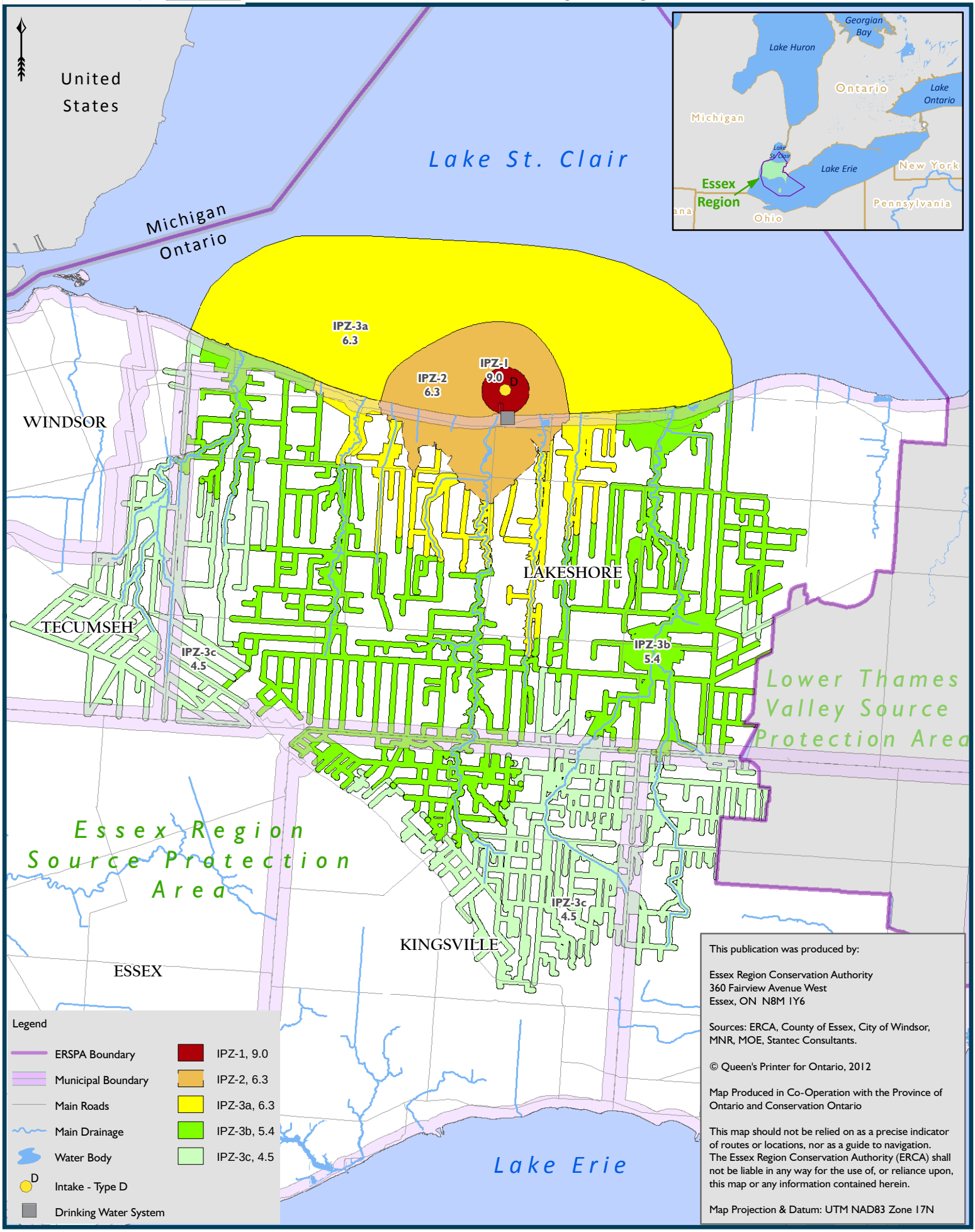
1:320,000

Essex Region Source Protection Plan - PROPOSED

0 10 Kilometers

Map 7: Lakeshore (Belle River) Water Treatment Plant
IPZs and Vulnerability Scoring

Made possible by the Government of Ontario



Legend

- ERSPA Boundary
- Municipal Boundary
- Main Roads
- Main Drainage
- Water Body
- D Intake - Type D
- Drinking Water System
- IPZ-1, 9.0
- IPZ-2, 6.3
- IPZ-3a, 6.3
- IPZ-3b, 5.4
- IPZ-3c, 4.5

This publication was produced by:

Essex Region Conservation Authority
360 Fairview Avenue West
Essex, ON N8M 1Y6

Sources: ERCA, County of Essex, City of Windsor, MNR, MOE, Stantec Consultants.

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Map Projection & Datum: UTM NAD83 Zone 17N

1:200,000

Essex Region Source Protection Plan - PROPOSED

0 5 Kilometers

MTCS Checklists

Criteria for Evaluating Archaeological Potential

Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes

Ontario

Ministry of Tourism, Culture and Sport

Programs & Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

Criteria for Evaluating Archaeological Potential

A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area may contain archaeological resources i.e., have archaeological potential
- it includes all areas that may be impacted by project activities, including – but not limited to:
  - the main project area
  - temporary storage
  - staging and working areas
  - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Archaeological assessment

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a licensed consultant archaeologist (see page 4 for definitions) to undertake an archaeological assessment.

The assessment will help you:

- identify, evaluate and protect archaeological resources on your property or project area
- reduce potential delays and risks to your project

Note: By law, archaeological assessments **must** be done by a licensed consultant archaeologist. Only a licensed archaeologist can assess – or alter – an archaeological site.

What to do if you:

- **find an archaeological resource**

  If you find something you think may be of archaeological value during project work, you must – by law – stop all activities immediately and contact a licensed consultant archaeologist

  The archaeologist will carry out the fieldwork in compliance with the *Ontario Heritage Act* [s.48(1)].

- **unearth a burial site**

  If you find a burial site containing human remains, you must immediately notify the appropriate authorities (i.e., police, coroner's office, and/or Registrar of Cemeteries) and comply with the *Funeral, Burial and Cremation Services Act*.

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – separate checklist
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages when completing this form.

Project or Property Name

Class Environmental Assessment, Denis St. Pierre Water Pollution Control Plant Expansion

Project or Property Location (upper and lower or single tier municipality)

276 Rourke Line Road, Town of Lakeshore, County of Essex

Proponent Name

The Corporation of the Town of Lakeshore

Proponent Contact Information

Kevin Girard, P.Eng. , Manager of Environmental Services, Tel: 519-728-1975 x239 email: kgirard@lakeshore.ca

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	☐	☑

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

	Yes	No
2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?	☐	☑

If Yes, do **not** complete the rest of the checklist. You are expected to follow the recommendations in the archaeological assessment report(s).

The proponent, property owner and/or approval authority will:

- summarize the previous assessment
- add this checklist to the project file, with the appropriate documents that demonstrate an archaeological assessment was undertaken e.g., MTCS letter stating acceptance of archaeological assessment report

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., environmental assessment document
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Are there known archaeological sites on or within 300 metres of the property (or the project area)?	☐	☑
4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property (or project area)?	☐	☑
5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or project area)?	☐	☑
6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?	☐	☑
7. Has the property (or project area) been recognized for its cultural heritage value?	☐	☑

If Yes to any of the above questions (3 to 7), do **not** complete the checklist. Instead, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment of your property or project area.

If No, continue to question 8.

	Yes	No
8. Has the entire property (or project area) been subjected to recent, extensive and intensive disturbance?	☑	☐

If Yes to the preceding question, do **not** complete the checklist. Instead, please keep and maintain a summary of documentation that provides evidence of the recent disturbance.

An archaeological assessment is not required.

If No, continue to question 9.

	Yes	No
9. Are there present or past water sources within 300 metres of the property (or project area)?	☐	☐

If Yes, an archaeological assessment is required.

If No, continue to question 10.

	Yes	No
10. Is there evidence of two or more of the following on the property (or project area)?	☐	☐

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

If Yes, an archaeological assessment is required.

If No, there is low potential for archaeological resources at the property (or project area).

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g., under the *Environmental Assessment Act, Planning Act* processes
- maintained by the property owner, proponent or approval authority

Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
  - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

In this context, the following definitions apply:

- **consultant archaeologist** means, as defined in Ontario regulation as an archaeologist who enters into an agreement with a client to carry out or supervise archaeological fieldwork on behalf of the client, produce reports for or on behalf of the client and provide technical advice to the client. In Ontario, these people also are required to hold a valid professional archaeological licence issued by the Ministry of Tourism, Culture and Sport.
- **proponent** means a person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.

1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may be already in place for identifying archaeological potential, including:

- one prepared and adopted by the municipality e.g., archaeological management plan
- an environmental assessment process e.g., screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport under the Ontario government's Standards & Guidelines for Conservation of Provincial Heritage Properties [s. B.2.]

2. Has an archaeological assessment been prepared for the property (or project area) and been accepted by MTCS?

Respond 'yes' to this question, if all of the following are true:

- an archaeological assessment report has been prepared and is in compliance with MTCS requirements
  - a letter has been sent by MTCS to the licensed archaeologist confirming that MTCS has added the report to the Ontario Public Register of Archaeological Reports (Register)
- the report states that there are no concerns regarding impacts to archaeological sites

Otherwise, if an assessment has been completed and deemed compliant by the MTCS, and the ministry recommends further archaeological assessment work, this work will need to be completed.

For more information about archaeological assessments, contact:

- approval authority
- proponent
- consultant archaeologist
- Ministry of Tourism, Culture and Sport at archaeology@ontario.ca

3. Are there known archaeological sites on or within 300 metres of the property (or project area)?

MTCS maintains a database of archaeological sites reported to the ministry.

For more information, contact MTCS Archaeological Data Coordinator at archaeology@ontario.ca.

4. Is there Aboriginal or local knowledge of archaeological sites on or within 300 metres of the property?

Check with:

- Aboriginal communities in your area
- local municipal staff

They may have information about archaeological sites that are not included in MTCS' database.

Other sources of local knowledge may include:

- property owner
- local heritage organizations and historical societies
- local museums
- municipal heritage committee
- published local histories

5. Is there Aboriginal knowledge or historically documented evidence of past Aboriginal use on or within 300 metres of the property (or property area)?

Check with:

- Aboriginal communities in your area
- local municipal staff

Other sources of local knowledge may include:

- property owner
- local heritage organizations and historical societies
- local museums
- municipal heritage committee
- published local histories

6. Is there a known burial site or cemetery on the property or adjacent to the property (or project area)?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulation Unit, Ontario Ministry of Consumer Services – for database of registered cemeteries
- Ontario Genealogical Society (OGS) – to locate records of Ontario cemeteries, both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to locate early cemeteries

In this context, 'adjacent' means 'contiguous', or as otherwise defined in a municipal official plan.

7. Has the property (or project area) been recognized for its cultural heritage value?

There is a strong chance there may be archaeological resources on your property (or immediate area) if it has been listed, designated or otherwise identified as being of cultural heritage value by:

- your municipality
- Ontario government
- Canadian government

This includes a property that is:

- designated under *Ontario Heritage Act* (the OHA), including:
  - individual designation (Part IV)
  - part of a heritage conservation district (Part V)
  - an archaeological site (Part VI)
- subject to:
  - an agreement, covenant or easement entered into under the OHA (Parts II or IV)
  - a notice of intention to designate (Part IV)
  - a heritage conservation district study area by-law (Part V) of the OHA
- listed on:
  - a municipal register or inventory of heritage properties
  - Ontario government's list of provincial heritage properties
  - Federal government's list of federal heritage buildings
- part of a:
  - National Historic Site
  - UNESCO World Heritage Site
- designated under:
  - *Heritage Railway Station Protection Act*
  - *Heritage Lighthouse Protection Act*
- subject of a municipal, provincial or federal commemorative or interpretive plaque.

To determine if your property or project area is covered by any of the above, see:

- Part A of the MTCS Criteria for Evaluating Potential for Built Heritage and Cultural Heritage Landscapes

Part VI – Archaeological Sites

Includes five sites designated by the Minister under Regulation 875 of the Revised Regulation of Ontario, 1990 (Archaeological Sites) and 3 marine archaeological sites prescribed under Ontario Regulation 11/06.

For more information, check Regulation 875 and Ontario Regulation 11/06.

8. Has the entire property (or project area) been subjected to recent extensive and intensive ground disturbance?

Recent: after-1960

Extensive: over all or most of the area

Intensive: thorough or complete disturbance

Examples of ground disturbance include:

- quarrying
- major landscaping – involving grading below topsoil
- building footprints and associated construction area
  - where the building has deep foundations or a basement
- infrastructure development such as:
  - sewer lines
  - gas lines
  - underground hydro lines
  - roads
  - any associated trenches, ditches, interchanges. **Note**: this applies only to the excavated part of the right-of-way; the remainder of the right-of-way or corridor may not have been impacted.

A ground disturbance does **not** include:

- agricultural cultivation
- gardening
- landscaping

Site visits

You can typically get this information from a site visit. In that case, please document your visit in the process (e.g., report) with:

- photographs
- maps
- detailed descriptions

If a disturbance isn't clear from a site visit or other research, you need to hire a licensed consultant archaeologist to undertake an archaeological assessment.

9. Are there present or past water bodies within 300 metres of the property (or project area)?

Water bodies are associated with past human occupations and use of the land. About 80-90% of archaeological sites are found within 300 metres of water bodies.

Present

- Water bodies:
  - primary - lakes, rivers, streams, creeks
  - secondary - springs, marshes, swamps and intermittent streams and creeks
- accessible or inaccessible shoreline, for example:
  - high bluffs
  - swamps
  - marsh fields by the edge of a lake
  - sandbars stretching into marsh

Water bodies not included:

- man-made water bodies, for example:
  - temporary channels for surface drainage
  - rock chutes and spillways
  - temporarily ponded areas that are normally farmed
  - dugout ponds
- artificial bodies of water intended for storage, treatment or recirculation of:
  - runoff from farm animal yards
  - manure storage facilities
  - sites and outdoor confinement areas

Past

Features indicating past water bodies:

- raised sand or gravel beach ridges – can indicate glacial lake shorelines
- clear dip in the land – can indicate an old river or stream
- shorelines of drained lakes or marshes
- cobble beaches

You can get information about water bodies through:

- a site visit
- aerial photographs
- 1:10,000 scale Ontario Base Maps - or equally detailed and scaled maps.

10. Is there evidence of two or more of the following on the property (or project area)?

- elevated topography
- pockets of well-drained sandy soil
- distinctive land formations
- resource extraction areas
- early historic settlement
- early historic transportation routes

- **Elevated topography**

  Higher ground and elevated positions - surrounded by low or level topography - often indicate past settlement and land use.

  Features such as eskers, drumlins, sizeable knolls, plateaus next to lowlands, or other such features are a strong indication of archaeological potential.

  Find out if your property or project area has elevated topography, through:

  - site inspection
  - aerial photographs
  - topographical maps

- **Pockets of well-drained sandy soil, especially within areas of heavy soil or rocky ground**

  Sandy, well-drained soil - in areas characterized by heavy soil or rocky ground - may indicate archaeological potential

  Find out if your property or project area has sandy soil through:

  - site inspection
  - soil survey reports

- **Distinctive land formations**

  Distinctive land formations include – but are not limited to:

  - waterfalls
  - rock outcrops
  - rock faces
  - caverns
  - mounds, etc.

  They were often important to past inhabitants as special or sacred places. The following sites may be present – or close to – these formations:

  - burials
  - structures
  - offerings
  - rock paintings or carvings

  Find out if your property or project areas has a distinctive land formation through:

  - a site visit
  - aerial photographs
  - 1:10,000 scale Ontario Base Maps - or equally detailed and scaled maps.

- **Resource extraction areas**

  The following resources were collected in these extraction areas:

  - food or medicinal plants e.g., migratory routes, spawning areas, prairie
  - scarce raw materials e.g., quartz, copper, ochre or outcrops of chert
  - resources associated with early historic industry e.g., fur trade, logging, prospecting, mining

  Aboriginal communities may hold traditional knowledge about their past use or resources in the area.

- **Early historic settlement**

  Early Euro-Canadian settlement include – but are not limited to:

  - early military or pioneer settlement e.g., pioneer homesteads, isolated cabins, farmstead complexes
  - early wharf or dock complexes
  - pioneers churches and early cemeteries

  For more information, see below – under the early historic transportation routes.

- **Early historic transportation routes** - such as trails, passes, roads, railways, portage routes, canals.

  For more information, see:

  - historical maps and/or historical atlases
    - for information on early settlement patterns such as trails (including Aboriginal trails), monuments, structures, fences, mills, historic roads, rail corridors, canals, etc.
    - Archives of Ontario holds a large collection of historical maps and historical atlases
    - digital versions of historic atlases are available on the Canadian County Atlas Digital Project
  - commemorative markers or plaques such as local, provincial or federal agencies
  - municipal heritage committee or other local heritage organizations
    - for information on early historic settlements or landscape features (e.g., fences, mill races, etc.)
    - for information on commemorative markers or plaques

Ontario

Ministry of Tourism, Culture and Sport

Programs & Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7

Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes

A Checklist for the Non-Specialist

The **purpose of the checklist** is to determine:

- if a property(ies) or project area:
  - is a recognized heritage property
  - may be of cultural heritage value
- it includes all areas that may be impacted by project activities, including – but not limited to:
  - the main project area
  - temporary storage
  - staging and working areas
  - temporary roads and detours

Processes covered under this checklist, such as:

- *Planning Act*
- *Environmental Assessment Act*
- *Aggregates Resources Act*
- *Ontario Heritage Act* – Standards and Guidelines for Conservation of Provincial Heritage Properties

Cultural Heritage Evaluation Report (CHER)

If you are not sure how to answer one or more of the questions on the checklist, you may want to hire a qualified person(s) (see page 5 for definitions) to undertake a cultural heritage evaluation report (CHER).

The CHER will help you:

- identify, evaluate and protect cultural heritage resources on your property or project area
- reduce potential delays and risks to a project

Other checklists

Please use a separate checklist for your project, if:

- you are seeking a Renewable Energy Approval under Ontario Regulation 359/09 – separate checklist
- your Parent Class EA document has an approved screening criteria (as referenced in Question 1)

Please refer to the Instructions pages for more detailed information and when completing this form.

Project or Property Name

Class Environmental Assessment, Denis St. Pierre Water Pollution Control Plant Expansion

Project or Property Location (upper and lower or single tier municipality)

276 Rourke Line Road, Town of Lakeshore, County of Essex

Proponent Name

The Corporation of the Town of Lakeshore

Proponent Contact Information

Kevin Girard, P.Eng. , Manager of Environmental Services, Tel: 519-728-1975 x239 email: kgirard@lakeshore.ca

Screening Questions

	Yes	No
1. Is there a pre-approved screening checklist, methodology or process in place?	☐	☑

If Yes, please follow the pre-approved screening checklist, methodology or process.

If No, continue to Question 2.

Part A: Screening for known (or recognized) Cultural Heritage Value

	Yes	No
2. Has the property (or project area) been evaluated before and found **not** to be of cultural heritage value?	☐	☑

If Yes, do **not** complete the rest of the checklist.

The proponent, property owner and/or approval authority will:

- summarize the previous evaluation and
- add this checklist to the project file, with the appropriate documents that demonstrate a cultural heritage evaluation was undertaken

The summary and appropriate documentation may be:

- submitted as part of a report requirement
- maintained by the property owner, proponent or approval authority

If No, continue to Question 3.

	Yes	No
3. Is the property (or project area):		
a. identified, designated or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value?	☐	☑
b. a National Historic Site (or part of)?	☐	☑
c. designated under the *Heritage Railway Stations Protection Act*?	☐	☑
d. designated under the *Heritage Lighthouse Protection Act*?	☐	☑
e. identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office (FHBRO)?	☐	☑
f. located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?	☐	☑

If Yes to any of the above questions, you need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report, if a Statement of Cultural Heritage Value has not previously been prepared or the statement needs to be updated

If a Statement of Cultural Heritage Value has been prepared previously and if alterations or development are proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No, continue to Question 4.

Part B: Screening for Potential Cultural Heritage Value

	Yes	No
4. Does the property (or project area) contain a parcel of land that:		
a. is the subject of a municipal, provincial or federal commemorative or interpretive plaque?	☐	☑
b. has or is adjacent to a known burial site and/or cemetery?	☐	☑
c. is in a Canadian Heritage River watershed?	☐	☑
d. contains buildings or structures that are 40 or more years old?	☐	☑

Part C: Other Considerations

	Yes	No
5. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area):		
a. is considered a landmark in the local community or contains any structures or sites that are important in defining the character of the area?	☐	☑
b. has a special association with a community, person or historical event?	☐	☑
c. contains or is part of a cultural heritage landscape?	☐	☑

If Yes to one or more of the above questions (Part B and C), there is potential for cultural heritage resources on the property or within the project area.

You need to hire a qualified person(s) to undertake:

- a Cultural Heritage Evaluation Report (CHER)

If the property is determined to be of cultural heritage value and alterations or development is proposed, you need to hire a qualified person(s) to undertake:

- a Heritage Impact Assessment (HIA) – the report will assess and avoid, eliminate or mitigate impacts

If No to all of the above questions, there is low potential for built heritage or cultural heritage landscape on the property.

The proponent, property owner and/or approval authority will:

- summarize the conclusion
- add this checklist with the appropriate documentation to the project file

The summary and appropriate documentation may be:

- submitted as part of a report requirement e.g. under the *Environmental Assessment Act, Planning Act* processes
- maintained by the property owner, proponent or approval authority

Instructions

Please have the following available, when requesting information related to the screening questions below:

- a clear map showing the location and boundary of the property or project area
  - large scale and small scale showing nearby township names for context purposes
- the municipal addresses of all properties within the project area
- the lot(s), concession(s), and parcel number(s) of all properties within a project area

For more information, see the Ministry of Tourism, Culture and Sport's Ontario Heritage Toolkit or Standards and Guidelines for Conservation of Provincial Heritage Properties.

In this context, the following definitions apply:

- **qualified person(s)** means individuals – professional engineers, architects, archaeologists, etc. – having relevant, recent experience in the conservation of cultural heritage resources.
- **proponent** means a person, agency, group or organization that carries out or proposes to carry out an undertaking or is the owner or person having charge, management or control of an undertaking.

1. Is there a pre-approved screening checklist, methodology or process in place?

An existing checklist, methodology or process may already be in place for identifying potential cultural heritage resources, including:

- one endorsed by a municipality
- an environmental assessment process e.g. screening checklist for municipal bridges
- one that is approved by the Ministry of Tourism, Culture and Sport (MTCS) under the Ontario government's Standards & Guidelines for Conservation of Provincial Heritage Properties [s.B.2.]

Part A: Screening for known (or recognized) Cultural Heritage Value

2. Has the property (or project area) been evaluated before and found not to be of cultural heritage value?

Respond 'yes' to this question, if all of the following are true:

A property can be considered not to be of cultural heritage value if:

- a Cultural Heritage Evaluation Report (CHER) - or equivalent - has been prepared for the property with the advice of a qualified person and it has been determined not to be of cultural heritage value and/or
- the municipal heritage committee has evaluated the property for its cultural heritage value or interest and determined that the property is not of cultural heritage value or interest

A property may need to be re-evaluated, if:

- there is evidence that its heritage attributes may have changed
- new information is available
- the existing Statement of Cultural Heritage Value does not provide the information necessary to manage the property
- the evaluation took place after 2005 and did not use the criteria in Regulations 9/06 and 10/06

Note: Ontario government ministries and public bodies [prescribed under Regulation 157/10] may continue to use their existing evaluation processes, until the evaluation process required under section B.2 of the Standards & Guidelines for Conservation of Provincial Heritage Properties has been developed and approved by MTCS.

To determine if your property or project area has been evaluated, contact:

- the approval authority
- the proponent
- the Ministry of Tourism, Culture and Sport

3a. Is the property (or project area) identified, designated or otherwise protected under the *Ontario Heritage Act* as being of cultural heritage value e.g.:

i. designated under the *Ontario Heritage Act*

- individual designation (Part IV)
- part of a heritage conservation district (Part V)

Individual Designation – Part IV

A property that is designated:

- by a municipal by-law as being of cultural heritage value or interest [s.29 of the *Ontario Heritage Act*]
- by order of the Minister of Tourism, Culture and Sport as being of cultural heritage value or interest of provincial significance [s.34.5]. **Note**: To date, no properties have been designated by the Minister.

Heritage Conservation District – Part V

A property or project area that is located within an area designated by a municipal by-law as a heritage conservation district [s. 41 of the *Ontario Heritage Act*].

For more information on Parts IV and V, contact:

- municipal clerk
- Ontario Heritage Trust
- local land registry office (for a title search)

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ii. subject of an agreement, covenant or easement entered into under Parts II or IV of the *Ontario Heritage Act*

An agreement, covenant or easement is usually between the owner of a property and a conservation body or level of government. It is usually registered on title.

The primary purpose of the agreement is to:

- preserve, conserve, and maintain a cultural heritage resource
- prevent its destruction, demolition or loss

For more information, contact:

- Ontario Heritage Trust - for an agreement, covenant or easement [clause 10 (1) (c) of the *Ontario Heritage Act*]
- municipal clerk – for a property that is the subject of an easement or a covenant [s.37 of the *Ontario Heritage Act*]
- local land registry office (for a title search)

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iii. listed on a register of heritage properties maintained by the municipality

Municipal registers are the official lists - or record - of cultural heritage properties identified as being important to the community.

Registers include:

- all properties that are designated under the *Ontario Heritage Act* (Part IV or V)
- properties that have not been formally designated, but have been identified as having cultural heritage value or interest to the community

For more information, contact:

- municipal clerk
- municipal heritage planning staff
- municipal heritage committee

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iv. subject to a notice of:

- intention to designate (under Part IV of the *Ontario Heritage Act*)
- a Heritage Conservation District study area bylaw (under Part V of the *Ontario Heritage Act*)

A property that is subject to a **notice of intention to designate** as a property of cultural heritage value or interest and the notice is in accordance with:

- section 29 of the *Ontario Heritage Act*
- section 34.6 of the *Ontario Heritage Act.* **Note**: To date, the only applicable property is Meldrum Bay Inn, Manitoulin Island. [s.34.6]

An area designated by a municipal by-law made under section 40.1 of the *Ontario Heritage Act* as a **heritage conservation district study area**.

For more information, contact:

- municipal clerk – for a property that is the subject of notice of intention [s. 29 and s. 40.1]
- Ontario Heritage Trust

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v. included in the Ministry of Tourism, Culture and Sport's list of provincial heritage properties

Provincial heritage properties are properties the Government of Ontario owns or controls that have cultural heritage value or interest.

The Ministry of Tourism, Culture and Sport (MTCS) maintains a list of all provincial heritage properties based on information provided by ministries and prescribed public bodies. As they are identified, MTCS adds properties to the list of provincial heritage properties.

For more information, contact the MTCS Registrar at registrar@ontario.ca.

3b. Is the property (or project area) a National Historic Site (or part of)?

National Historic Sites are properties or districts of national historic significance that are designated by the Federal Minister of the Environment, under the *Canada National Parks Act*, based on the advice of the Historic Sites and Monuments Board of Canada.

For more information, see the National Historic Sites website.

3c. Is the property (or project area) designated under the *Heritage Railway Stations Protection Act*?

The *Heritage Railway Stations Protection Act* protects heritage railway stations that are owned by a railway company under federal jurisdiction. Designated railway stations that pass from federal ownership may continue to have cultural heritage value.

For more information, see the Directory of Designated Heritage Railway Stations.

3d. Is the property (or project area) designated under the *Heritage Lighthouse Protection Act*?

The *Heritage Lighthouse Protection Act* helps preserve historically significant Canadian lighthouses. The Act sets up a public nomination process and includes heritage building conservation standards for lighthouses which are officially designated.

For more information, see the Heritage Lighthouses of Canada website.

3e. Is the property (or project area) identified as a Federal Heritage Building by the Federal Heritage Buildings Review Office?

The role of the Federal Heritage Buildings Review Office (FHBRO) is to help the federal government protect the heritage buildings it owns. The policy applies to all federal government departments that administer real property, but not to federal Crown Corporations.

For more information, contact the Federal Heritage Buildings Review Office.

See a directory of all federal heritage designations.

3f. Is the property (or project area) located within a United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage Site?

A UNESCO World Heritage Site is a place listed by UNESCO as having outstanding universal value to humanity under the Convention Concerning the Protection of the World Cultural and Natural Heritage. In order to retain the status of a World Heritage Site, each site must maintain its character defining features.

Currently, the Rideau Canal is the only World Heritage Site in Ontario.

For more information, see Parks Canada – World Heritage Site website.

Part B: Screening for potential Cultural Heritage Value

4a. Does the property (or project area) contain a parcel of land that has a municipal, provincial or federal commemorative or interpretive plaque?

Heritage resources are often recognized with formal plaques or markers.

Plaques are prepared by:

- municipalities
- provincial ministries or agencies
- federal ministries or agencies
- local non-government or non-profit organizations

For more information, contact:

- municipal heritage committees or local heritage organizations – for information on the location of plaques in their community
- Ontario Historical Society's Heritage directory – for a list of historical societies and heritage organizations
- Ontario Heritage Trust – for a list of plaques commemorating Ontario's history
- Historic Sites and Monuments Board of Canada – for a list of plaques commemorating Canada's history

4b. Does the property (or project area) contain a parcel of land that has or is adjacent to a known burial site and/or cemetery?

For more information on known cemeteries and/or burial sites, see:

- Cemeteries Regulations, Ontario Ministry of Consumer Services – for a database of registered cemeteries
- Ontario Genealogical Society (OGS) – to locate records of Ontario cemeteries, both currently and no longer in existence; cairns, family plots and burial registers
- Canadian County Atlas Digital Project – to locate early cemeteries

In this context, adjacent means contiguous or as otherwise defined in a municipal official plan.

4c. Does the property (or project area) contain a parcel of land that is in a Canadian Heritage River watershed?

The Canadian Heritage River System is a national river conservation program that promotes, protects and enhances the best examples of Canada's river heritage.

Canadian Heritage Rivers must have, and maintain, outstanding natural, cultural and/or recreational values, and a high level of public support.

For more information, contact the Canadian Heritage River System.

If you have questions regarding the boundaries of a watershed, please contact:

- your conservation authority
- municipal staff

4d. Does the property (or project area) contain a parcel of land that contains buildings or structures that are 40 or more years old?

A 40 year 'rule of thumb' is typically used to indicate the potential of a site to be of cultural heritage value. The approximate age of buildings and/or structures may be estimated based on:

- history of the development of the area
- fire insurance maps
- architectural style
- building methods

Property owners may have information on the age of any buildings or structures on their property. The municipality, local land registry office or library may also have background information on the property.

Note: 40+ year old buildings or structure do not necessarily hold cultural heritage value or interest; their age simply indicates a higher potential.

A building or structure can include:

- residential structure
- farm building or outbuilding
- industrial, commercial, or institutional building
- remnant or ruin
- engineering work such as a bridge, canal, dams, etc.

For more information on researching the age of buildings or properties, see the Ontario Heritage Tool Kit Guide Heritage Property Evaluation.

Part C: Other Considerations

5a. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) is considered a landmark in the local community or contains any structures or sites that are important to defining the character of the area?

Local or Aboriginal knowledge may reveal that the project location is situated on a parcel of land that has potential landmarks or defining structures and sites, for instance:

- buildings or landscape features accessible to the public or readily noticeable and widely known
- complexes of buildings
- monuments
- ruins

5b. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) has a special association with a community, person or historical event?

Local or Aboriginal knowledge may reveal that the project location is situated on a parcel of land that has a special association with a community, person or event of historic interest, for instance:

- Aboriginal sacred site
- traditional-use area
- battlefield
- birthplace of an individual of importance to the community

5c. Is there local or Aboriginal knowledge or accessible documentation suggesting that the property (or project area) contains or is part of a cultural heritage landscape?

Landscapes (which may include a combination of archaeological resources, built heritage resources and landscape elements) may be of cultural heritage value or interest to a community.

For example, an Aboriginal trail, historic road or rail corridor may have been established as a key transportation or trade route and may have been important to the early settlement of an area. Parks, designed gardens or unique landforms such as waterfalls, rock faces, caverns, or mounds are areas that may have connections to a particular event, group or belief.

For more information on Questions 5.a., 5.b. and 5.c., contact:

- Elders in Aboriginal Communities or community researchers who may have information on potential cultural heritage resources. Please note that Aboriginal traditional knowledge may be considered sensitive.
- municipal heritage committees or local heritage organizations
- Ontario Historical Society's "Heritage Directory" - for a list of historical societies and heritage organizations in the province

An internet search may find helpful resources, including:

- historical maps
- historical walking tours
- municipal heritage management plans
- cultural heritage landscape studies
- municipal cultural plans

Information specific to trails may be obtained through Ontario Trails.

APPENDIX C

- **C-1 Project Initiation**
- **C-2 Phase 3 Open House and Draft ESR**
- **C-3 First Nations Consultation**
- **C-4 Final ESR and Notice of Completion**

APPENDIX C-1

Project Initiation

DENIS ST. PIERRE WATER POLLUTION CONTROL PLANT EXPANSION CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF STUDY COMMENCEMENT

The Study

The Town of Lakeshore adopted its first comprehensive Water and Wastewater Master Plan in November 2008, and then an update of this Master Plan was undertaken and completed in 2017 in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment (EA) process.

The Water and Wastewater Master Plan and Update identified capacity issues within the Denis St. Pierre Wastewater System. The former Belle River community and the Maidstone urban are serviced by the Denis St. Pierre Wastewater System consisting of sanitary sewers, pumping stations, the Denis St. Pierre Water Pollution Control Plant (WPCP) and an outfall discharging to Lake St. Clair.

It is outlined in the Master Plan and Update that additional treatment capacity at the Denis St. Pierre Water Pollution Control Plant (WPCP) is required to support the existing services areas and the anticipated future growth through 2035. The Master Plan and Update were prepared in accordance with Phases 1 and 2 of the Class EA process to implement the preferred solution which involves capacity expansion of the Denis St. Pierre WPCP which is located on Rourke Line. Further information may be obtained by viewing the Water and Wastewater Master Plan at http://lakeshore.ca

The Town of Lakeshore is now undertaking Phases 3 and 4 of the Class EA process which will involve evaluation of alternative design concepts for the proposed Denis St. Pierre WPCP capacity expansion, and preparation of an Environmental Study Report documenting the activities and recommendations from the Class EA process.

Public Consultation

One of the key components of this Class EA is consultation with the public. This Notice of Study Commencement is a part of the public consultation process. The public is invited to submit comments and express any concerns with respect to the project. During the course of the Class EA as the study work is nearing completion, the public will be invited to an Open House to review the findings of the study and to submit any further comments and concerns. The public will be notified in advance of the Open House through publication of notices in local newspapers.

If you have any questions or wish to be added to the study mailing list, please contact:

Mr. Kevin Girard, P.Eng.
Manager of Environmental Services
419 Notre Dame Street
Belle River, Ontario N0R 1A0
Phone: 519-728-1975 x 239
Fax: 519-728-9530
Email: kgirard@lakeshore.ca

or

Dr. Jian Li, P. Eng.
Stantec Consulting Ltd.
140 Ouellette Place Suite 100
Windsor, Ontario N8X 1L9
Phone: 519-966-2250 x 240
Fax: 519-966-5523
Email: jian.li@stantec.com

Stantec Consulting Ltd
100-140 Ouellette Place, Windsor ON N8X 1L9

April 3, 2019
File: 165620173

«Company»
«Address1»
«Address2»
«Address3»
«City», Ontario
«PostalCode»

Attention: **«FirstName»**
«Title»

Dear Sir/Madam:

Reference: **Denis St. Pierre Water Pollution Control Plant Expansion**
Class Environmental Assessment
Town of Lakeshore

Following completion of the Water and Wastewater Plan in November 2008 and its update in December 2017 which included Phases 1 & 2 of the Class EA process for the subject project, the Town of Lakeshore is now undertaking Phases 3 & 4 Class EA for the Denis St. Pierre Water Pollution Control Plant Expansion Project. Attached for your information is an Introductory Brief which provides a description of the existing Denis St. Pierre Water Pollution Control Plant and the problems being addressed by this Class EA, the preferred solutions that have been identified and a general outline of the work plan and timetable. Also attached is a copy of the Notice of Study Commencement which will be published in local newspapers.

We trust this information is satisfactory for your present purposes. You are invited to submit any comments you may have at this stage of the project. Please advise if you wish to be kept informed on the project as it proceeds to completion. If you do not express any interest in the project, you will be removed from the mailing list of contacts.

Sincerely,

STANTEC CONSULTING LTD.

Jian Li, Ph.D., P. Eng., PE
Project Manager
Phone: (519) 966-2250
Fax: (519) 966-5523
jiian.li@stantec.com

Attachment: Notice of Study Commencement
Introductory Brief

Stantec

INTRODUCTORY BRIEF

TO MANDATORY CONTACTS AND REVIEW AGENCIES

DENIS ST. PIERRE WATER POLLUTION CONTROL PLANT EXPANSION CLASS EA

TOWN OF LAKESHORE

1.0 BACKGROUND

The Town of Lakeshore adopted its first comprehensive Water and Wastewater Master Plan in November 2008, and then an update of this Master Plan was undertaken and completed in 2017 in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment (EA) process.

The Water and Wastewater Master Plan and Update identified capacity issues within the Denis St. Pierre Wastewater System. The former Belle River community and the Maidstone urban are serviced by the Denis St. Pierre Wastewater System consisting of sanitary sewers, pumping stations, the Denis St. Pierre Water Pollution Control Plant (WPCP) and an outfall discharging to Lake St. Clair.

It is outlined in the Master Plan and Update that additional treatment capacity at the Denis St. Pierre Water Pollution Control Plant (WPCP) is required to support the existing services areas and the anticipated future growth through 2035. The Master Plan and Update were prepared in accordance with Phases 1 and 2 of the Class EA process to implement the preferred solution which involves capacity expansion of the Denis St. Pierre WPCP which is located on Rourke Line. Further information may be obtained by viewing the Water and Wastewater Master Plan at http://lakeshore.ca

The Town of Lakeshore is now undertaking Phases 3 and 4 of the Class EA process which will involve evaluation of alternative design concepts for the proposed Denis St. Pierre WPCP capacity expansion, and preparation of an Environmental Study Report documenting the activities and recommendations from the Class EA process.

2.0 EXISTING DENIS ST. PIERRE WASTEWATER SYSTEM

The Denis St. Pierre Sewage Works (formerly Belle River / Maidstone Sewage Works) services the urban areas between Manning Road and Charron Line Road north of the Canada Pacific Rail (CPR) tracks by the sanitary sewage works system. This system consists of sanitary sewers, pumping stations, and the Denis St. Pierre WPCP (formerly the Belle River/Maidstone WPCP), which is located on Rourke Line. The system was developed by the Ministry of the Environment, Conservation and Parks (MECP) as a Provincial Sewage Works Project that was

constructed and built between 1974 and 1981 under a total of ten (10) construction contracts.

The Denis St. Pierre WPCP is located on Rourke Line Road south of County Road 22 and provides secondary level biological treatment. The treatment plant was designed for an average daily sewage flow of 14,500 m^3/day and a peak flow capacity of 35,069 m^3/d. The Denis St. Pierre WPCP has recently been rerated to an average daily sewage flow of 14,500 m^3/day. The treatment process consists of fine screening, grit removal, three extended aeration tanks, two final settling tanks, and UV disinfection. Waste activated sludge is aerobically digested for stabilization and the stabilized biosolids are gravity-thickened and dewatered by centrifuges. The dewatered biosolids are hauled to an offsite storage facility and ultimately land applied.

Treated effluent is discharged into Lake St. Clair through a 900-mm-diameter plant outfall sewer. The existing outfall sewer currently has a peak design capacity of 67,855 m^3/d and extends approximately 600 m into Lake St. Clair. Effluent discharges through nozzles at the end of the outfall to assist in dispersing the effluent.

3.0 PROBLEM STATEMENT

The existing capacity of the Denis St. Pierre WPCP is not adequate to accommodate the projected future flows from the Belle River/Maidstone wastewater service area. Additional treatment capacity at the Denis St. Pierre WPCP is required to support the existing services areas and the anticipated future growth through 2035.

The estimated wastewater flow rate based on the last five-year rolling average (2014 to 2018) is approximately 87 percent of the plant's design capacity. The projected wastewater flows to the Denis St. Pierre WPCP indicates the capacity of the WPCP will be met around 2024, assuming linear flow increase. However, an average treated flow of 14,228 m^3/d was recorded for 2018, which is greater than expected from the projected population forecast. If the future flows increase at a rate greater than the population forecast, the available WPCP capacity may be consumed in 2019.

4.0 PREFERRED SOLUTIONS

As part of the Phase 2 Class EA process the Lakeshore Water and Wastewater Master Plan included consideration and documentation of a number of alternative concepts and solutions with respect to the problems of insufficient treatment capacity at the Denis St. Pierre WPCP. The preferred solutions are the capacity

expansion and upgrades of the Denis St. Pierre WPCP to accommodate the existing services areas and the anticipated future growth through 2035.

5.0 PHASES 3 & 4 OF THE CLASS EA

The work that will be undertaken under Phases 3 & 4 of the Class EA process will follow the planning and design process of the Municipal Engineers Association (MEA) Class EA, October 2000, as amended in 2007, 2011 & 2015). The following is a general outline of the tasks that will be included.

6.0 Phase 3

- Publish Notice of Study Commencement.
- Notify mandatory contacts and review agencies of the Study Commencement.
- Identify impacts on the environment of alternative design concepts and the appropriate mitigating measures.
- Conduct a detailed evaluation of alternative designs for the Denis St. Pierre WPCP based on effluent discharge criteria, biosolids management, buffer zone requirements, ultimate plant configuration, etc.
- Summarize preferred designs for the capacity expansion and upgrades of the Denis St. Pierre WPCP.
- Prepare drawings showing the treatment facility flow schematic, plant layout and hydraulic profile.
- Prepare opinions of probable costs of the selected designs including capital and operating costs.
- Prepare preliminary ESR, review with Municipal Administration and present to Council
- Circulate the preliminary ESR to mandatory contacts and review agencies.
- Publish Notice of Public Meeting or Open House.
- Evaluate feedback from public meeting, mandatory contacts and review agencies.

- Select preferred designs for the capacity expansion and upgrades of the Denis St. Pierre WPCP.

7.0 Phase 4

- Update ESR to identify the preferred design and include all comments received from the public, mandatory contacts and review agencies together with responses to comments received.

- File ESR with Town Clerk.

- Publish Notice of Study Completion and allow 30 calendar days for further comments and input.

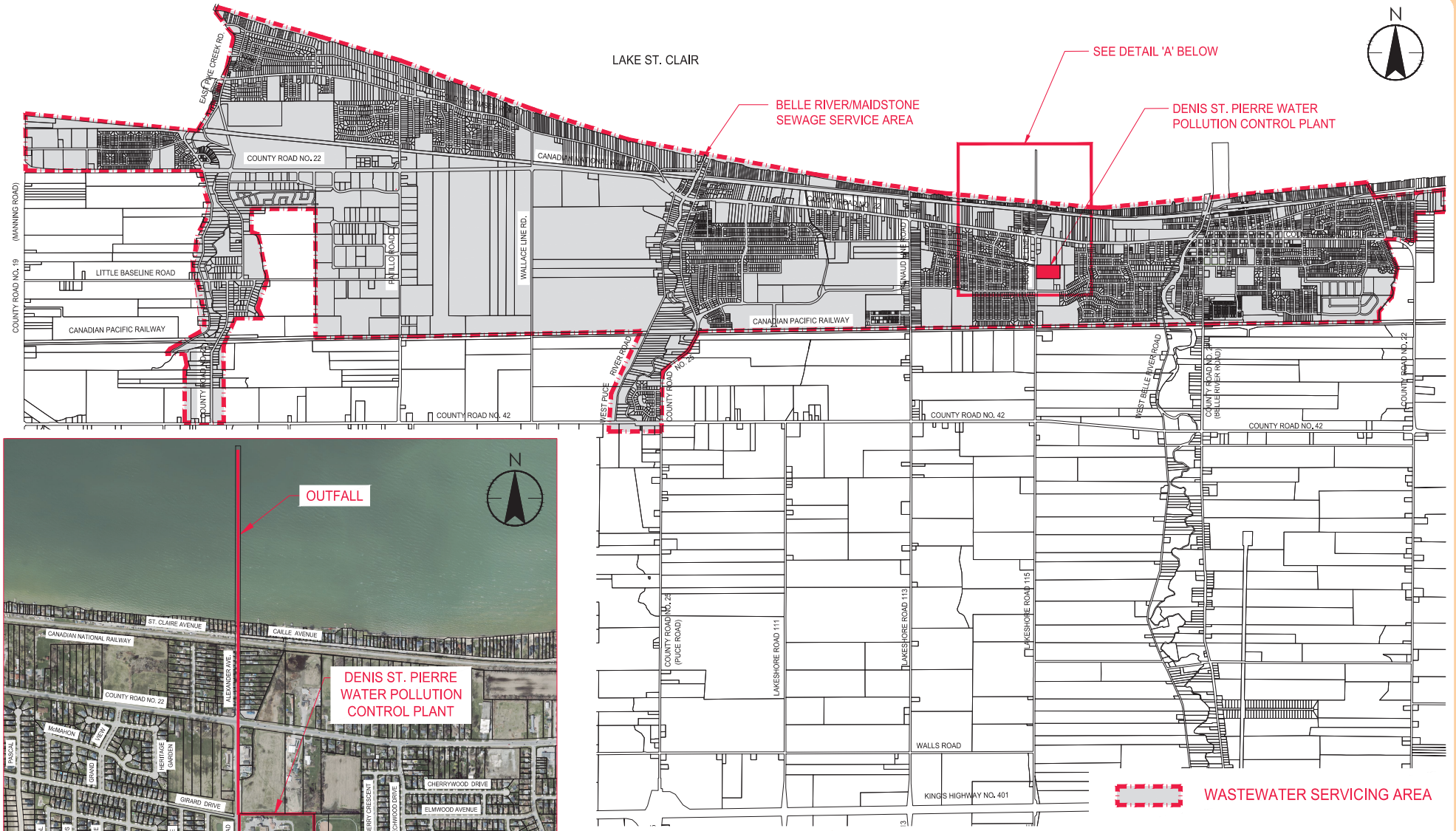
- If request received for “Part II Order” attempt to resolve concerns in conjunction with Town. If requested, submit copy of ESR and Project File to MOE EA Branch. Upon resolution, complete ESR incorporating details of the “Part II Order”.

- If there is no “Part II Order”, add any comments received to the ESR.

- Obtain Council resolution accepting final ESR.

8.0 PROJECT SCHEDULE

The work outlined above for Phases 3 & 4 of the Class EA is expected to be completed in approximately 48 weeks subject to response time from mandatory contacts and review agencies and also subject to whether or not a “Part II Order” is requested.



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Stantec

TOWN OF LAKESHORE
DENIS ST. PIERRE WATER POLLUTION CONTROL PLANT EXPANSION EA
WASTEWATER SERVICING AREA

PROJECT NO. 165620173	0 400 1200 2000m	DRAWING NO.
PROJECT NO. 2019.04.02	1:40000	FIGURE 1

W:\active\165600944_lakeshore_water_and_wastewater_master_plan\design\report\FIGURE-10.dwg
2008-10-09 08:56AM By: qkha

Title	First Name	Surname	Job Title	Organization	Address	City/Prov	Postal Code
Conservation Authorities							
Mr.	Richard	Wyma	General Manager	Essex Region Conservation Authority	360 Fairview Avenue West, Suite 311	Essex, ON	N8M 1Y6
Mr.	Tim	Byrne	Director, Watershed Management Services	Essex Region Conservation Authority	360 Fairview Avenue West, Suite 311	Essex, ON	N8M 1Y6
Mr.	Michael	Nelson	Watershed Planner	Essex Region Conservation Authority	360 Fairview Avenue West, Suite 311	Essex, ON	N8M 1Y6
Dr.	Katie	Stammler	Water Quality Scientist/Source Water Protection Project Manager	Essex Region Conservation Authority	360 Fairview Avenue West, Suite 311	Essex, ON	N8M 1Y6
Mr.	Jason	Wintermute	Water Management Supervisor	Lower Thames Valley Conservation Authority	100 Thames Street	Chatham, ON	N7L 2Y8
Ms.	Claire	Sanders	RAP Coordinator	Detroit River Canadian Cleanup	360 Fairview Avenue West, Suite 311	Windsor, ON	N8M 1Y6
Ms.	Averil	Parent	Coordinator	Windsor Essex Environment Committee	c/o 350 City Hall Square West	Windsor, ON	N9A 6S1
Local Public Services							
Chief	Bruce	Krauter	Chief	Essex-Windsor EMS	360 Fairview Ave West	Essex, ON	N8M 1Y6
Mr.	Chris	Grant	Deputy Chief	Essex-Windsor EMS	920 Mercer Street	Windsor, ON	N9A 1N6
Mr.	Barry	Horrobin	Director of Planning & Physical Resources	Windsor Police Service	150 Goyeau Street, PO Box 60	Windsor, ON	N9A 6J5
Fire Chief	Stephen	Laforet	Fire Chief	Windsor Fire and Rescue	815 Goyeau Street	Windsor, ON	N9A 1H7
Mr.	Doug	Gooding	Deputy Chief of Operations	Windsor Fire and Rescue	815 Goyeau Street	Windsor, ON	N9A 1H7
Mr.	Beth	Krauter		Central Ambulance Communications Centre	4510 Rhodes Drive, Suite 320	Windsor, ON	N8W 5K5
Sgt.	Rick	Tonial	Detachment Commander	Ontario Provincial Police	963 Lesperance Road	Tecumseh, ON	N8N 1W9
Staff Sgt	Ed	Marocko		Ontario Provincial Police	1219 Hicks Road, PO Box 910	Essex, ON	N8M 2Y2
Ms.	Brian	Yeomans	Operations Manager	Downtown Windsor Business Improvement Association	419 Pelissier St.	Windsor, ON	N9A 4L2
Sir/Madam				Municipal Property Assessment Corporation	1695 Manning Road, Unit 195	Tecumseh, ON	N8N 2L9
Mr.	Rakesh	Naidu	President & CEO	Windsor-Essex Regional Chamber of Commerce	2575 Ouellette Place	Windsor, ON	N8X 1L9
Mr.	Derek	Coronardo	Coordinator	Citizens Environmental Alliance of Southwestern Ontario	1950 Ottawa Street	Windsor, ON	N8Y 1R7
Ms.	Lisa	Tulen	President	Citizens Environmental Alliance of Southwestern Ontario	1950 Ottawa Street	Windsor, ON	N8Y 1R7
Mr.	Steve	Marks	Vice-President	Essex County Field Naturalist's Club	C/O Ojibway Nature Centre 5200 Matchette Road	Windsor, ON	N9C 4E8
Mr.	Paul	Pratt	President	Essex County Field Naturalist's Club	5200 Matchette Road	Windsor, ON	N9C 4E8
Ms.	Susan	Budden	Business Development Manager	Ontario Clean Water Agency	1 Yonge Street, Suite 1700	Toronto, Ontario	M5E 1E5
Mr.	Rob	Dobos	Head	Environment Canada, Ontario Region	867 Lakeshore Road, P.O. Box 5050	Burlington, ON	L7R 4A6

Title	First Name	Surname	Job Title	Organization	Address	City/Prov	Postal Code
Mr.	John	Shaw	Manager	Great Lakes Sustainability Fund	867 Lakeshore Road, PO Box 5050	Burlington, ON	L7R 4A6
Ms.	Sandra	Kok	Acting Manager	Great Lakes Sustainability Fund	867 Lakeshore Road, PO Box 5050	Burlington, ON	L7R 4A6
	Superintendent			Canadian Coast Guard c/o ASI Group Ltd	120 Seaway Road	Sarnia, ON	N7T 8A5
Ms.	Celina	Russell		Fisheries and Oceans Canada	520 Exmouth Street	Sarnia, ON	N7T 8B1
Ms.	Sara	Eddy	Fish Habitat Biologist	Fisheries and Oceans Canada - Central and Arctic Region	867 Lakeshore Road, PO Box 5050	Burlington, ON	L7R 4A6
Ms.	Suzanne	Shea		Transport Canada Marine	100 Front Street South	Sarnia, ON	N7T 2M4
Mr.	Steven	C Salmons	President & CEO	Windsor Port Authority	3190 Sandwich Street	Windsor, ON	N9C 1A6
Mr.	Vince	Diano	Manager of Procurement	Windsor-Detroit Bridge Authority	100 Ouellette Ave, Suite 400	Windsor, ON	N9A 6T3
Mr.	Darren	Winger	Regional Advisor	Ministry of Citizenship, Immigration & International Trade / Ministry of Tourism, Culture & Sport	221 Mill Street	Windsor, ON	N9C 2R1
Ms.	Katherine	Kirzati	Heritage Planner	Ministry of Tourism, Culture and Sport	401 Bay Street, Suite 1700	Toronto, ON	M7A 0A7
Ms.	Karla	Barboza	Team Lead, Heritage	Ministry of Tourism, Culture and Sport	401 Bay Street, Suite 1700	Toronto, ON	M7A 0A7
Ms.	Amanda	Liu	Manager of Business Planning and Finance Unit (Infrastructure)	Ministry of Economic Development, Job Creation and Trade	777 Bay Street, 4th Floor, Suite 425	Toronto, ON	M5G 2E5
Mr.	Craig	Newton	Regional Environnmental Planner / Regional EA Coordinator	Ministry of the Environment, Conservation and Parks	733 Exert Road	London , ON	N6E 1L3
Mr.	Shawn	Howard	Supervisor	Ministry of the Environment, Conservation and Parks	4510 Rhodes Drive, Unit 620	Windsor, ON	N8W 5K5
Ms.	Emily	Awad	Provincial Officer	Ministry of the Environment, Conservation and Parks	4510 Rhodes Drive, Unit 620	Windsor, ON	N8W 5K5
Mr.	Ken	Yaraskavitch	Supervisor	Ontario Ministry of Natural Resources	870 Richmond Street, P.O. Box 910	Chatham, ON	N7M 5L3
Ms.	Sherry	Pineo	Resources Management Supervisor	Ministry of Natural Resources and Forestry	615 John Street North	Aylmer, ON	N5H 2S8
Ms.	Amanda	McCloskey	District Planner	Ministry of Natural Resources and Forestry	615 John Street North	Aylmer, ON	N5H 2S8
Mr.	Erick	Boyd	Manager - Community Planning and Development	Ministry of Municipal Affairs and Housing	659 Exeter Road, 2nd Floor	London, ON	N6E 1L3
Mr.	David	Stubbs	Planner - Community Planning and Development	Ministry of Municipal Affairs and Housing	659 Exeter Road, 2nd Floor	London, ON	N6E 1L3
Mr.	Kevin	Laidley	Regional Manager	Ontario Ministy of Agriculture, Food and Rural Affairs	667 Exeter Road	London, ON	N6E 1L3
Mr.	Terri	Bulman	Manager - Environmental Stewardship Policy	Ontario Ministy of Agriculture, Food and Rural Affairs	1 Stone Road West, 2nd floor	Guelph, ON	N1G 4Y2

Title	First Name	Surname	Job Title	Organization	Address	City/Prov	Postal Code
Ms.	Jodie	Lucente	Corridor Management Planner	Ontario Ministry of Transportation	659 Exeter Road	London, ON	N6E 1L3
Ms.	Cathy	Giesbrecht	Head - Environmental	Ontario Ministry of Transportation	659 Exeter Road	London, ON	N6E 1L3
Mr.	Martin	Favell	Planning & Design Head	Ontario Ministry of Transportation	659 Exeter Road	London, Ontario	N6E 1L3
Ms.	Joanne	Brown	Regional Issues and Integration Manager	Ministry of Community and Social Services, West Region Office	P.O. Box 5217	London, ON	N6A 5R1
Mr.	Sean	Court	Director, Strategic Policy Branch	Ministry of Health and Long Term Care	438 University Ave, 10th Floor	Toronto, ON	M5G 2K8
Local Municipalities							
Mr.	Kevin	Girard	Manager of Environmental Services	Town of Lakeshore	419 Notre Dame Street	Belle River, ON	N0R 1A0
Mrs.	Jane	Mustac	County Engineer	County of Essex	360 Fairview Avenue West	Essex, Ontario	N8M 1Y6
Mr.	Bill	King	County Planning Department	County of Essex	360 Fairview Avenue West	Essex, Ontario	N8M 1Y6
Mr.	Peter	Marra	Manager of Water and Wastewater	Town of LaSalle	5950 Malden Road	LaSalle, Ontario	N9H 1S4
Ms.	Antonietta	Giofu	Director of Engineering & Public Works	Town of Amherstburg	271 Sandwich Street South	Amherstburg, ON	N9V 2A5
Mr.	Phil	Bartnik	Director Public Works & Environmental Services	Town of Tecumseh	917 Lesperance Road	Tecumseh, ON	N8N 1W9
Mr.	Peter	Neufeld	Chief Administravie Officer	Municipality of Leamington	111 Erie Street North	Leamington, ON	N8H 2Z9
Mr.	Chris	Nepszy	Chief Administravie Officer	Town of Essex	33 Talbot Street South	Essex, ON	N8M 1A8
Mr.	Onorio	Colucci	Chief Administravie Officer	City of Windsor	350 City Hall Square West	Windsor, ON	N9A 6S1
Ms.	Peggy	Van Mierlo-West	Chief Administravie Officer	Town of Kingsville	2021 Division Road North	Kingsville, ON	N9Y 2Y9
Mr.	Don	Shropshire	Chief Administravie Officer	Municpality of Chatham Ken	315 King Street West P.O. Box 640	Chatham, ON	N7M 5K8
Mr.	Tim	Sunderland	General Manager	Chatham-Kent Public Utilities	325 Grand Ave E	Chatham, ON	N7L 1W9
Ms.	Erin	Kelly	Director of Education	Greater Essex County District School Board	451 Park Street West	Windsor, ON	N9A 4W7
Mr.	Stephen	Fields	Communications Coordinator	Windsor Essex Catholic District School Board	1325 California Ave	Windsor, ON	N9B 3Y6
Ms.	Tracy	Ramsey	Essex M.P.	Consituency Office	316 Talbot Street N, Unit 6	Essex, ON	N8M 2E1
Mr.	Phil	Wong	Manager of Environmental Health	Windsor Essex County Health Unit	1005 Ouellette Ave	Windsor, ON	N9A 4J8

Title	First Name	Surname	Job Title	Organization	Address	City/Prov	Postal Code
Utilities							
Mr.	Chris	Manzon	Director, Engineering	ENWIN Utilities	4545 Rhodes Drive , PO Box 1625 Stn A	Windsor, ON	N8W 5T1
Mr.	Randy	Matis		Bell Canada	1149 Goyeau Street, PO Box 1601	Windsor, ON	N9A 1H9
Mr.	David	Cowing	Coordinator	Bell Canada	1149 Goyeau Street, PO Box 1601	Windsor, ON	N9A 1H9
Mr.	Clifford	Trepanier		Bell Canada	1149 Goyeau Street, PO Box 1601	Windsor, ON	N9A 1H9
Mr.	Tyson	Fuerth		Bell Canada	1149 Goyeau Street, PO Box 1601	Windsor, ON	N9A 1H9
Mr.	Bill	Sorrell		Cogeco Cable Services	2225 Dougall Avenue	Windsor, ON	N8X 5A7
				Essex Terminal Railway Company	1601 Lincoln Road	Windsor, ON	N8Y 2J3
Ms.	Shirley	Brundritt		Union Gas Ltd	50 Keil Drive North	Chatham, ON	N7M 5M1
Mr.	Stan	Bulkiewicz	Operations Manager	Hydro One	125 Irwin Avenue	Essex, ON	N8M 2T3
Mr.	Paul	Dockrill		Hydro One	P.O. Box 4300	Markham, ON	L3R 5Z5
Ms.	Jenny	Seo		Hydro One	483 Bay Street, 13th Floor North Tower	Toronto, ON	M5G 2P5
Mr.	Rodney	Bouchard	General Manager	Union Water Supply System Joint Board Management	1615 Union Ave P.O. Box 359	Ruthvan, ON	N0P 2G0
Mr.	Dave	Jubenville	General Manager	Ontario Clean Water Agency	276 Rourke Line Road, RR #3	Belle River, ON	N0R 1A0
Ms.	Amber	New	Director, Business Development	Plains Midstream	Box 7277	Windsor, ON	N9C 0C4
Mr.	Raymond	Tracey	President & CEO	Essex Power Corporation	2199 Blackacre Dr. Suite 2	Oldcastle, ON	N0R 1L0
Mr.	Michael	Audet	Chief Executive Officer	ELK Energy Inc	172 Forest Ave	Essex, ON	N8M 3E4
Aboriginal Agencies							
Ms.	Leslie	Brewer-Palhazi		Ministry of Aboriginal Affairs	9th Floor, 160 Bloor Street East	Toronto, ON	M7A 2E6
Ms.	Allison	Berman	Regional Subject Expert	Aboriginal Affairs and Northern Development Canada	10 Wellington St	Gatineau, QC	K1A OH4
Mr.	Corwin	Troje	Manager (Acting)	Ministry of Aboriginal Affairs	9th Floor, 160 Bloor Street East	Toronto, ON	M7A 2E6
Ms.	Johnson	Ashley		Ministry of Aboriginal Affairs	9th Floor, 160 Bloor Street East	Toronto, ON	M7A 2E6
Ms.	Jennifer	Whiteye	Executive Director	Southern First Nations Secretariat	22361 Austin Line	Bothwell, ON	N0P 1L0
Ms.	Leea	Litzgus	Associate Regional Director	Indigenous & Northern Affairs Canada, Ontario Region	25 St Clair Ave East, 8th Floor	Toronto, ON	M4T 1M2
First Nation Communities/Métis Groups							
Mr.	Dean	Jacobs	Heritage Centre Director	Walpole Island First Nation / Bkejwanong Territory	R.R. #3	Wallaceburg, ON	N8A 4K9

Title	First Name	Surname	Job Title	Organization	Address	City/Prov	Postal Code
Chief	Daniel	Miskokomon	Chief	Walpole Island First Nation / Bkejwanong Territory	117 Tahgahoning Road,R.R. #3	Wallaceburg, ON	N8A 4K9
Ms.	Janet	MacBeth	Project Review Coordinator	Walpole Island First Nation / Bkejwanong Territory	117 Tahgahoning Road,R.R. #3	Wallaceburg, ON	N8A 4K9
Chief	Mary	Duckworth	Chief	Caldwell First Nation	14 Orange Street	Leamington, ON	N8H 1P5
Ms.	Nikki	Orosz	Acting Director of Operations	Caldwell First Nation	14 Orange Street	Leamington, ON	N8H 1P5
Chief	Joanne	Rogers	Chief	Aamjiwnaang First Nation	978 Tashmoo Avenue	Sarnia, ON	N7T 7H5
Ms.	Sharilyn	Johnston	Environmental Coordinator	Aamjiwnaang First Nation	978 Tashmoo Avenue	Sarnia, ON	N7T 7H5
Ms.	Christine	Rogers	Environment Worker	Aamjiwnaang First Nation	978 Tashmoo Avenue	Sarnia, ON	N7T 7H5
Chief	Denise	Stonefish	Chief	Moravian of the Thames (Delaware Nation)	14760 School House Line, RR 3	Thamesville, ON	N0P 2K0
Mr.	Aly	Alibhai	Director, Lands, Resources and Consultations	Métis Nation of Ontario	75 Sherbourne Street, Suite 311	Toronto, ON	M5A 2P9
Chief	Tom	Bressette	Chief	Chippewas of Kettle & Stony Point First Nation	6247 Indian Lane, RR#2	Forest, ON	N0N 1J1
Ms.	Valerie	George	Consultation Coordinator	Chippewas of Kettle & Stony Point First Nation	6247 Indian Lane, RR#2	Forest, ON	N0N 1J1
Chief	Henry	Myeengun	Chief	Chippewas of the Thames First Nation	320 Chippewa Road	Muncey, ON	N0L 1Y0
Ms.	Kelly	Riley	Acting Director	Chippewas of the Thames First Nation	320 Chippewa Road	Muncey, ON	N0L 1Y0
Ms.	Rochelle	Smith	Consultation Coordinator	Chippewas of the Thames First Nation	320 Chippewa Road	Muncey, ON	N0L 1Y0
Chief	Randall	Phillips	Political Chief	Onelda Nation of the Thames ONYOTA'A:KA	2212 Elm Avenue	Southwold, ON	N0L 2G0
Ms.	Catherine	Cornellus	Assistant	Onelda Nation of the Thames ONYOTA'A:KA	2212 Elm Avenue	Southwold, ON	N0L 2G0
Other Stakeholders							
Mr.	Ryan	Conner	Project Manager	Jacobs	72 Victoria Street South, Suite 300	Kitchener, ON	N2G 4Y9
Mr.	Raymond	Beshro		CN Rail McMillan Administration Road	1 Administration Road, 1st Floor	Concord, ON	L4K 1B9
Ms.	Josie	Tomei		C.P. Limited Railway Real Estate & Facility Management	800- 1290 Central Parkway	Mississauga, ON	L5C 4R3
	K.C.	Rose	Director	VIA Rail Canada	50 Drummond Street, Building C	Toronto, ON	M8V 4B5
Mr.	Henry	Bustard	President	Carleton Trail Management Inc	#1, 1715 - 27th Avenue N.E.	Calgary, AB	T2E 7E1
Mr.	Hilary	Payne	Development Coordination	Hilary G Payne & Associates	2985 Dougall Avenue	Windsor, ON	N9E 1S1
			Att: Circulations Intake, Planning & Design	MMM Group Limited	100 Commerce Valley Drive West	Thornhill, ON	L3T 0A1
Mr.	Carmen	Starnichuk		Tecumseh Letter Carrier Depot	11910 Tecumseh Road East	Tecumseh, ON	N8N 1M0

Title	First Name	Surname	Job Title	Organization	Address	City/Prov	Postal Code
Mr.	Bruno	DeSando		Canada Post Delivery Planning	955 Highbury Aveneu	London, ON	N5Y 1A3
Mr.	Jeff	Nawalany		Orion Homes Inc	5848 Malden Road Suite 306	LaSalle, ON	N9H 04A
Mr.	Marlo	Piroli		Piroli Construction	1500 Ouellette Ave Unit 201	Windsor, ON	N8X 1K7
Mr.	Tim / Ray	Belanger		Ray Belanger Builders Ltd	536 Brighton Road	Tecumseh, ON	N9N 2L6
Mr.	Ralph	Meo		Seven Lakes Homes Ltd./Meo & Associates Inc	7200 Disputed Road, Suite 200	LaSalle, ON	N9A 6Z6
				Silver Spring construction	7865 Howard Ave.	McGregor, ON	N0R 1J0
Mr.	Tim	McFarlane		T. McFarlane Builders Ltd	1054 Mole	Essex, ON	N8M 2X5
Mr.	Gino	Piccioni		Timberland General Contractors	6224 Wales Crt.	Windsor, ON	N9J 3R7
Mr.	Trevor			TMC Construction	63 Given Road	Chatham, ON	N7L 0C7
Mr.	Brian	Towsley		Towsley Construction Co Inc	2090 Fasan Drive	Old Castle, ON	N0R 1L0
				Tri-World Development	3235 Electricity Drive	Windsor, ON	N8W 5J1
Mr.	Steve	Valente		Valente Construction	25 Amy Croft Drive, Unit 23B	Tecumseh, ON	N9K 1C7
Mr.	Peter	Valente		Valente Real Estate & Development	2985 Dougall Ave	Windsor, ON	N9E 1S1
Mr.	Bill	Maggio		Vanderbilt Homes Ltd	1731 Wyandotte Street East	Windsor, ON	N8Y 1C9
Mr.	Vince	Russo		Affinity Custom Homes	3154 Troup Crescent	Windsor, ON	N8R 0A3
Mr.	Peirre	Amine		Amine Construction Ltd	1051 Chelsea Park Way	Belle River, ON	N0R 1A0
Mr.	Dino	Fantin		Amico Design Build Inc	2199 Blackacre Drive	Old Castle, ON	N0R 1L0
Mr.	Louis			Archambault Contracting	5095 Tecumseh Road	Pointe aux Roches, ON	N0R 1N0
Mr.	Danny	Azar		Azar Homes	1126 Lesperance Road	Tecumseh, ON	N8N 1X2
Ms.	Annalisa	McCarthy		Bart DiGiovanni Construction Ltd	2217 Walker Road	McGregor, ON	N0R 1J0
Mr.	Ben	Klundert		BK Cornerstone	13405 Desro Drive	Tecumseh, ON	N8N 2L9
Mr.	Ted	Bachynski		Bachynski Builders	1061 County Rd 46	Woodslee, ON	N0R 1V0
Mr.	Sam	Jraige		Bayshide Homes Ltd	20 Division Rd N RR 3	Cottam, ON	N0R 1B0
Mr.	Jeff			Boy Construction	432 W Puce Road	Belle River, ON	N0R 1A0
Ms.	Tammy			Brady Homes	339 County Road 34	Essex, ON	N8M 2X5
Mr.	Brian	Klundert		Brian Klundert Builders Ltd	1617 County Rd 46	Woodslee, ON	N0R 1V0
Mr.	Scott			Brian Spakres & Son Ltd	56 Bolohan Dr	Tilbury, ON	N0P 2L0
Mr.	Brian	Sterritt		Brimar Homes Ltd	1616 Chornoby Cres	Tecumseh, ON	N8N 4W3
Mr.	Don			Brouillette Builders	1553 Lakeshore Rd 123	Belle River, ON	N0R 1A0
Ms.	Nicole	Ciarrocchi		Bungalow Group	3409 McKay Ave	Windsor, ON	N9E 2R8
Mr.	Dan	Caster		Caster Custom Homes	13401 Desro Dr	Tecumseh, ON	N8N 2L9
	Mark			Cedar Hill Homes	11500 Tecumseh Rd E	Windsor, ON	N8N 5G6
Mr.	Chris	King		Chris King & Sons Construction	1675 Division Rd North	Kingsville, ON	N9Y 2H1
Ms.	Patti	Fraize		Coco Developments	485 Little Baseline Rd	Tecumseh, ON	N8N 2L9

Title	First Name	Surname	Job Title	Organization	Address	City/Prov	Postal Code
Mr.	Dan			Elite Construction	2005 Candlewood Dr	Tecumseh, ON	N9K 0A3
				Everjonge Homes	782 W Belle River Rd	Belle River, ON	N0R 1A0
Mr.	John	Evola		Evola Builders	2165 Suzanne St	Windsor, ON	N9H 2L4
Mr.	Steve	Shore		Fernwood Builders	1558 County Rd 31	Saint Joachim, ON	N0R 1S0
Mr.	Ezio	Tartaro		Gintar Contractors Ltd	820 Erie Street East	Windsor, ON	N9A 3Y4
Mr.	Joe	Hadi		Hadi Construction	7135 Malden Road	LaSalle, ON	N9J 2T8
Mr.	John			Hanna Homes	34 Carter Ave	Leamington, ON	N8H 5C9
Mr.	Jeff	Rivest		Homes of Integrity	262 Redwood, SS6	Belle River, ON	N0R 1A0
Ms.	Jeannette	Sylvestre		James Sylvestre Ent.	1865 Manning Road	Tecumseh, ON	N8N 2L9
Mr.	John	Rauti		J. Rauti Custom Homes	1357 Tuscany Oaks Drive	LaSalle, ON	N9J 0B6
Mr.	Mo	Kolody		Kolody Contracting	424 Old Tecumseh Road	Windsor, ON	N8N 3S8
Mr.	Sam			Lakepoint Homes	1865 Manning Road	Tecumseh, ON	N8N 2L9
Mr.	Anthony	Lapico		Lapico Homes	2895 Normandy Street	LaSalle, ON	N9H 1C8
Mr.	Bruno			Maple Leaf Homes Ltd	411 Pinehurst Drive	Belle River, ON	N0R 1A0
Ms.	Mary	Morabito		Marpasco Homes	2503 Buttery Street	Windsor, ON	N9E 4L9
Ms.	Laura	Fanelli		Mastercraft Homes Windsor (2011) Inc	3199 Dougall Ave	Windsor, ON	N9E 1S5
Mr.	Jack	Moceri		Moceri, Jack & Sons	11254 Tecumseh Road E	Windsor, ON	N8R 1A8
Mr.	Tom	Jraiche		New Millennium Homes	33 Princess Street	Leamington, ON	N8H 5C5
Mr.	Joe	Noah		Noah Homes	950 Seacliff Dr	Kingsville, ON	N9Y 2K9
Mr.	Norbert	Bolger		Nor-Built Construction	20 Ranaud Street	Amherstburg, ON	N9V 4B1

Simona Lehan from Leamington's Simona's Flowers and Home Accents demonstrates the art of flower and plant arranging to attendees.

kend! One-hundred and sixty women joined us at our morn- enjoyed a great lunch together. It was also our pleasure to Life Membership for 65 years of dedicated service. Special Life Membership Officer, for joining us too and Lakeshore Bailey.

Lakeshore News, April 11, 2019

Lakeshore
OUR COMMUNITIES. OUR HOME.

TOWN OF LAKESHORE

DENIS ST. PIERRE WATER POLLUTION CONTROL PLANT EXPANSION

CLASS ENVIRONMENTAL ASSESSMENT

NOTICE OF STUDY COMMENCEMENT

The Study

The Town of Lakeshore adopted its first comprehensive Water and Wastewater Master Plan in November 2009, and then an update of this Master Plan was undertaken and completed in 2017 in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment (EA) process.

The Water and Wastewater Master Plan and Update identified capacity issues within the Denis St. Pierre Wastewater System. The former Belle River community and the Maidstone urban are serviced by the Denis St. Pierre Wastewater System consisting of sanitary sewers, pumping stations, the Denis St. Pierre Water Pollution Control Plant (WPCP) and an outfall discharging to Lake St. Clair.

It is outlined in the Master Plan and Update that additional treatment capacity at the Denis St. Pierre Water Pollution Control Plant (WPCP) is required to support the existing services areas and the anticipated future growth through 2035. The Master Plan and Update were prepared in accordance with Phases 1 and 2 of the Class EA process to implement the preferred solution which involves capacity expansion of the Denis St. Pierre WPCP which is located on Rourke Line. Further information may be obtained by viewing the Water and Wastewater Master Plan at http://lakeshore.ca

The Town of Lakeshore is now undertaking Phases 3 and 4 of the Class EA process which will involve evaluation of alternative design concepts for the proposed Denis St. Pierre WPCP capacity expansion, and preparation of an Environmental Study Report documenting the activities and recommendations from the Class EA process.

Public Consultation

One of the key components of this Class EA is consultation with the public. This Notice of Study Commencement is a part of the public consultation process. The public is invited to submit comments and express any concerns with respect to the project. During the course of the Class EA as the study work is nearing completion, the public will be invited to an Open House to review the findings of the study and to submit any further comments and concerns. The public will be notified in advance of the Open House through publication of notices in local newspapers.

If you have any questions or wish to be added to the study mailing list, please contact:

Mr. Kevin Girard, P.Eng.
Manager of Environmental Services
419 Notre Dame Street
Belle River, Ontario N0R 1A0
Phone: 519-728-1975 x 239
Fax: 519-728-9530
Email: kgirard@lakeshore.ca

or

Dr. Jian Li, P. Eng.
Stantec Consulting Ltd.
140 Ouellette Place Suite 100
Windsor, Ontario N8X 1L9
Phone: 519-966-2250 x 240
Fax: 519-966-5523
Email: jian.li@stantec.com

...nunicate regularly ...ne community to ...nforcement of these ... confirms. "But not ...ner is affiliated with ...o."

...tems Group Greenway to equestrian use in the future.

"It's important that we find a way for all trail users to enjoy these beautiful trails without conflict," Money adds.

Run on Sunday Tube Centre

...T and registration IS CLOSED!
...to the Ronald McDonald House in Windsor.
...to several lucky walk/race participants.
...unity of leaders who believe in the healing power of togeth-
...acy we support the Ronald McDonald House Charities of
...ildren what they need most . . . their families
...amilies of seriously ill children who require medical care by

...nation, please visit *Facebook.com/BigRedShoeRun*

Shoreline April 12, 2019

Lakeshore

TOWN OF LAKESHORE

DENIS ST. PIERRE WATER POLLUTION CONTROL PLANT EXPANSION

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Manager of Environmental Services
419 Notre Dame Street
Belle River, Ontario N0R 1A0
Phone: 519-728-1975 x.239
Fax: 519-728-9530
Email: kgirard@lakeshore.ca

or

Dr. Jian Li, P. Eng.
Stantec Consulting Ltd.
140 Ouellette Place Suite 100
Windsor, Ontario N8X 1L9
Phone: 519-966-2250 x.240
Fax: 519-966-5523
Email: jian.li@stantec.com

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Client Approval:

Typesetter: Alan

Account Rep: Eunice

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Lakeshore
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Manager of Environmental Services
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Belle River, Ontario N0R 1A0
Phone: 519-728-1975 x 239
Fax: 519-728-9530
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Dr. Jian Li, P. Eng.
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Windsor, Ontario N8X 1L9
Phone: 519-966-2250 x 240
Fax: 519-966-5523
Email: jian.li@stantec.com

Ontario

Ministry of the Environment, Conservation and Parks
Southwest Region
733 Exeter Road
London ON N6E 1L3
Tel: 519 873-5000

Ministère de l'Environnement, de la Protection de la nature et des Parcs
Direction régionale du Sud-Ouest
733, rue Exeter
London ON N6E 1L3
Tél.: 519 873-5000

May 31st, 2019

Town of Lakeshore
419 Notre Dame Street
Belle River, Ontario
NOR 1A0

Attention: Mr. Kevin Girard, P. Eng., Manager of Environmental Services

Re: Notice of Commencement Denis St. Pierre Water Pollution Control Plant Expansion Class EA

Dear Mr. Girard:

This letter acknowledges the Ministry of Environment, Conservation and Parks (MECP) receipt, with thanks, of the Notice of Commencement for the Denis St. Pierre Water Pollution Control Plant Expansion.

Based on the information submitted, the MECP have identified the following key project details with respect to the proposed undertaking:

Aboriginal Consultation

The Crown has a legal duty to consult Aboriginal communities when it has knowledge, real or constructive, of the existence or potential existence of an Aboriginal or treaty right and contemplates conduct that may adversely impact that right. Before the Town of Lakeshore may proceed with this project, the Crown must ensure that its duty to consult has been fulfilled, where such a duty is triggered. Although the duty to consult with Aboriginal peoples is a duty of the Crown, the Crown may delegate procedural aspects of consultation to project proponents while retaining oversight of the process.

The Town of Lakeshore's proposed project may have the potential to affect Aboriginal or treaty rights protected under section 35 of Canada's *Constitution Act 1982*. Where the Crown's duty to consult is triggered in relation to the Town of Lakeshore's proposed project, the MECP is delegating the procedural aspects of rights-based consultation to the Town of Lakeshore through this letter. The Crown intends to rely on the delegated consultation process in discharging its duty to consult and maintains the right to participate in the consultation process as it sees fit.

Based on information you have provided to date and the Crown`s preliminary assessment the Town of Lakeshore is required to consult with the following communities who have been identified as potentially affected by your proposed project:

Aamjiwnaang First Nation	Aamjiwnaang First Nation 978 Tashmoo Ave. Sarnia, ON N7T 7H5 519-336-8410 Chief Chris Plain chief@aamjiwnaang.ca Other Contacts: Sharilyn Johnston, Environment Coordinator sjohnston@aamjiwnaang.ca Christine James, Environment Worker cjames@aamjiwnaang.ca (same mailing address for all)	Sarnia, ON
Bkejwanong Territory (Walpole Island First Nation)	Bkejwanong Territory 117 Tahgahoning Road R.R.#3 Wallaceburg, ON N8K 4K9 519-627-1481 Chief Dan Miskokomon drskoke@wifn.org Other Contacts: Dean Jacobs, Consultation Manager Walpole Island Heritage Centre 2185 River Road R.R.#3 Wallaceburg, ON N8K 4K9 519-627-1475 dean.jacobs@wifn.org and Janet Macbeth, Project Review Coordinator janet.macbeth@wifn.org	Wallaceburg, ON
Chippewas of Kettle and Stony Point First Nation	Chippewas of Kettle and Stony Point First Nation 6247 Indian Lane, R.R.#2 Forest, ON N0N 1J1 519-786-2125 Chief Jason Henry jason.henry@kettlepoint.org Other Contact: Valerie George Consultation Officer valerie.george@kettlepoint.org	Forest, ON
Chippewas of the Thames First Nation	Chippewas of the Thames First Nation 320 Chippewa Rd., Muncey, ON N0L 1Y0 519-289-5555 Chief Myeengun Henry myeengun@cottfn.com Other Contacts: Kelly Riley, Acting Director - Lands & Environment kriley@cottfn.com Consultation Manager : Fallon Burch (Notices should be sent to Chief with an email copy to consultation@cottfn.com) Consultation email: consultation@cottfn.com	Muncey, ON
Caldwell First Nation	Caldwell First Nation 14 Orange St. Leamington, ON N8H 3W3 519-322-1766 or 1-800-206-7522 Chief Mary Duckworth chief.duckworth@caldwellfirstnation.ca Executive Administrator Nikki Orosz nikki.orosz@caldwellfirstnation.ca	Leamington, ON
Oneida Nation of the Thames ONYOTA'A:KA	Oneida Nation of the Thames 2212 Elm Ave. Southwold, ON N0L 2G0 519-652-3244 Chief Jessica Hill jessica.hill@oneida.on.ca Other Contact: Political Office Manager Email: cherilyn.hill@oneida.on.ca Tel: (519) 318-4593 Environment Contact: Brandon Doxtator, Environment Coordinator Email: environment@oneida.on.ca Phone (519) 652-6922	London, ON

Steps that you may need to take in relation to Aboriginal consultation for your proposed project are outlined in the "Code of Practice for Consultation in Ontario's Environmental Assessment Process" which can be found at the following link:

https://www.ontario.ca/document/consultation-ontarios-environmental-assessment-process

Additional information related to Ontario's *Environmental Assessment Act* is available online at:

www.ontario.ca/environmentalassessments

You must contact the Director of Environmental Assessment and Permissions Branch (Director) under the following circumstances subsequent to initial discussions with the communities identified by MOECC:

- Aboriginal or treaty rights impacts are identified to you by the communities;
- You have reason to believe that your proposed project may adversely affect an Aboriginal or treaty right;
- Consultation has reached an impasse;
- A Part II Order request or elevation request is expected.

The Director can be notified either by email, mail or fax using the information provided below:

Email:	enviropermissions@ontario.ca Subject: Potential Duty to Consult
Fax:	416-314-8452
Address:	Environmental Assessment and Permissions Branch 135 St. Clair Avenue West, 1st Floor Toronto, ON, M4V 1P5

The MECP will then assess the extent of any Crown duty to consult for the circumstances and will consider whether additional steps should be taken, including what role the Town of Lakeshore will be asked to play should additional steps and activities be required.

Source Water Protection

As per the recent amendments to the Municipal Engineers Association (MEA) Class Environmental Assessment parent document approved October 2015, proponents undertaking a Municipal Class EA project must identify early in the process whether a project is occurring within a source water protection vulnerable area. This must be clearly documented in an ESR. If the project is occurring in a vulnerable area, then there may be policies in the local Source Protection Plan (SPP) that need to be addressed (requirements under the Clean Water Act). The proponent should contact

and consult with the appropriate Conservation Authority/Source Protection Authority (CA/SPA) to discuss potential considerations and policies in the SPP that apply to the project.

Please include a section in the report on Source Water Protection. Specifically, it should discuss whether or not the project is located in a vulnerable area or changes or creates new vulnerable areas and provide applicable details about the area. If located in a vulnerable area, proponents should document whether any project activities are a prescribed drinking water threat and thus pose a risk to drinking water (this should be consulted on with the appropriate CA/SPA). Where an activity poses a risk to drinking water, the proponent must document and discuss in the Project File Report/ESR how the project adheres to or has regard to applicable policies in the local SPP. If creating or changing a vulnerable area, proponents should document whether any existing uses or activities may potentially be affected by the implementation of source protection policies. This section should then be used to inform and should be reflected in other sections of the report, such as the identification of net positive/ negative effects of alternatives, mitigation measures, evaluation of alternatives etc. As a note, even if the project activities in a vulnerable area are deemed not to be a drinking water risk, there may be other policies that apply and so consultation with the local CA/SPA is important.

Climate Change

The Town of Lakeshore is strongly encouraged to include climate change in this EA. Climate change should be considered in the context of mitigation and the context of adaptation. The Ministry has recently released a guidance document to support proponents in including climate change in environmental assessments. The guide can be found online: https://www.ontario.ca/page/considering-climate-change-environmental-assessment-process. It should be noted that Climatic Features is identified in Appendix 2 of the Municipal Class EA page 2-7 (2015).

Part II Order Request Form

Please note that as of July 1, 2018, a Part II Order Request Form must be used to request a Part II Order as per O. Reg. 152/18. Accordingly, please include those details when conveying information regarding the Part II Order process such as on the Notice of Completion. The following sample text would cover this requirement in the Notice of Completion for this project:

"As of July 1, 2018, a Part II Order Request Form must be used to request a Part II Order in accordance with O. Reg. 152/18. The Part II Order Request Form is available online on the Forms Repository website (http://www.forms.ssb.gov.on.ca/) by searching "Part II Order" or "012-2206E" (the form ID number)."

Conclusion

Thank you for the opportunity to comment on this project. Please keep this office fully informed of the status of this project as it proceeds through the Class EA process. All future correspondence with respect to this project should be sent to my attention, as I am this ministry's one window contact for this project, Craig Newton, Regional Environmental Planner / Regional EA Coordinator at (519) 873-5014 or by email at craig.newton@ontario.ca

A draft copy of the Environmental Study Report (ESR) should be sent to the appropriate MECP regional office before the Town of Lakeshore issues its notice of completion of the final report. Allow a minimum of 30 days for MECP's technical reviewers to provide comments on the draft ESR.

When the ESR is finalized, please send the Notice of Completion and final documentation to me.

Should you or any members of your project team have any questions regarding the material above, please contact me directly.

Yours truly,

Craig Newton
Regional Environmental Planner / Regional EA Coordinator
Ministry of Environment, Conservation and Parks
733 Exeter Road
London ON, N6E 1L3
519-873-5014

cc Mr. Marc Bechard, Supervisor, Safe Drinking Water, MECP Windsor / Sarnia District
Dr. Jian Li, P. Eng., Stantec Consulting Ltd., Windsor

From:	Newton, Craig (MECP)
To:	Li, Jian
Cc:	kgirard@lakeshore.ca
Subject:	FW: Denis St. Pierre Water Pollution Control Plant Expansion Class EA - Town of Lakeshore
Date:	Wednesday, April 10, 2019 11:18:23 AM
Attachments:	20190410091236270.pdf

Dear Dr. Li:

This e-mail acknowledges my receipt of the Notice of Study Commencement for this project.

That said, this may have just be an oversight, or perhaps you have just not gotten to this task as yet given your competing priorities, but if you are not already aware, **please resubmit this and future Notices of Commencement to the MECP SWR Regional EA mail**

When you get an opportunity, sometime in the next few days, please re-submit this Notice of Commencement in the manner described immediately below:

As of May 1, 2018, proponents must follow the planning process set out in the approved class environmental assessments or streamlined environmental assessment processes, and send their notices and completed project information form project information form to the region where the project is located. If your project is located in more than one ministry region, you need to submit your notices to all appropriate regions. This is in addition to the existing notification requirements in each class environmental assessments and streamlined environmental assessment process.

To submit your notice you need to do the following:
1.download and complete the project information form
2.the subject line of your email must include the project location, type of streamlined environmental assessment and project name, for example: ◦York Region, MEA Class EA, Elgin Mills Rd East (Bayview to Woodbine)
◦Durham Region, Electricity Screening Process, New Cogeneration Station
◦City of Ottawa, Waste Management Screening Process, Landfill Expansion Project

3.attach a copy of your project notice in PDF format and your completed project information form in Excel format to the email
4.send your email to the appropriate ministry regional office:
◦Central Region – eanotification.cregion@ontario.ca
◦Eastern Region – eanotification.eregion@ontario.ca
◦Northern Region – eanotification.nregion@ontario.ca
◦South West Region – eanotification.swregion@ontario.ca
◦West Central Region – eanotification.wcregion@ontario.ca

Thanks in advance.

Yours truly,

Craig Newton
Regional Environmental Planner / Regional EA Coordinator
Ministry of the Environment, Conservation and Parks
Southwestern Region
733 Exeter Road
London, Ontario
N6E 1L3

Telephone: (519) 873-5014
E-mail: craig.newton@ontario.ca

From:	Cerniavskaja, Karina (MNRF)
To:	kgirard@lakeshore.ca; Li, Jian
Subject:	Town of Lakeshore - Denis St. Pierre Water Pollution Control Plant Expansion Class EA
Date:	Wednesday, April 10, 2019 10:30:58 AM
Attachments:	2019-04-09_Lakeshore - Denis St. Pierre Water Pollution Control Plant Expansion Class EA.pdf

Good morning Kevin and Jian,

Thank you for circulating the attached Class Environmental Assessment Notice to the Ministry of Natural Resources and Forestry (MNRF) office. Please note, the Ministry of Environment, Conservation and Parks (MECP) has now assumed responsibility for the Endangered Species Act (ESA), including species at risk (SAR) in Ontario. All future correspondence related to ESA or SAR should be sent to SAROntario@ontario.ca to reach the MECP directly.

MNRF will continue to review projects for matters that fall within the scope of the ministry's mandate and provide guidance with respect to legislation under the ministry's jurisdiction. I just wanted to make sure that you are aware of the above changes.

Please let me know if you have any questions.

Thank you,
Karina

Karina Cerniavskaja, District Planner
Ministry of Natural Resources and Forestry, Aylmer District
615 John St. N. Aylmer, ON N5H 2S8
Tel: 519-773-4757 | Cell: 519-630-5292 | Fax: 519-773-9014 | Email: karina.cerniavskaja@ontario.ca

As part of providing accessible customer service, please let me know if you have any accommodation needs or require communication supports or alternate formats.

Ministry of Tourism, Culture and Sport

Programs and Services Branch
401 Bay Street, Suite 1700
Toronto ON M7A 0A7
Tel: 416.314.7643

Ministère du Tourisme, de la Culture et du Sport

Direction des programmes et des services
401, rue Bay, Bureau 1700
Toronto ON M7A 0A7
Tél: 416.314.7643

Ontario

08 May 2019 EMAIL ONLY

Jian Li, P.Eng.
Project Manager
Stantec Consulting Ltd.
100-140 Ouellette Place
Windsor, ON N8X 1L9
jian.li@stantec.com

MTCS File	**:**	**0010508**
Your File	**:**	**165620173**
Proponent	**:**	**Town of Lakeshore**
Subject	**:**	**Notice of Commencement**
Project	**:**	**Denis St. Pierre Water Pollution Control Plant Expansion**
Location	**:**	**Rourke Line Road, South of County Road 22, Town of Lakeshore**

Dear Mr. Li:

Thank you for providing the Ministry of Tourism, Culture and Sport (MTCS) with the Notice of Commencement for the above-referenced project. MTCS's interest in this Municipal Class Environmental Assessment (EA) project relates to its mandate of conserving Ontario's cultural heritage, which includes:

- archaeological resources, including land and marine;
- built heritage resources, including bridges and monuments; and,
- cultural heritage landscapes.

Under the EA process, the proponent is required to determine a project's potential impact on cultural heritage resources.

Project Summary
The Town of Lakeshore is proposing the expansion of the Denis St. Pierre Water Pollution Control Plant in anticipation of anticipated future growth and expansion through to 2035 for the former Belle River Community and the Maidston Urban Area.

The project is following Phases 3 and 4 of the Municipal Class EA, which began in 2008 as a Master Plan (completing Phases 1 and 2 in 2017) and had identified capacity issues this for plant.

Identifying Cultural Heritage Resources
While some cultural heritage resources may have already been formally identified, others may be identified through screening and evaluation. Indigenous communities may have knowledge that can contribute to the identification of cultural heritage resources, and we suggest that any engagement with Indigenous communities includes a discussion about known or potential cultural heritage resources that are of value to these communities. Municipal Heritage Committees, historical societies and other local heritage organizations may also have knowledge that contributes to the identification of cultural heritage resources.

Archaeological Resources
This EA project may impact archaeological resources and should be screened using the MTCS *Criteria for Evaluating Archaeological Potential* and *Criteria for Evaluating Marine Archaeological Potential* to determine if an archaeological assessment is needed. MTCS archaeological sites data are available at *archaeology@ontario.ca*. If the EA project area exhibits archaeological potential, then an archaeological assessment (AA) should be undertaken by an archaeologist licenced under the *OHA*, who is responsible for submitting the report directly to MTCS for review.

Built Heritage and Cultural Heritage Landscapes
The MTCS *Criteria for Evaluating Potential for Built Heritage Resources and Cultural Heritage Landscapes* should be completed to help determine whether this EA project may impact cultural heritage resources. The Clerk for theTown of Lakeshore can provide information on property registered or designated under the *Ontario Heritage Act*. Municipal Heritage Planners can also provide information that will assist in completing the checklist.

If potential or known heritage resources exist, MTCS recommends that a Heritage Impact Assessment (HIA), prepared by a qualified consultant, should be completed to assess potential project impacts. Our Ministry's *Info Sheet #5: Heritage Impact Assessments and Conservation Plans* outlines the scope of HIAs. Please send the HIA to MTCS and the Town of Lakeshore for review, and make it available to local organizations or individuals who have expressed interest in review.

Environmental Assessment Reporting
All technical cultural heritage studies and their recommendations are to be addressed and incorporated into EA projects. Please advise MTCS whether any technical cultural heritage studies will be completed for this EA project, and provide them to MTCS before issuing a Notice of Completion or commencing any work on the site. If screening has identified no known or potential cultural heritage resources, or no impacts to these resources, please include the completed checklists and supporting documentation in the EA report or file.

Thank you for consulting MTCS on this project and please continue to do so throughout the EA process. If you have any questions or require clarification, do not hesitate to contact me.

Sincerely,

Katherine Kirzati
Heritage Planner
katherine.kirzati@ontario.ca

c: Kevin Girard, Manager of Environmental Services, Town of Lakeshorse

From:	EnviroOnt
To:	kgirard@lakeshore.ca; Li, Jian
Subject:	NEATS 49807- Denis St. Pierre Water Pollution control plant expansion- Town of Lakeshore
Date:	Thursday, May 9, 2019 9:47:11 AM
Attachments:	NEATS 49807.pdf

Greetings,

Thank you for your correspondence.

Please note Transport Canada **does not** require receipt of all individual or Class EA related notifications. We are requesting project proponents to self-assess if their project:

1. Will interact with a federal property and/or waterway by reviewing the Directory of Federal Real Property, available at at www.tbs-sct.gc.ca/dfrp-rbif/; **and**
2. Will require approval and/or authorization under any Acts administered by Transport Canada* available at http://www.tc.gc.ca/eng/acts-regulations/menu.htm.

Projects that will occur on federal property prior to exercising a power, performing a function or duty in relation to that project, will be subject to a determination of the likelihood of significant adverse environmental effects, per Section 67 of the *Canadian Environmental Assessment Act, 2012*.

If the aforementioned does not apply, the Environmental Assessment program should not be included in any further correspondence and future notifications will not receive a response. If there is a role under the program, correspondence should be forwarded *electronically* to: EnviroOnt@tc.gc.ca with a **brief description of Transport Canada's expected role**.

*Below is a summary of the most common Acts that have applied to projects in an Environmental Assessment context:

- ***Navigation Protection Act (NPA)*** – the Act applies primarily to works constructed or placed in, on, over, under, through, or across scheduled navigable waters set out under the Act. The Navigation Protection Program administers the NPA through the review and authorization of works affecting scheduled navigable waters. Information about the Program, NPA and approval process is available at: http://www.tc.gc.ca/eng/programs-621.html. Enquiries can be directed to NPPONT-PPNONT@tc.gc.ca or by calling (519) 383-1863.

- ***Railway Safety Act (RSA)*** – the Act provides the regulatory framework for railway safety, security, and some of the environmental impacts of railway operations in Canada. The Rail Safety Program develops and enforces regulations, rules, standards and procedures governing safe railway operations. Additional information about the Program is available at: https://www.tc.gc.ca/eng/railsafety/menu.htm. Enquiries can be directed to RailSafety@tc.gc.ca or by calling (613) 998-2985.

- ***Transportation of Dangerous Goods Act (TDGA)*** – the transportation of dangerous goods

by air, marine, rail and road is regulated under the TDGA. Transport Canada, based on risks, develops safety standards and regulations, provides oversight and gives expert advice on dangerous goods to promote public safety. Additional information about the transportation of dangerous goods is available at: https://www.tc.gc.ca/eng/tdg/safety-menu.htm. Enquiries can be directed to TDG-TMDOntario@tc.gc.ca or by calling (416) 973-1868.

- ***Aeronautics Act*** – Transport Canada has sole jurisdiction over aeronautics, which includes aerodromes and all related buildings or services used for aviation purposes. Aviation safety in Canada is regulated under this Act and the Canadian Aviation Regulations (CARs). Elevated Structures, such as wind turbines and communication towers, would be examples of projects that must be assessed for lighting and marking requirements in accordance with the CARs. Transport Canada also has an interest in projects that have the potential to cause interference between wildlife and aviation activities. One example would be waste facilities, which may attract birds into commercial and recreational flight paths. The *Land Use In The Vicinity of Aerodromes* publication recommends guidelines for and uses in the vicinity of aerodromes, available at: https://www.tc.gc.ca/eng/civilaviation/publications/tp1247-menu-1418.htm. Enquires can be directed to at tc.aviationservicesont-servicesaviationont.tc@tc.gc.ca or by calling 1 (800) 305-2059 / (416) 952-0230.

Please advise if additional information is needed.

Thank you,

Environmental Assessment Program, Ontario Region
Transport Canada / Government of Canada / 4900 Yonge St., Toronto, ON M2N 6A5
EnviroOnt@tc.gc.ca / Facsimile : (416) 952-0514 / TTY: 1-888-675-6863

Programme d'évaluation environnementale, Région de l'Ontario
Transports Canada / Gouvernement du Canada / 4900, rue Yonge, Toronto, ON, M2N 6A5
EnviroOnt@tc.gc.ca / télécopieur: (416) 952-0514

From: Corinne Chiasson
To: Li, Jian
Subject: Notice of Study Commencement: Denis St. Pierre Water Pollution Control Plant Expansion Class EA
Date: Wednesday, May 29, 2019 10:20:37 AM

Good morning Dr. Jian Li.

We have had an opportunity to review the circulation of the Notice of Study Commencement for the Denis St. Pierre Water Pollution Control Plant Expansion Class EA and introductory brief. We are interested in providing support and comments to the Town as this study progresses. Please keep us informed through our general planning mailbox at: planning@erca.org.

Sincerely,

Essex Region Conservation Authority
sustaining the place for life

CORINNE CHIASSON
Resource Planner
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311
Essex, Ontario Ÿ N8M 1Y6
P. 519-776-5209 x 330 Ÿ F. 519-776-8688
essexregionconservation.ca cchiasson@erca.org

Hydro One Networks Inc
483 Bay St
Toronto, ON

July 30, 2019

Re: Denis St. Pierre Water Pollution Control Plant Expansion

Attention:
Kevin Girard, P.Eng
Manager of Environmental Services

Following our preliminary assessment, we confirm there are no existing Hydro One Transmission assets in the subject area. Please be advised that this is only a preliminary assessment based on current information. No further consultation with Hydro One Networks Inc. is required if no changes are made to the current information.

However, if plans for the undertaking change or the study area expands beyond that shown, please contact Hydro One to assess impacts of existing or future planned electricity infrastructure.

Any future communications are sent to Secondarylanduse@hydroone.com.

Sent on behalf of,

Secondary Land Use
Asset Optimization
Strategy & Integrated Planning
Hydro One Networks Inc.

APPENDIX C-2

Phase 3 Open House and Draft ESR

Lakeshore News August 29, 2019

; dual axle dump trailer; good implement
- 3 ph chopper; 1000 gal water tank; transfer

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TO generator, used once; 2 large truck axles
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ette at 2357 Essex Cty Rd 42 approx. 1 **Reserve. Farm is Rented. This is a very machinery.Tractors: Int. model 3688** w by the Barrettes in 1984, has new AC TO shafts, 2 hydr. outlets, good rubber, tires, this tractor is sharp & clean; **Case** 9-38 rear tires, 3 hydr. outlets, two speed very clean tractor; **Duals**; 18.4-38 T-rail e PGB series 21" pull type cult w/wire wheel disc, approx. 18' cut, new blades; cker unit w/3 – 7' units, will be sold as lel 540 plow w/Triple K mouldboards & board; **Wagons & Auger**: three approx. e smaller seed wagon; Westfield W70-46 is is the only consigned item in the sale Case Int. 5100 – 21 run grain drill, hydr. dition; **Other Items**: Woods SB8-C – 3 r, like new; Bush Hog Squealer 6' – 3 ph hydr. auger; new 12.5L-16 tire; table saw ights for Super A tractor; milk can; hydr. to tractor; plus a few misc. items. **Grain** n bin w/aeration floor, fan & unloading 20 to run both fan & auger, purchaser removes.

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NOTICE

Lakeshore
OUR COMMUNITIES. OUR HOME.

NOTICE OF PUBLIC INFORMATION CENTRE
CLASS ENVIRONMENTAL ASSESSMENT

DENIS ST. PIERRE WATER POLLUTION CONTROL PLANT EXPANSION

The Town of Lakeshore adopted its first comprehensive Water and Wastewater Master Plan in November 2008, and then an update of this Master Plan was undertaken and completed in 2017. The Master Plan and Update, which were prepared in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment, identified the need for additional treatment capacity within the Denis St. Pierre Wastewater System servicing the Belle River and Maidstone communities.

The Denis St. Pierre Wastewater System consists of sanitary sewers, pumping stations, the Denis St. Pierre Water Pollution Control Plant (WPCP) including an outfall discharging to Lake St. Clair. The expansion of the Denis St. Pierre WPCP was identified as the preferred solution to support the existing services areas and the anticipated future growth.

The Town of Lakeshore has commenced a study to investigate alternatives and develop a preferred design for the Denis St. Pierre WPCP Capacity Expansion. This project is being planned as a **Schedule C** project under the **Municipal Class Environmental Assessment** (Municipal Engineers Association, October 2000 as amended in 2007, 2011 & 2015).

The project is now in Phase 3 of the Class EA process which involves evaluation of alternative designs for the Denis St. Pierre WPCP Capacity Expansion leading to selection of a preferred design for this application.

A Public Consultation Centre is planned to provide further information to the public on the project and to receive input and comment from interested persons:

PUB C INFORMATION CENTRE
September 11, 2019
4:00 p.m. – 7:00 p.m.
Atlas Tube Centre – Lobby (447 Renaud Line Rd., Belle River N0R 1A0)

Following the public information centre, further comments are invited, for incorporation into the planning and design of this project, and will be received until October 18, 2019. For further information, please visit the Town of Lakeshore's website at www.lakeshore.ca or contact:

Mr. Kevin Girard, P.Eng.
Manager of Environmental Services
419 Notre Dame Street
Belle River, Ontario N0R 1A0
Phone: 519-728-1975 x 239
Fax: 519-728-9530
Email: kgirard@lakeshore.ca

or

Dr. Jian Li, P. Eng.
Stantec Consulting Ltd.
140 Ouellette Place Suite 100
Windsor, Ontario N8X 1L9
Phone: 519-966-2250 x 240
Fax: 519-966-5523
Email: jian.li@stantec.com

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DAVISON

Stantec Consulting Ltd
100-140 Ouellette Place, Windsor ON N8X 1L9

September 10, 2019
File: 165620173

«Company»
«Address1»
«Address2»
«Address3»
«City», Ontario
«PostalCode»

Attention: **«FirstName»**
«Title»

Dear Sir/Madam:

Reference: **Denis St. Pierre Water Pollution Control Plant Expansion**
Class Environmental Assessment
Town of Lakeshore

The Town of Lakeshore adopted its first comprehensive Water and Wastewater Master Plan in November 2008, and then an update of this Master Plan was undertaken and completed in 2018. The Master Plan and Update, which were prepared in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment, identified the need for additional capacity within the Denis St. Pierre Wastewater System servicing the Belle River and Maidstone communities.

The Town of Lakeshore has commenced a study to investigate options and develop a preferred alternative for the Denis St. Pierre Wastewater System. This project is being planned as a **Schedule C** project under the **Municipal Class Environmental Assessment** (Municipal Engineers Association, October 2000 as amended in 2007, 2011 & 2015).

The Water and Wastewater Master Plan and Update were prepared in accordance with Phases 1 and 2 of the Class EA process. The preferred wastewater solution for servicing the Belle River and Maidstone areas is to expand the Denis St. Pierre Water Pollution Control Plant (WPCP).

The project is now in Phase 3 of the Class EA process which involves evaluation of alternative designs for the Denis St. Pierre WPCP expansion leading to selection of a preferred design for this application. Your agency is invited to submit comments on the *"Draft"* Environmental Study Report. In an effort to conserve paper and reduce printing costs, the report is being distributed in electronic format as a PDF file on the FTP site below. If you would prefer, a hard copy of the draft report will be provided on request.

Login Information

Browser link: https://projsftp.stantec.com
Login name: 165620173DENISSTPIERREWATERPOLLUTIONCONTROLPLANTEXPANSIONEASTUDY1044
Password: 4779676

A public information centre has been held on September 11, 2019 to provide information on this project and to solicit public input. Copies of the public information centre material are also available on the FTP site above.

Reference: Error! Reference source not found.

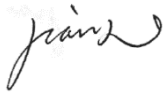
We would appreciate receiving any comments you care to offer on the draft report by October 18, 2019. Any comments or questions should be submitted to the following:

Mr. Kevin Girard, P.Eng.
Manager of Environmental Services
419 Notre Dame Street
Belle River, Ontario N0R 1A0
Phone: 519-728-1975 x 239
Fax: 519-728-9530
Email: kgirard@lakeshore.ca

Dr. Jian Li, P. Eng.
Stantec Consulting Ltd.
140 Ouellette Place Suite 100
Windsor, Ontario N8X 1L9
Phone: 519-966-2250 x 240
Fax: 519-966-5523
Email: jian.li@stantec.com

Sincerely,

STANTEC CONSULTING LTD.



Jian Li, Ph.D., P. Eng., PE
Project Manager
Phone: (519) 966-2250
Fax: (519) 966-5523
jian.li@stantec.com

Attachment: public information centre material

jcl w:\active\165620173\planning\notice of commencement\letter to mandatory contacts and review agencies.doc

Denis St. Pierre Water Pollution Control Plant Expansion

Class Environmental Assessment

Phase 3 Public Consultation

PUBLIC INFORMATION CENTRE

Wednesday, September 11, 2019
4:00 p.m.– 7:00 p.m.

Atlas Tube Centre – Lobby
447 Renaud Line Road
Lakeshore, Ontario

Prepared for:

The Town of Lakeshore

Prepared by:

Stantec Consulting Ltd.
Windsor, Ontario

165620173

September 11, 2019

DENIS ST. PIERRE WATER POLLUTION CONTROL PLANT EXPANSION
CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE

BACKGROUND

The Town of Lakeshore adopted its first comprehensive Water and Wastewater Master Plan in November 2008, and then an update of this Master Plan was undertaken and completed in 2018. The Master Plan and Update, which were prepared in accordance with Phases 1 and 2 of the Municipal Class Environmental Assessment, identified the need for additional capacity within the Denis St. Pierre Wastewater System servicing the Belle River and Maidstone communities. The Denis St. Pierre Wastewater System consists of sanitary sewers, pumping stations, and the Denis St. Pierre Water Pollution Control Plant (WPCP) including an outfall discharging to Lake St. Clair.

There are pressures from residential and industrial development in the Belle River and Maidstone areas and to avoid a restriction to development, additional treatment capacity is required. The expansion of the Denis St. Pierre WPCP was identified as the preferred solution to support the existing services areas and the anticipated future growth.

CLASS ENVIRONMENTAL ASSESSMENT

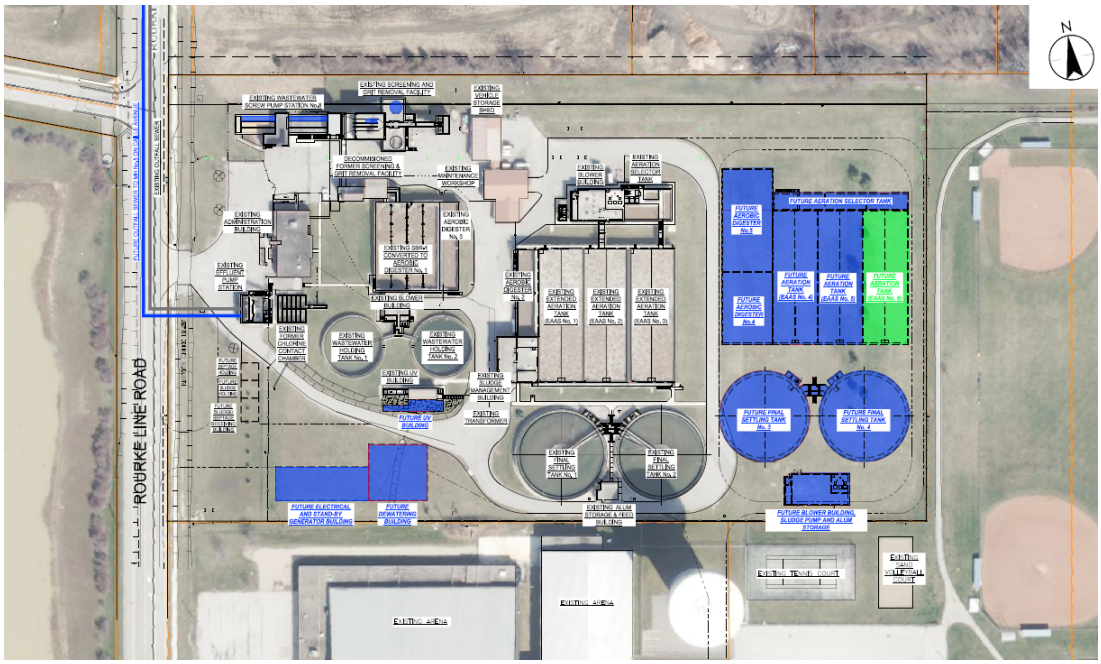
The Town of Lakeshore has commenced a study to investigate alternatives and develop a preferred design for the Denis St. Pierre WPCP Expansion. This project is being planned as a **Schedule C** undertaking following the provisions of the **Municipal Class Environmental Assessment** document. The overall objective of this project is to identify a preferred solution and design that will satisfy wastewater servicing requirements for the anticipated future growth that is acceptable to the public and all concerned review agencies.

The Water and Wastewater Master Plan and Update were prepared in accordance with Phases 1 & 2 of the Class EA process, which identified the problem that needs to be addressed and consideration of alternative solutions leading to selection of the preferred solution. Through this process, the expansion of the Denis St. Pierre WPCP was identified as the preferred solution to meet future growth and development needs in the Belle River and Maidstone areas.

A draft Environmental Study Report has been prepared which presents a number of possible alternative designs for the preferred solution. The merits and disadvantages of these alternatives are discussed with the decision-making process being structured to select the design that minimizes undesirable impacts on the natural, social and economic environments. Through this evaluation process, a recommended design has been identified and is provided for consideration as the preferred design. The recommended design consists of the following main elements:

- Add third screw pumps at the existing Maidstone Pumping Station No.8
- Add second fine screen and vortex grit tank in the existing Screening and Grit Removal Facility

- Add two new aeration tanks and final clarifiers
- Build new UV disinfection facility
- Construct new service building accommodating blowers, sludge pumps, and chemical feed and storage
- Add two new aerobic digesters
- Construct new centrifugal dewatering facility
- Construct new electrical and standby generator building
- Twinning of inland portion of outfall sewer along Rourke Line Road from the plant to Caille Avenue and enlarging outfall diffusers from 5” to 10”.



Copies of a draft study report have been distributed to mandatory contacts and review agencies. Feedback from review agencies and input gained through this public information centre will be included in the evaluation process to finalize selection of the preferred design.

FURTHER PLANNING

The Environmental Study Report will be finalized with modifications, as necessary, to reflect input from the public and review agencies. The completed Environmental Study Report will then be placed on the public record for a 30 day review period and notice of completion will be issued to review agencies, the public and the Ministry of the Environment, Conservation, and Parks Environmental Approvals Branch.

THANK YOU

Thank you for your interest in this project and attendance at this public information centre.

DENIS ST. PIERRE WATER POLLUTION CONTROL PLANT EXPANSION
CLASS ENVIORNMENTAL ASSESSMENT
PUBLIC INFORMATION CENTRE

You are invited to provide comments about the proposed alternative designs for the expansion of the Denis St. Pierre WPCP.

Copies of the Public Information Centre material are available on the FTP site below:

Login Information

Browser link: https://projsftp.stantec.com
Login name: 165620173DENISSTPIERREWATERPOLLUTIONCONTROLPLANTEXPANSIONEASTUDY1044
Password: 4779676

Hard copies of the report can be made available for review on request and is available at the Town of Lakeshore Town Hall at 419 Notre Dame St, Belle River. Input from this Public Information Centre and from review agencies will be included in the evaluation process to select the preferred design alternative and finalize the study report. Thereafter the Environmental Study Report will be placed on the public record for a 30 day review period and notice of completion will be issued to review agencies, the public and the Ministry of the Environment, Conservation, and Parks Environmental Approvals Branch.

Please return your completed questionnaire on or before October 18, 2019 to:

Stantec Consulting Ltd.
140 Ouellette Place, Suite 100
Windsor ON N8X 1L9
Attention: Dr. Jian Li, P. Eng.

COMMENTS OR CONCERNS: _____

_____

_____

_____

_____

_____

(Attach additional sheets if needed)

NAME _____

ADDRESS _____

TELEPHONE NO. ( ) _____

FAX NO. (IF ANY) ( ) _____

AFFILIATION OR GROUP (IF ANY) _____

DATE _____ SIGNATURE _____

Town of Lakeshore

Denis St. Pierre Water Pollution Control Plant Expansion

PUBLIC OPEN HOUSE

WELCOME

Municipal Class Environmental Assessment

September 11, 2019

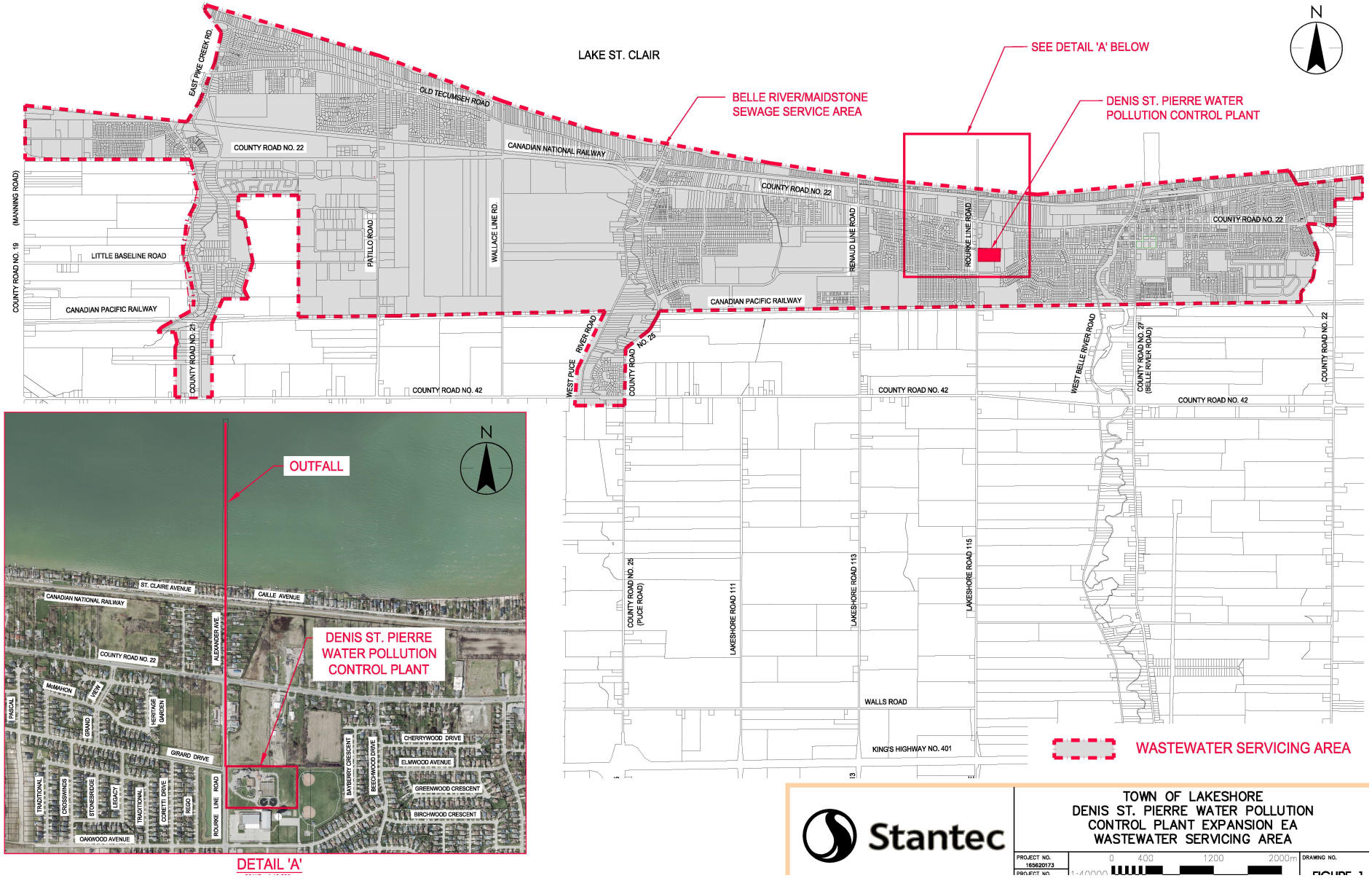
4:00pm -7:00pm

Study Overview

Purpose of this project is to select preferred design for the Denis St. Pierre Water Pollution Control Plant Expansion.

This Public Open House is to introduce the project, describe work completed to date, and obtain comments on the preferred design of the plant expansion.

Belle River and Maidstone Wastewater Servicing Area



DETAIL 'A'

Stantec

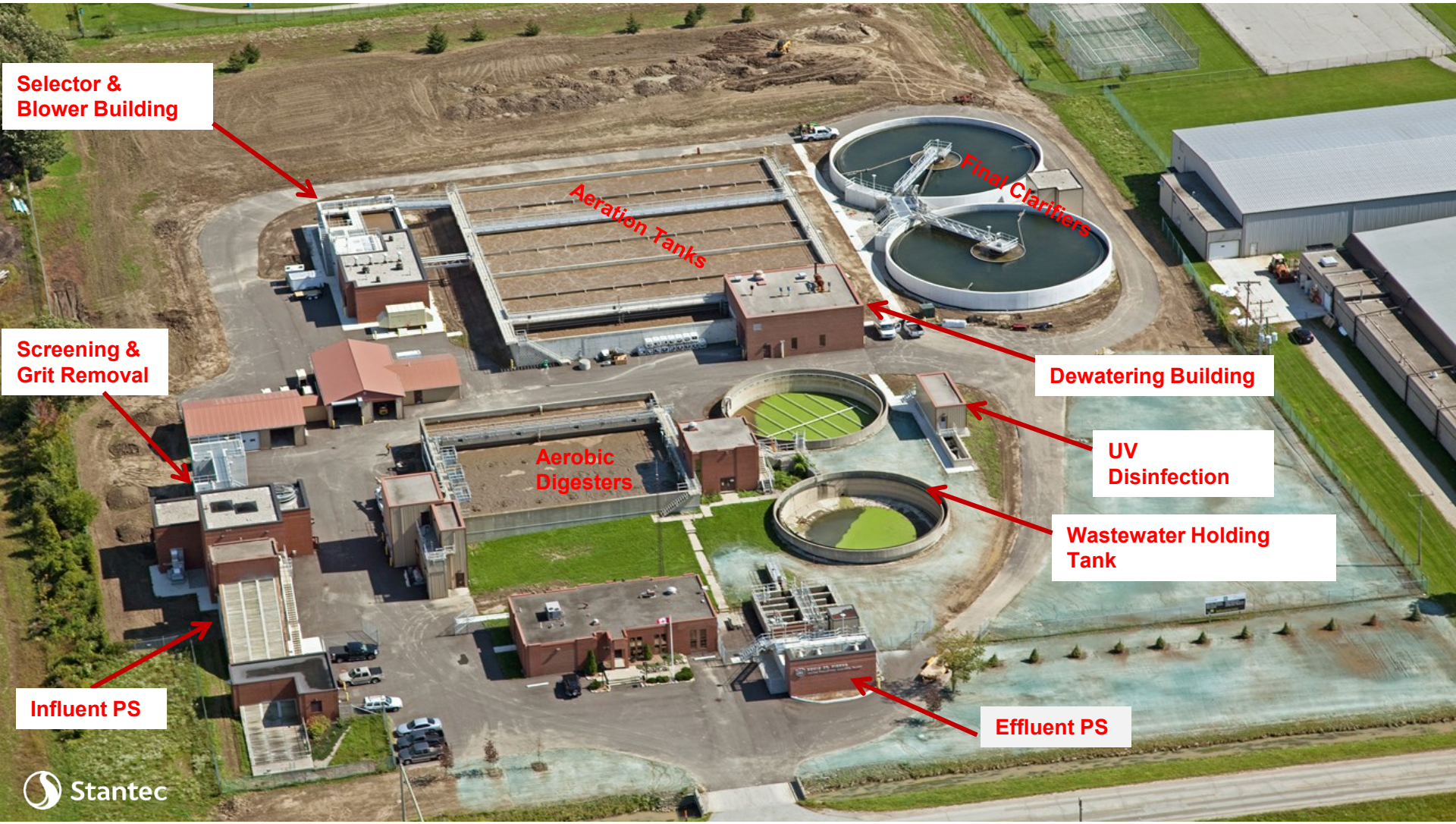
TOWN OF LAKESHORE
DENIS ST. PIERRE WATER POLLUTION CONTROL PLANT EXPANSION EA
WASTEWATER SERVICING AREA

PROJECT NO. 165620173
0 400 1200 2000m
DRAWING NO.

Wastewater Servicing in Belle River and Maidstone Area

- The Belle River and Maidstone Area can be described as an urban community. It contains a mixture of residential, commercial and industrial developments.
- The Belle River community and Maidstone urban area are serviced by a sanitary sewage works system consisting of sanitary sewers, pumping stations, the Denis St. Pierre Water Pollution Control Plant(WPCP) and an outfall discharging to Lake St. Clair.
- The Belle River and Maidstone area are serviced by a gravity collection system with a series of lift stations conveying wastewater to the Denis St. Pierre WPCP for treatment.
- The Denis St. Pierre WPCP is located on Rourke Line Road south of County Road 22 and provides secondary level biological treatment.

Denis St. Pierre Water Pollution Control Plant



The treatment plant was designed for an average daily sewage flow of 14,500 m^3/d and a peak flow capacity of 35,069 m^3/d.

Historical Wastewater Flows to Denis St. Pierre WPCP (2010-2018)

Year	Daily Average Flow (m^3/d)	Daily Max Flow (m^3/d)	Annual Precipitation (mm)	Annual Average Lake Level (m)
2018	14,228	37,657	935	175.408
2017	13,332	35,872	1,014	175.281
2016	12,399	36,650	1,020	175.031
2015	11,887	-	981	175.139
2014	11,302	33,579	1,053	174.983
2013	9,646	25,677	1,148	174.747
2012	8,089	25,677	782	174.481
2011	13,819	33,966	1,568	174.895

- An average treated flow of 14,228 m^3/d was recorded for 2018, which is approximately 98% percent of the plant's rated capacity of 14,500 m^3/d.
- Lake level records obtained from 9044049 Windmill Point Station

Projected Wastewater Flows to Denis St. Pierre WPCP

Daily Flow	Existing	20 Year Design	Ultimate Design
Average Daily Flow, m^3/d	14,500 (3.2 MIGD)	25,000 (5.5 MIGD)	30,000 (6.6 MIGD)
Maximum Dry Weather Flow, m^3/d	37,300 (8.2 MIGD)	64,000 (14.1 MIGD)	77,000 (16.9 MIGD)
Maximum Wet Weather Flow, m^3/d	72,100 (15.9 MIGD)	90,000 (19.9 MIGD)	108,000 (23.9 MIGD)

Problem Statement

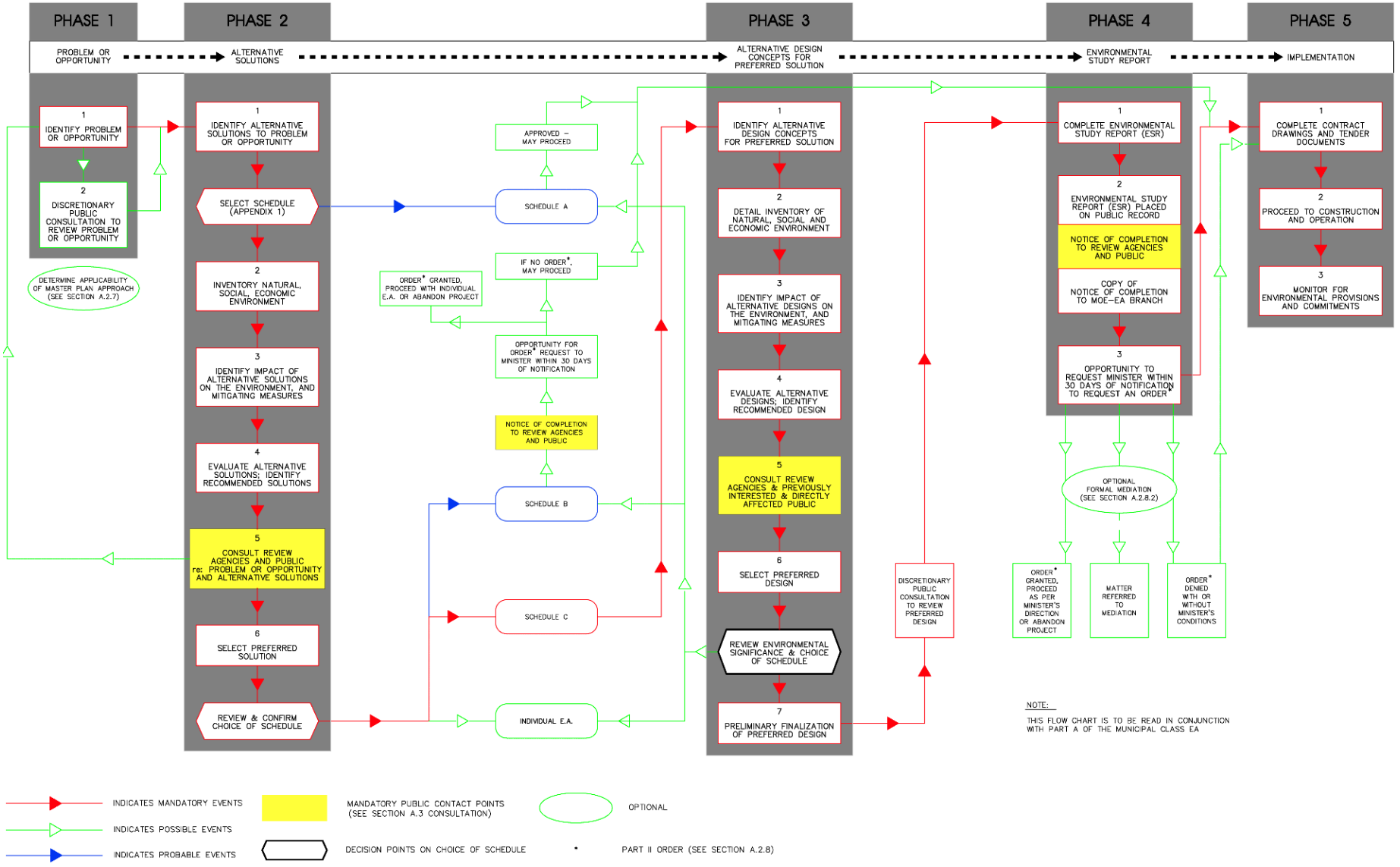
- The existing capacity of the Denis St. Pierre WPCP is not adequate to accommodate the projected future flows from the Belle River and Maidstone wastewater service area.

- Additional wastewater treatment capacity required to support the existing service area and the anticipated future growth.

- Frequently experiences periods of high infiltration and inflow (I/I) entering sanitary sewer system during storm events. Capacity of existing sewers, pumping station and treatment plant unable to accommodate handle all wet weather flows during severe storm events.

- Failure to have adequate infrastructure in place may result in the inability to accommodate community growth.

OVERVIEW OF THE CLASS ENVIRONMENTAL ASSESSMENT PROCESS



KEY FEATURES OF THE CLASS EA PROCESS

The project is being conducted in accordance with the Class EA requirements for Schedule "C projects", which is to be approved subject to completion of Phase 1, 2, 3, 4 and 5 Class EA, including:

- *Phase 1 – Review and identify problem or opportunity*
- *Phase 2 – Alternative solutions to problem*
- *Phase 3 – Alternative design concepts for the preferred solution*
- *Phase 4 – Environmental Study Report*
- *Phase 5 – Implementation of the preferred design*

The Town of Lakeshore adopted its first comprehensive Water and Wastewater Master Plan in November 2008, and then an update of this Master Plan was undertaken and completed in 2018 in accordance with Phases 1 and 2 of the Class EA process.

The above Phases 1 and 2 were covered under Lakeshore Water and Wastewater Master Plan and Update.

Phase 1 and Phase 2 EA - Completed

The need for additional wastewater treatment capacity in the Belle River and Maidstone Area has been identified.

After consultation with review agencies and the public, the preferred solution was determined as follows

- ***Capacity expansion to the Denis St. Pierre WPCP***

Ongoing Phase 3 Class EA

- Review alternative designs for the Denis St. Pierre WPCP Capacity Expansion
- Select the preferred design
- Preferred design is one that satisfies wastewater collection and treatment criteria, minimizes undesirable impacts on the natural, social and economic environment, and is acceptable to the public and regulatory agencies

This open house is held as part of Phase 3 Class EA.

DESIGN ALTERNATIVES – Wastewater Treatment

WASTEWATER TREATMENT PROCESSES CONSIDERED

Activated Sludge Systems

- *Conventional Activated Sludge (CAS)*
- *Extended Aeration Activated Sludge (EAAS)*
- *Sequencing Batch Reactor (SBR)*

Attached Growth Systems

- *Trickling Filter/Solids Contact (TF/SC)*
- *Rotating Biological Contactor (RBC)*
- *Biological Aerated Filter (BAF)*

Membrane Bioreactors (MBR)

PREFERRED WASTEWATER TREATMENT PROCESS

Selected Wastewater Treatment Process

- *The existing site has difficulty accommodating any of alternatives that require primary settling tanks.*
- *EAAS and the SBR treatment processes do not require primary settling tanks are particularly well suited to the existing site.*
- *Town of Lakeshore has experience with both the EAAS and the SBR treatment processes. The Denis St. Pierre WPCP was upgraded in 2008 and, at the same time, the treatment process was converted from an SBR to an EAAS system.*
- *To date, operating experience with the EAAS system has been very good and there is definite merit in utilizing the same process for the plant expansion.*
- *By using the same process at the existing plant, operator training would be confined to a single process and assignment of operating staff to any treatment facilities would be simplified.*

The preferred design is EAAS wastewater treatment process

BIOSOLIDS MANAGEMENT

Introduction

- *EASS processes produce excess solids known as waste activated sludge*
- *Biosolids management deals with all aspects of handling the waste sludge stream including storage, dewatering or thickening, stabilization and ultimate disposal*
- *Terms “sludge“ and “biosolids” often used interchangeably, although biosolids is more commonly used to describe sludge that has undergone treatment to make it suitable for land application*

BIOSOLIDS MANAGEMENT ALTERNATIVES

ALTERNATIVES CONSIDERED

1. *Biosolids Thickening including gravity thickening, gravity belt thickeners, and rotary drum thickeners*

2. *Biosolids Stabilization including anaerobic digestion, aerobic digestion, lime stabilization, composting and pelletization*

3. *Biosolids Dewatering including belt presses, rotary presses, and screw presses, and centrifuges*

4. *Biosolids Disposal including incineration, re-sale or giveaway, landfilling, and farmland application*

PREFERRED BIOSOLIDS MANAGEMENT

Preferred Biosolids Management System is

Aerobic digestion → centrifugal dewatering → Land application

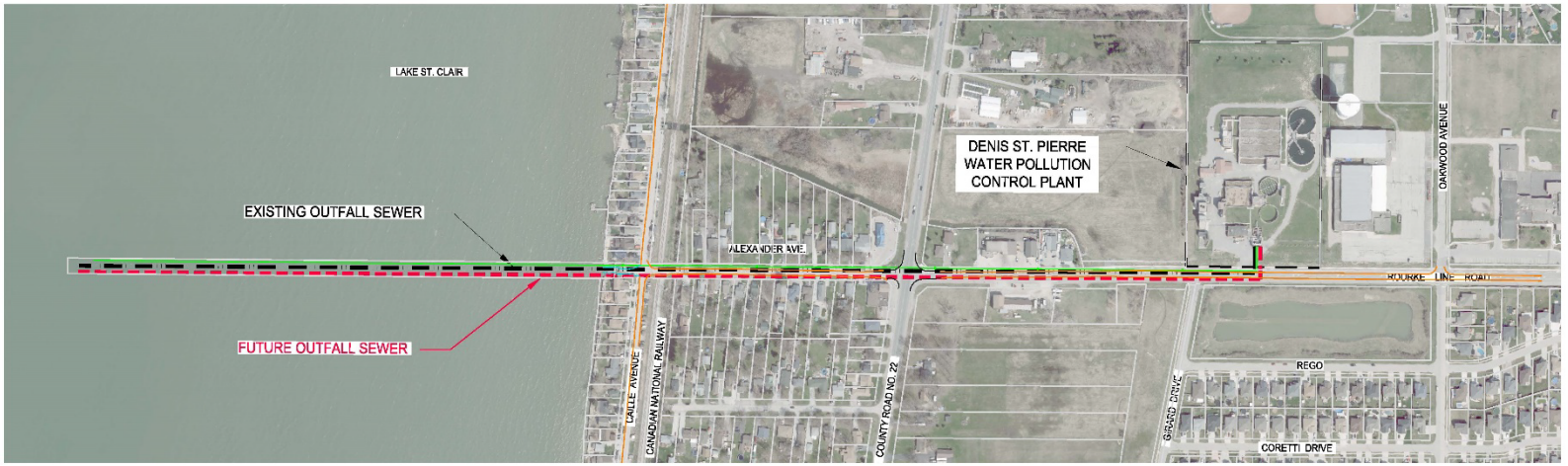
It is recommended as the preferred design for biosolids management because it is a proven process and has been used successfully at the existing plant for many years.

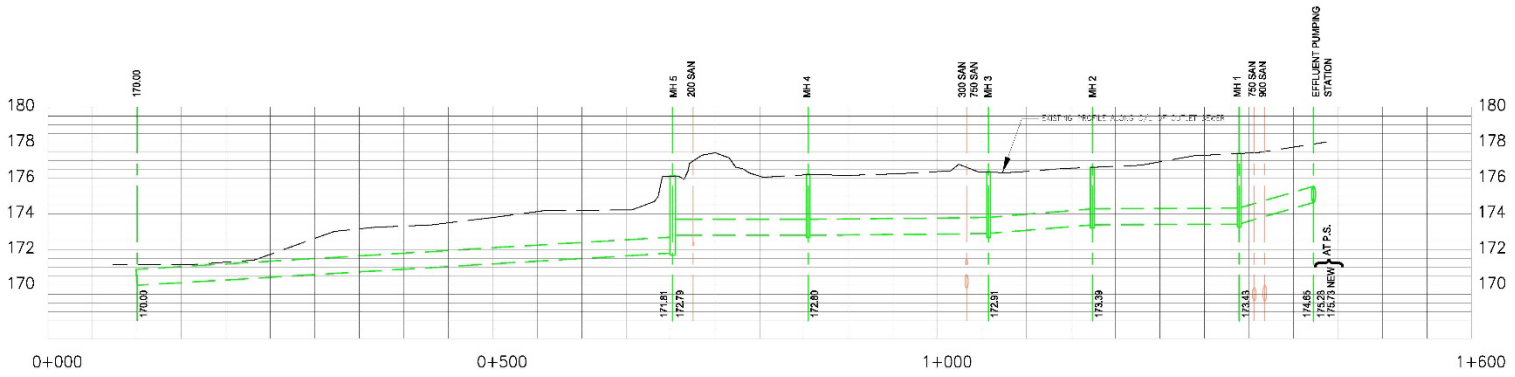
Proposed Plant Expansion for Biosolids Management

- *Add aerobic digestion*
- *Construct new centrifugal dewatering facilities*
- *Use of existing sludge cake storage/transfer site*
- *Land Application*

DESIGN ALTERNATIVES - OUTFALL SEWER

Alternative 1 – Twining of Entire Outfall Sewer



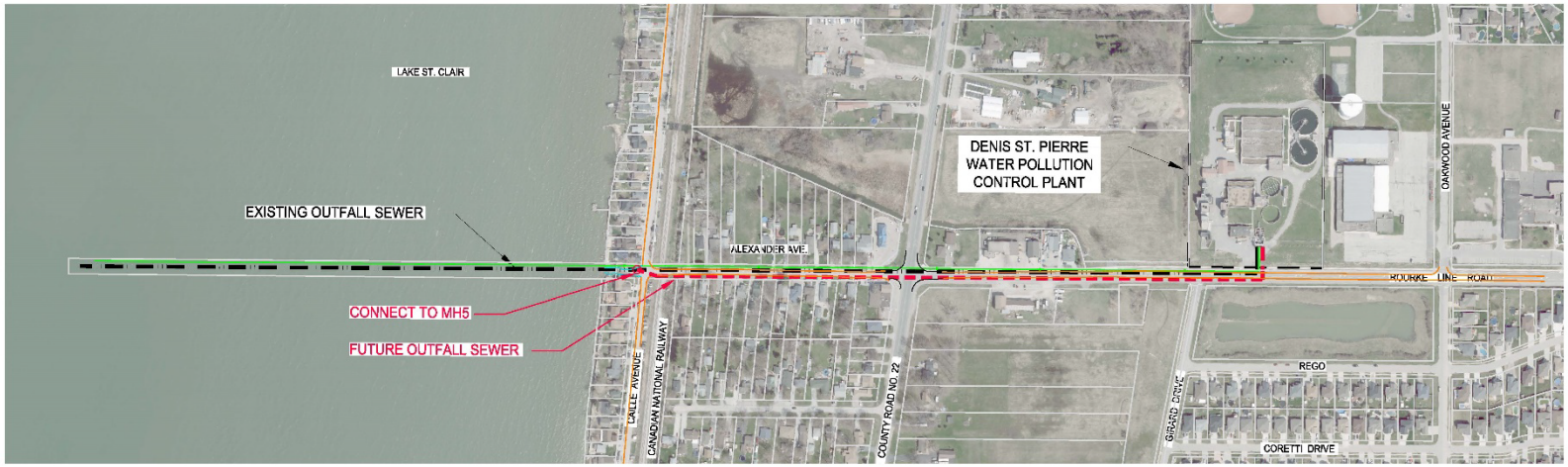


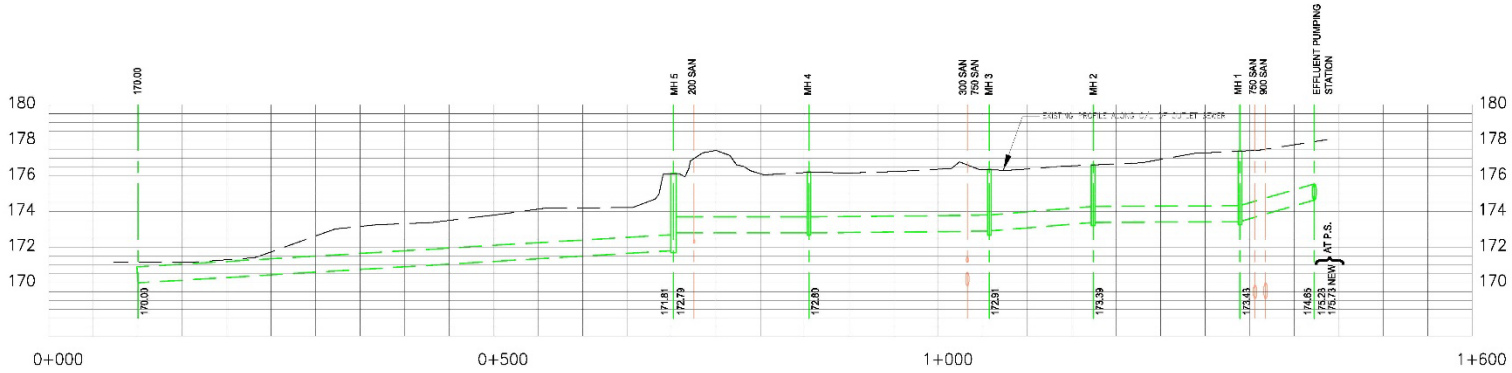
- Costly and complex outfall construction into the lake

Not carried forward for detailed consideration

DESIGN ALTERNATIVES - OUTFALL SEWER

Alternative 2 – Twining Inland Portion of Outfall Sewer and Enlarging Diffusers from 5" to 10"





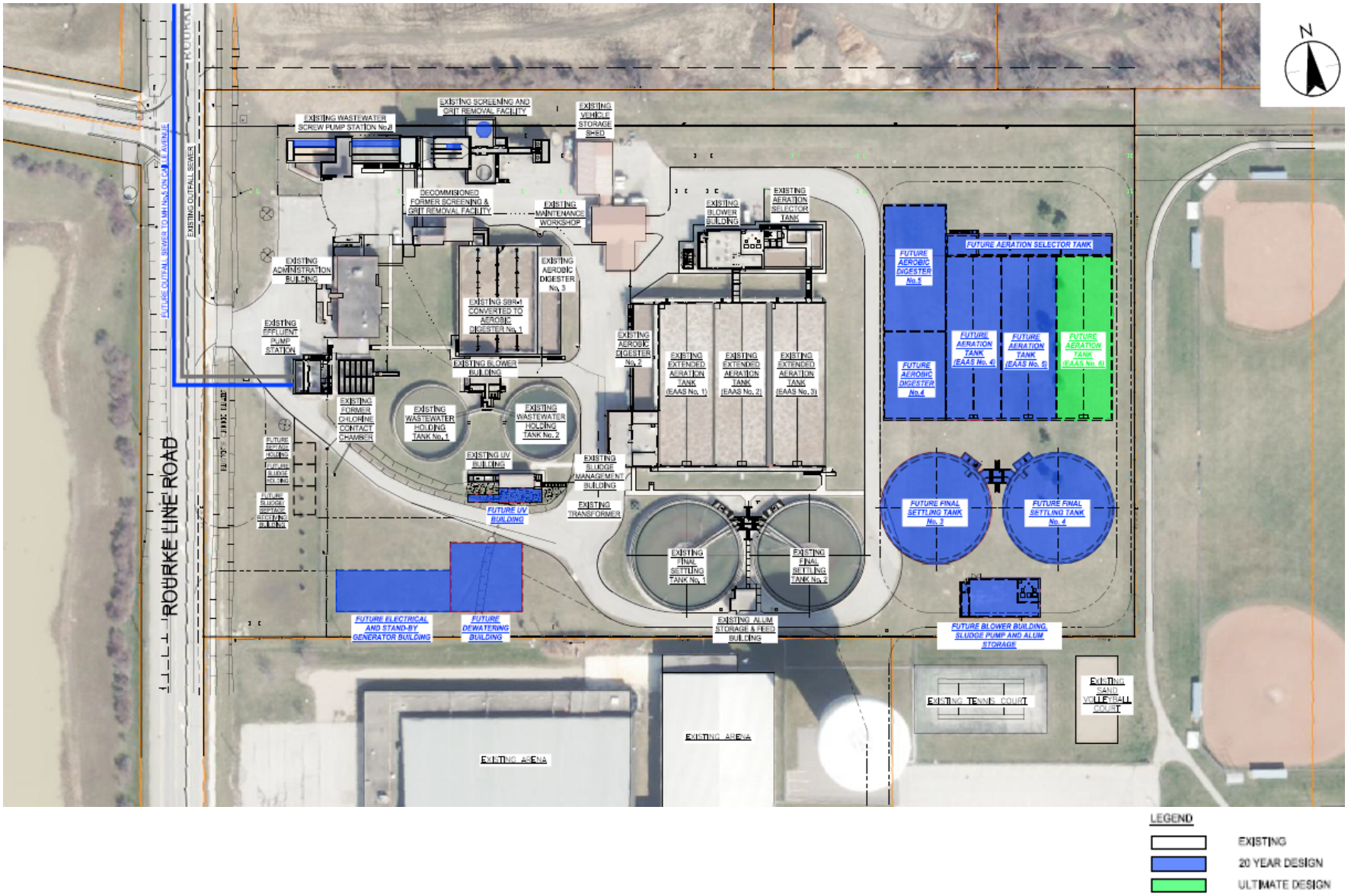
- Suitable for ultimate flow condition

This alternative recommended as the preferred design

Summary of Recommended Design for Plant Expansion

- Increase pumping capacity of the existing Maidstone Pumping Station No.8
- Add second fine screen and vortex grit tank in the existing Screening and Grit Removal Facility
- Add two new aeration tanks and final clarifiers
- Build new UV disinfection facility
- Construct new service building accommodating blowers, sludge pumps, and chemical feed and storage
- Add two new aerobic digesters
- Construct new centrifugal dewatering facility
- Construct new electrical and standby generator building
- Twinning of inland portion of outfall sewer along Rourke Line Road from the Denis St. Pierre WPCP to Caille Avenue.

Summary of Recommended Plant Expansion



OPINION OF PROBABLE COST

Description	Cost
Inlet Works and Grit Building	$1,500,000
Extended Aeration Tanks and Blower Facility	$5,500,000
Final Settling Tanks and Alum Storage/Feed Facility	$4,800,000
UV disinfection	$1,200,000
Outfall	$3,500,000
Aerobic Digester	$1,500,000
Dewatering Building	$2,500,000
Electrical and Standby Generator Building	$1,200,000
Sub-total	$21,700,000
Contingency 10%	$2,170,000
Engineering Allowance 15%	$3,255,000
TOTAL	**$27,125,000**

Future Class EA Work

- Draft Phase 3 Environmental Study Report (ESR) has been distributed to mandatory and discretionary contacts and agencies for review
- Open house being held to present information and solicit public input on recommended design
- Complete the ESR including modifications as necessary to reflect input from the public and review agencies
- Present ESR to Town Council for final approval and adoption
- Place ESR on public record and issue notice of completion

Class Environmental Assessment - Schedule C
Central Box Study Area, City of Windsor
Stakeholder Contact List
August 7, 2014

Title	First Name	Surname	Job Title	Organization	Address	City/Prov	Postal Code
Conservation Authorities							
Mr.	Richard	Wyma	General Manager	Essex Region Conservation Authority	360 Fairview Avenue West, Suite 311	Essex, ON	N8M 1Y6
Mr.	Tim	Byrne	Director, Watershed Management Services	Essex Region Conservation Authority	360 Fairview Avenue West, Suite 311	Essex, ON	N8M 1Y6
Mr.	Michael	Nelson	Watershed Planner	Essex Region Conservation Authority	360 Fairview Avenue West, Suite 311	Essex, ON	N8M 1Y6
Dr.	Katie	Stammler	Water Quality Scientist/Source Water Protection Project Manager	Essex Region Conservation Authority	360 Fairview Avenue West, Suite 311	Essex, ON	N8M 1Y6
Ms.	Corinne	Chiasson	Resource Planner	Essex Region Conservation Authority	360 Fairview Avenue West, Suite 311	Essex, ON	N8M 1Y6
Mr.	Jason	Wintermute	Water Management Supervisor	Lower Thames Valley Conservation Authority	100 Thames Street	Chatham, ON	N7L 2Y8
Ms.	Claire	Sanders	RAP Coordinator	Detroit River Canadian Cleanup	360 Fairview Avenue West, Suite 311	Windsor, ON	N8M 1Y6
Ms.	Averil	Parent	Coordinator	Windsor Essex Environment Committee	c/o 350 City Hall Square West	Windsor, ON	N9A 6S1
Local Public Services							
Chief	Bruce	Krauter	Chief	Essex-Windsor EMS	360 Fairview Ave West	Essex, ON	N8M 1Y6
Mr.	Chris	Grant	Deputy Chief	Essex-Windsor EMS	920 Mercer Street	Windsor, ON	N9A 1N6
Mr.	Barry	Horrobin	Director of Planning & Physical Resources	Windsor Police Service	150 Goyeau Street, PO Box 60	Windsor, ON	N9A 6J5
Fire Chief	Stephen	Laforet	Fire Chief	Windsor Fire and Rescue	815 Goyeau Street	Windsor, ON	N9A 1H7
Mr.	Doug	Gooding	Deputy Chief of Operations	Windsor Fire and Rescue	815 Goyeau Street	Windsor, ON	N9A 1H7
Mr.	Beth	Krauter		Central Ambulance Communications Centre	4510 Rhodes Drive, Suite 320	Windsor, ON	N8W 5K5
Sgt.	Rick	Tonial	Detachment Commander	Ontario Provincial Police	963 Lesperance Road	Tecumseh, ON	N8N 1W9
Staff Sgt	Ed	Marocko		Ontario Provincial Police	1219 Hicks Road, PO Box 910	Essex, ON	N8M 2Y2
Ms.	Brian	Yeomans	Operations Manager	Downtown Windsor Business Improvement Association	419 Pelissier St.	Windsor, ON	N9A 4L2
Sir/Madam				Municipal Property Assessment Corporation	1695 Manning Road, Unit 195	Tecumseh, ON	N8N 2L9
Mr.	Rakesh	Naidu	President & CEO	Windsor-Essex Regional Chamber of Commerce	2575 Ouellette Place	Windsor, ON	N8X 1L9
Mr.	Derek	Coronardo	Coordinator	Citizens Environmental Alliance of Southwestern Ontario	1950 Ottawa Street	Windsor, ON	N8Y 1R7
Ms.	Lisa	Tulen	President	Citizens Environmental Alliance of Southwestern Ontario	1950 Ottawa Street	Windsor, ON	N8Y 1R7
Mr.	Steve	Marks	Vice-President	Essex County Field Naturalist's Club	C/O Ojibway Nature Centre 5200 Matchette Road	Windsor, ON	N9C 4E8
Mr.	Paul	Pratt	President	Essex County Field Naturalist's Club	5200 Matchette Road	Windsor, ON	N9C 4E8

Class Environmental Assessment - Schedule C
Central Box Study Area, City of Windsor
Stakeholder Contact List
August 7, 2014

Title	First Name	Surname	Job Title	Organization	Address	City/Prov	Postal Code
Ms.	Susan	Budden	Business Development Manager	Ontario Clean Water Agency	1 Yonge Street, Suite 1700	Toronto, Ontario	M5E 1E5
Mr.	Rob	Dobos	Head	Environment Canada, Ontario Region	867 Lakeshore Road, P.O. Box 5050	Burlington, ON	L7R 4A6
Mr.	John	Shaw	Manager	Great Lakes Sustainability Fund	867 Lakeshore Road, PO Box 5050	Burlington, ON	L7R 4A6
Ms.	Sandra	Kok	Acting Manager	Great Lakes Sustainability Fund	867 Lakeshore Road, PO Box 5050	Burlington, ON	L7R 4A6
	Superintendent			Canadian Coast Guard c/o ASI Group Ltd	120 Seaway Road	Sarnia, ON	N7T 8A5
Ms.	Celina	Russell		Fisheries and Oceans Canada	520 Exmouth Street	Sarnia, ON	N7T 8B1
Ms.	Sara	Eddy	Fish Habitat Biologist	Fisheries and Oceans Canada - Central and Arctic Region	867 Lakeshore Road, PO Box 5050	Burlington, ON	L7R 4A6
Ms.	Suzanne	Shea		Transport Canada Marine	100 Front Street South	Sarnia, ON	N7T 2M4
Mr.	Steven	C Salmons	President & CEO	Windsor Port Authority	3190 Sandwich Street	Windsor, ON	N9C 1A6
Mr.	Vince	Diano	Manager of Procurement	Windsor-Detroit Bridge Authority	100 Ouellette Ave, Suite 400	Windsor, ON	N9A 6T3
Mr.	Darren	Winger	Regional Advisor	Ministry of Citizenship, Immigration & International Trade / Ministry of Tourism, Culture & Sport	221 Mill Street	Windsor, ON	N9C 2R1
Ms.	Katherine	Kirzati	Heritage Planner	Ministry of Tourism, Culture and Sport	401 Bay Street, Suite 1700	Toronto, ON	M7A 0A7
Ms.	Karla	Barboza	Team Lead, Heritage	Ministry of Tourism, Culture and Sport	401 Bay Street, Suite 1700	Toronto, ON	M7A 0A7
Ms.	Amanda	Liu	Manager of Business Planning and Finance Unit (Infrastructure)	Ministry of Economic Development, Job Creation and Trade	777 Bay Street, 4th Floor, Suite 425	Toronto, ON	M5G 2E5
Mr.	Craig	Newton	Regional Environnmental Planner / Regional EA Coordinator	Ministry of the Environment, Conservation and Parks	733 Exert Road	London , ON	N6E 1L3
Mr.	Shawn	Howard	Supervisor	Ministry of the Environment, Conservation and Parks	4510 Rhodes Drive, Unit 620	Windsor, ON	N8W 5K5
Ms.	Emily	Awad	Provincial Officer	Ministry of the Environment, Conservation and Parks	4510 Rhodes Drive, Unit 620	Windsor, ON	N8W 5K5
Mr.	Ken	Yaraskavitch	Supervisor	Ontario Ministry of Natural Resources	870 Richmond Street, P.O. Box 910	Chatham, ON	N7M 5L3
Ms.	Sherry	Pineo	Resources Management Supervisor	Ministry of Natural Resources and Forestry	615 John Street North	Aylmer, ON	N5H 2S8
Ms.	Amanda	McCloskey	District Planner	Ministry of Natural Resources and Forestry	615 John Street North	Aylmer, ON	N5H 2S8
Mr.	Erick	Boyd	Manager - Community Planning and Development	Ministry of Municipal Affairs and Housing	659 Exeter Road, 2nd Floor	London, ON	N6E 1L3
Mr.	David	Stubbs	Planner - Community Planning and Development	Ministry of Municipal Affairs and Housing	659 Exeter Road, 2nd Floor	London, ON	N6E 1L3

Title	First Name	Surname	Job Title	Organization	Address	City/Prov	Postal Code
Mr.	Kevin	Laidley	Regional Manager	Ontario Ministy of Agriculture, Food and Rural Affairs	667 Exeter Road	London, ON	N6E 1L3
Mr.	Terri	Bulman	Manager - Environmental Stewardship Policy	Ontario Ministy of Agriculture, Food and Rural Affairs	1 Stone Road West, 2nd floor	Guelph, ON	N1G 4Y2
Ms.	Jodie	Lucente	Corridor Management Planner	Ontario Ministry of Transportation	659 Exeter Road	London, ON	N6E 1L3
Ms.	Cathy	Giesbrecht	Head - Environmental	Ontario Ministry of Transportation	659 Exeter Road	London, ON	N6E 1L3
Mr.	Martin	Favell	Planning & Design Head	Ontario Ministry of Transportation	659 Exeter Road	London, Ontario	N6E 1L3
Ms.	Joanne	Brown	Regional Issues and Integration Manager	Ministry of Community and Social Services, West Region Office	P.O. Box 5217	London, ON	N6A 5R1
Local Municipalities							
Mr.	Kevin	Girard	Manager of Environmental Services	Town of Lakeshore	419 Notre Dame Street	Belle River, ON	N0R 1A0
Mrs.	Jane	Mustac	County Engineer	County of Essex	360 Fairview Avenue West	Essex, Ontario	N8M 1Y6
Mr.	Bill	King	County Planning Department	County of Essex	360 Fairview Avenue West	Essex, Ontario	N8M 1Y6
Mr.	Peter	Marra	Manager of Water and Wastewater	Town of LaSalle	5950 Malden Road	LaSalle, Ontario	N9H 1S4
Ms.	Antonietta	Giofu	Director of Engineering & Public Works	Town of Amherstburg	271 Sandwich Street South	Amherstburg, ON	N9V 2A5
Mr.	Phil	Bartnik	Director Public Works & Environmental Services	Town of Tecumseh	917 Lesperance Road	Tecumseh, ON	N8N 1W9
Mr.	Peter	Neufeld	Chief Administravie Officer	Municipality of Leamington	111 Erie Street North	Leamington, ON	N8H 2Z9
Mr.	Chris	Nepszy	Chief Administravie Officer	Town of Essex	33 Talbot Street South	Essex, ON	N8M 1A8
Mr.	Onorio	Colucci	Chief Administravie Officer	City of Windsor	350 City Hall Square West	Windsor, ON	N9A 6S1
Ms.	Peggy	Van Mierlo-West	Chief Administravie Officer	Town of Kingsville	2021 Division Road North	Kingsville, ON	N9Y 2Y9
Mr.	Don	Shropshire	Chief Administravie Officer	Municpality of Chatham Ken	315 King Street West P.O. Box 640	Chatham, ON	N7M 5K8
Mr.	Tim	Sunderland	General Manager	Chatham-Kent Public Utilities	325 Grand Ave E	Chatham, ON	N7L 1W9
Ms.	Erin	Kelly	Director of Education	Greater Essex County District School Board	451 Park Street West	Windsor, ON	N9A 4W7
Mr.	Stephen	Fields	Communications Coordinator	Windsor Essex Catholic District School Board	1325 California Ave	Windsor, ON	N9B 3Y6
Ms.	Tracy	Ramsey	Essex M.P.	Consituency Office	316 Talbot Street N, Unit 6	Essex, ON	N8M 2E1
Mr.	Phil	Wong	Manager of Environmental Health	Windsor Essex County Health Unit	1005 Ouellette Ave	Windsor, ON	N9A 4J8

Title	First Name	Surname	Job Title	Organization	Address	City/Prov	Postal Code
Utilities							
Mr.	Chris	Manzon	Director, Engineering	ENWIN Utilities	4545 Rhodes Drive , PO Box 1625 Stn A	Windsor, ON	N8W 5T1
Mr.	Randy	Matis		Bell Canada	1149 Goyeau Street, PO Box 1601	Windsor, ON	N9A 1H9
Mr.	David	Cowing	Coordinator	Bell Canada	1149 Goyeau Street, PO Box 1601	Windsor, ON	N9A 1H9
Mr.	Clifford	Trepanier		Bell Canada	1149 Goyeau Street, PO Box 1601	Windsor, ON	N9A 1H9
Mr.	Tyson	Fuerth		Bell Canada	1149 Goyeau Street, PO Box 1601	Windsor, ON	N9A 1H9
Mr.	Bill	Sorrell		Cogeco Cable Services	2225 Dougall Avenue	Windsor, ON	N8X 5A7
				Essex Terminal Railway Company	1601 Lincoln Road	Windsor, ON	N8Y 2J3
Ms.	Shirley	Brundritt		Union Gas Ltd	50 Keil Drive North	Chatham, ON	N7M 5M1
Mr.	Stan	Bulkiewicz	Operations Manager	Hydro One	125 Irwin Avenue	Essex, ON	N8M 2T3
Mr.	Paul	Dockrill		Hydro One	P.O. Box 4300	Markham, ON	L3R 5Z5
Ms.	Jenny	Seo		Hydro One	483 Bay Street, 13th Floor North Tower	Toronto, ON	M5G 2P5
Mr.	Rodney	Bouchard	General Manager	Union Water Supply System Joint Board Management	1615 Union Ave P.O. Box 359	Ruthvan, ON	N0P 2G0
Mr.	Dave	Jubenville	General Manager	Ontario Clean Water Agency	276 Rourke Line Road, RR #3	Belle River, ON	N0R 1A0
Ms.	Amber	New	Director, Business Development	Plains Midstream	Box 7277	Windsor, ON	N9C 0C4
Mr.	Raymond	Tracey	President & CEO	Essex Power Corporation	2199 Blackacre Dr. Suite 2	Oldcastle, ON	N0R 1L0
Mr.	Michael	Audet	Chief Executive Officer	ELK Energy Inc	172 Forest Ave	Essex, ON	N8M 3E4
Aboriginal Agencies							
Ms.	Leslie	Brewer-Palhazi		Ministry of Aboriginal Affairs	9th Floor, 160 Bloor Street East	Toronto, ON	M7A 2E6
Ms.	Allison	Berman	Regional Subject Expert	Aboriginal Affairs and Northern Development Canada	10 Wellington St	Gatineau, QC	K1A OH4
Mr.	Corwin	Troje	Manager (Acting)	Ministry of Aboriginal Affairs	9th Floor, 160 Bloor Street East	Toronto, ON	M7A 2E6
Ms.	Johnson	Ashley		Ministry of Aboriginal Affairs	9th Floor, 160 Bloor Street East	Toronto, ON	M7A 2E6
Ms.	Jennifer	Whiteye	Executive Director	Southern First Nations Secretariat	22361 Austin Line	Bothwell, ON	N0P 1L0
Ms.	Leea	Litzgus	Associate Regional Director	Indigenous & Northern Affairs Canada, Ontario Region	25 St Clair Ave East, 8th Floor	Toronto, ON	M4T 1M2
First Nation Communities/Métis Groups							
Mr.	Dean	Jacobs	Heritage Centre Director	Walpole Island First Nation / Bkejwanong Territory	R.R. #3	Wallaceburg, ON	N8A 4K9

Class Environmental Assessment - Schedule C
Central Box Study Area, City of Windsor
Stakeholder Contact List
August 7, 2014

Title	First Name	Surname	Job Title	Organization	Address	City/Prov	Postal Code
Chief	Daniel	Miskokomon	Chief	Walpole Island First Nation / Bkejwanong Territory	117 Tahgahoning Road,R.R. #3	Wallaceburg, ON	N8A 4K9
Ms.	Janet	MacBeth	Project Review Coordinator	Walpole Island First Nation / Bkejwanong Territory	117 Tahgahoning Road,R.R. #3	Wallaceburg, ON	N8A 4K9
Chief	Mary	Duckworth	Chief	Caldwell First Nation	14 Orange Street	Leamington, ON	N8H 1P5
Ms.	Nikki	Orosz	Acting Director of Operations	Caldwell First Nation	14 Orange Street	Leamington, ON	N8H 1P5
Chief	Chris	Plain	Chief	Aamjiwnaang First Nation	978 Tashmoo Avenue	Sarnia, ON	N7T 7H5
Ms.	Sharilyn	Johnston	Environmental Coordinator	Aamjiwnaang First Nation	978 Tashmoo Avenue	Sarnia, ON	N7T 7H5
Ms.	Christine	James	Environment Worker	Aamjiwnaang First Nation	978 Tashmoo Avenue	Sarnia, ON	N7T 7H5
Chief	Denise	Stonefish	Chief	Moravian of the Thames (Delaware Nation)	14760 School House Line, RR 3	Thamesville, ON	N0P 2K0
Mr.	Aly	Alibhai	Director, Lands, Resources and Consultations	Métis Nation of Ontario	75 Sherbourne Street, Suite 311	Toronto, ON	M5A 2P9
Chief	Jason	Henry	Chief	Chippewas of Kettle & Stony Point First Nation	6247 Indian Lane, RR#2	Forest, ON	N0N 1J1
Ms.	Valerie	George	Consultation Coordinator	Chippewas of Kettle & Stony Point First Nation	6247 Indian Lane, RR#2	Forest, ON	N0N 1J1
Chief	Henry	Myeengun	Chief	Chippewas of the Thames First Nation	320 Chippewa Road	Muncey, ON	N0L 1Y0
Ms.	Kelly	Riley	Acting Director	Chippewas of the Thames First Nation	320 Chippewa Road	Muncey, ON	N0L 1Y0
Ms.	Rochelle	Smith	Consultation Coordinator	Chippewas of the Thames First Nation	320 Chippewa Road	Muncey, ON	N0L 1Y0
Chief	Jessica	Hill	Chief	Onelda Nation of the Thames ONYOTA'A:KA	2212 Elm Avenue	Southwold, ON	N0L 2G0
Ms.	Brandon	Doxtator	Environment Coordinator	Onelda Nation of the Thames ONYOTA'A:KA	2212 Elm Avenue	Southwold, ON	N0L 2G0
Other Stakeholders							
				CN Rail Regional Engineering Services	1 Administration Road P.O. Box 1000	Concord, ON	L4K 1B9
				CN Rail Support Real Estate Group	1 Administration Road P.O. Box 1000	Concord, ON	L4K 1B9
Mr.	Raymond	Beshro		CN Rail McMillan Administration Road	1 Administration Road, 1st Floor	Concord, ON	L4K 1B9
Ms.	Josie	Tomei		C.P. Limited Railway Real Estate & Facility Management	800- 1290 Central Parkway	Mississauga, ON	L5C 4R3
	K.C.	Rose	Director	VIA Rail Canada	50 Drummond Street, Building C	Toronto, ON	M8V 4B5
Mr.	Henry	Bustard	President	Carleton Trail Management Inc	#1, 1715 - 27th Avenue N.E.	Calgary, AB	T2E 7E1
Mr.	Hilary	Payne	Development Coordination	Hilary G Payne & Associates	2985 Dougall Avenue	Windsor, ON	N9E 1S1
			Att: Circulations Intake, Planning & Design	MMM Group Limited	100 Commerce Valley Drive West	Thornhill, ON	L3T 0A1

Title	First Name	Surname	Job Title	Organization	Address	City/Prov	Postal Code
Mr.	Carmen	Starnichuk		Tecumseh Letter Carrier Depot	11910 Tecumseh Road East	Tecumseh, ON	N8N 1M0
				TSSA Intake & Licensing	3300 Bloor Street West	Toronto, ON	M8X 2X4
				Windsor-Essex Family Network & Resource Centre	7025 Enterprise Way	Windsor, ON	N8T 3N6
Mr.	Bruno	DeSando		Canada Post Delivery Planning	955 Highbury Aveneu	London, ON	N5Y 1A3
Other Stakeholders							
Mr.	Jeff	Nawalany		Orion Homes Inc	5848 Malden Road Suite 306	LaSalle, ON	N9H 04A
Mr.	Mario	Piroli		Piroli Construction	3850 Dougall Ave, Unit 10	Windsor, ON	N9G 1X2
Mr.	Tim / Ray	Belanger		Ray Belanger Builders Ltd	536 Brighton Road	Tecumseh, ON	N9N 2L6
Mr.	Ralph	Meo		Seven Lakes Homes Ltd./Meo & Associates Inc	Suite 200, 3600 Seven Lakes Drive	LaSalle, ON	N9H 0E5
				Silver Spring construction	7865 Howard Ave.	McGregor, ON	N0R 1J0
Mr.	Tim	McFarlane		T. McFarlane Builders Ltd	1054 Mole	Essex, ON	N8M 2X5
Mr.	Gino	Piccioni		Timberland General Contractors	6224 Wales Crt.	Windsor, ON	N9J 3R7
Mr.	Trevor			TMC Construction	63 Given Road	Chatham, ON	N7L 0C7
Mr.	Brian	Towsley		Towsley Construction Co Inc	2090 Fasan Drive	Old Castle, ON	N0R 1L0
				Tri-World Development	3235 Electricity Drive	Windsor, ON	N8W 5J1
Mr.	Steve	Valente		Valente Construction	25 Amy Croft Drive, Unit 23B	Tecumseh, ON	N9K 1C7
Mr.	Peter	Valente		Valente Real Estate & Development	2985 Dougall Ave	Windsor, ON	N9E 1S1
Mr.	Bill	Maggio		Vanderbilt Homes Ltd	1731 Wyandotte Street East	Windsor, ON	N8Y 1C9
Mr.	Vince	Russo		Affinity Custom Homes	3154 Troup Crescent	Windsor, ON	N8R 0A3
Mr.	Peirre	Amine		Amine Construction Ltd	1051 Chelsea Park Way	Belle River, ON	N0R 1A0
Mr.	Dino	Fantin		Amico Design Build Inc	2199 Blackacre Drive	Old Castle, ON	N0R 1L0
Mr.	Louis			Archambault Contracting	5095 Tecumseh Road	Pointe aux Roches, ON	N0R 1N0
Mr.	Danny	Azar		Azar Homes	1126 Lesperance Road	Tecumseh, ON	N8N 1X2
Ms.	Annalisa	McCarthy		Bart DiGiovanni Construction Ltd	2217 Walker Road	McGregor, ON	N0R 1J0
Mr.	Ben	Klundert		BK Cornerstone	13405 Desro Drive	Tecumseh, ON	N8N 2L9
Mr.	Ted	Bachynski		Bachynski Builders	1061 County Rd 46	Woodslee, ON	N0R 1V0
Mr.	Sam	Jraige		Bayshide Homes Ltd	20 Division Rd N RR 3	Cottam, ON	N0R 1B0
Mr.	Jeff			Boy Construction	432 W Puce Road	Belle River, ON	N0R 1A0
Ms.	Tammy			Brady Homes	339 County Road 34	Essex, ON	N8M 2X5
Mr.	Brian	Klundert		Brian Klundert Builders Ltd	1617 County Rd 46	Woodslee, ON	N0R 1V0
Mr.	Scott			Brian Spakres & Son Ltd	56 Bolohan Dr	Tilbury, ON	N0P 2L0
Mr.	Brian	Sterritt		Brimar Homes Ltd	1616 Chornoby Cres	Tecumseh, ON	N8N 4W3
Mr.	Don			Brouillette Builders	1553 Lakeshore Rd 123	Belle River, ON	N0R 1A0

Class Environmental Assessment - Schedule C
Central Box Study Area, City of Windsor
Stakeholder Contact List
August 7, 2014

Title	First Name	Surname	Job Title	Organization	Address	City/Prov	Postal Code
Ms.	Nicole	Ciarrocchi		Bungalow Group	3409 McKay Ave	Windsor, ON	N9E 2R8
Mr.	Dan	Caster		Caster Custom Homes	13401 Desro Dr	Tecumseh, ON	N8N 2L9
	Mark			Cedar Hill Homes	11500 Tecumseh Rd E	Windsor, ON	N8N 5G6
Mr.	Chris	King		Chris King & Sons Construction	1675 Division Rd North	Kingsville, ON	N9Y 2H1
Ms.	Patti	Fraize		Coco Developments	485 Little Baseline Rd	Tecumseh, ON	N8N 2L9
Mr.	Dan			Elite Construction	2005 Candlewood Dr	Tecumseh, ON	N9K 0A3
				Everjonge Homes	782 W Belle River Rd	Belle River, ON	N0R 1A0
Mr.	John	Evola		Evola Builders	2165 Suzanne St	Windsor, ON	N9H 2L4
Mr.	Steve	Shore		Fernwood Builders	1558 County Rd 31	Saint Joachim, ON	N0R 1S0
Mr.	Ezio	Tartaro		Gintar Contractors Ltd	820 Erie Street East	Windsor, ON	N9A 3Y4
Mr.	Joe	Hadi		Hadi Construction	7135 Malden Road	LaSalle, ON	N9J 2T8
Mr.	John			Hanna Homes	34 Carter Ave	Leamington, ON	N8H 5C9
Mr.	Jeff	Rivest		Homes of Integrity	262 Redwood, SS6	Belle River, ON	N0R 1A0
Ms.	Jeannette	Sylvestre		James Sylvestre Ent.	1865 Manning Road	Tecumseh, ON	N8N 2L9
Mr.	Joe	Rauti		J. Rauti Custom Homes	1290 Monty St	Windsor, ON	N9J 3S2
Mr.	Mo	Kolody		Kolody Contracting	424 Old Tecumseh Road	Windsor, ON	N8N 3S8
Mr.	Sam			Lakepoint Homes	1865 Manning Road	Tecumseh, ON	N8N 2L9
Mr.	Anthony	Lapico		Lapico Homes	2895 Normandy Street	LaSalle, ON	N9H 1C8
Mr.	Bruno			Maple Leaf Homes Ltd	P.O. Box 332	Emeryville, ON	N0R 1C0
Ms.	Mary	Morabito		Marpasco Homes	2503 Buttery Street	Windsor, ON	N9E 4L9
Ms.	Laura	Fanelli		Mastercraft Homes Windsor (2011) Inc	3199 Dougall Ave	Windsor, ON	N9E 1S5
Mr.	Jack	Moceri		Moceri, Jack & Sons	11254 Tecumseh Road E	Windsor, ON	N8R 1A8
Mr.	Tom	Jraiche		New Millennium Homes	33 Princess Street	Leamington, ON	N8H 5C5
Mr.	Joe	Noah		Noah Homes	950 Seacliff Dr	Kingsville, ON	N9Y 2K9
Mr.	Norbert	Bolger		Nor-Built Construction	20 Ranaud Street	Amherstburg, ON	N9V 4B1

APPENDIX C-3

First Nations Consultation

Aboriginal Consultation Log
Municipal Class Environmental Assessment
Town of Lakeshore Denis St. Pierre Water Pollution Control Plant Expansion

Contact Information	Date/Method of Communication	Correspondence Received and/or Project Information Distributed	Consultant Response
Ministry of Aboriginal Affairs Leslie Brewer-Palhazi Corwin Troje Ashley Johnson Ministry Partnerships Unit, Aboriginal Relations and Ministry Partnerships Branch	**Notice of Commencement** Date: April 3, 2019 Method: Newspaper and Canada Post	The Notice of Commencement was sent to Leslie Brewer-Palhazi, Corwin Troje and Ashley Johnson on April 3, 2019 via Canada Post. The Notice was published in the April 11, 2019 edition of the Lakeshore News and Tilbury Times, and the April 12, 2019 edition of the Shoreline News.	N/A
	Phase 3 Open House and Draft ESR Date: September 11, 2019 Method: Newspaper and Canada Post	The Notice of Phase 3 Open House was in the August 24, 2019 edition of the Windsor Star, August 27, 2019 edition of Tilbury Times, August 29, 2019 edition of the Lakeshore News, and August 30, 2019 edition of the Shoreline News. The print copy of handout materials was mailed to Leslie Brewer-Palhazi, Corwin Troje and Ashley Johnson to solicit comments and inputs on September 10, 2019.	N/A
	Notice of Completion		
Ministry of Aboriginal Affairs and Northern Development Canada Allison Berman Consultation and Accommodation Unit	**Notice of Commencement** Date: April 3, 2019 Method: Newspaper and Canada Post	The Notice of Commencement was sent to Allison Berman on April 3, 2019 via Canada Post. The Notice was published in the April 11, 2019 edition of the Lakeshore News and Tilbury Times, and the April 12, 2019 edition of the Shoreline News.	N/A
	Phase 3 Open House and Draft ESR Date: September 11, 2019 Method: Newspaper and Canada Post	The Notice of Phase 3 Open House was in the August 24, 2019 edition of the Windsor Star, August 27, 2019 edition of Tilbury Times, August 29, 2019 edition of the Lakeshore News, and August 30, 2019 edition of the Shoreline News. The print copy of handout materials was mailed to Allison Berman to solicit comments and inputs on September 10, 2019.	N/A
	Notice of Completion		
Indigenous & Northern Affairs Canada Leea Litzgus Ontario Region	**Notice of Commencement** Date: April 3, 2019 Method: Newspaper and Canada Post	The Notice of Commencement was sent to Leea Litzgus on April 3, 2019 via Canada Post. The Notice was published in the April 11, 2019 edition of the Lakeshore News and Tilbury Times, and the April 12, 2019 edition of the Shoreline News.	requested in a letter dated May 6, 2019 that ISC be kept informed of progress of this project. ISC has no comments concerning the project at this time
	Phase 3 Open House and Draft ESR Date: September 11, 2019 Method: Newspaper and Canada Post	The Notice of Phase 3 Open House was in the August 24, 2019 edition of the Windsor Star, August 27, 2019 edition of Tilbury Times, August 29, 2019 edition of the Lakeshore News, and August 30, 2019 edition of the Shoreline News. The print copy of handout materials was mailed to Leea Litzgus to solicit comments and inputs on September 10, 2019.	N/A
	Notice of Completion		
Southern First Nations Secretariat Jennifer Whiteye Consultation and Accommodation Unit	**Notice of Commencement** Date: April 3, 2019 Method: Newspaper and Canada Post	The Notice of Commencement was sent to Jennifer Whiteye on April 3, 2019 via Canada Post. The Notice was published in the April 11, 2019 edition of the Lakeshore News and Tilbury Times, and the April 12, 2019 edition of the Shoreline News.	N/A
	Phase 3 Open House and Draft ESR Date: September 11, 2019 Method: Newspaper and Canada Post	The Notice of Phase 3 Open House was in the August 24, 2019 edition of the Windsor Star, August 27, 2019 edition of Tilbury Times, August 29, 2019 edition of the Lakeshore News, and August 30, 2019 edition of the Shoreline News. The print copy of handout materials was mailed to Jennifer Whiteye to solicit comments and inputs on September 10, 2019.	N/A
	Notice of Completion		

Aboriginal Consultation Log
Municipal Class Environmental Assessment
Town of Lakeshore Denis St. Pierre Water Pollution Control Plant Expansion

Contact Information	Date/Method of Communication	Correspondence Received and/or Project Information Distributed	Consultant Response
Delaware Nation (Moravian of the Thames) Denise Stonefish 14760 School House Line Thamesville ON N0P 2K0	**Notice of Commencement** Date: April 3, 2019 Method: Newspaper and Canada Post	The Notice of Commencement was sent to Denise Stonefish on April 3, 2019 via Canada Post. The Notice was published in the April 11, 2019 edition of the Lakeshore News and Tilbury Times, and the April 12, 2019 edition of the Shoreline News.	N/A
	Phase 3 Open House and Draft ESR Date: September 11, 2019 Method: Newspaper and Canada Post	The Notice of Phase 3 Open House was in the August 24, 2019 edition of the Windsor Star, August 27, 2019 edition of Tilbury Times, August 29, 2019 edition of the Lakeshore News, and August 30, 2019 edition of the Shoreline News. The print copy of handout materials was mailed to Denise Stonefish to solicit comments and inputs on September 10, 2019.	N/A
	Notice of Completion		
Aamjiwnaang First Nation Chris Plain (chief@aamjiwnaang.ca) Joanne Rogers (jrogers@aamjiwnaang.ca) Sharilyn Johnston (sjohnston@aamjiwnaang.ca) Christine Rogers ((crogers@aamjiwnaang.ca) 978 Tashmoo Avenue Sarnia ON N7T 7H5	**Notice of Commencement** Date: April 3, 2019 Method: Newspaper and Canada Post	The Notice of Commencement was sent to Joanne Rogers, Sharilyn Johnston and Christine Rogers on April 3, 2019 via Canada Post. The Notice was published in the April 11, 2019 edition of the Lakeshore News and Tilbury Times, and the April 12, 2019 edition of the Shoreline News.	N/A
	Phase 3 Open House and Draft ESR Date: September 11, 2019 Method: Newspaper and Canada Post	The Notice of Phase 3 Open House was in the August 24, 2019 edition of the Windsor Star, August 27, 2019 edition of Tilbury Times, August 29, 2019 edition of the Lakeshore News, and August 30, 2019 edition of the Shoreline News. The print copy of handout materials was mailed to Chris Plain, Sharilyn Johnston and Christine Rogers to solicit comments and inputs on September 10, 2019.	N/A
	Notice of Completion		
Caldwell First Nation Mary Duckworth Nikki Orosz PO Box 388 Leamington ON N8H 3W3	**Notice of Commencement** Date: April 3, 2019 Method: Newspaper and Canada Post	The Notice of Commencement was sent to Mary Duckworth and Nikki Orosz on April 3, 2019 via Canada Post. The Notice was published in the April 11, 2019 edition of the Lakeshore News and Tilbury Times, and the April 12, 2019 edition of the Shoreline News.	N/A
	Phase 3 Open House and Draft ESR Date: September 11, 2019 Method: Newspaper and Canada Post	The Notice of Phase 3 Open House was in the August 24, 2019 edition of the Windsor Star, August 27, 2019 edition of Tilbury Times, August 29, 2019 edition of the Lakeshore News, and August 30, 2019 edition of the Shoreline News. The print copy of handout materials was mailed to Mary Duckworth and Nikki Orosz to solicit comments and inputs on September 10, 2019.	N/A
	Notice of Completion		
Bkejwanong Territory (Walpole Island) First Nation Dan Miskokomon (drskoke@wifn.org) Dean Jacobs (dean.jacobs@wifn.org) Janet Macbeth (janet.macbeth@wifn.org) 117 Tahgahoning Road, RR#3 Wallaceburg ON N8A 4K95	**Notice of Commencement** Date: April 3, 2019 Method: Newspaper and Canada Post	The Notice of Commencement was sent to Dan Miskokomon, Dean Jacobs and Janet Macbeth on April 3, 2019 via Canada Post The Notice was published in the April 11, 2019 edition of the Lakeshore News and Tilbury Times, and the April 12, 2019 edition of the Shoreline News.	N/A
	Phase 3 Open House and Draft ESR Date: September 11, 2019 Method: Newspaper and Canada Post	The Notice of Phase 3 Open House was in the August 24, 2019 edition of the Windsor Star, August 27, 2019 edition of Tilbury Times, August 29, 2019 edition of the Lakeshore News, and August 30, 2019 edition of the Shoreline News. The print copy of handout materials was mailed to Dan Miskokomon, Dean Jacobs and Janet Macbeth to solicit comments and inputs on September 10, 2019.	N/A
	Notice of Completion		

Aboriginal Consultation Log
Municipal Class Environmental Assessment
Town of Lakeshore Denis St. Pierre Water Pollution Control Plant Expansion

Contact Information	Date/Method of Communication	Correspondence Received and/or Project Information Distributed	Consultant Response
Metis Nation of Ontario Aly Alibhai (alya@metisnation.org) 500 Old St. Patrick Street, Unit 3 Ottawa ON K1N 9G4 75 Sherbourne Street, Unit 311 Toronto ON M5A 2P9	**Notice of Commencement** Date: April 3, 2019 Method: Newspaper and Canada Post	The Notice of Commencement was sent to Aly Alibhai on April 3, 2019 via Canada Post. The Notice was published in the April 11, 2019 edition of the Lakeshore News and Tilbury Times, and the April 12, 2019 edition of the Shoreline News.	N/A
	Phase 3 Open House and Draft ESR Date: September 11, 2019 Method: Newspaper and Canada Post	The Notice of Phase 3 Open House was in the August 24, 2019 edition of the Windsor Star, August 27, 2019 edition of Tilbury Times, August 29, 2019 edition of the Lakeshore News, and August 30, 2019 edition of the Shoreline News. The print copy of handout materials was mailed to Aly Alibhai to solicit comments and inputs on September 10, 2019.	N/A
	Notice of Completion		
Chippewas of Kettle and Stony Point First Nation Jason Henry (Jason.henry@ kettlepoint.org) Tom Bressette (Thomas.bressette@kettlepoint.org) Valerie George (Valerie.george@kettlepoint.org) 6247 Indian Lane, R.R. #2 Forest, ON N0N 1J1	**Notice of Commencement** Date: April 3, 2019 Method: Newspaper and Canada Post	The Notice of Commencement was sent to Tom Bressette and Valerie George on April 3, 2019 via Canada Post. The Notice was published in the April 11, 2019 edition of the Lakeshore News and Tilbury Times, and the April 12, 2019 edition of the Shoreline News.	N/A
	Phase 3 Open House and Draft ESR Date: September 11, 2019 Method: Newspaper and Canada Post	The Notice of Phase 3 Open House was in the August 24, 2019 edition of the Windsor Star, August 27, 2019 edition of Tilbury Times, August 29, 2019 edition of the Lakeshore News, and August 30, 2019 edition of the Shoreline News. The print copy of handout materials was mailed to Jason Henry and Valerie George to solicit comments and inputs on September 10, 2019.	N/A
	Notice of Completion		
Chippewas of the Thames First Nation Henry Myeengun (myeengun@cottfn.com) Kelly Riley (kriley@cottfn.com) Fallon Burch Rochelle Smith (rsmith@cottfn.com) 320 Chippewa Road Muncey ON N0L 1Y0	**Notice of Commencement** Date: April 3, 2019 Method: Newspaper and Canada Post	The Notice of Commencement was sent to Henry Myeengun, Kelly Riley and Rochelle Smith on April 3, 2019 via Canada Post. The Notice was published in the April 11, 2019 edition of the Lakeshore News and Tilbury Times, and the April 12, 2019 edition of the Shoreline News.	Chippewas of the Thames First Nation (COTTFN) advised in a letter dated May 8, 2019 that the proposed project is located within the Mckee Treaty area (1790) to which COTTFN is a signatory, as well as the Big Bear Creek Addition to Reserve (ATR) land selection area, and COTTFN's Traditional Territory. COTTFN has minimal concerns with the proposed project. It is requested that COTTFN be kept informed of progress of this project including distribution of a digital copy of the study report.
	Phase 3 Open House and Draft ESR Date: September 11, 2019 Method: Newspaper and Canada Post	The Notice of Phase 3 Open House was in the August 24, 2019 edition of the Windsor Star, August 27, 2019 edition of Tilbury Times, August 29, 2019 edition of the Lakeshore News, and August 30, 2019 edition of the Shoreline News. The print copy of handout materials was mailed to Henry Myeengun, Kelly Riley and Rochelle Smith to solicit comments and inputs on September 10, 2019.	N/A
	Notice of Completion		

Aboriginal Consultation Log
Municipal Class Environmental Assessment
Town of Lakeshore Denis St. Pierre Water Pollution Control Plant Expansion

Contact Information	Date/Method of Communication	Correspondence Received and/or Project Information Distributed	Consultant Response
Onelda Nation of the Thames ONYOTA'A:KA Jessica Hill (Jessica.hill@oneida.on.ca) Brandon Doxtator (environment@oneida.on.ca) Randall Phillips Catherine Cornellus 2212 Elm Avenue Southwold, ON N0L 2G0	**Notice of Commencement** Date: April 3, 2019 Method: Newspaper and Canada Post	The Notice of Commencement was sent to Randall Phillips and Catherine Cornellus on April 3, 2019 via Canada Post. The Notice was published in the April 11, 2019 edition of the Lakeshore News and Tilbury Times, and the April 12, 2019 edition of the Shoreline News.	N/A
	Phase 3 Open House and Draft ESR Date: September 11, 2019 Method: Newspaper and Canada Post	The Notice of Phase 3 Open House was in the August 24, 2019 edition of the Windsor Star, August 27, 2019 edition of Tilbury Times, August 29, 2019 edition of the Lakeshore News, and August 30, 2019 edition of the Shoreline News. The print copy of handout materials was mailed to Jessica Hill and Brandon Doxtator to solicit comments and inputs on September 10, 2019.	
	Notice of Completion		

CHIPPEWAS OF THE THAMES FIRST NATION

May 8, 2019

VIA EMAIL

Mr. Kevin Girard, P.Eng
Manager of Environmental Services
419 Notre Dame Street
Belle River, Ontario N0R 1A0

RE: Denis St. Pierre Water Pollution Control Plant Expansion
Class Environmental Assessment, Notice of Study Commencement

Dear Mr. Girard,

We have received the *Notice of Study Commencement* regarding the aforementioned project. The proposed project is located within the Mckee Treaty area (1790) to which Chippewas of the Thames First Nation is a signatory (COTTFN), as well as the Big Bear Creek Additions to Reserve (ATR) land selection area, and COTTFN's Traditional Territory.

We presently have minimal concerns with the proposed project. However, upon completion of any environmental study reports, we request a digital copy be electronically sent to consultation@cottfn.com. If there is an archaeology assessment conducted, we require notification and the opportunity to actively participate by sending an Archaeology Field Liaison on behalf of the First Nation.

We look forward to continuing this open line of communication. To Implement meaningful consultation, COTTFN has developed its own protocol – a document and a process that will guide positive working relationships. We would be happy to meet with you to review COTTFN's Consultation Protocol.

Please do not hesitate to contact me if you need further clarification of this letter.

Sincerely,

Fallon Burch
Consultation Coordinator
Chippewas of the Thames First Nation
(519) 289-5555 Ext. 251
consultation@cottfn.com

c: Dr. Jian Li, P.Eng, Stantec Consulting Ltd.

Indigenous Services Canada | Services aux Autochtones Canada

MAY 0 6 2019

ON7249

Mr. Jian Li, Ph.D., P.Eng., PE
Project Manager
Stantec Consulting Ltd.
100-140 Ouellette Place
WINDSOR ON N8X 1L9

Dear Mr. Li:

This is in follow up to your correspondence of April 3, 2019, in which you included the Introductory Brief regarding the Denis St. Pierre Water Pollution Control Plant Expansion and Class Environmental Assessment.

While the Department has no comments concerning the project at the present time, we would appreciate if you could continue to keep us apprised of the project's progress moving forward.

I wish you success in your project.

Yours sincerely,

Lina Letiecq
Director of Lands and Economic Development
Indigenous Services Canada

655 Bay Street, 3rd Floor
TORONTO ON M5G 2K4

RECEIVED
MAY 0 8 2019
STANTEC CONSULTING LTD.
Consulting Engineers

Canada

APPENDIX C-4

Final ESR and Notice of Completion