MUNICIPALITY OF BRIGHTON

BRIGHTON WASTEWATER TREATMENT SYSTEM

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

PHASE 1 REPORT (DRAFT)

DECEMBER 6, 2016

Submitted by:

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

203-863 Princess Street

Kingston, ON Canada

K7L 5N4

JLR 27271

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

1.0 INTRODUCTION

1.1 Background

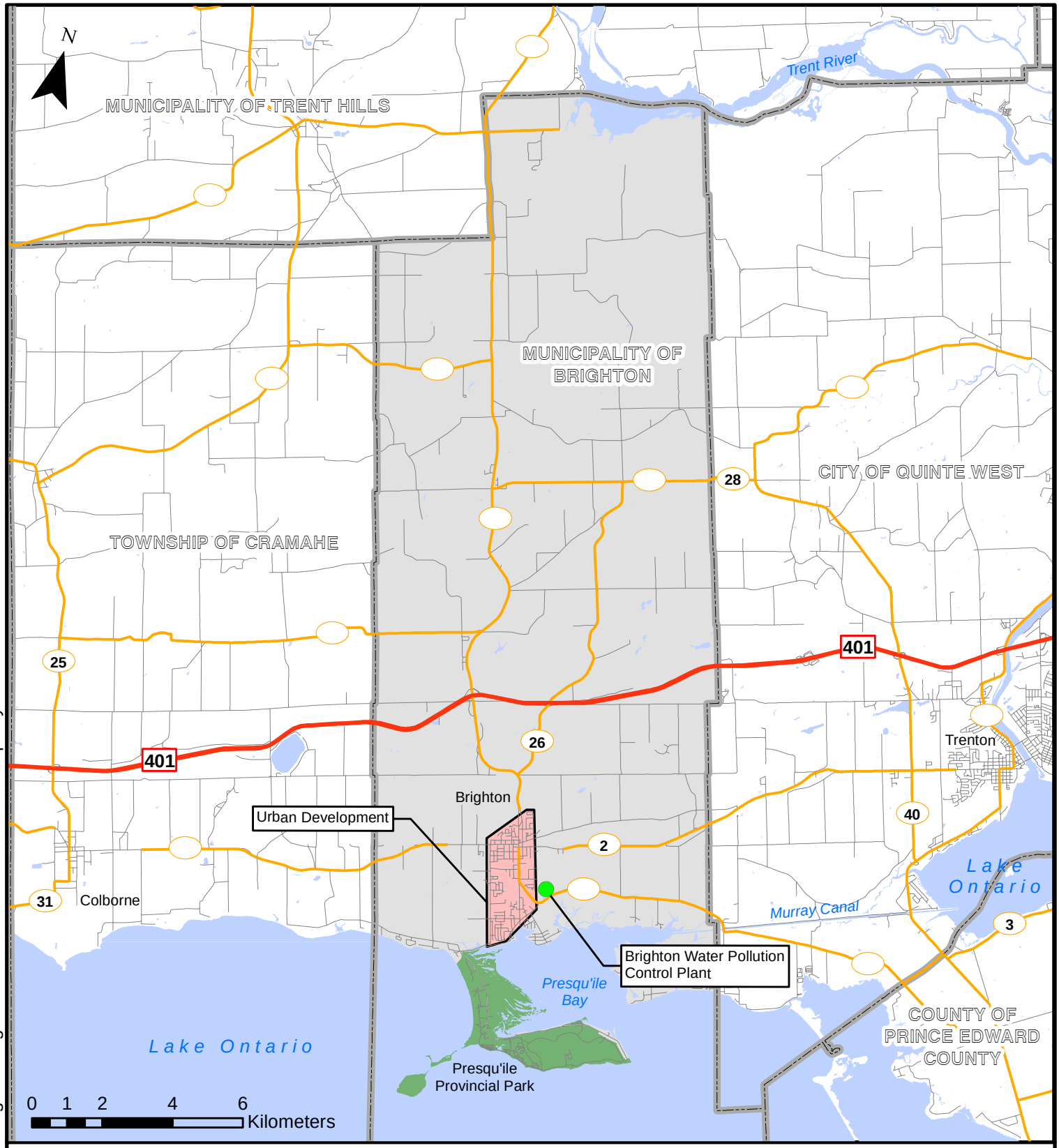
The Municipality of Brighton (the Municipality) initiated a Class Environmental Assessment (Class EA) of their wastewater treatment system in August 2016 to address various problems experienced with treatment at their treatment lagoon (e.g. elevated ammonia concentrations in the treated effluent) and also to ensure that increased influent flows from future growth can be effectively accommodated. In order to fully define the problems and identify a preferred solution to address these issues, J.L. Richards & Associates Limited (JLR) was retained by the Municipality to assist in the completion of the Class EA.

The Municipality includes the former Town and Township of Brighton and is the most eastern Municipality within the County of Northumberland. The Municipality is bounded by the City of Quinte West to the east and the Town of Cramahe to the west, with the shoreline of Lake Ontario to the south. Highway 401 provides the main east-west corridor through the Municipality, which tends to be a regional focus for hamlets in the surrounding areas. Refer to Figure 1-1 for an overview of the Municipality and study location.

The communal sewage system generally consists of the Brighton Wastewater Treatment Lagoon system (currently rated for 4,600 m^3/day), the Harbour Street Sewage Pumping Station (SPS) and forcemain, a small sub-area sewage pumping station and forcemain servicing Presqu'ile Provincial Park, and several kilometers of gravity collection sewer. Approximately half of the sewage generated in the collection system is directed to the Harbour Street SPS and pumped via a 8.2 km long, 300mm forcemain to the Lagoon and the other half flows by gravity to the Lagoon. Refer to Figure 1-2 for an overview of the Brighton communal sewage system.

The Harbour Street SPS receives sewage from a significant portion of the collection system. The SPS generally consists of a wet well/dry well configuration and is equipped with three dry pit centrifugal type raw sewage pumps (lead/lag/standby operation) complete with inlet and outlet piping, a standby diesel generator, a wet well emergency overflow to Butter Creek, and related instrumentation and controls for the station.

The wastewater treatment system consists of a 0.68 ha single cell aerated lagoon, a single cell 5.44 ha waste stabilization pond with baffle partition curtains, and a 2-cell constructed wetland with a total surface area of 6.2 ha. There is also a chemical storage/feed system used to facilitate continuous phosphorus removal. Chemical is introduced after the aerated lagoon and upstream of the waste stabilization pond. Treated effluent from the waste stabilization pond is discharged continuously to the constructed wetland and from the constructed wetland it continuously discharges to a natural wetland and ultimately to Presqu'ile Bay, which is located off the northeast shore of Lake Ontario.



PROJECT:

BRIGHTON WASTEWATER TREATMENT SYSTEM CLASS EA

MUNICIPALITY OF BRIGHTON, ONTARIO

DRAWING:

LOCATION PLAN

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS
www.jlrichards.ca

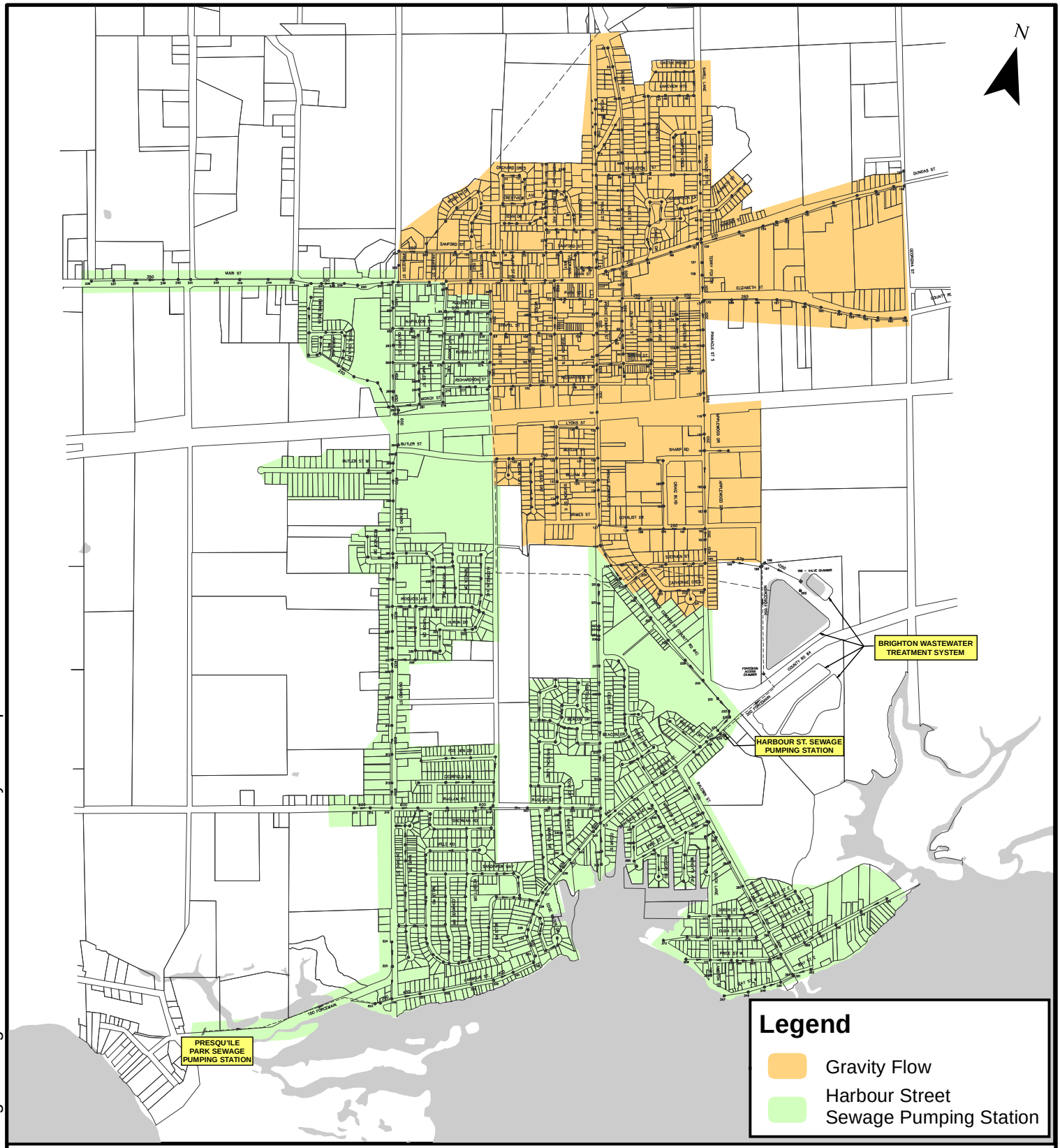
DESIGN:	JW
DRAWN:	KTK
CHECKED:	BH

JLR NO: 27271

DRAWING NO.: FIGURE 1-1

File Location: K:\27000\27271 - Brighton Lagoon\JLR DWG\Plan\27271 Municipality.mxd

Plot Date: December 6, 2016 2:49:03 PM



PROJECT:

BRIGHTON WASTEWATER TREATMENT SYSTEM CLASS EA

MUNICIPALITY OF BRIGHTON, ONTARIO

DRAWING:

SYSTEM MAP (PUMPING STATION(S), FORCEMAIN, LAGOON SITE)

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS
www.jlrichards.ca

DESIGN:	JW
DRAWN:	KTK
CHECKED:	BH

JLR NO: 27271

DRAWING NO.: FIGURE 1-2

File Location: K:\27000\27271 - Brighton Lagoon\JLR DWG\Plan\27271 SystemMap.mxd

Plot Date: December 6, 2016 2:52:09 PM

1.2 Class Environmental Assessment Process

The Ontario Environmental Assessment Act (the Act) sets out a planning and decision-making process so that potential environmental effects are considered before a project begins. The purpose of the Act is to provide for the protection and conservation of the natural environment (R.S.O. 1990, c.E.18, s.2).

The Municipal Class EA process is followed for common types of projects to streamline the review process while ensuring that the project meets the requirements of the Act. It involves detailed site-specific information gathering and studies, as well as consultation with the public and stakeholder agencies. In 1987 the first Class EA guidance document prepared by the Municipal Engineers Association (MEA) on behalf of Ontario Municipalities was approved under the Act. Updates and amendments were subsequently made in 1993, 2000, 2007, 2011, and 2015.

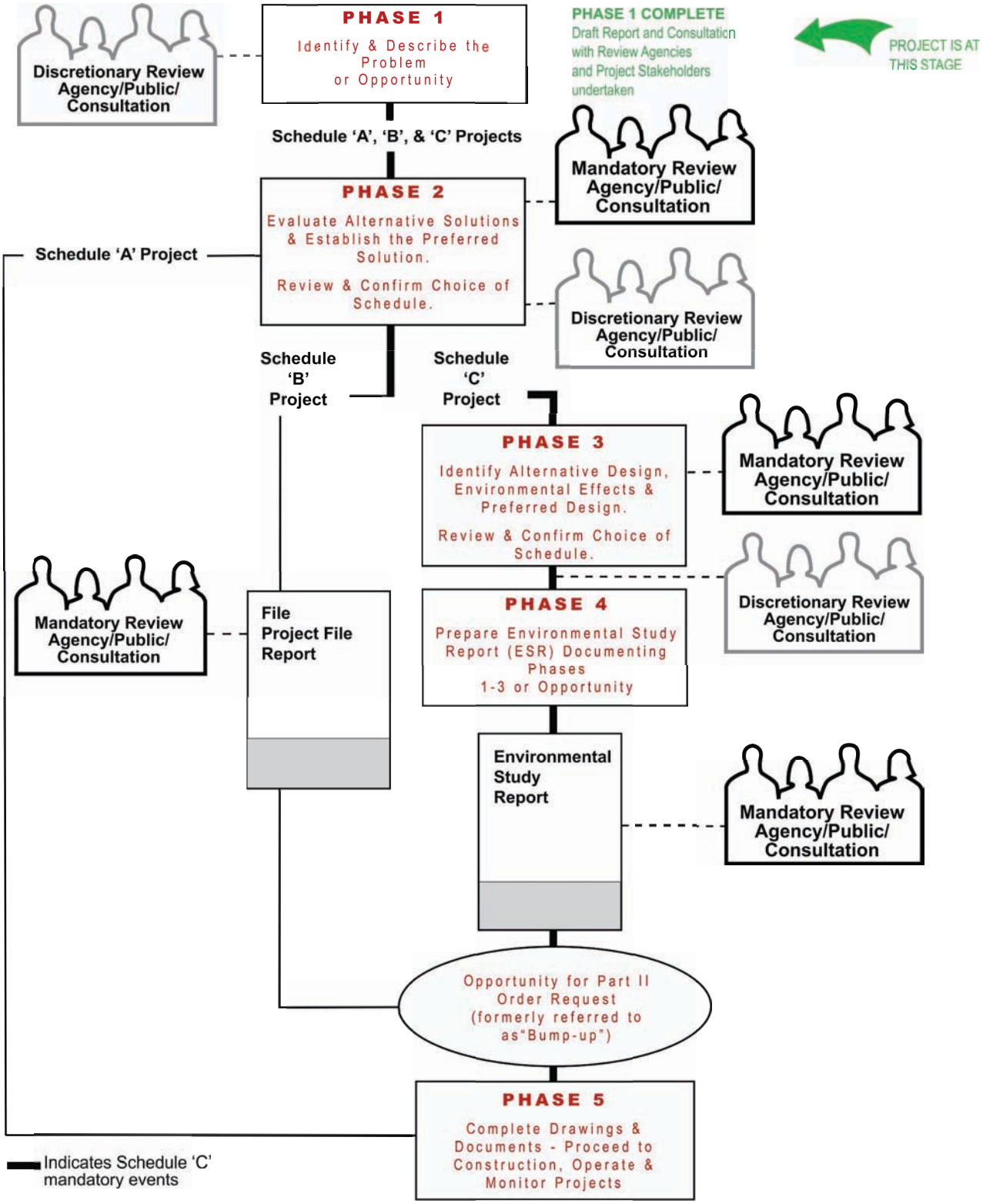
This Class EA has been initiated as a Schedule B project under the Class EA process. Projects categorized as Schedule 'B' undertakings have the potential for significant environmental effects, and are required to follow Phase 1 and Phase 2 specified under the Municipal Class EA. This includes consultation with all parties that may potentially be affected by the project, and the preparation of a Class EA Project File that documents the Class EA process for the project. At the end of Phase 2, the project Schedule is reviewed to determine if the project is complete under a Schedule B Schedule or if the project needs to proceed as a Schedule C undertaking in which case Phases 3 and 4 of the Class EA process are completed.

The Class EA framework defines the process for each type of project (refer to Figure 1-3). For Schedule B projects, the completion of the following Phases of the Class EA process are required:

Phase 1 – Identify the Problem and/or Opportunity

Phase 2 – Identify Alternative Solutions to the Problem and/or Opportunity

The Project File shall be made available for public and agency review at the completion of Phase 2 of the Class EA process for a mandatory 30-day period. If there are no requests to the MOECC for a 'Part II Order' within this 30-day review period, then the project may proceed to implementation (Phase 5).



PROJECT:

BRIGHTON WASTEWATER TREATMENT SYSTEM CLASS EA

MUNICIPALITY OF BRIGHTON, ONTARIO

DRAWING:

CLASS EA PROCESS

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS
www.jlrichards.ca

DESIGN: JW	JLR NO: 27271
DRAWN: RW	DRAWING #: FIGURE 1-3
CHECKED: BH	

File Location: K:\27000\27271 - Brighton Lagoon\JLR DWG\Plan\27271 ClassEAProcess.dwg

PLOT DATE: December 6, 2016 2:56:06 PM

1.3 Objectives of the Class EA

The objective of this Class EA is to identify the preferred strategies for wastewater treatment and for the main sewage pumping station and associated forcemain for the Brighton communal sewage system over a 20-year planning period.

The purpose of this Phase 1 Report is to summarize and confirm existing conditions and constraints that require consideration as the Class EA moves into Phase 2, and to clearly identify the problem(s) associated with the existing system. Several Technical Memoranda will form part of the Class EA Project File which is anticipated to be the key deliverable for this project.

Four Technical Memoranda are anticipated and will cover the following topics:

- Growth Evaluation Report
- Condition Assessment
- Receiving Water Assessment
- Process Technology Evaluation

As noted previously, the Class EA is proceeding in accordance with the Schedule B requirements of the Ontario Municipal Class EA, October 2000, as amended in 2015, but will be reconfirmed at the end of Phase 2.

2.0 PHASE 1 METHODOLOGY

2.1 Compilation of Documentation

A documentation request was prepared by JLR and provided to the Municipality in July 2016. Available documentation from the Municipality and JLR's files was subsequently compiled and reviewed in detail. General sources of information are listed below. Documents were compiled and will be provided to the Municipality on a USB for future reference.

The main sources of information for the Phase 1 background review included:

- Existing Drawings and Surveys
- Sewage Quality and Quantity Data (excel format)
- Design Briefs
- Certificate of Approval/Environmental Compliance Approval
- MOE Annual Repots
- Operations Manuals
- Previous Studies and Reports
- Planning Documents

2.2 Stakeholder Consultation

The Class EA process requires consultation with parties that may potentially be affected by the project. As part of Phase 1, a consultation plan was prepared in order to facilitate communication with the public and various other agencies and interested parties. Refer to Appendix A for the Phase 1 Public Consultation Summary and supporting documentation.

Key components of Phase 1 Stakeholder consultation included:

- Development of a Public Consultation Plan
- Project Team/Committee Meetings
- Notice of Study Commencement
- Responding to Public Stakeholder Comments
- Responding to Review Agency Comments
- Maintaining Project Mailing List and Contacts

2.3 Preparation of Base Maps

A digital base map was developed for the project area based on available information. It should be noted that this base map was based on available maps from other reports and sources and, therefore, it should be considered a schematic representation of the project area.

Three figures were developed from the project base map in order to provide an overview of the Municipality and illustrate the major components of the communal wastewater system, including the collection and treatment.

2.4 Phase 1 Supporting Documents

As part of Phase 1 a background review of available information was undertaken along with the preparation of a Growth Evaluation Memo (JLR, 2016) and a Condition Assessment (JLR, 2016). The results of these studies are documented within this report.

3.0 SYSTEM HISTORY

The following is a brief chronological summary of the Municipality's sewage system.

1970s	The original Brighton wastewater treatment system was constructed at 100 County Road 64 and consisted of a gravity sewer system and a single 5.44 ha lagoon cell (now referred to as the stabilization pond).
1977 (approx.)	The Brighton wastewater treatment system was expanded to include the 0.68 ha aerated cell and the Harbour Street sewage pumping station.

1999	The artificial wetland was constructed and allowed the rated capacity of the lagoon system to expand from the original rating of 3,864 m^3/day to the current rating of 4,600 m^3/day. The wetland consists of two cells and has a total area of 6.2 ha. It is important to note that the effluent from the artificial wetlands is not sampled for compliance testing (objectives only).
2003	Presqu'ile Provincial Park pumping station and forcemain were constructed. This SPS is located inside the park and conveys sewage north into the Municipality's gravity collection system. There are 6 connections into the sanitary forcemain along the route out of the park.
2009	A report was prepared (CH2M Hill, 2009) on ammonia reduction alternatives. The report recommended a membrane based activated sludge system to highly treat approximately 1/3 of the flow, which would be combined with the remaining flow upstream of the sampling location for the stabilization pond. The intention was to "dilute" the effluent in order to achieve the compliance limits. Final design of this upgrade (estimated construction cost $6.4M) began in 2009, however, when ammonia levels improved in the same year, these recommendations were not implemented.
2011	A report was prepared (AECOM, 2011) looking at various options for improving the treated effluent performance of the lagoon, particularly with regards to ammonia. The report found that the Brighton lagoon is loaded higher than a typical facultative lagoon, but less than a typical aerated lagoon. The report suggested that buildup of sludge in the lagoon could be contributing to effluent ammonia concentration through a process of nitrogen feedback. Several options to improve effluent with respect to ammonia (aeration, SAGR, Bio Reef, UTech Volute System, new mechanical plant, recirculation from cell 2 to 1) were reviewed. It was determined that the lowest cost solution was to raise the berms in the aeration cell and use supplemental aeration to reduce the effluent ammonia concentrations. These recommendations were not implemented.

2012	According to GSS (2016), in January of 2012, a sludge report was completed (Cambium Environmental, 2012). The report estimated the volume of sludge in the stabilization lagoon to be 21,750 m^3. The total tonnage of dry solids in the lagoon, based on test results showing 8.3% solids, was estimated to be 1,810 tonnes. In August of 2012 a contract was awarded to remove 200 dry tonnes of sludge. This work was completed by Terratec Environmental.
2013	A number of activities took place in 2013. From September 2013 a BioDome pilot test commenced at the lagoon site. In October, approximately 19,000 m^3 of sludge was removed from the stabilization pond and 8,200 m^3 was removed from the aeration cell. Also, in the fall of 2013, the baffles were replaced and the south berm of the stabilization pond was rehabilitated.
2014	A study was conducted (RVA, 2014) to investigate reasons for the treatment issues and to provide recommendations to address the total ammonia nitrogen exceedances. The report concluded that the lagoon system's performance may be limited by low dissolved oxygen (DO) concentration and/or nitrification inhibition due to high strength incoming waste streams. Recommendations from this report included increasing solids retention time (SRT) by adding a secondary clarification system downstream of the aerated lagoon, recycling activated sludge back to the aeration system, and enhancing aeration with a fine bubble aeration system (keeping current aerators as backup). These recommendations were not implemented.
Jan 2015	Collection system repairs to address inflow and infiltration issues in areas with a high water table (i.e. near Presqu'ile Bay) where completed in January of 2015. The program consisted of flushing mains, conducting CCTV, and making repairs (typically manhole improvements).
Summer 2015	Under the Limited Operation Flexibility Process (LOF), four trial tests were conducted at the lagoon in the summer of 2015. These included: (a) installing temporary aeration equipment, (b) changing coagulant to ferric chloride, (c) re-starting the BioDome pilot, and (d) trial dosage of Aqua N.

September 2015	A review of events at the lagoon site over the period from 2008 – 2014 was undertaken (GSS, 2015). The review concluded that although steps have been taken to address the ammonia issues, a lack of staff continuity and changes in engineering consultants may have resulted in a loss of "momentum" to deal with the ammonia issue. The report suggested that previous reports lacked: process calculations for suggested treatment upgrades, detailed cost breakdowns for improvements, consideration of previous work done, and limited consideration of attached nitrifier solutions.
2016	In the summer of 2016 tests were conducted (EnviroSim, 2016) to determine if inhibitory compounds in Brighton's wastewater streams were contributing to issues achieving and maintaining nitrification. Influent samples were collected and analyzed from the gravity-fed portion of the system, the pumped flow portion of the system (includes Presqu'ile Provincial Park), and directly at the Park. It was found that nitrification inhibiting substances were not present at levels sufficient to cause inhibition. The report concluded that the influent streams are not responsible for nitrification difficulties experienced at the Brighton Water Pollution Control Plant (WPCP).
August 2016	A Class EA was initiated by JLR focusing on treatment issues and future capacity availability.

4.0 DESCRIPTION OF THE EXISTING CONDITIONS

4.1 Physical Description of the Existing Infrastructure

The Municipality of Brighton wastewater system generally consists of:

- A gravity sewer collection system
- Harbour Street Sewage Pumping Station (SPS) and forcemain
- Presqu'ile Provincial Park SPS and forcemain

The communal sewage system consists of the Brighton Wastewater Treatment Lagoon system (currently rated for 4,600 m^3/day), the Harbour Street Sewage Pumping Station (SPS) and forcemain, a small sub-area sewage pumping station and forcemain servicing Presqu'ile Provincial Park, and several kilometers of gravity collection sewer. Approximately half of the sewage generated in the collection system is directed to the Harbour Street SPS and pumped via a 300 mm forcemain to the Lagoon and the other half flows by gravity to the Lagoon.

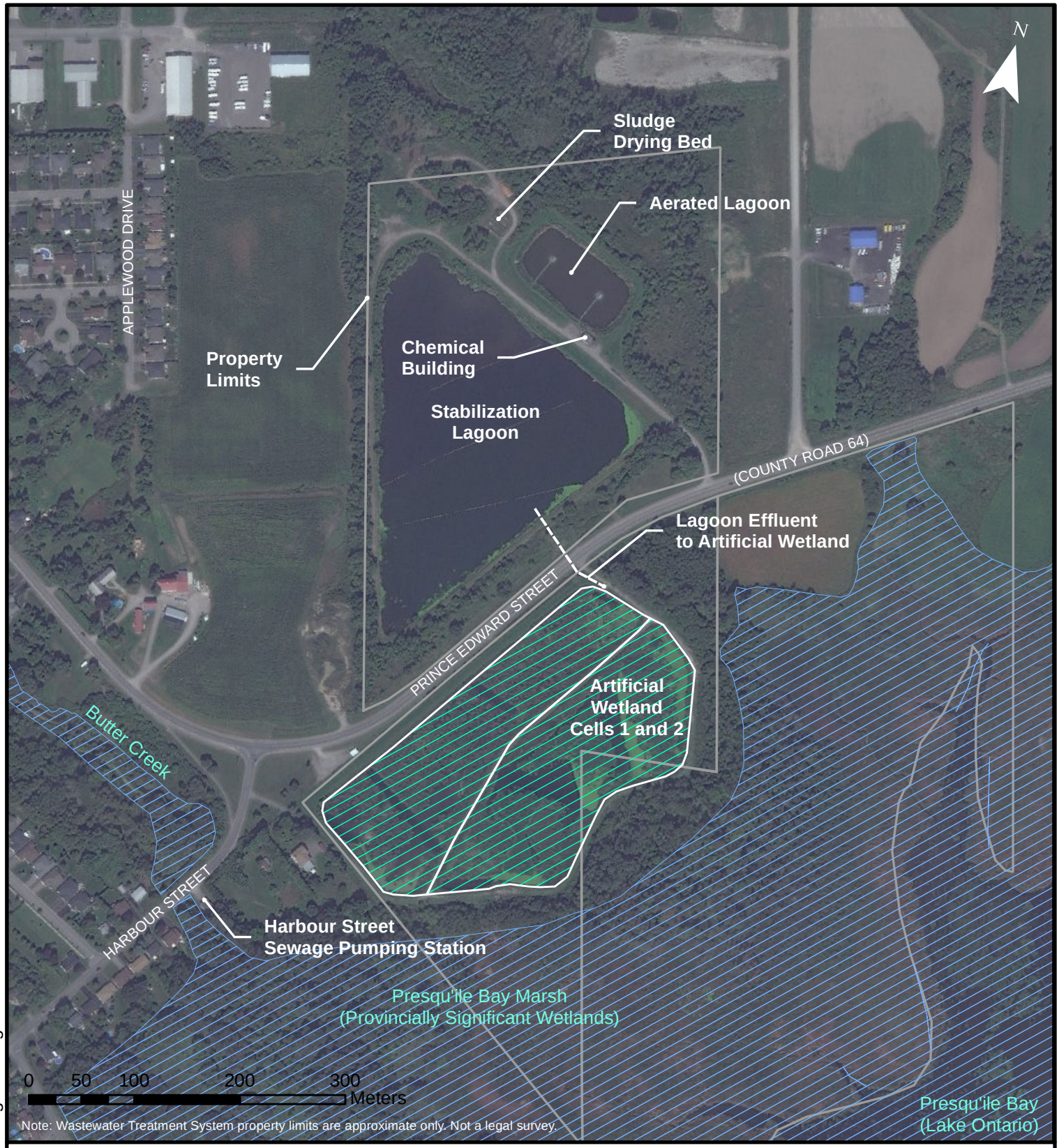
4.1.1 Harbour Street Sewage Pumping Station

The Harbour Street SPS is located on the south side of Harbour Street, southwest of Prince Edward Street. The SPS is equipped with three raw sewage pumps (each rated for approximately 50 L/s), a standby diesel generator, and an emergency overflow to Butter Creek. A copy of the ECA is provided in Appendix B.

4.1.2 Wastewater Treatment System

Brighton's wastewater treatment system currently services a population of approximately 6,462 people or 3,203 homes and businesses (from the 2015 Wastewater Annual Report), as well as Presqu'ile Provincial Park. The wastewater treatment system consists of a 0.68 ha single cell aerated lagoon, a 5.44 ha single cell waste stabilization pond with baffle partition curtains, and a 2-cell constructed wetland with a total surface area of 6.2 ha. The treatment system is classified as a Class 1 treatment facility that operates under ECA Number 3081-9XQNZK, issued by the Ontario MOECC, dated July 7, 2015. A copy of the ECA is provided in Appendix B.

Pumped and gravity flows combine in a chamber located upstream of the lagoon system and then flow by gravity into the aerated cell. Aeration is provided using portable and fixed aerators. Flows are directed through a channel containing a flume for flow measurement into the waste stabilization pond. There is also a chemical storage/feed system used to facilitate continuous phosphorus removal. Chemical is introduced after the aerated lagoon and upstream of the waste stabilization pond. Treated effluent from the waste stabilization pond is discharged continuously to the constructed wetland and from the constructed wetland it continuously discharges to a natural wetland and ultimately to Presqu'ile Bay, which is located off the northeast shore of Lake Ontario. The existing lagoon layout is shown in Figure 4-1 and summarized the lagoon major equipment specifications.



PROJECT:

BRIGHTON WASTEWATER TREATMENT SYSTEM CLASS EA

MUNICIPALITY OF BRIGHTON, ONTARIO

DRAWING:

WASTEWATER TREATMENT SYSTEM SITE MAP

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS
www.jlrichards.ca

DESIGN:	JW
DRAWN:	KTK
CHECKED:	BH

JLR NO: 27271

DRAWING NO.: FIGURE 4-1

File Location: K:\27000\27271 - Brighton Lagoon\JLR DWG\Plan\27271 SitePlan.mxd

Plot Date: December 6, 2016 2:50:19 PM

Table 4-1 Existing Brighton Wastewater Treatment System

Component	Surface Area	Side Slopes	Depth	Volume
Aerated Lagoon (Lagoon #1)	0.68 ha (ECA)	3.5:1 (GSS, 2015)	3.05 (AECOM, 2011) 3m (GSS, 2015)	21,366 m^3 (AECOM, 2011) 11,164 m^3 (RVA, 2014) 18,000 m^3 (GSS, 2015)
Stabilization Pond (Lagoon #2)	5.44 ha (ECA)	2.5:1 (GSS, 2015)	1.55m (AECOM, 2011) 1.5m (GSS, 2015)	84,320 m^3 (AECOM, 2011) 81,000 m^3 (GSS, 2015)
Constructed Wetland	6.2 ha (ECA)	3:1 (ECA)	0.3 – 1 m (GSS, 2015)	

As illustrated in Table 4-1 there are a number of discrepancies in the reported lagoon depth and volume. GSS Engineering Consultants Ltd. (GSS) confirmed that depths were measured for the aerated cell; however, the actual depth of the stabilization pond varies due to bedrock. The volumes provided by GSS (2016) are understood to be based on the best available data and will be used in subsequent sections of this review.

4.2 Land Use and Property Constraints

The lagoon is located on Lot 33 and 34, Concession B, in the Municipality. The property boundary of the existing lagoon is illustrated in Figure 4-1. As shown in the Figure, the existing lagoon cells and wetland take up most of the available property. A title search was not conducted as part of this Class EA; however, it is understood that the adjacent property is privately held.

Another aspect of land use planning that must be considered is MOECC (formally MOE) Guideline D-2 "Compatibility between Sewage Treatment and Sensitive land Use". This Guideline states that the recommend separation distances between property/lot line of sensitive land uses (e.g., residences) and wastewater lagoon vary between 100 to 400 metres depending on the type of pond and characteristics of the waste. Guideline D-2 states that a separation distance of 150 metres is recommended for wastewater treatment plants of capacity between 500 m^3/day and 25,000 m^3/day. This will be considered in subsequent phases of the Class EA.

4.3 Receiving Water Body

The Brighton lagoon discharges to the constructed wetland and from the constructed wetland it continuously discharges to a natural wetland and ultimately to Presqu'ile Bay, which is located off the northeast shore of Lake Ontario. Further review of the receiving water will be conducted in Phase 2 of this Class EA, if required.

4.4 Certificate of Approval Requirements

The wastewater treatment system is rated for an Average Day Flow (ADF) of 4,600 m^3/day. Some of the key objective and compliance requirements for the treatment system are outlined in Table 4-2 and Table 4-3 below. Effluent objectives are set for the wetland; however, the effluent limits are imposed on the waste stabilization pond (Lagoon No. 2).

Table 4-2 Effluent Objectives - Constructed Wetland (ECA No. 3081-9XQNZK)

Parameter	Concentration in Effluent
CBOD5	15.0 mg/L
Total Suspended Solids	15.0 mg/L
Ammonia + Ammonium Nitrogen	10.0 mg/L * May 01 to October 30 15.0 mg/L ** November 01 to April 30
Total Phosphorus	0.8 mg/L
E.coli	200 organisms per 100 mL
pH	6.0 - 9.5

Table 4-3 Effluent Compliance Limits – Waste Stabilization Pond (ECA No. 3081-9XQNZK)

Parameter	Concentration in Effluent	Loading in Effluent	Non-compliance
CBOD5	30.0 mg/L	138.0 kg/day	• Annual Average Concentration exceeds concentration • Annual Average Loading exceeds concentration specified during any 12 consecutive calendar months
Total Suspended Solids	40.0 mg/L	184.0 kg/day	• Annual Average Concentration exceeds concentration • Annual Average Loading exceeds concentration specified during any 12 consecutive calendar months
Ammonia + Ammonium Nitrogen	14.0 mg/L * 17.0 mg/L **	64.4 kg/day * 78.2 kg/day **	• Monthly Average Concentration exceeds concentration • Monthly Average Loading exceeds concentration
Total Phosphorus	1.0 mg/L	4.6 kg/day	• Monthly Average Loading exceeds concentration during any 12 consecutive calendar months
Notes	* from May 01 to October 30 ** from November 01 to April 30		

5.0 PRELIMINARY ANALYSIS OF FLOW AND QUALITY DATA

5.1 Annual Flows to the WPCP

Raw sewage flow is measured using a Parshall flume flow meter located in the mixing channel between the aerated lagoon and waste stabilization pond. Table 5-1 provides a summary of historical raw sewage volumes based on operating records from January 2011 to September 2016.

Table 5-1 Historical Raw Sewage Flows (2011 - Sept. 2016)

Year	Average Daily Flow (m3/day)	Percent of System Capacity (4,600 m^3/day)	Maximum Daily Flow (m3/day)
2011	3703	80%	11,899
2012	3188	69%	missing
2013	3206	70%	12,000
2014	3431	75%	12,190
2015	2807	61%	8,640
2016	2932	64%	9,736
5-year Average (2011 – 2015)	3267	71%	Max = 12,190

As shown in the table above, raw sewage average day flows have been relatively consistent over the past few years, with highest average daily flows occurring in 2011. Collection system repairs were completed in January of 2015, which may have led to reduction in inflow and infiltration. The impact of this system repair work can continue to be monitored over time. Based on the estimated connected population of 6,462 (ECA, 2015) the average per capita flow rate is approximately 500 L/capita/day. This is somewhat higher than might be expected and suggests that contributions from extraneous flow and/or industry may be a factor. It should, however, be noted that the most recent flow numbers for the last two years indicate per capita flow rates in the range of 430 L/capital/day to 450 L/capital/day, which may be a reflection of the work associated with reducing inflow and infiltration completed in 2015.

5.2 Maximum Day Flows

Over the period under review (2011 – 2016) the highest recorded daily flows typically occurred in April of each year. The maximum recorded flow occurred in April 2014 and was 12,190 m^3/day. Based on the annual average day flow presented in Table 3.1 the estimated maximum day flow (MDF) factor is approximately 3.7.

5.3 Uncommitted Hydraulic Reserve Capacity

In order to establish the near term hydraulic capacity requirements for the treatment system, the Uncommitted Hydraulic Reserve Capacity has been calculated following “Procedure D-5-1:

Calculating and Reporting Uncommitted Reserve Capacity at Sewage and Water Treatment Plants" (MOECC, 1995). The MOECC Procedure D-5-1 allows for the use of either a 3-year average of a 5-year average of the average daily flow. The 5-year average was used for this review.

Rated Sewage Capacity (ECA No. 3081-9XQNZK) 4,600 m^3/day

5-year Average Daily Flow - 3,267 m^3/day

Hydraulic Reserve Capacity = 1,333 m^3/day

The Uncommitted Reserve Capacity is calculated by deducting capacity for vacant lots and developments (Committed Reserve) that have achieved draft plan approval. Based on information provided by the Municipality, the amount of flow assigned to vacant units and draft approved development is summarized in Table 5-2 below.

Table 5-2 Flow Allocated to Approved Development

Type of Development	No. of Units	Equivalent Population[1]	Reserve Flow[2] (m^3/day)
Detached and Semi-Detached	345	759	342
Condo/Apartments	0	0	0
Total	345	759	342

Notes:
(1)Equivalent units were estimated using a population density of 2.2 persons per unit (based on discussion with Landmark Associates Ltd, October 2016).
(2) Based on average per capita usage of 0.45 m^3/d/cap (MOECC Guidelines).

The Uncommitted Reserve Capacity can then be calculated as follows:

Hydraulic Reserve Capacity 1,300 m^3/day

Average Committed Reserve Flow - 342 m^3/day

Uncommitted Hydraulic Reserve Capacity = 958 m^3/day

Based on MOECC Procedure D-5-1 and reported approved development information, the Municipality has allocated approximately 26% of the hydraulic reserve capacity of the lagoon treatment system. The remaining hydraulic reserve capacity is approximately 958 m^3/day. This is equivalent to an additional 967 units above the approved development identified above.

5.4 Raw Sewage Characteristics

Grab samples of the raw sewage are taken on a monthly basis and analyzed for $cBOD_5$, SS, TP, TKN, and Ammonia. Table 5-3 provides a summary of historical raw sewage characteristics based on operating records from January 2011 to September 2016.

Table 5-3 Summary of Historical Raw Sewage Quality Characteristics (mg/L)

Year	$cBOD_5$		Suspended Solids		Total Phosphorus		TKN		Ammonia	
	Avg.	Max.	Avg.	Max.	Avg.	Max.	Avg.	Max.	Avg.	Max.
2011	83	168	145	355	4.1	7.0	34	55	28	43
2012	--	--	--	--	--	--	--	--	--	--
2013	72	159	134	285	3.4	5.8	36	58	34	58
2014	64	150	130	230	4.6	6.8	40	61	38	61
2015	132	206	228	607	5.1	7.8	38	53	27	38
2016	73	123	132	223	4.0	6.1	36	51	28	40
Avg.	82	--	152	--	4.2	--	36	--	31	--
Max.		206		607		7.8		61		61

Based on the summary in Table 5-3, the raw sewage is relatively high strength, with monthly averages falling in the range of literature values for medium to high strength raw municipal wastewater, and monthly maximums in the range of very high strength domestic sewage. This suggests that non-residential contributions to the waste stream (e.g. industrial wastes or other sources) may be a significant contributor factor either on a consistent basis or during certain times.

The Municipality has a sewer use by-law (By-Law No. 013-2015) that controls discharges to the municipal sewer system. The sewer use by-law limits the concentration of a number of substances. Notably there is a limit of 300 mg/L for BOD, 100 mg/L for TKN, 10 mg/L phosphorous, and 350 mg/L for total suspended solids. The maximum recorded concentration of these parameters at the plant has, on occasion, approached or exceeded the limits for BOD and total suspended solids. As evidenced by the relatively high per capita flows as previously noted, dilution appears to be occurring in the collection system due to inflow and infiltration. However, the high strength sewage suggests that there may be significant contributions into the collection system from potentially high concentration dischargers.

It should be noted that additional time of day sampling was recently initiated to better characterize the raw sewage quality generated in the collection system and to determine if there are significant industrial contributors.

5.5 Treated Effluent Quality

Grab samples of the treated effluent from the stabilization pond and constructed wetland are taken on a weekly basis (except for E. Coli which is monthly) and analyzed for the parameters listed in Table 5-4 and Table 5-5. The same tables provide a summary of historical treated effluent characteristics based on operating records from January 2011 to September 2016.

Table 5-4 Summary of Waste Stabilization Pond Effluent Characteristics (mg/L)

Year	$cBOD_5$		Suspended Solids		Total Phosphorus		Ammonia		E.Coli (count)	
	Annual Average	Max. Monthly Average	Annual Avg.	Max. Monthly Average	Annual Average	Max. Monthly Average	Annual Average	Max. Monthly Average	Annual Mean	Max. Monthly Average
ECA	**30.0**	n/a	**40.0**	n/a	n/a	**1.0**	n/a	**14.0 * 17.0 ****	n/a	n/a
2011	6.4	12.4	14.1	32.0	0.53	1.20	15.8	22.6	127	4000
2012	5.6	13.0	11.6	29.0	0.33	0.54	17.5	26.6	58	2600
2013	9.7	22.0	18.6	38.0	0.54	0.83	17.2	26.2	105	940
2014	6.6	10.5	18.7	31.5	0.74	1.39	17.4	21.9	219	4000
2015	7.7	12.3	23.5	43.2	0.71	1.49	16.3	22.1	197	11400
2016	5.6	13.4	18.8	39.0	0.49	1.12	27.5	114.4	177	4900
Avg.	6.8	--	17.5	--	0.56	--	18.6	--	134	--
Max.	--	22.0	--	43.2	--	1.49	--	114.4	--	11400

Table 5-5 Summary of Constructed Wetland Effluent Characteristics (mg/L)

Year	$cBOD_5$		Suspended Solids		Total Phosphorus		Ammonia		E.Coli (count)	
	Annual Average	Max. Monthly Average	Annual Avg.	Max. Monthly Average	Annual Average	Max. Monthly Average	Annual Average	Max. Monthly Average	Annual Mean	Max. Monthly Average
ECA	**15.0**	n/a	**15.0**	n/a	n/a	**0.8**	n/a	**10.0 * 15.0 ****	n/a	**200/100 mL**
2011	5.1	18.6	7.6	17.5	0.32	0.68	13.4	20.4	132	4000
2012	3.1	7.0	6.9	12.0	0.20	0.34	13.9	19.8	54	200
2013	5.8	13.5	7.9	22.0	0.31	0.46	14.9	21.0	154	1280
2014	4.0	7.3	10.3	24.5	0.42	0.77	15.9	20.8	163	1320
2015	6.0	13.0	12.2	34.4	0.45	1.15	14.3	22.8	158	9600
2016	3.2	6.3	5.8	9.8	0.42	0.79	14.0	22.0	99	1100
Avg.	4.5	--	8.4	--	0.35	--	14.4	--	119	--
Max.	--	18.6	--	34.4	--	1.15	--	22.8	--	9600

Key findings with regards to effluent quality are as follows:

- **$cBOD_5$ and Suspended Solids:** Over the review period the treatment system has been able to consistently meet the ECA limits (stabilization pond) and objectives (wetland) for concentration of $cBOD_5$ and suspended solids.
- **Phosphorous:** In four of the six years under review, the ECA limits for phosphorous were not met by the stabilization pond. In general, the wetland appears to be reducing the phosphorus concentration to below the effluent objectives, with the exception of 2015 when exceedances occurred in February and March. In some instances, the exceedances from the stabilization pond have been attributed to alum dosing issues.
- **Ammonia:** Ammonia exceedances of the ECA limits (stabilization pond) and objectives (wetland) occurred in all of the years under review. From the summary of events prepared by GSS (2015) we understand that ammonia exceedances became more common in 2007 and 2008, were absent in 2009, and have occurred frequently in both warm and cold weather months since 2010.
- **E. Coli:** There are no limits for *E. Coli*, but the objective (wetland) was not met in five of the six years under review. In previous studies (AECOM, 2011) these exceedances have been attributed to naturally occurring *E. Coli* in the environment (e.g. from waterfowl).

5.6 Engineered Wetland

The 2-celled engineered wetland was constructed in 1999 and allowed for an increase to the rated capacity of the lagoon system from 3,864 m^3/day to 4,600 m^3/day. As noted previously the effluent from the artificial wetlands is not sampled for compliance testing (objectives only). A design brief has not been provided, however, the operations manual (CH2M, 2000) indicates that the average daily design flow to the treatment wetland was 7,000 m^3/day for a population of 10,000. There is no clear documentation of the design loading. As described in the previous section, with the exception of phosphorous removal the wetland appears to be providing limited treatment at the current time.

Staff have reported ongoing issues with muskrats and wetland maintenance has been minimal since the facility was constructed. There are a number of general maintenance items in the operations manual (e.g. year-end survey of plant type/heath, regular clearing of the “deep” channels, suggested seasonal water level changes, monitoring of muskrat burrows), however, maintenance is generally implemented on an as required basis.

The engineered wetland is adjacent to a natural wetland and both are valued by the local birding community. Questions have been raised by the birding community about the effect that changes at the wastewater treatment system might have on the annual nesting of various species of birds, birding, and birders access to the wetland.

6.0 ANALYSIS OF WASTEWATER TREATMENT SYSTEM PERFORMANCE

6.1 Overview

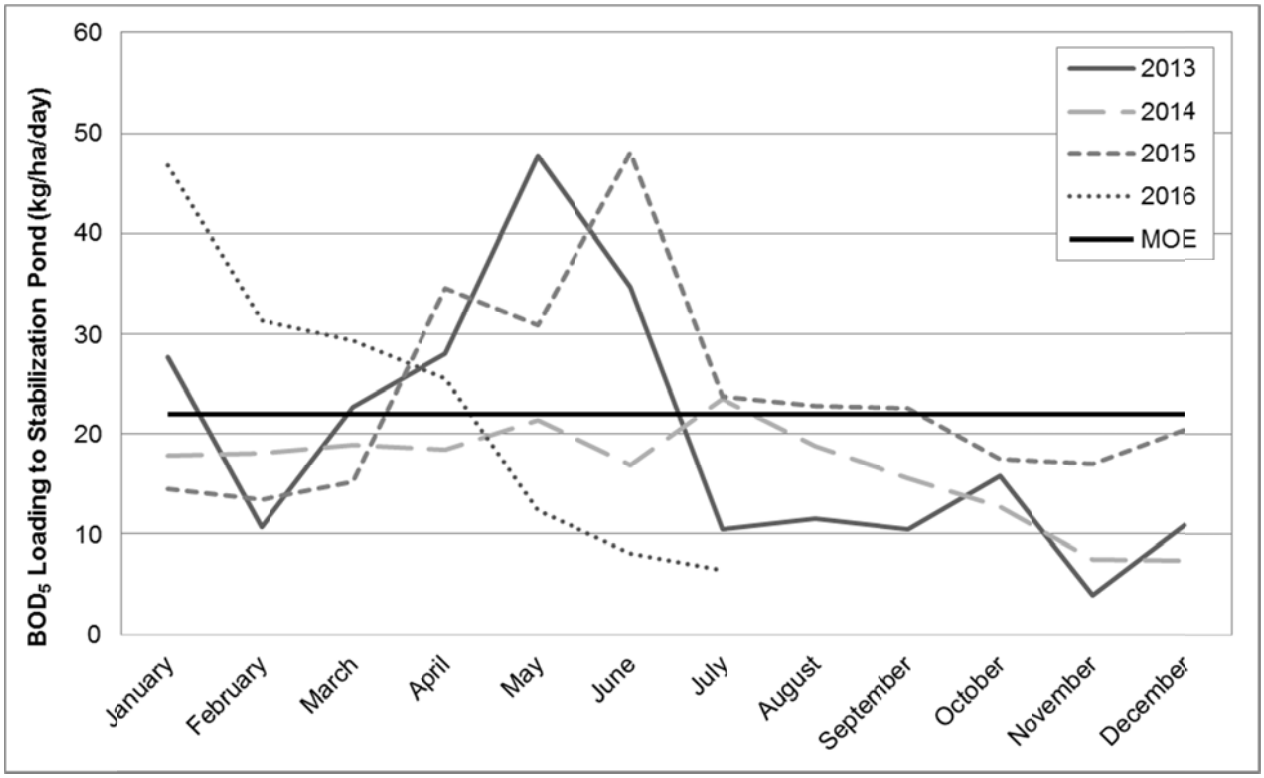
There are a number of common causes of wastewater lagoon treated effluent issues. These causes can include:

- Organic Overloading
- Short Hydraulic Detention Time
- Low Dissolved Oxygen Concentrations
- Release of Ammonia from Digesting Sludge
- Inhibition of nitrification at cold temperatures (< 5 deg. C)
- Other limiting factors (e.g. alkalinity or inhibitory substances)

6.2 Organic Loading

The MOECC Design Guidelines for Sewage Works (2008) recommends an average BOD_5 organic loading of less than 22 kg/ha/day for a facultative pond. If only the loading to the stabilization pond is considered (i.e. loading from the aeration pond to the stabilization), in two of the past four years the organic loading exceeds the MOECC recommendation from March to June. Also, the recommendation is exceeded in January and February of 2016. This suggests that the system is periodically organically overloaded; this is possibly a function of high influent $cBOD_5$ concentrations and insufficient treatment in the aerated cell. This is shown graphically in Figure 6-1. It is noted that the raw sewage and treated effluent is characterized by $cBOD_5$, which may be up to 20% less than BOD_5 measurements. For this analysis concentrations of $cBOD_5$ have been adjusted assuming a BOD_5:$cBOD_5$ ratio of 1.2:1 (per Metcalf and Eddy, 2003) to estimate the BOD_5 concentration.

Figure 6-1 Organic Loading to Waste Stabilization Pond (Cell #2)



6.2.1 Hydraulic Detention Time

There is limited guidance regarding the required Hydraulic Retention Time (HRT) in an aerated settling pond, and the MOECC simply states that the HRT should be "set by the area required to meet the design BOD_5 loading". Other sources indicate that typical HRT required for adequate BOD removal in an aerated settling pond is 4 – 10 days for an influent BOD between 20 – 30 kg/ha/day. Estimates of HRT are provided in Table 6-1, and show that, when a baffling factor is applied to each basin to account for short circuiting, the hydraulic retention time is relatively short at current and design flows.

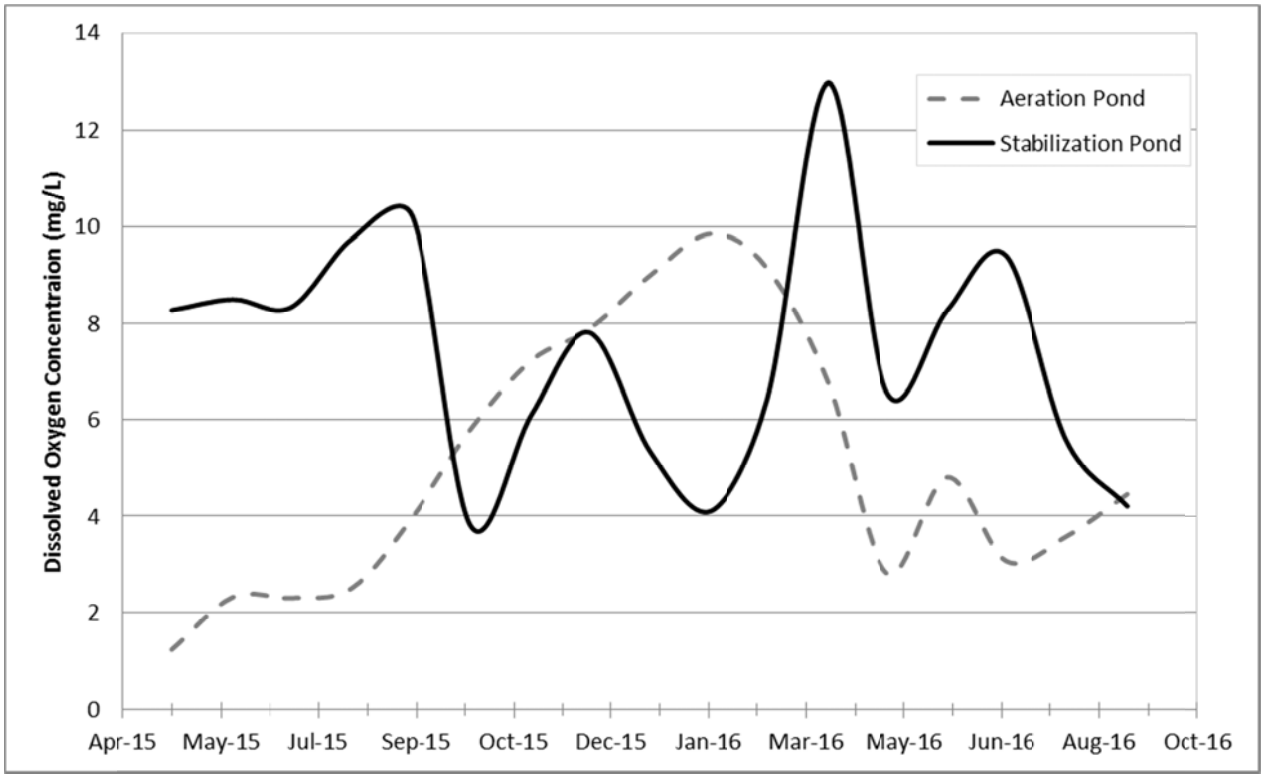
Table 6-1 Estimated Hydraulic Retention Time

Cell	Flow Condition	Baffle Factor[1]	Hydraulic Detention Time (days)
Aeration Cell (Vol = 18,000m^3)	5-year Average Day (3,267 m^3/day)	0.1	0.6
	Design Flow (4,600 m^3/day)	0.1	0.4
Stabilization Pond (Vol = 81,000m^3)	5-year Average Day (3,267 m^3/day)	0.5	12.4
	Design Flow (4,600 m^3/day)	0.5	8.8
Combined	5-year Average Day (3,267 m^3/day)	As shown above	12.9
	Design Flow (4,600 m^3/day)	As shown above	9.2
Notes: 1. Baffling factor for the aeration cell is based on a single chamber with a mechanical mixer. The factor for the stabilization pond is based on a tank with 3 – 4 baffles.			

The operator has noted that the baffles installed in 2013 do not appear to extend to the bottom of the lagoon and that there has been some evidence of flow under the baffles in the winter months. CFD (Computational Fluid Dynamic) analysis has been proposed to be undertaken to further assess the baffle factor for the stabilization pond. It is currently suspected that the lagoon volume is not all being utilized effectively and that residence time may actually be even less than those shown in Table 6-1. Dissolved Oxygen Concentration

Typically, concerns are raised about the dissolved oxygen (DO) concentration at a lagoon when it begins to approach 1 – 2 mg/L and digestion of BOD would be severely limited if DO drops to 0.5 mg/L. The RVA report in 2014 noted that the aeration system installed at that time was adequate to provide the required DO at average loads, but could be severely limiting (less than 0.5 mg/L) under peak loads. DO concentration data has been collected at various locations in the aeration and stabilization ponds on a weekly basis since May 2015. Figure 6-1 shows the average DO recorded each month in the aeration cell and stabilization pond.

Figure 6-2 Dissolved Oxygen Concentration (May 2015 - Sept. 2016)



The DO concentration was close to 2 mg/L in the summer of 2015, but it has been maintained well above 2 mg/L in the aeration pond since then. The Municipality initiated a pilot test adding additional aeration (2, 25 HP floating aspirator type aerators) in the summer of 2015. Four aerators ran continuously until April of 2016 until it was found that ammonia levels were increasing in the stabilization pond (possibly due to solids leaving the aeration cell). Various run time configurations were tested between April and May. Currently the aerators that are original to the pond run continuously and the additional aerators come on for 2 hours two times a day (6am – 8am and 6pm – 8pm). The effectiveness of the new aeration sequence was evaluated by taking additional DO measurements from July 2016 to September 2016. The results of this study will be reviewed in Phase 2. The operator has noted that there is a considerable amount of sludge leaving the aeration pond and settling at the entrance to the stabilization pond. Ongoing issues with the aeration system supports earlier recommendations from AECOM (2011) and R.V. Anderson (2014) for enhancements to the aeration system.

6.3 Release of Ammonia from Digesting Sludge

In response to the ongoing ammonia issues at the plant, desludging efforts have been undertaken in recent years at the WPCP. In 2012, it was estimated that the volume of sludge in the stabilization lagoon was 21,750 m^3 (Cambium Environmental, 2012). A large portion of this sludge was removed over a period of two years in 2012 and 2013. A summary of this work is

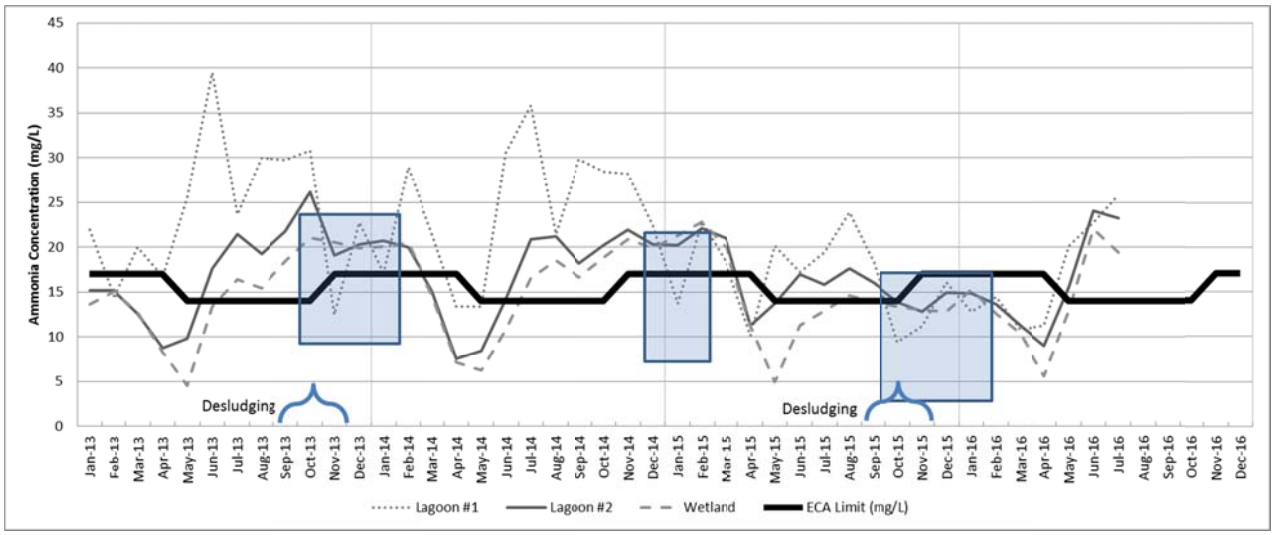
provided in Table 6-2 below. In some instances short term improvements in ammonia removal were realized, however, issues continued. As noted in the previous section, sludge is currently accumulating rapidly at the entrance to the stabilization pond.

Table 6-2 Historical Sludge Removal Volumes

Month	Volume of Sludge[1.] (m^3)		Dry mass of Sludge[1.] (dry tonnes)	
	Aeration Cell (Cell 1)	Stabilization Pond (Cell 2)	Aeration Cell (Cell 1)	Stabilization Pond (Cell 2)
2012 Aug/Sept	--	2,410	--	200
2013 Sept/Oct/Nov	8,200	19,000	680	1,577
2015 Sept/Oct/Nov	XXX			
Note: Based on test results in 2012 showing that the sludge was 8.3% solids.				

The ammonia concentrations in each stage of the treatment process are shown in Figure 6-3. The possible release of ammonia from digesting sludge is supported by decreasing effluent quality as the lagoon warms up in the spring and early summer. It is interesting to note that there are three occasions when ammonia concentrations from the aeration lagoon increased in the facultative pond. These all occur in the fall/winter, and warrant further consideration.

Figure 6-3 Lagoon and Wetland Ammonia Concentrations



6.4 Lagoon Temperature

Nitrification is generally limited at temperatures below 5 deg. C. Based on initial reviews of the temperature data, temperatures in the stabilization pond drop below 5 deg. C from mid-

November to mid-March each year. This may also be contributing to the poor ammonia removal in the facultative lagoon in the winter months.

6.5 Nitrification Inhibiting Substances

In the summer of 2016 tests were conducted (EnviroSim, 2016) to determine if inhibitory compounds in Brighton's wastewater streams were contributing to issues achieving and maintaining nitrification. Influent samples were collected and analyzed from the gravity-fed portion of the system, the pumped flow portion of the system (includes Presqu'ile Provincial Park), and directly at the Park. It was found that nitrification inhibiting substances were not present at levels sufficient to cause inhibition. The report concluded that the influent streams are not responsible for nitrification difficulties experienced at the Brighton wastewater treatment system.

If alkalinity is less than 50 mg/L as CaCO3 it could be limiting nitrifier growth. Raw sewage samples collected in the fall of 2016 were tested for alkalinity and it was found to be in the range of 300 to 400 mg/L. This suggests that alkalinity is not limiting nitrifier growth.

7.0 GROWTH AND FUTURE INFLUENT QUALITY AND QUANTITY

7.1 Growth Evaluation

An evaluation of growth in the service area was undertaken as part of Phase 1 of this Class EA. A Technical Memorandum was developed (refer to Appendix C) which used an existing service population of 6,462 and growth projections for the Municipality to develop residential population projections for the 20- year design populations. The population projections are shown in Table 7-1 below.

Table 7-1 Growth Projections for the 20- Year Design Period

Year	Total Serviced Population	Change from 2016
2016	6,462	n/a
2038	7,905	1,443

7.2 Design Average Day Flow

Projected average daily per capita wastewater flows from growth are anticipated be approximately 500 L/c/day, in keeping with current flows. This simplified approach for estimating future flows assumes that ICI growth stays proportional to residential growth. Due to the uncertainly in the amount and types of ICI development that may occur over the planning period, this is a reasonable assumption. Based on these assumptions, design average day flows are

provided in Table 7-2. The 5-year historical average flow to the treatment system of 3,267 m^3/day was used as the basis for current flows.

Table 7-2 Design Average Day Flow

Year	Existing Flow (m^3/day)	Population Growth	Flow from Growth (m^3/day)	Total Flow (m^3/day)	Percent of Rated Capacity (%)
2038	3,267	1,443	722	3,989	87%

7.3 Design Maximum Day Flow

Based on the information provided, the historical maximum day factor is estimated to be 3.7 (refer to Section 3.2). Initial estimates of maximum day flow in the 10- and 20-year review period have been generated assuming this factor applies to future flows.

Table 7-3 Design Maximum Day Flow

Year	Total Flow (m^3/day)	Maximum Day Factor	Maximum Day Flow (m^3/day)
2038	3,989	3.7	14,760

7.4 Design Average Wastewater Loads

The design loading for the plant has been estimated using the historical 5-year average loading and the increase in loading from the anticipated residential and ICI growth. For the purposes of projecting future loads the BOD5, TSS, TKN, and TP were based on the existing average concentration. As noted previously, the raw sewage is relatively high strength and this should continue to be monitored over time.

Table 7-4 Design Influent Loading

Parameter	Average Concentration (mg/L)	Current Loading (kg/day)	Loading Due to Growth (kg/day)	Total Design Average Loading (kg/day)
$cBOD_5$	82	267.9	59.2	327.1
TSS	152	496.6	109.7	606.3
TP	4.2	13.7	3.0	16.8
TKN	36	117.6	26.0	143.6
Ammonia	31	101.3	22.4	123.7

7.5 Pumping Station, Forcemain, and Lagoon Condition Assessment

A condition assessment of existing infrastructure was undertaken as part of Phase 1 of this Class EA. A Technical Memorandum was developed (refer to Appendix D) to summarize the existing condition of the Harbour Street Sewage Pumping Station and the building infrastructure associated with the wastewater treatment system, and to identify potential rehabilitation and maintenance measures and associated costs. A summary of the estimated costs associated with the recommendations made within this Memorandum has been provided in Table 5 1, organized by each location. Costs have only been shown for items requiring replacement within the next 0 to 2 years ("unacceptable condition") or 2 to 7 years ("poor condition"). All costs are in 2016 dollars.

Table 7-5 Total Estimated Repair/Replacement Cost (2016 $)

Class	Harbour St. SPS	Lagoon
Architectural and Structural	$ 61,500	$ 15,000
Building Electrical	$ 50,500	$ 12,000
Building Mechanical	$ 10,000	$ 4,000
Process Mechanical	$ -	$ -
Process Electrical	$ 123,000	$ 63,500
Sub total	$ 245,000	$ 94,500
Engineering and Contingency (30%)	$ 74,000	$ 29,000
Total	$ 319,000	$ 123,500

8.0 SUMMARY OF EXISTING CONDITION AND CONSTRAINTS

Based on a review of the available background information, the following are the key findings and constraints at the Brighton WPCP.

- The raw sewage is relatively high strength for a domestic sewage, with monthly samples each year falling in the range of literature values for medium to high strength raw municipal wastewater. Maximum values are reported to be even higher. This suggests that non-residential contributions to the waste stream (e.g. industrial wastes or other sources) may be significant in the system and may be loading the lagoon at a higher rate than it was originally designed for receiving.

- Numerous concerns related to effluent quality have been identified. Ammonia exceedances of the ECA limits (stabilization pond) and objectives (wetland) occurred in all of the years under review. Additionally, in four of the six years under review, the ECA limits for phosphorous were not met in for the stabilization pond. There are no limits for E. Coli, but the objective (wetland) was not met in five of the six years under review.

- A detailed review of the wastewater treatment system performance indicates that the system is facing a number of challenges including: regular organic overloading, potential short circuiting and limited hydraulic detention time, issues with the aeration system, rapid sludge accumulation, and poor ammonia removal at low temperatures.

- The wetland portion of the treatment system does not appear to be providing significant treatment with the exception of some marginal decreases in Total Phosphorus.

- Due to the age and condition of the existing infrastructure, within the next 7 years approximately $443,000 in infrastructure rehabilitation and maintenance is required at the Harbour Street SPS and Lagoon.

- Updated population and flow projections show that the rated capacity of the plant is not anticipated to be exceeded in the 20-year projections.

9.0 PROBLEM AND OPPORTUNITY STATEMENT

Based on the information developed and analyzed during Phase 1 of the Class EA, the following draft problem/opportunity statement was developed for the project:

> *The Brighton communal sewage system generally consists of several kilometers of gravity collection sewers, a main pumping station, a smaller sub-area pumping station and a continuously discharged lagoon based treatment system that includes an aeration cell, a waste stabilization pond, a constructed wetland and a continuous chemical feed system for phosphorus removal. The treatment system is currently licensed under Environmental Compliance Approval (ECA) No. 3081-9XQNZK which stipulates certain operational and performance requirements. The system currently services an estimated population of 6462 and some population growth is projected to occur within the 20 year planning period that will generate additional flows and increase hydraulic loading to the treatment system. The system is currently only operating at approximately 60% to 70% of its ECA rated "hydraulic" capacity.*
>
> *Based on an evaluation of the available operational historical treated effluent data, it has been determined that the treatment system has regular difficulties in achieving the effluent quality required by ECA No. 3081-9XQNZK, particularly for ammonia and in some cases Total Phosphorus. A review of historical raw sewage quality, hydraulic input and the overall physical configuration of the Lagoon based treatment system, indicates that the relatively high strength raw sewage combined with physical limitations of the treatment system is the primary cause for the treated effluent exceedances. The system, as currently configured, is not capable of treating the organic loadings received from the*

collection system. Further the constructed wetland portion of the treatment system is not providing any significant treatment with respect to the parameters of concern.

In addition, the Harbour Street SPS and the Lagoon based treatment system were evaluated as part of Phase 1 of the Class EA. Due to the age and condition of the existing infrastructure, within the next 7 years approximately $443,000 in infrastructure rehabilitation and maintenance is required.

Appendix A

Public Consultation Summary

MUNICIPALITY OF BRIGHTON

BRIGHTON WASTEWATER TREATMENT SYSTEM

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

PHASE 1

PUBLIC CONSULTATION SUMMARY

DECEMBER 6, 2016

Submitted by:

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

203-863 Princess Street

Kingston, ON Canada

K7L 5N4

JLR 27271

TABLE OF CONTENTS

TABLES

APPENDICES

1.0 OVERVIEW

The Municipality of Brighton (the Municipality) initiated a Class Environmental Assessment (Class EA) of their wastewater treatment system in August 2016 to address various problems experienced with treatment at their treatment lagoon (e.g. elevated ammonia concentrations in the treated effluent) and also to ensure that increased influent flows from future growth can be effectively accommodated. In order to fully define the problems and identify a preferred solution to address these issues, J.L. Richards & Associates Limited (JLR) was retained by the Municipality to assist in the completion of the Class EA.

Public consultation activities have been undertaken to ensure that the public and other stakeholders would have numerous opportunities to be involved in and to provide comments throughout the Class EA. This Consultation Summary will be updated on an ongoing basis throughout the Class EA.

2.0 NOTICE OF STUDY COMMENCEMENT

In accordance with Phase 1 of this Class EA, a Notice of Study Commencement (provided in Appendix A) was prepared by the consulting team. The Notice was issued in English and also included a survey for stakeholders to return by mail or email.

The Notice of Study Commencement was:

1. Placed on the Municipality's website home page from October 14, 2016 to date.
2. Placed in the Brighton Independent newspaper on December 8, 2016 and December 15, 2016.
3. Mailed to the mandatory review agencies on October 27, 2016.

3.0 PUBLIC STAKEHOLDER COMMENTS

Table 3.1 provides a summary of public comments received to date regarding this Class EA. Written correspondence from the public is also provided in Appendix B. In addition, 21 members of the public have requested to join the project mailing list as of November 28, 2016. These names have been added to the stakeholder list.

Table 3.1 Summary of Public Stakeholder Comments

Stakeholder	Comment	Action
Member of the Public No. 1 (June 16, 2016 Phone Call)	A member of the public (MOP) called the study team to discuss the project. In relation to the lagoon the MOP expressed concerns about toxicity testing, public access to the constructed wetlands, decline in weed beds and fish populations in Presqu'ile Bay, adequacy of current lagoons, and flows from Presqu'ile Park, calibration of flow meters, odours from the wetland. Concerns were also expressed about odour at the Harbour St. Sewage Pumping Station.	Each concern was addressed in turn by the consultant from GSS that received the call.
Member of the Public No. 1 (several email correspondence in October 2016)	The Aecom report states in section 3, ammonia control options, the retention time has to be increased from the present to 48 and 54 days of retention in order to meet the ammonia limits, in order to do this the top water has to be raised 0.9 m. Q) Is this sound advice, can this be done, and will it help? In the Aecom report it clearly states in section 3 that in order to maintain this retention time for a daily average flow rate for the future (4600 m^3/day) the berm would have to be raised 0.6 m. Q) Is this sound advice, can this be done, and will it help? Q) What is the max daily flow rate with a retention time of 48 and 54 day can our system handle with outraising the berm? In the Aecom report it is clear in section 2 with a retention time of 48 and 54 day that we have a reserve capacity equivalent to 2127 persons a day if we extended the hight of the berm 0.6 m. Q) Is this correct?	Comments will be addressed during evaluation of the list of alternatives and response provided to the member of the public at that time.

Stakeholder	Comment	Action
(cont.)	Presqu'ile Park has about 120,000 overnight guests ever year for 5 months that the park is open. We can't divide this number over a 12 month period because our system has to take that flow of sewage when it occurs. About 400 persons in new development to be conservative, 50 new commercial lots, and our first Tim Horton's. Q) Is our system sized for the population it serves by the size of our population (not by flow)? Q) Would adding raw water to the system at the plant help with the dilution of the raw sewage, and would this be helpful with ammonia control? Q) The smell of sewage is a problem, can a treatment system be installed to prevent the odor? Q) Can the discharge of the constructed wetland be redirected to discharge to the east side away from the north west wind and away from the shore line of Gosport? Q) The constructed wetland is not part of our system or C of A why is this, the final discharge from our treatment system is from the wetland? Q) Wildlife is a problem in the constructed wetland, would it help if we had a more aggressive wildlife removal program? Q) Why are we allowing the public to walk around this site, with no safety or staff on site?	

4.0 REVIEW AGENCY COMMENTS

A project mailing list was developed identifying review agency stakeholders. Refer to Appendix C for a copy of the project agency mailing list. The project agency mailing list will be updated throughout each Phase of this Class EA. Table 4.1 provides a summary of agency comments received to date regarding this Class EA. Written correspondence from the review agencies is also provided in Appendix C.

Table 4.1 Summary of Agency Stakeholder Comments

Stakeholder	Comment	Action
Lower Trent Region Conservation Authority (LTC)	The LTC expressed interest in being included on the mailings for this project as portions of the treatment system are in an area regulated by the LTC.	Added to the mailing list.
Ministry of Environment and Climate Change (MOECC)	The MOECC provided comments on the Class EA Process, MOECC Technical Review, and consultation with Aboriginal Communities.	A pre-consultation meeting with the MOECC was scheduled.

5.0 PROJECT COMMITTEE MEETINGS

To facilitate the consultation process the Project Management Team, including JLR team members and City staff, have met at regular intervals during the Class EA. Table 5.1 provides a summary of the meetings. Minutes for each meeting held to date are provided in Appendix D.

Table 5.1 Summary of Project Team Meetings

Meeting/Date	Comments
Progress Meeting No. 1 September 28, 2016	Meetings held to discuss Phase 1 activities to date, including review and collection of background information.

APPENDIX ‘A’

Notice of Study Commencement

J.L. Richards
& Associates Limited
203-863 Princess Street
Kingston, ON Canada
K7L 5N4
Tel: 613 544 1424
Fax: 613 544 5679

Date
Our File: 27271

VIA Mail

Agency
Name, Title
Address Line 1
Address Line 2

Salutation:

Re: Notice of Commencement for the Municipality of Brighton
Brighton Wastewater Treatment System Class Environmental Assessment

As a result of ongoing issues of consistently achieving the total ammonia effluent criterion set out in the Ministry of Environment and Climate Change (MOECC) Environmental Compliance Approval, the Municipality of Brighton has initiated a Class Environmental Assessment (Class EA) to determine the most suitable process for wastewater treatment in Brighton.

The study is being carried out as a Schedule B project under the Municipal Class Environmental Assessment (Class EA) process. Consultation with interested parties will be an important part of this process. A Notice of Commencement has been issued for the project. It has been advertised in the study area and sent to agencies and organizations that may have an interest in the study. A copy of the Notice is attached for your information.

You are invited to join our mailing list and/or provide comments as the study progresses. You are also invited to attend the proposed Public Information Centre in early 2017. Information on date and time will be relayed closer to the event.

Responses can be provided on the attached comment sheet and emailed or mailed to the address. A digital copy of the comment sheet is also available on the Municipality's website at www.brighton.ca. If you have any questions or concerns, please contact the undersigned.

Yours very truly,
J.L. RICHARDS & ASSOCIATES LIMITED

Steve Saxton, P.Eng.
J.L. Richards & Associates Ltd.
SS:jw

cc: Bill Watson, P.Eng., Chief Administrative Office, Municipality of Brighton

Attachments: Notice for Brighton Wastewater Treatment System Class EA
Agency Comment Sheet

Notice of Study Commencement

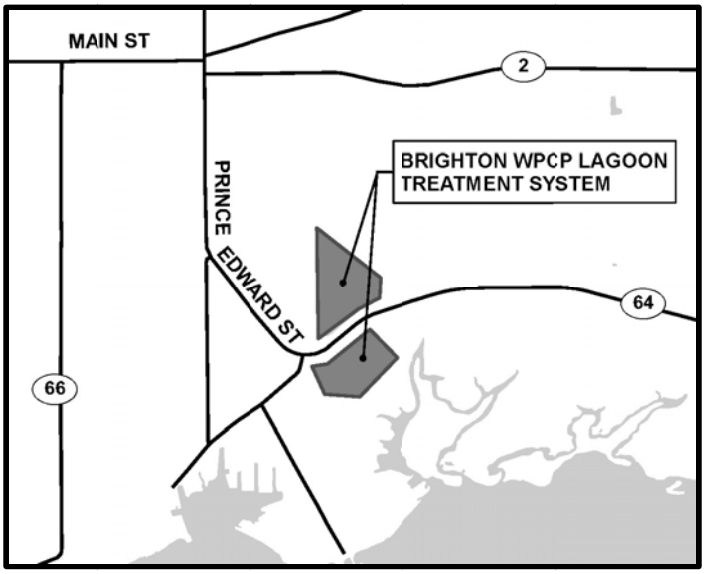
Municipality of Brighton
Brighton Wastewater Treatment System
Schedule B Class Environmental Assessment

The Municipality of Brighton has initiated a Class Environmental Assessment (Class EA) to determine the most suitable process for wastewater treatment in Brighton over the next 20 years.

How Will This Affect Me?

The study will assess current and future requirements of the Brighton wastewater treatment system, including the lagoon, main sewage pumping station, and forcemain and make recomemdations for the wastewater treatment system.

Public and agency consultation is a key element of the process. Based on your input, alternative strategies will be evaluated to identify optimal community, environmental and economic opportunities.



How Do I Get More Information?

A Public Information Centre (PIC) will be conducted in early 2017 prior to finalzing the preferred solution. In the meantime, the study team is reviewing background data and determining alternative solutions. You are also invited to contact a member of the study team at anytime with questions or to provide input into the study.

Updates will be provided thoghout the study on the Municipality website, and if you have any questions regarding the study, please visit our website at www.brighton.ca or contact one of the people listed below.

TO FIND OUT MORE VISIT
www.brighton.ca

Steve Saxton, P.Eng.
Civil Engineer
J.L. Richards & Associates Limited
203 – 863 Princess Street
Kingston, ON K7L 5N4
ssaxton@jlrichards.ca
Phone: 613-544-1424

Bill Watson, P.Eng.
Chief Administrative Officer
Municipality of Brighton
35 Alice Street, PO Box 189
Brighton, ON K0K 1H0
bwatson@brighton.ca
Phone: 613-475-0670

This study is being conducted according to the requirements of a Schedule B project under the Municipal Class Environmental Assessment process (October 2000, as amended in 2015).

This Notice issued October 14, 2016

Municipality of Brighton
Schedule 'B' Municipal Class Environmental Assessment
Brighton Wastewater Treatment System

COMMENT FORM

Name (please print): _____ **Date:** _____

I represent a(n):
(please select the most applicable)

☐ Resident ☐ Agency ☐ Public Interest Group ☐ Other Stakeholder

_____
(please specify)

Do you wish to receive updates in regards to this project? ☐ YES ☐ NO

Contact Name _____

Agency (if applicable) _____

Address (number, street, and apt. no.) _____

(City, Province, Postal Code) _____

Phone _____ E-mail _____

Please indicate any issue(s) that need to be explored/investigated as part of this Class EA:

Please provide any additional comments about this Class EA:

TO FIND OUT MORE VISIT
www.brighton.ca

Steve Saxton, P.Eng.
Civil Engineer
J.L. Richards & Associates Limited
203-863 Princess Street
Kingston, ON K7L 5N4
Email: ssaxton@jlrichards.ca
Phone: 613-544-1424

Bill Watson, P.Eng.
Chief Administrative Officer
Municipality of Brighton
35 Alice Street, P.O. Box 189
Brighton, ON K0K 1H0
Email: bwatson@brighton.ca
Phone: 613-475-0670

Click here to submit form by E-mail

Note: Comments and information regarding this Study are being collected to assist the Ministry in meeting the requirements of the EA Act. This material will be maintained on file for use during the Study and may be included in project documentation. With the exception of personal information, all comments will become part of the public record

APPENDIX ‘B’

Public Comments

From:	Brian Hein
To:	Jane Wilson; Steve Saxton
Subject:	FW: [redacted] comments - Brighton WWTP Class EA.
Date:	July 20, 2016 8:13:23 AM
Attachments:	Report to Council - Toxicity Testing of Final Effluent.pdf Results of Quarterly Toxicity Testing.pdf 15-017-Figure 12.pdf JLR_sig_logo_715c24bf-568b-46ae-8040-22d550fc23e3.png

Previously sent but just in case.

Brian

Brian Hein, P.Eng.
Executive Director
Chief Environmental Engineer

J.L. Richards & Associates Limited
864 Lady Ellen Place, Ottawa, ON K1Z 5M2
Tel: 613-728-3571 Fax: 613-728-6012

J.L. Richards & Associates Limited
ENGINEERS · ARCHITECTS · PLANNERS

CANADA'S BEST MANAGED COMPANIES

From: Jeff Graham [mailto:jeffgraham@gssengineering.ca]
Sent: June 16, 2016 11:27 AM
To: Brian Hein
Cc: Linda Widdifield; bwatson@brighton.ca
Subject: FW: [redacted] comments - Brighton WWTP Class EA.

Hi Brian

I received a call today from [redacted] – while I do not know all the facts and history, I gather he is a long time resident of Brighton who has expressed a number of concerns over the wastewater system.

[redacted]

I provide this summary of our discussion as I imagine he will participate in the EA process.

Issues he raised this morning are:

- He is glad Brighton has started the Class EA.

- Toxicity testing – I recently provided a report about quarterly toxicity testing to Town Council. He was aware of the testing and was glad to hear it would be done over the summer months as well. The last test done was for samples collected April 19, 2016. I attach my

recent report to Council. The next sample will thus be submitted in July.

- He feels the public should not have access to the constructed wetlands – as it is a "public work site". As I am sure you are aware, the constructed wetlands are a very popular birding and wildlife viewing area. He also feels the wetlands are not managed properly – and that turtles, geese and muskrats need to be controlled. I have done a draft staff report on muskrats in the wetlands but it has not been provided to Council as yet.

- He expressed concern that there has been a decline in weed beds and fish populations in Presquile Bay – but stopped short of linking it to the wastewater lagoon system.

- Overall he feels that the lagoons are inadequate – ie inadequate retention time – and expressed concern that the Municipality has not acquired additional land adjacent to the lagoons for expansion. He also implied that he thought a mechanical plant was too expensive

- He is concerned about flows coming from Presquile Park…. Based on the magmeter at the park pumping station, average flows are about 20 cmd when the park is relatively busy with flows up to 70 cmd on busy weekends. He is aware that the Town has been proactive in reducing infiltration via sewer repairs – but doubted that it has done much. I told him my estimate is that flows have been reduced about 500 cmd – this is based on average flows in 2015 versus of the average of the previous 5 years – though careful comparison of precipitation effects each year has not been done.

- He asked about calibration of flow meters and I advised this is done once a year by technicians that come to the site. I also referred him to the 2015 annual report on the Town website – which details meter calibration.

- He implies there are odours from the wetland component of the treatment plant. My general observation of the lagoon system is that it is generally odour free – though I have spent far more time around the aeration cell area and berm between the aerated cell and the lagoon versus the wetland side of the County Road.

Harbour Street Sewage Pumping Station.

As above, [redacted] and has complained about odours in the past. Specific comments :

- He feels the SPS should be provided with a carbon system on the wet well louvers to control odours

- He say that [redacted] there is a drop manhole fitted with a syphon system – not sure what he was getting at – though there might be a drop manhole here. He said odours do come from this manhole.

- Suggested that the sewers become pressurized due to the forcemain from Presquile Park discharging into the most upstream manhole (at west end of Harbour Street) causing air flow out of the manholes. I have attached our recent updated sewer map of Brighton to help with street locations.

Any questions – let me know.

Jeff Graham P. Eng., | President
GSS Engineering Consultants Ltd.
Unit 104D, 1010 9th Ave W, Owen Sound, ON N4K 5R7
Tel: 519-372-4828 Ext. 24 | jeffgraham@gssengineering.ca
http://www.gssengineering.ca/

Steve Saxton

From: [redacted]
Sent: October 25, 2016 7:44 AM
To: Steve Saxton
Cc: [redacted]
Subject: some questions on STP

The Aecom report states in section 3, ammonia control options, the retention time has to be increased from the present to 48 and 54 days of retention in order to meet the ammonia limits. in order to do this the top water has to be raised 0.9m.

Q Is this sound advice, can this be done, and will it help

In the Aecom report it clearly states in section 3 that in order to maintain this retention time for a daily average flow rate for the future (4600 m3/day) the berm would have to be raised 0.6m.

Q Is this sound advice, can this be done, and will it help

Q) What is the max daily flow rate with a retention time of 48 and 54 day can our system handle with out raising the berm?

In the Aecom report it is clear in section 2 with a retention time of 48 and 54 day that we have a reserve capacity equivalent to 2127 persons a day if we extended the hight of the berm 0.6m,

Q) Is this correct?

Pres'quile Park has about 120000 overnight guests ever year for 5 months that the park is open. We can`t divide this number over a 12 month period because our system has to take that flow of sewage when it occurs. About 400 persons in new development to be conservative, 50 new commercial lots, and our first Tim Horton's.

Q) Is our system sized for the population it severs by the size of our population (not by flow).

Q) Would adding raw water too the system at the plant help with the dilution of the raw sewage, and would this be helpful with ammonia control.

Q) The smell of sewage is a problem, can a treatment system be installed to prevent the odor.

Q) Can the discharge of the constructed wetland be redirected to discharged to the east side away from the north west wind and away from the shore line of Gosport.

Q) The constructed wetland is not part of our system or C of A why is this, the final discharge from our treatment system is from the wetland.

Q) Wildlife is a problem in the constructed wetland, would it help if we had a more aggressive wildlife removal program.

Q) Why are we allowing the public to walk around this site, with no safety or staff on site.

Steve Saxton

From: [redacted]
Sent: October 27, 2016 7:45 AM
To: Steve Saxton; [redacted]
Subject: some solution

Follow Up Flag: Follow up
Flag Status: Flagged

Our WWTS is a very low tec system, hear are my salutations to our treatment problems. Aeration, dilution, retention time, and travel distance.

The constructed wet land is not part of our WWTS nor is it required according to the MOE. If we remove the vegetation, increase the depth and add bio curtains this will increase retention time and travel distance. It also increases the overall size of the WWTS.

By adding raw water to the system this will provide dilution.

More aeration is required.

Steve Saxton

From: [redacted]
Sent: October 27, 2016 12:44 PM
To: Steve Saxton; [redacted]
Subject: Odour solution

Odour

I have complained in the past odour and was always told it was rotten vegetation, it was not the WWTS. Well Brighton finally removed all the sludge, and like magic no more odour from the site. Just a little from the pump now and then.

I think it is in our best interest if all the sludge be removed every 5 years no mater what.

I think that we need to install odour control measure it the pump station on lakeshore road, it is easer to treat odour up stream from the WWTS.

I would like to see odour removal filters installed in the pump house at east end of Harbour St. to control odour from the pump house.

APPENDIX ‘C’

Agency Mailing List

Date Created: August 8, 2016
Last Modified: August 23, 2016
JLR File No. 27271

Brighton Lagoon
Notice of Commencment Agency and Organization Mailing List - MASTER

Jurisdiction	Agency	Address 1	Address 2	Salutation
Aboriginal	Ontario Ministry of Aboriginal Affairs	4th floor, 160 Bloor Street East	Toronto ON M7A 2E6	To Whom It May Concern
Aboriginal	Metis Consultation Unit – Metis Nation of Ontario Head Office	500 Old St. Patrick Street, Unit D	Ottawa ON, K1N 9G4	To Whom It May Concern
Aboriginal	Metis Nation of Ontario – Land, Resources & Consultation	355 Cranston Cres	Midland ON L4R 4K6	To Whom It May Concern
Federal	Environment Canada	P.O. Box 5050 867 Lakeshore Road	Burlington ON L7R 4A6	Mr. Dobos
Federal	Fisheries and Oceans Canada – Communication Branch	200 Kent Street, 13th Floor, Station 13E228	Ottawa ON K1A 0E6	To Whom It May Concern
Federal	Health Canada	200 Eglantine Driveway, Tunney's Pasture	Ottawa ON K1A 0K9	To Whom It May Concern
Provincial	Ministry of the Environment and Climate Change (MOECC) – Peterborough District MOECC Office	300 Water Street Robinson Place	Peterborough ON K9J 8M5	Mr. Muloin
Provincial	Ministry of Natural Resources and Forestry (MNRF) - Southern Regional Office	4th Floor South Tower, 300 Water Street	Peterborough ON K9J 3C7	To Whom It May Concern
Provincial	Ministry of Natural Resources and Forestry (MNRF) - Peterborough District Office	1st Floor South Tower, 300 Water Street	Peterborough, ON K9J 3C7	To Whom It May Concern
Provincial	Ministry of Agriculture and Food & Rural Affairs	R R #3, 95 Dundas Street	Brighton, ON K0K 1H0	Mr. Valaitis
Provincial	Ministry of Culture, Tourism & Recreation	5th Floor, 180 Dundas Street	Toronto ON M7A 2R9	To Whom It May Concern
Provincial	Ministry of Transportation	1201 Wilson Ave., 7th Floor, Atrium Tower	Downsview ON M3M 1J8	Mr. DeVos
Provincial	Ministry of Municipal Affairs & Housing – Planners, Community P & D	777 Bay St., 13th Floor	Toronto ON M5G 2E5	Ms. Gonzalez
Provincial	Infrastructure Ontario	1 Dundas St. West, Suite 2000	Toronto ON M5G 2L5	To Whom It May Concern
Regional	Brighton Health Unit	35 Alice St.	Brighton, ON K0K 1H0	Dr. Noseworthy
Regional	Hydro One Networks Inc	12th Floor, North Tower, 483 Bay Street	Toronto ON M5G 2P5	To Whom It May Concern
Regional	Enbridge Consumers Gas	500 Consumers Road	North York ON M2J 1P8	To Whom It May Concern
Regional	Bell Canada	Floor 5, Blue, 100 Borough Drive	Toronto ON M1P 4W2	Mr. Lachapelle
Regional	Lower Trent Conservation Authority	714 Murray Street, R.R. 1	Trenton, Ontario, K8V 5P4	Ms. Noyes
Provincial	Ministry of the Environment and Climate Change (MOECC) – Peterborough District MOECC Office	300 Water Street Robinson Place	Peterborough ON K9J 8M5	Ms. Light
Provincial	Ministry of the Environment and Climate Change (MOECC) – Eastern Region - Kingston MOECC Office	PO Box 22032	Kingston, ON K7M 8S5	Ms. Mitchell

Jane Wilson

From: Steve Saxton
Sent: November 23, 2016 3:24 PM
To: Janet Noyes
Cc: Bill Watson; Jane Wilson
Subject: RE: Schedule B Class EA Brighton WWTP

Hi Janet,
Thanks for letting us know. We'll be sure to include you in the communications and will seek LTC comments as the project progresses.
Kind regards,
Steve

Steve Saxton, P.Eng.
Civil Engineer

J.L. Richards & Associates Limited
203 - 863 Princess Street, Kingston, ON K7L 5N4
Tel: 613-544-1424 Fax: 613-544-5679

J.L. Richards & Associates Limited
ENGINEERS · ARCHITECTS · PLANNERS

BEST MANAGED COMPANIES

From: Janet Noyes [mailto:janet.noyes@ltc.on.ca]
Sent: November 22, 2016 3:15 PM
To: Steve Saxton
Cc: Bill Watson
Subject: Schedule B Class EA Brighton WWTP

Hello Steve;

Lower Trent Region Conservation Authority (LTC) received the Notice of Commencement for the above noted Class EA project in Brighton.

Since portions of the WWTP are located within the Presqu'ile Bay Marsh Provincially Significant Wetland and along the Lake Ontario shoreline, and therefore within an area regulated by LTC, we are interested in being including on the communications mailings for this project.

We look forward to reviewing the submissions and providing comments to aid in the protection of this coastal wetland and the Lake Ontario shoreline.

Regards,

Janet Noyes

Janet Noyes, P.Eng.

Manager, Development Services & Water Resources

Lower Trent Conservation

Phone: 613-394-3915 x 211

Fax: 613-394-5226

714 Murray Street

R.R. #1 Trenton, ON

K8V 5P4

Buying or building near wetlands or waterways? Check out these new **online services** – ***Property Inquiry Service*** and ***Map Viewer*** will help you get information about environmental features & required permits*!*

Check out our website at: ***www.ltc.on.ca***

Ministry of the Environment and Climate Change

P.O. Box 22032
Kingston, Ontario
K7M 8S5
613/549-4000 or 1-800/267-0974
Fax: 613/548-6908

Ministère de l'Environnement et de l'Action en matière de changement climatique

C.P. 22032
Kingston (Ontario)
K7M 8S5
613/549-4000 ou 1-800/267-0974
Fax: 613/548-6908

Ontario

By email only

November 30, 2016

Municipality of Brighton

Attention: Bill Watson, P. Eng., Chief Administrative Officer
bwatson@brighton.ca

Dear Mr. Watson:

Re: Brighton Wastewater Treatment System, Municipality of Brighton

Thank you for providing the Notice of Study Commencement issued October 14, 2016. The notice indicates that the project is being planned as a schedule B activity in accordance with the Municipal Class Environmental Assessment (Class EA).

Class EA Process

I have also received a copy of an October 24, 2016 letter sent to Viktoria Light, Drinking Water Inspector at MOECC, from Keith Lee, Wastewater Supervisor at the Brighton Water Pollution Control Plant (WPCP) which states that "The municipality has also retained J.L. Richards to complete a Class EA process for the wastewater treatment system. This Class EA will evaluate alternatives to upgrade, and potentially expand, the treatment system for short term and long term servicing conditions". If the municipality proceeds with a Class EA project to expand the system, depending on the specifics of the expansion, the project may need to be elevated to a schedule C project rather than a schedule B project. For example, if the existing rated capacity of a WPCP will be increased by expansion of a sewage treatment plant or lagoons, or by adding sewage storage tanks, the project would be classified as schedule C.

As the MOECC Regional EA Coordinator for this project, I will be responsible for circulating project notices and information to other MOECC reviewers and coordinating the MOECC response during the Class EA process. I am a mandatory contact for all Notices issued for the project. I would prefer to receive copies of notices by email, if possible. In addition, I request copies of other relevant information such as information updates, technical studies, interim reports and technical memoranda, and two copies of the Project Report when it is available.

Please send notices and copies of reports and information packages to the attention of:

Vicki Mitchell, Environmental Assessment Coordinator
Ministry of the Environment and Climate Change
1259 Gardiners Road
P.O. Box 22032
Kingston, Ontario
K7M 8S5

vicki.mitchell@ontario.ca

We normally recommend that intermediate reports or Technical Memoranda, be prepared and circulated for comment before the final Project Report is prepared. This is not a requirement of the Municipal Class Environmental Assessment (Class EA) process; however, it can ensure that consultation with review agencies is carried out in an effective way and that technical comments are received from agencies before the report is finalized.

Supporting technical information, such as proposed effluent criteria, should be submitted at an early stage of the Class EA process, so that this Ministry has an opportunity to confirm our acceptance of the proposal before the report is finalized.

MOECC Technical Review

This Ministry's interest in the project includes problems identified during MOECC inspections of the existing facilities; impacts to the receiving water body due to increase in the discharge of sewage treatment plant effluent; impacts to groundwater and surface water due to construction (i.e. dewatering of trenches during installation of sewers or tanks, control of erosion and sedimentation, construction and/or dredging at outfall location); information on the existing sewage collection system, extent of inflow and infiltration to sewage collection system and any remedial measures under consideration; noise and odour impacts to nearby residents from new infrastructure such as pumping stations; and information on water and sewage service areas.

Impacts to surface water due to increased volumes or concentrations of sewage effluent should be evaluated as soon in the Municipal Class EA process as possible. A site-specific receiving water assessment may need to be conducted to determine the effluent requirements based on the waste assimilative capacity of the receiver. The site-specific effluent requirements derived from the receiving water assessment must be compared to provincial guidelines for effluent discharge (MOECC procedure F-5-1: *Determination of Treatment Requirements for Municipal and Private Sewage Treatment Works Discharging to Surface Waters*), and the most stringent criteria will apply. Receiving water assessments, including background water quality and flow data, must be provided to MOECC by the proponent during the Class EA process.

The Class EA study should consider the need for an adequate buffer area between the sewage treatment facility and residences, and should identify the separation distances between the facility and nearest residences. Adequate buffer area should be acquired for new facilities or enlargements of existing facilities. The study should discuss the potential for odour or noise impacts, and propose appropriate mitigation measures. Please refer to this Ministry's Guideline *D-2 Compatibility between Sewage Treatment and Sensitive Land Use*.

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 a Project File report or 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 (please consult 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. Even if the project activities in a vulnerable area are deemed to not to be a drinking water risk, there may be other policies that apply, so consultation with the local CA/SPA is important.

Consultation with First Nation and Métis Communities

Your proposed project may have the potential to affect Aboriginal communities who hold or claim Aboriginal or treaty rights protected under Section 35 of Canada's *Constitution Act* 1982. The Crown has a legal duty to consult First Nation and Métis communities when it has knowledge of established or credibly asserted Aboriginal or treaty rights, and contemplates decisions or actions that may adversely affect them.

Although the Crown remains responsible for ensuring the adequacy of Aboriginal consultation, it may delegate procedural aspects of the consultation process to project proponents. The MOECC relies on Aboriginal consultation conducted by proponents as part of its assessment of the Crown's obligations and directs proponents during the prescribed process.

Where the Crown's duty to consult is triggered in relation to your proposed project**, the MOECC is delegating the procedural aspects of rights-based consultation to you through this letter.**

Based on information you have provided to date and the Crown`s preliminary assessment you are required to consult with the following Aboriginal communities who have been identified as potentially affected by your proposed project:

- Mohawks of the Bay of Quinte
- Curve Lake First Nation
- Alderville First Nation
- Hiawatha First Nation
- Mississaugas of Scugog First Nation
- Metis Nation of Ontario
- Huron-Wendat (if archaeological assessments will be undertaken)

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 Approvals Branch 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; or,
- A Part II Order request or elevation request is expected

The MOECC 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 you will be asked to play in them.

Should you or any members of your project team have any questions regarding the material above, please contact me at (613) 540-6852.

Yours sincerely,

V. Mitchell
Environmental Assessment Coordinator
Eastern Region
VM/dv

Ec: J.L. Richards and Associates, Steve Saxton, P. Eng., ssaxton@jlrichards.ca

Viktoria Light, MOECC
Victor Castro, MOECC

APPENDIX ‘D’

Project Committee Meeting Minutes

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

J.L. Richards & Associates Limited
203-863 Princess Street
Kingston, ON Canada
K7L 5N4
Tel: 613 544 1424
Fax: 613 544 5679

MUNICIPALITY OF BRIGHTON
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
BRIGHTON WASTEWATER TREATMENT SYSTEM

MEETING NO. 1 AND SITE VISIT

Attendance:	Name	Company	Email
	Bill Watson	Municipality of Brighton	BWatson@brighton.ca
	Keith Lee	Municipality of Brighton	KLee@brighton.ca
	Jeff Graham	GSS Engineering Consultants	jeffgraham@gssengineering.ca
	Brian Hein	J.L. Richards & Associates	bhein@jlrichards.ca
	Steve Saxton	J.L. Richards & Associates	ssaxton@ jlrichards.ca
	Jane Wilson	J.L. Richards & Associates	jwilson@jlrichards.ca
	Leeshawn O'Sullivan	J.L. Richards & Associates	
	Chris Wolfert	J.L. Richards & Associates	
	Brad Gillies	J.L. Richards & Associates	

The meeting commenced at 9:00 a.m. on Wednesday, September 28, 2016 at Brighton Municipal Offices.

The following summary of the discussions of this meeting has been prepared to record decisions reached and actions required for the project. Please advise the undersigned of any errors or omissions within the next three business days.

ITEM		ACTION BY	DUE BY
1.0	**Welcome and Introductions**		
2.0	**Project Start-up and Administration**		
	• JLR has a signed copy of the Consulting Agreement. • Invoices will be provided monthly showing percent of project complete.		
3.0	**Public and Agency Consultation Plan**		
	• Bill Watson (Brighton) will provide details for issuing Notice's (i.e. newspaper) • JLR will add additional info to the Notice regarding the anticipated schedule. • It was noted that the Public Information Centre (PIC) will be held at the Community Centre and attendance is anticipated to be 30 – 50 people. Details will be confirmed closer to the date (anticipated for early 2017).	Brighton JLR	Oct. 17 Oct. 17
4.0 & 5.0	**Review of Data Received and Data Gaps** A general discussion was held regarding the Water Pollution Control Plant (WPCP) and the Harbour St. Sewage Pumping Station (SPS). Documentation of discussion and action items is provided below: Missing Data • Brighton's Planner will send number of approved and planned subdivisions. • All other missing data was provided by Keith after the meeting. Lagoon • Short Circuiting: It was noted by Keith and that the new baffles in the stabilization pond do not extend to the bottom of the lagoon. There has been some evidence of flow under the first baffle in the winter months. A simple die tracer test could be performed to confirm if this is an issue.	Brighton	ASAP

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

J.L. Richards & Associates Limited
203-863 Princess Street
Kingston, ON Canada
K7L 5N4
Tel: 613 544 1424
Fax: 613 544 5679

MUNICIPALITY OF BRIGHTON
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
BRIGHTON WASTEWATER TREATMENT SYSTEM

MEETING NO. 1 AND SITE VISIT

- Lagoon Volume: JLR indicated that there are some discrepancies regarding the lagoon volume reported in various reports. Jeff (GSS) confirmed that the area for both lagoons was obtained from the ECA and that depths were measured for the aerated cell, but that the actual depth of the stabilization varies (due to bedrock) and has not been measured by GSS or the Municipality. The volumes shown on the GSS 2016 drawings are based on the best available data
- Sludge and Desluding Activities: Keith indicated that both cells were desludged in 2003-04 by Teratech. The baffles were in place at the time of desludging and a floating dredge was used. Sludge from the settling pond was land applied and due to metals content aeration pond sludge was dewatered and sent to landfill. The area close to the entrance of the settling pond was desludged again in 2012. The Brighton WPCP was selected for an MOECC sludge study in 2016. GSS will provide the MOECC contact information and JLR will follow up to obtain a copy of the study results. — GSS/JLR — Oct. 17
- Wetland: The wetland was constructed in 1999 (approx.) and allowed the capacity of the plant to increase from 3,400 m3/day to 4,600 m3/day. It provides some polishing of lagoon effluent. Its performance has remained relatively unchanged since commissioning. The Municipality conducts some maintenance activities (e.g. removing muskrats), however, Keith and Bill noted that most maintenance is ad hoc and a better operations plan is required.
- Other Lagoon Issues: GSS has prepared a history memo. This was sent to JLR following the meeting.

Collection System:

- Inflow & Infiltration: Brighton has completed I/I remedial work in areas with a high water table (closer to Bay). The program consisted of flushing mains, conducting CCTV, and repairing issues (typically manhole improvements). Keith reported that flows have been down at the plant over past three years since I&I work started.
- Sewage Strength: The raw sewage at the plant is relatively high strength with regards to ammonia. GSS also noted that BOD to TSS ratios in the raw sewage are not typical. Grab samples are collected weekly from the gravity part of the collection system (40%) and the pumped portion (60%). An auto sampler is also available for additional sample collection, though it has not been deployed. There are no known sources (i.e. industry) of high strength sewage in the community. Uther investigation may be required. JLR will prepare a simple monitoring plan for discussion. — JLR — Oct. 17

6.0 Other Business

- Growth Study: Jeff emphasised the importance of the Growth Study in determining (a) if additional plant capacity is required and (b) if the Class EA can proceed as Schedule B. JLR indicated that the study was underway and would be completed once information was received from the Municipality's planner.

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

J.L. Richards & Associates Limited
203-863 Princess Street
Kingston, ON Canada
K7L 5N4
Tel: 613 544 1424
Fax: 613 544 5679

MUNICIPALITY OF BRIGHTON
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT
BRIGHTON WASTEWATER TREATMENT SYSTEM

MEETING NO. 1 AND SITE VISIT

- Implementation Plan: The Municipality and Jeff stressed the importance of an implemental plan going forward that address short, medium and long term objectives. This phased approach will be incorporated into JLR's project documentation.

7.0 Meeting adjourned at 11:00 a.m and Keith and JLR proceeded to site visit.

Prepared by:

Jane Wilson, P.Eng.
Environmental Engineer

Issued on: October 11, 2016

Distribution: All attendees
CC: Name

Appendix B

Environmental Certificate of Approval (ECA)

Ontario

Ministry of the Environment and Climate Change
Ministère de l'Environnement et de l'Action en matière de changement climatique

AMENDED ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 3081-9XQNZK
Issue Date: July 7, 2015

The Corporation of the Municipality of Brighton
67 Sharp Road
Suburban Service, No. 8
Brighton, Ontario
K0K 1H0

Site Location: Town of Brighton WPCP
100 County Road 64
Lot 33 & 34, Concession B
Municipality of Brighton
County of Northumberland

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:

sewage Works servicing the Town of Brighton, for the collection, transmission, treatment and disposal of domestic sewage, located at the above site location, rated at the capacity mentioned below and consisting of the following Works;

Brighton Water Pollution Control Plant (*Rated Capacity*)	
Average Daily Flow	4,600 cubic metres per day

Wastewater Treatment Facilities

- a 0.68 hectare aerated lagoon with two (2) 11.2 kilowatts mechanical aerators;

- coagulant feed system consisting of one (1) 35,000 litres external storage tank, two (2) chemical feed pumps (one (1) duty and one (1) standby), injection point at the chemical

mixing chamber, and one (1) flash mixer;

- one (1) Parshall flume flow meter located in the mixing channel and measuring flow directed into the stabilization pond;

- a 5.44 hectares waste stabilization pond equipped with three (3) floating baffles installed from east to west direction to improve flow distribution, and effluent discharged to a constructed wetland described below.

Constructed Wetland

The constructed wetland is located on the south side of County Road 64, immediately east of Harbour Street)

- a constructed wetland having a surface area of 6.2 hectares, side slopes of 3:1 and 0.8 free board, constructed south of the waste stabilization pond consisting of Wetland Cell # 1 and Wetland Cell # 2, each wetland cell consisted of a 300 millimetres shallow vegetative terrace between 1.0 metre deep front and rear zones;

- a 600 millimetres diameter pipe constructed and connected from the waste stabilization pond outflow chamber to the inlet flow structure of the constructed wetland;

- a 3.0 metres x 2.4 metres x 3.0 metres deep inlet flow structure constructed at the front end of Wetland Cell # 1 to control waste stabilization pond effluent through weirs and baffles to the wetland cells by 600 millimetres diameter pipes;

- a 3.0 metres x 2.4 metres x 3.05 metres deep outlet flow structure having weirs and baffles, constructed at the rear end of Wetland Cell # 2 to receive wetland effluent from a level control structure (equipped with stop logs) of each wetland cell and discharge wetland effluent through three (3) outflow swales to the natural wetland in Prequ`ile Bay;

- two (2) 2.4 metres long emergency weir having a weir crest elevation of 79.0 metres, constructed on the common berm at the rear ends of the two wetland cells and the rear berm of Wetland Cell # 2; and

- three (3) flow meters: one (1) Parshall flume measuring flow into constructed wetland, two (2) V notch weirs measuring flow into each of Wetland Cell #1 and Wetland Cell # 2, and two (2) V notch weirs measuring effluent flows from each constructed wetland cell.

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

all in accordance with supporting documents listed in Schedule 'A'.

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

"Annual Average Concentration" means the arithmetic mean of the Monthly Average Concentrations of a contaminant in the effluent calculated for any particular calendar year;

"Annual Average Loading" means the value obtained by multiplying the Annual Average Concentration of a contaminant by the Average Daily Flow over the same calendar year;

"Approval" means this entire document and any schedules attached to it, and the application;

"Average Daily Flow" means the cumulative total sewage flow to the sewage works during a calendar year divided by the number of days during which sewage was flowing to the sewage works that year;

"BOD_5" (also known as $TBOD_5$) means five day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogenous oxygen demand;

"By-pass" means diversion of sewage around one or more unit processes 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 location, and discharging to the environment through the Sewage Treatment Plant outfall;

"$CBOD_5$" means five day carbonaceous (nitrification inhibited) biochemical oxygen demand measured in an unfiltered sample;

"Daily Concentration" means the concentration of a contaminant in the effluent discharged over any single day, as measured by a composite or grab sample, whichever is required;

"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;

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

"Emergency Situation" means a structural, mechanical or electrical failure that causes a temporary reduction in the capacity of the Sewage Treatment Plant or an unforeseen flow condition that may result in:

a) danger to the health or safety of any person; or

b) injury or damage to any property, or serious risk of injury or damage to any property; or

c) treatment process biomass washout.

"Equivalent Equipment" means a substituted equipment or like-for-like equipment that meets the

required quality and performance standards of a named equipment;

"Event" means an action or occurrence, at a given location within the Sewage Treatment Plant that causes a Plant Bypass or Plant Overflow. An Event ends when there is no recurrence of a Bypass or Overflow in the 12-hour period following the last Bypass or Overflow. Two Events are separated by at least 12 hours during which there has been no recurrence of a Bypass or Overflow;

"Final Effluent" means sewage discharge via the Sewage Treatment Plant outfall after undergoing the full train of unit processes as listed in the Approval;

"Geometric Mean Density" is the nth root of the product of multiplication of the results of n number of samples over the period specified;

"Individual Waste Loading" means the loading expressed in kilograms per day and calculated by multiplying the concentration of a parameter in a sample by the total volume of effluent discharged from the Works during the day in which the sample is taken;

"Limited Operational Flexibility" (LOF) means any modifications that the Owner is permitted to make to the Works under this Approval;

"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;

"Monthly Average Concentration" means the arithmetic mean of all Daily Concentrations of a contaminant in the effluent sampled or measured, or both, during a calendar month;

"Monthly Average Daily Flow" means the cumulative total sewage flow to the sewage works during a calendar month divided by the number of days during which sewage was flowing to the sewage works that month;

"Monthly Average Loading" means the value obtained by multiplying the Monthly Average Concentration of a contaminant by the Monthly Average Daily Flow over the same calendar month:

"Notice of Modifications" means the form entitled "Notice of Modifications to Sewage Works";

"Owner" means The Corporation of the Municipality of Brighton and its successors and assignees;

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

"Partial Treatment" means any treatment that does not include the full train of unit processes of the Sewage Treatment Plant described and approved in the Approval;

"Peak Flow Rate" means the maximum rate of sewage flow for which the plant or process unit was designed;

"Plant Overflow" means a discharge to the environment from the Sewage Treatment Plant at a location other than the plant outfall or into the plant outfall downstream of the Final Effluent sampling location;

"Rated Capacity" means the Average Daily Flow for which the Works are approved to handle;

"Sewage Treatment Plant" means the entire sewage treatment and effluent discharge facility;

"Water Supervisor" means the Water Supervisor for the Peterborough Office of the Ministry; and

"Works" means the sewage works described in the Owner's application, and this Approval, and modifications made under Limited Operational Flexibility.

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

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

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

(2) Except as otherwise provided by these conditions, the Owner shall design, build, install, operate and maintain the Works in accordance with the description given in this Approval, and the application for approval of the Works.

(3) Where there is a conflict between a provision of any document in the schedule referred to in this Approval and the conditions of this Approval, the Conditions in this Approval shall take precedence, and where there is a conflict between the documents in the schedule, the document bearing the most recent date shall prevail.

(4) Where there is a conflict between the documents listed in the Schedule A, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

(5) The Conditions of this Approval are severable. If any Condition of this Approval, or the application of any requirement of this Approval to any circumstance, is held invalid or unenforceable, the application of such condition to other circumstances and the remainder

of this Approval shall not be affected thereby.

2. CHANGE OF OWNER

(1) The Owner shall notify the Water Supervisor and the Director, in writing, of any of the following changes within thirty (30) days of the change occurring:

(a) change of Owner;

(b) change of address of the Owner;

(c) change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act* , R.S.O. 1990, c.B17 shall be included in the notification to the Water Supervisor; and

(d) change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the *Corporations Information Act* , R.S.O. 1990, c. C39 shall be included in the notification to the Water Supervisor.

(2) In the event of any change in ownership of the Works, other than a change to a successor municipality, the Owner shall notify in writing the succeeding owner of the existence of this Approval, and a copy of such notice shall be forwarded to the Water Supervisor and the Director.

3. BY-PASSES

(1) Any By-pass or Plant Overflow is prohibited, except:

(a) in an Emergency Situation;

(b) where the By-pass / Plant Overflow is a direct and unavoidable result of a planned maintenance procedure, the Owner notified the Water Supervisor 15 days prior to the By-pass and the Water Supervisor has given written consent of the By-pass; and

(c) where the By-pass / Plant Overflow is planned for research or training purposes, the discharger notified the Water Supervisor 15 days prior to the By-pass / Plant Overflow and the Water Supervisor has given written consent of the By-pass / Plant Overflow.

(2) The Owner shall forthwith notify the Spills Action Centre (SAC) and the Medical Officer of Health of all By-pass and Plant Overflow Events except the events occurring under

subsection (1)(b). This notice shall include, at a minimum, the following information:

(a) the date, time, and duration of the Event;

(b) the location of the Event;

(c) the measured or estimated volume of the Event (unless the Event is ongoing);

(d) the reason for the Event; and

(e) the level of treatment the By-pass(es) and/or Plant Overflow(s) received and disinfection status of same.

(3) The Owner shall submit By-pass and Plant Overflow Event Reports to the Ministry's local office on a quarterly basis, no later than each of the following dates for each calendar year: **February 14**, **May 15**, **August 14**, and **November 15**. Event Reports shall be in an electronic format specified by the Ministry. In each Event Report the Owner shall include, at a minimum, the following information on any Events that occurred during the preceding quarter:

(a) the date of the Event(s);

(b) the measured or estimated volume of the Event(s);

(c) the duration of the Event(s);

(d) the location of the Event(s);

(e) the reason for the Event(s); and

(f) the level of treatment the By-pass(es) and/or Plant Overflow(s) received and disinfection status of same.

(4) The Owner shall use best efforts to collect a representative sample consisting of a minimum of two (2) grab samples of the By-pass / Plant Overflow and have it analyzed for parameters outlined in Condition 5 (Effluent Limits Condition) using the protocols specified in Condition 7 (Monitoring and Recording Condition), one at the beginning of the Event and the second approximately near the end of the Event, to best reflect the effluent quality of such By-pass or Plant Overflow.

(5) The Owner shall maintain a logbook of all Plant By-passes and Plant Overflows, which shall contain, at a minimum; the types of information set out in subsection 2 (a) to 2(e) in respect of each By-pass and Plant Overflow.

4. EFFLUENT OBJECTIVES

(1) In order to ensure continuous compliance with the performance criteria stipulated in Condition 5, the Owner shall use best efforts to design, construct and operate the Works with the objective that the concentrations of the materials named below as effluent parameters are not exceeded in the effluent from the constructed wetland.

Table 1 – Effluent Objective – Constructed Wetland	
Effluent Parameter	**Concentration in Effluent** (milligrams per litre)
$CBOD_5$	15.0
Total Suspended Solids	15.0
Ammonia + Ammonium Nitrogen	10.0 * 15.0 **
Total Phosphorus	0.8
E. coli	200 organisms per 100 millimetres ***
* from May 01 to October 30; ** from November 01 to April 30; and *** The *Geometric Mean Density* of *E. coli* in effluent should not exceed 200 organisms per 100 millimetres for any calendar month.	

(2) The Owner shall use best efforts to:

(a) maintain the pH of the effluent from the Works within the range of 6.0 to 9.5, inclusive, at all times;

(b) operate the Works within the Rated Capacity of the Works; and

(c) ensure that the effluent from the Works 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.

(3) The Owner shall include in all reports submitted in accordance with Conditions 7 and 8 a summary of the efforts made and results achieved under this Condition.

5. EFFLUENT LIMITS

(1) The Owner shall design, construct, operate and maintain the Works such that the concentrations and waste loadings of the materials named below as effluent parameters are not exceeded in the effluent from the waste stabilization pond.

Table 2 – Effluent Limit – Waste Stabilization Pond		
Effluent Parameter	**Concentration in Effluent** (milligrams per litre)	**Loading in Effluent** (kilograms per day)
$CBOD_5$	30.0	138.0
Total Suspended Solids	40.0	184.0
Ammonia + Ammonium Nitrogen	14.0 * 17.0 **	64.4 * 78.2 **
Total Phosphorus	1.0	4.6
* from May 01 to October 30; and ** from November 01 to April 30.		

(2) For the purposes of determining compliance with and enforcing subsection (1):

(a) Non-compliance with respect to concentration of **CBOD5** and **Total Suspended Solids** in the effluent is deemed to have occurred when the Annual Average Concentration of any of the parameters, as defined in this Certificate, based on all grab samples taken in accordance with Condition 7, supplemented by spot sampling by the Ministry's staff as necessary, prior to and during the effluent discharge period, exceeds its corresponding concentration in effluent specified in subsection (1).

(b) Non-compliance with respect to concentration of **Ammonia + Ammonium Nitrogen** and **Total Phosphorus** in the effluent is deemed to have occurred when the Monthly Average Concentration of any of the parameters, as defined in this Approval, based on all grab samples taken in accordance with Condition 7, supplemented by spot sampling by the Ministry's staff as necessary, during any calendar months, exceeds its corresponding concentration in effluent specified in subsection (1).

(c) Non-compliance with respect to total loading of **CBOD5** and **Total Suspended Solids** is deemed to have occurred when the Annual Average Loading of any of the parameters, as defined in this Approval, based on all grab samples taken in accordance with Condition 7, supplemented by spot sampling by the Ministry's staff as necessary, during any **twelve (12) consecutive calendar months**, exceeds its corresponding total loading from effluent specified in subsection (1).

(d) Non-compliance with respect to loading of **Ammonia + Ammonium Nitrogen** is deemed to have occurred when the Monthly Average Concentration of the

parameter, as defined in this Approval, based on all grab samples taken in accordance with Condition 7, supplemented by spot sampling by the Ministry's staff as necessary, during any **calendar day**, multiplied by the Average Daily Flow over the seasonal period the sample was taken, exceeds its corresponding loading from effluent specified in subsection (1).

(e) Non-compliance with respect to total loading of **Total Phosphorus** is deemed to have occurred when the Monthly Average Loading of the parameter, as defined in this Approval, based on all grab samples taken in accordance with Condition 7, supplemented by spot sampling by the Ministry's staff as necessary, during any **twelve (12) consecutive calendar months**, exceeds its corresponding total loading from effluent specified in subsection (1).

(3) Paragraph (a), (b), (c), (d) and (e) of subsection (2) shall apply upon the issuance of this Approval.

6. OPERATION AND MAINTENANCE

(1) The Owner shall exercise due diligence in ensuring 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 operator 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 prepare an operations manual prior to the commencement of operation of the sewage Works that includes, but not necessarily limited to, the following information:

(a) operating procedures for routine operation of the Works;

(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) a spill prevention control and countermeasures plan, consisting of contingency plans and procedures for dealing with equipment breakdowns, potential spills and any other abnormal situations, including notification of the Water Supervisor; and

(f) procedures for receiving, responding and recording public complaints, including

recording any follow-up actions taken.

(3) The Owner shall maintain the operations manual current and retain a copy at the location of the Works for the operational life of the Works. Upon request, the Owner shall make the manual available to Ministry staff.

(4) The Owner shall provide for the overall operation of the Works with an operator who holds a licence that is applicable to that type of facility and that is of the same class as or higher than the class of the facility in accordance with Ontario Regulation 129/04.

7. MONITORING AND RECORDING

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

(1) All samples and measurements taken for the purposes of this Approval are to be taken at a time and in a location characteristic of the quality and quantity of the effluent stream over the time period being monitored.

(2) For the purposes of this condition, the following definitions apply:

(a) Weekly means once each week; and

(b) Monthly means once every month.

(3) Samples shall be collected at the following sampling points, at the frequency specified, by means of the specified sample type and analyzed for each parameter listed and all results recorded:

Table 3 – Raw Sewage Monitoring – (sampled at influent structure)	
Frequency	Monthly
Sample Type	Grab
Parameters	BOD_5, Total Suspended Solids, Total Phosphorus, and Total Kjeldahl Nitrogen

Table 4 – Effluent Monitoring – Waste Stabilization Pond		
Parameters	**Sample Type**	**Frequency**
$CBOD_5$	Grab	Weekly
Total Suspended Solids	Grab	Weekly
Total Phosphorus	Grab	Weekly
Total Kjeldahl Nitrogen	Grab	Weekly
(Ammonia + Ammonium) Nitrogen	Grab	Weekly
Nitrate Nitrogen	Grab	Weekly
Nitrite Nitrogen	Grab	Weekly
Temperature	Grab	Weekly
pH	Grab	Weekly
E. coli	Grab	Monthly

Table 5 – Effluent Monitoring – Constructed Wetland		
Parameters	**Sample Type**	**Frequency**
$CBOD_5$	Grab	Weekly
Total Suspended Solids	Grab	Weekly
Total Phosphorus	Grab	Weekly
Total Kjeldahl Nitrogen	Grab	Weekly
(Ammonia + Ammonium) Nitrogen	Grab	Weekly
Nitrate Nitrogen	Grab	Weekly
Nitrite Nitrogen	Grab	Weekly
E. coli	Grab	Monthly
Temperature	Grab	Weekly
pH	Grab	Weekly

(4) The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following:

(a) the Ministry's Procedure F-10-1, “Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only), as amended from time to time by more recently published editions;

(b) the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater" (January 1999), ISBN 0-7778-1880-9, as amended from time to time by more recently published editions; and

(c) the publication "Standard Methods for the Examination of Water and Wastewater" (21st edition), as amended from time to time by more recently published editions.

(5) The temperature and pH of the effluent from the Works shall be determined in the field at the time of sampling for Total Ammonia Nitrogen. The concentration of un-ionized ammonia shall be calculated using the total ammonia concentration, pH and temperature using the methodology stipulated in "Ontario's Provincial Water Quality Objectives" dated July 1994, as amended, for ammonia (un-ionized).

(6) The Owner shall install and maintain (a) continuous flow measuring device(s), to measure the flow rate of the effluent from the Works with an accuracy to within plus or minus 15 per cent (+/- 15%) of the actual flow rate for the entire design range of the flow measuring device, and record the flow rate at a daily frequency.

(7) 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.

8. REPORTING

(1) **Ten (10) days** prior to the date of a planned By-pass being conducted pursuant to Condition 3 (By-passes Condition) and as soon as possible for an unplanned By-pass, the Owner shall notify the Water Supervisor in writing of the pending start date, in addition to an assessment of the potential adverse effects on the environment and the duration of the By-pass.

(2) The Owner shall report to the Water Supervisor or designate, any exceedence of any parameter specified in Condition 5 (Effluent Limits Condition) orally, as soon as reasonably possible, and in writing within **seven (7) days** of the exceedence.

(3) In addition to the obligations under Part X of the *Environmental Protection Act* , the Owner shall, within **ten (10) working days** of the occurrence of any reportable spill as

defined in Ontario Regulation 675/98, bypass or loss of any product, by-product, intermediate product, oil, solvent, waste material or any other polluting substance into the environment, submit a full written report of the occurrence to the Water Supervisor describing the cause and discovery of the spill or loss, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation.

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

(5) The Owner shall prepare and submit a performance report to the Water Supervisor on an annual basis, within **ninety (90) days** following the end of the period being reported upon. The first such report shall cover the first annual period following the commencement of operation of the Works and subsequent reports shall be submitted to cover successive annual periods following thereafter. The reports shall contain, but shall not be limited to, the following information:

(a) a summary and interpretation of all monitoring data and a comparison to the effluent limits outlined in Condition 5 (Effluent Limits Condition), including an overview of the success and adequacy of the Works;

(b) a description of any operating problems encountered and corrective actions taken;

(c) a summary of all maintenance carried out on any major structure, equipment, apparatus, mechanism or thing forming part of the Works;

(d) a summary of any effluent quality assurance or control measures undertaken in the reporting period;

(e) a summary of the calibration and maintenance carried out on all effluent monitoring equipment; and

(f) a description of efforts made and results achieved in meeting the Effluent Objectives of Condition 4 (Effluent Objectives Condition).

(g) a tabulation of the volume of sludge generated in the reporting period, 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;

(h) a summary of any complaints received during the reporting period and any steps taken to address the complaints;

(i) a summary of all By-pass, spill or abnormal discharge events;

(j) a copy of all Notice of Modifications submitted to the Water Supervisor as a result of Schedule B, Section 1, with a status report on the implementation of each

modification;

(k) a report summarizing all modifications completed as a result of Schedule B, Section 3; and

(l) any other information the Water Supervisor requires from time to time.

(7) The Owner shall, within **thirty (30) calendar days** of issuance of this Approval, submit a **Municipal Wastewater System Profile Information Form**, and shall resubmit the updated document every time a notification is provided to the Water Supervisor in compliance with requirements of change of ownership under this Approval.

9. LIMITED OPERATIONAL FLEXIBILITY

(1) The Owner may make modifications to the Works in accordance with the Terms and Conditions of this Approval and subject to the Ministry's "Limited Operational Flexibility Criteria for Modifications to Sewage Works ", included under Schedule B of this Approval, as amended.

(2) Sewage works proposed under Limited Operational Flexibility shall adhere to the design guidelines contained within the Ministry's publication "Design Guidelines for Sewage Works 2008", as amended.

(3) The Owner shall ensure at all times, that the Works, related equipment and appurtenances which are installed or used to achieve compliance are operated in accordance with all Terms and Conditions of this Approval.

(4) For greater certainty, the following are not permitted as part of Limited Operational Flexibility:

(a) Modifications to the Works that result in an increase of the Rated Capacity of the Works;

(b) Modifications to the Works that may adversely affect the approved effluent quality criteria or the location of the discharge/outfall;

(c) Modifications to the treatment process technology of the Works, or modifications that involve construction of new reactors (tanks) or alter the treatment train process design;

(d) Modifications to the Works approved under s.9 of the EPA, and

(e) Modifications to the Works pursuant to an order issued by the Ministry.

(5) Implementation of Limited Operational Flexibility is not intended to be used for piecemeal measures that result in major alterations or expansions.

(6) If the implementation of Limited Operational Flexibility requires changes to be made to the Emergency Response, Spill Reporting and Contingency Plan, the Owner shall, as deemed necessary in consultation with the Water Supervisor, provide a revised copy of this plan for approval to the local fire services authority prior to implementing Limited Operational Flexibility.

(7) For greater certainty, any modification made under the Limited Operational Flexibility may only be carried out after other legal obligations have been complied with, including those arising from the *Environmental Protection Act*, *Niagara Escarpment Planning and Development Act*, *Oak Ridges Moraine Conservation Act*, *Lake Simcoe Protection Act* and *Greenbelt Act*.

(8) Prior to implementing Limited Operational Flexibility, the Owner shall complete a Notice of Modifications describing any proposed modifications to the Works and submit it to the Water Supervisor.

Schedule 'A' forms part of this Approval and contains a list of supporting documentation / information received, reviewed and relied upon in the issuance of this Approval.

SCHEDULE 'A'

1. Field Alert Number 4073-9XKJTL, created on June 17, 2015, by Ms. Viktoria Light, Drinking Water Inspector, MOECC, Peterborough Office.

2. Existing ECA # **3560-8A8LEY**, issued on **November 17, 2010**.

Schedule B

Limited Operational Flexibility Criteria for Modifications to Municipal Sewage Works

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

   1.1 Sewage Pumping Stations

   a. Alter pumping capacity by adding or replacing equipment where new equipment is located within an existing sewage treatment plant site or an existing sewage pumping station site, provided that the modifications do not result in an increase of the sewage treatment plant Rated Capacity and the existing flow process and/or treatment train are maintained, as applicable.

   b. Forcemain relining and replacement with similar pipe size where the nominal diameter is not greater than 1,200mm

   1.2 Sewage Treatment Process

   a. Installing additional chemical dosage equipment including replacing with alternative chemicals for pH adjustment or coagulants (non-toxic polymers) provided that there are no modifications of treatment processes or other modifications that may alter the intent of operations and may have negative impacts on the effluent quantity and quality.

   b. Expanding the buffer zone between a sanitary sewage lagoon facility or land treatment area and adjacent uses provided that the buffer zone is entirely on the proponent's land.

   c. Optimizing existing sanitary sewage lagoons with the purpose to increase efficiency of treatment operations provided that existing sewage treatment plant rated capacity is not exceeded and where no land acquisition is required.

   d. Optimizing existing sewage treatment plant equipment with the purpose to increase the efficiency of the existing treatment operations, provided that there are no modifications to the works that result in an increase of the approved Rated Capacity, and may have adverse effects to the effluent quality or location of the discharge.

e. Replacement, refurbishment of previously approved equipment in whole or in part with Equivalent Equipment, like-for-like of different make and model, provided that the firm capacity, reliability, performance standard, level of quality and redundancy of the group of equipment is kept the same or exceeded. For clarity purposes, the following equipment can be considered under this provision: pumps, screens, grit separators, blowers, aeration equipment, sludge thickeners, dewatering equipment, UV systems, chlorine contact equipment, bio-disks, and sludge digester systems.

1.3 Sewage Treatment Plant Outfall

a. Replacement of discharge pipe with similar pipe size or diffusers provided that the outfall location is not changed.

1.4 Sanitary Sewers

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

1.5 Pilot Systems

a. Installation of pilot systems for new or existing technologies provided that:

i. any effluent from the pilot system is discharged to the inlet of the sewage treatment plant or hauled off-site for proper disposal,
ii. any effluent from the pilot system discharged to the inlet of the sewage treatment plant or sewage conveyance system does not significantly alter the composition/concentration of the influent sewage to be treated in the downstream process; and that it does not add any inhibiting substances to the downstream process, and
iii. the pilot system's duration does not exceed a maximum of two years; and a report with results is submitted to the Director and Water Supervisor three months after completion of the pilot project.

2. Sewage works that are exempt from section 53 of the OWRA by O. Reg. 525/98 continue to be exempt and are not required to follow the notification process under this Limited Operational Flexibility.

3. Normal or emergency operational modifications, such as repairs, reconstructions, or other improvements that are part of maintenance activities, including cleaning, renovations to existing approved sewage works equipment, provided that the modification is made with Equivalent Equipment, are considered pre-approved.

4. The modifications noted in section (3) above are <u>not</u> required to follow the notification protocols under Limited Operational Flexibility, provided that the number of pieces and description of the equipment as described in the Approval does not change.

Ontario
Ministry of
the Environment

Notice of Modification to Sewage Works

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

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

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

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

ECA Owner	Municipality

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

(Attach a detailed description of the sewage works)

Description shall include:

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

Part 3 – Declaration by Professional Engineer

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

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

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

Name (Print)	PEO License Number

Signature	Date (mm/dd/yy)

Name of Employer

Part 4 – Declaration by Owner

I hereby declare that:

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

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

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

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

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

1. Condition 1 is imposed to ensure that the Works are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the Approval and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review. The condition also advises the Owners their responsibility to notify any person they authorized to carry out work pursuant to this Approval the existence of this Approval.

2. Condition 2 is included to ensure that the Ministry records are kept accurate and current with respect to the approved works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

3. Condition 3 is included to indicate that By-pass / Plant Overflows of untreated or partially treated sewage to the receiving watercourse is prohibited, save in certain limited circumstances where the failure to By-pass / Plant Overflow could result in greater injury to the public interest than the Bypass itself where a By-pass / Plant Overflow will not violate the approved effluent requirements, or where the By-pass / Plant Overflow can be limited or otherwise mitigated by handling it in accordance with an approved contingency plan. 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 By-pass / Plant Overflow events.

4. Condition 4 is imposed to establish non-enforceable effluent quality objectives which the Owner is obligated to use best efforts to strive towards on an ongoing basis. These objectives are to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occur and before the compliance limits of Condition 5 are exceeded.

5. Condition 5 is imposed to ensure that the effluent discharged from the Works to the environment meets the Ministry's effluent quality requirements thus minimizing environmental impact on the receiver and to protect water quality, fish and other aquatic life in the receiving water body.

6. Condition 6 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 and made available to the Ministry. 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.

7. Condition 7 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 effluent limits specified in the Approval and that the Works does not cause any impairment to the receiving watercourse.

8. Condition 8 is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, and to provide a compliance record for all the terms and conditions outlined in this Approval, so that the Ministry can work with the Owner in resolving any problems in a timely manner.

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

Upon issuance of the environmental compliance approval, I hereby revoke Approval No(s). 3560-8A8LEY issued on November 17, 2010.

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:

1. 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;
2. 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:

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

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

This Notice must be served upon:

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

AND

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

*** Further information on the Environmental Review Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349, Fax: (416) 314-4506 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 7th day of July, 2015

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

AA/
c: DWMD Supervisor, MOECC Peterborough Office
Viktoria Light, Drinking Water Inspector

CERTIFICATE No. 2-032 4-751676

continu

Ontario

MINISTRY OF THE ENVIRONMENT

SEWAGE WORKS APPROVAL

Whereas

of - 5 -

has applied in accordance with Section 42 of The Ontario Water Resources Act for approval of: -

extension to the existing sanitary sewage works facilities (continued) -

STREET	FROM	TO
Baldwin Street	Queen St.	Bay St.
FORCEMAINS		
Harbour St. and Ministry property	approx. 400' S.W. of Prince Edward St. (Proposed Harbour St. Sewage Pumping Station)	Easement #3

including building sewers from the main sewer to the street line together with the construction of the following sewage pumping station:

HARBOUR STREET SEWAGE PUMPING STATION: to be located on the south side of Harbour St. approx. 400' S.W of Prince Edward Street and to be equipped with three (3) 800 US GPM raw sewage pumps, a standby diesel generator and an emergency overflow to Butter Creek together with all necessary appurtenances and controls, together with the construction of an aerated lagoon having a surface area of approx. 1.70 acres to be located adjacent to the existing 13.6 acre waste stabilization pond and to be equipped with two (2) 15 HP mechanical aerators with effluent discharge via a chemical mixing chamber to the existing waste stabilization pond, all in accordance with the final plans and specifications prepared by Totten Sims Hubicki Associates Limited, Consulting Engineers, at a total estimated cost, including land charges, engineering and contingencies, of FOUR MILLION THREE HUNDRED AND FIFTY TWO THOUSAND THREE HUNDRED AND TWENTY FIVE DOLLARS ($4,352,325.00),

Now Therefore this is to certify that after due enquiry the said proposed works have been approved under Section 42 of The Ontario Water Resources Act.

DATED AT TORONTO this 31st day of July 19 75.

Ontario

Ministry of the Environment
Ministère de l'Environnement

CERTIFICATE OF APPROVAL

AIR

NUMBER 0078-7BEMZX
Issue Date: February 5, 2008

The Corporation of the Municipality of Brighton
35 Alice Street
Brighton, Ontario
K0K 1H0

Site Location: Harbour Street Pumping Station
Municipality of Brighton, County of Northumberland, Ontario

You have applied in accordance with Section 9 of the Environmental Protection Act for approval of:

- one (1) standby diesel gas generator set, having a rating of 117.5 kilowatts, to provide power for the Harbour Street Pumping Station during emergency situations;

all in accordance with the Application for Approval (Air & Noise) dated May 7, 2007 and signed by Jim Phillips, P.Eng., Director of Public Works, the Corporation of the Municipality of Brighton, and all supporting information associated with the application including additional information provided by Conestoga-Rovers & Associates.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

(1) "Act" means the *Environmental Protection Act;*

(2) "Certificate" means this Certificate of Approval issued in accordance with Section 9 of the Act;

(3) "Equipment" means the diesel generator set described in the Owner's application, this Certificate and in the supporting documentation submitted with the application, to the extent approved by this Certificate;

(4) "Manual" means a document or a set of documents that provide written instructions to staff of the Owner;

(5) "Ministry" means the Ontario Ministry of the Environment;

(6) "Owner" means The Corporation of the Municipality of Brighton, and includes its successors and assignees;

(7) “Publication NPC-205" means Ministry Publication NPC-205, Sound Level Limits for Stationary Sources in Class 1 & 2 Areas (Urban), October, 1995; and

(8) “Publication NPC-232" means Ministry Publication NPC-232, Sound Level Limits for Stationary Sources in Class 3 Areas (Rural), October, 1995.

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

TERMS AND CONDITIONS

GENERAL

1. Except as otherwise provided by these Conditions, the Owner shall design, build, install, operate and maintain the Equipment in accordance with the description given in this Certificate, application for approval of the Equipment and the submitted supporting documents and plans and specifications as listed in this Certificate.

2. Where there is a conflict between a provision of any submitted document referred to in this Certificate and the Conditions of this Certificate, the Conditions in this Certificate shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.

PERFORMANCE

3. The Owner shall ensure that the noise emissions from the Equipment comply with the limits set out in Publication NPC-205 or NPC-232, as applicable.

OPERATION AND MAINTENANCE

4. The Owner shall restrict the periodic testing of the Equipment to the daytime hours from 7:00 am to 7:00 pm.

5. The Owner shall ensure that the Equipment is properly operated and maintained at all times. The Owner shall:

    (1) prepare, not later than three (3) months after the date of this Certificate or the date of commissioning of the Equipment, and update, as necessary, a Manual outlining the operating procedures and a maintenance program for the Equipment, including:

        (a) routine operating and maintenance procedures in accordance with good engineering practices and as recommended by the Equipment suppliers;

        (b) emergency procedures;

(c) procedures for any record keeping activities relating to operation and maintenance of the Equipment;

(d) all appropriate measures to minimize noise and odorous emissions from all potential sources;

(2) implement the recommendations of the Manual; and

(3) retain, for a minimum of two (2) years from the date of their creation, all records on the maintenance, repair and inspection of the Equipment, and make these records available for review by staff of the Ministry upon request.

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

1. Condition Nos. 1 and 2 are imposed to ensure that the Equipment is built and operated in the manner in which it was described for review and upon which approval was granted. These conditions are also included to emphasize the precedence of Conditions in the Certificate and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review.

2. Condition No. 3 is included to provide the minimum performance requirement considered necessary to prevent an adverse effect resulting from the operation of the Equipment.

3. Condition No. 4 is included to ensure that the proposed operation, excluding emergency situations, is not extended beyond specific daytime hours to prevent an adverse effect resulting from the operation of the Equipment.

4. Condition No. 5 is included to emphasize that the Equipment must be maintained and operated according to a procedure that will result in compliance with the Act, the regulations and this Certificate. In addition the Owner is required to keep records and provide information to staff of the Ministry so that compliance with the Act, the regulations and this Certificate can be verified.

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

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

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;

7. The name of the Director;
8. The municipality within which the works are located;

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

This Notice must be served upon:

The Secretary*****
Environmental Review Tribunal
2300 Yonge St., Suite 1700
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Section 9, *Environmental Protection Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

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

The above noted works are approved under Section 9 of the Environmental Protection Act.

DATED AT TORONTO this 5th day of February, 2008

Zafar Bhatti

Zafar Bhatti, P.Eng.
Director
Section 9, *Environmental Protection Act*

AV/

c: District Manager, MOE Peterborough District Office
Diane Freeman, P. Eng., Conestoga-Rovers & Associates

Ontario

Ministry of the Environment **Ministère de l'Environnement**

CERTIFICATE OF APPROVAL
MUNICIPAL AND PRIVATE SEWAGE WORKS
NUMBER 2635-5KFL34

The Corporation of the Municipality of Brighton
P.O. Box 189
Brighton, Ontario
K0K 1H0

Site Location: Harbour Street, Presqu'ile Parkway, Bayshore Road and Easement
Municipality of Brighton, County of Northumberland

You have applied in accordance with Section 53 of the Ontario Water Resources Act for approval of:

Sanitary forcemain located on Harbour Street, Presqu'ile Parkway, Bayshore Road, Lilac Road and easement,

and a 3.45 mm square precast concrete sewage pumping station located approx. 100 m west of Bayshore Road, equipped with two (2) submersible pumps, each pump rated at 14.1 L/s at 21.5 m TDH, together with an ultra-sonic liquid level measurement probe, dual air vent pipes, float level assembly, a portable lifting davit and an adjoining 1200 mm diameter by-pass chamber,

all in accordance with the Application for Approval, final plans and specification prepared by The Greer Galloway Group Inc., Consulting Engineers.

For the purpose of this Certificate of Approval and the terms and conditions specified below, the following definitions apply:

1. "Owner" means The Corporation of the Municipality of Brighton.

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

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

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

(2) Except as otherwise provided by these Conditions, the *Owner* shall design, build, install, operate and maintain the *Works* in accordance with the description given in this *Certificate*, the application for approval of the works and the submitted supporting documents and plans and specifications as listed in this *Certificate*.

(3) Where there is a conflict between a provision of any submitted document referred to in this *Certificate* and the Conditions of this *Certificate*, the Conditions in this *Certificate* shall take precedence, and where there is a conflict between the listed submitted documents, the document bearing the most recent date shall prevail.

(4) Where there is a conflict between the listed submitted documents, and the application, the application shall take precedence unless it is clear that the purpose of the document was to amend the application.

(5) The requirements of this *Certificate* are severable. If any requirement of this *Certificate*, or the application of any requirement of this *Certificate* to any circumstance, is held invalid or unenforceable, the application of such requirement to other circumstances and the remainder of this certificate shall not be affected thereby.

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

1. Condition 1 is imposed to ensure that the *Works* are built and operated in the manner in which they were described for review and upon which approval was granted. This condition is also included to emphasize the precedence of Conditions in the *Certificate* and the practice that the Approval is based on the most current document, if several conflicting documents are submitted for review. The condition also advises the Owners their responsibility to notify any person they authorized to carry out work pursuant to this *Certificate* the existence of this *Certificate*.

In accordance with Section 100 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, as amended, you may by written notice served upon me and the Environmental Review Tribunal within 15 days after receipt of this Notice, require a hearing by the Tribunal. Section 101 of the Ontario Water Resources Act, R.S.O. 1990, Chapter 0.40, provides that the Notice requiring the hearing shall state:

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

The Notice should also include:

3. The name of the appellant;
4. The address of the appellant;
5. The Certificate of Approval number;
6. The date of the Certificate of Approval;

7. The name of the Director;
8. The municipality within which the works are located;

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

This Notice must be served upon:

The Secretary*****
Environmental Review Tribunal
2300 Yonge St., 12th Floor
P.O. Box 2382
Toronto, Ontario
M4P 1E4

AND

The Director
Section 53, *Ontario Water Resources Act*
Ministry of the Environment
2 St. Clair Avenue West, Floor 12A
Toronto, Ontario
M4V 1L5

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

The above noted sewage works are approved under Section 53 of the Ontario Water Resources Act.

DATED AT TORONTO this 18th day of March, 2003

A. Ahmed

Aziz Ahmed, P.Eng.
Director
Section 53, *Ontario Water Resources Act*

HV/

c: District Manager, MOE Peterborough District Office
S. Blakey, P. Eng., The Greer Galloway Group

Appendix C

Technical Memorandum: Growth Evaluation Document

MUNICIPALITY OF BRIGHTON

BRIGHTON WASTEWATER TREATMENT SYSTEM

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

TECHNICAL MEMORANDUM

GROWTH EVALUATION DOCUMENT (DRAFT)

DECEMBER 6, 2016

Submitted by:

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

203-863 Princess Street

Kingston, ON Canada

K7L 5N4

JLR 27271

TABLE OF CONTENTS

FIGURES

TABLES

1.0 INTRODUCTION

1.1 Background

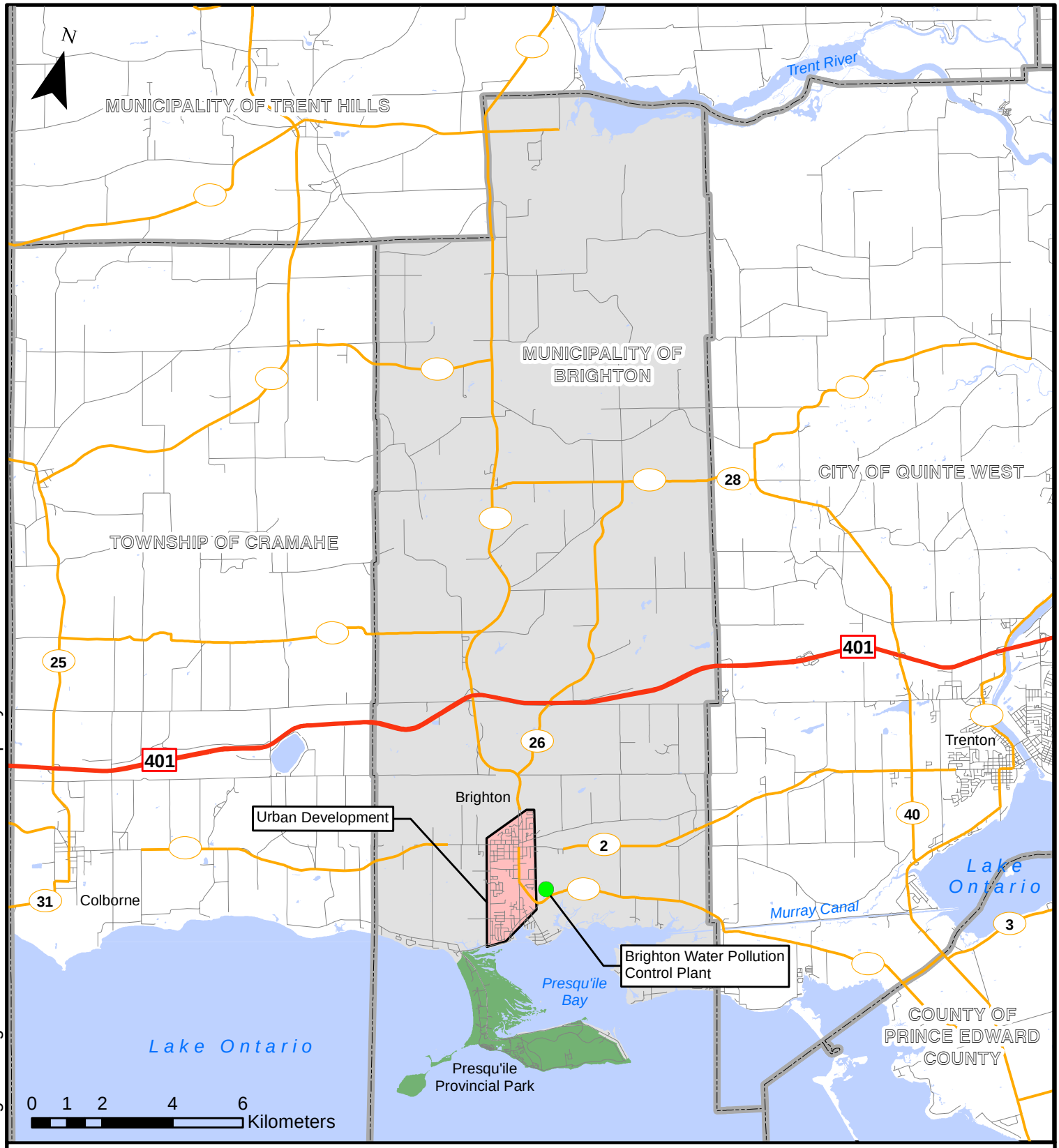
The Municipality of Brighton (the Municipality) initiated a Class Environmental Assessment of their wastewater treatment system in August 2016 to address various problems experienced with treatment at their treatment lagoon (e.g. elevated ammonia concentrations in the treated effluent), and also to ensure that increased influent flows from future growth can be effectively accommodated. In order to fully define the problems and identify a preferred solution to address these issues, J.L. Richards & Associates Limited (JLR) was retained by the Municipality to assist in the completion of the Class Environmental Assessment (Class EA).

The Municipality includes the former Town and Township of Brighton and is the most eastern municipality within the County of Northumberland. The Municipality is bounded by the City of Quinte West to the east and the Town of Cramahe to the west, with the shoreline of Lake Ontario to the south. Highway 401 provides the main east-west corridor through the Municipality, which tends to be a regional focus for hamlets in the surrounding areas. Refer to Figure 1-1 for an overview of the Municipality and study location.

The communal sewage system generally consists of the Brighton Wastewater Treatment Lagoon system (currently rated for 4,600 m^3/day), the Harbour Street Sewage Pumping Station (SPS) and forcemain, a small sub-area sewage pumping station and forcemain servicing Presqu'ile Provincial Park, and several kilometers of gravity collection sewer. Approximately half of the sewage generated in the collection system is directed to the Harbour Street SPS and pumped via a 8.2 km long, 300mm forcemain to the Lagoon and the other half flows by gravity to the Lagoon. Refer to Figure 1-2 for an overview of the Brighton communal sewage system.

The Harbour Street SPS receives sewage from a significant portion of the collection system. The SPS generally consists of a wet well/dry well configuration and is equipped with three dry pit centrifugal type raw sewage pumps (lead/lag/standby operation) complete with inlet and outlet piping, a standby diesel generator, a wet well emergency overflow to Butter Creek, and related instrumentation and controls for the station.

The wastewater treatment system consists of a 0.68 ha single cell aerated lagoon, a single cell 5.44 ha waste stabilization pond with baffle partition curtains, and a 2-cell constructed wetland with a total surface area of 6.2 ha. There is also a chemical storage/feed system used to facilitate continuous phosphorus removal. Chemical is introduced after the aerated lagoon and upstream of the waste stabilization pond. Treated effluent from the waste stabilization pond is discharged continuously to the constructed wetland and from the constructed wetland it continuously discharges to a natural wetland and ultimately to Presqu'ile Bay, which is located off the northeast shore of Lake Ontario.



PROJECT:

BRIGHTON WASTEWATER TREATMENT SYSTEM CLASS EA

MUNICIPALITY OF BRIGHTON, ONTARIO

DRAWING:

LOCATION PLAN

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS
www.jlrichards.ca

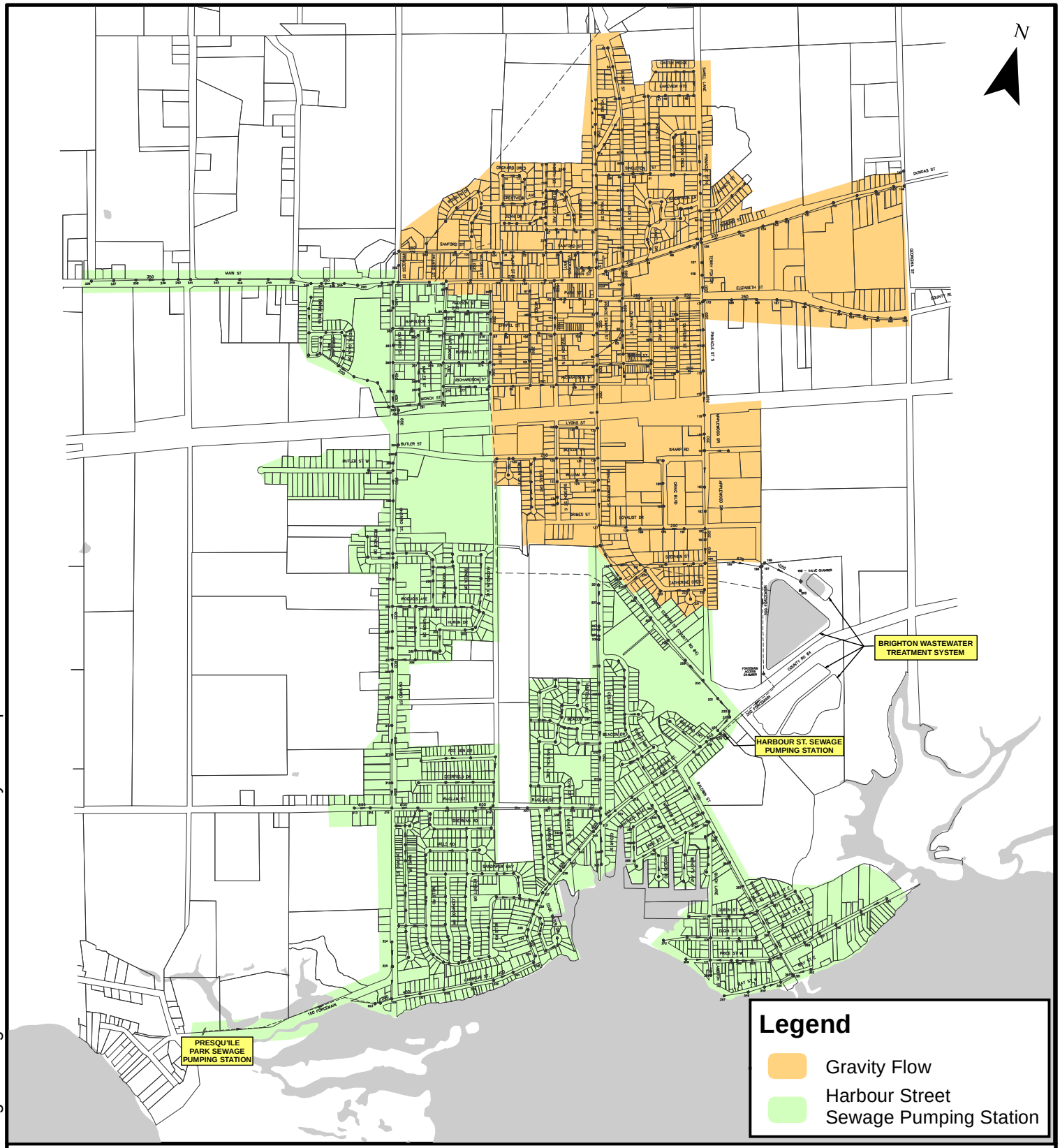
DESIGN:	JW
DRAWN:	KTK
CHECKED:	BH

JLR NO: 27271

DRAWING NO.: FIGURE 1-1

File Location: K:\27000\27271 - Brighton Lagoon\JLR DWG\Plan\27271 Municipality.mxd

Plot Date: December 6, 2016 2:49:03 PM



PROJECT:

BRIGHTON WASTEWATER TREATMENT SYSTEM CLASS EA

MUNICIPALITY OF BRIGHTON, ONTARIO

DRAWING:

SYSTEM MAP (PUMPING STATION(S), FORCEMAIN, LAGOON SITE)

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS
www.jlrichards.ca

DESIGN:	JW
DRAWN:	KTK
CHECKED:	BH

JLR NO: 27271

DRAWING NO.: FIGURE 1-2

File Location: K:\27000\27271 - Brighton Lagoon\JLR DWG\Plan\27271 SystemMap.mxd

Plot Date: December 6, 2016 2:52:09 PM

1.2 Class Environmental Assessment Process

The Ontario Environmental Assessment Act (the Act) sets out a planning and decision-making process so that potential environmental effects are considered before a project begins. The purpose of the Act is to provide for the protection and conservation of the natural environment (R.S.O. 1990, c.E.18, s.2).

The Municipal Class EA process is followed for common types of projects to streamline the review process while ensuring that the project meets the requirements of the Act. It involves detailed site-specific information gathering and studies, as well as consultation with the public and stakeholder agencies. In 1987 the first Class EA prepared by the Municipal Engineers Association (MEA) on behalf of Ontario Municipalities was approved under the Act. Updates and amendments were subsequently made in 1993, 2000, 2007, 2011, and 2015.

This Class EA has been initiated as a Schedule B project under the Class EA process. Projects categorized as Schedule B undertakings have the potential for significant environmental effects, and are required to follow Phase 1 and Phase 2 specified under the Municipal Class EA. This includes consultation with all parties that may potentially be affected by the project, and the preparation of a Class EA project file that documents the Class EA process for the project. At the end of Phase 2, the project Schedule is reviewed to determine if the project is complete under a Schedule B Schedule or if the project needs to proceed as a Schedule C undertaking, in which case Phases 3 and 4 of the Class EA process are completed.

The Class EA framework defines the process for each type of project. For Schedule B projects, the completion of the following Phases of the Class EA process are required:

Phase 1 – Identify the Problem and/or Opportunity

Phase 2 – Identify Alternative Solutions to the Problem and/or Opportunity

The Project File shall be made available for public and agency review at the completion of Phase 2 of the Class EA process for a mandatory 30-day period. If there are no requests to the Minister of the Environment and Climate Change (MOECC) for a 'Part II Order' within this 30-day review period, then the project may proceed to implementation (Phase 5).

1.3 Objectives of the Class EA

The objective of this Class EA is to identify the preferred strategies for wastewater treatment and for the main sewage pumping station and associated forcemain for the Brighton communal sewage system over a 20-year planning period.

The purpose of this Technical Memorandum is to summarize anticipated growth in the study area over a 20-year planning period in order to confirm projected future flows that will be conveyed to the lagoon. This information is important when considering potential solutions to the problems.

Several technical memoranda and reports are to be prepared to summarize various elements of the overall project. Technical Memoranda and reports will form part of the Class EA Project File, which is anticipated to be the key deliverable for this project.

Four Technical Memoranda are anticipated and will cover the following topics:

- Growth Evaluation Report
- Condition Assessment
- Receiving Water Assessment
- Process Technology Evaluation

The Class EA is proceeding in accordance with the Schedule B requirements of the Ontario Municipal Class EA, October 2000, as amended in 2015, but the Schedule will be reconfirmed at the end of Phase 2.

2.0 PLANNING POLICIES

2.1 Provincial Policy Statement

The 2006 Provincial Policy Statement (the Statement) provides general policy guidance on matters of provincial interest related to land use planning and development. The Statement provides policy direction for appropriate development while protecting resources of provincial interest, public health and safety as well as the quality of the natural environment. The Statement is issued under Section 2 of the Planning Act. The Planning Act requires that decisions of Council be consistent with the Statement.

2.2 The Municipality of Brighton Official Plan

In 2001, the Municipality of Brighton was established through the combination of the former Town of Brighton and the former Township of Brighton. Prior to this amalgamation, land use and development was dictated by each of the former municipality's Official Plans and Zoning By-Laws. The purpose of the new Official Plan, developed in 2014, is to guide land use and development within the rural and urban areas of the Municipality, so as to protect and enhance the established settlement areas, natural heritage, agricultural, mineral and aggregate resources, cultural and archaeological resources, and recreational value. The Official Plan sets areas of growth and population projections for the Municipality of Brighton.

3.0 POTENTIAL POPULATION GROWTH

3.1 Forecast of Population Distribution

As per *Section 2.3.1 Traditional Growth Projections,* of the Official Plan, in 2006 was 10,253 and the forecast population is shown in Table 3-1. This distribution of Municipality-wide growth is based on the recommendations of the 2009 Northumberland Growth Management Study (NGMS) conducted by Meridian. Factors contributing to the Municipality's growth are its proximity to urban centers along Lake Ontario, as well as growth occurring in the City of Quinte West associated with the multi-million dollar expansion of the Canadian Forces Base at Trenton (Official Plan, 2014). It is important to note that these projections include rural properties outside of the boundaries of the serviced urban area and, therefore will need to be adjusted to suit the scope of this Class EA which is limited to the communal sewage system that services only the urban area.

Table 3-1 Population Projections (Municipality of Brighton Official Plan, 2014)

Municipality	2006 (Actual)	2031 (Projected)	Growth 2006 - 2031
Brighton	10,253	11,890	1,637

Forecast of Industrial/Commercial/Institutional (ICI) Growth: The Official Plan notes that the Municipality of Brighton has become an area people go to retire and this will have an impact on the demands for recreation, health services, schools, long-term care, etc. (Official Plan, 2014). Based on discussions with the Municipality it has been assumed that ICI growth will be proportional to population growth.

4.0 ADDITIONAL CONSIDERATIONS

4.1 Presqu'ile Provincial Park

In the past, Presqu'ile Provincial Park was a large focus of the Municipality's development as it provided opportunities for both commercial and recreational fisheries. It continues to provide a recreational focus for this area since it is commonly known as the gateway to Presqu'ile Provincial Park which attracts over 200,000 visitors each year (OMNR, 2003).

5.0 POPULATION FOR INFLUENT FLOW PROJECTIONS

The population projections for developing future flow projections will be based on 2018 as the starting year since it is assumed that any upgraded infrastructure would not be in place until this year at the earliest. The population was estimated using a linear interpolation and extraction of

the data in the Municipality of Brighton Official Plan (2014). This was done using the currently serviced population of 6,462 from the 2015 Wastewater Annual Report as a starting point, and assuming that all growth in the Municipality occurs in the service area. The population projections shown in Table 5-1 will be used to develop 20-year influent flow projections.

Table 5-1 Growth Projections for 20-Year Design Period

Year	Total Serviced Population	Change from 2016
2016	6,462	n/a
2038	7,905	1,443

Appendix D

Technical Memorandum: Condition Assessment

MUNICIPALITY OF BRIGHTON

BRIGHTON WASTEWATER TREATMENT SYSTEM

MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

TECHNICAL MEMORANDUM

HARBOUR STREET SEWAGE PUMPING STATION AND WASTEWATER TREATMENT SYSTEM CONDITION ASSESSMENT

DECEMBER 6, 2016

Submitted by:

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS

203-863 Princess Street

Kingston, ON Canada

K7L 5N4

JLR 27271

TABLE OF CONTENTS

FIGURES

TABLES

APPENDICES

1.0 INTRODUCTION

1.1 Background

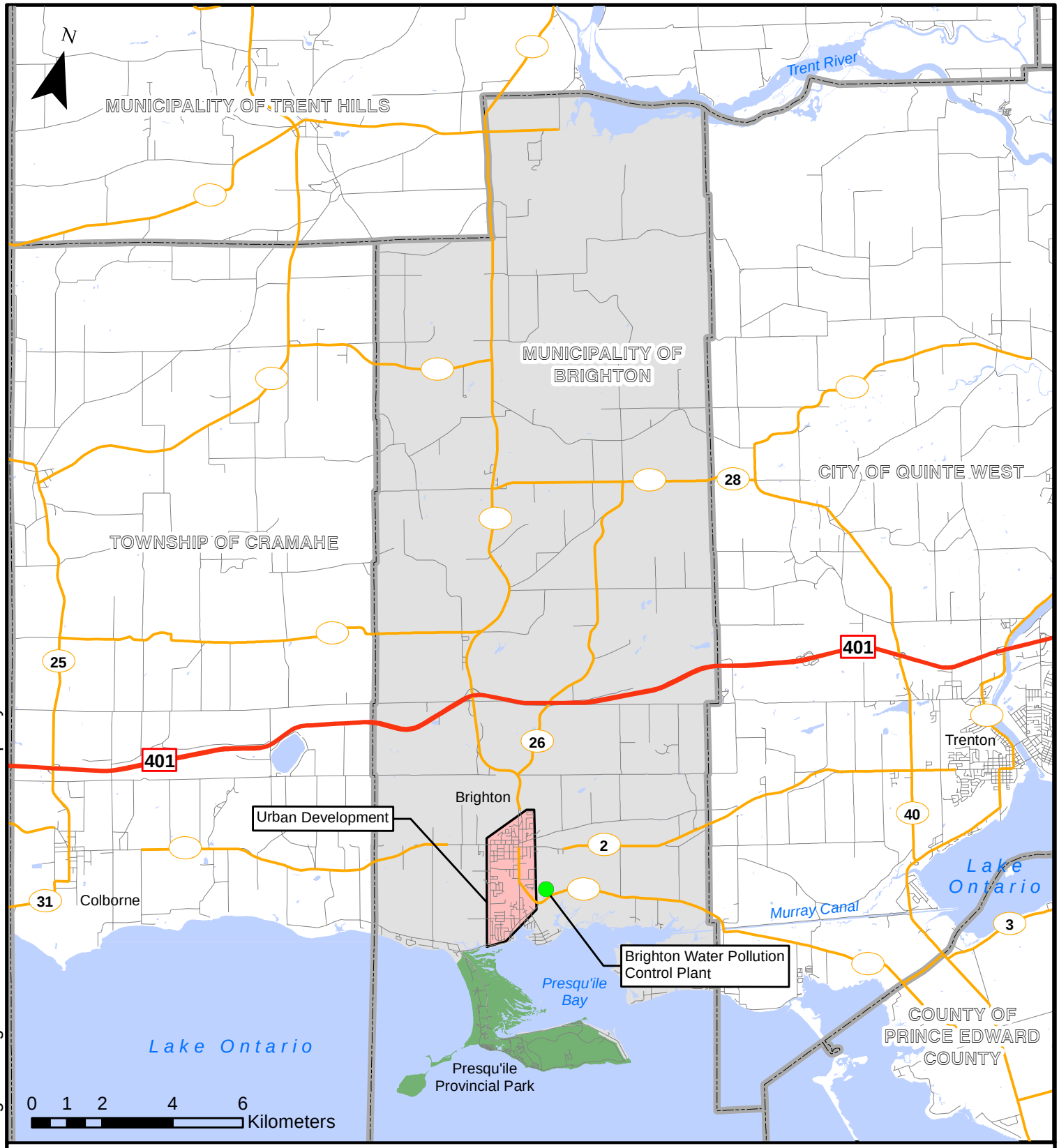
The Municipality of Brighton (the Municipality) initiated a Class Environmental Assessment of their wastewater treatment system in August 2016 to address various problems experienced with treatment at their treatment lagoon (e.g. elevated ammonia concentrations in the treated effluent), and also to ensure that increased influent flows from future growth can be effectively accommodated. In order to fully define the problems and identify a preferred solution to address these issues, J.L. Richards & Associates Limited (JLR) was retained by the Municipality to assist in the completion of the Class Environmental Assessment (Class EA).

The Municipality includes the former Town and Township of Brighton and is the most eastern municipality within the County of Northumberland. The Municipality is bounded by the City of Quinte West to the east and the Town of Cramahe to the west, with the shoreline of Lake Ontario to the south. Highway 401 provides the main east-west corridor through the Municipality, which tends to be a regional focus for hamlets in the surrounding areas. Refer to Figure 1-1 for an overview of the Municipality and study location.

The communal sewage system generally consists of the Brighton Wastewater Treatment Lagoon system (currently rated for 4,600 m3/day), the Harbour Street Sewage Pumping Station (SPS) and forcemain, a small sub-area sewage pumping station and forcemain servicing Presqu'ile Provincial Park, and several kilometers of gravity collection sewer. Approximately half of the sewage generated in the collection system is directed to the Harbour Street SPS and pumped via a 8.2 km long, 300mm forcemain to the Lagoon and the other half flows by gravity to the Lagoon. Refer to Figure 1-2 for an overview of the Brighton communal sewage system.

The Harbour Street SPS receives sewage from a significant portion of the collection system. The SPS generally consists of a wet well/dry well configuration and is equipped with three dry pit centrifugal type raw sewage pumps (lead/lag/standby operation) complete with inlet and outlet piping, a standby diesel generator, a wet well emergency overflow to Butter Creek, and related instrumentation and controls for the station.

The wastewater treatment system consists of a 0.68 ha single cell aerated lagoon, a single cell 5.44 ha waste stabilization pond with baffle partition curtains, and a 2-cell constructed wetland with a total surface area of 6.2 ha. There is also a chemical storage/feed system used to facilitate continuous phosphorus removal. Chemical is introduced after the aerated lagoon and upstream of the waste stabilization pond. Treated effluent from the waste stabilization pond is discharged continuously to the constructed wetland and from the constructed wetland it continuously discharges to a natural wetland and ultimately to Presqu'ile Bay, which is located off the northeast shore of Lake Ontario.



PROJECT:

BRIGHTON WASTEWATER TREATMENT SYSTEM CLASS EA

MUNICIPALITY OF BRIGHTON, ONTARIO

DRAWING:

LOCATION PLAN

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS
www.jlrichards.ca

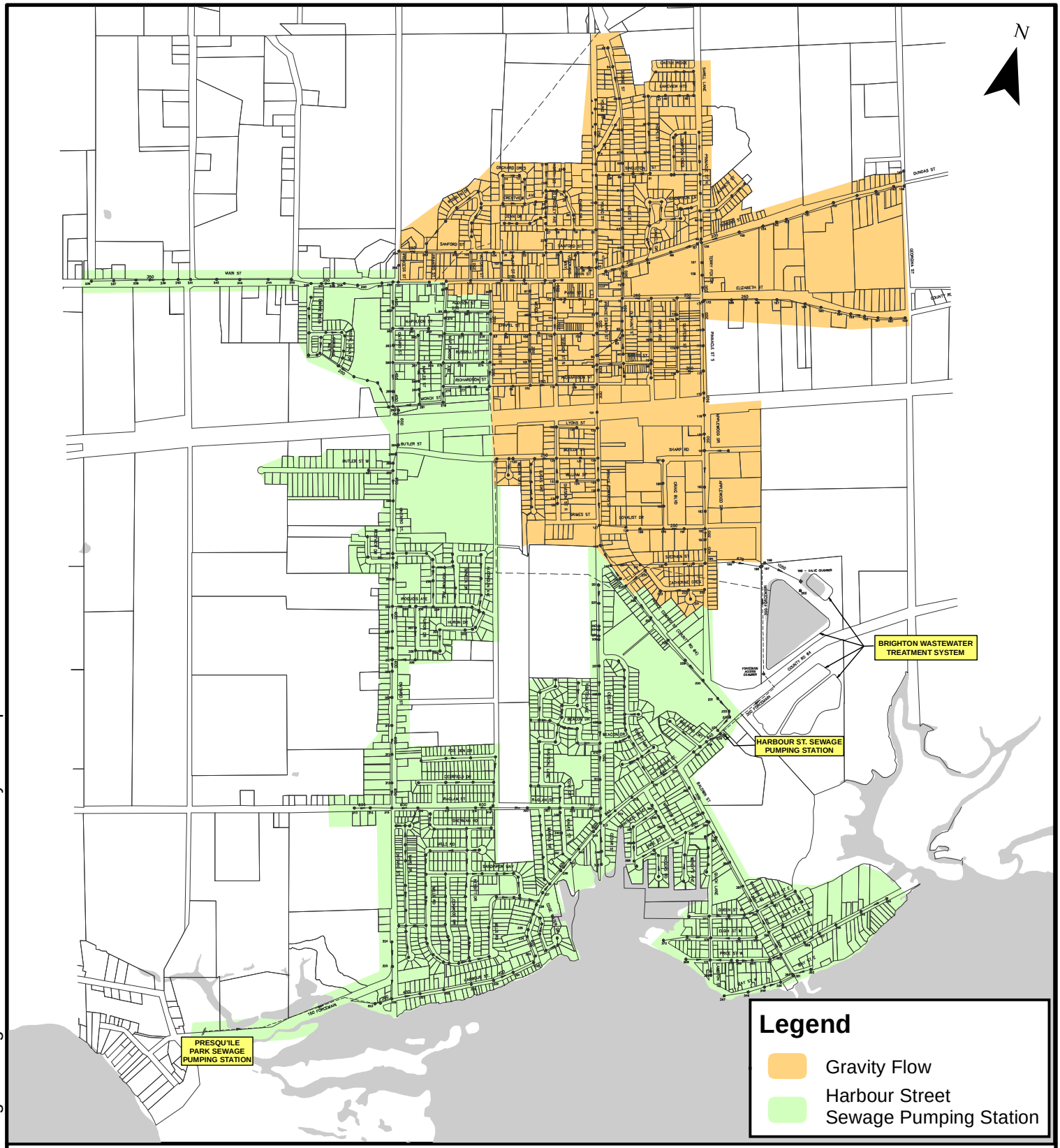
DESIGN:	JW
DRAWN:	KTK
CHECKED:	BH

JLR NO: 27271

DRAWING NO.: FIGURE 1-1

File Location: K:\27000\27271 - Brighton Lagoon\JLR DWG\Plan\27271 Municipality.mxd

Plot Date: December 6, 2016 2:49:03 PM



PROJECT:

BRIGHTON WASTEWATER TREATMENT SYSTEM CLASS EA

MUNICIPALITY OF BRIGHTON, ONTARIO

DRAWING:

SYSTEM MAP (PUMPING STATION(S), FORCEMAIN, LAGOON SITE)

J.L.Richards
ENGINEERS · ARCHITECTS · PLANNERS
www.jlrichards.ca

DESIGN:	JW
DRAWN:	KTK
CHECKED:	BH

JLR NO: 27271

DRAWING NO.: FIGURE 1-2

File Location: K:\27000\27271 - Brighton Lagoon\JLR DWG\Plan\27271 SystemMap.mxd

Plot Date: December 6, 2016 2:52:09 PM

1.2 Class Environmental Assessment Process

The Ontario Environmental Assessment Act (the Act) sets out a planning and decision-making process so that potential environmental effects are considered before a project begins. The purpose of the Act is to provide for the protection and conservation of the natural environment (R.S.O. 1990, c.E.18, s.2).

The Municipal Class EA process is followed for common types of projects to streamline the review process while ensuring that the project meets the requirements of the Act. It involves detailed site-specific information gathering and studies, as well as consultation with the public and stakeholder agencies. In 1987 the first Class EA prepared by the Municipal Engineers Association (MEA) on behalf of Ontario Municipalities was approved under the Act. Updates and amendments were subsequently made in 1993, 2000, 2007, 2011, and 2015.

This Class EA has been initiated as a Schedule B project under the Class EA process. Projects categorized as Schedule B undertakings have the potential for significant environmental effects, and are required to follow Phase 1 and Phase 2 specified under the Municipal Class EA. This includes consultation with all parties that may potentially be affected by the project, and the preparation of a Class EA project file that documents the Class EA process for the project. At the end of Phase 2, the project Schedule is reviewed to determine if the project is complete under a Schedule B Schedule or if the project needs to proceed as a Schedule C undertaking in which case Phases 3 and 4 of the Class EA process are completed.

The Class EA framework defines the process for each type of project. For Schedule B projects, the completion of the following Phases of the Class EA process are required:

Phase 1 – Identify the Problem and/or Opportunity

Phase 2 – Identify Alternative Solutions to the Problem and/or Opportunity

The Project File shall be made available for public and agency review at the completion of Phase 2 of the Class EA process for a mandatory 30-day period. If there are no requests to the Minister of the Environment and Climate Change (MOECC) for a 'Part II Order' within this 30-day review period, then the project may proceed to implementation (Phase 5).

1.3 Objectives of the Class EA

The objective of this Class EA is to identify the preferred strategies for wastewater treatment and for the main sewage pumping station and associated forcemain for the Brighton communal sewage system over a 20-year planning period.

The purpose of this Technical Memorandum is to summarize the existing condition of the Harbour Street Sewage Pumping Station and the building infrastructure associated with the wastewater treatment system and to identify potential rehabilitation and maintenance measures and associated costs. It is intended that the information presented in this Memorandum be

utilized in the assessment of potential sewage system upgrades which will be undertaken as part of Phase 2 of this Class EA.

Several technical memorandum and reports are to be prepared as part of this Class EA to summarize various elements of the overall project. Technical Memoranda will form part of the Class EA Project File, which is anticipated to be the key deliverable for this project.

Four Technical Memoranda are anticipated and will cover the following topics:

- Growth Evaluation Report
- Harbour Street SPS and Wastewater Treatment System Condition Assessment
- Receiving Water Assessment (TM3)
- Process Technology Evaluation (TM4)

The Class EA is proceeding in accordance with the Schedule B requirements of the Ontario Municipal Class EA, October 2000, as amended in 2015.

2.0 GENERAL METHODOLOGY, LIMITATIONS, AND ASSUMPTIONS

2.1 Memorandum Objectives

The objectives of this Memorandum are to:

- Summarize the condition assessment methodology;
- Report on significant findings from the facilities condition assessment;
- Identify possible methods of rehabilitations, upgrades, replacement, and/or maintenance; and
- Provide background information which can be drawn upon during Phase 2 of the Class EA when evaluating various alternatives and their associated costs for addressing identified problems with the communal sewage system.

It is important to note that this Memorandum is only intended as a general summary based on site observations and that a full building and electrical code review has not been included.

2.2 Review of Background Information

Available background documents were reviewed, including available drawings and other documentation. Drawings that were part of the review included:

- General As-Constructed Drawings for the Wastewater Treatment System
- General As-Constructed Drawings for the Sanitary Sewer System

2.3 Preparation of Inspection Materials

Before conducting the site visits, the JLR Team developed an inspection and assessment data collection system which included working forms for each team member to complete while on-site. Inspection methodology and assessment criteria were also established and a brief team meeting was held before the site visit to ensure each team member thoroughly understood data collection requirements.

2.4 Site Inspection

A detailed visual on-site multi-discipline inspection was undertaken on September 28, 2016 at the Harbour Street SPS and the wastewater treatment system. Access to the sites and guidance was provided by Mr. Keith Lee – Senior Operator. The inspections completed and data obtained were limited to visual observations and discussion with staff. No special lift devices or ladders were mobilized during the assignment and no destructive or exploratory testing or inspection was carried out. Confined spaces (i.e. reservoir, tanks, etc.) were not included in the scope of the review with the exception of visual observations outside of the confined space area.

2.5 Review of Collected Data

Following the site inspections, a review and analysis of the gathered data was undertaken. Each engineering discipline summarized the condition of each major building/equipment component and identified potential options and opinions of probable costs to renew and/or replace certain items.

2.6 Limitations

The information provided in this Memorandum is based primarily on visual inspections with no non-destructive testing.

The conclusions and recommendations in this Memorandum are based on information determined and collected at the time that the inspections were carried out. Additional deficiencies that were not detected or anticipated at the time of the investigation may be encountered during future modifications and/or upgrades. Should conditions change in any aspect at any of the facilities assessed, the conclusions and recommendations in this Memorandum may require modifications.

The information contained in this Memorandum reflects the project team's judgment and interpretation in light of the information available at the time of preparation. Any use that a third party makes of this document, or any reliance on decisions that a third party may make based on this document, is the sole responsibility of the third party.

2.7 Assumptions

Due to the nature of the site and the systems and engineering disciplines involved, assumptions were made when undertaking the condition assessment. Some of the assumptions made include:

- Background information provided is assumed to accurately depict the physical attributes of the site;
- The assessments were based strictly on visual assessments. No type of destructive or other specialty testing techniques were used;
- In cases where the age of older equipment or assets were unknown, it was assumed to be original to the facility construction;
- The assessment of the remaining life of a system is not exact. It is based on limited information and influenced by factors that may occur at some future date. Certain replacements may be advanced or deferred by the Municipality subject to other considerations (i.e. financial, coordination with related work, incorporation into facility-wide upgrades, etc.);
- The opinions of replacement costs for the various items are order-of-magnitude only and are based on the experience and current (2016) unit prices in the construction industry; and
- All costs, including those for future years, are expressed in 2016 dollars. If these costs are to be used for long-range cash-flow projections, the implications for potential future trends of inflation and interest must be applied accordingly.

For this type of infrastructure, it is typically recommended that a condition assessment be undertaken approximately every five (5) years in order to ensure that information presented is updated accordingly and to account for continually changing conditions.

3.0 EVALUATION METHODOLOGY

3.1 Quality Assurance/Quality Control Approach

The project team developed an overall evaluation approach to establish consistency in reporting and to provide the Municipality with a tool that could be used for inventory management and prioritization of identified needs in the future. The template used for this project divides each of the Harbour Street components into asset classifications as generally illustrated in Table 3-1. This table demonstrates the hierarchical structure and does not include all components of the system. The full and completed table, found in Appendix A, provides a description, location, manufacturer, year of installation, estimated remaining life, replacement cost, and condition for each attribute of each asset throughout the identified facility.

By utilizing this organizational hierarchy the Municipality can easily view asset classification within each facility, to a specific asset and attribute within the facility. Additionally, it addresses

the condition, any identified need, the cost of implementation of the identified needs, and the proposed year of implementation for each attribute of each asset throughout each facility. The data collected is intended to provide a summary of inventory and valuation at each facility as well as act to aid the Town's ongoing asset management procedures with respect to their water facilities.

Table 3-1: Example Categories in Hierarchical Structure

Level 1: Facility	Level 2: Class
• Brighton Sewage Treatment System • Brighton Sewage Pumping Station • Pumping Station Forcemain	• Architectural and Structural • Building Electrical • Building Mechanical • Process Piping and Equipment • Instrumentation and Controls
Level 3: Asset	**Level 4: Attribute**
• Suction Header • Pump 1 • Control Panel • Etc.	• Stainless Steel Suction Header Piping • Butterfly Valve • Air Valve • Etc.

3.2 Condition Rating System

Clear asset evaluation criteria are essential for developing assessment data, as several inspection staff work to collect a single comprehensive and consistent set of information for each asset. The on-site assessment of the facilities includes a confirmation of asset inventory and an assignment of a "condition rating" based on the visually observed physical condition. The physical condition rate scale is shown with definition in Table 3-2: Condition Rating Criteria, below.

Table 3-2: Condition Rating Criteria

Grade	Condition	Description
1	Unacceptable	• Failed or failure imminent. Immediate need to replace most or all of asset. Health and safety hazards exist or asset cannot be serviced or operated without risk to personnel/public/environment. • Major work or replacement required urgently.
2	Poor	• Poor physical condition – heavy wear and tear, failure is likely in short term. Likely need to replace most or all of asset within 2 years. No immediate risk to health or safety, but work required within 2 years to ensure asset remains safe. • Substantial work required in short term, asset barely serviceable.
3	Fair	• Acceptable physical condition – moderate wear and tear, moderate risk of physical failure. Failure unlikely within next 2 years but further deterioration likely and major rehabilitation/replacement required within next 5 years. Minor components or isolated sections of the asset need replacement or repair now, but asset still functions safely at adequate level of service.

		• Minor work may be required, but asset is still serviceable
4	Good	• Acceptable physical condition – minor wear and tear, minimum risk of physical failure. No substantial deterioration over the next 5-10 years. • No immediate repair work required, or only minor work required

3.3 Estimated Remaining Life

The remaining life of an asset is the period from the observed point in time to the time that the asset requires renewal. Understanding asset failure modes and remaining life will result in better decision-making as it allows effort to be focused on understanding the timing and consequences of failure.

The Estimated Remaining Life (ERL) is strongly correlated with the asset condition rating. Table 3-3 below outlines the expected or theoretical design life of each asset class. The life expectancies shown are "typical" expectancy for wastewater treatment facilities. This table is used only as a guideline in estimating the ERL since the function of an asset in the overall process, the initial system quality, and maintenance attention given to an asset over its life cycle plays an important role in establishing the ERL. In some instances, the actual life cycle of an asset will greatly exceed its predicted life cycle at the time of initial construction/installation. In other instances, the ERL of an asset may be less than was initially predicted due to changes in operational parameters, lack of regular preventative maintenance, or faulty components. The final ERL is based primarily on a review of the asset condition from visual observations, discussions with operations staff regarding the maintenance program, and a review of background information with consideration to current condition, performance, and expected future use.

Table 3-3: Expected Useful Life Estimations for Each Asset Class

Asset Class	Expected Life (years)	General Description
Architectural and Structural	60	Large scale structural components, concrete works.
Building Electrical	15-25	Conduit, cabling, cable trays, step down transformers, junction boxes, receptacles, lighting, electrical appurtenances, etc.
Building Mechanical	20-35	Building systems for heating, ventilating, and air conditioning including hot water systems and boilers, plumbing systems, and fixtures.
Process Piping and Equipment	20	Pumps, mixers, blowers, compressors, piping.
Process Electrical	20-25	Electrical equipment including motor control centers, distribution panels, building transformers.
Instrumentation and Controls	8	Level sensors, alarms, transmitters, data loggers, SCADA.

4.0 FACILITY CONDITION ASSESSMENTS

4.1 Harbour Street Sewage Pumping Station and Forcemain

The Harbour Street SPS receives sewage from a significant portion of the collection system. The SPS generally consists of a wet well/dry well configuration and is equipped with three dry pit centrifugal type raw sewage pumps (lead/lag/standby operation) complete with inlet and outlet piping, a standby diesel generator, a wet well emergency overflow to Butter Creek, and related instrumentation and controls for the station. There is also a mechanical grinder at the inlet to the station which was installed several years ago to replace a manually cleaned screen. The station is housed within a building which contains a walk down basement to the pump room area. According to the original Sewage Works Approval, each of the station pumps is rated for 800 USGPM (or approximately 72 L/s).

Flow is conveyed to the wastewater treatment system through am approximately 8.2 km long 300 mm diameter pipe where it combines in a below grade concrete chamber with the other gravity drained portion of the Municipality's collection system. The forcemain was constructed in 1977 at the same time as the Harbour Street SPS. A condition assessment of the forcemain was not conducted as part of this assignment; however, no issues with the forcemain were reported by the operations staff.

4.1.1 Architectural and Structural

This section provides an overview of observations with respect to the Building and structural foundation systems associated with the Harbour Street SPS. The following should be noted (referenced photos are presented in Appendix B):

- The Sewage Pumping Station generally consists of a single-storey rectangular building located at grade (see photo ID01_AS01). The basement extends approximately 12 metres below grade. No evidence of building settlement or other poor foundation performance was observed. Overall, the structure appeared to be in good condition given its age and construction, and there was no evidence of structural distress.
- The basement walls are of reinforced concrete construction. Although the existing 'as-built' drawings indicate that the construction joints contain PVC waterstops, there is evidence of water damage and subsequent concrete repairs at each of these 'bands' around the structure (see photos ID01_AS02 & ID01_AS03). According to the operator, the Municipality has not noted problems with leakage and it is likely that these repairs were completed at the time of construction. No visually evident signs of structural distress or other deterioration were noted.
- The base slab has ferrous staining assumed to be the result of runoff from rusting equipment. Minor delamination was noted via a chain drag survey in the northwest and southwest corners (see photo ID01_AS04). Overall, the base slab appeared to be in good condition. An unguarded sump pit in the southwest corner of the pump room was observed, which is a potential safety hazard (see photo ID01_AS05).
- The Wet Well is of reinforced concrete construction. A review of this area was limited to opening the aluminum checker plate cover at the ground floor level. From this vantage point, no visually evident signs of structural distress or other deterioration were noted. Ferrous fasteners anchoring the aluminum access ladder to the north concrete wall were noted (see photo ID01_AS06). Ferrous components should ideally be replaced with aluminum or stainless steel.
- The ground floor structure consists of a cast-in-place reinforced concrete slab spanning between concrete beams and walls. No visually evident signs of structural distress or deterioration were noted. Precast concrete panels spanning over the equipment access opening should be removed for review.
- The building roof structure consists of a cast-in-place reinforced concrete slab spanning between walls. No evidence of structural distress was noted from the underside of the structure. The only observed deterioration was a small area (approximate 300 mm x 300 mm) of apparent water damage to the paint coating at the west side (see photo ID01_AS07). According to the operator, the roofing assembly was recently replaced and

thus the source of moisture has likely been resolved. This area should be monitored to ensure any deterioration does not progress.

- The building superstructure consists of loadbearing concrete block walls. The majority of these walls were concealed behind insulation which precluded review (see photo ID01_AS08). Areas where block walls were exposed displayed minor cracking in the mortar joints but appeared to be in good condition overall.
- The building is clad in a split faced block architectural façade. Face shell cracking and spalling on the north side of the building as well as organic growth around louvres indicates the presence of moisture (see photo ID01_AS09). The majority of the façade is in fair condition given the age of the building. Repairs should be undertaken to prevent further deterioration of the wall assembly.
- As previously noted, the roof assembly and flashing have been replaced within the past five years. The roof was not accessed during the inspection although it is assumed to be in good condition given the recent replacement and its age. The drip edges around the perimeter appear to be original as evidenced by the condition of the paint coating, however, appear to be functioning as intended (see photo ID01_AS10).
- The first concrete stair riser above the Pump Room base slab is cracked, delaminated, and spalled (see photo ID01_AS11). Delamination and pop-outs at the side of stair nosing bars show further evidence of deteriorating reinforcing steel. Loose concrete should be removed and concrete repairs completed.
- Exterior doors consist of hollow metal single and double doors. The doors are beginning to show their age, however, appear to be operating as intended at the date of inspection.
- Guardrails along the concrete stairs down to the pump room are insufficient height. National Building Code of Canada requires a height of 42” (see photo ID01_AS12).
- There is a concrete stair and landing c/w ornamental handrail at the south exterior of the facility (see photo ID01_AS13). The handrail has ferrous components which will corrode and subsequently cause damage to the concrete. The purpose of the stair is unknown.
- According to the operator, both monorail cranes were reviewed in 2016. The inspection records and reports should be made accessible on site for review.

4.1.2 Building Electrical

This section provides an overview of observations with respect to the Building electrical support systems associated with the Harbour Street SPS. The following should be noted (referenced photos are presented in Appendix B):

- The 120/240 V electrical infrastructure is original and should be upgraded as part of the next major upgrades. This infrastructure consists of lighting, receptacles, panel board, and a transformer (see photo ID01_E01). The upgrades to the lighting should consider accessibility to the fixtures - at least one of the fixtures is inaccessible without the use of a motorized lifting device (see photo ID01_E02). It is noted that emergency lighting was installed in 2015 as a result of a safety audit that was conducted on the facility. The emergency lighting appears to be in good working condition.
- The SPS standby generator was installed in 2011 and appears to be in good condition. The generator, however, is located in the main office/electrical room on the ground floor. Depending on the length of time that the operator spends inside the office, it is not ideal for a generator to be located inside an office area for various reasons, including maintenance and noise emissions. The relocation of the generator to a dedicated acoustically treated room should be considered as part of the next major upgrade project. Alternatively, an outdoor generator could be used in lieu of the indoor unit.
- The automatic transfer switch is original and should be replaced as part of the next major upgrades project due to age and advances in technology.
- Wiring inside the pumping station is generally via cast-in-place conduit with individual conductors. Based on age, the wiring should be replaced as part of the next major upgrades project. The use of exposed wiring such as surface run conduits and/or cables on cable trays should be considered to simplify maintenance and accessibility.
- All the electrical equipment, including the MCC, panel board, transformers, and various electrical panels are located inside the main ground floor office area. It is recommended that this equipment be relocated to a dedicated electrical room as part of the next major upgrades project for safety and maintainability reasons. It should also be noted that clearance around some of the electrical equipment does not meet current electrical code requirements (see photo ID01_E03). This should also be addressed.
- The electrical service to the pumping station consists of three (3) 2.4 kV/600-347 V 75 kVA transformers mounted on a pole. This system was installed in early 2015 to replace

the original system which had failed. The old transformers and associated pole is still in place on-site (see photo ID01_E04). The Municipality may want to have this equipment removed to clear the site.

4.1.3 Building Mechanical

This section provides an overview of observations with respect to the Building mechanical support systems associated with the Harbour Street SPS. The following should be noted (referenced photos are presented in Appendix B):

- The exhaust fans in the generator room on the ground level appear to be original and have surpassed their expected service life. They appear to be in poor to fair condition (see photo ID01_M01) and should be replaced.
- The water closet in the washroom does not function and should be replaced.
- The unit heater in the dry pit area is noted to not function effectively and should be replaced (see photo ID01_M02).

4.1.4 Process Mechanical

This section provides an overview of observations with respect to Process mechanical systems associated with the Harbour Street SPS. The following should be noted (referenced photos are presented in Appendix B):

- Air compressors and the generator have recently been replaced (within the past 5 years) and are in good condition.
- The raw sewage pumps are noted to be original, but appear to be in good condition. The pumps were noted to be recently rebuilt (see photo ID01_M03).
- Piping in the dry pit is original and shows signs of rusting at couplings and where it meets the wall. This piping is in relatively poor condition (see photo ID01_M04) and should be replaced in the near term.
- The backup generator (see photo ID01_M05) should be reviewed to ensure that it meets the most recent code requirements of:
    - Ontario Fire Code
    - CSA B139
- The exhaust vent for the generator is not insulated and poses a hazard to the operators. Insulation should be provided to protect the operators.
- The wet well is a confined space and the equipment within it was not reviewed.

4.1.5 Process Electrical

This section provides an overview of observations with respect to the Process electrical systems associated with the Harbour Street SPS. The following should be noted (referenced photos are presented in Appendix B):

- The pressure switches for the raw sewage pumps were installed in the late 1990's and should be replaced as part of the next major upgrade project due to age (see photo ID01_E05).
- The disconnect switches for the raw sewage pumps were installed in 2012 and appear to be in good condition.
- The Motor Control Centre (MCC) is original to the SPS and should be replaced as part of the next major upgrades (see photo ID01_E06).
- The electromagnetic flow meter was installed in the early 1990's and is not operational. The meter should be replaced due to age and condition (see photo ID01_E07). It was observed that the outside chamber where the sensor is located is filled with water. Measures should be put in place to prevent submergence of any new replacement sensors.
- The raw sewage grinder control panel was installed in 2011 and appears to be in good condition. Future replacement of this panel would be contingent on modifications to the grinder system and/or the system manufacturer's recommendation.
- The wet well Ultrasonic level meter was installed in the early 1990's and should be replaced as part of the next major upgrades due to age and advances in technology (see photo ID01_E08).

4.2 Wastewater Treatment System

The Wastewater Treatment System includes lagoon cells, a wetland system, and a single-story building located between the Aerated Lagoon and the Stabilization Pond. This building generally contains an office space, a washroom facility, as well as chemical feed pumps for the phosphorus removal system. A single bulk storage chemical tank is located adjacent the building and supplies the chemical to the chemical feed pumps for phosphorus removal.

4.2.1 Architectural and Structural

This section provides an overview of observations with respect to the single storey building and other structures associated with the wastewater treatment system. The following should be noted (referenced photos are presented in Appendix C):

- The chemical building a single-storey rectangular configured building with a basement level (see photo ID02_AS01). Overall the structure appears to be in good condition given its age and construction.
- The chemical building basement consists of reinforced concrete perimeter walls and a concrete base slab. No evidence of building settlement or other poor foundation performance was observed. Minor areas of delamination were noted on the base slab detected via a chain drag survey, but overall the base slab appears to be in good condition. Staining on the walls and floor were noted and are indicative of a past ferric-chloride leak (see photo ID02_AS02). It is possible that buried plumbing components associated with the floor drains are in poor condition as a result of chemical exposure from this leak.
- A thin diagonal crack in the basement wall near the bottom of the stair (see photo ID02_AS03) was observed. The surrounding concrete was sounded using a hammer and no delamination was detected. It is unknown when this crack formed. The wall does not show any signs of distress.
- The ground floor structure consists of a cast-in-place reinforced concrete structural slab. No evidence of any excessive deflections or cracking indicating distress was observed. A localized area of moisture damage to the paint coating below the washroom was noted (see photo ID02_AS04). This should be further investigated.
- The roof structure consists of a cast-in-place reinforced concrete structural slab. There was no indication of excessive deflections or cracking indicating distress or moisture damage.
- The superstructure consists of load-bearing concrete masonry block walls. A significant portion of the interior wall surface was covered with insulation precluding visual observation. Accessible portions indicated minor cracking in mortar joints and appeared to be in good condition overall.
- According to the operator, the roof assembly and flashing have been replaced within the past five years. The roof was not accessed although it is assumed to be in good condition given its age. The drip edges around the perimeter appear to be original as evidenced by the condition of the paint coating (see photo ID02_AS05), however, appear to be functioning as intended. There was no evidence of moisture ingress from within the building.

- The exterior veneer consists of a split face masonry block façade. The veneer appears to be in fair condition given its age. Penetrations have been sealed with a variety of different products, some of which appear to be brittle and cracking (see photo ID02_AS06). A bathroom fan that was inappropriately flashed and sealed was observed. Although there were no areas of immediate concern, these openings are potential pathways for water and insects (see photo ID02_AS07).
- Exterior doors are a combination of hollow metal single and double doors. Paint is flaking and chipping from the doors, frames, and adjacent flashing (see photo ID02_AS08). These surfaces should be repainted.
- A bulk chemical storage tank (currently used to store ferric chloride) sits on a concrete pad at grade to the east of the building. This tank is anchored to the concrete with ferrous fasteners and clip angles that are rusting and damaging the concrete. The concrete slab is stained from exposure to ferric chloride ions (see photo ID02_AS09). It is noted that an area of concrete on the northeast side of the slab has spalled and broken off (see photo ID02_AS10).
- The area around the east side of the building should be regraded to ensure positive drainage. Ferrous staining on the adjacent brick up above the brick ledge which is evidence of a spill or leak was observed (see photo ID02_AS11). Consideration should be given to providing a secondary containment system around this tank.
- The outlet/mixing channel on the west side of the building consists of reinforced concrete with aluminum grating, baffles, and guardrails. Staining of concrete walls was observed, as well as aluminum components exposed to process liquids that generally increase in severity from the grating level down to the liquid level. Cast-in railing posts have recently been replaced with anchorage plates and repairs to the surrounding concrete completed (see photo ID02_AS12). A review of the chamber structure is recommended when it can be temporarily removed from service and cleaned.
- There are two identical walkways that provide access to the aeration equipment within the Aerated Lagoon. Each walkway consists of serrated aluminum grating spanning between structural aluminum beams that bear on reinforced concrete piers (see photo ID02_AS13). The aluminum structure is corroding (see photo ID02_AS14 and ID02_AS15) and cast-in plates have damaged the surrounding concrete (see photo ID02_AS16). There is organic growth on the concrete piers in immersed areas and

splash zones. A more detailed review of these walkways should be undertaken to determine the level of deterioration and a remediation strategy.

4.2.2 Building Electrical

This section provides an overview of observations with respect to the electrical systems for the single storey building and other facilities associated with the wastewater treatment system. The following should be noted (referenced photos are presented in Appendix C):

- The wastewater treatment system site is supplied with electrical power via a 3-phase 600/347 V system consisting of three transformers on a Utility pole. Power from the transformers to the building is via overhead wiring. Based on the nameplate information on the service disconnect, the service size is 100 A.
- The 120/240 V electrical infrastructure is original and should be upgraded as part of the next major upgrade project. This infrastructure consists of lighting, receptacles, panel board, and a transformer. It is noted that emergency lighting was installed in 2015 as a result of a safety audit that was conducted on the facility. The emergency lighting appears to be in good working condition. The 120/240 V transformer and associated panel board is integrated inside the MCC.
- The original wiring inside the chemical building is generally via cast-in-place conduit with individual conductors. Based on age, the original wiring should be replaced as part of the next major upgrade project (see photo ID02_E01). The use of exposed wiring such as surface run conduits and/or cables on cable trays should be considered to simplify maintenance and accessibility.

4.2.3 Building Mechanical

This section provides an overview of observations with respect to the single storey building and other facilities associated with the wastewater treatment system. The following should be noted (referenced photos are presented in Appendix C):

- A washroom exhaust fan is missing and needs to be replaced (see photo ID02_M01).
- The hot water heater in the basement is showing signs of corrosion at the base but the unit is in fair condition (see photo ID02_M02).
- The plumbing fixtures in the washroom appear to be in good condition.

- The sanitary sump pump in the basement is noted to have been replaced within the past 2 years and is in good condition. The pump may have a reduced service life should a ferric chloride leak occur.

4.2.4 Process Mechanical

This section provides an overview of observations with respect to the process mechanical systems associated with the single storey building at the wastewater treatment site. The following should be noted (referenced photos are presented in Appendix C):

- The ferric chloride tank located outside is in relatively good condition. The valves on the tank have been replaced within the past few years. It was noted by the operator that it is a double wall tank. The operator also noted that modifications to the area surrounding the tank are planned. If the tank needs to be moved during these modifications, there is a risk it may be damaged. A new tank should be purchased if the existing tank is required to be moved (see photo ID02_M03).
- The ferric chloride pumps in the control building basement appear to be in good condition.
- The fixed mechanical aerators in the lagoon are original, though it was noted by the operator that some repairs have been made in 2013. It was also noted by the operator that although the units appear to be functioning, they do not adequately aerate the lagoon. Other used mechanical aerators were purchased and installed on pontoons in the lagoon in 2015. The age of these units is not known. The new mechanical aerators are noted by the operator to function well, and are in relatively good condition (see photo ID02_M04).
- The chemical flash mixer is original, with some repairs conducted in 2009 and 2014. It appears to be in relatively good condition.

4.2.5 Process Electrical

This section provides an overview of observations with respect to the process electrical systems associated with the wastewater treatment system. The following should be noted (referenced photos are presented in Appendix C):

- The Motor Control Centre (MCC) is original to the chemical building and should be replaced as part of the next major upgrade project. It should be noted that the MCC was modified to accommodate the recently installed floating aerators. It appears that for each set of aerators, three motors are now being fed from one MCC cell that was originally

designated for one aerator. The extent of the modification is unknown. It should also be noted that fans were added to each MCC aerator cell to improve heat removal. New wall mounted starters and associated disconnects and controls as well as a splitter were provided for the new aerators (see photo ID02_E02). This equipment appears to be in good condition.

- The building service disconnect was installed in 2009 when the original pole with the service transformers fell and pulled the secondary wiring from the MCC. The service disconnect appears to be in good condition (see photo ID02_E03).
- The ferric chloride control panel was installed in 2009 and is showing signs of corrosion (see photo ID02_E04). Future upgrades should consider the relocation of this panel as it is currently located directly inside the containment area and exposed to the chemical fumes.
- An ultrasonic level meter is used to measure the level inside the ferric chloride tank which is located outdoors. It is understood that the reading is sometimes inaccurate due to temperature fluctuations; however, based on empirical data, the operator is able to use the readings to estimate the tank level. This meter was installed in the early 1990's and should be replaced as part of the next major upgrade project (see photo ID02_E05).
- Flow measurement from the aeration cell to the lagoon is via an ultrasonic level meter and a flume. This meter was installed in 2015 and appears to be in good condition.

5.0 COST SUMMARY OF RECOMMENDED CAPITAL UPGRADES

A summary of the estimated costs associated with the recommendations made within this Memorandum has been provided in Table 5-1, organized by each location. These recommendations are based on the criteria outlined in Table 3-2 and costs have only been provided for items that fall into a "1" or "2" rating, as outlined in the table.

A more detailed breakdown of recommended capital upgrades can be found in Appendix A.

Table 5-1: Total Estimated Costs of Recommendations

Harbour Street Sewage Pumping Station		
Class	**Cost**	
Architectural and Structural	$	61,500
Building Electrical	$	50,500
Building Mechanical	$	10,000
Process Mechanical	$	-
Process Electrical	$	123,000
Sub total	$	245,000
Engineering and Contingency (30%)	$	74,000
Total Harbour St. SPS	$	319,000
Wastewater Treatment System (Lagoon)		
Architectural and Structural	$	15,000
Building Electrical	$	12,000
Building Mechanical	$	4,000
Process Mechanical	$	-
Process Electrical	$	63,500
Sub total	$	94,500
Engineering and Contingency (30%)	$	29,000
Total Lagoon System	$	123,500
Grand Total	**$**	**442,500**

APPENDIX ‘A’

Asset Inventory Tables

Location ID	Asset Hierarchy					Identification			Sustainability Data (Asset Life)						Valuation
	Facility / Class / Asset / Attribute					Location	Manufacturer	Description	Year of Installation	Life Expectancy (years)	Current Age (years)	Effective Life Remaining (years)	Condition Rating	Comments/ Identified Need	Estimated Replacement Cost
	Facility	Class	Asset		Attribute										
ID01	**HARBOUR STREET PUMPING STATION**														**$245,000.00**
	1.1	Architectural & Structural													$61,500.00
		1.1.1	Substructure												$7,500.00
				1.1.1.1	Base Slab	Sewage Pumping Station (below grade)	N/A	Reinforced Concrete	1975	60	41	19	4	• Slab showed evidence of moisture exposure including staining from ferrous corrosion (according to Keith no concerns with slab performance) • Minor delamination of floor in NW and SW corners (aggregate visible in SW corner) • Unguarded sump pit in SW corner	$2,500.00
				1.1.1.2	Foundation Walls	Sewage Pumping Station (below grade)	N/A	Reinforced Concrete	1975	60	41	19	4	• Hammer sounding of accessible areas completed • Existing drawings indicate foundation walls poured in 4 'lifts' of varying thickness. Each joint to contain PVC water • JLR noted efflorescence, staining and concrete repairs at each of these horizontal joints. According to Keith, these repairs were completed prior to 2000 and they haven't experienced any leakage since. • The efflorescence should be removed any the coating inspected further	$5,000.00
		1.1.2	Superstructure												$2,500.00
				1.1.2.1	Ground Floor Structure	Sewage Pumping Station	N/A	Reinforced concrete structural slab spanning between foundation walls and intermediate reinforced concrete beams	1975	60	41	19	4	• No evidence of distress	$0.00
				1.1.2.2	Roof Structure	Sewage Pumping Station	N/A	Reinforced concrete structural slab	1975	60	41	19	4	• Visual review from ground floor level • Painted white • No evidence of excessive deflections or distress • one small area (12"x12") of moisture damage to roof paint (roof project in 2012 assumed to have stopped source)	$0.00
				1.1.2.3	Walls	Sewage Pumping Station (ground floor)	N/A	Concrete block, combination of load bearing and non-load bearing	1975	60	41	19	3	• Insulation had been installed over approx. 75% of the block walls, concealing them from site • insulation should be removed to permit review • washroom and diesel tank room appeared to be in good condition • East wall stepped cracking • Over man door, horizontal crack in mortar joint below top course of block • Crack in corner of abutting block walls	$2,500.00
		1.1.3	Building Envelope												$50,000.00
				1.1.3.1	Roof	Sewage Pumping Station	N/A	According to Keith, new MOD bit roof and flashing installed in 2012	2012	60	4	56	4	• JLR did not access roof for review, no evidence of moisture ingress into structure	$0.00
				1.1.3.2	Cladding	Sewage Pumping Station (exterior)	N/A	Split ribbed concrete block	1975	60	41	19	2	• North wall in poor condition around louvre, faces have been spalled off and cracking continuing • Organic growth around louvres indicate presence of moisture	$50,000.00
				1.1.3.3	Exterior Doors	Sewage Pumping Station (exterior)	N/A	Hollow metal single and double doors	1975	60	41	19	3	• Generally performing and operating as needed	$0.00
		1.1.4	Miscellaneous												$1,500.00
				1.1.4.1	Hoist	One interior, one exterior	-	Monorail beams with trolley and hoist	1975	60	41	19	N/A	• Annual crane inspection reports to be completed at crane location	$0.00

		1.1.4.2	Stairs	Sewage Pumping Station (pump room access)	N/A	Reinforced concrete with cast-in aluminum handrail	1975	60	41	19	3 and 1	• Minor cracking at stair nosing typically starting from cast-in handrail posts • At delaminated areas, underlying reinforcing bars were corroded. Extent of deteriorating reinforcing unknown • Bottom riser at pump room floor cracked, delaminating and spalled. Loose concrete to be chipped out and concrete repairs completed	$750.00
		1.1.4.3	Ladder to Wet Well	Sewage Pumping Station (wet well)	N/A	Aluminum ladder	1975	60	41	19	2	• JLR opened hatch at ground level to look into wet well. Noted ferrous fasteners in aluminum ladder. These should be replaced	$750.00
		1.1.4.4	Exterior Stair at South Exterior	Sewage Pumping Station (exterior)	N/A	Concrete stair and landing at grade with bolt-on handrail	1975	60	41	19	2	• Handrail has ferrous components which will deteriorate and damage concrete. • Purpose of asset is unknown	$0.00
1.2	Building Electrical													$50,500.00
	1.2.1 Building Electrical Assets													$50,500.00
		1.2.1.1	Standby Generator	Ground Floor	Perking	600 V, 100 kW	2011	30	5	25	4	• Indoor unit c/w indoor fuel tank	$0.00
		1.2.1.2	120 / 240 V Transformer	Ground Floor	Hammond	7.5 kVA, 600 V, 120 / 240 V	1975	20	41	-21	2	-	$5,000.00
		1.2.1.3	Various Lighting	Various	N/A	2-tube, 4 feet long fluorescent fixtures open style on the ground floor, vaporous type in dry pit	1975	20	41	-21	2	• One fixture in stair well to dry pit is inaccessible • Replacement cost is provided at cost per fixture	$500.00
		1.2.1.4	Emergency Lighting	Various	Lumacell	Double head emergency light c/w integral battery	2015	20	1	19	3	• Plug - in style	$0.00
		1.2.1.5	Service Transformer	Outside	N/A	3 x 75 kVA cans on a Hydro Pole	2015	40	1	39	4	• 24 kV primary, 600 / 34 V secondary • The transformer is utility owned so there is no replacement cost to the Municipality	$0.00
		1.2.1.6	Security System	Panel located on Ground Floor	N/A	-	2010	20	6	14	3	• Security system would be replaced by a security monitoring company; likely under the monitoring contract	$0.00
		1.2.1.7	ATS	Ground Floor	Beimber Engineering Limited	-	1975	30	41	-11	2	-	$45,000.00
1.3	Building Mechanical													$10,000.00
	1.3.1 Heating, Ventilation and Air Conditioning (HVAC) Systems													$8,000.00
		1.3.1.1	Unit Heater	Ground Level	N/A	-	1977	25	39	-14	3	• Fan motor replaced in 1999	$0.00
		1.3.1.2	Motorized Louvre	Ground Level	Be limo Actuator AF-RO	120 / 1 / 60, 133 in-lb, 6W	1977	25	39	-14	3	-	$0.00
		1.3.1.3	Exhaust Fan (EF-5)	Ground Level	N/A	Centrifugal exhaust fan suspended from ceiling	1977	25	39	-14	2	• Vibrates while operating	$3,500.00
		1.3.1.4	Exhaust Fan (EF-4)	Ground Level	N/A	Floor mounted centrifugal fan	1977	25	39	-14	2	• Unit has surpassed its expected service life • Runs quietly	$3,500.00
		1.3.1.5	Unit Heater	Dry Pit Basement	N/A	-	1977	25	39	-14	1	• Operator notes it does not work well	$1,000.00
	1.3.2 Bathroom Configuration													$2,000.00
		1.3.2.1	Propeller Exhaust Fan	Ground Level	N/A	120 / 1 / 60, 1/3 hip	1977	25	39	-14	1	• Fan blades show signs of cracking	$1,000.00
		1.3.2.2	Water Heater	Bathroom	N/A	Electric water heater, 1.5 kW	1977	25	39	-14	3	• Some surface rust	$0.00
		1.3.2.3	Water Closet	Bathroom	N/A	-	1977	25	39	-14	1	• Plunger does not work • Installed on wood shims	$1,000.00
		1.3.2.4	Sink	Bathroom	N/A	CIW Faucet and eyewash	1977	25	39	-14	3	-	$0.00
		1.3.2.5	Exhaust Fan	Bathroom	N/A	-	1977	25	39	-14	3	• Quiet operation	$0.00
	1.3.3 Miscellaneous													$0.00
		1.3.3.1	Sump Pit	Dry Pit Basement	N/A	Submersible pump & piping	2016	25	0	25	3	• Pump is not visible • Piping is in good condition	$0.00
		1.3.3.2	Water Service Entry	Ground Level	N/A	Valves, water metre, piping	1977	25	39	-14	3	• Signs of surface corrosion	$0.00
1.4	Process Mechanical													$0.00
	1.4.1 Generator Assembly													$0.00
		1.4.1.1	Generator	Ground Level	N/A	-	2011	25	5	20	3	• Insulation and guards needed	$0.00
		1.4.1.2	Fuel oil tank for generator	Closet, Ground Level	N/A	-	2014	25	2	23	3	• No visible signs of wear	$0.00
	1.4.2 Raw Sewage Pump #1 Assembly													$0.00
		1.4.2.1	Raw Sewage Pump #1	Dry Pit, Basement	Grundfos	-	1977	25	39	-14	3	• Surface rust on pipes • All valves replaced in 2007 • Surface rust on pump flanges	$0.00
		1.4.2.2	Pump Seal Primer	Ground Level	N/A	-	1977	25	39	-14	3	• No visible signs of wear	$0.00
	1.4.3 Raw Sewage Pump #2 Assembly													$0.00
		1.4.3.1	Raw Sewage Pump #2	Dry Pit, Basement	Grundfos	-	1977	25	39	-14	3	• Rusting as pipes leave pit • All valves replaced in 2007 • Surface rust on pump flanges	$0.00
		1.4.3.2	Pump Seal Primer	Ground Level	N/A	-	1977	25	39	-14	3	• No visible signs of wear	$0.00

	1.4.4	Raw Sewage Pump #3 Assembly												$0.00
		1.4.4.1	Raw Sewage Pump #3	Dry Pit, Basement	Grundfos	-	1977	25	39	-14	3	• Surface rust on pipes • All valves replaced in 2007 • Surface rust on pump flanges	$0.00
		1.4.4.2	Pump Seal Primer	Ground Level	N/A	-	1977	25	39	-14	3	• No visible signs of wear	$0.00
	1.4.5	Miscellaneous												$0.00
		1.4.5.1	Air Compressor #1	Ground Level	N/A	-	2012	25	4	21	3	• No visible signs of wear	$0.00
		1.4.5.2	Air Compressor #2	Ground Level	N/A	-	2012	25	4	21	3	• No visible signs of wear	$0.00
		1.4.5.3	Muffin Monster Pump	Ground Level	N/A	-	2011	25	5	20	3	• No visible signs of wear	$0.00
	1.5	Process Electrical												$123,000.00
	1.5.1	Process Electrical Assets												$123,000.00
		1.5.1.1	Pressure Switch #1	Dry Pit	Mercoid Control	-	1999	20	17	3	2	Outlived its useful life	$1,500.00
		1.5.1.2	Pressure Switch #2	Dry Pit	Mercoid Control	-	1999	20	17	3	2	Outlived its useful life	$1,500.00
		1.5.1.3	Pressure Switch #3	Dry Pit	Mercoid Control	-	1999	20	17	3	2	Outlived its useful life	$1,500.00
		1.5.1.4	Sewage Pump #1 Disconnect	Both Levels	Square D	-	2012	20	4	16	3	-	$0.00
		1.5.1.5	Sewage Pump #2 Disconnect	Both Levels	Square D	-	2012	20	4	16	3	-	$0.00
		1.5.1.6	Sewage Pump #3 Disconnect	Dry Pit	Square D	-	2012	20	4	16	3	-	$0.00
		1.5.1.7	MCC	Ground Floor	Square D	100 A, 600 V, 4 sections	1975	30	41	-11	2	• Integrated 20 circuit, 100 A, 120 / 240 V panel board	$75,000.00
		1.5.1.8	Electro-magnetic Flow meter	Ground Floor	ABB	Sensor, Transmitter and logger/display	1990	20	26	-6	1	• 12" sensor: sensor not working • Manhole filled with water-sensor submerged. Need to provide a solution to permanently dewater the manhole.	$40,000.00
		1.5.1.9	Grinder Control Panel	Ground Floor	Muffin Monster	-	2011	20	5	15	3	-	$0.00
		1.5.1.10	Level Meter	Ground Floor (transmitter)	Milltronics Multiranger Plus	Wet Well Level	1990	20	26	-6	2	• Sensor located in wet well	$3,500.00
ID02	**WATER POLLUTION CONTROL CENTER**													**$94,500.00**
	2.1	Architectural & Structural												$15,000.00
	2.1.1	Substructure												$0.00
		2.1.1.1	Foundations (general)	WPCP	N/A	Reinforced concrete	1974	60	42	18	4	• no evidence of building settlement or other poor foundation performance	$0.00
		2.1.1.2	Basement	WPCP	N/A	Reinforced concrete base slab and painted perimeter walls	1974	60	42	18	3	• Minor areas of delamination evidence or ferric chloride staining on walls near base slab indicating past leak. • New containment curb and Ferric draining system recently installed • Crack in south wall at stair landing surrounding concrete appeared to be solid/stable	$0.00
	2.1.2	Superstructure												$1,000.00
		2.1.2.1	Ground Floor Structure	WPCP	N/A	Reinforced concrete structural slab	1974	60	42	18	4	• No evidence of excessive deflections or cracking indicating distress • Painted top and bottom • Evidence of moisture below shower should be further investigated and repairs completed	$1,000.00
		2.1.2.2	Roof Structure	WPCP	N/A	Reinforced concrete structural slab	1974	60	42	18	4	• Review completed from ground floor level • No evidence of excessive deflections or cracking indicating distress or moisture damage	$0.00
		2.1.2.3	Walls	WPCP	N/A	Concrete block	1974	60	42	18	3	• Majority of walls covered with insulation, precluding review. Portions that were accessible for review in good condition • Horizontal crack on East wall in Mortar Joint below top course	$0.00
	2.1.3	Building Envelope												$1,000.00
		2.1.3.1	Roof	WPCP (exterior)	N/A	According to Keith, new roof installed in 2012	2012	60	4	56	4	• Roof not accessed for review. Less than 4 years old, no evidence of moisture within building	$0.00
		2.1.3.2	Cladding	WPCP (exterior)	N/A	Split face block cladding	1974	60	42	18	4	• Penetrations sealed with multiple different products. Some starting to crack - should repair	$1,000.00
		2.1.3.3	Doors	WPCP (exterior)	N/A	Hollow metal single and double doors	1974	60	42	18	3	• Overall behaving as intended • Paint is flaking and chipping • Could recoat doors and adjacent frames	$0.00
	2.1.4	Miscellaneous												$13,000.00

		2.1.4.1	Ferric Chloride Tank	WPCP (exterior)	N/A	Ferric chloride tank bearing on concrete pad	1974	60	42	18	2	• Ferrous clips angles and fasteners will corrode and damage concrete • Portion of slab spalled off on East side • Regrade area around building and tank to provide positive drainage • Perhaps provide secondary containment	$2,500.00
		2.1.4.2	Outlet / Mixing Chamber	WPCP (exterior)	N/A	Reinforced concrete channel with aluminum grating, baffles and handrails	1974	60	42	18	3	• visual review from above grating while in operation • staining of immersed components and concrete • Further investigation required • Recent aluminum railing repaired and concrete repaired	$500.00
		2.1.4.3	Aluminum Walkways	Aeration Basin	N/A	Aluminum walkway structure spanning between reinforced concrete piers	1974	60	42	18	2	• Aluminum railings and grating in good condition • Aluminum beams show widespread corrosion • Concrete components appeared to be performing as intended • Cast-in ferrous plates damaging concrete • Detailed review recommended	$10,000.00
2.2	Buliding Electrical													$12,000.00
	2.2.1 Building Electrical Assets													$12,000.00
		2.2.1.1	Service Transformer	Outside	N/A	3 cans on a Hydro pole. Secondary wiring O/H to building	2009	40	7	33	4	• Nameplate not visible • 100 A main disconnect • The transformer is utility owned so there is no replacement cost to the Municipality	$0.00
		2.2.1.2	Bio dome Facility	-	N/A	Shipping container with bio dome process. Fed via 30A, 240 V plug in feed	N/A	20	N/A	N/A	3	• Trailer has a small 240 V panel board for internal power distribution	$0.00
		2.2.1.3	Security System	Panel inside electrical room	N/A	-	2010	20	6	14	3	• Security system would be replaced by a security monitoring company; likely under the monitoring contract	$0.00
		2.2.1.4	Various Lighting	All areas	N/A	2-tube 4 feet long, fluorescent fixtures, open style	1977	20	39	-19	2	• Replacement cost is provided at cost per fixture	$500.00
		2.2.1.5	Emergency Lighting	Various	Lumacell	Double head emergency light c/w integral battery	2015	20	1	19	3	• Plug - in style	$0.00
2.3	Building Mechanical													$4,000.00
	2.3.1 Heating, Ventilation and Air Conditioning (HVAC) Systems													$3,000.00
		2.3.1.1	Unit Heater	Electrical Room	N/A	Electric forced air unit heater	1977	25	39	-14	3	• No signs of wear	$0.00
		2.3.1.2	Unit Heater	Basement	N/A	Electric forced air unit heater	1977	25	39	-14	3	• No signs of wear	$0.00
		2.3.1.3	Water Heater	Basement	Giant	Electrical water heater, 3kW, 240 / 1 / 60	1977	25	39	-14	2	• Corrosion at bottom due to ferric chloride leak	$3,000.00
		2.3.1.4	Cabinet Unit Heater	Office Vestibule	N/A	-	1977	20	39	-19	2	• Nameplate not visible	$1,500.00
	2.3.2 Bathroom Configuration													$1,000.00
		2.3.2.1	Sink	Bathroom	N/A	-	1977	25	39	-14	3	-	$0.00
		2.3.2.2	Water Closet	Bathroom	N/A	-	1977	25	39	-14	3	• Mounted on wood	$0.00
		2.3.2.3	Shower	Bathroom	N/A	-	1977	25	39	-14	3	-	$0.00
		2.3.2.4	Exhaust Fan	Bathroom	N/A	-	1977	25	39	-14	1	• Fan missing, replaced with outlet and a wall mounted fan	$1,000.00
		2.3.2.5	Service Sink	Basement	N/A	Plastic sink with faucets and eyewash station	1977	25	39	-14	3	-	$0.00
		2.3.2.6	Sump Pump	Basement	N/A	Sanitary sump pump	2014	25	2	23	3	• Life span could be shorted should ferric chloride leak	$0.00
	2.3.3 Miscellaneous													$0.00
		2.3.3.1	Water Service Entry	Basement	N/A	Water Meter, valves and piping	1977	25	39	-14	3	• Surface corrosion on pipes	$0.00
2.4	Process Mechanical													$0.00
	2.4.1 Original Aeration System													$0.00
		2.4.1.1	Aerator #1 (fixed)	In Lagoon, closest to control building	N/A	15 hp, 600 / 3 / 60 Mechanical aerator fixed into walkway	1977	25	39	-14	1	• Operator notes very poor mixing despite visual surface disturbance • Repairs made in 2013 • Although these aerators still run, new mechanical aerators (floating aerators) have been purchased and installed	$0.00
		2.4.1.2	Aerator #2 (fixed)	In Lagoon, furthest from control building	N/A	15 hp, 600 / 3 / 60 Mechanical aerator fixed into walkway	1977	25	39	-14	1	• Very poor mixing • Although these aerators still run, new mechanical aerators (floating aerators) have been purchased and installed	$0.00
	2.4.2 Updated Aeration System													$0.00
		2.4.2.1	Floating Aerator #1 (closest to shore)	In Lagoon	N/A	Mechanical aerator, floating on lagoon	2015	25	1	24	3	• Runs 24 / 7 • Very good mixing	$0.00
		2.4.2.2	Floating Aerator #2	In Lagoon (furthest from shore)	N/A	Mechanical aerator, floating on lagoon	2015	25	1	24	3	• Runs twice a day for 4 hours each time • Very good mixing	$0.00
	2.4.3 Chemical Feed System													$0.00

		2.4.3.1	Ferric Chloride Tank	Exterior	N/A	Double wall tank, originally used for alum, 6000 balloon capacity, insulated	1977	25	39	-14	3	• Valves and piping replaced 2 years ago • If tank is disturbed / moved, it could risk damage and should be replaced at that time	$0.00
		2.4.3.2	Ferric Chloride Pump #1	Basement	Wallace & Tiernan Premia 75 (Siemens)	Solenoid metering pump, 120 / 1 / 60, 37.5 L/h @ 2.4 Bar Max.	2016	25	0	25	3	• Operator notes pumps operating well • Piping installed in 2010 and is in good condition	$0.00
		2.4.3.3	Ferric Chloride Pump #2	Basement	Wallace & Tiernan Premia 75 (Siemens)	Solenoid metering pump, 120 / 1 / 60, 37.5 L/h @ 2.4 Bar Max.	2013	25	3	22	3	• Operator notes pumps operating well • Piping installed in 2010 and is in good condition	$0.00
		2.4.3.4	Flash Mixer	Exterior Mixing Chamber	Lightnin Mixer	3 hp, 600 / 3 / 60	1977	25	39	-14	3	• Runs quietly • No signs of corrosion • Repairs in 2009 & 2014	$0.00
		2.4.3.5	Hand Gate	Exterior Mixing Chamber	N/A	Hand gate	-	-	-	-	3	• No signs of wear	$0.00
2.5	Process Electrical													$63,500.00
	2.5.1 Process Electrical Assets													$63,500.00
		2.5.1.1	Main Disconnect	Electrical Room	Eaton	100 A, 600 V, 3P	2009	20	7	13	3	• Installed at the same time as the new service transformer. • Original pole fell and pulled wiring out of MCC	$0.00
		2.5.1.2	MCC	Electrical Room	Square D	100 A, 600 V, 3 sections	1977	30	39	-9	2	• Integrated 12 circuit 100 A 120 / 240 V panel board	$60,000.00
		2.5.1.3	Aerator #1 Disconnect	Electrical Room	Square D	60 A, 600 V	2015	20	1	19	3	-	$0.00
		2.5.1.4	Aerator #2 Disconnect	Electrical Room	Square D	60 A, 600 V	2015	20	1	19	3	-	$0.00
		2.5.1.5	Aerator #1 Timer	Electrical Room	Intermatic	-	2015	20	1	19	3	-	$0.00
		2.5.1.6	Aerator #2 Timer	Electrical Room	Intermatic	-	2015	20	1	19	3	-	$0.00
		2.5.1.7	Aerator #1 Control Panel	Electrical Room	N/A	-	2015	20	1	19	3	-	$0.00
		2.5.1.8	Aerator #2 Control Panel	Electrical Room	N/A	-	2015	20	1	19	3	-	$0.00
		2.5.1.9	Splitter	Electrical Room	Eurobex	125 A, 600 V	2015	20	1	19	3	-	$0.00
		2.5.1.10	Level Meter	Office (transmitter)	Milltronics MultiRanger Plus	Meter level in the Ferric Chloride Tank	1990	20	26	-6	1	• Reading not very reliable • Affected by temperature	$3,500.00
		2.5.1.11	Ferric Chloride Pump Panel	Basement	N/A	-	2009	20	7	13	3	-	$0.00
		2.5.1.12	Flow Meter (flume)	Office (transmitter)	Siemens LUT 400	Flume Measures Flow from the aeration cell to the lagoon	2015	20	1	19	3	-	$0.00

APPENDIX ‘B’

Reference Photos: Harbour Street Sewage Pumping Station

Location ID01: Harbour Street Sewage Pumping Station

ID01_AS01: Sewage Pumping Station Located at Grade

ID01_AS02: Water Damage and Concrete Repairs

ID01_AS03: Water Damage and Concrete Repairs

ID01_AS04: Ferrous Staining on Concrete Slab

ID01_AS05: Unguarded Sump Pit

ID01_AS06: Ferrous Fasteners on Aluminum Access Ladder

ID01_AS07: Paint Coating Damaged by Water

ID01_AS08: Insulation Covering Concrete Superstructure

ID01_AS09: Face Shell Cracking and Spalling

ID01_AS10: Perimeter Drip Edges

ID01_AS11: Cracked, Delaminated and Spalled Concrete Stair Riser

ID01_AS12: Insufficient Guardrail Height

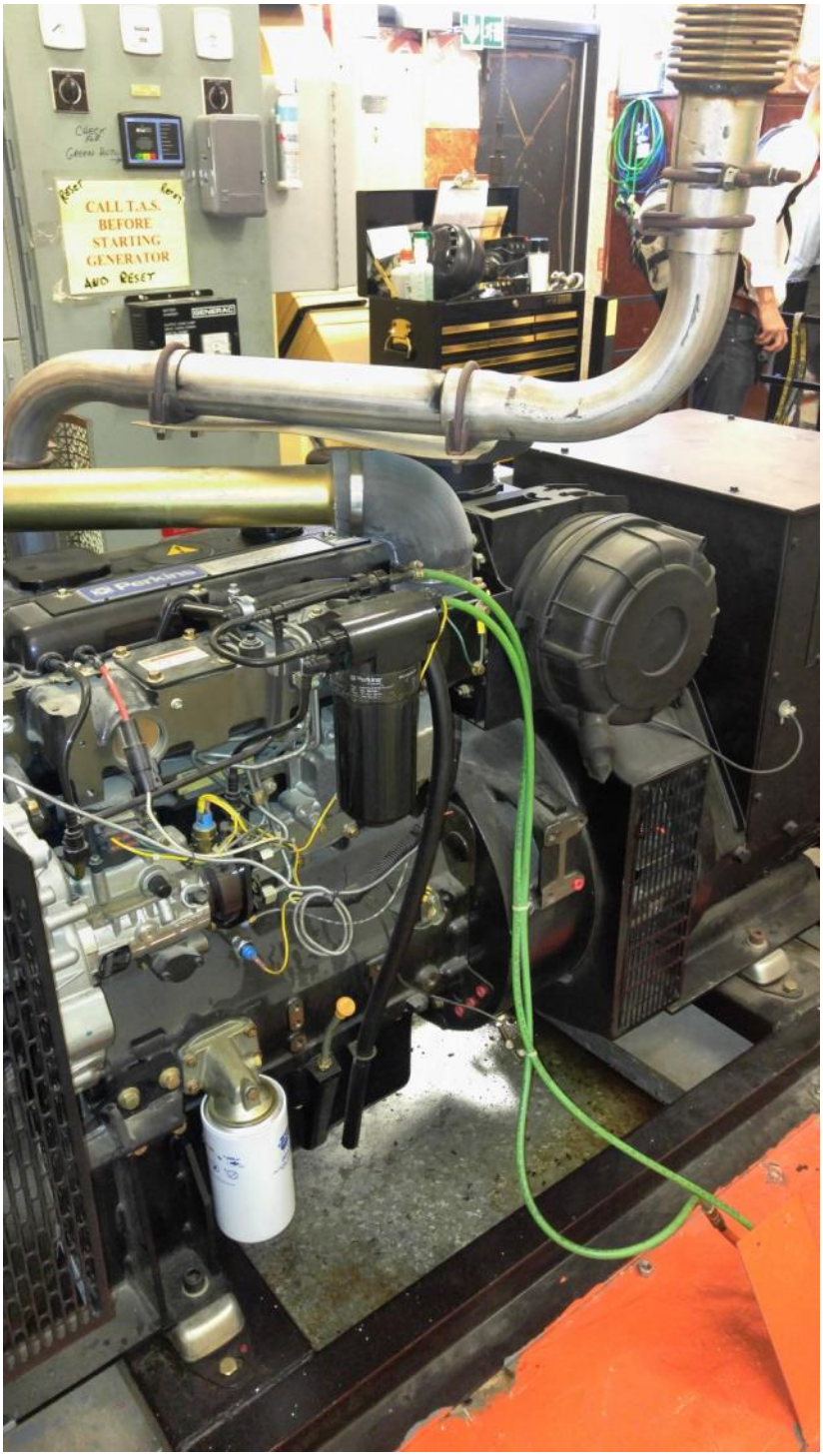
ID01_AS13: Ferrous Handrail

ID01_M01: Generator Room Exhaust Fan

ID01_M02: Electric Unit Heater

ID01_M03: Raw Sewage Pumps

ID01_M04: Rusted Piping in the Dry Pit



ID01_M05: Backup Generator

ID01_E01: 120 V Transformer and Top of MCC

ID01_E02: Inaccessible Light Fixture

ID01_E03: Clearance between MCC and Generator Battery

ID01_E04: Old Service Transformers

ID01_E05: Pressure Switches

ID01_E06: MCC and ATS

ID01_E07: Magnetic Flowmeter Videographic Recorder

ID01_E08: Level and Magnetic Flowmeter Transmitters

APPENDIX ‘C’

Reference Photos: Brighton Wastewater Treatment System

Location ID02: Water Pollution Control Center

ID02_AS01: Water Pollution Control Center

ID02_AS02: Stains on Floor and Walls from Past Ferric Chloride Leak

ID02_AS03: Crack in Basement Wall

ID02_AS04: Paint Coating Damaged by Moisture

ID02_AS05: Perimeter Drip Edges

ID02_AS06: Brittle and Cracking Seal

ID02_AS07: Potential Pathway for Water and Insects

ID02_AS08: Paint Flaking and Chipping from Doors

ID02_AS09: Stains from Ferric Chloride Ions

ID02_AS10: Spalled and Broken Concrete Slab

ID02_AS11: Ferrous Staining on Brick

ID02_AS12: Recently Upgraded Cast in Railings

ID02_AS13: Aluminum Walkway

ID02_AS14: Corrosion on Aluminum Walkway

ID02_AS15: Corrosion on Aluminum Walkway

ID02_AS16: Damaged Concrete from Cast-in Plates

ID02_M01: Washroom Exhaust Fan

ID02_M02: Corrosion at the Base of the Hot Water Heater

ID02_M03: Outdoor Ferric Chloride Tank

ID02_M04: New Mechanical Aerators

ID02_E01: Corroded Conduits to Ferric Chloride Tank

ID02_E02: Starters for New Floating Aerators

ID02_E03: MCC and Service Disconnect

ID02_E04: Ferric Chloride Control Panel

ID02_E05: Level and Flowmeter Transmitters