

PUBLIC INFORMATION CENTRE

May 29, 2017

MUNICIPALITY OF BRIGHTON

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

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PROJECT LOCATION AND OVERVIEW

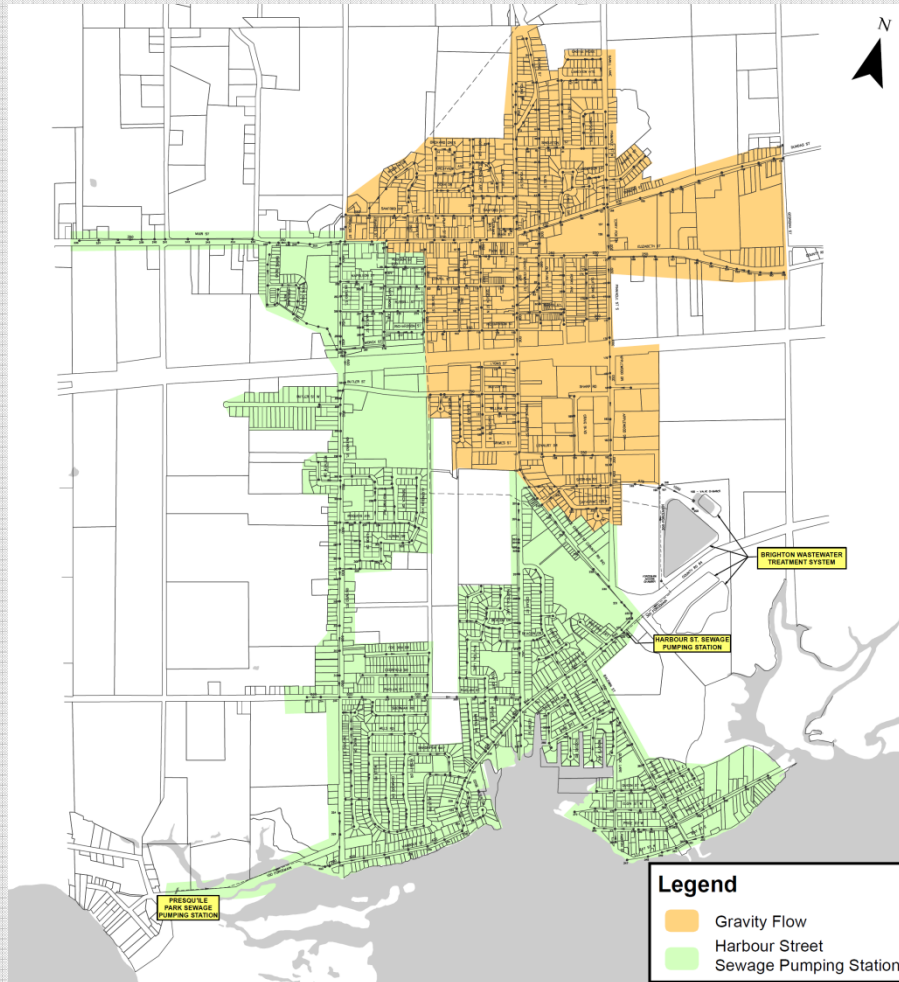


Figure 1 – Brighton Wastewater Collection System

- Several kilometres of gravity collection sewers
- Pumping Stations:
 - One main pumping station on Harbour Street
 - One small pumping station at Presqu'ile Park
- Approximately half of the sewage generated is directed to the Harbour Street Sewage Pumping Station and pumped via forcemain to the lagoon and the other half flows by gravity directly to the lagoon

BRIGHTON LAGOON TREATMENT SYSTEM



Figure 2 – Brighton Lagoon Treatment System Site Plan

- A wastewater treatment system consisting of:
 - A pre-aeration lagoon cell (0.68 ha)
 - A single facultative stabilization lagoon cell (5.44 ha)
 - A constructed wetland (6.2 ha)
 - A chemical storage/feed system

- Brighton Lagoon Treatment System is:
 - A continuously operated system that discharges year-round
 - Currently rated for 4,600 m³/d average day flow
 - A Class 1 treatment facility operating under the MOECC ECA No. 3081-9XQNZK
 - Historically operating at about 60 - 70% of its rated average day flow capacity

PURPOSE OF THIS STUDY

- To evaluate the Brighton Wastewater System and to identify what is required for it to perform effectively and in accordance with regulations over a 20 year planning period.

SUMMARY OF PROBLEM / OPPORTUNITY STATEMENT

- Difficulties have been experienced in meeting effluent quality compliance criterion and objectives, particularly for ammonia and phosphorus
- The existing wastewater treatment system “struggles” with performance sometimes as a result of:
 - Relatively high organic loading (e.g. Ammonia)
 - Potential hydraulic short circuiting in the lagoon
 - Limited retention time in the lagoon
 - Sludge accumulation
 - Lack of a dedicated nitrification process for ammonia removal
- The Constructed Wetland is not providing significant additional treatment
- Aging infrastructure at the Harbour Street Sewage Pumping Station and the lagoon requires upgrades to maintain the appropriate level of service.
- It has been determined that the current Environmental Compliance Approval (ECA) rated hydraulic capacity does not need to increase for the next 20-year planning horizon.

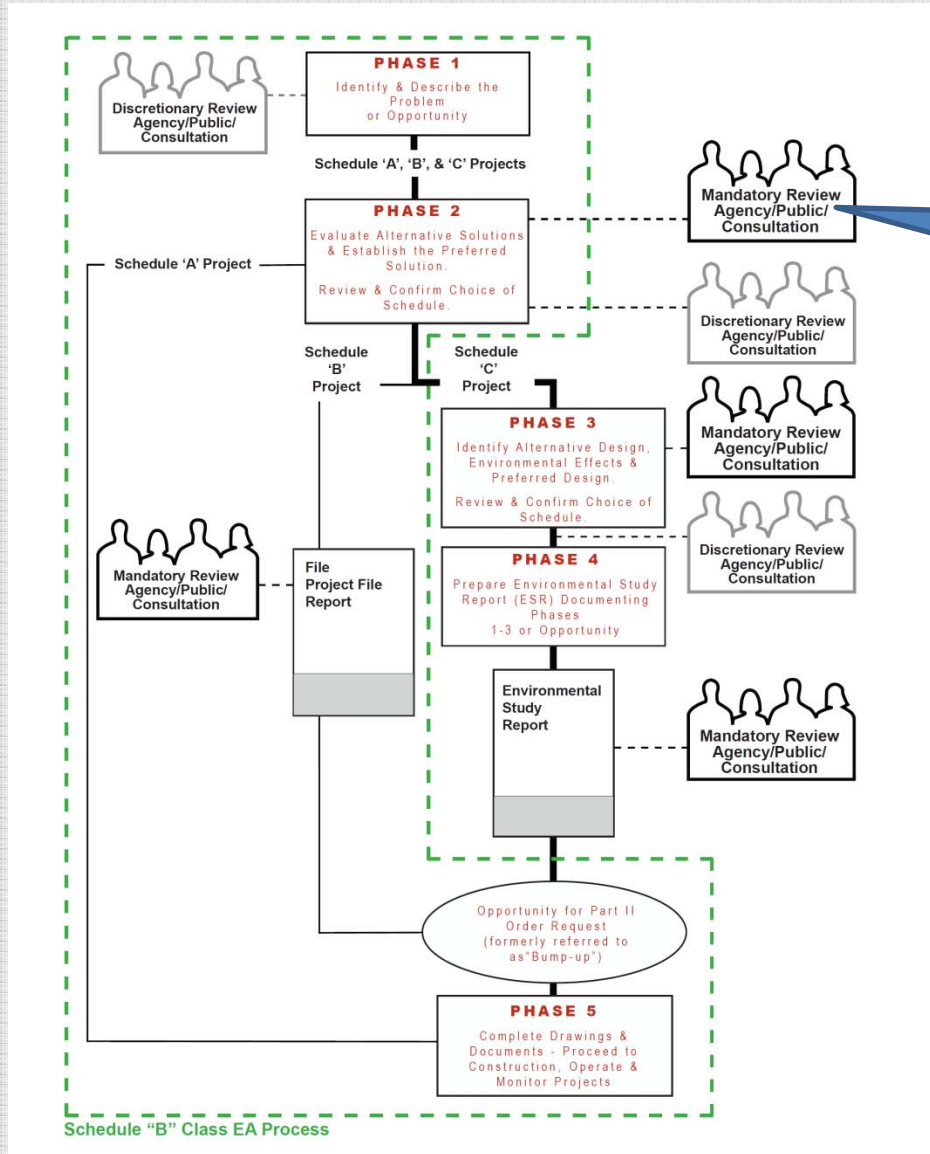
PHASE 1 PROBLEM AND OPPORTUNITY STATEMENT

“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 6,462 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 \$500,000 in infrastructure rehabilitation and maintenance is required.”

OVERVIEW OF THE SCHEDULE B CLASS EA PROCESS



We are here

THE MUNICIPAL CLASS EA PROCESS

- What is a Municipal Class Environmental Assessment ?



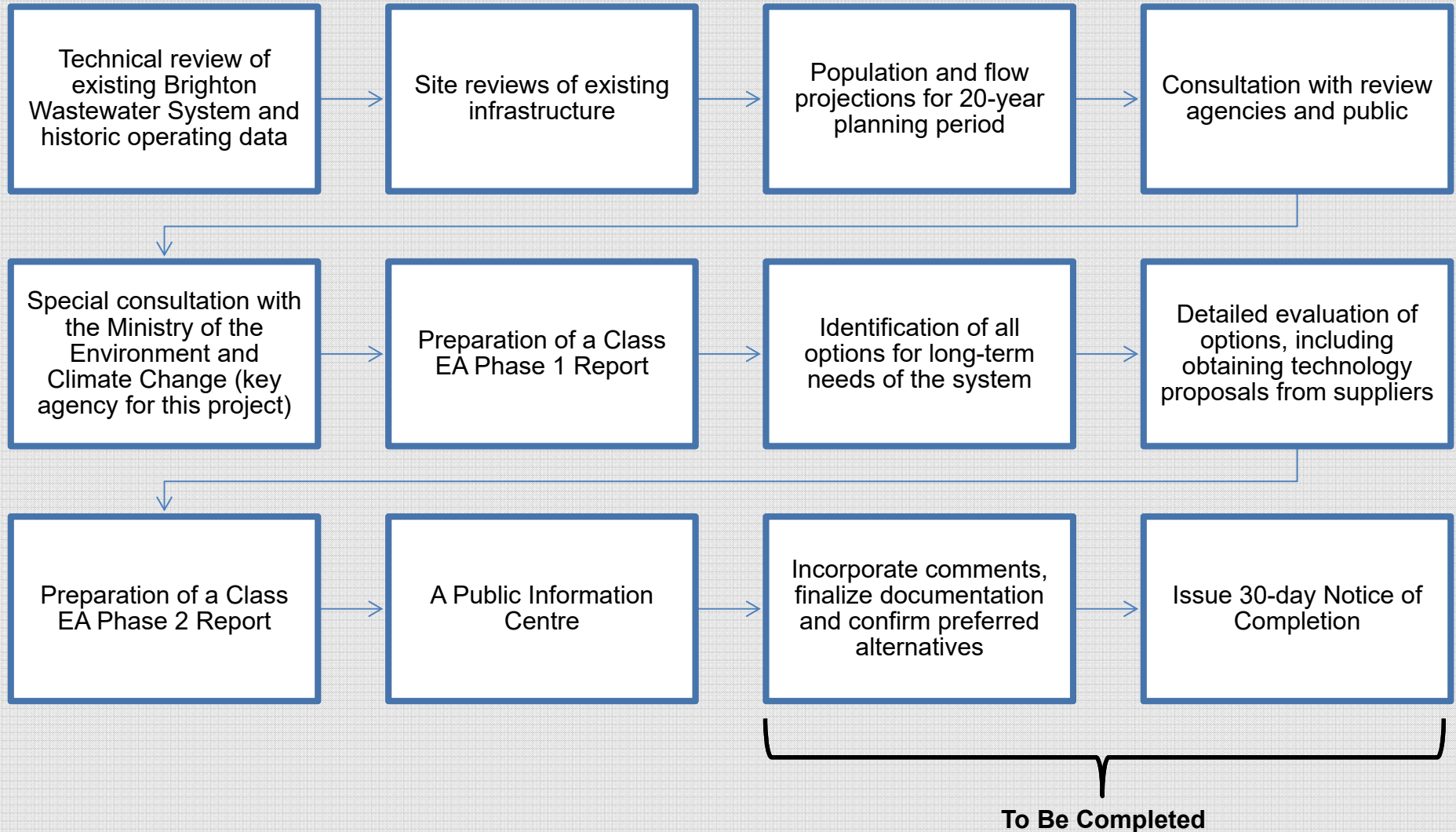
- A **self-assessment** process by which municipal infrastructure projects will be planned in accordance with the Environmental Assessment Act
- The Class EA provides for:
 - the identification of problems or opportunities;
 - the **identification, evaluation and selection** of a preferred means of addressing the problems or opportunities, giving due regard to the need to **protect the environment and minimize environmental effects**; and
 - doing the foregoing with the **involvement of affected stakeholders** in the decision-making process

THE MUNICIPAL CLASS EA PROCESS

- Municipal Projects can involve:
 - Road Projects
 - Transit Projects
 - Water Projects
 - **Wastewater Projects**

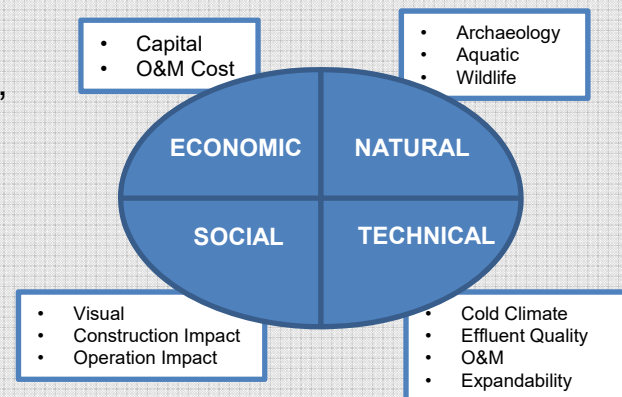
- Projects have various levels of complexity:
 - **Schedule A** projects are limited in scale and are pre-approved.
 - They have minimal adverse effects and often involve normal and maintenance activities
 - **Schedule A+** projects are pre-approved with public notification.
 - **Schedule B** projects have the potential for some adverse impacts.
 - There is mandatory contact with public and review agencies to ensure they are aware of the project and that their concerns are addressed.
 - **Schedule C** projects have the potential for significant adverse impacts.
 - There is mandatory full screening process including filing of an Environmental Study Report (ESR)
 - Generally for construction of new facilities and major expansions (ie. New Mechanical Sewage Treatment Plant)

SUMMARY OF WORK COMPLETED AS PART OF THIS CLASS EA



IDENTIFICATION OF ALTERNATIVE SOLUTIONS

- All options were evaluated against their impact to the natural, social, technical and economic environment.
- The impact for each criterion relative to each potential solution was assessed and evaluated.
- Key consideration was given to whether the option addresses the existing problem and conditions.



OPTION	DESCRIPTION	EVALUATION
1	Do Nothing	<ul style="list-style-type: none"> • Effluent continues to exceed compliance limits • Negative effect on the environment • Existing problem not addressed
2	Optimize and Modify Current Lagoon Operation <ul style="list-style-type: none"> a. Remove sludge from lagoons ✓ b. Optimize and upgrade existing baffles ✓ c. Modify lagoon operating volume and aeration ✗ d. Optimize alum dosage for phosphorus removal ✓ e. Upgrade and refurbish the constructed wetland ✓ f. Investigate and divert high strength wastewater stream from lagoon ✓ 	<ul style="list-style-type: none"> • Various optimization and modification measures identified not sufficient to address the existing effluent quality issues • These measures should be carried forward in addition to the preferred solution for improved performance
3	Install Specialized Treatment System to Complement Existing Lagoon System	<ul style="list-style-type: none"> • Meets effluent design and compliance limits • Addresses existing conditions and constrains • Modest capital, operation and maintenance costs
4	New Mechanical Treatment Plant	<ul style="list-style-type: none"> • Improved treatment performance • High capital, operation and maintenance costs

*** RECOMMENDED
PREFERRED
SOLUTION
(WITH
MODIFICATIONS TO
EXISTING LAGOONS)**







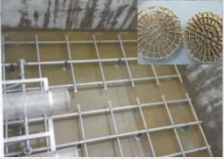



DESCRIPTION OF THE RECOMMENDED PREFERRED SOLUTION

1. Installation of a specialized treatment system, either upstream or downstream of the lagoon, to complement the treatment performance of the existing facility and to target ammonia removal
2. Lifecycle upgrades at Harbour Street Pumping Station and Lagoon
3. Various other upgrades to the existing facility, including:
 - De-sludge the existing lagoon
 - Enhance baffling in the stabilization lagoon
 - Optimize chemical dosage
 - Refurbish the constructed wetland
 - Further investigate reasons for high strength wastewater

Opinion of Probable Costs for the Recommended Preferred Solution:
\$6,500,000 (including engineering and contingency, excluding HST)

EXAMPLES OF AVAILABLE SPECIALIZED TREATMENT TECHNOLOGIES

<p>Option A: Complete Mix Activated Sludge Process</p>	<p>Option B: Submersible Aerated Bio-film Reactor</p>	<p>Option C: Submerged Attached Growth Reactor</p>
		
<ul style="list-style-type: none"> ▪ Install within the existing aerated lagoon ▪ Suspended growth environment for biomass ▪ Aeration and mixing provided by blowers and diffusers ▪ Proven technology in cold climate ▪ Reliable performance with no new tankage or building 	<ul style="list-style-type: none"> • Install the new system within the stabilization lagoon • Attached growth environment for biomass • Very limited installation in cold climate • Expensive capital investment 	<ul style="list-style-type: none"> • Install new tankage downstream of the wetland • New tankage to house attached growth reactors • Upgrade aeration system in aerated and stabilization lagoons • Proven technology in cold climate • High quality effluent
<p>Option D: Fixed Film Biological Process (Upstream)</p>	<p>Option E: Fixed Film Biological Process (Downstream)</p>	<p>Option F: Activated Sludge with Membrane Technology</p>
		
<ul style="list-style-type: none"> • New treatment tanks in part of aerated lagoon • Existing lagoons acts as clarifiers to polish effluent • Proven technology in cold climate 	<ul style="list-style-type: none"> • New treatment tank downstream of the stabilization lagoon • Proven technology in cold climate 	<ul style="list-style-type: none"> • A combination of activated sludge process and membrane technology • New treatment tank within aerated lagoon • Provides highest level of treatment • Most expensive capital investment

EXAMPLE CONCEPT – OPTION E



Figure 3 – Future Brighton Lagoon Treatment System Conceptual Layout

Fixed Film Biological Process (MBBR) Downstream of Lagoons

- Targets ammonia removal in the lagoon effluent to meet compliance requirements
- Small footprint
- Very limited operation and maintenance requirements
- Easily expandable in the future (if required)
- Proven technology in cold climate
- Least intrusive to existing site layout



NEXT STEPS

CURRENT
TASKS



FUTURE
TASKS

- Obtain and evaluate public, stakeholders and agency comments and confirm the preferred solution
 - Issue Schedule 'B' Class EA Project 30-day Notice of Completion and advise public and stakeholders
 - Following the 30-day public review period, finalize Class EA documents
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- Proceed to preliminary and detailed design and project implementation
 - Estimated schedule to implement the recommended solution:
 - Design Phase: 8 to 12 months
 - Construction Phase: 12 to 18 months

THANK YOU!
Your Comments are Important to Us

**YOUR COMMENTS WILL BE CONSIDERED
IN THE FINAL ASSESSMENT AND
EVALUATION OF THE PREFERRED
SOLUTION**



Ongoing information about this project can be found at www.brighton.ca

