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ENGINEERS · ARCHITECTS · PLANNERS

TOWNSHIP OF
North Dundas

TOWNSHIP OF NORTH DUNDAS
WINCHESTER SEWAGE TREATMENT SYSTEM UPGRADES
MUNICIPAL CLASS ENVIRONMENTAL ASSESSMENT

PUBLIC INFORMATION CENTRE

WELCOME!

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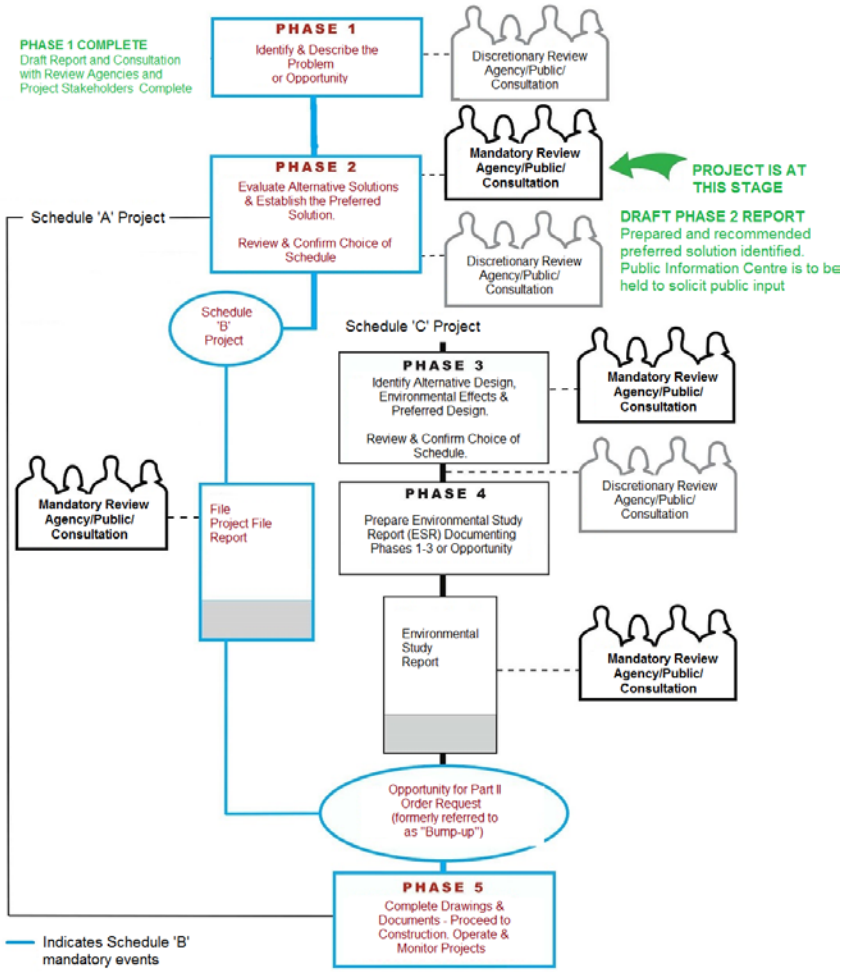
Problem and Opportunity Statement

"A review of the Winchester Sewage Treatment System (STS) suggests that there are operational constraints limiting the capacity of the lagoon as demonstrated by recent challenges in achieving effluent quality requirements as well as discharging effluent within the allotted discharge windows. As a result, the Township of North Dundas is undertaking a Class Environmental Assessment (Class EA) to evaluate options to upgrade the Winchester STS that consider current and future loadings to the lagoon, address operational issues related to achieving effluent quality, and ensure that the 20-year community growth is adequately planned for and accommodated. The Class EA will consider the level of adequacy of wastewater treatment at the lagoon and will recommend a solution to address the findings in accordance with the Municipal Class EA, 2015 process."

Overview of the Schedule 'B' Class EA Process



- ✓ Notice of Study Commencement
- ✓ Phase 1 – Identification of Problem or Opportunity
- ✓ Phase 2 – Evaluation of Alternative Solutions and Identification of Recommended Solutions
- ✓ Review Project Schedule

Public Information Centre No. 1

Place Project File Report on Public Record for 30-day Review Period

Existing Conditions and Constraints

- The current system consists of three (3) primary facultative lagoon cells operated in parallel (Cells No. 1, 2 and 3), one polishing cell (Cell No. 4), and one post-aeration cell (Cell No. 5) with a rated capacity of 2,220 m^3/day. Total phosphorous is controlled by a continuous feed phosphorous removal system (alum). Treated effluent is discharged to the South Nation River in the spring and the fall.

CONSTRAINTS:

- Although the treated effluent quality has been within the C of A compliance requirements based on average seasonal concentrations, individual samples from the treated effluent have exceeded the total ammonia nitrogen (TAN), total suspended solids (TSS) and total phosphorus (TP) effluent objectives in past years.
- Treated effluent quality has been above the C of A objectives for undissociated hydrogen sulphide (H_2S) and the average concentration was at the C of A limit during the spring of 2013.
- Limited Township-owned land available for expanding the lagoon cells.
- There are operational challenges related to operating within allowable effluent discharge periods (e.g. high early-spring TAN levels), the “ice free cover” requirement, the minimum 21-day discharge requirement and the effluent dilution ratios.
- These above-noted challenges create discharge constraints (e.g., extended winter storage period) which increase storage requirements. This issue may be exacerbated by high wet weather flows.

Preliminary Evaluation of Alternatives

The options were pre-screened and the following options were not carried forward for further evaluation:

Option 2A – Increasing the dimensions of the primary facultative cells

- Expanding the surface area is limited
- Maximum recommended sewage depth in facultative lagoons is 1.8 m (MOECC 2008); current effective depths range between 2.5 m and 3.0 m
- Does not address issues associated with discharge constraints or effluent quality

Option 2B – Modifying the primary facultative lagoon cells to aerated cells

- Deepening of the cells required to maintain effective storage volume
- Significant capital and operational costs
- Only reduces a fraction of the ammonia levels needed to meet proposed effluent criteria
- Does not address issues associated with discharge constraints or effluent quality

Option 5 – New Mechanical Treatment Plant

- Significant changes to the site and operations would be required (i.e. decommission existing lagoon system and reuse part of the lagoon cells for equalization storage)
- Significant capital and operational costs relative to other options considered

Screened Alternative Solutions

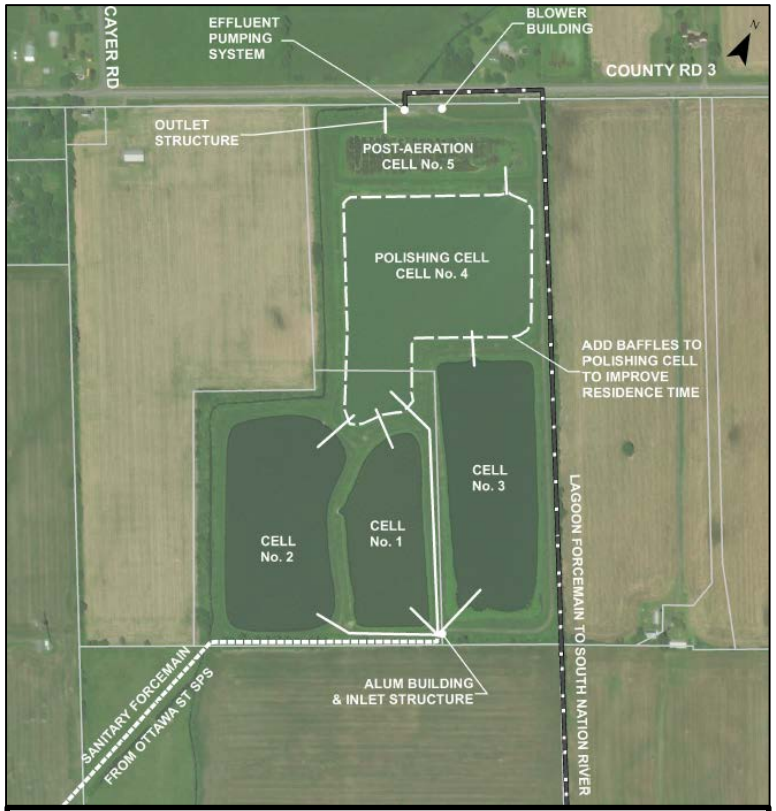
Option 1 – Do Nothing

Implies maintaining status quo - Generally carried forward for detailed assessment as a baseline for review.

Option 2 – Optimize/Modify Current Lagoon

Option 2C – Add baffles to Cell No. 4 – (Polishing Cell)

- Does not address all of the identified problems on its own
- Could provide some additional treatment by increasing lagoon retention time and preventing short-circuiting
- Carried forward but only as an <u>option to be considered in combination with other alternatives</u>



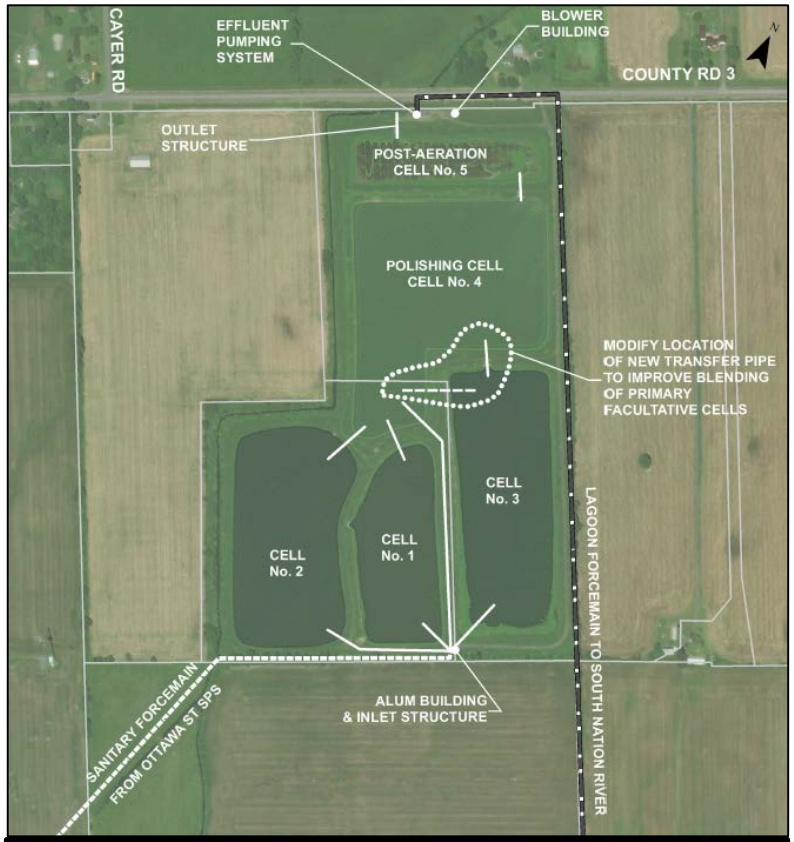
Option 2C

Screened Alternative Solutions

Option 2 – Optimize/Modify Current Lagoon

Option 2D – Enhancing blending of primary facultative cells into Cell No. 4

- Does not address all of the identified problems on its own
- Could provide some additional treatment by producing a more consistent quality of effluent discharge (i.e. minimize potential large fluctuations in effluent samples)
- Carried forward but only as an option to be considered in combination with other alternatives



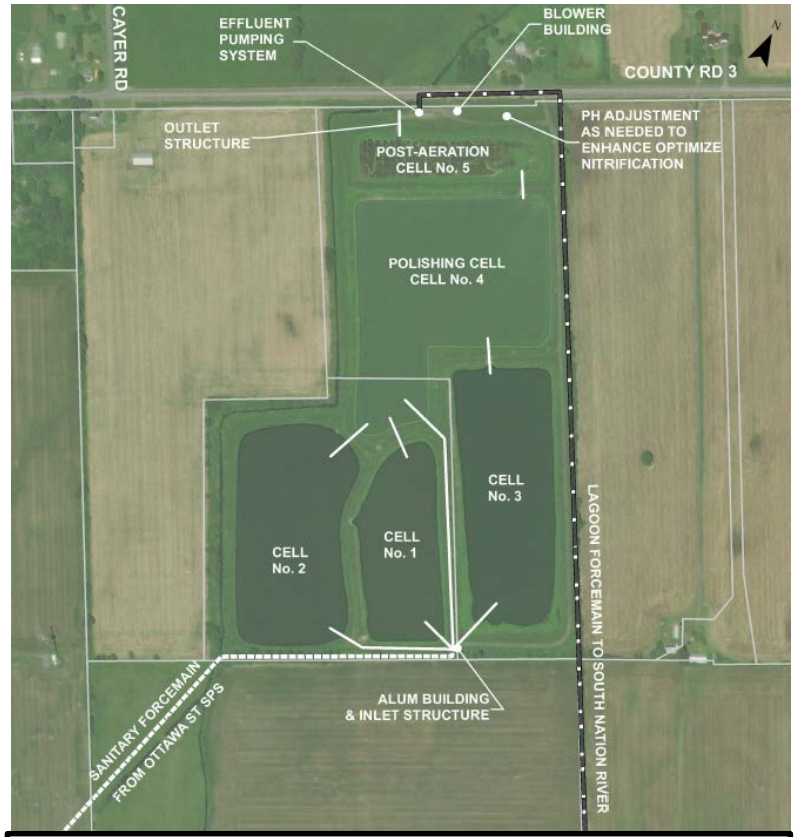
Option 2D

Screened Alternative Solutions

Option 2 – Optimize/Modify Current Lagoon

Option 2E – Adjusting pH prior to discharge

- Does not address all of the identified problems on its own
- Could provide some additional treatment by improving nitrifier growth rates (i.e. reduces ammonia levels in effluent discharge)
- Carried forward for review during preliminary design but only as an option to be considered in combination with other alternatives



Option 2E

Screened Alternative Solutions

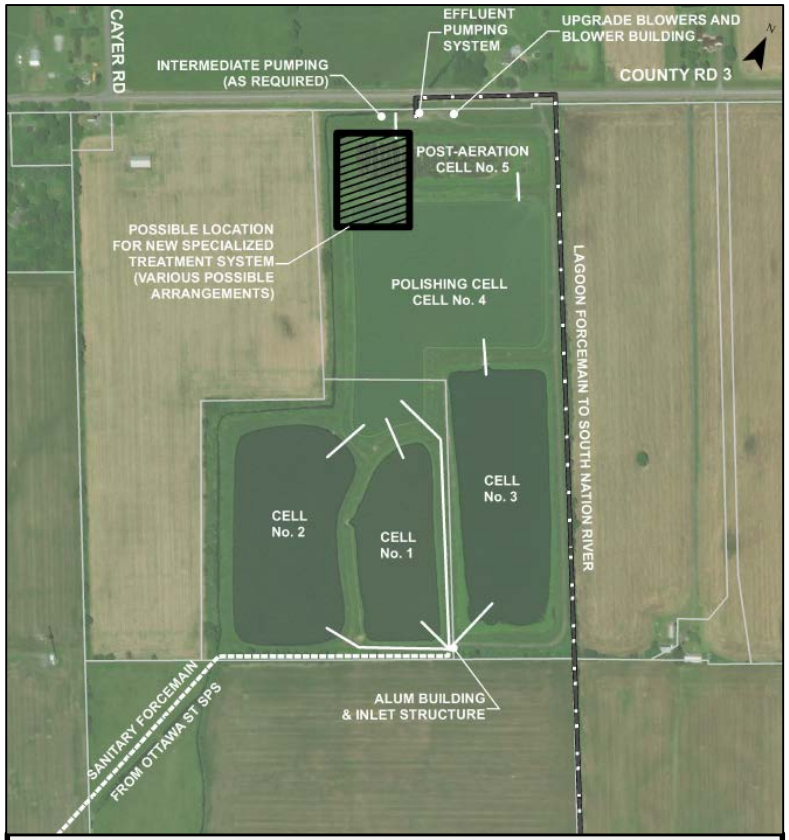
Option 3 – New Specialized Treatment System with Existing Discharge Windows

- **Current discharge periods:**
  - **March 1 to April 30 (Spring)**
  - **November 1 to December 31 (Fall)**

✓ More consistent and improved effluent quality can be maintained over longer periods including winter months

✓ Specialized treatment systems have the ability to target the ammonia effluent quality issue

✓ Can be implemented within Township-owned lands



Option 3

Screened Alternative Solutions

Option 4: New Specialized Treatment System with New Discharge Windows

- **Proposed discharge periods:**
  - **January 1 to May 15 (Spring/Winter)**
  - **November 1 to December 31 (Fall)**

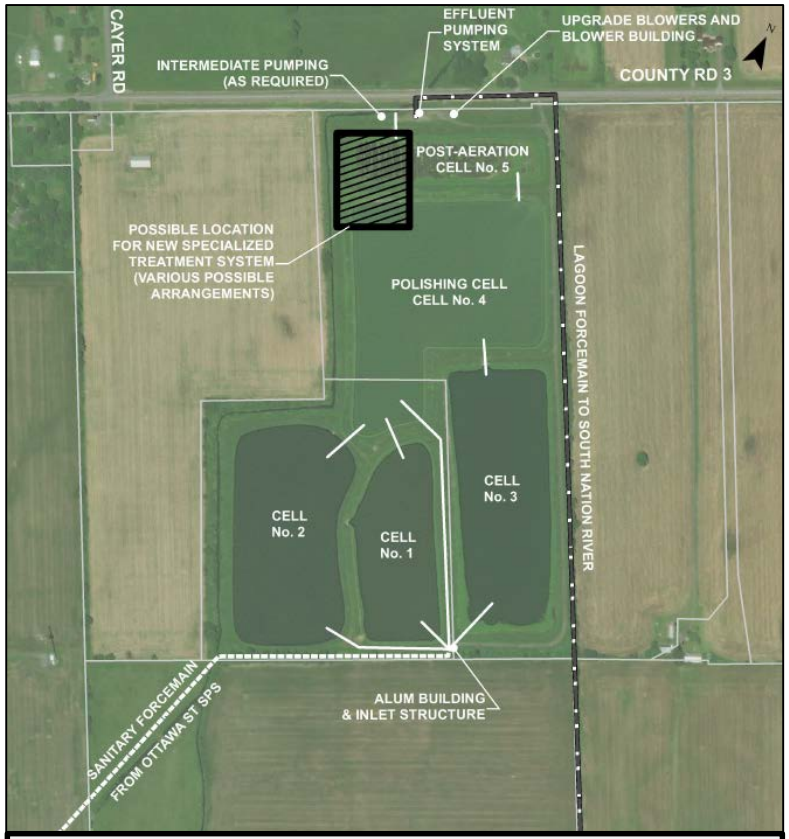
✓ More consistent and improved effluent quality can be maintained over longer periods including winter months

✓ Specialized treatment systems have the ability to target the ammonia effluent quality issue

✓ Can be implemented within Township-owned lands

✓ Discharging over longer periods (i.e. during winter months) can provide more opportunities to optimize the new treatment technology

✓ Longer discharge periods can reduce storage requirements and lower more consistent discharge rates can be maintained

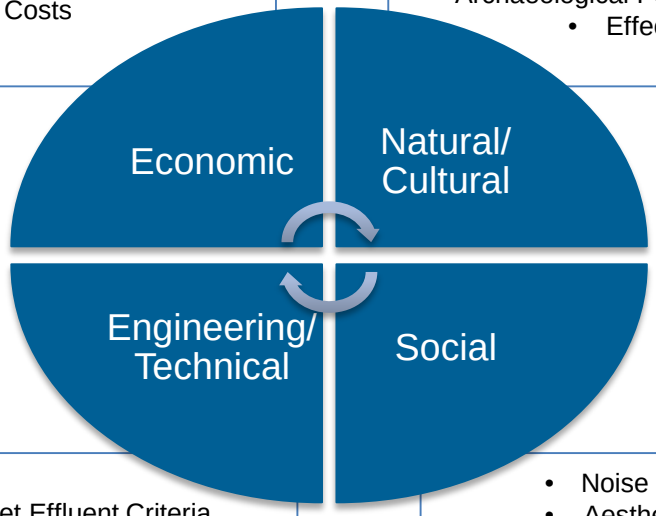


Option 4

Evaluation of Alternative Solutions

- Capital Cost
- Operating Costs

- Effect on Aquatic/Wildlife Habitat
- Archaeological Potential
- Effect of Receiving Water



- Ability to Meet Effluent Criteria
- Ease of Operation and Operational Flexibility
- Proven Cold Weather Installations
- Impact to Existing Infrastructure
- Opportunities for future Expansion

- Noise and Odour
- Aesthetics
- Impacts during Construction
- Compatibility with Surrounding Land Use

- All screened alternative solutions were evaluated against their impact to the natural, cultural, social, and economic environments

Impact Level	Score
High Positive Impact	4
Moderate Positive Impact	3
No Impact	2
Moderate Negative Impact	1
High Negative Impact	0

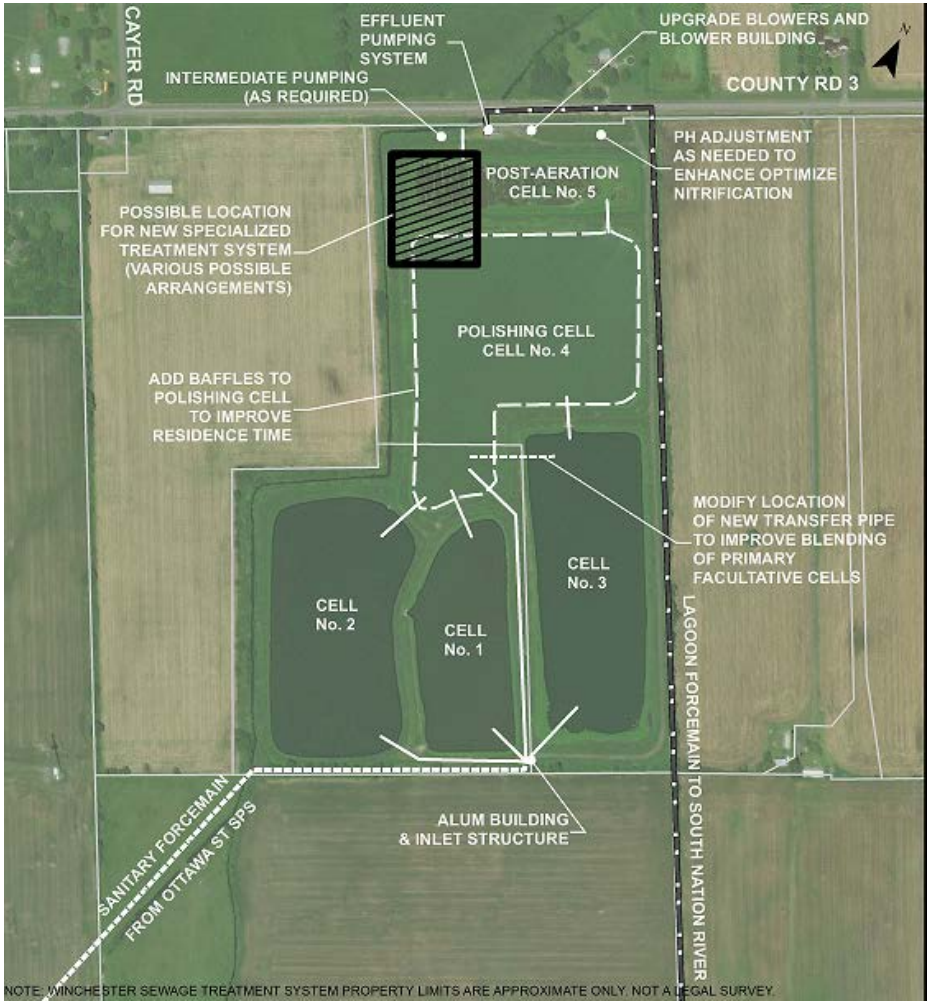
- The relative impact for each criterion relative to each potential screened solution was assessed based on a scoring system

Evaluation of Alternative Solutions (Ranking)

Option	Score	Rank	Comments
Option 1: Do Nothing	25	**3**	- Does not address operational challenges in discharging the lagoon effectively during allotted discharge windows - Does not improve quality of effluent discharged - Lowest capital and operating cost
Option 3: New Specialized Treatment System and Existing Discharge Periods	32	**2**	- Improves effluent quality - Reduces operational challenges in discharging the lagoon during the existing full discharge window - Less flexibility to discharge effluent at more consistent rates and to discharge total effluent volumes under minimum stream flows (compared to Option 4)
Option 4: New Specialized Treatment System and New Discharge Periods **Preferred Alternative**	34	**1**	- Improves effluent quality - Provides increased flexibility to discharge total effluent volumes under minimum stream flows - Longer discharge periods can reduce storage requirements and provide opportunities to maintain more consistent discharge rates and optimize the new treatment technology

- NOTE: Options 2C, 2D and 2E were only considered in combination with the above alternatives, and were therefore not evaluated

Identification of Preferred Solution



Estimated Treatment Upgrade Costs

Description	Estimated Capital Cost[1]
Option 4 - Install Specialized Treatment System	$5,500,000
Option 2C - Add Baffles to Cell No. 4	$200,000
Option 2D - New Transfer Pipe, Maintenance Structure and Valve to Improve Blending into Cell No. 4	$150,000
Grand Total (rounded)	**$5,850,000**

1. Engineering and Contingency of 35% was included in the above estimated capital cost

- Option 2E (pH adjustment) should be further evaluated during preliminary design.

Next Steps

- Consider Comments from this Public Information Centre
- Confirm the Preferred Solution
- Finalize Phase 2 Report
- Issue Notice of Completion
- Post the Class EA Project File for a 30-day Review Period

THANK YOU

Your Comments are Important to Us

Please complete a comment sheet and place it in the box provided or e-mail it to us at the noted address by January 25, 2019

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.northdundas.com

E-mail address for comments: sgore@jlrichards.ca